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INTERIM FINAL BASELINE HUMAN HEALTH RISK ASSESSMENT

VOLUME II OF III

Centredale Manor Restoration Project Superfund Site North Providence, Rhode Island

TABLES

Table 1.1
Baseline Human Health Risk Assessment Approach

Baseline Human Health Risk Assessment – Workplan Addendum
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Timeframe	Receptor	Exposure Point	Activity	Exposure Medium	Exposure Route*	Previous Evaluations	RI/FS Approach
Current/Future	Commercial/ Industrial Worker	Commercial property @ NE corner of Lyman Mill Pond; commercial properties on bank of Lyman Mill Pond.	Working or taking breaks outdoors	Surface soil	Direct contact	Not applicable.	Will not be evaluated in RI/FS because accessible parts of commercial properties appear to be above the flood level of Lyman Mill Pond.
			Working indoors	Groundwater	Inhalation of volatiles that migrate from the subsurface to indoor air of current buildings.	Not applicable.	Not included; site-related VOCs not likely to be found in groundwater in Lyman Mill Pond area.
		John E. Fogarty Center	Working or taking breaks outdoors	Surface soil	Direct contact	Human Health Risk Assessment in progress.	Included in RI/FS
			Working indoors	Groundwater	Inhalation of volatiles that migrate from the subsurface to indoor air of current buildings.	Not applicable.	Not included; site-related VOCs not likely to be found in groundwater in Lyman Mill Pond area.
	Visiting Subsistence Angler	Greystone Mill Pond, Assapumpset Brook, Allendale Pond, Lyman Mill Pond. Manton Reach, Dyerville Reach	Angling, fish consumption	Aquatic biota tissue	Ingestion	Human Health Biota Consumption Risk Assessment in progress	Included in RI/FS. Data will be included in assessment of cumulative risk to subsistence anglers.
			Wading (while angling)	Surface water/aquatic sediment	Direct contact	EPA screening in 1998 using 1996 data (2/24/98 memo from Ann-Marie Burke to Woonasquatucket Team)	Data will also be included in assessment of cumulative risk to visiting subsistence anglers.
		Recreational areas along bank of Greystone Mill Pond, Allendale and Lyman Mill Pond	Walking to access angling locations	Bank surface soil	Direct contact	Streamlined HHRA in EE/CA (TtNUS, 2000); report was basis for NTCRA	Post-removal existing bank data will be included in assessment of cumulative risk to visiting subsistence anglers.

Notes:

* "Direct contact" includes dermal contact with and/or incidental ingestion of the particular medium.

VOCs = volatile organic compounds

Table 1.1
Baseline Human Health Risk Assessment Approach

Baseline Human Health Risk Assessment – Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Timeframe	Receptor	Exposure Point	Activity	Exposure Medium	Exposure Route*	Previous Evaluations	RI/FS Approach
Current/Future	Resident	Centredale Manor and Brook Village Apartments	Living onsite	Surface soil	Direct contact	Qualitatively evaluated by ATSDR (Draft Health Consultation, March 19, 1999) and EPA Region I Action Memorandum (May 4, 1999), with addendums (September 13, 1999 and June 1, 2000); report was basis for TCRA	Evaluation of protectiveness from exposure to those contaminated soils and integrity of the interim caps and the pavement will be included in the FS as part of the components of the permanent remedy.
				Surface soil	Inhalation of particulates and vapors	Not applicable.	Evaluation of protectiveness from exposure to those contaminated soils and integrity of the interim caps and the pavement will be included in the FS as part of the components of the permanent remedy.
				Groundwater	Inhalation of VOCs	Air samples collected from Centredale Manor and Brook Village in 1999 by OEME, no significant migration of VOCs into buildings was found.	Not included; indoor air survey indicated insignificant migration of VOCs into buildings.
		Greystone Mill Pond, Assapumpset Brook, Allendale Pond, Lyman Mill Pond, Manton Reach, Dyerville Reach	Angling, fish consumption	Aquatic biota tissue	Ingestion	Human Health Biota Consumption Risk Assessment in progress	Included in RI/FS. Data will be included in assessment of cumulative risk to anglers.
			Swimming/wading	Surface water/aquatic sediment	Direct contact	EPA screening in 1998 using 1996 data (2/24/98 memo from Ann-Marie Burke to Woonasquatucket Team)	Include in RI/FS and use post-removal existing data to verify USEPA 1998 screening evaluation. Data will also be included in assessment of cumulative risk to anglers.
		Recreational areas along bank of Greystone Mill Pond, Allendale and Lyman Mill Pond	Walking/exploring edges of pond	Bank surface soil	Direct contact	Streamlined HHRA in EE/CA (TtNUS, 2000); report was basis for NTCRA	Removal of soil as part of NTCRA expected to be final action; this scenario will not be included in the RI/FS. Post-removal existing bank data will be included in assessment of cumulative risk to anglers.
		Residential exposure points (homes)	Living along the river	Surface/subsurface soil	Direct contact	Streamlined HHRA in EE/CA (TtNUS, 2000); report was basis for NTCRA	Removal of soil as part of NTCRA expected to be final action; this scenario will not be included in the RI/FS.
				Surface soil	Inhalation of particulates	Not applicable.	Removal of soil as part of NTCRA expected to be final action; this scenario will not be included in the RI/FS.
				Groundwater	Inhalation of VOCs	Not applicable. VOCs are not likely to be present in groundwater outside of the source area.	Removal of soil as part of NTCRA expected to be final action; this scenario will not be included in the RI/FS.
	Visiting Recreational Angler	Greystone Mill Pond, Assapumpset Brook, Allendale Pond, Lyman Mill Pond, Manton Reach, Dyerville Reach	Angling, fish consumption	Aquatic biota tissue	Ingestion	Human Health Biota Consumption Risk Assessment in progress	Included in RI/FS. Data will be included in assessment of cumulative risk to recreational anglers.
			Wading (while angling)	Surface water/aquatic sediment	Direct contact	EPA screening in 1998 using 1996 data (2/24/98 memo from Ann-Marie Burke to Woonasquatucket Team)	Data will also be included in assessment of cumulative risk to visiting recreational anglers.
		Recreational areas along bank of Greystone Mill Pond, Allendale and Lyman Mill Pond	Walking to access angling locations	Bank surface soil	Direct contact	Streamlined HHRA in EE/CA (TtNUS, 2000); report was basis for NTCRA	Post-removal existing bank data will be included in assessment of cumulative risk to visiting recreational anglers.

Table 1.2
Exposure Pathway Summary

Baseline Human Health Risk Assessment - Work Plan Addendum
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

EXPOSURE POINT AND RECEPTOR POPULATION	RECEPTOR AGE	SCENARIO TIMEFRAME	POTENTIAL EXPOSURE MEDIUM AND RELEVANT PATHWAYS			
			Sediment	*Surface Water*	*Bank Surface Soil*	*Fish*
Greystone Mill Pond (background)						
Area Resident (swimming, wading, recreational angling)	Child, Adolescent, Adult	C/F	ING, DERM	ING, DERM	ING, DERM	ING
Visiting Recreational Angler	Adolescent, Adult [a]	C/F	ING, DERM	ING, DERM	ING, DERM	ING
Visiting Subsistence Angler	Adolescent, Adult [a]	C/F	ING, DERM	ING, DERM	ING, DERM	ING
Assapumpset Brook (reference area)						
Area Resident (swimming, wading, recreational angling)	Child, Adolescent, Adult	C/F	ING, DERM	ING, DERM	--	ING
Visiting Recreational Angler	Adolescent, Adult [a]	C/F	ING, DERM	ING, DERM	--	ING
Visiting Subsistence Angler	Adolescent, Adult [a]	C/F	ING, DERM	ING, DERM	--	ING
Allendale Pond						
Area Resident (swimming, wading, recreational angling)	Child, Adolescent, Adult	C/F	ING, DERM	ING, DERM	ING, DERM	ING
Visiting Recreational Angler	Adolescent, Adult [a]	C/F	ING, DERM	ING, DERM	ING, DERM	ING
Visiting Subsistence Angler	Adolescent, Adult [a]	C/F	ING, DERM	ING, DERM	ING, DERM	ING
Lyman Mill Pond						
Area Resident (swimming, wading, recreational angling)	Child, Adolescent, Adult	C/F	ING, DERM	ING, DERM	--	ING
Visiting Recreational Angler	Adolescent, Adult [a]	C/F	ING, DERM	ING, DERM	--	ING
Visiting Subsistence Angler	Adolescent, Adult [a]	C/F	ING, DERM	ING, DERM	--	ING
Commercial/industrial Worker	Adult	C/F	--	--	ING, DERM	--
Manton Reach						
Area Resident (swimming, wading, recreational angling)	Child, Adolescent, Adult	C/F	ING, DERM	ING, DERM	--	ING
Visiting Recreational Angler	Adolescent, Adult [a]	C/F	ING, DERM	ING, DERM	--	ING
Visiting Subsistence Angler	Adolescent, Adult [a]	C/F	ING, DERM	ING, DERM	--	ING
Dyerville Reach						
Area Resident (swimming, wading, recreational angling)	Child, Adolescent, Adult	C/F	ING, DERM	ING, DERM	--	ING
Visiting Recreational Angler	Adolescent, Adult [a]	C/F	ING, DERM	ING, DERM	--	ING
Visiting Subsistence Angler	Adolescent, Adult [a]	C/F	ING, DERM	ING, DERM	--	ING

Notes:

[a] - A young child is also evaluated for ingestion of fish that are caught by older members of the family.
Timeframe:
C - current land use
F - future land use
Pathways:
DERM - exposure via dermal contact
ING = exposure via incidental ingestion
"-" indicates that the pathway is incomplete.

Prepared by: MJM
Checked by JHP

Table 2.1
Occurrence, Distribution and Selection of Chemicals of Potential Concern
American Eel

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: American Eel
Exposure Medium: Whole Body

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Background Value	Screening Toxicity Value (3)	Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source	Retain as COPC?	Rationale for Contaminant Deletion or Selection (5)
	Semivolatile Organics															
91-57-6	2-Methylnaphthalene	0.00243		0.00534		MG/KG	LPX-AE-4006-0000-01-W	20 / 23	0.00187 - 0.00189	0.00534	N/A	2.7 N	N/A	N/A	No	S
83-32-9	Acenaphthene	0.00179	J	0.0082		MG/KG	LPX-AE-4002-0000-01-W	23 / 23	-	0.0082	N/A	8.1 N	N/A	N/A	No	S
208-96-8	Acenaphthylene	0.00054	J	0.00294		MG/KG	LPX-AE-4009-0000-01-W	23 / 23	-	0.00294	N/A		N/A	N/A	Yes	A
120-12-7	Anthracene	0.00063	J	0.00379		MG/KG	LPX-AE-4009-0000-01-W	23 / 23	-	0.00379	N/A	41 N	N/A	N/A	No	S
56-55-3	Benzo(a)anthracene	0.00345		0.00345		MG/KG	LPX-AE-4004-0000-01-W	1 / 23	0.00126 - 0.00189	0.00345	N/A	0.0043 C	N/A	N/A	No	S
50-32-8	Benzo(a)pyrene	0.00382		0.00382		MG/KG	LPX-AE-4004-0000-01-W	1 / 23	0.00126 - 0.00189	0.00382	N/A	0.00043 C	N/A	N/A	Yes	A
205-99-2	Benzo(b)fluoranthene	0.00577		0.00577		MG/KG	LPX-AE-4004-0000-01-W	1 / 23	0.00126 - 0.00286	0.00577	N/A	0.0043 C	N/A	N/A	Yes	A
207-08-9	Benzo(k)fluoranthene	0.00511		0.00511		MG/KG	LPX-AE-4004-0000-01-W	1 / 23	0.00126 - 0.00236	0.00511	N/A	0.043 C	N/A	N/A	No	S
218-01-9	Chrysene	0.00738		0.00738		MG/KG	LPX-AE-4004-0000-01-W	1 / 23	0.00126 - 0.00381	0.00738	N/A	0.43 C	N/A	N/A	No	S
53-70-3	Dibenzo(a,h)anthracene	0.00017	J	0.00075	J	MG/KG	LPX-AE-4004-0000-01-W	5 / 23	0.00126 - 0.00189	0.00075	N/A	0.00043 C	N/A	N/A	Yes	A
132-64-9	Dibenzofuran	0.0006	J	0.00231		MG/KG	LPX-AE-4003-0000-01-W	23 / 23	-	0.00231	N/A	0.54 N	N/A	N/A	No	S
206-44-0	Fluoranthene	0.00513		0.02309		MG/KG	LPX-AE-4004-0000-01-W	22 / 23	0.00476 - 0.00476	0.02309	N/A	5.4 N	N/A	N/A	No	S
86-73-7	Fluorene	0.00106	J	0.00511		MG/KG	LPX-AE-4003-0000-01-W	23 / 23	-	0.00511	N/A	5.4 N	N/A	N/A	No	S
193-39-5	Indeno(1,2,3-cd)pyrene	0.00338		0.00338		MG/KG	LPX-AE-4004-0000-01-W	1 / 23	0.00126 - 0.00189	0.00338	N/A	0.0043 C	N/A	N/A	No	S
91-20-3	Naphthalene	0.00332		0.00666		MG/KG	LPX-AE-4009-0000-01-W	20 / 23	0.00224 - 0.00314	0.00666	N/A	2.7 N	N/A	N/A	No	S
85-01-8	Phenanthrene	0.00404		0.02717		MG/KG	LPX-AE-4002-0000-01-W	23 / 23	-	0.02717	N/A		N/A	N/A	Yes	A
129-00-0	Pyrene	0.00596		0.01165		MG/KG	LPX-AE-4004-0000-01-W	4 / 23	0.00229 - 0.00502	0.01165	N/A	4.1 N	N/A	N/A	No	S
92-52-4	1,1'-Biphenyl	0.00039	J	0.00128	J	MG/KG	LPX-AE-4006-0000-01-W	20 / 23	0.00126 - 0.00134	0.00128	N/A	6.8 N	N/A	N/A	No	S
	Pesticides/PCBs															
72-54-8	4,4'-DDD	0.00606	J	0.04205		MG/KG	APC-AE-4006-0000-01-W	23 / 23	-	0.04205	N/A	0.013 C	N/A	N/A	Yes	A
72-55-9	4,4'-DDE	0.00352		0.07891	J	MG/KG	LPX-AE-4009-0000-01-W	23 / 23	-	0.07891	N/A	0.0093 C	N/A	N/A	Yes	A
50-29-3	4,4'-DDT	0.00137		0.01467		MG/KG	DYP-AE-5001-0000-01-W	18 / 23	0.00127 - 0.00132	0.01467	N/A	0.0093 C	N/A	N/A	Yes	A
5103-71-9	alpha-Chlordane	0.0075	J	0.06327		MG/KG	APC-AE-4007-0000-01-W	23 / 23	-	0.06327	N/A		N/A	N/A	Yes	A
11097-69-1	Aroclor-1254	0.26877		1.17773	J	MG/KG	LPX-AE-4009-0000-01-W	21 / 23	0.01607 - 0.01633	1.17773	N/A	0.0016 C	N/A	N/A	Yes	A
11100-14-4	Aroclor-1268	0.07747	J	0.07747	J	MG/KG	APC-AE-4006-0000-01-W	1 / 23	0.01581 - 0.01891	0.07747	N/A		N/A	N/A	Yes	A
319-85-7	beta-BHC	0.00061	J	0.00255	J	MG/KG	LPX-AE-4005-0000-01-W	10 / 23	0.00059 - 0.00152	0.00255	N/A	0.0018 C	N/A	N/A	Yes	A
60-57-1	Dieldrin	0.00313		0.01448		MG/KG	APC-AE-4009-0000-01-W	22 / 23	0.00059 - 0.00059	0.01448	N/A	0.0002 C	N/A	N/A	Yes	A
1031-07-8	Endosulfan Sulfate	0.00999		0.00999		MG/KG	APC-AE-4006-0000-01-W	1 / 23	0.00127 - 0.00152	0.00999	N/A		N/A	N/A	Yes	A
7421-93-4	Endrin Aldehyde	0.0008		0.0008		MG/KG	APC-AE-4006-0000-01-W	1 / 23	0.00127 - 0.00152	0.0008	N/A		N/A	N/A	Yes	A
58-89-9	gamma-BHC	0.00026	J	0.0014	J	MG/KG	LPX-AE-4005-0000-01-W	16 / 23	0.00059 - 0.00152	0.0014	N/A	0.0024 C	N/A	N/A	No	S
5103-74-2	gamma-Chlordane	0.0026	J	0.02296		MG/KG	APC-AE-4007-0000-01-W	23 / 23	-	0.02296	N/A		N/A	N/A	Yes	A
76-44-8	Heptachlor	0.00129		0.00129		MG/KG	APC-AE-4007-0000-01-W	1 / 23	0.00059 - 0.00152	0.00129	N/A	0.0007 C	N/A	N/A	Yes	A
1024-57-3	Heptachlor Epoxide	0.00067	J	0.00559		MG/KG	LPX-AE-4003-0000-01-W	22 / 23	0.00059 - 0.00059	0.00559	N/A	0.00035 C	N/A	N/A	Yes	A
57-74-9	Technical Chlordane	0.10259	J	0.76577		MG/KG	LPX-AE-4003-0000-01-W	23 / 23	-	0.76577	N/A	0.009 C	N/A	N/A	Yes	A
	Inorganics															
7429-90-5	Aluminum	1.16	J	41.6		MG/KG	LPX-AE-4004-0000-01-W	21 / 23	1.12 - 2.11	41.6	N/A	140 N	N/A	N/A	No	E
7440-36-0	Antimony	0.00643	J	0.00643	J	MG/KG	LPX-AE-4004-0000-01-W	1 / 23	0.034 - 0.054	0.00643	N/A	0.054 N	N/A	N/A	No	S
7440-39-3	Barium	0.2		0.781		MG/KG	LPX-AE-4004-0000-01-W	23 / 23	-	0.781	N/A	9.5 N	N/A	N/A	No	S
7440-43-9	Cadmium	0.011	J	0.261		MG/KG	DYP-AE-5001-0000-01-W	23 / 23	-	0.261	N/A	0.14 N	N/A	N/A	Yes	A
7440-47-3	Chromium	0.0281	J	0.187	J	MG/KG	LPX-AE-4004-0000-01-W	15 / 23	0.269 - 0.269	0.187	N/A	0.41 N	N/A	N/A	No	S
7440-48-4	Cobalt	0.0369	J	0.138	J	MG/KG	APC-AE-4007-0000-01-W	23 / 23	-	0.138	N/A	2.7 N	N/A	N/A	No	S
7440-50-8	Copper	0.519	J	1.03	J	MG/KG	APC-AE-4007-0000-01-W	23 / 23	-	1.03	N/A	5.4 N	N/A	N/A	No	E
7439-89-6	Iron	11.7		53.2		MG/KG	LPX-AE-4004-0000-01-W	23 / 23	-	53.2	N/A	41 N	N/A	N/A	No	E
7439-92-1	Lead	0.11	J	0.952	J	MG/KG	APC-AE-4007-0000-01-W	22 / 23	0.12 - 0.12	0.952	N/A		N/A	N/A	Yes	A
7439-96-5	Manganese	1.62	J	23	J	MG/KG	DYP-AE-5003-0000-01-W	23 / 23	-	23	N/A	19 N	N/A	N/A	Yes	A
7439-97-6	Mercury	0.0297		0.24		MG/KG	APC-AE-4007-0000-01-W	19 / 23	0.0202 - 0.0646	0.24	N/A		N/A	N/A	Yes	A
22967-92-6	Mercury (methyl)	0.0164		0.471		MG/KG	APC-AE-4008-0000-01-W	23 / 23	-	0.471	N/A	0.014 N	N/A	N/A	Yes	A
7439-98-7	Molybdenum	0.0135	J	0.115	J	MG/KG	APC-AE-4004-0000-01-W	3 / 23	0.32 - 0.32	0.115	N/A	0.68 N	N/A	N/A	No	S
7440-02-0	Nickel	0.0372	J	0.214	J	MG/KG	APC-AE-4007-0000-01-W	23 / 23	-	0.214	N/A	2.7 N	N/A	N/A	No	S

Table 2.1
Occurrence, Distribution and Selection of Chemicals of Potential Concern
American Eel

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: American Eel
Exposure Medium: Whole Body

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Background Value	Screening Toxicity Value (3)	Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source	Retain as COPC?	Rationale for Contaminant Deletion or Selection (5)
7782-49-2	Selenium	0.273	J	0.523		MG/KG	APC-AE-4003-0000-01-W	19 / 23	0.448 - 0.448	0.523	N/A	0.68 N	N/A	N/A	No	S
7440-22-4	Silver	0.000324	J	0.0238	J	MG/KG	LPX-AE-4002-0000-01-W	5 / 23	0.06 - 0.06	0.0238	N/A	0.68 N	N/A	N/A	No	S
7440-28-0	Thallium	0.00444	J	0.00815	J	MG/KG	LPX-AE-4007-0000-01-W	4 / 23	0.022 - 0.022	0.00815	N/A	0.0095 N	N/A	N/A	No	S
7440-62-2	Vanadium	0.00195	J	0.109	J	MG/KG	APC-AE-4005-0000-01-W	6 / 23	0.179 - 0.179	0.109	N/A	0.95 N	N/A	N/A	No	S
7440-66-6	Zinc	18.2	J	34.6	J	MG/KG	APC-AE-4004-0000-01-W	20 / 23	20.2 - 24.9	34.6	N/A	41 N	N/A	N/A	No	S
	Dioxins/Furans															
38178-99-3	HCX	0.00000774	J	0.00010904	J	MG/KG	APC-AE-4005-0000-01-W	22 / 23	0.00001998 - 0.00001998	0.00010904	N/A		N/A	N/A	Yes	A
	Toxicity Equivalency (Dioxins/Furans) - Mammals	0.00000957		0.000108		MG/KG	APC-AE-4006-0000-01-W	23 / 23	-	0.000108	N/A	0.000000021 C	N/A	N/A	Yes	A
	Toxicity Equivalency (PCB Congeners) - Mammals	0.0000154		0.0000604		MG/KG	LPX-AE-4001-0000-01-W	7 / 7	-	0.0000604	N/A	0.000000021 C	N/A	N/A	Yes	A

(1) Minimum or maximum concentration detected in exposure area. Samples included in data set are provided in Appendix A.
(2) The concentration used for screening is the maximum detected concentration, per USEPA Region I (USEPA, 1995).
(3) Values are the Risk-Based Concentrations (RBCs) obtained from USEPA Region III dated October 9, 2002.
Values used for screening are the fish ingestion RBCs for the lesser of cancer risks equal to 1E-06 or non-cancer risks equal to a hazard index of 0.1, per USEPA Region I (USEPA, 1999).
(4) There are no applicable ARAR values for biota
(5) Analyte is selected as a COPC if the concentration used for screening exceeds the PRG
S = Concentration used for screening is less than the screening toxicity value; the analyte was not selected as a COPC.
A = Concentration used for screening is greater than the screening toxicity value; the analyte was selected as a COPC
E = The analyte is a human essential nutrient, and is not considered to be toxic at the concentration detected; the analyte was not selected as a COPC (A.D. Little, 1998; USEPA, 1995).

N/A = Not applicable
- Background values are not applicable for selection of COPCs. Risks at the two reference (Background) locations will be characterized and compared to the risks characterized in this assessment.
- Potential ARAR/TBC values are not applicable for selection of COPCs. EPA suggests use of risk-based media concentrations for screening COPCs

Qualifier definitions:
J = Value is estimated.

MG/KG = milligrams per kilogram
COPC = chemical of potential concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirements / To Be Considered

Basis of screening toxicity value:
N - Based on non-cancer endpoint
C - Based on cancer endpoint

Prepared by: KJA
Checked by: MJM

Table 2.2
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Largemouth Bass

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe Current/Future
Medium Largemouth Bass
Exposure Medium: Fillet

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Background Value	Screening Toxicity Value (3)	Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source	Retain as COPC?	Rationale for Contaminant Deletion or Selection (5)
	Semivolatile Organics															
92-52-4	1,1'-Biphenyl	0.00013	J	0.00034	J	MG/KG	LPX-LB-4008-0000-01-F	8 / 13	0.00064 - 0.00182	0.00034	N/A	6.8 N	N/A	N/A	No	S
91-57-6	2-Methylnaphthalene	0.00039	J	0.0037		MG/KG	MAP-LB-4003-0000-01-F	12 / 13	0.00098 - 0.00098	0.0037	N/A	2.7 N	N/A	N/A	No	S
83-32-9	Acenaphthene	0.00016	J	0.00144		MG/KG	LPX-LB-4003-0000-01-F	10 / 13	0.00058 - 0.00082	0.00144	N/A	8.1 N	N/A	N/A	No	S
208-96-8	Acenaphthylene	0.00005	J	0.00062	J	MG/KG	LPX-LB-4003-0000-01-F	10 / 13	0.00063 - 0.00111	0.00062	N/A		N/A	N/A	Yes	A
120-12-7	Anthracene	0.00008	J	0.00099		MG/KG	LPX-LB-4003-0000-01-F	11 / 13	0.0007 - 0.0009	0.00099	N/A	41 N	N/A	N/A	No	S
56-55-3	Benzo(a)anthracene	0.00004	J	0.0029		MG/KG	LPX-LB-4003-0000-01-F	6 / 13	0.00059 - 0.00182	0.0029	N/A	0.0043 C	N/A	N/A	No	S
50-32-8	Benzo(a)pyrene	0.00373		0.00373		MG/KG	LPX-LB-4003-0000-01-F	1 / 13	0.00057 - 0.00182	0.00373	N/A	0.00043 C	N/A	N/A	Yes	A
205-99-2	Benzo(b)fluoranthene	0.00009	J	0.00509		MG/KG	LPX-LB-4003-0000-01-F	4 / 13	0.00057 - 0.00182	0.00509	N/A	0.0043 C	N/A	N/A	Yes	A
191-24-2	Benzo(g,h,i)perylene	0.00372		0.00372		MG/KG	LPX-LB-4003-0000-01-F	1 / 13	0.00057 - 0.0091	0.00372	N/A		N/A	N/A	Yes	A
207-08-9	Benzo(k)fluoranthene	0.00016	J	0.00462		MG/KG	LPX-LB-4003-0000-01-F	3 / 13	0.00057 - 0.00182	0.00462	N/A	0.043 C	N/A	N/A	No	S
218-01-9	Chrysene	0.00009	J	0.00562		MG/KG	LPX-LB-4003-0000-01-F	9 / 13	0.00064 - 0.00212	0.00562	N/A	0.43 C	N/A	N/A	No	S
53-70-3	Dibenzo(a,h)anthracene	0.00012	J	0.0008	J	MG/KG	LPX-LB-4003-0000-01-F	3 / 13	0.00057 - 0.00111	0.0008	N/A	0.00043 C	N/A	N/A	Yes	A
132-64-9	Dibenzofuran	0.00014	J	0.00096		MG/KG	LPX-LB-4003-0000-01-F	12 / 13	0.00182 - 0.00182	0.00096	N/A	0.54 N	N/A	N/A	No	S
206-44-0	Fluoranthene	0.00032	J	0.01084		MG/KG	LPX-LB-4003-0000-01-F	10 / 13	0.0009 - 0.00104	0.01084	N/A	5.4 N	N/A	N/A	No	S
86-73-7	Fluorene	0.00017	J	0.00154		MG/KG	LPX-LB-4003-0000-01-F	13 / 13	-	0.00154	N/A	5.4 N	N/A	N/A	No	S
193-39-5	Indeno(1,2,3-cd)pyrene	0.0001	J	0.00387		MG/KG	LPX-LB-4003-0000-01-F	9 / 13	0.00064 - 0.00182	0.00387	N/A	0.0043 C	N/A	N/A	No	S
91-20-3	Naphthalene	0.00076		0.00292		MG/KG	MAP-LB-4002-0000-01-F	6 / 13	0.00076 - 0.00582	0.00292	N/A	2.7 N	N/A	N/A	No	S
85-01-8	Phenanthrene	0.00046	J	0.00712	J	MG/KG	LPX-LB-4003-0000-01-F	12 / 13	0.0009 - 0.0009	0.00712	N/A		N/A	N/A	Yes	A
129-00-0	Pyrene	0.0035		0.00759		MG/KG	LPX-LB-4003-0000-01-F	2 / 13	0.00057 - 0.00111	0.00759	N/A	4.1 N	N/A	N/A	No	S
	Pesticides/PCBs															
72-54-8	4,4'-DDD	0.00078	J	0.0074		MG/KG	LPX-LB-4003-0000-01-F	13 / 13	-	0.0074	N/A	0.013 C	N/A	N/A	No	S
72-55-9	4,4'-DDE	0.00309		0.0391		MG/KG	LPX-LB-4003-0000-01-F	13 / 13	-	0.0391	N/A	0.0093 C	N/A	N/A	Yes	A
50-29-3	4,4'-DDT	0.00014	J	0.00337		MG/KG	LPX-LB-4003-0000-01-F	12 / 13	0.00072 - 0.00072	0.00337	N/A	0.0093 C	N/A	N/A	No	S
5103-71-9	alpha-Chlordane	0.00038	J	0.0099		MG/KG	LPX-LB-4003-0000-01-F	13 / 13	-	0.0099	N/A		N/A	N/A	Yes	A
11097-69-1	Aroclor-1254	0.02716		0.59434	J	MG/KG	LPX-LB-4003-0000-01-F	13 / 13	-	0.59434	N/A	0.0016 C	N/A	N/A	Yes	A
11100-14-4	Aroclor-1268	0.00298	J	0.06755		MG/KG	MAP-LB-4002-0000-01-F	13 / 13	-	0.06755	N/A		N/A	N/A	Yes	A
60-57-1	Dieldrin	0.00018	J	0.00255		MG/KG	LPX-LB-4003-0000-01-F	10 / 13	0.00052 - 0.00146	0.00255	N/A	0.0002 C	N/A	N/A	Yes	A
1031-07-8	Endosulfan Sulfate	0.0019		0.0019		MG/KG	MAP-LB-4001-0000-01-F	1 / 11	0.00046 - 0.00146	0.0019	N/A		N/A	N/A	Yes	A
5103-74-2	gamma-Chlordane	0.00011	J	0.0038		MG/KG	LPX-LB-4003-0000-01-F	12 / 13	0.00072 - 0.00072	0.0038	N/A		N/A	N/A	Yes	A
57-74-9	Technical Chlordane	0.01513		0.1365	J	MG/KG	LPX-LB-4003-0000-01-F	12 / 13	0.06426 - 0.06426	0.1365	N/A	0.009 C	N/A	N/A	Yes	A
	Inorganics															
7429-90-5	Aluminum	0.4		5.34		MG/KG	LPX-LB-4008-0000-01-F	8 / 13	1.12 - 1.12	5.34	N/A	140 N	N/A	N/A	No	S, E
7440-36-0	Antimony	0.00194	J	0.00194	J	MG/KG	LPX-LB-4008-0000-01-F	1 / 13	0.034 - 0.034	0.00194	N/A	0.054 N	N/A	N/A	No	S
7440-39-3	Barium	0.0195	J	0.212	J	MG/KG	LPX-LB-4010-0000-01-F	9 / 13	0.011 - 0.039	0.212	N/A	9.5 N	N/A	N/A	No	S
7440-43-9	Cadmium	0.00304	J	0.00304	J	MG/KG	LPX-LB-4010-0000-01-F	1 / 13	0.2 - 0.2	0.00304	N/A	0.14 N	N/A	N/A	No	S
7440-47-3	Chromium	0.035	J	0.115	J	MG/KG	MAP-LB-4003-0000-01-F	5 / 13	0.269 - 0.269	0.115	N/A	0.41 N	N/A	N/A	No	S
7440-48-4	Cobalt	0.00443	J	0.0231	J	MG/KG	LPX-LB-4002-0000-01-F	13 / 13	-	0.0231	N/A	2.7 N	N/A	N/A	No	S
7440-50-8	Copper	0.136	J	1.71	J	MG/KG	LPX-LB-4008-0000-01-F	13 / 13	-	1.71	N/A	5.4 N	N/A	N/A	No	S, E
7439-89-6	Iron	2	J	3.93	J	MG/KG	LPX-LB-4007-0000-01-F	13 / 13	-	3.93	N/A	41 N	N/A	N/A	No	S, E
7439-92-1	Lead	0.0017	J	0.0144	J	MG/KG	LPX-LB-4010-0000-01-F	9 / 13	0.022 - 0.022	0.0144	N/A		N/A	N/A	Yes	A
7439-96-5	Manganese	0.103		0.649		MG/KG	LPX-LB-4005-0000-01-F	13 / 13	-	0.649	N/A	19 N	N/A	N/A	No	S
7439-97-6	Mercury	0.0924		0.398		MG/KG	LPX-LB-4008-0000-01-F	6 / 13	0.0924 - 0.385	0.398	N/A		N/A	N/A	Yes	A
22967-92-6	Mercury (methyl)	0.0758		0.41		MG/KG	LPX-LB-4008-0000-01-F	13 / 13	-	0.41	N/A	0.014 N	N/A	N/A	Yes	A
7439-98-7	Molybdenum	0.0308	J	0.0308	J	MG/KG	LPX-LB-4007-0000-01-F	1 / 13	0.32 - 0.32	0.0308	N/A	0.68 N	N/A	N/A	No	S
7440-02-0	Nickel	0.0154	J	0.0466	J	MG/KG	LPX-LB-4002-0000-01-F	10 / 13	0.32 - 0.32	0.0466	N/A	2.7 N	N/A	N/A	No	S
7782-49-2	Selenium	0.102	J	0.174	J	MG/KG	LPX-LB-4002-0000-01-F	9 / 13	0.448 - 0.448	0.174	N/A	0.68 N	N/A	N/A	No	S
7440-22-4	Silver	0.00768	J	0.0184	J	MG/KG	LPX-LB-4010-0000-01-F	2 / 13	0.06 - 0.06	0.0184	N/A	0.68 N	N/A	N/A	No	S
7440-28-0	Thallium	0.00163	J	0.00471	J	MG/KG	MAP-LB-4001-0000-01-F	11 / 13	0.022 - 0.022	0.00471	N/A	0.0095 N	N/A	N/A	No	S
7440-66-6	Zinc	4.07	J	12.9	J	MG/KG	LPX-LB-4003-0000-01-F	10 / 13	5.5 - 6.54	12.9	N/A	41 N	N/A	N/A	No	S

Table 2.2
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Largemouth Bass

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Largemouth Bass
Exposure Medium: Fillet

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Background Value	Screening Toxicity Value (3)	Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source	Retain as COPC?	Rationale for Contaminant Deletion or Selection (5)
	Dioxins/Furans															
38178-99-3	HCX	0.00000345	J	0.00000649	J	MG/KG	LPX-LB-4008-0000-01-F	4 / 13	0.00001986 - 0.00007988	0.00000649	N/A		N/A	N/A	Yes	A
	Toxicity Equivalency (Dioxins/Furans) - Mammals	0.00000695		0.000044		MG/KG	LPX-LB-4002-0000-01-F	13 / 13	-	0.000044	N/A	0.000000021 C	N/A	N/A	Yes	A
	Toxicity Equivalency (PCB Congeners) - Mammals	0.00000138		0.0000109		MG/KG	LPX-LB-4004-0000-01-F	5 / 5	-	0.0000109	N/A	0.000000021 C	N/A	N/A	Yes	A

(1) Minimum or maximum concentration detected in exposure area. Samples included in data set are provided in Appendix A.
(2) The concentration used for screening is the maximum detected concentration, per USEPA Region I (USEPA, 1995)
(3) Values are the Risk-Based Concentrations (RBCs) obtained from USEPA Region III dated October 9, 2002.
Values used for screening are the fish ingestion RBCs for the lesser of cancer risks equal to 1E-06 or non-cancer risks equal to a hazard index of 0.1, per USEPA Region I (USEPA, 1999).
(4) There are no applicable ARAR values for biota.
(5) Analyte is selected as a COPC if the concentration used for screening exceeds the PRG
S = Concentration used for screening is less than the screening toxicity value, the analyte was not selected as a COPC.
A = Concentration used for screening is greater than the screening toxicity value, the analyte was selected as a COPC
E = The analyte is a human essential nutrient, and is not considered to be toxic at the concentration detected, the analyte was not selected as a COPC (A.D. Little, 1998, USEPA, 1995).

N/A = Not applicable
- Background values are not applicable for selection of COPCs. Risks at the two reference (Background) locations will be characterized and compared to the risks characterized in this assessment
- Potential ARAR/TBC values are not applicable for selection of COPCs. EPA suggests use of risk-based media concentrations for screening COPCs.

Qualifier definitions:
J = Value is estimated

MG/KG = milligrams per kilogram
COPC = chemical of potential concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirements / To Be Considered

Basis of screening toxicity value:
N - Based on non-cancer endpoint
C - Based on cancer endpoint

Prepared by: KJA
Checked by: MJM

Table 2.3
Occurrence, Distribution and Selection of Chemicals of Potential Concern
White Sucker

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe Current/Future
Medium White Sucker
Exposure Medium Whole Body

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Background Value	Screening Toxicity Value (3)		Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source	Retain as COPC?	Rationale for Contaminant Deletion or Selection (5)
	Semivolatile Organics																
92-52-4	1,1'-Biphenyl	0.00075		0.00162		MG/KG	LPX-WS-4005-0000-01-W	20 / 20	-	0.00162	N/A	6.8	N	N/A	N/A	No	S
91-57-6	2-Methylnaphthalene	0.00288		0.00553		MG/KG	LPX-WS-4007-0000-01-W	20 / 20	-	0.00553	N/A	2.7	N	N/A	N/A	No	S
83-32-9	Acenaphthene	0.00258		0.00561		MG/KG	LPX-WS-4005-0000-01-W	20 / 20	-	0.00561	N/A	8.1	N	N/A	N/A	No	S
208-96-8	Acenaphthylene	0.00136		0.00458		MG/KG	LPX-WS-4005-0000-01-W	20 / 20	-	0.00458	N/A			N/A	N/A	Yes	A
120-12-7	Anthracene	0.00154		0.00541		MG/KG	LPX-WS-4007-0000-01-W	20 / 20	-	0.00541	N/A	41	N	N/A	N/A	No	S
56-55-3	Benzo(a)anthracene	0.00037	J	0.01173		MG/KG	LPX-WS-4009-0000-01-W	20 / 20	-	0.01173	N/A	0.0043	C	N/A	N/A	Yes	A
50-32-8	Benzo(a)pyrene	0.00013	J	0.01469		MG/KG	LPX-WS-4009-0000-01-W	19 / 20	0.00068 - 0.00068	0.01469	N/A	0.00043	C	N/A	N/A	Yes	A
205-99-2	Benzo(b)fluoranthene	0.00025	J	0.02077		MG/KG	LPX-WS-4009-0000-01-W	20 / 20	-	0.02077	N/A	0.0043	C	N/A	N/A	Yes	A
191-24-2	Benzo(g,h,i)perylene	0.00115		0.01143		MG/KG	LPX-WS-4009-0000-01-W	10 / 20	0.00066 - 0.00075	0.01143	N/A			N/A	N/A	Yes	A
207-08-9	Benzo(k)fluoranthene	0.00027	J	0.01739		MG/KG	LPX-WS-4009-0000-01-W	20 / 20	-	0.01739	N/A	0.043	C	N/A	N/A	No	S
218-01-9	Chrysene	0.00072		0.02304		MG/KG	LPX-WS-4009-0000-01-W	20 / 20	-	0.02304	N/A	0.43	C	N/A	N/A	No	S
53-70-3	Dibenzo(a,h)anthracene	0.00012	J	0.00273		MG/KG	LPX-WS-4009-0000-01-W	20 / 20	-	0.00273	N/A	0.00043	C	N/A	N/A	Yes	A
132-64-9	Dibenzofuran	0.00186		0.00461		MG/KG	LPX-WS-4002-0000-01-W	20 / 20	-	0.00461	N/A	0.54	N	N/A	N/A	No	S
206-44-0	Fluoranthene	0.00517		0.04906		MG/KG	LPX-WS-4009-0000-01-W	20 / 20	-	0.04906	N/A	5.4	N	N/A	N/A	No	S
86-73-7	Fluorene	0.00274		0.00814		MG/KG	LPX-WS-4002-0000-01-W	20 / 20	-	0.00814	N/A	5.4	N	N/A	N/A	No	S
193-39-5	Indeno(1,2,3-cd)pyrene	0.00018	J	0.01347		MG/KG	LPX-WS-4009-0000-01-W	20 / 20	-	0.01347	N/A	0.0043	C	N/A	N/A	Yes	A
91-20-3	Naphthalene	0.00215		0.00492		MG/KG	LPX-WS-4005-0000-01-W	20 / 20	-	0.00492	N/A	2.7	N	N/A	N/A	No	S
85-01-8	Phenanthrene	0.00569		0.02954		MG/KG	LPX-WS-4009-0000-01-W	20 / 20	-	0.02954	N/A			N/A	N/A	Yes	A
129-00-0	Pyrene	0.00118		0.02235		MG/KG	LPX-WS-4009-0000-01-W	20 / 20	-	0.02235	N/A	4.1	N	N/A	N/A	No	S
	Pesticides/PCBs																
72-54-8	4,4'-DDD	0.00618	J	0.0668	J	MG/KG	LPX-WS-4005-0000-01-W	20 / 20	-	0.0668	N/A	0.013	C	N/A	N/A	Yes	A
72-55-9	4,4'-DDE	0.01089	J	0.28651	J	MG/KG	LPX-WS-4005-0000-01-W	20 / 20	-	0.28651	N/A	0.0093	C	N/A	N/A	Yes	A
50-29-3	4,4'-DDT	0.00031	J	0.02462	J	MG/KG	APC-WS-4001-0000-01-W	20 / 20	-	0.02462	N/A	0.0093	C	N/A	N/A	Yes	A
5103-71-9	alpha-Chlordane	0.00837	J	0.05956	J	MG/KG	LPX-WS-4005-0000-01-W	20 / 20	-	0.05956	N/A			N/A	N/A	Yes	A
11097-69-1	Aroclor-1254	0.42643	J	7.09977	J	MG/KG	LPX-WS-4005-0000-01-W	20 / 20	-	7.09977	N/A	0.0016	C	N/A	N/A	Yes	A
11100-14-4	Aroclor-1268	0.01823	J	0.05274	J	MG/KG	APC-WS-4007-0000-01-W	20 / 20	-	0.05274	N/A			N/A	N/A	Yes	A
60-57-1	Dieldrin	0.00166	J	0.0099	J	MG/KG	APC-WS-4005-0000-01-W	20 / 20	-	0.0099	N/A	0.0002	C	N/A	N/A	Yes	A
58-89-9	gamma-BHC	0.00007	J	0.00047	J	MG/KG	LPX-WS-4005-0000-01-W	19 / 20	0.00123 - 0.00123	0.00047	N/A	0.0024	C	N/A	N/A	No	S
5103-74-2	gamma-Chlordane	0.0051	J	0.0408	J	MG/KG	LPX-WS-4005-0000-01-W	20 / 20	-	0.0408	N/A			N/A	N/A	Yes	A
1024-57-3	Heptachlor Epoxide	0.00032	J	0.002	J	MG/KG	LPX-WS-4002-0000-01-W	20 / 20	-	0.002	N/A	0.00035	C	N/A	N/A	Yes	A
57-74-9	Technical Chlordane	0.0999	J	2.61185	J	MG/KG	LPX-WS-4005-0000-01-W	20 / 20	-	2.61185	N/A	0.009	C	N/A	N/A	Yes	A
	Inorganics																
7429-90-5	Aluminum	1.06	J	117		MG/KG	LPX-WS-4009-0000-01-W	20 / 20	-	117	N/A	140	N	N/A	N/A	No	S, E
7440-36-0	Antimony	0.00481	J	0.01	J	MG/KG	LPX-WS-4009-0000-01-W	6 / 20	0.034 - 0.034	0.01	N/A	0.054	N	N/A	N/A	No	S
7440-38-2	Arsenic	0.0715		0.0715		MG/KG	LPX-WS-4009-0000-01-W	1 / 20	0.0295 - 0.08	0.0715	N/A	0.0021	C	N/A	N/A	Yes	A
7440-39-3	Barium	0.4	J	2.06		MG/KG	LPX-WS-4009-0000-01-W	20 / 20	-	2.06	N/A	9.5	N	N/A	N/A	No	S
7440-41-7	Beryllium	0.00642		0.0137		MG/KG	LPX-WS-4009-0000-01-W	5 / 20	0.004 - 0.00532	0.0137	N/A	0.27	N	N/A	N/A	No	S
7440-43-9	Cadmium	0.0113	J	0.0484	J	MG/KG	APC-WS-4008-0000-01-W	20 / 20	-	0.0484	N/A	0.14	N	N/A	N/A	No	S
7440-47-3	Chromium	0.0669	J	0.513		MG/KG	LPX-WS-4009-0000-01-W	16 / 20	0.139 - 0.269	0.513	N/A	0.41	N	N/A	N/A	Yes	A
7440-48-4	Cobalt	0.051	J	0.127	J	MG/KG	APC-WS-4005-0000-01-W	19 / 20	0.0745 - 0.0745	0.127	N/A	2.7	N	N/A	N/A	No	S, E
7440-50-8	Copper	0.551		2.23		MG/KG	APC-WS-4010-0000-01-W	20 / 20	-	2.23	N/A	5.4	N	N/A	N/A	No	S, E
7439-89-6	Iron	14.1		174		MG/KG	LPX-WS-4009-0000-01-W	20 / 20	-	174	N/A	41	N	N/A	N/A	No	E
7439-92-1	Lead	0.0976	J	1.01	J	MG/KG	LPX-WS-4009-0000-01-W	16 / 20	0.0513 - 0.135	1.01	N/A			N/A	N/A	Yes	A
7439-96-5	Manganese	3.83	J	12.3	J	MG/KG	APC-WS-4008-0000-01-W	20 / 20	-	12.3	N/A	19	N	N/A	N/A	No	S
7439-97-6	Mercury	0.0648		0.216		MG/KG	APC-WS-4007-0000-01-W	20 / 20	-	0.216	N/A			N/A	N/A	Yes	A
22967-92-6	Mercury (methyl)	0.0642		0.225		MG/KG	APC-WS-4007-0000-01-W	20 / 20	-	0.225	N/A	0.014	N	N/A	N/A	Yes	A
7439-98-7	Molybdenum	0.0252	J	0.0939	J	MG/KG	APC-WS-4008-0000-01-W	12 / 20	0.0394 - 0.32	0.0939	N/A	0.68	N	N/A	N/A	No	S

Table 2.3
Occurrence, Distribution and Selection of Chemicals of Potential Concern
White Sucker

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe Current/Future
Medium White Sucker
Exposure Medium Whole Body

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Background Value	Screening Toxicity Value (3)	Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source	Retain as COPC?	Rationale for Contaminant Deletion or Selection (5)
7440-02-0	Nickel	0.0963	J	0.252	J	MG/KG	LPX-WS-4009-0000-01-W	20 / 20	-	0.252	N/A	2.7 N	N/A	N/A	No	S
7782-49-2	Selenium	0.199	J	0.349	J	MG/KG	APC-WS-4008-0000-01-W	19 / 20	0.306 - 0.306	0.349	N/A	0.68 N	N/A	N/A	No	S
7440-22-4	Silver	0.00283	J	0.0167	J	MG/KG	LPX-WS-4008-0000-01-W	4 / 20	0.06 - 0.06	0.0167	N/A	0.68 N	N/A	N/A	No	S
7440-62-2	Vanadium	0.071	J	0.254		MG/KG	LPX-WS-4009-0000-01-W	12 / 20	0.179 - 0.179	0.254	N/A	0.95 N	N/A	N/A	No	S
7440-66-6	Zinc	14.6	J	26.3	J	MG/KG	APC-WS-4005-0000-01-W	20 / 20	-	26.3	N/A	41 N	N/A	N/A	No	S
	Dioxins/Furans															
	Toxicity Equivalency (PCB Congeners) - Mamm	0.0000182		0.0000503		MG/KG	LPX-WS-4007-0000-01-W	6 / 6	-	0.0000503	N/A	0.000000021 C	N/A	N/A	Yes	A
38178-99-3	HCX	0.00001474	J	0.00008931	J	MG/KG	APC-WS-4003-0000-01-W	18 / 20	0.00001987 - 0.00001994	0.00008931	N/A		N/A	N/A	Yes	A
	Toxicity Equivalency (Dioxins/Furans) - Mamm	0.00008		0.00137		MG/KG	LPX-WS-4005-0000-01-W	20 / 20	-	0.00137	N/A	0.000000021 C	N/A	N/A	Yes	A

(1) Minimum or maximum concentration detected in exposure area. Samples included in data set are provided in Appendix A.
(2) The concentration used for screening is the maximum detected concentration, per USEPA Region I (USEPA, 1995).
(3) Values are the Risk-Based Concentrations (RBCs) obtained from USEPA Region III dated October 9, 2002.
Values used for screening are the fish ingestion RBCs for the lesser of cancer risks equal to 1E-06 or non-cancer risks equal to a hazard index of 0.1, per USEPA Region I (USEPA, 1999).
(4) There are no applicable ARAR values for biota.
(5) Analyte is selected as a COPC if the concentration used for screening exceeds the PRG.
S = Concentration used for screening is less than the screening toxicity value, the analyte was not selected as a COPC.
A = Concentration used for screening is greater than the screening toxicity value; the analyte was selected as a COPC.
E = The analyte is a human essential nutrient, and is not considered to be toxic at the concentration detected, the analyte was not selected as a COPC (A.D. Little, 1998; USEPA, 1995).

N/A = Not applicable
- Background values are not applicable for selection of COPCs. Risks at the two reference (Background) locations will be characterized and compared to the risks characterized in this assessment.
- Potential ARAR/TBC values are not applicable for selection of COPCs. EPA suggests use of risk-based media concentrations for screening COPCs.

Qualifier definitions:
J = Value is estimated.

MG/KG = milligrams per kilogram
COPC = chemical of potential concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirements / To Be Considered

Basis of screening toxicity value:
N - Based on non-cancer endpoint
C - Based on cancer endpoint

Prepared by: KJA
Checked by: MJM

Table 2.4
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Surface Water

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Background Value	Screening Toxicity Value (3)	Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source	Retain as COPC?	Rationale for Contaminant Deletion or Selection (5)
	Volatile Organics															
75-09-2	Methylene Chloride	0.0003	J	0.0003	J	MG/L	WRC-SW-4004-01	1 / 6	0.001 - 0.001	0.0003	N/A	0.0043 C	N/A	N/A	No	S
127-18-4	Tetrachloroethene	0.0005	J	0.0007	J	MG/L	WRC-SW-4003-01	2 / 6	0.001 - 0.001	0.0007	N/A	0.00066 C	N/A	N/A	Yes	A
	Semivolatile Organics															
117-81-7	bis(2-Ethylhexyl)phthalate	0.001	J	0.16	*	MG/L	WRL-SW-2043-01	2 / 34	0.01 - 0.011	0.16	N/A	0.0048 C	N/A	N/A	Yes	A
108-95-2	Phenol	0.002	J	0.002	J	MG/L	CMW-SW-2019-01	1 / 34	0.01 - 0.011	0.002	N/A	2.2 N	N/A	N/A	No	S
	Pesticides/PCBs															
72-55-9	4,4'-DDE	0.0000043	J	0.0000043	J	MG/L	WRL-SW-2042-01	1 / 34	0.00000185 - 0.0001	0.0000043	N/A	0.0002 C	N/A	N/A	No	S
50-29-3	4,4'-DDT	0.00001	J	0.00001	J	MG/L	LPX-SW-2050-01	1 / 34	0.00000185 - 0.0001	0.00001	N/A	0.0002 C	N/A	N/A	No	S
309-00-2	Aldrin	0.000003	J	0.000069		MG/L	LPX-SW-2049-01	5 / 34	0.00000185 - 0.00005	0.000069	N/A	0.000004 C	N/A	N/A	Yes	A
11097-69-1	Aroclor-1254	0.0046		0.0046		MG/L	CMW-SW-2019-01	1 / 34	0.00002308 - 0.001	0.0046	N/A	0.000034 C	N/A	N/A	Yes	A
319-85-7	beta-BHC	0.00000097	J	0.00000149	J	MG/L	WRL-SW-4005-01	2 / 34	0.00000185 - 0.00005	0.00000149	N/A	0.000037 C	N/A	N/A	No	S
72-20-8	Endrin	0.00021		0.00021		MG/L	CMW-SW-2019-01	1 / 34	0.00000185 - 0.0001	0.00021	N/A	0.0011 N	N/A	N/A	No	S
58-89-9	gamma-BHC	0.00000062	J	0.00000083	J	MG/L	WRL-SW-4005-01	2 / 34	0.00000185 - 0.00005	0.00000083	N/A	0.000052 C	N/A	N/A	No	S
	Inorganics															
7429-90-5	Aluminum	0.0358	J	6.19		MG/L	CMW-SW-2019-01	24 / 33	0.0004 - 0.0005	6.19	N/A	3.6 N	N/A	N/A	Yes	A
7440-36-0	Antimony	0.000183		0.00022	J	MG/L	WRL-SW-4004-01	6 / 33	0.0021 - 0.005	0.00022	N/A	0.0015 N	N/A	N/A	No	S
7440-38-2	Arsenic	0.000533		0.0125		MG/L	APB-SW-2029-01	16 / 33	0.0022 - 0.006	0.0125	N/A	0.000045 C	N/A	N/A	Yes	A
7440-39-3	Barium	0.016		0.271		MG/L	WRC-SW-2015-01	32 / 33	0.019 - 0.019	0.271	N/A	0.26 N	N/A	N/A	Yes	A
7440-41-7	Beryllium	0.0000467	J	0.0002		MG/L	WRL-SW-2042-01	7 / 33	0.0001 - 0.002	0.0002	N/A	0.0073 N	N/A	N/A	No	S
7440-43-9	Cadmium	0.0000196	J	0.0000289	J	MG/L	WRL-SW-4005-01	6 / 33	0.0003 - 0.001	0.0000289	N/A	0.0018 N	N/A	N/A	No	S
7440-47-3	Chromium	0.001	J	0.042		MG/L	APB-SW-2029-01	8 / 33	0.0003 - 0.012	0.042	N/A	0.011 N	N/A	N/A	Yes	A
7440-48-4	Cobalt	0.000126		0.0054		MG/L	APB-SW-2029-01	8 / 33	0.0006 - 0.001	0.0054	N/A	0.073 N	N/A	N/A	No	S
7440-50-8	Copper	0.0013		0.0914		MG/L	CMW-SW-2019-01	33 / 33	-	0.0914	N/A	0.15 N	N/A	N/A	No	S
7439-89-6	Iron	0.229		113		MG/L	APB-SW-2029-01	33 / 33	-	113	N/A	1.1 N	N/A	N/A	No	E
7439-92-1	Lead	0.00104		0.223		MG/L	CMW-SW-2019-01	14 / 33	0.0011 - 0.0033	0.223	N/A	0.015 N	N/A	N/A	Yes	A
7439-96-5	Manganese	0.0141		2.6		MG/L	APB-SW-2029-01	33 / 33	-	2.6	N/A	0.088 N	N/A	N/A	Yes	A
7439-97-6	Mercury	0.00000211		0.00000394		MG/L	WRL-SW-4004-01	6 / 33	0.0001 - 0.0002	0.00000394	N/A		N/A	N/A	Yes	A
7439-98-7	Molybdenum	0.000929	J	0.0011	J	MG/L	WRC-SW-4002-01	6 / 6	-	0.0011	N/A	0.018 N	N/A	N/A	No	S
7440-02-0	Nickel	0.00124	J	0.0343	J	MG/L	APB-SW-2029-01	24 / 33	0.0013 - 0.002	0.0343	N/A	0.073 N	N/A	N/A	No	S
7782-49-2	Selenium	0.0059		0.0108		MG/L	APB-SW-2029-01	3 / 33	0.0004 - 0.005	0.0108	N/A	0.018 N	N/A	N/A	No	S
7440-22-4	Silver	0.001	J	0.0018	J	MG/L	CMW-SW-2025-01	7 / 33	0.0004 - 0.00268	0.0018	N/A	0.018 N	N/A	N/A	No	S
7440-28-0	Thallium	0.00000607	J	0.0145		MG/L	CMW-SW-2024-01	12 / 33	0.0021 - 0.0089	0.0145	N/A	0.00024 N	N/A	N/A	Yes	A
7440-62-2	Vanadium	0.00000506	J	0.022		MG/L	CMW-SW-2019-01	10 / 33	0.0005 - 0.008	0.022	N/A	0.026 N	N/A	N/A	No	S
7440-66-6	Zinc	0.00592		0.5		MG/L	APB-SW-2029-01	29 / 33	0.0129 - 0.0129	0.5	N/A	1.1 N	N/A	N/A	No	S
NITRATE	Nitrate	0.733		0.773		MG/L	WRC-SW-4002-01	8 / 8	-	0.773	N/A		N/A	N/A	Yes	A
14797-65-0	Nitrite-N	0.082		0.139		MG/L	WRC-SW-4001-01	6 / 6	-	0.139	N/A	0.1 N	N/A	N/A	Yes	A
	Inorganics (D)															
7429-90-5	Aluminum	0.02	J	0.14		MG/L	WRC-SW-2011-01F	18 / 36	0.014 - 0.0797	0.14	N/A	3.6 N	N/A	N/A	No	S, E
7440-36-0	Antimony	0.000178		0.00022		MG/L	WRL-SW-4004-01	5 / 36	0.000161 - 0.005	0.00022	N/A	0.0015 N	N/A	N/A	No	S
7440-38-2	Arsenic	0.000416		0.0113		MG/L	CMW-SW-2024-01F	15 / 36	0.0022 - 0.006	0.0113	N/A	0.000045 C	N/A	N/A	No	T
7440-39-3	Barium	0.0136		0.254		MG/L	CMW-SW-2024-01F	24 / 36	0.0083 - 0.177	0.254	N/A	0.26 N	N/A	N/A	No	S
7440-41-7	Beryllium	0.0000286	J	0.0000435	J	MG/L	WRC-SW-4002-01	6 / 36	0.0001 - 0.0025	0.0000435	N/A	0.0073 N	N/A	N/A	No	S
7440-43-9	Cadmium	0.0000129	J	0.0000175	J	MG/L	WRC-SW-4003-01	6 / 36	0.0003 - 0.001	0.0000175	N/A	0.0018 N	N/A	N/A	No	S
7440-47-3	Chromium	0.0016		0.0016		MG/L	WRC-SW-2015-01F	1 / 36	0.0003 - 0.012	0.0016	N/A	0.011 N	N/A	N/A	No	S
7440-48-4	Cobalt	0.0000669		0.001	J	MG/L	WRC-SW-2015-01F	7 / 36	0.0006 - 0.001	0.001	N/A	0.073 N	N/A	N/A	No	S, E
7440-50-8	Copper	0.00131	J	0.016		MG/L	CMW-SW-2019-01F	35 / 36	0.001 - 0.001	0.016	N/A	0.15 N	N/A	N/A	No	S, E
7439-89-6	Iron	0.126		7.95		MG/L	CMW-SW-2019-01F	36 / 36	-	7.95	N/A	1.1 N	N/A	N/A	No	E
7439-92-1	Lead	0.000475		0.0047		MG/L	WRL-SW-2043-01F	7 / 36	0.0011 - 0.0028	0.0047	N/A	0.015 N	N/A	N/A	No	S
7439-96-5	Manganese	0.0096		1.57		MG/L	APB-SW-2029-01F	36 / 36	-	1.57	N/A	0.088 N	N/A	N/A	No	T
7439-97-6	Mercury	0.00000127		0.00000173		MG/L	WRC-SW-4003-01	6 / 36	0.0001 - 0.0002	0.00000173	N/A		N/A	N/A	No	T

Table 2.4
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Surface Water

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Background Value	Screening Toxicity Value (3)	Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source	Retain as COPC?	Rationale for Contaminant Deletion or Selection (5)
7439-98-7	Molybdenum	0.000859	J	0.000897	J	MG/L	WRL-SW-4004-01	6 / 6	-	0.000897	N/A	0.018 N	N/A	N/A	No	S
7440-02-0	Nickel	0.000989	J	0.0082		MG/L	CMW-SW-2019-01F	20 / 36	0.0013 - 0.002	0.0082	N/A	0.073 N	N/A	N/A	No	S
7782-49-2	Selenium	0.0039	J	0.0053		MG/L	APB-SW-2029-01F	2 / 36	0.0004 - 0.005	0.0053	N/A	0.018 N	N/A	N/A	No	S
7440-22-4	Silver	0.0011	J	0.0017	J	MG/L	APB-SW-2029-01F	6 / 36	0.0004 - 0.00268	0.0017	N/A	0.018 N	N/A	N/A	No	S
7440-28-0	Thallium	0.00000513	J	0.0106	J	MG/L	CMW-SW-2025-01F	13 / 36	0.0021 - 0.0089	0.0106	N/A	0.00024 N	N/A	N/A	No	T
7440-62-2	Vanadium	0.0008	J	0.0008	J	MG/L	APC-SW-2036-01F	1 / 36	0.0005 - 0.008	0.0008	N/A	0.026 N	N/A	N/A	No	S
7440-66-6	Zinc	0.00444	J	0.121		MG/L	CMW-SW-2024-01F	34 / 36	0.0118 - 0.0129	0.121	N/A	1.1 N	N/A	N/A	No	S
	Dioxins/Furans															
38178-99-3	HCX	0.00000001876	J	0.000000398	J	MG/L	CMW-SW-2019-01	6 / 26	-	0.000000398	N/A		N/A	N/A	Yes	A
	Toxicity Equivalency (Dioxins/Furans) - Mammals	0.0000000047		0.0000129		MG/L	CMW-SW-2019-01	26 / 26	-	0.0000129	N/A	4.5E-10 C	N/A	N/A	Yes	A

(1) Minimum or maximum concentration detected in exposure area. Samples included in data set are provided in Appendix A.
(2) The concentration used for screening is the maximum detected concentration, per USEPA Region I (USEPA, 1995).
(3) Values are the Tapwater Preliminary Remediation Goals (PRGs) obtained from USEPA Region IX dated October 1, 2002.
Values used for screening are the tapwater PRGs for the lesser of cancer risks equal to 1E-06 or non-cancer risks equal to a hazard index of 0.1, per USEPA Region I (USEPA, 1999).
(4) There are no applicable ARAR values for surface water.
(5) Analyte is selected as a COPC if the concentration used for screening exceeds the PRG
S = Concentration used for screening is less than the screening toxicity value; the analyte was not selected as a COPC.
A = Concentration used for screening is greater than the screening toxicity value; the analyte was selected as a COPC.
E = The analyte is a human essential nutrient, and is not considered to be toxic at the concentration detected; the analyte was not selected as a COPC (A.D. Little, 1998, USEPA, 1995).
T = Total metals will be evaluated further as a COPC, therefore dissolved metals were not selected as COPCs

N/A = Not applicable
- Background values are not applicable for selection of COPCs. Risks at the two reference (Background) locations will be characterized and compared to the risks characterized in this assessment.
- Potential ARAR/TBC values are not applicable for selection of COPCs. EPA suggests use of risk-based media concentrations for screening COPCs.

Qualifier definitions:
J = Value is estimated

MG/L = milligrams per liter
COPC = chemical of potential concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirements / To Be Considered

Basis of screening toxicity value:
N - Based on non-cancer endpoint
C - Based on cancer endpoint

Prepared by: KJA
Checked by: MJM

Table 2.5
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Sediment

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Background Value	Screening Toxicity Value (3)	Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source	Retain as COPC?	Rationale for Contaminant Deletion or Selection (5)
	Semivolatile Organics															
92-52-4	1,1'-Biphenyl	0.03103	J	0.08503		MG/KG	APB-SD-4010-0000-01	10 / 36	0.4 - 8.8	0.08503	N/A	350 S	N/A	N/A	No	S
95-95-4	2,4,5-Trichlorophenol	0.08	J	0.08	J	MG/KG	APB-SD-4010-0000-01	1 / 82	0.91 - 24	0.08	N/A	610 N	N/A	N/A	No	S
121-14-2	2,4-Dmitrotoluene	1.2	J	1.2	J	MG/KG	WRM-SD-2055-01	1 / 75	0.36 - 9.6	1.2	N/A	12 N	N/A	N/A	No	S
95-57-8	2-Chlorophenol	1.8	J	1.8	J	MG/KG	WRM-SD-2055-01	1 / 75	0.36 - 9.6	1.8	N/A	6.3 N	N/A	N/A	No	S
91-57-6	2-Methylnaphthalene	0.031	J	0.13608		MG/KG	APB-SD-4010-0000-01	12 / 85	0.36 - 9.6	0.13608	N/A		N/A	N/A	Yes	A
59-50-7	4-Chloro-3-methylphenol	2.2	J	2.2	J	MG/KG	WRM-SD-2055-01	1 / 75	0.36 - 9.6	2.2	N/A		N/A	N/A	Yes	A
106-44-5	4-Methylphenol	0.47	J	0.83		MG/KG	APB-SD-4010-0000-01	2 / 82	0.36 - 9.6	0.83	N/A	31 N	N/A	N/A	No	S
100-02-7	4-Nitrophenol	2.2	J	2.2	J	MG/KG	WRM-SD-2055-01	1 / 73	0.91 - 22	2.2	N/A		N/A	N/A	Yes	A
83-32-9	Acenaphthene	0.048	J	1.8	J	MG/KG	WRM-SD-2055-01	27 / 90	0.36 - 9.6	1.8	N/A	370 N	N/A	N/A	No	S
208-96-8	Acenaphthylene	0.043	J	0.97	J	MG/KG	CMS-192-A	25 / 92	0.36 - 9.6	0.97	N/A		N/A	N/A	Yes	A
120-12-7	Anthracene	0.06	J	1.8	J	MG/KG	RES-SS-14-334-01	46 / 93	0.36 - 9.6	1.8	N/A	2200 N	N/A	N/A	No	S
1912-24-9	Atrazine	0.073	J	0.073	J	MG/KG	DYP-SD-2066-01	1 / 26	0.4 - 8.8	0.073	N/A	2.2 C	N/A	N/A	No	S
100-52-7	Benzaldehyde	0.04089		0.37	JEB	MG/KG	LPX-SD-2045B-02	18 / 39	0.4 - 8.8	0.37	N/A	610 N	N/A	N/A	No	S
56-55-3	Benzo(a)anthracene	0.025	J	8.4		MG/KG	RES-SS-14-334-01	82 / 94	0.36 - 4.9	8.4	N/A	0.62 C	N/A	N/A	Yes	A
50-32-8	Benzo(a)pyrene	0.032	J	9.2		MG/KG	RES-SS-14-334-01	85 / 94	0.36 - 4.9	9.2	N/A	0.062 C	N/A	N/A	Yes	A
205-99-2	Benzo(b)fluoranthene	0.055	J	13	J*	MG/KG	WRM-SD-2055-01	85 / 94	0.36 - 3.9	13	N/A	0.62 C	N/A	N/A	Yes	A
191-24-2	Benzo(g,h,i)perylene	0.023	J	7		MG/KG	RES-SS-14-334-01	66 / 94	0.36 - 4.9	7	N/A		N/A	N/A	Yes	A
207-08-9	Benzo(k)fluoranthene	0.045	J	9.2		MG/KG	RES-SS-14-334-01	85 / 94	0.36 - 3.9	9.2	N/A	6.2 C	N/A	N/A	Yes	A
117-81-7	bis(2-Ethylhexyl)phthalate	0.043	J	50	J*	MG/KG	WRM-SD-2055-01	59 / 91	0.52 - 13	50	N/A	35 C	N/A	N/A	Yes	A
85-68-7	Butylbenzylphthalate	0.064	J	1.2	J	MG/KG	LPX-SD-4012-0000-01	27 / 89	0.36 - 9.6	1.2	N/A	1200 N	N/A	N/A	No	S
86-74-8	Carbazole	0.037	J	1.8	J	MG/KG	RES-SS-14-334-01	36 / 89	0.36 - 9.6	1.8	N/A	24 C	N/A	N/A	No	S
218-01-9	Chrysene	0.042	J	11		MG/KG	RES-SS-14-334-01	88 / 94	0.41 - 3.9	11	N/A	62 C	N/A	N/A	No	S
53-70-3	Dibenzo(a,h)anthracene	0.038	J	2.6	J	MG/KG	RES-SS-14-334-01	46 / 93	0.36 - 9.6	2.6	N/A	0.062 C	N/A	N/A	Yes	A
132-64-9	Dibenzofuran	0.027	J	0.64	J	MG/KG	RES-SS-14-366-01	20 / 87	0.36 - 9.6	0.64	N/A	29 N	N/A	N/A	No	S
131-11-3	Dimethylphthalate	0.18	J	0.18	J	MG/KG	LPX-SD-2045B-02	1 / 76	0.36 - 9.6	0.18	N/A	100000 M	N/A	N/A	No	S
84-74-2	Di-n-Butylphthalate	0.047	J	1.8	J	MG/KG	WRM-SD-2055-01	14 / 86	0.36 - 9.6	1.8	N/A	610 N	N/A	N/A	No	S
117-84-0	Di-n-octylphthalate	0.072	J	0.4	J	MG/KG	LPX-SD-4012-0000-01	6 / 84	0.36 - 9.6	0.4	N/A	240 N	N/A	N/A	No	S
206-44-0	Fluoranthene	0.039	J	20		MG/KG	RES-SS-14-334-01	91 / 94	1.8 - 2.5	20	N/A	230 N	N/A	N/A	No	S
86-73-7	Fluorene	0.033	J	0.93	J	MG/KG	RES-SS-14-366-01	31 / 91	0.36 - 9.6	0.93	N/A	270 N	N/A	N/A	No	S
193-39-5	Indeno(1,2,3-cd)pyrene	0.028	J	6.8		MG/KG	RES-SS-14-334-01	80 / 94	0.36 - 4.9	6.8	N/A	0.62 C	N/A	N/A	Yes	A
91-20-3	Naphthalene	0.039	J	0.18514		MG/KG	LPX-SD-4012-0000-01	16 / 88	0.36 - 9.6	0.18514	N/A	5.6 N	N/A	N/A	No	S
621-64-7	N-Nitroso-di-n-propylamine	1.4	J	1.4	J	MG/KG	WRM-SD-2055-01	1 / 75	0.36 - 9.6	1.4	N/A	0.069 C	N/A	N/A	Yes	A
87-86-5	Pentachlorophenol	1.4	J	18	J	MG/KG	RES-SS-14-333-01	2 / 83	0.91 - 24	18	N/A	3 C	N/A	N/A	Yes	A
85-01-8	Phenanthrene	0.023	J	12		MG/KG	RES-SS-14-366-01	80 / 93	0.36 - 8.4	12	N/A		N/A	N/A	Yes	A
108-95-2	Phenol	1.9	JEB	1.9	JEB	MG/KG	WRM-SD-2055-01	1 / 82	0.32 - 9.6	1.9	N/A	3700 N	N/A	N/A	No	S
129-00-0	Pyrene	0.051	J	16		MG/KG	S-SS-14-334-01	RES-SS-14-36	87 / 94	0.36 - 4.1	16	N/A	230 N	N/A	N/A	No	S
	Pesticides/PCBs															
72-54-8	4,4'-DDD	0.00002	J	0.052		MG/KG	WRM-SD-2057-01	34 / 102	0.0031 - 0.011	0.052	N/A	2.4 C	N/A	N/A	No	S
72-55-9	4,4'-DDE	0.00031	J	0.2	*	MG/KG	RES-SS-12-551-01	51 / 108	0.0031 - 0.0096	0.2	N/A	1.7 C	N/A	N/A	No	S
50-29-3	4,4'-DDT	0.0016	J	0.039	J	MG/KG	WRL-SD-2071-01	32 / 106	0 - 0.027	0.039	N/A	1.7 C	N/A	N/A	No	S
309-00-2	Aldrin	0.00058	J	0.00058	J	MG/KG	SD-12	1 / 103	0 - 0.0055	0.00058	N/A	0.029 C	N/A	N/A	No	S
5103-71-9	alpha-Chlordane	0.00021	J	0.14075		MG/KG	LPX-SD-4004-0000-01	64 / 107	0.0016 - 0.0049	0.14075	N/A		N/A	N/A	Yes	A
53469-21-9	Aroclor-1242	0.19	J	0.19	J	MG/KG	RES-SS-14-333-01	1 / 132	0 - 7.6	0.19	N/A	0.22 C	N/A	N/A	No	S
12672-29-6	Aroclor-1248	0.016	J	0.14		MG/KG	WRC-SD-2015-01	13 / 131	0 - 13	0.14	N/A	0.22 C	N/A	N/A	No	S
11097-69-1	Aroclor-1254	0.011	J	27		MG/KG	CMS-606-A	116 / 140	0.036 - 0.066	27	N/A	0.22 C	N/A	N/A	Yes	A
11096-82-5	Aroclor-1260	0.029	J	0.27		MG/KG	WRC-SD-2015-01	7 / 131	0 - 7.6	0.27	N/A	0.22 C	N/A	N/A	Yes	A
11100-14-4	Aroclor-1268	0.03393		0.31379	J	MG/KG	LPX-SD-4013-0000-01	20 / 20	-	0.31379	N/A		N/A	N/A	Yes	A
319-85-7	beta-BHC	0.0026		0.0026		MG/KG	CMW-SD-2025-000 5-01	1 / 99	0 - 0.0066	0.0026	N/A	0.32 C	N/A	N/A	No	S
319-86-8	delta-BHC	0.0024	J	0.0024	J	MG/KG	SD-20	1 / 102	0 - 0.0055	0.0024	N/A		N/A	N/A	Yes	A
60-57-1	Dieldrin	0.0014	J, EB	0.11297	J	MG/KG	APB-SD-4010-0000-01	32 / 103	0.0022 - 0.011	0.11297	N/A	0.03 C	N/A	N/A	Yes	A

Table 2.5
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Sediment

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Background Value	Screening Toxicity Value (3)	Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source	Retain as COPC?	Rationale for Contaminant Deletion or Selection (5)
33213-65-9	Endosulfan II	0.0041	J	0.44	*	MG/KG	RES-SS-12-551-01	24 / 105	0 - 0.011	0.44	N/A		N/A	N/A	Yes	A
1031-07-8	Endosulfan sulfate	0.0017	J	0.011		MG/KG	DAM005-SD	8 / 100	0 - 0.039	0.011	N/A		N/A	N/A	Yes	A
72-20-8	Endrin	0.0014	J	0.028		MG/KG	APB-FP-2032-01	6 / 103	0 - 0.027	0.028	N/A	1.8 N	N/A	N/A	No	S
7421-93-4	Endrin aldehyde	0.00077	J	0.011	J	MG/KG	CMS-192-A	4 / 101	0 - 0.01	0.011	N/A		N/A	N/A	Yes	A
53494-70-5	Endrin Ketone	0.00129		0.034		MG/KG	RES-SS-14-334-01	5 / 79	0 - 0.027	0.034	N/A		N/A	N/A	Yes	A
58-89-9	gamma-BHC	0.0003	J	0.006		MG/KG	WRL-SD-2042-02	3 / 102	0 - 0.0055	0.006	N/A	0.44 C	N/A	N/A	No	S
5103-74-2	gamma-Chlordane	0.0024	J	0.074	*	MG/KG	RES-SS-14-398-01	56 / 106	0 - 0.0049	0.074	N/A		N/A	N/A	Yes	A
76-44-8	Heptachlor	0.00043	J	0.0044		MG/KG	RES-SS-12-551-01	6 / 103	0 - 0.0055	0.0044	N/A	0.11 C	N/A	N/A	No	S
1024-57-3	Heptachlor epoxide	0.003		0.006	P	MG/KG	WRL-SD-2042-02	3 / 99	0 - 0.02	0.006	N/A	0.053 C	N/A	N/A	No	S
72-43-5	Methoxychlor	0.0027	J	0.035	J	MG/KG	RES-SS-12-551-01	11 / 106	0 - 0.053	0.035	N/A	31 N	N/A	N/A	No	S
57-74-9	Technical Chlordane	0.2814		2.21273		MG/KG	LPX-SD-4004-0000-01	17 / 21	0 - 0.053	2.21273	N/A		N/A	N/A	Yes	A
	Inorganics															
7429-90-5	Aluminum	1640		27773	J	MG/KG	LPX-SD-4011-0000-01	96 / 96	-	27773	N/A	7600 N	N/A	N/A	No	E
7440-36-0	Antimony	0.0443	J	13.7	J	MG/KG	RES-SS-14-419-01	43 / 95	0.0566 - 11	13.7	N/A	3.1 N	N/A	N/A	Yes	A
7440-38-2	Arsenic	0.6	J	18	J	MG/KG	CMS-192-A	90 / 96	0.69 - 35	18	N/A	0.39 C	N/A	N/A	Yes	A
7440-39-3	Barium	10		380	J	MG/KG	LPX-SD-4004-0000-01	93 / 96	15.7 - 41.5	380	N/A	540 N	N/A	N/A	No	S
7440-41-7	Beryllium	0.19	J	4.36		MG/KG	LPX-SD-4012-0000-01	86 / 95	0.11 - 0.55	4.36	N/A	15 N	N/A	N/A	No	S
7440-43-9	Cadmium	0.17		23.9		MG/KG	WRM-SD-2055-01	60 / 93	0.06 - 3	23.9	N/A	3.7 N	N/A	N/A	Yes	A
7440-70-2	Calcium	158		7620	J	MG/KG	RES-SS-14-333-01	78 / 79	447 - 447	7620	N/A		N/A	N/A	No	E
7440-47-3	Chromium	2.8	J	536	J	MG/KG	RES-SS-14-449-01	96 / 96	-	536	N/A	210 C	N/A	N/A	Yes	A
7440-48-4	Cobalt	1.5	J	26.6		MG/KG	LPX-SD-4012-0000-01	80 / 96	1.2 - 7.2	26.6	N/A	900 C	N/A	N/A	No	S, E
7440-50-8	Copper	4		1110		MG/KG	WRM-SD-2055-01	95 / 96	5.6 - 5.6	1110	N/A	310 N	N/A	N/A	No	E
7439-89-6	Iron	3370	J	52400	J	MG/KG	RES-SS-14-333-01	96 / 96	-	52400	N/A	2300 N	N/A	N/A	No	E
7439-92-1	Lead	12.7	J	1090		MG/KG	APB-FP-2033-000.5-01	96 / 96	-	1090	N/A	400 N	N/A	N/A	Yes	A
7439-95-4	Magnesium	358		4820	J	MG/KG	APB-FP-2033-000.5-01	79 / 79	-	4820	N/A		N/A	N/A	No	E
7439-96-5	Manganese	44.1	J	1970		MG/KG	LPX-SD-2050-01	96 / 96	-	1970	N/A	180 N	N/A	N/A	Yes	A
7439-97-6	Mercury	0.00743	J	3.6		MG/KG	CMW-SD-2023-01	71 / 93	0.02 - 0.32	3.6	N/A		N/A	N/A	Yes	A
22967-92-6	Mercury (methyl)	0.000196	J	0.00959	J	MG/KG	WRL-SD-4005-0000-01	17 / 17	-	0.00959	N/A	0.61 N	N/A	N/A	No	S
7439-98-7	Molybdenum	1.24	J	29.6		MG/KG	CMS-SD-4003-0000-01	18 / 18	-	29.6	N/A	39 N	N/A	N/A	No	S
7440-02-0	Nickel	0.883	J	187	J	MG/KG	WRM-SD-2055-01	77 / 96	2.8 - 16.3	187	N/A	160 N	N/A	N/A	Yes	A
7440-09-7	Potassium	224		2130		MG/KG	RES-SS-12-551-01	71 / 76	252 - 400	2130	N/A		N/A	N/A	No	E
7782-49-2	Selenium	0.58	J	3.8	J	MG/KG	RES-SS-14-449-01	27 / 93	0.245 - 10.6	3.8	N/A	39 N	N/A	N/A	No	S
7440-22-4	Silver	0.359	J	14.6		MG/KG	WRL-SD-2044-000.5-01	56 / 96	0.35 - 5.6	14.6	N/A	39 N	N/A	N/A	No	S
7440-23-5	Sodium	17.4	J	845	J	MG/KG	RES-SS-14-333-01	37 / 76	16.6 - 480	845	N/A		N/A	N/A	No	E
7440-28-0	Thallium	0.0543	J	6.8	J	MG/KG	RES-SS-14-333-01	23 / 93	0.35 - 627	6.8	N/A	0.52 N	N/A	N/A	Yes	A
7440-62-2	Vanadium	4.8		91.7		MG/KG	LPX-SD-4012-0000-01	96 / 96	-	91.7	N/A	55 N	N/A	N/A	Yes	A
7440-66-6	Zinc	23		2088	J	MG/KG	CMS-SD-4007-0000-01	94 / 96	29.2 - 30.8	2088	N/A	2300 N	N/A	N/A	No	S
57-12-5	Cyanide	2.4		2.4		MG/KG	CMS-192-A	1 / 1	-	2.4	N/A	120 N	N/A	N/A	No	S

Table 2.5
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Sediment

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Background Value	Screening Toxicity Value (3)	Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source	Retain as COPC?	Rationale for Contaminant Deletion or Selection (5)
	Dioxins/Furans															
38178-99-3	HCX	0.00000146	J	0.364758	J	MG/KG	SD-23	75 / 94	0.00026132 - 0.005036	0.364758	N/A		N/A	N/A	Yes	A
TEM	Toxicity Equivalency (Dioxins/Furans) - Mammals	8.96E-08		0.073		MG/KG	CMS-022-A	203 / 203	-	0.073	N/A	0.0000039 C	N/A	N/A	Yes	A
PCBCTEM	Toxicity Equivalency (PCB) - Mammals	2.53E-08		0.0000649		MG/KG	LPX-SD-4004-0000-01	7 / 7	-	0.0000649	N/A	0.0000039 C	N/A	N/A	Yes	A

(1) Minimum or maximum concentration detected in exposure area. Samples included in data set are provided in Appendix A
(2) The concentration used for screening is the maximum detected concentration, per USEPA Region I (USEPA, 1995).
(3) Values are the Residential Soil Preliminary Remediation Goals (PRGs) obtained from USEPA Region IX dated October 1, 2002.
Values used for screening are the residential soil PRGs for the lesser of cancer risks equal to 1E-06 or non-cancer risks equal to a hazard index of 0.1, per USEPA Region I (USEPA, 1999).
(4) There are no applicable ARAR values for sediment\.
(5) Analyte is selected as a COPC if the concentration used for screening exceeds the PRG.
S = Concentration used for screening is less than the screening toxicity value; the analyte was not selected as a COPC.
A = Concentration used for screening is greater than the screening toxicity value; the analyte was selected as a COPC
E = The analyte is a human essential nutrient, and is not considered to be toxic at the concentration detected; the analyte was not selected as a COPC (A.D. Little, 1998; USEPA, 1995).

MG/KG = milligrams per kilogram
COPC = chemical of potential concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirements / To Be Considered

Basis of screening toxicity value:
N - Based on non-cancer endpoint
C - Based on cancer endpoint
S - Saturated
M - Maximum

N/A = Not applicable
- Background values are not applicable for selection of COPCs. Risks at the two reference (Background) locations will be characterized and compared to the risks characterized in this assessment.
- Potential ARAR/TBC values are not applicable for selection of COPCs. EPA suggests use of risk-based media concentrations for screening COPCs.

Qualifier definitions:
J = Value is estimated.

Prepared by: KJA
Checked by: MJM

Table 2.6
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Bank Soil

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Soil

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Background Value	Screening Toxicity Value (3)	Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source	Retain as COPC?	Rationale for Contaminant Deletion or Selection (5)
	Dioxins/Furans															
1746-01-6	2,3,7,8-TCDD	0.00000781		0.00151		MG/KG	3428-CMS-019	19 / 21	0.000021 - 0.000023	0.00151	N/A	0.0000039 C	N/A	N/A	Yes	A

(1) Minimum or maximum concentration detected in exposure area. Samples included in data set are provided in Appendix A.
(2) The concentration used for screening is the maximum detected concentration, per USEPA Region I (USEPA, 1995).
(3) Values are the Residential Soil Preliminary Remediation Goals (PRGs) obtained from USEPA Region IX dated October 1, 2002.
Values used for screening are the residential soil PRGs for the lesser of cancer risks equal to 1E-06 or non-cancer risks equal to a hazard index of 0.1, per USEPA Region I (USEPA, 1999)
(4) There are no applicable ARAR values for soil
(5) Analyte is selected as a COPC if the concentration used for screening exceeds the PRG.
S = Concentration used for screening is less than the screening toxicity value, the analyte was not selected as a COPC.
A = Concentration used for screening is greater than the screening toxicity value; the analyte was selected as a COPC.
E = The analyte is a human essential nutrient, and is not considered to be toxic at the concentration detected; the analyte was not selected as a COPC (A.D. Little, 1998, USEPA, 1995).

N/A = Not applicable
- Background values are not applicable for selection of COPCs. Risks at the two reference (Background) locations will be characterized and compared to the risks characterized in this assessment.
- Potential ARAR/TBC values are not applicable for selection of COPCs. EPA suggests use of risk-based media concentrations for screening COPCs.

MG/KG = milligrams per kilogram
COPC = chemical of potential concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirements / To Be Considered

Basis of screening toxicity value:
N - Based on non-cancer endpoint
C - Based on cancer endpoint

Prepared by: KJA
Checked by: MJM

Table 2.7
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Fogarty Center

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Background Value	Screening Toxicity Value (3)	Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source	Retain as COPC?	Rationale for Contaminant Deletion or Selection (5)
	Semivolatile Organics															
92-52-4	1,1'-Biphenyl	0.00111		0.503		MG/KG	LPX-SS-4113-0005-01	3 / 3	-	0.503		350 S			No	S
91-57-6	2-Methylnaphthalene	0.00238	J	1.56		MG/KG	LPX-SS-4113-0005-01	3 / 3	-	1.56					Yes	A
83-32-9	Acenaphthene	0.00474	J	2.59		MG/KG	LPX-SS-4113-0005-01	3 / 3	-	2.59		370 N			No	S
208-96-8	Acenaphthylene	0.00709	J	0.152		MG/KG	LPX-SS-4113-0005-01	3 / 3	-	0.152					Yes	A
120-12-7	Anthracene	0.0159	J	3.38		MG/KG	LPX-SS-4113-0005-01	3 / 3	-	3.38		2200 N			No	S
56-55-3	Benzo(a)anthracene	0.105		7.3		MG/KG	LPX-SS-4113-0005-01	3 / 3	-	7.3		0.62 C			Yes	A
50-32-8	Benzo(a)pyrene	0.0863		5.12		MG/KG	LPX-SS-4113-0005-01	3 / 3	-	5.12		0.062 C			Yes	A
205-99-2	Benzo(b)fluoranthene	0.123		5.14		MG/KG	LPX-SS-4113-0005-01	3 / 3	-	5.14		0.62 C			Yes	A
191-24-2	Benzo(g,h,i)perylene	0.0913		3.17		MG/KG	LPX-SS-4113-0005-01	3 / 3	-	3.17					Yes	A
207-08-9	Benzo(k)fluoranthene	0.11		5.72		MG/KG	LPX-SS-4113-0005-01	3 / 3	-	5.72		6.2 C			No	S
117-81-7	bis(2-Ethylhexyl)phthalate	0.065	J	0.28	J	MG/KG	LPX-SS-4112-0005-01 LPX-SS-4114-0005-01	3 / 3	-	0.28		35 C			No	S
85-68-7	Butylbenzylphthalate	0.08	J	0.08	J	MG/KG	LPX-SS-4112-0005-01	1 / 3	0.4 - 0.44	0.08		1200 N			No	S
86-74-8	Carbazole	0.63		0.63		MG/KG	LPX-SS-4113-0005-01	1 / 3	0.4 - 0.44	0.63		24 C			No	S
218-01-9	Chrysene	0.122		7.51		MG/KG	LPX-SS-4113-0005-01	3 / 3	-	7.51		62 C			No	S
53-70-3	Dibenzo(a,h)anthracene	0.0258		0.668		MG/KG	LPX-SS-4113-0005-01	3 / 3	-	0.668		0.062 C			Yes	A
132-64-9	Dibenzofuran	0.00395	J	3.11		MG/KG	LPX-SS-4113-0005-01	3 / 3	-	3.11		29 N			No	S
206-44-0	Fluoranthene	0.21		21.8		MG/KG	LPX-SS-4113-0005-01	3 / 3	-	21.8		230 N			No	S
86-73-7	Fluorene	0.00486	J	2.81		MG/KG	LPX-SS-4113-0005-01	3 / 3	-	2.81		270 N			No	S
193-39-5	Indeno(1,2,3-cd)pyrene	0.0975		3.57	J	MG/KG	LPX-SS-4113-0005-01	3 / 3	-	3.57		0.62 C			Yes	A
91-20-3	Naphthalene	0.00397	J	4.39		MG/KG	LPX-SS-4113-0005-01	3 / 3	-	4.39		5.6 N			No	S
85-01-8	Phenanthrene	0.0942	J	24.6		MG/KG	LPX-SS-4113-0005-01	3 / 3	-	24.6					Yes	A
129-00-0	Pyrene	0.185		17.3		MG/KG	LPX-SS-4113-0005-01	3 / 3	-	17.3		230 N			No	S
	Pesticides/PCBs															
72-54-8	4,4'-DDD	0.00905		0.0171		MG/KG	LPX-SS-4113-0005-01	3 / 3	-	0.0171		2.4 C			No	S
72-55-9	4,4'-DDE	0.0168	J	0.0228	J	MG/KG	LPX-SS-4112-0005-01	3 / 3	-	0.0228		1.7 C			No	S
50-29-3	4,4'-DDT	0.00255		0.00259		MG/KG	LPX-SS-4114-0005-01	2 / 3	0.0000888 - 0.0000888	0.00259		1.7 C			No	S
5103-71-9	alpha-Chlordane	0.00603		0.0888		MG/KG	LPX-SS-4112-0005-01	3 / 3	-	0.0888					Yes	A
11097-69-1	Aroclor-1254	0.467		0.938		MG/KG	LPX-SS-4112-0005-01	2 / 3	0.0101 - 0.0101	0.938		0.22 C			Yes	A
60-57-1	Dieldrin	0.00256		0.00336		MG/KG	LPX-SS-4113-0005-01	3 / 3	-	0.00336		0.03 C			No	S
33213-65-9	Endosulfan II	0.00158		0.032		MG/KG	LPX-SS-4113-0005-01	3 / 3	-	0.032					Yes	A
1031-07-8	Endosulfan Sulfate	0.00108		0.00108		MG/KG	LPX-SS-4112-0005-01	1 / 3	0.0000936 - 0.000101	0.00108					Yes	A
5103-74-2	gamma-Chlordane	0.0255		0.0762		MG/KG	LPX-SS-4112-0005-01	2 / 3	0.0000701 - 0.0000701	0.0762					Yes	A
76-44-8	Heptachlor	0.00137		0.00309		MG/KG	LPX-SS-4112-0005-01	2 / 3	0.0000742 - 0.0000742	0.00309		0.11 C			No	S
1024-57-3	Heptachlor Epoxide	0.00183		0.0102		MG/KG	LPX-SS-4112-0005-01	3 / 3	-	0.0102		0.053 C			No	S
57-74-9	Technical Chlordane	0.49		0.943		MG/KG	LPX-SS-4112-0005-01	3 / 3	-	0.943					Yes	A
	Inorganics															
7429-90-5	Aluminum	17100	J	24800	J	MG/KG	LPX-SS-4113-0005-01	3 / 3	-	24800		7600 N			Yes	A
7440-36-0	Antimony	0.0675	J	0.163	J	MG/KG	LPX-SS-4114-0005-01	3 / 3	-	0.163		3.1 N			No	S
7440-38-2	Arsenic	9.77		11.5		MG/KG	LPX-SS-4112-0005-01	3 / 3	-	11.5		0.39 C			Yes	A
7440-39-3	Barium	54.7		126		MG/KG	LPX-SS-4113-0005-01	3 / 3	-	126		540 N			No	S
7440-41-7	Beryllium	0.556		0.934		MG/KG	LPX-SS-4113-0005-01	3 / 3	-	0.934		15 N			No	S
7440-43-9	Cadmium	0.184	J	0.428	J	MG/KG	LPX-SS-4114-0005-01	3 / 3	-	0.428		37 N			No	S
7440-47-3	Chromium	21.7		27		MG/KG	LPX-SS-4113-0005-01	3 / 3	-	27		210 C			No	S
7440-48-4	Cobalt	5.11		6.62		MG/KG	LPX-SS-4113-0005-01	3 / 3	-	6.62		900 C			No	S
7440-50-8	Copper	29.2		36.7		MG/KG	LPX-SS-4114-0005-01	3 / 3	-	36.7		310 N			No	S
7439-89-6	Iron	21800		23100		MG/KG	LPX-SS-4113-0005-01	3 / 3	-	23100		2300 N			No	B
7439-92-1	Lead	154	J	215	J	MG/KG	LPX-SS-4114-0005-01	3 / 3	-	215		400 N			No	S
7439-96-5	Manganese	402		478		MG/KG	LPX-SS-4114-0005-01	3 / 3	-	478		180 N			Yes	A
7439-97-6	Mercury	0.116		0.258		MG/KG	LPX-SS-4113-0005-01	3 / 3	-	0.258					Yes	A
22967-92-6	Mercury (methyl)	0.000183	J	0.000223		MG/KG	LPX-SS-4112-0005-01	3 / 3	-	0.000223		0.61 N			No	S
7440-02-0	Nickel	10.6		15.2		MG/KG	LPX-SS-4113-0005-01	3 / 3	-	15.2		160 N			No	S
7440-22-4	Silver	0.201	J	0.27	J	MG/KG	LPX-SS-4114-0005-01	3 / 3	-	0.27		39 N			No	S
7440-28-0	Thallium	0.143	J	0.242	J	MG/KG	LPX-SS-4113-0005-01	3 / 3	-	0.242		0.52 N			No	S
7440-62-2	Vanadium	38		54.9		MG/KG	LPX-SS-4113-0005-01	3 / 3	-	54.9		55 N			No	S
7440-66-6	Zinc	397		2190		MG/KG	LPX-SS-4113-0005-01	3 / 3	-	2190		2300 N			No	S

Table 2.7
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Fogarty Center

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Background Value	Screening Toxicity Value (3)	Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source	Retain as COPC?	Rationale for Contaminant Deletion or Selection (5)
	Dioxins/Furans															
38178-99-3	HCX	0.00000435	J	0.00002495	J	MG/KG	LPX-SS-4114-0005-01	3 / 3	-	0.00002495					Yes	A
TEM	Toxicity Equivalency (Dioxins/Furans) - Mammals	0.00000497		0.00000664		MG/KG	LPX-SS-4114-0005-01	3 / 3	-	0.00000664		0.0000039 C			Yes	A

(1) Minimum or maximum concentration detected in exposure area. Samples included in data set are provided in Appendix A.
(2) The concentration used for screening is the maximum detected concentration, per USEPA Region I (USEPA, 1995)
(3) Values are the Risk-Based Concentrations (RBCs) obtained from USEPA Region III dated October 9, 2002
Values used for screening are the fish ingestion RBCs for the lesser of cancer risks equal to 1E-06 or non-cancer risks equal to a hazard index of 0.1, per USEPA Region I (USEPA, 1999).
(4) There are no applicable ARAR values for biota.
(5) Analyte is selected as a COPC if the concentration used for screening exceeds the PRG
S = Concentration used for screening is less than the screening toxicity value; the analyte was not selected as a COPC.
A = Concentration used for screening is greater than the screening toxicity value; the analyte was selected as a COPC.
E = The analyte is a human essential nutrient, and is not considered to be toxic at the concentration detected, the analyte was not selected as a COPC (A.D. Little, 1998, USEPA, 1995).

MG/KG = milligrams per kilogram
COPC = chemical of potential concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirements / To Be Considered

Basis of screening toxicity value.
N - Based on non-cancer endpoint
C - Based on cancer endpoint

N/A = Not applicable
- Background values are not applicable for selection of COPCs. As part of the development of Preliminary Remediation Goals (PRGs), risks at the two reference (Background) locations will be characterized and compared to the risks characterized in this assessment.
- Potential ARAR/TBC values are not applicable for selection of COPCs. EPA suggests use of risk-based media concentrations for screening COPCs

Qualifier definitions:
J = Value is estimated.

Prepared by: KJA
Checked by: MJM

Table 2.8
Occurrence, Distribution and Selection of Chemicals of Potential Concern
American Eel - Background/Reference

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: American Eel
Exposure Medium: Whole Body

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Background Value	Screening Toxicity Value (3)	Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source	Retain as COPC?	Rationale for Contaminant Deletion or Selection (5)
	Semivolatile Organics															
91-57-6	2-Methylnaphthalene	0.00096	J	0.02339		MG/KG	RAB-AE-5004-0000-01-W	16 / 16	-	0.02339		2.7 N			No	S
83-32-9	Acenaphthene	0.00045	J	0.00403		MG/KG	GMP-AE-5004-0000-01-W	16 / 16	-	0.00403		8.1 N			No	S
208-96-8	Acenaphthylene	0.00107	J	0.00179		MG/KG	RAB-AE-5006-0000-01-W	9 / 16	0.00124 - 0.00126	0.00179					Yes	A
120-12-7	Anthracene	0.00082	J	0.00128		MG/KG	GMP-AE-5007-0000-01-W	8 / 16	0.00124 - 0.00126	0.00128		41 N			No	S
50-32-8	Benzo(a)pyrene	0.00457		0.00457		MG/KG	GMP-AE-5008-0000-01-W	1 / 16	0.00124 - 0.00387	0.00457		0.00043 C			Yes	A
205-99-2	Benzo(b)fluoranthene	0.00533		0.00533		MG/KG	GMP-AE-5008-0000-01-W	1 / 16	0.00124 - 0.00399	0.00533		0.0043 C			Yes	A
207-08-9	Benzo(k)fluoranthene	0.00452		0.00452		MG/KG	GMP-AE-5008-0000-01-W	1 / 16	0.00124 - 0.00382	0.00452		0.043 C			No	S
218-01-9	Chrysene	0.00558		0.00558		MG/KG	GMP-AE-5008-0000-01-W	1 / 16	0.00124 - 0.00456	0.00558		0.43 C			No	S
53-70-3	Dibenzo(a,h)anthracene	0.00142		0.00156		MG/KG	GMP-AE-5007-0000-01-W	2 / 16	0.00124 - 0.00126	0.00156		0.00043 C			Yes	A
206-44-0	Fluoranthene	0.00645		0.00906		MG/KG	GMP-AE-5005-0000-01-W	6 / 16	0.00126 - 0.00537	0.00906		5.4 N			No	S
86-73-7	Fluorene	0.0009	J	0.0018		MG/KG	RAB-AE-5001-0000-01-W	16 / 16	-	0.0018		5.4 N			No	S
193-39-5	Indeno(1,2,3-cd)pyrene	0.00432		0.00432		MG/KG	GMP-AE-5008-0000-01-W	1 / 16	0.00124 - 0.00435	0.00432		0.0043 C			Yes	A
91-20-3	Naphthalene	0.00603		0.02459		MG/KG	RAB-AE-5004-0000-01-W	9 / 16	0.00184 - 0.00562	0.02459		2.7 N			No	S
85-01-8	Phenanthrene	0.00623		0.00876		MG/KG	RAB-AE-5001-0000-01-W	3 / 16	0.00217 - 0.00506	0.00876					Yes	A
	Pesticides/PCBs															
72-54-8	4,4'-DDD	0.00261	J	0.0163	J	MG/KG	GMP-AE-5007-0000-01-W	16 / 16	-	0.0163		0.013 C			Yes	A
72-55-9	4,4'-DDE	0.00995	J	0.0439	J	MG/KG	GMP-AE-5007-0000-01-W	16 / 16	-	0.0439		0.0093 C			Yes	A
50-29-3	4,4'-DDT	0.00051	J	0.0042	J	MG/KG	GMP-AE-5005-0000-01-W	16 / 16	-	0.0042		0.0093 C			No	S
5103-71-9	alpha-Chlordane	0.00093	J	0.0222	J	MG/KG	GMP-AE-5010-0000-01-W	16 / 16	-	0.0222					Yes	A
11097-69-1	Aroclor-1254	0.04665	J	0.2928	J	MG/KG	GMP-AE-5006-0000-01-W	12 / 16	0.0206 - 0.02095	0.2928		0.0016 C			Yes	A
11100-14-4	Aroclor-1268	0.05866	J	0.14591	J	MG/KG	GMP-AE-5006-0000-01-W	10 / 16	0.0206 - 0.021	0.14591					Yes	A
60-57-1	Dieldrin	0.00073	J	0.00885	J	MG/KG	GMP-AE-5010-0000-01-W	16 / 16	-	0.00885		0.0002 C			Yes	A
58-89-9	gamma-BHC	0.00125	J	0.00125	J	MG/KG	GMP-AE-5010-0000-01-W	1 / 16	0.00165 - 0.00169	0.00125		0.0024 C			No	S
5103-74-2	gamma-Chlordane	0.00031	J	0.00902	J	MG/KG	GMP-AE-5006-0000-01-W	16 / 16	-	0.00902					Yes	A
1024-57-3	Heptachlor Epoxide	0.00026	J	0.0026	J	MG/KG	GMP-AE-5010-0000-01-W	14 / 16	0.00168 - 0.00168	0.0026		0.00035 C			Yes	A
57-74-9	Technical Chlordane	0.12072	J	0.41089	J	MG/KG	GMP-AE-5010-0000-01-W	11 / 16	0.20399 - 0.20982	0.41089		0.009 C			Yes	A
	Inorganics															
7429-90-5	Aluminum	1.44		41.4		MG/KG	GMP-AE-5005-0000-01-W	15 / 16	1.62 - 1.62	41.4		140 N			No	S
7440-36-0	Antimony	0.000672	J	0.00265	J	MG/KG	GMP-AE-5004-0000-01-W	2 / 16	0.034 - 0.034	0.00265		0.054 N			No	S
7440-39-3	Barium	0.136	J	0.853		MG/KG	GMP-AE-5005-0000-01-W	16 / 16	-	0.853		9.5 N			No	S
7440-41-7	Beryllium	0.00279	J	0.00828		MG/KG	GMP-AE-5005-0000-01-W	9 / 16	0.004 - 0.004	0.00828		0.27 N			No	S
7440-43-9	Cadmium	0.00829	J	0.0581	J	MG/KG	GMP-AE-5005-0000-01-W	16 / 16	-	0.0581		0.14 N			No	S
7440-47-3	Chromium	0.0286	J	0.187	J	MG/KG	GMP-AE-5004-0000-01-W	6 / 16	0.269 - 0.269	0.187		0.41 N			No	S
7440-48-4	Cobalt	0.0182	J	0.0433	J	MG/KG	GMP-AE-5001-0000-01-W	16 / 16	-	0.0433		2.7 N			No	S
7440-50-8	Copper	0.409		1.18	J	MG/KG	GMP-AE-5005-0000-01-W	16 / 16	-	1.18		5.4 N			No	S
7439-89-6	Iron	12		55.5		MG/KG	GMP-AE-5005-0000-01-W	16 / 16	-	55.5		41 N			No	E
7439-92-1	Lead	0.0335		1.47		MG/KG	GMP-AE-5008-0000-01-W	9 / 16	0.022 - 0.0237	1.47					Yes	A
7439-96-5	Manganese	1.5	J	7.75	J	MG/KG	RAB-AE-5005-0000-01-W	16 / 16	-	7.75		19 N			No	S
7439-97-6	Mercury	0.0216	J	0.227		MG/KG	GMP-AE-5001-0000-01-W	12 / 16	0.031 - 0.0453	0.227					Yes	A
22967-92-6	Mercury (methyl)	0.0253		0.234		MG/KG	GMP-AE-5001-0000-01-W	16 / 16	-	0.234		0.014 N			Yes	A
7440-02-0	Nickel	0.0256	J	0.309	J	MG/KG	RAB-AE-5004-0000-01-W	13 / 16	0.32 - 0.32	0.309		2.7 N			No	S
7782-49-2	Selenium	0.222	J	0.436	J	MG/KG	GMP-AE-5005-0000-01-W	9 / 16	0.448 - 0.448	0.436		0.68 N			No	S
7440-22-4	Silver	0.00365	J	0.0202	J	MG/KG	RAB-AE-5003-0000-01-W	3 / 16	0.06 - 0.06	0.0202		0.68 N			No	S
7440-28-0	Thallium	0.00108	J	0.00842	J	MG/KG	RAB-AE-5004-0000-01-W	12 / 16	0.022 - 0.022	0.00842		0.0095 N			No	S
7440-62-2	Vanadium	0.00533	J	0.15	J	MG/KG	GMP-AE-5005-0000-01-W	7 / 16	0.179 - 0.179	0.15		0.95 N			No	S
7440-66-6	Zinc	14.3		53.3	J	MG/KG	GMP-AE-5008-0000-01-W	13 / 16	18.3 - 30.1	53.3		41 N			Yes	A
	Dioxins/Furans															
	Toxicity Equivalency (Dioxins/Furans) - Mammals	0.000000227		0.00000178		MG/KG	RAB-AE-5006-0000-01-W	16 / 16	-	0.00000178		0.000000021 C			Yes	A
	Toxicity Equivalency (PCB) - Mammals	0.00000183		0.00000183		MG/KG	GMP-AE-5001-0000-01-W	1 / 1	-	0.00000183		0.000000021 C			Yes	A

(1) Minimum or maximum concentration detected in exposure area. Samples included in data set are provided in Appendix A.
(2) The concentration used for screening is the maximum detected concentration, per USEPA Region I (USEPA, 1995)
(3) Values are the Risk-Based Concentrations (RBCs) obtained from USEPA Region III dated October 9, 2002.
Values used for screening are the fish ingestion RBCs for the lesser of cancer risks equal to 1E-06 or non-cancer risks equal to a hazard index of 0.1, per USEPA Region I (USEPA, 1999)
(4) There are no applicable ARAR values for biota
(5) Analyte is selected as a COPC if the concentration used for screening exceeds the PRG
S = Concentration used for screening is less than the screening toxicity value, the analyte was not selected as a COPC
A = Concentration used for screening is greater than the screening toxicity value, the analyte was selected as a COPC.
E = The analyte is a human essential nutrient, and is not considered to be toxic at the concentration detected; the analyte was not selected as a COPC (A.D. Little, 1998, USEPA, 1995).

MG/KG = milligrams per kilogram
COPC = chemical of potential concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirements / To Be Considered

Basis of screening toxicity value:
N - Based on non-cancer endpoint
C - Based on cancer endpoint

Table 2.8
Occurrence, Distribution and Selection of Chemicals of Potential Concern
American Eel - Background/Reference

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: American Eel
Exposure Medium: Whole Body

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Background Value	Screening Toxicity Value (3)	Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source	Retain as COPC?	Rationale for Contaminant Deletion or Selection (5)

N/A = Not applicable
- Background values are not applicable for selection of COPCs. Risks at the two reference (Background) locations will be characterized and compared to the risks characterized in this assessment.
- Potential ARAR/TBC values are not applicable for selection of COPCs. EPA suggests use of risk-based media concentrations for screening COPCs

Qualifier definitions:
J = Value is estimated.

Prepared by: KJA
Checked by: RAR

Table 2.9
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Largemouth Bass - Background/Reference

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe Current/Future
Medium Largemouth Bass
Exposure Medium Fillet

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Background Value	Screening Toxicity Value (3)	Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source	Retain as COPC?	Rationale for Contaminant Detection or Selection (5)
	Semivolatile Organics															
92-52-4	1,1'-Biphenyl	0.00007	J	0.00022	J	MG/KG	GMP-LB-5004-0000-01-F	10 / 14	0.00063 - 0.00183	0.00022		6.8 N			No	S
91-57-6	2-Methylnaphthalene	0.00104		0.00893		MG/KG	RAB-LB-5004-0000-01-F	9 / 14	0.00062 - 0.00189	0.00893		2.7 N			No	S
83-32-9	Acenaphthene	0.0001	J	0.00032	J	MG/KG	RAB-LB-5003-0000-01-F	7 / 14	0.00062 - 0.00189	0.00032		8.1 N			No	S
208-96-8	Acenaphthylene	0.0001	J	0.00047	J	MG/KG	GMP-LB-5004-0000-01-F	9 / 14	0.00062 - 0.00189	0.00047					Yes	A
120-12-7	Anthracene	0.00007	J	0.00024	J	MG/KG	RAB-LB-5003-0000-01-F	14 / 14	-	0.00024		41 N			No	S
56-55-3	Benzo(a)anthracene	0.00014	J	0.00014	J	MG/KG	GMP-LB-5001-0000-01-F	1 / 14	0.00062 - 0.00184	0.00014		0.0043 C			No	S
50-32-8	Benzo(a)pyrene	0.00128	J	0.00128	J	MG/KG	RAB-LB-5002-0000-01-F	1 / 14	0.00062 - 0.00189	0.00128		0.00043 C			Yes	A
207-08-9	Benzo(k)fluoranthene	0.0013	J	0.0013	J	MG/KG	RAB-LB-5002-0000-01-F	1 / 14	0.00062 - 0.00189	0.0013		0.043 C			No	S
218-01-9	Chrysene	0.00005	J	0.00024	J	MG/KG	GMP-LB-5001-0000-01-F	9 / 14	0.00063 - 0.00184	0.00024		0.43 C			No	S
53-70-3	Dibenzo(a,h)anthracene	0.00014	J	0.00022	J	MG/KG	RAB-LB-5003-0000-01-F	3 / 14	0.00062 - 0.00189	0.00022		0.00043 C			No	S
132-64-9	Dibenzofuran	0.00006	J	0.00019	J	MG/KG	GMP-LB-5001-0000-01-F GMP-LB-5010-0000-01-F	10 / 14	0.00063 - 0.00183	0.00019		0.54 N			No	S
206-44-0	Fluoranthene	0.00028	J	0.00102		MG/KG	GMP-LB-5004-0000-01-F	7 / 14	0.00063 - 0.00274	0.00102		5.4 N			No	S
86-73-7	Fluorene	0.00015	J	0.0005	J	MG/KG	RAB-LB-5003-0000-01-F	14 / 14	-	0.0005		5.4 N			No	S
91-20-3	Naphthalene	0.00472		0.00544		MG/KG	GMP-LB-5004-0000-01-F	3 / 14	0.00064 - 0.0049	0.00544		2.7 N			No	S
85-01-8	Phenanthrene	0.0004	J	0.00147		MG/KG	GMP-LB-5004-0000-01-F	8 / 14	0.00151 - 0.0024	0.00147					Yes	A
129-00-0	Pyrene	0.00068	J	0.00068	J	MG/KG	GMP-LB-5004-0000-01-F	1 / 14	0.00062 - 0.00216	0.00068		4.1 N			No	S
	Pesticides/PCBs															
72-54-8	4,4'-DDD	0.00035	J	0.00151		MG/KG	GMP-LB-5009-0000-01-F	13 / 14	0.00121 - 0.00121	0.00151		0.013 C			No	S
72-55-9	4,4'-DDE	0.00144		0.02122	J	MG/KG	GMP-LB-5008-0000-01-F	14 / 14	-	0.02122		0.0093 C			Yes	A
50-29-3	4,4'-DDT	0.0001	J	0.00093	J	MG/KG	GMP-LB-5009-0000-01-F	12 / 14	0.00074 - 0.00121	0.00093		0.0093 C			No	S
5103-71-9	alpha-Chlordane	0.0001	J	0.0018		MG/KG	GMP-LB-5007-0000-01-F	13 / 14	0.00121 - 0.00121	0.0018					Yes	A
11097-69-1	Aroclor-1254	0.00974		0.10139		MG/KG	GMP-LB-5008-0000-01-F	10 / 14	0.00631 - 0.01831	0.10139		0.0016 C			Yes	A
11100-14-4	Aroclor-1268	0.00506	J	0.08518		MG/KG	GMP-LB-5009-0000-01-F	10 / 14	0.00631 - 0.01831	0.08518					Yes	A
60-57-1	Dieldrin	0.00012	J	0.00042	J	MG/KG	GMP-LB-5007-0000-01-F GMP-LB-5008-0000-01-F	8 / 14	0.00051 - 0.00151	0.00042		0.0002 C			Yes	A
5103-74-2	gamma-Chlordane	0.0001	J	0.00076		MG/KG	GMP-LB-5007-0000-01-F	8 / 14	0.00051 - 0.00152	0.00076					Yes	A
57-74-9	Technical Chlordane	0.00662	J	0.01794	J	MG/KG	GMP-LB-5007-0000-01-F	7 / 14	0.06311 - 0.18888	0.01794		0.009 C			Yes	A
	Inorganics															
7429-90-5	Aluminum	1.12	J	2.5		MG/KG	GMP-LB-5008-0000-01-F	2 / 14	0.222 - 1.12	2.5		140 N			No	S
7440-39-3	Barium	0.0597	J	0.0865		MG/KG	GMP-LB-5004-0000-01-F	5 / 14	0.0126 - 0.0517	0.0865		9.5 N			No	S
7440-43-9	Cadmium	0.00309	J	0.00309	J	MG/KG	RAB-LB-5003-0000-01-F	1 / 14	0.2 - 0.2	0.00309		0.14 N			No	S
7440-47-3	Chromium	0.0423	J	0.101	J	MG/KG	RAB-LB-5004-0000-01-F	5 / 14	0.269 - 0.269	0.101		0.41 N			No	S
7440-48-4	Cobalt	0.00416	J	0.0083	J	MG/KG	GMP-LB-5006-0000-01-F	14 / 14	-	0.0083		2.7 N			No	S
7440-50-8	Copper	0.168		0.346		MG/KG	GMP-LB-5010-0000-01-F	14 / 14	-	0.346		5.4 N			No	S
7439-89-6	Iron	1.62		11.6	J	MG/KG	GMP-LB-5009-0000-01-F	10 / 14	1.28 - 2.14	11.6		41 N			No	S, E
7439-96-5	Manganese	0.0892	J	0.774	J	MG/KG	GMP-LB-5010-0000-01-F	14 / 14	-	0.774		19 N			No	S
7439-97-6	Mercury	0.155	J	0.708	J	MG/KG	GMP-LB-5008-0000-01-F	14 / 14	-	0.708					Yes	A
22967-92-6	Mercury (methyl)	0.141		0.652		MG/KG	GMP-LB-5008-0000-01-F	14 / 14	-	0.652		0.014 N			Yes	A
7440-02-0	Nickel	0.0116	J	1.47	J	MG/KG	GMP-LB-5009-0000-01-F	4 / 14	0.32 - 0.32	1.47		2.7 N			No	S
7782-49-2	Selenium	0.127	J	0.198	J	MG/KG	GMP-LB-5010-0000-01-F	11 / 14	0.448 - 0.448	0.198		0.68 N			No	S
7440-22-4	Silver	0.00417	J	0.0635	J	MG/KG	RAB-LB-5004-0000-01-F	3 / 14	0.06 - 0.06	0.0635		0.68 N			No	S
7440-28-0	Thallium	0.00137	J	0.00329	J	MG/KG	GMP-LB-5007-0000-01-F	14 / 14	-	0.00329		0.0095 N			No	S
7440-62-2	Vanadium	0.00218	J	0.00683	J	MG/KG	RAB-LB-5003-0000-01-F	3 / 14	0.179 - 0.179	0.00683		0.95 N			No	S
7440-66-6	Zinc	4.03	J	9.14	J	MG/KG	GMP-LB-5009-0000-01-F	14 / 14	-	9.14		41 N			No	S
	Dioxins/Furans															
38178-99-3	HCX	0.00000535	J	0.00000535	J	MG/KG	RAB-LB-5001-0000-01-F	1 / 14	0.00001989 - 0.00006059	0.00000535					Yes	A
TEM	Toxicity Equivalency (Dioxins/Furans) - Mammals	0.000000148		0.00000279		MG/KG	RAB-LB-5004-0000-01-F	14 / 14	-	0.00000279		0.000000021 C			Yes	A
PCBCTEM	Toxicity Equivalency (PCB) - Mammals	0.0000106		0.0000106		MG/KG	GMP-LB-5001-0000-01-F	1 / 1	-	0.0000106		0.000000021 C			Yes	A

(1) Minimum or maximum concentration detected in exposure area. Samples included in data set are provided in Appendix A.
(2) The concentration used for screening is the maximum detected concentration, per USEPA Region I (USEPA, 1995)
(3) Values are the Risk-Based Concentrations (RBCs) obtained from USEPA Region III dated October 9, 2002.
Values used for screening are the fish ingestion RBCs for the lesser of cancer risks equal to 1E-06 or non-cancer risks equal to a hazard index of 0.1, per USEPA Region I (USEPA, 1999)
(4) There are no applicable ARAR values for biota
(5) Analyte is selected as a COPC if the concentration used for screening exceeds the PRG.
S = Concentration used for screening is less than the screening toxicity value; the analyte was not selected as a COPC.
A = Concentration used for screening is greater than the screening toxicity value; the analyte was selected as a COPC.
E = The analyte is a human essential nutrient, and is not considered to be toxic at the concentration detected, the analyte was not selected as a COPC (A.D. Little, 1998; USEPA, 1995).

MG/KG = milligrams per kilogram
COPC = chemical of potential concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirements / To Be Considered

Basis of screening toxicity value:
N - Based on non-cancer endpoint
C - Based on cancer endpoint

Table 2.9
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Largemouth Bass - Background/Reference

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe Current/Future
Medium: Largemouth Bass
Exposure Medium: Fillet

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Background Value	Screening Toxicity Value (3)	Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source	Retain as COPC?	Rationale for Contaminant Deletion or Selection (5)

N/A = Not applicable
- Background values are not applicable for selection of COPCs. Risks at the two reference (Background) locations will be characterized and compared to the risks characterized in this assessment.
- Potential ARAR/TBC values are not applicable for selection of COPCs. EPA suggests use of risk-based media concentrations for screening COPCs

Qualifier definitions.
J = Value is estimated.

Prepared by:	RAR
Checked by:	MJM

Table 2.10
Occurrence, Distribution and Selection of Chemicals of Potential Concern
White Sucker - Background

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe Current/Future
Medium White Sucker
Exposure Medium Whole Body

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Background Value	Screening Toxicity Value (3)	Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source	Retain as COPC?	Rationale for Contaminant Deletion or Selection (5)
	Semivolatile Organics															
92-52-4	1,1'-Biphenyl	0.0009	J	0.00174	J	MG/KG	GMP-WS-5008-0000-01-W	10 / 10	-	0.00174		6.8 N			No	S
91-57-6	2-Methylnaphthalene	0.00355		0.0073		MG/KG	GMP-WS-5008-0000-01-W	10 / 10	-	0.0073		2.7 N			No	S
83-32-9	Acenaphthene	0.00213		0.00607		MG/KG	GMP-WS-5008-0000-01-W	10 / 10	-	0.00607		8.1 N			No	S
208-96-8	Acenaphthylene	0.00217		0.00706		MG/KG	GMP-WS-5008-0000-01-W	10 / 10	-	0.00706					Yes	A
120-12-7	Anthracene	0.002		0.00928		MG/KG	GMP-WS-5008-0000-01-W	10 / 10	-	0.00928		41 N			No	S
56-55-3	Benzo(a)anthracene	0.00154	J	0.00331		MG/KG	GMP-WS-5007-0000-01-W	8 / 10	0.00186 - 0.00189	0.00331		0.0043 C			No	S
50-32-8	Benzo(a)pyrene	0.00273		0.00273		MG/KG	GMP-WS-5007-0000-01-W	1 / 10	0.00186 - 0.00191	0.00273		0.00043 C			Yes	A
205-99-2	Benzo(b)fluoranthene	0.00174	J	0.0035		MG/KG	GMP-WS-5007-0000-01-W	4 / 10	0.00186 - 0.00191	0.0035		0.0043 C			No	S
191-24-2	Benzo(g,h,i)perylene	0.00138	J	0.00138	J	MG/KG	GMP-WS-5005-0000-01-W	1 / 10	0.00186 - 0.00192	0.00138					Yes	A
207-08-9	Benzo(k)fluoranthene	0.00157	J	0.00313		MG/KG	GMP-WS-5007-0000-01-W	4 / 10	0.00186 - 0.00191	0.00313		0.043 C			No	S
218-01-9	Chrysene	0.00216		0.00563		MG/KG	GMP-WS-5007-0000-01-W	8 / 10	0.00189 - 0.00195	0.00563		0.43 C			No	S
53-70-3	Dibenzo(a,h)anthracene	0.00028	J	0.00039	J	MG/KG	GMP-WS-5007-0000-01-W	4 / 10	0.00186 - 0.00191	0.00039		0.00043 C			No	S
132-64-9	Dibenzofuran	0.00212		0.00542		MG/KG	GMP-WS-5008-0000-01-W	10 / 10	-	0.00542		0.54 N			No	S
206-44-0	Fluoranthene	0.00708		0.02085		MG/KG	GMP-WS-5007-0000-01-W	10 / 10	-	0.02085		5.4 N			No	S
86-73-7	Fluorene	0.00357		0.00977		MG/KG	GMP-WS-5008-0000-01-W	10 / 10	-	0.00977		5.4 N			No	S
91-20-3	Naphthalene	0.00524		0.00524		MG/KG	GMP-WS-5008-0000-01-W	1 / 10	0.00301 - 0.00484	0.00524		2.7 N			No	S
85-01-8	Phenanthrene	0.00895		0.02832		MG/KG	GMP-WS-5008-0000-01-W	10 / 10	-	0.02832					Yes	A
129-00-0	Pyrene	0.00735		0.0114		MG/KG	GMP-WS-5007-0000-01-W	5 / 10	0.00444 - 0.0065	0.0114		4.1 N			No	S
	Pesticides/PCBs															
72-54-8	4,4'-DDD	0.00942		0.02488		MG/KG	GMP-WS-5008-0000-01-W	10 / 10	-	0.02488		0.013 C			Yes	A
72-55-9	4,4'-DDE	0.02428		0.06803		MG/KG	GMP-WS-5008-0000-01-W	10 / 10	-	0.06803		0.0093 C			Yes	A
50-29-3	4,4'-DDT	0.00646		0.01314	J	MG/KG	GMP-WS-5001-0000-01-W	6 / 10	0.00149 - 0.00154	0.01314		0.0093 C			Yes	A
5103-71-9	alpha-Chlordane	0.01307		0.02862		MG/KG	GMP-WS-5008-0000-01-W	10 / 10	-	0.02862					Yes	A
11097-69-1	Aroclor-1254	0.13404		0.35135		MG/KG	GMP-WS-5008-0000-01-W	10 / 10	-	0.35135		0.0016 C			Yes	A
11100-14-4	Aroclor-1268	0.02937		0.16789		MG/KG	GMP-WS-5008-0000-01-W	10 / 10	-	0.16789					Yes	A
60-57-1	Dieldrin	0.00563		0.02346		MG/KG	GMP-WS-5005-0000-01-W	3 / 10	0.00149 - 0.00153	0.02346		0.0002 C			Yes	A
58-89-9	gamma-BHC	0.00099	J	0.00103	J	MG/KG	GMP-WS-5010-0000-01-W	2 / 10	0.00149 - 0.00154	0.00103		0.0024 C			No	S
5103-74-2	gamma-Chlordane	0.00743		0.01453		MG/KG	GMP-WS-5003-0000-01-W	10 / 10	-	0.01453					Yes	A
1024-57-3	Heptachlor Epoxide	0.00075	J	0.00123	J	MG/KG	GMP-WS-5008-0000-01-W	3 / 10	0.00149 - 0.00153	0.00123		0.00035 C			Yes	A
57-74-9	Technical Chlordane	0.1956		0.34491		MG/KG	GMP-WS-5003-0000-01-W	10 / 10	-	0.34491		0.009 C			Yes	A
	Inorganics															
7429-90-5	Aluminum	9.34		52.8		MG/KG	GMP-WS-5002-0000-01-W	10 / 10	-	52.8		140 N			No	S
7440-36-0	Antimony	0.000776	J	0.00105	J	MG/KG	GMP-WS-5002-0000-01-W	3 / 10	0.034 - 0.034	0.00105		0.054 N			No	S
7440-39-3	Barium	0.498		1.25		MG/KG	GMP-WS-5001-0000-01-W	10 / 10	-	1.25		9.5 N			No	S
7440-41-7	Beryllium	0.00356	J	0.00736		MG/KG	GMP-WS-5007-0000-01-W	10 / 10	-	0.00736		0.27 N			No	S
7440-43-9	Cadmium	0.00347	J	0.0289	J	MG/KG	GMP-WS-5007-0000-01-W	7 / 10	0.2 - 0.2	0.0289		0.14 N			No	S
7440-47-3	Chromium	0.105	J	0.163	J	MG/KG	GMP-WS-5002-0000-01-W	6 / 10	0.0269 - 0.269	0.163		0.41 N			No	S
7440-48-4	Cobalt	0.0516	J	0.388	J	MG/KG	GMP-WS-5003-0000-01-W	10 / 10	-	0.388		2.7 N			No	S
7440-50-8	Copper	0.669	J	1.52	J	MG/KG	GMP-WS-5004-0000-01-W	10 / 10	-	1.52		5.4 N			No	S
7439-89-6	Iron	23.4		66.3		MG/KG	GMP-WS-5007-0000-01-W	10 / 10	-	66.3		41 N			No	E
7439-92-1	Lead	0.022	J	0.022	J	MG/KG	GMP-WS-5002-0000-01-W	1 / 10	0.022 - 0.022	0.022					Yes	A
7439-96-5	Manganese	2.58	J	12.1	J	MG/KG	GMP-WS-5001-0000-01-W	10 / 10	-	12.1		19 N			No	S
7439-97-6	Mercury	0.122		0.278		MG/KG	GMP-WS-5010-0000-01-W	10 / 10	-	0.278					Yes	A
22967-92-6	Mercury (methyl)	0.125		0.299		MG/KG	GMP-WS-5010-0000-01-W	10 / 10	-	0.299		0.014 N			Yes	A
7440-02-0	Nickel	0.0501	J	0.117	J	MG/KG	GMP-WS-5002-0000-01-W	10 / 10	-	0.117		2.7 N			No	S
7440-22-4	Silver	0.0383	J	0.0383	J	MG/KG	GMP-WS-5008-0000-01-W	1 / 10	0.06 - 0.06	0.0383		0.68 N			No	S
7440-28-0	Thallium	0.000879	J	0.00193	J	MG/KG	GMP-WS-5007-0000-01-W	5 / 10	0.022 - 0.022	0.00193		0.0095 N			No	S
7440-62-2	Vanadium	0.0474	J	0.296	J	MG/KG	GMP-WS-5009-0000-01-W	7 / 10	0.179 - 0.179	0.296		0.95 N			No	S
7440-66-6	Zinc	12		21.1		MG/KG	GMP-WS-5004-0000-01-W	10 / 10	-	21.1		41 N			No	S
	Dioxins/Furans															
TEM	Toxicity Equivalency - Mammals	0.000000722		0.00000395		MG/KG	GMP-WS-5010-0000-01-W	10 / 10	-	0.00000395		0.000000021 C			Yes	A
PCBCTEM	Toxicity Equivalency (PCB) - Mammals	0.0000116		0.0000116		MG/KG	GMP-WS-5001-0000-01-W	1 / 1	-	0.0000116		0.000000021 C			Yes	A

(1) Minimum or maximum concentration detected in exposure area. Samples included in data set are provided in Appendix A
(2) The concentration used for screening is the maximum detected concentration, per USEPA Region I (USEPA, 1995)
(3) Values are the Risk-Based Concentrations (RBCs) obtained from USEPA Region III dated October 9, 2002
Values used for screening are the fish ingestion RBCs for the lesser of cancer risks equal to 1E-06 or non-cancer risks equal to a hazard index of 0.1, per USEPA Region I (USEPA, 1999)

MG/KG = milligrams per kilogram
COPC = chemical of potential concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirements / To Be Considered

Table 2.10
Occurrence, Distribution and Selection of Chemicals of Potential Concern
White Sucker - Background

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: White Sucker
Exposure Medium: Whole Body

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Background Value	Screening Toxicity Value (3)	Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source	Retain as COPC?	Rationale for Contaminant Deletion or Selection (5)

(4) There are no applicable ARAR values for biota.
(5) Analyte is selected as a COPC if the concentration used for screening exceeds the PRG.
S = Concentration used for screening is less than the screening toxicity value; the analyte was not selected as a COPC.
A = Concentration used for screening is greater than the screening toxicity value; the analyte was selected as a COPC.
E = The analyte is a human essential nutrient, and is not considered to be toxic at the concentration detected; the analyte was not selected as a COPC (A.D. Little, 1998; USEPA, 1995).
N/A = Not applicable
- Background values are not applicable for selection of COPCs. Risks at the two reference (Background) locations will be characterized and compared to the risks characterized in this assessment.
- Potential ARAR/TBC values are not applicable for selection of COPCs. EPA suggests use of risk-based media concentrations for screening COPCs.

Basis of screening toxicity value:
N - Based on non-cancer endpoint
C - Based on cancer endpoint

Qualifier definitions:
J = Value is estimated.

Prepared by: RAR
Checked by: MJM

Table 2.11
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Brown Bullhead - Reference

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Brown Bullhead
Exposure Medium: Whole Body

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Background Value	Screening Toxicity Value (3)	Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source	Retain as COPC?	Rationale for Contaminant Deletion or Selection (5)
	Semivolatile Organics															
92-52-4	1,1'-Biphenyl	0.00049	J	0.00076	J	MG/KG	RAB-BB-5003-0000-01-W	3 / 3	-	0.00076		6.8 N			No	S
91-57-6	2-Methylnaphthalene	0.00841		0.02429		MG/KG	RAB-BB-5003-0000-01-W	3 / 3	-	0.02429		2.7 N			No	S
83-32-9	Acenaphthene	0.00041	J	0.00041	J	MG/KG	RAB-BB-5001-0000-01-W RAB-BB-5003-0000-01-W	2 / 3	0.00192 - 0.00192	0.00041		8.1 N			No	S
208-96-8	Acenaphthylene	0.00047	J	0.00122	J	MG/KG	RAB-BB-5001-0000-01-W	3 / 3	-	0.00122					Yes	A
120-12-7	Anthracene	0.00049	J	0.00105	J	MG/KG	RAB-BB-5002-0000-01-W	3 / 3	-	0.00105		41 N			No	S
56-55-3	Benzo(a)anthracene	0.00808		0.00808		MG/KG	RAB-BB-5002-0000-01-W	1 / 3	0.00189 - 0.00201	0.00808		0.0043 C			Yes	A
50-32-8	Benzo(a)pyrene	0.00791		0.00791		MG/KG	RAB-BB-5002-0000-01-W	1 / 3	0.00189 - 0.00201	0.00791		0.00043 C			Yes	A
205-99-2	Benzo(b)fluoranthene	0.01058		0.01058		MG/KG	RAB-BB-5002-0000-01-W	1 / 3	0.00189 - 0.00201	0.01058		0.0043 C			Yes	A
191-24-2	Benzo(g,h,i)perylene	0.00462		0.00462		MG/KG	RAB-BB-5002-0000-01-W	1 / 3	0.00189 - 0.00201	0.00462					Yes	A
207-08-9	Benzo(k)fluoranthene	0.00894		0.00894		MG/KG	RAB-BB-5002-0000-01-W	1 / 3	0.00189 - 0.00201	0.00894		0.043 C			No	S
218-01-9	Chrysene	0.01161		0.01161		MG/KG	RAB-BB-5002-0000-01-W	1 / 3	0.00189 - 0.00201	0.01161		0.43 C			No	S
53-70-3	Dibenzo(a,h)anthracene	0.00129	J	0.00129	J	MG/KG	RAB-BB-5002-0000-01-W	1 / 3	0.00189 - 0.00201	0.00129		0.00043 C			Yes	A
132-64-9	Dibenzofuran	0.00042	J	0.00067	J	MG/KG	RAB-BB-5001-0000-01-W	3 / 3	-	0.00067		0.54 N			No	S
206-44-0	Fluoranthene	0.00523		0.02088		MG/KG	RAB-BB-5002-0000-01-W	3 / 3	-	0.02088		5.4 N			No	S
86-73-7	Fluorene	0.00048	J	0.00119	J	MG/KG	RAB-BB-5003-0000-01-W	3 / 3	-	0.00119		5.4 N			No	S
193-39-5	Indeno(1,2,3-cd)pyrene	0.00653		0.00653		MG/KG	RAB-BB-5002-0000-01-W	1 / 3	0.00189 - 0.00201	0.00653		0.0043 C			Yes	A
91-20-3	Naphthalene	0.00873		0.01204		MG/KG	RAB-BB-5001-0000-01-W	2 / 3	0.00491 - 0.00491	0.01204		2.7 N			No	S
85-01-8	Phenanthrene	0.0064		0.00776		MG/KG	RAB-BB-5001-0000-01-W	3 / 3	-	0.00776					Yes	A
129-00-0	Pyrene	0.01562		0.01562		MG/KG	RAB-BB-5002-0000-01-W	1 / 3	0.00189 - 0.00207	0.01562		4.1 N			No	S
	Pesticides/PCBs															
72-55-9	4,4'-DDE	0.00667		0.02374		MG/KG	RAB-BB-5001-0000-01-W	3 / 3	-	0.02374		0.0093 C			Yes	A
72-54-8	4,4'-DDD	0.00219		0.00413		MG/KG	RAB-BB-5001-0000-01-W	2 / 3	0.00154 - 0.00154	0.00413		0.013 C			No	S
5103-71-9	alpha-Chlordane	0.00157		0.00288		MG/KG	RAB-BB-5001-0000-01-W	2 / 3	0.00154 - 0.00154	0.00288					Yes	A
5103-74-2	gamma-Chlordane	0.0015	J	0.0013	J	MG/KG	RAB-BB-5001-0000-01-W	1 / 3	0.00152 - 0.00154	0.0013					Yes	A
	Inorganics															
7429-90-5	Aluminum	5.31		13.5		MG/KG	RAB-BB-5001-0000-01-W	3 / 3	-	13.5		140 N			No	S
7440-39-3	Barium	0.735	J	1.21	J	MG/KG	RAB-BB-5001-0000-01-W	3 / 3	-	1.21		9.5 N			No	S
7440-41-7	Beryllium	0.000348	J	0.000348	J	MG/KG	RAB-BB-5002-0000-01-W	1 / 3	0.004 - 0.004	0.000348		0.27 N			No	S
7440-43-9	Cadmium	0.00463	J	0.0319	J	MG/KG	RAB-BB-5002-0000-01-W	3 / 3	-	0.0319		0.14 N			No	S
7440-47-3	Chromium	0.0758	J	0.1	J	MG/KG	RAB-BB-5002-0000-01-W	3 / 3	-	0.1		0.41 N			No	S
7440-48-4	Cobalt	0.0353	J	0.0456	J	MG/KG	RAB-BB-5001-0000-01-W	3 / 3	-	0.0456		2.7 N			No	S
7440-50-8	Copper	0.409		0.688		MG/KG	RAB-BB-5001-0000-01-W	3 / 3	-	0.688		5.4 N			No	S
7439-89-6	Iron	43.6		58.1	J	MG/KG	RAB-BB-5001-0000-01-W	3 / 3	-	58.1		41 N			No	E
7439-92-1	Lead	0.0371		0.129	J	MG/KG	RAB-BB-5002-0000-01-W	3 / 3	-	0.129					Yes	A
7439-96-5	Manganese	3.07	J	5.42	J	MG/KG	RAB-BB-5003-0000-01-W	3 / 3	-	5.42		19 N			No	S
7439-97-6	Mercury	0.045		0.137	J	MG/KG	RAB-BB-5002-0000-01-W	3 / 3	-	0.137					Yes	A
22967-92-6	Mercury (methyl)	0.0417		0.145		MG/KG	RAB-BB-5002-0000-01-W	3 / 3	-	0.145		0.014 N			Yes	A
7440-02-0	Nickel	0.0337	J	0.0439	J	MG/KG	RAB-BB-5001-0000-01-W	3 / 3	-	0.0439		2.7 N			No	S
7782-49-2	Selenium	0.162	J	0.196	J	MG/KG	RAB-BB-5002-0000-01-W	2 / 3	0.448 - 0.448	0.196		0.68 N			No	S
7440-22-4	Silver	0.00988	J	0.0236	J	MG/KG	RAB-BB-5002-0000-01-W	2 / 3	0.06 - 0.06	0.0236		0.68 N			No	S
7440-28-0	Thallium	0.00315	J	0.00315	J	MG/KG	RAB-BB-5002-0000-01-W	1 / 3	0.022 - 0.022	0.00315		0.0095 N			No	S
7440-62-2	Vanadium	0.0513	J	0.0711	J	MG/KG	RAB-BB-5002-0000-01-W	2 / 3	0.179 - 0.179	0.0711		0.95 N			No	S
7440-66-6	Zinc	10.4		12.2		MG/KG	RAB-BB-5002-0000-01-W	2 / 3	13.5 - 13.5	12.2		41 N			No	S
	Dioxins/Furans															
TEM	Toxicity Equivalency - Mammals	0.00000186		0.00000258		MG/KG	RAB-BB-5002-0000-01-W	3 / 3	-	0.00000258		0.000000021 C			Yes	A

(1) Minimum or maximum concentration detected in exposure area. Samples included in data set are provided in Appendix A.
(2) The concentration used for screening is the maximum detected concentration, per USEPA Region I (USEPA, 1995).
(3) Values are the Risk-Based Concentrations (RBCs) obtained from USEPA Region III dated October 9, 2002.
Values used for screening are the fish ingestion RBCs for the lesser of cancer risks equal to 1E-06 or non-cancer risks equal to a hazard index of 0.1, per USEPA Region I (USEPA, 1999).
(4) There are no applicable ARAR values for biota
(5) Analyte is selected as a COPC if the concentration used for screening exceeds the PRG
S = Concentration used for screening is less than the screening toxicity value, the analyte was not selected as a COPC.
A = Concentration used for screening is greater than the screening toxicity value, the analyte was selected as a COPC.
E = The analyte is a human essential nutrient, and is not considered to be toxic at the concentration detected; the analyte was not selected as a COPC (A.D. Little, 1998; USEPA, 1995).

MG/KG = milligrams per kilogram
COPC = chemical of potential concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirements / To Be Considered

Basis of screening toxicity value:
N - Based on non-cancer endpoint
C - Based on cancer endpoint

Table 2.11
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Brown Bullhead - Reference

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Brown Bullhead
Exposure Medium: Whole Body

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Background Value	Screening Toxicity Value (3)	Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source	Retain as COPC?	Rationale for Contaminant Deletion or Selection (5)

N/A = Not applicable
- Background values are not applicable for selection of COPCs. Risks at the two reference (Background) locations will be characterized and compared to the risks characterized in this assessment.
- Potential ARAR/TBC values are not applicable for selection of COPCs. EPA suggests use of risk-based media concentrations for screening COPCs.

Qualifier definitions:
J = Value is estimated.

Prepared by: KJA
Checked by: MJM

Table 2.12
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Surface Water - Background/Reference

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Background Value	Screening Toxicity Value (3)	Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source	Retain as COPC?	Rationale for Contaminant Deletion or Selection (5)
	Semivolatile Organics															
117-81-7	bis(2-Ethylhexyl)phthalate	0.001	J	0.001	J	MG/L	RAB-SW-3004-01	1/5	0.01 - 0.011	0.001	N/A	0.0048 C	N/A	N/A	No	S
	Pesticides/PCBs															
319-85-7	beta-BHC	0.00000098	J	0.00000105	J	MG/L	RWR-SW-5002-01	2/5	0.00000185 - 0.00005	0.00000105	N/A	0.000037 C	N/A	N/A	No	S
58-89-9	gamma-BHC	0.0000006	J	0.00000075	J	MG/L	RWR-SW-5002-01	2/5	0.00000185 - 0.00005	0.00000075	N/A	0.000052 C	N/A	N/A	No	S
	Inorganics, Total															
7429-90-5	Aluminum	0.0434		0.263		MG/L	RAB-SW-3004-01	5/5	-	0.263	N/A	3.6 N	N/A	N/A	No	S
7440-36-0	Antimony	0.000168		0.000173		MG/L	RWR-SW-5002-01	2/5	0.0000652 - 0.005	0.000173	N/A	0.0015 N	N/A	N/A	No	S
7440-38-2	Arsenic	0.000491		0.00055		MG/L	RWR-SW-5002-01	3/5	0.006 - 0.006	0.00055	N/A	0.000045 C	N/A	N/A	Yes	A
7440-39-3	Barium	0.0195		0.025		MG/L	RAB-SW-3004-01	5/5	-	0.025	N/A	0.26 N	N/A	N/A	No	S
7440-41-7	Beryllium	0.0000487	J	0.0000551	J	MG/L	RWR-SW-5002-01	3/5	0.001 - 0.001	0.0000551	N/A	0.0073 N	N/A	N/A	No	S
7440-43-9	Cadmium	0.00000794	J	0.000022	J	MG/L	RWR-SW-5002-01	3/5	0.001 - 0.001	0.000022	N/A	0.0018 N	N/A	N/A	No	S
7440-70-2	Calcium	8.65		9.31		MG/L	RCC-SW-3001-01	2/2	-	9.31	N/A		N/A	N/A	No	E
7440-47-3	Chromium	0.0025		0.0025		MG/L	RCC-SW-3001-01	1/5	0.001 - 0.012	0.0025	N/A	0.011 N	N/A	N/A	No	S
7440-48-4	Cobalt	0.000114		0.00012		MG/L	RWR-SW-5001-01	3/5	0.001 - 0.001	0.00012	N/A	0.073 N	N/A	N/A	No	S
7440-50-8	Copper	0.000606	J	0.0126		MG/L	RCC-SW-3001-01	5/5	-	0.0126	N/A	0.15 N	N/A	N/A	No	S
7439-89-6	Iron	0.657		1.11		MG/L	RAB-SW-3004-01	5/5	-	1.11	N/A	1.1 N	N/A	N/A	No	E
7439-92-1	Lead	0.000166		0.0068		MG/L	RCC-SW-3001-01	4/5	0.002 - 0.002	0.0068	N/A	0.015 N	N/A	N/A	No	S
7439-95-4	Magnesium	1.43	J	1.65		MG/L	RAB-SW-3004-01	2/2	-	1.65	N/A		N/A	N/A	No	E
7439-96-5	Manganese	0.104		0.166		MG/L	RAB-SW-3004-01	5/5	-	0.166	N/A	0.088 N	N/A	N/A	Yes	A
7439-97-6	Mercury	0.00000188		0.00000215		MG/L	RAB-SW-3004-01	3/5	0.0002 - 0.0002	0.00000215	N/A		N/A	N/A	Yes	A
7439-98-7	Molybdenum	0.000368	J	0.000832	J	MG/L	RWR-SW-5002-01	3/3	-	0.000832	N/A	0.018 N	N/A	N/A	No	S
7440-02-0	Nickel	0.00115	J	0.0035	J	MG/L	RCC-SW-3001-01	5/5	-	0.0035	N/A	0.073 N	N/A	N/A	No	S
7440-09-7	Potassium	1.54		1.89		MG/L	RCC-SW-3001-01	2/2	-	1.89	N/A		N/A	N/A	No	E
7782-49-2	Selenium	0.0000815	J	0.0000868	J	MG/L	RWR-SW-5002-01	2/5	0.0004 - 0.005	0.0000868	N/A	0.018 N	N/A	N/A	No	S
7440-23-5	Sodium	18.6		21.6		MG/L	RCC-SW-3001-01	2/2	-	21.6	N/A		N/A	N/A	No	E
7440-28-0	Thallium	0.00000511	J	0.00000741	J	MG/L	RWR-SW-5001-01	3/5	0.007 - 0.007	0.00000741	N/A	0.00024 N	N/A	N/A	No	S
7440-62-2	Vanadium	0.0000358	J	0.0022		MG/L	RCC-SW-3001-01	2/5	0.002 - 0.008	0.0022	N/A	0.026 N	N/A	N/A	No	S
7440-66-6	Zinc	0.0016	J	0.0665		MG/L	RAB-SW-3004-01	5/5	-	0.0665	N/A	1.1 N	N/A	N/A	No	S
14797-55-8	Nitrate	0.149		0.68		MG/L	RWR-SW-5002-01	3/3	-	0.68	N/A	1 N	N/A	N/A	No	S
14797-65-0	Nitrite-N	0.0051		0.13		MG/L	RWR-SW-5001-01	3/3	-	0.13	N/A	0.1 N	N/A	N/A	Yes	A
	Inorganics, Dissolved															
7429-90-5D	Aluminum, Dissolved	0.019	J	0.0251	J	MG/L	RWR-SW-5002-01	3/6	0.014 - 0.0688	0.0251	N/A	3.6 N	N/A	N/A	No	S
7440-36-0D	Antimony, Dissolved	0.000164		0.000164		MG/L	RWR-SW-5002-01	1/6	0.0000603 - 0.005	0.000164	N/A	0.0015 N	N/A	N/A	No	S
7440-38-2D	Arsenic, Dissolved	0.000407		0.000444		MG/L	RWR-SW-5002-01	3/6	0.006 - 0.006	0.000444	N/A	0.000045 C	N/A	N/A	No	T
7440-39-3D	Barium, Dissolved	0.0153		0.0185		MG/L	RAB-SW-5004-01	3/6	0.0155 - 0.0216	0.0185	N/A	0.26 N	N/A	N/A	No	S
7440-41-7D	Beryllium, Dissolved	0.000032	J	0.0000366	J	MG/L	RWR-SW-5002-01	3/6	0.001 - 0.001	0.0000366	N/A	0.0073 N	N/A	N/A	No	S
7440-43-9D	Cadmium, Dissolved	0.00000641	J	0.004		MG/L	RCC-SW-3001-01F	4/6	0.001 - 0.001	0.004	N/A	0.0018 N	N/A	N/A	No	T
7440-70-2D	Calcium, Dissolved	7.21		8.59		MG/L	RAB-SW-3004-01F	3/3	-	8.59	N/A		N/A	N/A	No	T
7440-48-4D	Cobalt, Dissolved	0.0000894		0.000099		MG/L	RWR-SW-5002-01	3/6	0.001 - 0.001	0.000099	N/A	0.073 N	N/A	N/A	No	S
7440-50-8D	Copper, Dissolved	0.00119	J	0.0055		MG/L	RCC-SW-3002-01F	5/6	0.00324 - 0.00324	0.0055	N/A	0.15 N	N/A	N/A	No	S
7439-89-6D	Iron, Dissolved	0.173		0.551		MG/L	RAB-SW-5004-01	6/6	-	0.551	N/A	1.1 N	N/A	N/A	No	S
7439-92-1D	Lead, Dissolved	0.000232		0.000542		MG/L	RWR-SW-5002-01	3/6	0.002 - 0.002	0.000542	N/A	0.015 N	N/A	N/A	No	S
7439-95-4D	Magnesium, Dissolved	1.22		1.61		MG/L	RAB-SW-3004-01F	3/3	-	1.61	N/A		N/A	N/A	No	T
7439-96-5D	Manganese, Dissolved	0.0232		0.127		MG/L	RAB-SW-3004-01F	6/6	-	0.127	N/A	0.088 N	N/A	N/A	No	T

Table 2.12
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Surface Water - Background/Reference

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Background Value	Screening Toxicity Value (3)	Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source	Retain as COPC?	Rationale for Contaminant Deletion or Selection (5)
7439-97-6D	Mercury, Dissolved	0.00000121		0.00000162		MG/L	RAB-SW-5004-01	3 / 6	0.0002 - 0.0002	0.00000162	N/A		N/A	N/A	No	S
7439-98-7D	Molybdenum, Dissolved	0.000333	J	0.000786	J	MG/L	RWR-SW-5002-01	3 / 3	-	0.000786	N/A	0.018 N	N/A	N/A	No	S
7440-02-0D	Nickel, Dissolved	0.000916	J	0.0232		MG/L	RCC-SW-3001-01F	5 / 6	0.002 - 0.002	0.0232	N/A	0.073 N	N/A	N/A	No	S
7440-09-7D	Potassium, Dissolved	1.53		1.75		MG/L	RCC-SW-3001-01F	3 / 3	-	1.75	N/A		N/A	N/A	No	T
7440-23-5D	Sodium, Dissolved	20.6		21.2		MG/L	RCC-SW-3001-01F	2 / 3	18.6 - 18.6	21.2	N/A		N/A	N/A	No	T
7440-28-0D	Thallium, Dissolved	0.0000067	J	0.00000908	J	MG/L	RWR-SW-5002-01	3 / 6	0.007 - 0.007	0.00000908	N/A	0.00024 N	N/A	N/A	No	S
7440-62-2D	Vanadium, Dissolved	0.000127	J	0.000324	J	MG/L	RWR-SW-5002-01	2 / 6	0.002 - 0.008	0.000324	N/A	0.026 N	N/A	N/A	No	S
7440-66-6D	Zinc, Dissolved	0.00528		0.0343		MG/L	RCC-SW-3002-01F	5 / 6	0.0048 - 0.0048	0.0343	N/A	1.1 N	N/A	N/A	No	S
	Dioxins/Furans															
TEM	Toxicity Equivalency - Mammals	0.000000005.34		0.00000000564		MG/L	RCC-SW-3001-01	2 / 2	-	5.64E-09	N/A	4.5E-10 C	N/A	N/A	Yes	A

(1) Minimum or maximum concentration detected in exposure area. Samples included in data set are provided in Appendix A.
(2) The concentration used for screening is the maximum detected concentration, per USEPA Region I (USEPA, 1995).
(3) Values are the Tapwater Preliminary Remediation Goals (PRGs) obtained from USEPA Region IX dated October 1, 2002.
Values used for screening are the tapwater PRGs for the lesser of cancer risks equal to 1E-06 or non-cancer risks equal to a hazard index of 0.1, per USEPA Region I (USEPA, 1999).
(4) There are no applicable ARAR values for surface water.
(5) Analyte is selected as a COPC if the concentration used for screening exceeds the PRG.
S = Concentration used for screening is less than the screening toxicity value; the analyte was not selected as a COPC.
A = Concentration used for screening is greater than the screening toxicity value, the analyte was selected as a COPC.
E = The analyte is a human essential nutrient, and is not considered to be toxic at the concentration detected; the analyte was not selected as a COPC (A.D. Little, 1998; USEPA, 1995).
T = Total metals will be evaluated further as a COPC, therefore dissolved metals were not selected as COPCs.
N/A = Not applicable
- Background values are not applicable for selection of COPCs. Risks at the two reference (Background) locations will be characterized and compared to the risks characterized in this assessment.
- Potential ARAR/TBC values are not applicable for selection of COPCs. EPA suggests use of risk-based media concentrations for screening COPCs.

Qualifier definitions:
J = Value is estimated.

MG/L = milligrams per liter
COPC = chemical of potential concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirements / To Be Considered

Basis of screening toxicity value:
N - Based on non-cancer endpoint
C - Based on cancer endpoint

Prepared by: KJA
Checked by: MJM

Table 2.13
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Sediment - Background/Reference

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe Current/Future Land Use
Medium Sediment
Exposure Medium Sediment

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Background Value	Screening Toxicity Value (3)	Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source	Retain as COPC?	Rationale for Contaminant Deletion or Selection (5)
	Semivolatile Organics															
92-52-4	1,1'-Biphenyl	0.00644	J	0.03042	J	MG/KG	GMP-SD-5007-0000-01	2 / 4	0.43 - 0.5	0.03042	N/A	3.50E+02 S	N/A	N/A	No	S
91-57-6	2-Methylnaphthalene	0.01855		0.07478	J	MG/KG	GMP-SD-5007-0000-01	2 / 14	0.37 - 9.9	0.07478	N/A		N/A	N/A	Yes	A
83-32-9	Acenaphthene	0.03411	J	0.48	J	MG/KG	RCC-BK-3001Z-01	5 / 14	0.37 - 9.9	0.48	N/A	3.70E+02 N	N/A	N/A	No	S
208-96-8	Acenaphthylene	0.047	J	0.19279	J	MG/KG	GMP-SD-5007-0000-01	3 / 14	0.37 - 9.9	0.19279	N/A		N/A	N/A	Yes	A
120-12-7	Anthracene	0.1	J	0.93	J	MG/KG	RCC-BK-3001Z-01	6 / 14	0.37 - 9.9	0.93	N/A	2200 N	N/A	N/A	No	S
100-52-7	Benzaldehyde	0.031	JEB	0.27856		MG/KG	RAB-SD-5008-0000-01	3 / 4	0.43 - 0.43	0.27856	N/A	610 N	N/A	N/A	No	S
56-55-3	Benzo(a)anthracene	0.087	J	3.5		MG/KG	RCC-FP-3001-01	12 / 14	0.38 - 0.43	3.5	N/A	6.20E-01 C	N/A	N/A	Yes	A
50-32-8	Benzo(a)pyrene	0.1	J	3.1		MG/KG	RCC-FP-3001-01	12 / 14	0.38 - 0.43	3.1	N/A	0.062 C	N/A	N/A	Yes	A
205-99-2	Benzo(b)fluoranthene	0.022	J	3.1		MG/KG	RCC-FP-3001-01	14 / 14	-	3.1	N/A	6.20E-01 C	N/A	N/A	Yes	A
191-24-2	Benzo(g,h,i)perylene	0.056	J	2.07671	J	MG/KG	GMP-SD-5007-0000-01	12 / 14	0.38 - 0.43	2.07671	N/A		N/A	N/A	Yes	A
207-08-9	Benzo(k)fluoranthene	0.008	J	3.6		MG/KG	RCC-FP-3001-01	13 / 14	0.38 - 0.38	3.6	N/A	6.20E+00 C	N/A	N/A	No	S
117-81-7	bis(2-Ethylhexyl)phthalate	0.051	J	1	J	MG/KG	RAB-SD-2069-01	9 / 14	0.48 - 9.9	1	N/A	3.50E+01 C	N/A	N/A	No	S
85-68-7	Butylbenzylphthalate	0.46	J	0.54	J	MG/KG	RCC-FP-3001-01	3 / 12	0.37 - 9.9	0.54	N/A	1.20E+03 N	N/A	N/A	No	S
86-74-8	Carbazole	0.082	J	0.66	J	MG/KG	RCC-BK-3001Z-01	6 / 13	0.37 - 9.9	0.66	N/A	2.40E+01 C	N/A	N/A	No	S
218-01-9	Chrysene	0.083	J	4.1		MG/KG	RCC-FP-3001-01	13 / 14	0.43 - 0.43	4.1	N/A	6.20E+01 C	N/A	N/A	No	S
53-70-3	Dibenzo(a,h)anthracene	0.1	J	0.77	J	MG/KG	RCC-BK-3001Z-01	8 / 14	0.37 - 9.9	0.77	N/A	0.062 C	N/A	N/A	Yes	A
132-64-9	Dibenzofuran	0.03586		0.29	J	MG/KG	RCC-BK-3001Z-01	3 / 14	0.37 - 9.9	0.29	N/A	2.90E+01 N	N/A	N/A	No	S
84-74-2	Di-n-Butylphthalate	0.034	J	0.47	JEB	MG/KG	RCC-FP-3001-01	7 / 13	0.37 - 9.9	0.47	N/A	6.10E+02 N	N/A	N/A	No	S
206-44-0	Fluoranthene	0.023	J	7		MG/KG	RCC-FP-3001-01	14 / 14	-	7	N/A	2.30E+02 N	N/A	N/A	No	S
86-73-7	Fluorene	0.036	J	0.47	J	MG/KG	RCC-BK-3001Z-01	6 / 14	0.37 - 9.9	0.47	N/A	2.70E+02 N	N/A	N/A	No	S
193-39-5	Indeno(1,2,3-cd)pyrene	0.063	J	2.18335	J	MG/KG	GMP-SD-5007-0000-01	12 / 14	0.38 - 0.43	2.18335	N/A	6.20E-01 C	N/A	N/A	Yes	A
91-20-3	Naphthalene	0.01905		0.09382	J	MG/KG	GMP-SD-5007-0000-01	2 / 14	0.37 - 9.9	0.09382	N/A	5.60E+00 N	N/A	N/A	No	S
85-01-8	Phenanthrene	0.072	J	4.8		MG/KG	RCC-BK-3001Z-01	13 / 14	0.43 - 0.43	4.8	N/A		N/A	N/A	Yes	A
129-00-0	Pyrene	0.049	J	6.5		MG/KG	RCC-FP-3001-01	13 / 14	0.43 - 0.43	6.5	N/A	2.30E+02 N	N/A	N/A	No	S
	Pesticides/PCBs															
72-54-8	4,4'-DDD	0.00208		0.0193	J	MG/KG	GMP-SD-5002-0000-01	6 / 18	0.0035 - 0.0073	0.0193	N/A	2.40E+00 C	N/A	N/A	No	S
72-55-9	4,4'-DDE	0.00107		0.03128		MG/KG	GMP-SD-5002-0000-01	6 / 18	0.0035 - 0.0073	0.03128	N/A	1.70E+00 C	N/A	N/A	No	S
50-29-3	4,4'-DDT	0.00162		0.053		MG/KG	RCC-BK-3001Y-01	7 / 18	0.00103 - 0.0073	0.053	N/A	1.70E+00 C	N/A	N/A	No	S
5103-71-9	alpha-Chlordane	0.00107	J	0.01746	J	MG/KG	GMP-SD-5007-0000-01	10 / 18	0.0019 - 0.0038	0.01746	N/A		N/A	N/A	Yes	A
11104-28-2	Aroclor-1221	0.026	J	0.026	J	MG/KG	RCC-BK-3001Z-01	1 / 18	0.01142 - 0.15	0.026	N/A	0.22 C	N/A	N/A	No	S
11097-69-1	Aroclor-1254	0.023	J	0.38		MG/KG	RCC-FP-3002-01	13 / 18	0.037 - 0.073	0.38	N/A	2.20E-01 C	N/A	N/A	Yes	A
11096-82-5	Aroclor-1260	0.1		0.1		MG/KG	RCC-FP-3002-01	1 / 18	0.01142 - 0.073	0.1	N/A	2.20E-01 C	N/A	N/A	No	S
11100-14-4	Aroclor-1268	0.00455	J	0.24667		MG/KG	GMP-SD-5002-0000-01	6 / 6	-	0.24667	N/A		N/A	N/A	Yes	A
60-57-1	Dieldrin	0.00062	J	0.0051	J	MG/KG	GMP-SD-5002-0000-01	6 / 18	0.0035 - 0.0073	0.0051	N/A	3.00E-02 C	N/A	N/A	No	S
72-20-8	Endrin	0.00296		0.00296		MG/KG	GMP-SD-5002-0000-01	1 / 18	0.00091 - 0.0073	0.00296	N/A	1.8 N	N/A	N/A	No	S
5103-74-2	gamma-Chlordane	0.00065	J	0.01016		MG/KG	GMP-SD-5002-0000-01	9 / 18	0.00162 - 0.0038	0.01016	N/A		N/A	N/A	Yes	A
57-74-9	Technical Chlordane	0.06385	J	0.62618		MG/KG	GMP-SD-5007-0000-01	6 / 6	-	0.62618	N/A		N/A	N/A	Yes	A
	Inorganics															
7429-90-5	Aluminum	1880		24690	J	MG/KG	GMP-SD-5002-0000-01	19 / 19	-	24690	N/A	7.60E+03 N	N/A	N/A	Yes	A
7440-36-0	Antimony	0.367	J	4.3	J	MG/KG	RCC-FP-3002-01	4 / 19	0.0103 - 0.88	4.3	N/A	3.10E+00 N	N/A	N/A	Yes	A
7440-38-2	Arsenic	0.84	J	13.5		MG/KG	RCC-FP-3002-01	17 / 19	0.48 - 0.71	13.5	N/A	3.90E-01 C	N/A	N/A	Yes	A
7440-39-3	Barium	7.6		374	J	MG/KG	GMP-SD-5002-0000-01	19 / 19	-	374	N/A	5.40E+02 N	N/A	N/A	No	S
7440-41-7	Beryllium	0.15	J	5.07		MG/KG	GMP-SD-5002-0000-01	19 / 19	-	5.07	N/A	1.50E+01 N	N/A	N/A	No	S
7440-43-9	Cadmium	0.21	J	4.35		MG/KG	GMP-SD-5002-0000-01	9 / 19	0.06 - 0.51	4.35	N/A	3.70E+00 N	N/A	N/A	Yes	A
7440-70-2	Calcium	447		2660	J	MG/KG	RAB-FP-3004-01	12 / 12	-	2660	N/A		N/A	N/A	No	E
7440-47-3	Chromium	3.7	J	271		MG/KG	RCC-FP-3002-01	19 / 19	-	271	N/A	2.10E+02 C	N/A	N/A	Yes	A
7440-48-4	Cobalt	2.1		23.8		MG/KG	RCC-BK-3001Y-01	16 / 19	1.3 - 3.2	23.8	N/A	9.00E+02 C	N/A	N/A	No	S
7440-50-8	Copper	7.9		436		MG/KG	RCC-FP-3002-01	17 / 19	3.9 - 3.9	436	N/A	3.10E+02 N	N/A	N/A	Yes	A
7439-89-6	Iron	3700		28339		MG/KG	GMP-SD-5007-0000-01	19 / 19	-	28339	N/A	2.30E+03 N	N/A	N/A	No	E
7439-92-1	Lead	8.5	J	570		MG/KG	RCC-FP-3002-01	19 / 19	-	570	N/A	4.00E+01 N	N/A	N/A	Yes	A

Table 2.13
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Sediment - Background/Reference

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe Current/Future Land Use
Medium Sediment
Exposure Medium Sediment

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Background Value	Screening Toxicity Value (3)	Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source	Retain as COPC?	Rationale for Contaminant Deletion or Selection (5)
7439-95-4	Magnesium	573		2360	J	MG/KG	RCC-FP-3002-01	12 / 12	-	2360	N/A		N/A	N/A	No	E
7439-96-5	Manganese	81.8		1990		MG/KG	RCC-FP-3001-01	19 / 19	-	1990	N/A	1.80E+02 N	N/A	N/A	Yes	A
7439-97-6	Mercury	0.01	J	0.757		MG/KG	GMP-SD-5002-0000-01	15 / 19	0.02 - 0.05	0.757	N/A		N/A	N/A	Yes	A
22967-92-6	Mercury (methyl)	0.000079	J	0.000863	J	MG/KG	RAB-SD-5004-0000-01	6 / 6	-	0.000863	N/A	6.10E-01 N	N/A	N/A	No	S
7439-98-7	Molybdenum	1.56	J	17.2		MG/KG	RWR-SD-5004-0000-01	7 / 7	-	17.2	N/A	3.90E+01 N	N/A	N/A	No	S
7440-02-0	Nickel	2.03	J	261		MG/KG	RCC-FP-3002-01	14 / 19	2.8 - 6.7	261	N/A	1.60E+02 N	N/A	N/A	Yes	A
7440-09-7	Potassium	317		1580		MG/KG	RAB-FP-3004-01	10 / 12	368 - 412	1580	N/A		N/A	N/A	No	E
7782-49-2	Selenium	1.03	J	3.6	J	MG/KG	RCC-FP-3002-01	8 / 19	0.206 - 1.2	3.6	N/A	3.90E+01 N	N/A	N/A	No	S
7440-22-4	Silver	0.258	J	9.2		MG/KG	RCC-FP-3002-01	11 / 19	0.132 - 3.3	9.2	N/A	3.90E+01 N	N/A	N/A	No	S
7440-23-5	Sodium	26.3	J	254		MG/KG	RCC-FP-3002-01	6 / 12	13.3 - 143	254	N/A		N/A	N/A	No	E
7440-28-0	Thallium	0.079	J	0.71	J	MG/KG	RCC-BK-3001Z-01	8 / 19	0.39 - 1.4	0.71	N/A	5.20E-01 N	N/A	N/A	Yes	A
7440-62-2	Vanadium	5.8		129		MG/KG	RCC-FP-3002-01	19 / 19	-	129	N/A	5.50E+01 N	N/A	N/A	Yes	A
7440-66-6	Zinc	28		854	J	MG/KG	GMP-SD-5002-0000-01	18 / 19	22.8 - 22.8	854	N/A	2.30E+03 N	N/A	N/A	No	S
	Dioxins/Furans															
38178-99-3	HCX	0.00000169	J	0.00015429	J	MG/KG	GMP-SD-5002-0000-01	8 / 14	-	0.00015429	N/A		N/A	N/A	Yes	A
TEM	Toxicity Equivalency - Mammals	0.000000422		0.000179		MG/KG	RCC-FP-3002-01	16 / 16	-	0.000179	N/A	3.90E-06 C	N/A	N/A	Yes	A
PCBCTEM	Toxicity Equivalency (PCB) - Mammals	0.0000249		0.0000249		MG/KG	RWR-SD-5003-0000-01	1 / 1	-	0.0000249	N/A	3.90E-06 C	N/A	N/A	Yes	A

(1) Minimum or maximum concentration detected in exposure area. Samples included in data set are provided in Appendix A
(2) The concentration used for screening is the maximum detected concentration, per USEPA Region I (USEPA, 1995).
(3) Values are the Residential Soil Preliminary Remediation Goals (PRGs) obtained from USEPA Region IX dated October 1, 2002.
Values used for screening are the residential soil PRGs for the lesser of cancer risks equal to 1E-06 or non-cancer risks equal to a hazard index of 0.1, per USEPA Region I (USEPA, 1999).
(4) There are no applicable ARAR values for sediment\
(5) Analyte is selected as a COPC if the concentration used for screening exceeds the PRG
S = Concentration used for screening is less than the screening toxicity value; the analyte was not selected as a COPC.
A = Concentration used for screening is greater than the screening toxicity value, the analyte was selected as a COPC.
E = The analyte is a human essential nutrient, and is not considered to be toxic at the concentration detected; the analyte was not selected as a COPC (A.D. Little, 1998, USEPA, 1995).

MG/KG = milligrams per kilogram
COPC = chemical of potential concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirements / To Be Considered

Basis of screening toxicity value:
N - Based on non-cancer endpoint
C - Based on cancer endpoint
S - Saturated
M - Maximum

N/A = Not applicable
- Background values are not applicable for selection of COPCs. Risks at the two reference (Background) locations will be characterized and compared to the risks characterized in this assessment.
- Potential ARAR/TBC values are not applicable for selection of COPCs. EPA suggests use of risk-based media concentrations for screening COPCs.

Qualifier definitions:
J = Value is estimated

Prepared by: KJA
Checked by: MJM

Table 2.14
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Bank Soil - Background/Reference

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Soil

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Background Value	Screening Toxicity Value (3)	Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source	Retain as COPC?	Rationale for Contaminant Deletion or Selection (5)
	Semivolatile Organics															
92-52-4	1,1'-Biphenyl	0.02602		0.0617		MG/KG	RWR-FP-5001-0000-01	4 / 4	-	0.0617	N/A	3.50E+02 S	N/A	N/A	No	S
91-57-6	2-Methylnaphthalene	0.07282		0.17022	J	MG/KG	RWR-FP-5002-0000-01	4 / 4	-	0.17022	N/A		N/A	N/A	Yes	A
83-32-9	Acenaphthene	0.18626		0.56384	J	MG/KG	RWR-FP-5002-0000-01	4 / 4	-	0.56384	N/A	3.70E+02 N	N/A	N/A	No	S
208-96-8	Acenaphthylene	0.19667		0.49749		MG/KG	RWR-FP-5001-0000-01	4 / 4	-	0.49749	N/A		N/A	N/A	Yes	A
120-12-7	Anthracene	0.4802		0.98295		MG/KG	RWR-FP-5002-0000-01	4 / 4	-	0.98295	N/A	2200 N	N/A	N/A	No	S
100-52-7	Benzaldehyde	0.06052		0.17229		MG/KG	RWR-FP-5004-0000-01	4 / 4	-	0.17229	N/A	610 N	N/A	N/A	No	S
56-55-3	Benzo(a)anthracene	2.29265		3.41086		MG/KG	RWR-FP-5004-0000-01	4 / 4	-	3.41086	N/A	6.20E-01 C	N/A	N/A	Yes	A
50-32-8	Benzo(a)pyrene	2.29123		3.41803		MG/KG	RWR-FP-5001-0000-01	4 / 4	-	3.41803	N/A	6.20E-02 C	N/A	N/A	Yes	A
205-99-2	Benzo(b)fluoranthene	2.31549		4.28861		MG/KG	RWR-FP-5001-0000-01	4 / 4	-	4.28861	N/A	0.62 C	N/A	N/A	Yes	A
191-24-2	Benzo(g,h,i)perylene	1.676		2.87139		MG/KG	RWR-FP-5001-0000-01	4 / 4	-	2.87139	N/A		N/A	N/A	Yes	A
207-08-9	Benzo(k)fluoranthene	2.28394		3.86354		MG/KG	RWR-FP-5001-0000-01	4 / 4	-	3.86354	N/A	6.2 C	N/A	N/A	No	S
117-81-7	bis(2-Ethylhexyl)phthalate	0.8	J	1.9	J	MG/KG	RWR-FP-5001-0000-01	4 / 4	-	1.9	N/A	3.50E+01 C	N/A	N/A	No	S
85-68-7	Butylbenzylphthalate	0.12	J	0.58	J	MG/KG	RWR-FP-5004-0000-01	4 / 4	-	0.58	N/A	1.20E+03 N	N/A	N/A	No	S
86-74-8	Carbazole	0.42	J	0.86	J	MG/KG	RWR-FP-5002-0000-01	4 / 4	-	0.86	N/A	2.40E+01 C	N/A	N/A	No	S
218-01-9	Chrysene	2.74766		4.48851		MG/KG	RWR-FP-5001-0000-01	4 / 4	-	4.48851	N/A	6.20E+01 C	N/A	N/A	No	S
53-70-3	Dibenzo(a,h)anthracene	0.43544		0.72851		MG/KG	RWR-FP-5001-0000-01	4 / 4	-	0.72851	N/A	6.20E-02 C	N/A	N/A	Yes	A
132-64-9	Dibenzofuran	0.16055		0.39925		MG/KG	RWR-FP-5002-0000-01	4 / 4	-	0.39925	N/A	29 N	N/A	N/A	No	S
84-74-2	Di-n-Butylphthalate	0.061	J	0.17	J	MG/KG	RWR-FP-5004-0000-01	4 / 4	-	0.17	N/A	6.10E+02 N	N/A	N/A	No	S
117-84-0	Di-n-octylphthalate	0.083	J	0.083	J	MG/KG	RWR-FP-5002-0000-01	1 / 4	0.58 - 1	0.083	N/A	2.40E+02 N	N/A	N/A	No	S
206-44-0	Fluoranthene	5.22748		7.73124		MG/KG	RWR-FP-5001-0000-01	4 / 4	-	7.73124	N/A	2.30E+02 N	N/A	N/A	No	S
86-73-7	Fluorene	0.25625		0.65899	J	MG/KG	RWR-FP-5002-0000-01	4 / 4	-	0.65899	N/A	2.70E+02 N	N/A	N/A	No	S
193-39-5	Indeno(1,2,3-cd)pyrene	1.76819		3.0929		MG/KG	RWR-FP-5001-0000-01	4 / 4	-	3.0929	N/A	6.20E-01 C	N/A	N/A	Yes	A
91-20-3	Naphthalene	0.10375		0.30218	J	MG/KG	RWR-FP-5002-0000-01	4 / 4	-	0.30218	N/A	5.60E+00 N	N/A	N/A	No	S
85-01-8	Phenanthrene	3.07207		5.30136		MG/KG	RWR-FP-5002-0000-01	4 / 4	-	5.30136	N/A		N/A	N/A	Yes	A
129-00-0	Pyrene	4.33506		6.37272		MG/KG	RWR-FP-5004-0000-01	4 / 4	-	6.37272	N/A	2.30E+02 N	N/A	N/A	No	S
	Pesticides/PCBs															
72-54-8	4,4'-DDD	0.00464	J	0.01517		MG/KG	RWR-FP-5001-0000-01	4 / 4	-	0.01517	N/A	2.40E+00 C	N/A	N/A	No	S
72-55-9	4,4'-DDE	0.00519	J	0.02061		MG/KG	RWR-FP-5001-0000-01	4 / 4	-	0.02061	N/A	1.70E+00 C	N/A	N/A	No	S
50-29-3	4,4'-DDT	0.00269	J	0.01827	J	MG/KG	RWR-FP-5004-0000-01	4 / 4	-	0.01827	N/A	1.70E+00 C	N/A	N/A	No	S
5103-71-9	alpha-Chlordane	0.00781		0.03592		MG/KG	RWR-FP-5001-0000-01	4 / 4	-	0.03592	N/A		N/A	N/A	Yes	A
11097-69-1	Aroclor-1254	0.20734		0.83872		MG/KG	RWR-FP-5001-0000-01	4 / 4	-	0.83872	N/A	0.22 C	N/A	N/A	Yes	A
11100-14-4	Aroclor-1268	0.04356		0.13953	J	MG/KG	RWR-FP-5004-0000-01	4 / 4	-	0.13953	N/A		N/A	N/A	Yes	A
60-57-1	Dieldrin	0.00424		0.00941		MG/KG	RWR-FP-5001-0000-01	4 / 4	-	0.00941	N/A	3.00E-02 C	N/A	N/A	No	S
1031-07-8	Endosulfan Sulfate	0.00409	J	0.01269	J	MG/KG	RWR-FP-5004-0000-01	3 / 4	0.00215 - 0.00215	0.01269	N/A		N/A	N/A	Yes	A
1024-57-3	Heptachlor Epoxide	0.00074	J	0.00074	J	MG/KG	RWR-FP-5004-0000-01	1 / 4	0.00124 - 0.00215	0.00074	N/A	5.30E-02 C	N/A	N/A	No	S
57-74-9	Technical Chlordane	0.2782		0.73538		MG/KG	RWR-FP-5001-0000-01	4 / 4	-	0.73538	N/A		N/A	N/A	Yes	A
	Inorganics															
7429-90-5	Aluminum	10971	J	21793	J	MG/KG	RWR-FP-5001-0000-01	4 / 4	-	21793	N/A	7.60E+03 N	N/A	N/A	Yes	A
7440-36-0	Antimony	0.462	J	0.982	J	MG/KG	RWR-FP-5004-0000-01	4 / 4	-	0.982	N/A	3.10E+00 N	N/A	N/A	No	S
7440-38-2	Arsenic	5.58		12.2		MG/KG	RWR-FP-5004-0000-01	4 / 4	-	12.2	N/A	3.90E-01 C	N/A	N/A	Yes	A
7440-39-3	Barium	181		282		MG/KG	RWR-FP-5002-0000-01	4 / 4	-	282	N/A	5.40E+02 N	N/A	N/A	No	S
7440-41-7	Beryllium	1.9		4.46		MG/KG	RWR-FP-5001-0000-01	4 / 4	-	4.46	N/A	1.50E+01 N	N/A	N/A	No	S
7440-43-9	Cadmium	0.711		3.46		MG/KG	RWR-FP-5001-0000-01	4 / 4	-	3.46	N/A	3.70E+00 N	N/A	N/A	No	S
7440-47-3	Chromium	171		291		MG/KG	RWR-FP-5001-0000-01	4 / 4	-	291	N/A	210 C	N/A	N/A	Yes	A
7440-48-4	Cobalt	9.57		20.3		MG/KG	RWR-FP-5004-0000-01	4 / 4	-	20.3	N/A	9.00E+02 C	N/A	N/A	No	S
7440-50-8	Copper	109		324		MG/KG	RWR-FP-5001-0000-01	4 / 4	-	324	N/A	3.10E+02 N	N/A	N/A	Yes	A
7439-89-6	Iron	21383		37162		MG/KG	RWR-FP-5004-0000-01	4 / 4	-	37162	N/A	2.30E+03 N	N/A	N/A	No	E
7439-92-1	Lead	316		591		MG/KG	RWR-FP-5001-0000-01	4 / 4	-	591	N/A	4.00E+01 N	N/A	N/A	Yes	A
7439-96-5	Manganese	439		4126		MG/KG	RWR-FP-5004-0000-01	4 / 4	-	4126	N/A	1.80E+02 N	N/A	N/A	Yes	A

Table 2.14
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Bank Soil - Background/Reference

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Soil

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Sample ID of Maximum Concentration	Detection Frequency	Range of Detection Limits Min-Max	Concentration Used for Screening (2)	Background Value	Screening Toxicity Value (3)	Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source	Retain as COPC?	Rationale for Contaminant Deletion or Selection (5)
7439-97-6	Mercury	0.381		0.811		MG/KG	RWR-FP-5001-0000-01	4 / 4	-	0.811	N/A		N/A	N/A	Yes	A
22967-92-6	Mercury (methyl)	0.000526	J	0.000762	J	MG/KG	RWR-FP-5002-0000-01	4 / 4	-	0.000762	N/A	6.10E-01 N	N/A	N/A	No	S
7439-98-7	Molybdenum	34.8	J	87.7	J	MG/KG	RWR-FP-5003-0000-01	4 / 4	-	87.7	N/A	3.90E+01 N	N/A	N/A	Yes	A
7440-02-0	Nickel	25.5		387		MG/KG	RWR-FP-5001-0000-01	4 / 4	-	387	N/A	1.60E+02 N	N/A	N/A	Yes	A
7782-49-2	Selenium	0.687	J	0.963	J	MG/KG	RWR-FP-5004-0000-01	3 / 4	0.611 - 0.611	0.963	N/A	3.90E+01 N	N/A	N/A	No	S
7440-22-4	Silver	1.23		3.8		MG/KG	RWR-FP-5001-0000-01	4 / 4	-	3.8	N/A	3.90E+01 N	N/A	N/A	No	S
7440-28-0	Thallium	0.345		0.585		MG/KG	RWR-FP-5004-0000-01	4 / 4	-	0.585	N/A	0.52 N	N/A	N/A	Yes	A
7440-62-2	Vanadium	53.6		103		MG/KG	RWR-FP-5004-0000-01	4 / 4	-	103	N/A	5.50E+01 N	N/A	N/A	Yes	A
7440-66-6	Zinc	158		497		MG/KG	RWR-FP-5001-0000-01	4 / 4	-	497	N/A	2.30E+03 N	N/A	N/A	No	S
	Dioxins/Furans															
38178-99-3	HCX	0.00008577	J	0.00041706	J	MG/KG	RWR-FP-5004-0000-01	4 / 4	-	0.00041706	N/A		N/A	N/A	Yes	A
TEM	Toxicity Equivalency - Mammals	0.0000228		0.000109		MG/KG	RWR-FP-5001-0000-01	4 / 4	-	0.000109	N/A	3.90E-06 C	N/A	N/A	Yes	A
PCBCTEM	Toxicity Equivalency (PCB) - Mammals	0.0000379		0.0000379		MG/KG	RWR-FP-5002-0000-01	1 / 1	-	0.0000379	N/A	3.90E-06 C	N/A	N/A	Yes	A

(1) Minimum or maximum concentration detected in exposure area. Samples included in data set are provided in Appendix A.
(2) The concentration used for screening is the maximum detected concentration, per USEPA Region I (USEPA, 1995)
(3) Values are the Residential Soil Preliminary Remediation Goals (PRGs) obtained from USEPA Region IX dated October 1, 2002.
Values used for screening are the residential soil PRGs for the lesser of cancer risks equal to 1E-06 or non-cancer risks equal to a hazard index of 0.1, per USEPA Region I (USEPA, 1999).
(4) There are no applicable ARAR values for soil
(5) Analyte is selected as a COPC if the concentration used for screening exceeds the PRG.
S = Concentration used for screening is less than the screening toxicity value, the analyte was not selected as a COPC
A = Concentration used for screening is greater than the screening toxicity value, the analyte was selected as a COPC.
E = The analyte is a human essential nutrient, and is not considered to be toxic at the concentration detected, the analyte was not selected as a COPC (A.D. Little, 1998, USEPA, 1995)

MG/KG = milligrams per kilogram
COPC = chemical of potential concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirements / To Be Considered

Basis of screening toxicity value.
N - Based on non-cancer endpoint
C - Based on cancer endpoint

N/A = Not applicable
- Background values are not applicable for selection of COPCs. Risks at the two reference (Background) locations will be characterized and compared to the risks characterized in this assessment.
- Potential ARAR/TBC values are not applicable for selection of COPCs. EPA suggests use of risk-based media concentrations for screening COPCs.

Qualifier definitions.
J = Value is estimated.

Prepared by: KJA	
Checked by: MJM	

Table 3.1.RME
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
American Eel

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: American Eel
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
ASSAPUMPSET	**Semivolatile Organics**										
	Acenaphthylene	MG/KG	0.000943	NC		0.00179		0.00179	MG/KG	Max	(5)
	Phenanthrene	MG/KG	0.00246	NC		0.00876		0.00876	MG/KG	Max	(5)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.00461	NC		0.00828	J	0.00828	MG/KG	Max	(5)
	4,4'-DDE	MG/KG	0.0176	NC		0.0373	J	0.0373	MG/KG	Max	(5)
	alpha-Chlordane	MG/KG	0.0025	NC		0.00487	J	0.00487	MG/KG	Max	(5)
	Aroclor-1254	MG/KG	0.03178	NC		0.10246	J	0.10246	MG/KG	Max	(5)
	Dieldrin	MG/KG	0.0013	NC		0.00246	J	0.00246	MG/KG	Max	(5)
	gamma-Chlordane	MG/KG	0.00089	NC		0.00185	J	0.00185	MG/KG	Max	(5)
	Heptachlor Epoxide	MG/KG	0.00077	NC		0.00138	J	0.00138	MG/KG	Max	(5)
	Technical Chlordane	MG/KG	0.11622	NC		0.16108	J	0.16108	MG/KG	Max	(5)
	Inorganics										
	Lead	MG/KG	0.0466	NC		0.0893	J	0.0893	MG/KG	Max	(5)
	Mercury	MG/KG	0.0926	NC		0.14		0.14	MG/KG	Max	(5)
	Mercury (methyl)	MG/KG	0.0889	NC		0.137		0.137	MG/KG	Max	(5)
	Zinc	MG/KG	16.9	NC		26.2		26.2	MG/KG	Max	(5)
	Dioxins										
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.000000555	NC		0.00000178		0.00000178	MG/KG	Max	(5)
GREYSTONE	**Semivolatile Organics**										
	Acenaphthylene	MG/KG	0.00104	0.00121	N	0.00155		0.00121	MG/KG	95% UCL-N	(2)
	Benzo(a)pyrene	MG/KG	0.00132	0.00132	NP	0.00457		0.00132	MG/KG	95% UCL-NP	(4)
	Benzo(b)fluoranthene	MG/KG	0.00149	0.00149	NP	0.00533		0.00149	MG/KG	95% UCL-NP	(4)
	Dibenzo(a,h)anthracene	MG/KG	0.000799	0.000799	NP	0.00156		0.000799	MG/KG	95% UCL-NP	(4)
	Indeno(1,2,3-cd)pyrene	MG/KG	0.00132	0.00132	NP	0.00432		0.00132	MG/KG	95% UCL-NP	(4)
	Phenanthrene	MG/KG	0.00286	0.00475	T	0.00689		0.00475	MG/KG	95% UCL-T	(3)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.0128	0.0150	T	0.0163	J	0.0150	MG/KG	95% UCL-T	(3)
	4,4'-DDE	MG/KG	0.03161	0.03161	NP	0.0439	J	0.03161	MG/KG	95% UCL-NP	(4)
	alpha-Chlordane	MG/KG	0.0140	0.0170	N	0.0222	J	0.0170	MG/KG	95% UCL-N	(2)

Table 3.1.RME
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
American Eel

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: American Eel
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
	Aroclor-1254	MG/KG	0.20781	0.25318	T	0.2928	J	0.25318	MG/KG	95% UCL-T	(3)
	Aroclor-1268	MG/KG	0.1022	0.1251	T	0.14591	J	0.1251	MG/KG	95% UCL-T	(3)
	Dieldrin	MG/KG	0.00353	0.00353	NP	0.00885	J	0.00353	MG/KG	95% UCL-NP	(4)
	gamma-Chlordane	MG/KG	0.0055	0.0069	N	0.00902	J	0.0069	MG/KG	95% UCL-N	(2)
	Heptachlor Epoxide	MG/KG	0.0012	0.0012	NP	0.0026	J	0.0012	MG/KG	95% UCL-NP	(4)
	Technical Chlordane	MG/KG	0.26541	0.31695	N	0.41089	J	0.31695	MG/KG	95% UCL-N	(2)
	Inorganics										
	Lead	MG/KG	0.214	6.36	T	1.47		1.47	MG/KG	Max	(5)
	Mercury	MG/KG	0.0706	0.0706	NP	0.227		0.0706	MG/KG	95% UCL-NP	(4)
	Mercury (methyl)	MG/KG	0.0825	0.165	T	0.234		0.165	MG/KG	95% UCL-T	(3)
	Zinc	MG/KG	33.4	41.5	T	53.3	J	41.5	MG/KG	95% UCL-T	(3)
	Dioxins										
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.000000609	0.000000747	T	0.000000851		0.000000747	MG/KG	95% UCL-T	(3)
ALLENDALE	**Semivolatile Organics**										
	Acenaphthylene	MG/KG	0.0013	0.0013	NP	0.00187		0.0013	MG/KG	95% UCL-NP	(4)
	Phenanthrene	MG/KG	0.00807	0.00807	NP	0.01063		0.00807	MG/KG	95% UCL-NP	(4)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.0131	0.0131	NP	0.04205		0.0131	MG/KG	95% UCL-NP	(4)
	4,4'-DDE	MG/KG	0.0210	0.0210	NP	0.03305		0.0210	MG/KG	95% UCL-NP	(4)
	4,4'-DDT	MG/KG	0.00386	0.00892	T	0.01106		0.00892	MG/KG	95% UCL-T	(3)
	alpha-Chlordane	MG/KG	0.01923	0.01923	NP	0.06327		0.01923	MG/KG	95% UCL-NP	(4)
	Aroclor-1254	MG/KG	0.65474	0.88187	N	1.15576		0.88187	MG/KG	95% UCL-N	(2)
	Aroclor-1268	MG/KG	0.01504	0.01504	NP	0.07747	J	0.01504	MG/KG	95% UCL-NP	(4)
	beta-BHC	MG/KG	0.00062	0.00062	NP	0.00072	J	0.00062	MG/KG	95% UCL-NP	(4)
	Dieldrin	MG/KG	0.00667	0.00912	N	0.01448		0.00912	MG/KG	95% UCL-N	(2)
	Endosulfan Sulfate	MG/KG	0.00158	0.00158	NP	0.00999		0.00158	MG/KG	95% UCL-NP	(4)
	Endrin Aldehyde	MG/KG	0.001	0.001	NP	0.0008		0.001	MG/KG	95% UCL-NP	(4)
	gamma-Chlordane	MG/KG	0.00712	0.00712	NP	0.02296		0.00712	MG/KG	95% UCL-NP	(4)

Table 3.1.RME
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
American Eel

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: American Eel
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
	Heptachlor	MG/KG	0.000678	0.000678	NP	0.00129		0.000678	MG/KG	95% UCL-NP	(4)
	Heptachlor Epoxide	MG/KG	0.0015	0.0015	NP	0.00446		0.0015	MG/KG	95% UCL-NP	(4)
	Technical Chlordane	MG/KG	0.2615	0.2615	NP	0.76253		0.2615	MG/KG	95% UCL-NP	(4)
	Inorganics										
	Cadmium	MG/KG	0.0971	0.0971	NP	0.248		0.0971	MG/KG	95% UCL-NP	(4)
	Lead	MG/KG	0.428	0.580	N	0.952	J	0.580	MG/KG	95% UCL-N	(2)
	Manganese	MG/KG	3.51	5.04	T	7.7	J	5.04	MG/KG	95% UCL-T	(3)
	Mercury	MG/KG	0.111	0.153	N	0.24		0.153	MG/KG	95% UCL-N	(2)
	Mercury (methyl)	MG/KG	0.134	0.269	T	0.471		0.269	MG/KG	95% UCL-T	(3)
	Dioxins										
	HCX	MG/KG	0.0000582	0.0000778	N	0.00011	J	0.0000778	MG/KG	95% UCL-N	(2)
	Toxicity Equivalency (PCB Congeners) - Mammals	MG/KG	0.0000356	NC		0.000042		0.000042	MG/KG	Max	(5)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.000111	0.000111	NP	0.000308		0.000111	MG/KG	95% UCL-NP	(4)
LYMAN MILL	**Semivolatile Organics**										
	Acenaphthylene	MG/KG	0.00193	0.00193	NP	0.00294		0.00193	MG/KG	95% UCL-NP	(4)
	Benzo(a)pyrene	MG/KG	0.000962	0.000962	NP	0.00382		0.000962	MG/KG	95% UCL-NP	(4)
	Benzo(b)fluoranthene	MG/KG	0.00119	0.00119	NP	0.00577		0.00119	MG/KG	95% UCL-NP	(4)
	Dibenzo(a,h)anthracene	MG/KG	0.00065	0.00065	NP	0.00075	J	0.00065	MG/KG	95% UCL-NP	(4)
	Phenanthrene	MG/KG	0.01554	0.02012	T	0.02717		0.02012	MG/KG	95% UCL-T	(3)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.01469	0.01469	NP	0.02072	J	0.01469	MG/KG	95% UCL-NP	(4)
	4,4'-DDE	MG/KG	0.04451	0.04451	NP	0.07891	J	0.04451	MG/KG	95% UCL-NP	(4)
	4,4'-DDT	MG/KG	0.00238	0.00337	N	0.00566	J	0.00337	MG/KG	95% UCL-N	(2)
	alpha-Chlordane	MG/KG	0.02007	0.02007	NP	0.04272		0.02007	MG/KG	95% UCL-NP	(4)
	Aroclor-1254	MG/KG	0.70316	0.95861	T	1.17773	J	0.95861	MG/KG	95% UCL-T	(3)
	beta-BHC	MG/KG	0.0012	0.0018	T	0.00255	J	0.0018	MG/KG	95% UCL-T	(3)
	Dieldrin	MG/KG	0.00789	0.00789	NP	0.01115	J	0.00789	MG/KG	95% UCL-NP	(4)
	gamma-Chlordane	MG/KG	0.00859	0.00859	NP	0.01605		0.00859	MG/KG	95% UCL-NP	(4)
	Heptachlor Epoxide	MG/KG	0.00227	0.00227	NP	0.00559		0.00227	MG/KG	95% UCL-NP	(4)
	Technical Chlordane	MG/KG	0.44722	0.44722	NP	0.76577		0.44722	MG/KG	95% UCL-NP	(4)

Table 3.1.RME
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
American Eel

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: American Eel
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
	Inorganics										
	Cadmium	MG/KG	0.026	0.026	NP	0.0425	J	0.026	MG/KG	95% UCL-NP	(4)
	Lead	MG/KG	0.27	0.38	T	0.473	J	0.38	MG/KG	95% UCL-T	(3)
	Manganese	MG/KG	3.50	4.98	T	7.65		4.98	MG/KG	95% UCL-T	(3)
	Mercury	MG/KG	0.0349	0.0349	NP	0.0756		0.0349	MG/KG	95% UCL-NP	(4)
	Mercury (methyl)	MG/KG	0.0367	0.0367	NP	0.0673		0.0367	MG/KG	95% UCL-NP	(4)
	Dioxins										
	HCX	MG/KG	0.0000571	0.0000805	T	0.00011	J	0.0000805	MG/KG	95% UCL-T	(3)
	Toxicity Equivalency (PCB Congeners) - Mammals	MG/KG	0.0000323	NC		0.0000604		0.0000604	MG/KG	Max	(5)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.000141	0.000181	N	0.000248		0.000181	MG/KG	95% UCL-N	(2)
DYERVILLE	**Semivolatile Organics**										
	Acenaphthylene	MG/KG	0.00076	NC		0.00094	J	0.00094	MG/KG	Max	(5)
	Dibenzo(a,h)anthracene	MG/KG	0.00068	NC		0.00017	J	0.00017	MG/KG	Max	(5)
	Phenanthrene	MG/KG	0.00490	NC		0.00632		0.00632	MG/KG	Max	(5)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.03543	NC		0.04068		0.04068	MG/KG	Max	(5)
	4,4'-DDE	MG/KG	0.0110	NC		0.01474		0.01474	MG/KG	Max	(5)
	4,4'-DDT	MG/KG	0.0119	NC		0.01467		0.01467	MG/KG	Max	(5)
	alpha-Chlordane	MG/KG	0.01440	NC		0.01914		0.01914	MG/KG	Max	(5)
	Aroclor-1254	MG/KG	0.37026	NC		0.4495		0.4495	MG/KG	Max	(5)
	Dieldrin	MG/KG	0.00852	NC		0.01086		0.01086	MG/KG	Max	(5)
	gamma-Chlordane	MG/KG	0.00574	NC		0.0068		0.0068	MG/KG	Max	(5)
	Heptachlor Epoxide	MG/KG	0.00184	NC		0.00228		0.00228	MG/KG	Max	(5)
	Technical Chlordane	MG/KG	0.31006	NC		0.38798		0.38798	MG/KG	Max	(5)
	Inorganics										
	Cadmium	MG/KG	0.157	NC		0.261		0.261	MG/KG	Max	(5)
	Lead	MG/KG	0.341	NC		0.562		0.562	MG/KG	Max	(5)
	Manganese	MG/KG	12.6	NC		23	J	23	MG/KG	Max	(5)
	Mercury	MG/KG	0.102	NC		0.113		0.113	MG/KG	Max	(5)

Table 3.1.RME
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
American Eel

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: American Eel
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale
	Mercury (methyl)	MG/KG	0.117	NC	0.122	0.122	MG/KG	Max	(5)
	Dioxins								
	HCX	MG/KG	0.0000296	NC	0.0000343 J	0.0000343	MG/KG	Max	(5)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.0000522	NC	0.0000757	0.0000757	MG/KG	Max	(5)

(1) Chemicals of potential concern are identified in Table 2.1 and Table 2.9 for site exposure areas and reference/background areas respectively.
(2) 95% UCL-N: 95% Upper Concentration Limit on the mean, normal distribution
(3) 95% UCL-T: 95% Upper Concentration Limit on the mean, lognormal distribution
(4) 95% UCL-NP: 95% Upper Concentration Limit on the mean, nonparametric distribution. Arithmetic mean used to approximate the 95% UCL for nonparametric data.
(5) Max: Maximum detected concentration, applied if fewer than 10 samples (95% UCL not calculated), or if the 95% UCL is greater than the maximum concentration.

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

Qualifier Definitions:
J = Value is estimated.

MG/KG = milligrams per kilogram
NC = Not Calculated
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: MJM

Table 3.2.RME
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Largemouth Bass

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe Current/Future
Medium Largemouth Bass
Exposure Medium Fillet

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
ASSAPUMPSET	**Semivolatile Organics**										
	Acenaphthylene	MG/KG	0.0003	NC		0.00032	J	0.00032	MG/KG	Max	(5)
	Benzo(a)pyrene	MG/KG	0.000849	NC		0.00128	J	0.00128	MG/KG	Max	(5)
	Phenanthrene	MG/KG	0.00108	NC		0.00119		0.00119	MG/KG	Max	(5)
	Pesticides/PCBs										
	4,4'-DDE	MG/KG	0.00467	NC		0.00932		0.00932	MG/KG	Max	(5)
	alpha-Chlordane	MG/KG	0.0003	NC		0.00031	J	0.00031	MG/KG	Max	(5)
	Inorganics										
	Mercury	MG/KG	0.254	NC		0.315	J	0.315	MG/KG	Max	(5)
	Mercury (methyl)	MG/KG	0.3	NC		0.379		0.379	MG/KG	Max	(5)
	Dioxins										
	HCX	MG/KG	0.0000264	NC		0.00000535	J	0.00000535	MG/KG	Max	(5)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.00000182	NC		0.00000278		0.00000278	MG/KG	Max	(5)
GREYSTONE	**Semivolatile Organics**										
	Acenaphthylene	MG/KG	0.0004	0.0009	T	0.00047	J	0.00047	MG/KG	Max	(5)
	Phenanthrene	MG/KG	0.0009	0.001	T	0.00147		0.001	MG/KG	95% UCL-T	(3)
	Pesticides/PCBs										
	4,4'-DDE	MG/KG	0.00681	0.0157	T	0.02122	J	0.0157	MG/KG	95% UCL-T	(3)
	alpha-Chlordane	MG/KG	0.00064	0.00064	NP	0.0018		0.00064	MG/KG	95% UCL-NP	(4)
	Aroclor-1254	MG/KG	0.0378	0.0766	T	0.10139		0.0766	MG/KG	95% UCL-T	(3)
	Aroclor-1268	MG/KG	0.0302	0.0750	T	0.08518		0.0750	MG/KG	95% UCL-T	(3)
	Dieldrin	MG/KG	0.00035	0.00035	NP	0.00042	J	0.00035	MG/KG	95% UCL-NP	(4)
	gamma-Chlordane	MG/KG	0.0004	0.0007	T	0.00076		0.0007	MG/KG	95% UCL-T	(3)
	Technical Chlordane	MG/KG	0.0352	0.0352	NP	0.01794	J	0.01794	MG/KG	Max	(5)
	Inorganics										
	Mercury	MG/KG	0.419	0.419	NP	0.708	J	0.419	MG/KG	95% UCL-NP	(4)
	Mercury (methyl)	MG/KG	0.398	0.625	T	0.652		0.625	MG/KG	95% UCL-T	(3)
	Dioxins										
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.000000208	0.000000240	T	0.000000313		0.000000240	MG/KG	95% UCL-T	(3)
LYMAN MILL	**Semivolatile Organics**										
	Acenaphthylene	MG/KG	0.0002	0.0004	N	0.00062	J	0.0004	MG/KG	95% UCL-N	(2)
	Benzo(a)pyrene	MG/KG	0.000704	0.000704	NP	0.00373		0.000704	MG/KG	95% UCL-NP	(4)
	Benzo(b)fluoranthene	MG/KG	0.0008	0.0008	NP	0.00509		0.0008	MG/KG	95% UCL-NP	(4)
	Benzo(g,h,i)perylene	MG/KG	0.000703	0.000703	NP	0.00372		0.000703	MG/KG	95% UCL-NP	(4)
	Dibenzo(a,h)anthracene	MG/KG	0.00038	0.00038	NP	0.0008	J	0.00038	MG/KG	95% UCL-NP	(4)
	Phenanthrene	MG/KG	0.0014	0.0014	NP	0.00712	J	0.0014	MG/KG	95% UCL-NP	(4)

Table 3.2.RME
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Largemouth Bass

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Largemouth Bass
Exposure Medium: Fillet

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
	Pesticides/PCBs										
	4,4'-DDE	MG/KG	0.01037	0.01037	NP	0.0391		0.01037	MG/KG	95% UCL-NP	(4)
	alpha-Chlordane	MG/KG	0.002	0.002	NP	0.0099		0.002	MG/KG	95% UCL-NP	(4)
	Aroclor-1254	MG/KG	0.2166	0.2166	NP	0.59434	J	0.2166	MG/KG	95% UCL-NP	(4)
	Aroclor-1268	MG/KG	0.0127	0.0127	NP	0.05476	J	0.0127	MG/KG	95% UCL-NP	(4)
	Dieldrin	MG/KG	0.00061	0.00061	NP	0.00255		0.00061	MG/KG	95% UCL-NP	(4)
	gamma-Chlordane	MG/KG	0.00086	0.00086	NP	0.0038		0.00086	MG/KG	95% UCL-NP	(4)
	Technical Chlordane	MG/KG	0.03671	0.03671	NP	0.1365	J	0.03671	MG/KG	95% UCL-NP	(4)
	Inorganics										
	Lead	MG/KG	0.0066	0.0090	N	0.0144	J	0.0090	MG/KG	95% UCL-N	(2)
	Mercury	MG/KG	0.154	0.269	T	0.398		0.269	MG/KG	95% UCL-T	(3)
	Mercury (methyl)	MG/KG	0.236	0.236	NP	0.41		0.236	MG/KG	95% UCL-NP	(4)
	Dioxins										
	HCX	MG/KG	0.0000131	0.0000131	NP	0.00000649	J	0.00000649	MG/KG	Max	(5)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.00000453	NC		0.0000109		0.0000109	MG/KG	Max	(5)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.0000217	0.0000315	T	0.0000442		0.0000315	MG/KG	95% UCL-T	(3)
MANTON	**Semivolatile Organics**										
	Acenaphthylene	MG/KG	0.00030	NC		0.00041	J	0.00041	MG/KG	Max	(5)
	Dibenzo(a,h)anthracene	MG/KG	0.00030	NC		0.00022	J	0.00022	MG/KG	Max	(5)
	Phenanthrene	MG/KG	0.00293	NC		0.00498		0.00498	MG/KG	Max	(5)
	Pesticides/PCBs										
	4,4'-DDE	MG/KG	0.0089	NC		0.01235		0.01235	MG/KG	Max	(5)
	alpha-Chlordane	MG/KG	0.0014	NC		0.00263		0.00263	MG/KG	Max	(5)
	Aroclor-1254	MG/KG	0.12472	NC		0.22052		0.22052	MG/KG	Max	(5)
	Aroclor-1268	MG/KG	0.03292	NC		0.06755		0.06755	MG/KG	Max	(5)
	Dieldrin	MG/KG	0.00052	NC		0.00057		0.00057	MG/KG	Max	(5)
	Endosulfan Sulfate	MG/KG	0.00096	NC		0.0019		0.0019	MG/KG	Max	(5)
	gamma-Chlordane	MG/KG	0.00052	NC		0.00096	J	0.00096	MG/KG	Max	(5)
	Technical Chlordane	MG/KG	0.04062	NC		0.06498	J	0.06498	MG/KG	Max	(5)
	Inorganics										
	Lead	MG/KG	0.0113	NC		0.0119	J	0.0119	MG/KG	Max	(5)
	Mercury	MG/KG	0.185	NC		0.259		0.259	MG/KG	Max	(5)
	Mercury (methyl)	MG/KG	0.149	NC		0.278		0.278	MG/KG	Max	(5)

Table 3.2.RME
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Largemouth Bass

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Largemouth Bass
Exposure Medium: Fillet

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale
	Dioxins								
	HCX	MG/KG	0.0000163	NC	0.00000536 J	0.00000536	MG/KG	Max	(5)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.0000186	NC	0.0000310	0.000031	MG/KG	Max	(5)

(1) Chemicals of potential concern are identified in Table 2.2 and Table 2.10 for site exposure areas and reference/background areas respectively
(2) 95% UCL-N: 95% Upper Concentration Limit on the mean, normal distribution
(3) 95% UCL-T: 95% Upper Concentration Limit on the mean, lognormal distribution
(4) 95% UCL-NP: 95% Upper Concentration Limit on the mean, nonparametric distribution. Arithmetic mean used to approximate the 95% UCL for nonparametric data.
(5) Max: Maximum detected concentration, applied if fewer than 10 samples (95% UCL is not calculated), or if the 95% UCL is greater than the maximum concentration.

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

Qualifier Definitions:
J = Value is estimated

MG/KG = milligrams per kilogram
NC = Not Calculated
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: MJM

Table 3.3.RME
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
White Sucker

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: White Sucker, Brown Bullhead
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
ASSAPUMPSET	**Semivolatile Organics**										
BROWN BULLHEAD	Acenaphthylene	MG/KG	0.00091	NC		0.00122	J	0.00122	MG/KG	Max	(5)
USED AS A SURROGATE	Benzo(a)anthracene	MG/KG	0.00334	NC		0.00808		0.00808	MG/KG	Max	(5)
FOR WHITE SUCKER IN	Benzo(a)pyrene	MG/KG	0.00329	NC		0.00791		0.00791	MG/KG	Max	(5)
THIS AREA	Benzo(b)fluoranthene	MG/KG	0.004177	NC		0.01058		0.01058	MG/KG	Max	(5)
	Benzo(g,h,i)perylene	MG/KG	0.00219	NC		0.00462		0.00462	MG/KG	Max	(5)
	Dibenzo(a,h)anthracene	MG/KG	0.00108	NC		0.00129	J	0.00129	MG/KG	Max	(5)
	Indeno(1,2,3-cd)pyrene	MG/KG	0.00283	NC		0.00653		0.00653	MG/KG	Max	(5)
	Phenanthrene	MG/KG	0.0071	NC		0.00776		0.00776	MG/KG	Max	(5)
	Pesticides/PCBs										
	4,4'-DDE	MG/KG	0.0127	NC		0.02374		0.02374	MG/KG	Max	(5)
	alpha-Chlordane	MG/KG	0.00174	NC		0.00288		0.00288	MG/KG	Max	(5)
	gamma-Chlordane	MG/KG	0.00094	NC		0.0013	J	0.0013	MG/KG	Max	(5)
	Inorganics										
	Lead	MG/KG	0.0894	NC		0.129	J	0.129	MG/KG	Max	(5)
	Mercury	MG/KG	0.077	NC		0.137	J	0.137	MG/KG	Max	(5)
	Mercury (methyl)	MG/KG	0.0775	NC		0.145		0.145	MG/KG	Max	(5)
	Dioxins										
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.00000216	NC		0.00000258		0.00000258	MG/KG	Max	(5)
GREYSTONE	**Semivolatile Organics**										
	Acenaphthylene	MG/KG	0.00388	0.00482	N	0.00706		0.00482	MG/KG	95% UCL-N	(2)
	Benzo(a)pyrene	MG/KG	0.00112	0.00112	NP	0.00273		0.00112	MG/KG	95% UCL-NP	(4)
	Benzo(g,h,i)perylene	MG/KG	0.000988	0.000988	NP	0.00138	J	0.000988	MG/KG	95% UCL-NP	(4)
	Phenanthrene	MG/KG	0.0172	0.0172	NP	0.02832		0.0172	MG/KG	95% UCL-NP	(4)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.0174	0.0218	T	0.02488		0.0218	MG/KG	95% UCL-T	(3)
	4,4'-DDE	MG/KG	0.04306	0.05130	N	0.06803		0.05130	MG/KG	95% UCL-N	(2)
	4,4'-DDT	MG/KG	0.00626	0.00626	NP	0.01314	J	0.00626	MG/KG	95% UCL-NP	(4)
	alpha-Chlordane	MG/KG	0.02094	0.02431	T	0.02862		0.02431	MG/KG	95% UCL-T	(3)
	Aroclor-1254	MG/KG	0.20236	0.20236	NP	0.35135		0.20236	MG/KG	95% UCL-NP	(4)
	Aroclor-1268	MG/KG	0.05512	0.05512	NP	0.16789		0.05512	MG/KG	95% UCL-NP	(4)
	Dieldrin	MG/KG	0.00417	0.00417	NP	0.02346		0.00417	MG/KG	95% UCL-NP	(4)
	gamma-Chlordane	MG/KG	0.0112	0.0112	NP	0.01453		0.0112	MG/KG	95% UCL-NP	(4)
	Heptachlor Epoxide	MG/KG	0.00081	0.00081	NP	0.00123	J	0.00081	MG/KG	95% UCL-NP	(4)
	Technical Chlordane	MG/KG	0.2820	0.2820	NP	0.34491		0.2820	MG/KG	95% UCL-NP	(4)

Table 3.3.RME
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
White Sucker

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: White Sucker, Brown Bullhead
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
	Inorganics										
	Lead	MG/KG	0.012	0.012	NP	0.022	J	0.012	MG/KG	95% UCL-NP	(4)
	Mercury	MG/KG	0.190	0.190	NP	0.278		0.190	MG/KG	95% UCL-NP	(4)
	Mercury (methyl)	MG/KG	0.193	0.193	NP	0.299		0.193	MG/KG	95% UCL-NP	(4)
	Dioxins										
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.00000211	0.00000310	T	0.00000395		0.00000310	MG/KG	95% UCL-T	(3)
ALLENDALE	**Semivolatile Organics**										
	Acenaphthylene	MG/KG	0.00215	0.00268	T	0.00387		0.00268	MG/KG	95% UCL-T	(3)
	Benzo(a)anthracene	MG/KG	0.0013	0.0022	T	0.00301		0.0022	MG/KG	95% UCL-T	(3)
	Benzo(a)pyrene	MG/KG	0.0010	0.0024	T	0.00279		0.0024	MG/KG	95% UCL-T	(3)
	Benzo(b)fluoranthene	MG/KG	0.0012	0.0025	T	0.00401		0.0025	MG/KG	95% UCL-T	(3)
	Benzo(g,h,i)perylene	MG/KG	0.000632	0.000632	NP	0.00243		0.000632	MG/KG	95% UCL-NP	(4)
	Dibenzo(a,h)anthracene	MG/KG	0.00027	0.00040	T	0.00069		0.00040	MG/KG	95% UCL-T	(3)
	Indeno(1,2,3-cd)pyrene	MG/KG	0.00079	0.00079	NP	0.00267		0.00079	MG/KG	95% UCL-NP	(4)
	Phenanthrene	MG/KG	0.00958	0.0114	N	0.01451		0.0114	MG/KG	95% UCL-N	(2)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.0126	0.0126	NP	0.03498	J	0.0126	MG/KG	95% UCL-NP	(4)
	4,4'-DDE	MG/KG	0.02869	0.02869	NP	0.05383	J	0.02869	MG/KG	95% UCL-NP	(4)
	4,4'-DDT	MG/KG	0.00686	0.00686	NP	0.02462	J	0.00686	MG/KG	95% UCL-NP	(4)
	alpha-Chlordane	MG/KG	0.0168	0.0236	T	0.03511	J	0.0236	MG/KG	95% UCL-T	(3)
	Aroclor-1254	MG/KG	1.5832	2.8888	T	3.24344	J	2.8888	MG/KG	95% UCL-T	(3)
	Aroclor-1268	MG/KG	0.02949	0.03843	T	0.05274	J	0.03843	MG/KG	95% UCL-T	(3)
	Dieldrin	MG/KG	0.00537	0.00866	T	0.0099	J	0.00866	MG/KG	95% UCL-T	(3)
	gamma-Chlordane	MG/KG	0.0089	0.0089	NP	0.0247	J	0.0089	MG/KG	95% UCL-NP	(4)
	Heptachlor Epoxide	MG/KG	0.00061	0.00070	N	0.00083	J	0.00070	MG/KG	95% UCL-N	(2)
	Technical Chlordane	MG/KG	0.346	0.674	T	1.24742	J	0.674	MG/KG	95% UCL-T	(3)
	Inorganics										
	Chromium	MG/KG	0.112	0.112	NP	0.229	J	0.112	MG/KG	95% UCL-NP	(4)
	Lead	MG/KG	0.16	0.39	T	0.349		0.349	MG/KG	Max	(5)
	Mercury	MG/KG	0.136	0.136	NP	0.216		0.136	MG/KG	95% UCL-NP	(4)
	Mercury (methyl)	MG/KG	0.147	0.147	NP	0.225		0.147	MG/KG	95% UCL-NP	(4)
	Dioxins										
	HCX	MG/KG	0.0000472	0.0000615	N	0.0000893	J	0.0000615	MG/KG	95% UCL-N	(2)
	Toxicity Equivalency (PCB Congeners) - Mammals	MG/KG	0.0000195	NC		0.0000215		0.0000215	MG/KG	Max	(5)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.000346	0.000491	N	0.000802		0.000491	MG/KG	95% UCL-N	(2)

Table 3.3.RME
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
White Sucker

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: White Sucker, Brown Bullhead
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
LYMAN MILL	**Semivolatile Organics**										
	Acenaphthylene	MG/KG	0.00297	0.00355	T	0.00458		0.00355	MG/KG	95% UCL-T	(3)
	Benzo(a)anthracene	MG/KG	0.00447	0.00946	T	0.01173		0.00946	MG/KG	95% UCL-T	(3)
	Benzo(a)pyrene	MG/KG	0.0049	0.024	T	0.01469		0.01469	MG/KG	Max	(5)
	Benzo(b)fluoranthene	MG/KG	0.0067	0.007	NP	0.02077		0.00666	MG/KG	95% UCL-NP	(4)
	Benzo(g,h,i)perylene	MG/KG	0.0038	0.019	T	0.01143		0.01143	MG/KG	Max	(5)
	Dibenzo(a,h)anthracene	MG/KG	0.0010	0.0027	T	0.00273		0.0027	MG/KG	95% UCL-T	(3)
	Indeno(1,2,3-cd)pyrene	MG/KG	0.0043	0.034	T	0.01347		0.01347	MG/KG	Max	(5)
	Phenanthrene	MG/KG	0.0154	0.0212	T	0.02954		0.0212	MG/KG	95% UCL-T	(3)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.03866	0.06351	T	0.0668	J	0.06351	MG/KG	95% UCL-T	(3)
	4,4'-DDE	MG/KG	0.1309	0.2134	T	0.28651	J	0.2134	MG/KG	95% UCL-T	(3)
	4,4'-DDT	MG/KG	0.0037	0.0052	N	0.00847	J	0.0052	MG/KG	95% UCL-N	(2)
	alpha-Chlordane	MG/KG	0.03963	0.04690	N	0.05956	J	0.04690	MG/KG	95% UCL-N	(2)
	Aroclor-1254	MG/KG	4.19359	5.21365	T	7.09977	J	5.21365	MG/KG	95% UCL-T	(3)
	Aroclor-1268	MG/KG	0.03590	0.04370	T	0.04566	J	0.04370	MG/KG	95% UCL-T	(3)
	Dieldrin	MG/KG	0.00556	0.00862	T	0.00971	J	0.00862	MG/KG	95% UCL-T	(3)
	gamma-Chlordane	MG/KG	0.02921	0.02921	NP	0.0408	J	0.02921	MG/KG	95% UCL-NP	(4)
	Heptachlor Epoxide	MG/KG	0.0014	0.0017	T	0.002	J	0.0017	MG/KG	95% UCL-T	(3)
	Technical Chlordane	MG/KG	1.3657	2.5751	T	2.61185	J	2.5751	MG/KG	95% UCL-T	(3)
	Inorganics										
	Arsenic	MG/KG	0.0276	0.0276	NP	0.0715		0.0276	MG/KG	95% UCL-NP	(4)
	Chromium	MG/KG	0.270	0.378	T	0.513		0.378	MG/KG	95% UCL-T	(3)
	Lead	MG/KG	0.428	0.594	N	1.01	J	0.594	MG/KG	95% UCL-N	(2)
	Mercury	MG/KG	0.0984	0.118	T	0.157		0.118	MG/KG	95% UCL-T	(3)
	Mercury (methyl)	MG/KG	0.0927	0.109	T	0.139		0.109	MG/KG	95% UCL-T	(3)
	Dioxins										
	HCX	MG/KG	0.0000548	0.0000548	NP	0.0000814	J	0.0000548	MG/KG	95% UCL-NP	(4)
	Toxicity Equivalency (PCB Congeners) - Mammals	MG/KG	0.0000401	NC		0.0000503		0.0000503	MG/KG	Max	(5)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.000580	0.000898	T	0.00137		0.000898	MG/KG	95% UCL-T	(3)

(1) Chemicals of potential concern are identified in Table 2.4 and Table 2.12 for site exposure areas and reference/background areas respecitively
Chemicals of potential concern for Brown Bullhead area identified in Table 2.13.
(2) 95% UCL-N: 95% Upper Concentration Limit on the mean, normal distribution

Table 3.3.RME
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
White Sucker

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: White Sucker, Brown Bullhead
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale

(3) 95% UCL-T: 95% Upper Concentration Limit on the mean, lognormal distribution
(4) 95% UCL-NP: 95% Upper Concentration Limit on the mean, nonparametric distribution. Arithmetic mean used to approximate the 95% UCL for nonparametric data.
(5) Max Maximum detected concentration, applied if fewer than 10 samples (95% UCL not calculated), or if the 95% UCL is greater than the maximum concentration.

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

Qualifier Definitions.
J = Value is estimated.

MG/KG = milligrams per kilogram
NC = Not Calculated
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by KJA
Checked by MJM

Table 3.4.RME
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Combined Fish

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Biota
Exposure Medium: Combined Fish Diet

Exposure Point	Chemical of Potential Concern (1)	Units	Exposure Point Concentration American Eel			Exposure Point Concentration White Sucker / Brown Bullhead			Exposure Point Concentration Largemouth Bass			Exposure Point Concentration Combined Fish Diet (7)
			Value	Statistic (1)	Rationale	Value	Statistic (1)	Rationale	Value	Statistic (1)	Rationale	Value
ASSAPUMPSET	**Semivolatile Organics**											
	Acenaphthylene	MG/KG	0.00179	Max	(5)	0.00122	Max	(5)	0.00032	Max	(5)	0.0011
	Benzo(a)anthracene	MG/KG	0.000638	Mean	(6)	0.00808	Max	(5)	0.00072	Mean	(6)	0.0031
	Benzo(a)pyrene	MG/KG	0.000666	Mean	(6)	0.00791	Max	(5)	0.00128	Max	(5)	0.00329
	Benzo(b)fluoranthene	MG/KG	0.000688	Mean	(6)	0.01058	Max	(5)	0.00072	Mean	(6)	0.0040
	Benzo(g,h,i)perylene	MG/KG	0.000638	Mean	(6)	0.00462	Max	(5)	0.00359	Mean	(6)	0.00295
	Dibenzo(a,h)anthracene	MG/KG	0.000626	Mean	(6)	0.00129	Max	(5)	0.00022	Max	(5) A	0.00071
	Indeno(1,2,3-cd)pyrene	MG/KG	0.000667	Mean	(6)	0.00653	Max	(5)	0.00072	Mean	(6)	0.0026
	Phenanthrene	MG/KG	0.00876	Max	(5)	0.00776	Max	(5)	0.00119	Max	(5)	0.00590
	Pesticides/PCBs											
	4,4'-DDD	MG/KG	0.00828	Max	(5)	0.00413	Max	(5) A	0.00095	Max	(5) A	0.00445
	4,4'-DDE	MG/KG	0.0373	Max	(5)	0.02374	Max	(5)	0.00932	Max	(5)	0.0235
	alpha-Chlordane	MG/KG	0.00487	Max	(5)	0.00288	Max	(5)	0.00031	Max	(5)	0.0027
	Aroclor-1254	MG/KG	0.10246	Max	(5)	0.009712	Mean	(6)	0.007184	Mean	(6)	0.03979
	Dieldrin	MG/KG	0.00246	Max	(5)	0.000778	Mean	(6)	0.00058	Mean	(6)	0.0013
	gamma-Chlordane	MG/KG	0.00185	Max	(5)	0.0013	Max	(5)	0.00058	Mean	(6)	0.0012
	Heptachlor Epoxide	MG/KG	0.00138	Max	(5)	0.000778	Mean	(6)	0.00058	Mean	(6)	0.00091
	Technical Chlordane	MG/KG	0.16108	Max	(5)	0.097115	Mean	(6)	0.07183	Mean	(6)	0.1100
	Inorganics											
	Lead	MG/KG	0.0893	Max	(5)	0.129	Max	(5)	0.0110	Mean	(6)	0.0764
	Mercury	MG/KG	0.14	Max	(5)	0.137	Max	(5)	0.315	Max	(5)	0.20
	Mercury (methyl)	MG/KG	0.137	Max	(5)	0.145	Max	(5)	0.379	Max	(5)	0.220
	Zinc	MG/KG	26.2	Max	(5)	12.2	Max	(5) A	8.81	Max	(5) A	15.7
	Dioxins											
	HCX	MG/KG	0.000009965	Mean	(6)	0.000009948	Mean	(6)	0.00000535	Max	(5)	0.00000842
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.00000178	Max	(5)	0.00000258	Max	(5)	0.00000278	Max	(5)	0.00000238
GREYSTONE	**Semivolatile Organics**											
	Acenaphthylene	MG/KG	0.00121	95% UCL-N	(2)	0.00482	95% UCL-N	(2)	0.00047	Max	(5)	0.0022
	Benzo(a)pyrene	MG/KG	0.00132	95% UCL-NP	(4)	0.00112	95% UCL-NP	(4)	0.00051	Mean	(6)	0.00099
	Benzo(b)fluoranthene	MG/KG	0.00149	95% UCL-NP	(4)	0.00148	95% UCL-NP	(4) A	0.00051	Mean	(6)	0.0012
	Benzo(g,h,i)perylene	MG/KG	0.00125	Mean	(6)	0.000988	95% UCL-NP	(4)	0.00051	Mean	(6)	0.00092
	Dibenzo(a,h)anthracene	MG/KG	0.000799	95% UCL-NP	(4)	0.00039	Max	(5) A	0.00051	Mean	(6)	0.00057
	Indeno(1,2,3-cd)pyrene	MG/KG	0.00132	95% UCL-NP	(4)	0.000945	Mean	(6)	0.00051	Mean	(6)	0.00092
	Phenanthrene	MG/KG	0.00475	95% UCL-T	(3)	0.0172	95% UCL-NP	(4)	0.001	95% UCL-T	(3)	0.008
	Pesticides/PCBs											
	4,4'-DDD	MG/KG	0.0150	95% UCL-T	(3)	0.0218	95% UCL-T	(3)	0.00078	95% UCL-NP	(4) A	0.013

Table 3.4.RME
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Combined Fish

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Biota
Exposure Medium: Combined Fish Diet

Exposure Point	Chemical of Potential Concern (1)	Units	Exposure Point Concentration American Eel			Exposure Point Concentration White Sucker / Brown Bullhead			Exposure Point Concentration Largemouth Bass			Exposure Point Concentration Combined Fish Diet (7)
			Value	Statistic (1)	Rationale	Value	Statistic (1)	Rationale	Value	Statistic (1)	Rationale	Value
	4,4'-DDE	MG/KG	0.03161	95% UCL-NP	(4)	0.05130	95% UCL-N	(2)	0.0157	95% UCL-T	(3)	0.0329
	4,4'-DDT	MG/KG	0.0020	95% UCL-NP	(4) A	0.00626	95% UCL-NP	(4)	0.0006	95% UCL-T	(3) A	0.003
	alpha-Chlordane	MG/KG	0.0170	95% UCL-N	(2)	0.02431	95% UCL-T	(3)	0.00064	95% UCL-NP	(4)	0.014
	Aroclor-1254	MG/KG	0.25318	95% UCL-T	(3)	0.20236	95% UCL-NP	(4)	0.0766	95% UCL-T	(3)	0.177
	Aroclor-1268	MG/KG	0.1251	95% UCL-T	(3)	0.05512	95% UCL-NP	(4)	0.0750	95% UCL-T	(3)	0.0851
	Dieldrin	MG/KG	0.00353	95% UCL-NP	(4)	0.00417	95% UCL-NP	(4)	0.00035	95% UCL-NP	(4)	0.0027
	gamma-Chlordane	MG/KG	0.0069	95% UCL-N	(2)	0.0112	95% UCL-NP	(4)	0.0007	95% UCL-T	(3)	0.006
	Heptachlor Epoxide	MG/KG	0.0012	95% UCL-NP	(4)	0.00081	95% UCL-NP	(4)	0.0004	Mean	(6)	0.0008
	Technical Chlordane	MG/KG	0.31695	95% UCL-N	(2)	0.2820	95% UCL-NP	(4)	0.01794	Max	(5)	0.2056
	Inorganics											
	Lead	MG/KG	1.47	Max	(5)	0.012	95% UCL-NP	(4)	0.00967	Mean	(6)	0.50
	Mercury	MG/KG	0.0706	95% UCL-NP	(4)	0.190	95% UCL-NP	(4)	0.419	95% UCL-NP	(4)	0.226
	Mercury (methyl)	MG/KG	0.165	95% UCL-T	(3)	0.193	95% UCL-NP	(4)	0.625	95% UCL-T	(3)	0.328
	Zinc	MG/KG	41.5	95% UCL-T	(3)	18	95% UCL-T	(3) A	7.36	95% UCL-T	(3) A	22
	Dioxins											
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.000000747	95% UCL-T	(3)	0.00000310	95% UCL-T	(3)	0.000000240	95% UCL-T	(3)	0.00000136
ALLENDALE	**Semivolatile Organics**											
	Acenaphthylene	MG/KG	0.0013	95% UCL-NP	(4)	0.00268	95% UCL-T	(3)	NS	NS	NS	0.0020
	Benzo(a)anthracene	MG/KG	0.000676	Mean	(6)	0.0022	95% UCL-T	(3)	NS	NS	NS	0.0014
	Benzo(a)pyrene	MG/KG	0.000666	Mean	(6)	0.0024	95% UCL-T	(3)	NS	NS	NS	0.0015
	Benzo(b)fluoranthene	MG/KG	0.000768	Mean	(6)	0.0025	95% UCL-T	(3)	NS	NS	NS	0.0016
	Benzo(g,h,i)perylene	MG/KG	0.000667	Mean	(6)	0.000632	95% UCL-NP	(4)	NS	NS	NS	0.000650
	Dibenzo(a,h)anthracene	MG/KG	0.000647	Mean	(6)	0.00040	95% UCL-T	(3)	NS	NS	NS	0.00053
	Indeno(1,2,3-cd)pyrene	MG/KG	0.000670	Mean	(6)	0.00079	95% UCL-NP	(4)	NS	NS	NS	0.00073
	Phenanthrene	MG/KG	0.00807	95% UCL-NP	(4)	0.0114	95% UCL-N	(2)	NS	NS	NS	0.00975
	Pesticides/PCBs											
	4,4'-DDD	MG/KG	0.0131	95% UCL-NP	(4)	0.0126	95% UCL-NP	(4)	NS	NS	NS	0.0128
	4,4'-DDE	MG/KG	0.0210	95% UCL-NP	(4)	0.02869	95% UCL-NP	(4)	NS	NS	NS	0.0249
	4,4'-DDT	MG/KG	0.00892	95% UCL-T	(3)	0.00686	95% UCL-NP	(4)	NS	NS	NS	0.00789
	alpha-Chlordane	MG/KG	0.01923	95% UCL-NP	(4)	0.0236	95% UCL-T	(3)	NS	NS	NS	0.0214
	Aroclor-1254	MG/KG	0.88187	95% UCL-N	(2)	2.8888	95% UCL-T	(3)	NS	NS	NS	1.8853
	Aroclor-1268	MG/KG	0.01504	95% UCL-NP	(4)	0.03843	95% UCL-T	(3)	NS	NS	NS	0.02673
	beta-BHC	MG/KG	0.00062	95% UCL-NP	(4)	0.0003	Mean	(6)	NS	NS	NS	0.0005
	Dieldrin	MG/KG	0.00912	95% UCL-N	(2)	0.00866	95% UCL-T	(3)	NS	NS	NS	0.00889
	Endosulfan Sulfate	MG/KG	0.00158	95% UCL-NP	(4)	0.0003	Mean	(6)	NS	NS	NS	0.001
	Endrin Aldehyde	MG/KG	0.001	95% UCL-NP	(4)	0.0003	Mean	(6)	NS	NS	NS	0.0005

Table 3.4.RME
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Combined Fish

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Biota
Exposure Medium: Combined Fish Diet

Exposure Point	Chemical of Potential Concern (1)	Units	Exposure Point Concentration American Eel			Exposure Point Concentration White Sucker / Brown Bullhead			Exposure Point Concentration Largemouth Bass			Exposure Point Concentration Combined Fish Diet (7)
			Value	Statistic (1)	Rationale	Value	Statistic (1)	Rationale	Value	Statistic (1)	Rationale	Value
	gamma-Chlordane	MG/KG	0.00712	95% UCL-NP	(4)	0.0089	95% UCL-NP	(4)	NS	NS	NS	0.0080
	Heptachlor	MG/KG	0.000678	95% UCL-NP	(4)	0.0003	Mean	(6)	NS	NS	NS	0.0005
	Heptachlor Epoxide	MG/KG	0.0015	95% UCL-NP	(4)	0.00070	95% UCL-N	(2)	NS	NS	NS	0.0011
	Technical Chlordane	MG/KG	0.2615	95% UCL-NP	(4)	0.674	95% UCL-T	(3)	NS	NS	NS	0.468
	Inorganics											
	Cadmium	MG/KG	0.0971	95% UCL-NP	(4)	0.0316	95% UCL-T	(3) A	NS	NS	NS	0.0644
	Chromium	MG/KG	0.0933	95% UCL-T	(3) A	0.112	95% UCL-NP	(4)	NS	NS	NS	0.103
	Lead	MG/KG	0.580	95% UCL-N	(2)	0.349	Max	(5)	NS	NS	NS	0.464
	Manganese	MG/KG	5.04	95% UCL-T	(3)	8.36	95% UCL-N	(2) A	NS	NS	NS	6.70
	Mercury	MG/KG	0.153	95% UCL-N	(2)	0.136	95% UCL-NP	(4)	NS	NS	NS	0.144
	Mercury (methyl)	MG/KG	0.269	95% UCL-T	(3)	0.147	95% UCL-NP	(4)	NS	NS	NS	0.208
	Dioxins											
	HCX	MG/KG	0.0000778	95% UCL-N	(2)	0.0000615	95% UCL-N	(2)	NS	NS	NS	0.0000696
	Toxicity Equivalency (PCB Congeners) - Mammals	MG/KG	0.000042	Max	(5)	0.0000215	Max	(5)	NS	NS	NS	0.000032
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.000111	95% UCL-NP	(4)	0.000491	95% UCL-N	(2)	NS	NS	NS	0.000301
LYMAN MILL	**Semivolatile Organics**											
	Acenaphthylene	MG/KG	0.00193	95% UCL-NP	(4)	0.00355	95% UCL-T	(3)	0.0004	95% UCL-N	(2)	0.002
	Benzo(a)anthracene	MG/KG	0.000946	95% UCL-NP	(4) A	0.00946	95% UCL-T	(3)	0.00288	95% UCL-T	(3) A	0.00443
	Benzo(a)pyrene	MG/KG	0.000962	95% UCL-NP	(4)	0.01469	Max	(5)	0.000704	95% UCL-NP	(4)	0.00545
	Benzo(b)fluoranthene	MG/KG	0.00119	95% UCL-NP	(4)	0.00666	95% UCL-NP	(4)	0.0008	95% UCL-NP	(4)	0.003
	Benzo(g,h,i)perylene	MG/KG	0.000645	Mean	(6)	0.01143	Max	(5)	0.000703	95% UCL-NP	(4)	0.00426
	Dibenzo(a,h)anthracene	MG/KG	0.00065	95% UCL-NP	(4)	0.0027	95% UCL-T	(3)	0.00038	95% UCL-NP	(4)	0.0012
	Indeno(1,2,3-cd)pyrene	MG/KG	0.000918	95% UCL-NP	(4) A	0.01347	Max	(5)	0.000579	95% UCL-NP	(4) A	0.00499
	Phenanthrene	MG/KG	0.02012	95% UCL-T	(3)	0.0212	95% UCL-T	(3)	0.0014	95% UCL-NP	(4)	0.014
	Pesticides/PCBs											
	4,4'-DDD	MG/KG	0.01469	95% UCL-NP	(4)	0.06351	95% UCL-T	(3)	0.0020	95% UCL-NP	(4) A	0.027
	4,4'-DDE	MG/KG	0.04451	95% UCL-NP	(4)	0.2134	95% UCL-T	(3)	0.01037	95% UCL-NP	(4)	0.08941
	4,4'-DDT	MG/KG	0.00337	95% UCL-N	(2)	0.0052	95% UCL-N	(2)	0.0008	95% UCL-NP	(4) A	0.003
	alpha-Chlordane	MG/KG	0.02007	95% UCL-NP	(4)	0.04690	95% UCL-N	(2)	0.002	95% UCL-NP	(4)	0.02
	Aroclor-1254	MG/KG	0.95861	95% UCL-T	(3)	5.21365	95% UCL-T	(3)	0.2166	95% UCL-NP	(4)	2.130
	Aroclor-1268	MG/KG	0.008058	Mean	(6)	0.04370	95% UCL-T	(3)	0.0127	95% UCL-NP	(4)	0.0215
	beta-BHC	MG/KG	0.0018	95% UCL-T	(3)	0.0003	Mean	(6)	0.00032	Mean	(6)	0.0008
	Dieldrin	MG/KG	0.00789	95% UCL-NP	(4)	0.00862	95% UCL-T	(3)	0.00061	95% UCL-NP	(4)	0.0057
	gamma-Chlordane	MG/KG	0.00859	95% UCL-NP	(4)	0.02921	95% UCL-NP	(4)	0.00086	95% UCL-NP	(4)	0.013
	Heptachlor Epoxide	MG/KG	0.00227	95% UCL-NP	(4)	0.0017	95% UCL-T	(3)	0.00032	Mean	(6)	0.0014
	Technical Chlordane	MG/KG	0.44722	95% UCL-NP	(4)	2.5751	95% UCL-T	(3)	0.03671	95% UCL-NP	(4)	1.020

Table 3.4.RME
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Combined Fish

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Biota
Exposure Medium: Combined Fish Diet

Exposure Point	Chemical of Potential Concern (1)	Units	Exposure Point Concentration American Eel			Exposure Point Concentration White Sucker / Brown Bullhead			Exposure Point Concentration Largemouth Bass			Exposure Point Concentration Combined Fish Diet (7)
			Value	Statistic (1)	Rationale	Value	Statistic (1)	Rationale	Value	Statistic (1)	Rationale	Value
	Inorganics											
	Arsenic	MG/KG	0.024	Mean	(6)	0.0276	95% UCL-NP	(4)	0.019	Mean	(6)	0.024
	Cadmium	MG/KG	0.026	95% UCL-NP	(4)	0.0228	95% UCL-T	(3) A	0.00304	Max	(5) A	0.017
	Chromium	MG/KG	0.131	95% UCL-NP	(4) A	0.378	95% UCL-T	(3)	0.0828	Max	(5) A	0.197
	Lead	MG/KG	0.38	95% UCL-T	(3)	0.594	95% UCL-N	(2)	0.0090	95% UCL-N	(2)	0.33
	Manganese	MG/KG	4.98	95% UCL-T	(3)	7.5	95% UCL-NP	(4) A	0.46	95% UCL-T	(3) A	4.31
	Mercury	MG/KG	0.0349	95% UCL-NP	(4)	0.118	95% UCL-T	(3)	0.269	95% UCL-T	(3)	0.141
	Mercury (methyl)	MG/KG	0.0367	95% UCL-NP	(4)	0.109	95% UCL-T	(3)	0.236	95% UCL-NP	(4)	0.127
	Dioxins											
	HCX	MG/KG	0.0000805	95% UCL-T	(3)	0.0000548	95% UCL-NP	(4)	0.00000649	Max	(5)	0.0000473
	Toxicity Equivalency (PCB Congeners) - Mammals	MG/KG	0.0000604	Max	(5)	0.0000503	Max	(5)	0.0000109	Max	(5)	0.0000405
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.000181	95% UCL-N	(2)	0.000898	95% UCL-T	(3)	0.0000315	95% UCL-T	(3)	0.000370
MANTON	**Semivolatile Organics**											
	Acenaphthylene	MG/KG	NS	NS	NS	NS	NS	NS	0.00041	Max	(5)	0.00041
	Dibenzo(a,h)anthracene	MG/KG	NS	NS	NS	NS	NS	NS	0.00022	Max	(5)	0.00022
	Phenanthrene	MG/KG	NS	NS	NS	NS	NS	NS	0.00498	Max	(5)	0.00498
	Pesticides/PCBs											
	4,4'-DDE	MG/KG	NS	NS	NS	NS	NS	NS	0.01235	Max	(5)	0.01235
	alpha-Chlordane	MG/KG	NS	NS	NS	NS	NS	NS	0.00263	Max	(5)	0.00263
	Aroclor-1254	MG/KG	NS	NS	NS	NS	NS	NS	0.22052	Max	(5)	0.22052
	Aroclor-1268	MG/KG	NS	NS	NS	NS	NS	NS	0.06755	Max	(5)	0.06755
	Dieldrin	MG/KG	NS	NS	NS	NS	NS	NS	0.00057	Max	(5)	0.00057
	Endosulfan Sulfate	MG/KG	NS	NS	NS	NS	NS	NS	0.0019	Max	(5)	0.0019
	gamma-Chlordane	MG/KG	NS	NS	NS	NS	NS	NS	0.00096	Max	(5)	0.00096
	Technical Chlordane	MG/KG	NS	NS	NS	NS	NS	NS	0.06498	Max	(5)	0.06498
	Inorganics											
	Lead	MG/KG	NS	NS	NS	NS	NS	NS	0.0119	Max	(5)	0.0119
	Mercury	MG/KG	NS	NS	NS	NS	NS	NS	0.259	Max	(5)	0.259
	Mercury (methyl)	MG/KG	NS	NS	NS	NS	NS	NS	0.278	Max	(5)	0.2780
	Dioxins											
	HCX	MG/KG	NS	NS	NS	NS	NS	NS	0.00000536	Max	(5)	0.00000536
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	NS	NS	NS	NS	NS	NS	0.000031	Max	(5)	0.0000310
DYERVILLE	**Semivolatile Organics**											
	Acenaphthylene	MG/KG	0.00094	Max	(5)	NS	NS	NS	NS	NS	NS	0.00094
	Dibenzo(a,h)anthracene	MG/KG	0.00017	Max	(5)	NS	NS	NS	NS	NS	NS	0.00017
	Phenanthrene	MG/KG	0.00632	Max	(5)	NS	NS	NS	NS	NS	NS	0.00632

Table 3.4.RME
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Combined Fish

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Biota
Exposure Medium: Combined Fish Diet

Exposure Point	Chemical of Potential Concern (1)	Units	Exposure Point Concentration American Eel			Exposure Point Concentration White Sucker / Brown Bullhead			Exposure Point Concentration Largemouth Bass			Exposure Point Concentration Combined Fish Diet (7)
			Value	Statistic (1)	Rationale	Value	Statistic (1)	Rationale	Value	Statistic (1)	Rationale	Value
	Pesticides/PCBs											
	4,4'-DDD	MG/KG	0.04068	Max	(5)	NS	NS	NS	NS	NS	NS	0.04068
	4,4'-DDE	MG/KG	0.01474	Max	(5)	NS	NS	NS	NS	NS	NS	0.01474
	4,4'-DDT	MG/KG	0.01467	Max	(5)	NS	NS	NS	NS	NS	NS	0.01467
	alpha-Chlordane	MG/KG	0.01914	Max	(5)	NS	NS	NS	NS	NS	NS	0.01914
	Aroclor-1254	MG/KG	0.4495	Max	(5)	NS	NS	NS	NS	NS	NS	0.4495
	Dieldrin	MG/KG	0.01086	Max	(5)	NS	NS	NS	NS	NS	NS	0.01086
	gamma-Chlordane	MG/KG	0.0068	Max	(5)	NS	NS	NS	NS	NS	NS	0.0068
	Heptachlor Epoxide	MG/KG	0.00228	Max	(5)	NS	NS	NS	NS	NS	NS	0.00228
	Technical Chlordane	MG/KG	0.38798	Max	(5)	NS	NS	NS	NS	NS	NS	0.38798
	Inorganics											
	Cadmium	MG/KG	0.261	Max	(5)	NS	NS	NS	NS	NS	NS	0.261
	Lead	MG/KG	0.562	Max	(5)	NS	NS	NS	NS	NS	NS	0.562
	Manganese	MG/KG	23	Max	(5)	NS	NS	NS	NS	NS	NS	23
	Mercury	MG/KG	0.113	Max	(5)	NS	NS	NS	NS	NS	NS	0.113
	Mercury (methyl)	MG/KG	0.122	Max	(5)	NS	NS	NS	NS	NS	NS	0.122
	Dioxins											
	HCX	MG/KG	0.0000343	Max	(5)	NS	NS	NS	NS	NS	NS	0.0000343
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.0000757	Max	(5)	NS	NS	NS	NS	NS	NS	0.0000757

Notes:
(1) Chemicals of potential concern are identified in Tables 2.1, 2.2, and 2.3 for site exposure areas and in Tables 2.8, 2.9, and 2.10 for reference/background areas.
(2) 95% UCL-N: 95% Upper Concentration Limit on the mean, normal distribution
(3) 95% UCL-T: 95% Upper Concentration Limit on the mean, lognormal distribution
(4) 95% UCL-NP: 95% Upper Concentration Limit on the mean, nonparametric distribution. Arithmetic mean used to approximate the 95% UCL for nonparametric data
(5) Max: Maximum detected concentration, applied if fewer than 10 samples (95% UCL not calculated), or if the 95% UCL is greater than the maximum concentration.
(6) All samples were non-detect, the value is the average of one-half of the reporting limits.
(7) Combined Fish Diet EPCs were calculated by averaging the EPC values for each chemical across all sampled species.
A - Chemical was not selected as a chemical of potential concern for that species. EPC was calculated in order to average combined fish EPCs for all species

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed
N - The Shapiro-Wilk W Test indicates that the data are normally distributed
NS - Not Sampled

MG/KG = milligrams per kilogram
NC = Not Calculated
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: RAR

Table 3.5.RME
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Surface Water

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
ASSAPUMPSET	Inorganics										
	Arsenic	MG/L	0.00175	NC		0.000491		0.000491	MG/L	Max	(4)
	Manganese	MG/L	0.135	NC		0.166		0.166	MG/L	Max	(4)
	Mercury	MG/L	0.0000511	NC		0.00000215		0.00000215	MG/L	Max	(4)
	Nitrite-N	MG/L	0.00510	NC		0.0051		0.0051	MG/L	Max	(4)
	Dioxins/Furans										
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/L	0.00000000534	NC		0.00000000534		0.00000000534	MG/L	Max	(4)
GREYSTONE	Inorganics										
	Arsenic	MG/L	0.00136	NC		0.00055		0.00055	MG/L	Max	(4)
	Manganese	MG/L	0.131	NC		0.144		0.144	MG/L	Max	(4)
	Mercury	MG/L	0.0000346	NC		0.00000193		0.00000193	MG/L	Max	(4)
	Nitrite-N	MG/L	0.128	NC		0.13		0.13	MG/L	Max	(4)
	Dioxins/Furans										
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/L	0.00000000326	NC		0.00000000564		0.00000000564	MG/L	Max	(4)
ALLENDALE	Volatile Organics										
	Tetrachloroethene	MG/L	0.00055	NC		0.0007	J	0.0007	MG/L	Max	(5)
	Semivolatile Organics										
	bis(2-Ethylhexyl)phthalate	MG/L	0.0048	0.0048	NP	0.001	J	0.001	MG/L	Max	(5)
	Pesticides/PCBs										
	Aldrin	MG/L	0.000017	0.000017	NP	0.000011	J	0.000011	MG/L	Max	(5)
	alpha-Chlordane	MG/L	0.000019	0.000019	NP	0.00000069	J	0.00000069	MG/L	Max	(5)
	delta-BHC	MG/L	0.000017	0.000017	NP	0.0000096	J	0.0000096	MG/L	Max	(5)
	Endosulfan Sulfate	MG/L	0.000035	0.000035	NP	0.0000026	J	0.0000026	MG/L	Max	(5)
	Endrin Aldehyde	MG/L	0.000031	0.000031	NP	0.0000028	J	0.0000028	MG/L	Max	(5)
	gamma-Chlordane	MG/L	0.000019	0.000019	NP	0.00000075	J	0.00000075	MG/L	Max	(5)

Table 3.5.RME
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Surface Water

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
	Inorganics										
	Arsenic	MG/L	0.0032	0.0075	T	0.0125		0.0075	MG/L	95% UCL-T	(3)
	Barium	MG/L	0.045	0.045	NP	0.271		0.045	MG/L	95% UCL-NP	(4)
	Chromium	MG/L	0.0052	0.027	T	0.042		0.027	MG/L	95% UCL-T	(3)
	Lead	MG/L	0.013	0.013	NP	0.156		0.013	MG/L	95% UCL-NP	(4)
	Manganese	MG/L	0.42	0.42	NP	2.6		0.42	MG/L	95% UCL-NP	(4)
	Mercury	MG/L	0.000054	0.000054	NP	0.00000319		0.00000319	MG/L	Max	(5)
	Thallium	MG/L	0.0032	3.2	T	0.0145		0.0145	MG/L	Max	(5)
	Nitrate	MG/L	0.76	NC		0.773		0.773	MG/L	Max	(5)
	Nitrite-N	MG/L	0.12	NC		0.139		0.139	MG/L	Max	(5)
	Dioxins/Furans										
	HCX	MG/L	0.000000247	NC		0.000000271	J	0.000000271	MG/L	Max	(5)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/L	0.000000385	0.000000385	NP	0.00000409		0.000000385	MG/L	95% UCL-NP	(4)
LYMAN MILL	**Semivolatile Organics**										
	Acenaphthylene	MG/L	0.0042	0.0042	NP	0.00000132	J	0.00000132	MG/L	Max	(4)
	bis(2-Ethylhexyl)phthalate	MG/L	0.017	0.017	NP	0.16	*	0.017	MG/L	95% UCL-NP	(3)
	Pesticides/PCBs										
	Aldrin	MG/L	0.000023	0.000023	NP	0.000069		0.000023	MG/L	95% UCL-NP	(3)
	alpha-Chlordane	MG/L	0.000021	0.000021	NP	0.000019	J	0.000019	MG/L	Max	(4)
	Endosulfan Sulfate	MG/L	0.000039	0.000039	NP	0.0000032	J	0.0000032	MG/L	Max	(4)
	Endrin Aldehyde	MG/L	0.000026	NC		0.000005	J	0.000005	MG/L	Max	(4)
	gamma-Chlordane	MG/L	0.000021	0.000021	NP	0.000021	J	0.000021	MG/L	95% UCL-NP	(3)
	Inorganics										
	Arsenic	MG/L	0.0023	0.0046	T	0.0092	J	0.0046	MG/L	95% UCL-T	(2)
	Barium	MG/L	0.021	0.021	NP	0.0311		0.021	MG/L	95% UCL-NP	(3)
	Chromium	MG/L	0.0023	0.0023	NP	0.0063		0.0023	MG/L	95% UCL-NP	(3)
	Lead	MG/L	0.0044	0.0044	NP	0.0218		0.0044	MG/L	95% UCL-NP	(3)
	Manganese	MG/L	0.13	0.13	NP	0.436		0.13	MG/L	95% UCL-NP	(3)
	Mercury	MG/L	0.000063	0.000063	NP	0.00000394		0.00000394	MG/L	Max	(4)
	Thallium	MG/L	0.0022	0.0022	NP	0.0077	J	0.0022	MG/L	95% UCL-NP	(3)
	Nitrate	MG/L	0.76	NC		0.765		0.765	MG/L	Max	(4)
	Nitrite-N	MG/L	0.084	NC		0.0865		0.0865	MG/L	Max	(4)

Table 3.5.RME
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Surface Water

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale
	Dioxins/Furans								
	HCX	MG/L	0.0000000406	NC	0.0000000809	0.0000000809	MG/L	Max	(4)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/L	0.000000120	0.00000146 T	0.000000861	0.000000861	MG/L	Max	(5)

(1) Chemicals of potential concern are identified in Table 2.5 and Table 2.14 for site exposure areas and reference/background areas respectively.
(2) 95% UCL-T: 95% Upper Concentration Limit on the mean, lognormal distribution
(3) 95% UCL-NP: 95% Upper Concentration Limit on the mean, nonparametric distribution. Arithmetic mean used to approximate the 95% UCL for nonparametric data.
(4) Max: Maximum detected concentration, applied if fewer than 10 samples (95% UCL is not calculated), or if the 95% UCL is greater than the maximum concentration.

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

Qualifier Definitions:
J = Value is estimated.

MG/L = milligrams per liter
NC = Not Calculated
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: MJM

Table 3.6.RME
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Sediment

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic (1)	Rationale
ASSAPUMPSET	**Semivolatile Organics**									
	2-Methylnaphthalene	MG/KG	0.22	NC	0.01855		0.01855	MG/KG	Max	(5)
	Acenaphthylene	MG/KG	0.19	NC	0.0589		0.0589	MG/KG	Max	(5)
	Benzo(a)anthracene	MG/KG	0.52	NC	1		1	MG/KG	Max	(5)
	Benzo(a)pyrene	MG/KG	0.53	NC	0.84		0.84	MG/KG	Max	(5)
	Benzo(b)fluoranthene	MG/KG	0.63	NC	1.4		1.4	MG/KG	Max	(5)
	Benzo(g,h,i)perylene	MG/KG	0.40	NC	0.59468		0.59468	MG/KG	Max	(5)
	Dibenzo(a,h)anthracene	MG/KG	0.15	NC	0.17898		0.17898	MG/KG	Max	(5)
	Indeno(1,2,3-cd)pyrene	MG/KG	0.43	NC	0.65		0.65	MG/KG	Max	(5)
	Phenanthrene	MG/KG	0.54	NC	0.79474		0.79474	MG/KG	Max	(5)
	Pesticides/PCBs									
	alpha-Chlordane	MG/KG	0.0013	NC	0.00133	J	0.00133	MG/KG	Max	(5)
	Aroclor-1254	MG/KG	0.032	NC	0.05755		0.05755	MG/KG	Max	(5)
	Aroclor-1268	MG/KG	0.023	NC	0.04166		0.04166	MG/KG	Max	(5)
	gamma-Chlordane	MG/KG	0.0012	NC	0.00065	J	0.00065	MG/KG	Max	(5)
	Technical Chlordane	MG/KG	0.11	NC	0.15253	J	0.15253	MG/KG	Max	(5)
	Inorganics									
	Aluminum	MG/KG	9841	NC	21774	J	21774	MG/KG	Max	(5)
	Arsenic	MG/KG	2.7	NC	5.21	J	5.21	MG/KG	Max	(5)
	Cadmium	MG/KG	0.37	NC	0.858		0.858	MG/KG	Max	(5)
	Chromium	MG/KG	10.4	NC	17.5	J	17.5	MG/KG	Max	(5)
	Copper	MG/KG	11.8	NC	18.3	J	18.3	MG/KG	Max	(5)
	Lead	MG/KG	40.5	NC	88.6	J	88.6	MG/KG	Max	(5)
	Manganese	MG/KG	711	NC	1590		1590	MG/KG	Max	(5)
	Mercury	MG/KG	0.051	NC	0.114		0.114	MG/KG	Max	(5)
	Nickel	MG/KG	10.1	NC	20	J	20	MG/KG	Max	(5)
	Thallium	MG/KG	0.43	NC	0.354	J	0.354	MG/KG	Max	(5)
	Vanadium	MG/KG	17.0	NC	32		32	MG/KG	Max	(5)
	Dioxins/Furans									
	HCX	MG/KG	0.0000172	NC	0.0000172	J	0.0000172	MG/KG	Max	(5)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.00000379	NC	0.00000773		0.00000773	MG/KG	Max	(5)

Table 3.6.RME
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Sediment

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
GREYSTONE	**Semivolatile Organics**										
	2-Methylnaphthalene	MG/KG	1.1	NC		0.07478	J	0.07478	MG/KG	Max	(5)
	Acenaphthylene	MG/KG	1.1	NC		0.19279	J	0.19279	MG/KG	Max	(5)
	Benzo(a)anthracene	MG/KG	1.5	NC		3.5		3.5	MG/KG	Max	(5)
	Benzo(a)pyrene	MG/KG	1.4	NC		3.1		3.1	MG/KG	Max	(5)
	Benzo(b)fluoranthene	MG/KG	1.5	NC		3.1		3.1	MG/KG	Max	(5)
	Benzo(g,h,i)perylene	MG/KG	0.9	NC		2.07671	J	2.07671	MG/KG	Max	(5)
	Dibenzo(a,h)anthracene	MG/KG	1.0	NC		0.77	J	0.77	MG/KG	Max	(5)
	Indeno(1,2,3-cd)pyrene	MG/KG	1.0	NC		2.18335	J	2.18335	MG/KG	Max	(5)
	Phenanthrene	MG/KG	2.1	NC		4.8		4.8	MG/KG	Max	(5)
	Pesticides/PCBs										
	alpha-Chlordane	MG/KG	0.0061	0.0061	NP	0.01746	J	0.0061	MG/KG	95% UCL-NP	(4)
	Aroclor-1254	MG/KG	0.1	0.5	T	0.38		0.38	MG/KG	Max	(5)
	Aroclor-1268	MG/KG	0.14	NC		0.24667		0.24667	MG/KG	Max	(5)
	gamma-Chlordane	MG/KG	0.005	0.005	NP	0.01016		0.005	MG/KG	95% UCL-NP	(4)
	Technical Chlordane	MG/KG	0.4015	NC		0.62618		0.62618	MG/KG	Max	(5)
	Inorganics										
	Aluminum	MG/KG	8210	15554	T	24690	J	15554	MG/KG	95% UCL-T	(3)
	Antimony	MG/KG	0.73	4.3	T	4.3	J	4.3	MG/KG	Max	(5)
	Arsenic	MG/KG	3.9	9.6	T	13.5		9.6	MG/KG	95% UCL-T	(3)
	Cadmium	MG/KG	0.81	10.4	T	4.35		4.35	MG/KG	Max	(5)
	Chromium	MG/KG	99.3	601	T	271		271	MG/KG	Max	(5)
	Copper	MG/KG	72.8	650	T	436		436	MG/KG	Max	(5)
	Lead	MG/KG	179	179	NP	570		179	MG/KG	95% UCL-NP	(4)
	Manganese	MG/KG	599	599	NP	1990		599	MG/KG	95% UCL-NP	(4)
	Mercury	MG/KG	0.21	1.0	T	0.757		0.757	MG/KG	Max	(5)
	Nickel	MG/KG	31.2	142	T	261		142	MG/KG	95% UCL-T	(3)
	Thallium	MG/KG	0.37	0.37	NP	0.71	J	0.37	MG/KG	95% UCL-NP	(4)
	Vanadium	MG/KG	37.6	79.0	T	129		79.0	MG/KG	95% UCL-T	(3)
	Dioxins/Furans										
	HCX	MG/KG	0.0000325	NC		0.000154	J	0.000154	MG/KG	Max	(5)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.0000349	0.000121	T	0.000179		0.000121	MG/KG	95% UCL-T	(3)
	Toxicity Equivalency (PCB Congeners) - Mammals	MG/KG	0.0000249	NC		0.0000249		0.0000249	MG/KG	Max	(5)

Table 3.6.RME
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Sediment

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
ALLENDALE	**Semivolatile Organics**										
	2-Methylnaphthalene	MG/KG	1.6	3.7	T	0.13608		0.13608	MG/KG	Max	(5)
	Acenaphthylene	MG/KG	1.6	1.9	N	0.97	J	0.97	MG/KG	Max	(5)
	Benzo(a)anthracene	MG/KG	2.2	3.4	T	8.4		3.4	MG/KG	95% UCL-T	(3)
	Benzo(a)pyrene	MG/KG	2.3	4.0	T	9.2		4.0	MG/KG	95% UCL-T	(3)
	Benzo(b)fluoranthene	MG/KG	2.8	4.4	T	9.5		4.4	MG/KG	95% UCL-T	(3)
	Benzo(g,h,i)perylene	MG/KG	2.0	2.0	NP	7		2.0	MG/KG	95% UCL-NP	(4)
	Benzo(k)fluoranthene	MG/KG	2.6	3.9	T	9.2		3.9	MG/KG	95% UCL-T	(3)
	bis(2-Ethylhexyl)phthalate	MG/KG	2.3	3.2	T	12		3.2	MG/KG	95% UCL-T	(3)
	Dibenzo(a,h)anthracene	MG/KG	1.4	2.0	T	2.6	J	2.0	MG/KG	95% UCL-T	(3)
	Indeno(1,2,3-cd)pyrene	MG/KG	1.9	3.2	T	6.8	J	3.2	MG/KG	95% UCL-T	(3)
	Pentachlorophenol	MG/KG	4.6	6.5	T	18	J	6.5	MG/KG	95% UCL-T	(3)
	Phenanthrene	MG/KG	2.9	4.8	T	12		4.8	MG/KG	95% UCL-T	(3)
	Pesticides/PCBs										
	alpha-Chlordane	MG/KG	0.0113	0.0113	NP	0.062		0.0113	MG/KG	95% UCL-NP	(4)
	Aroclor-1254	MG/KG	1.5	2.4	T	27		2.4	MG/KG	95% UCL-T	(3)
	Aroclor-1260	MG/KG	0.20	0.20	NP	0.27	J	0.20	MG/KG	95% UCL-NP	(4)
	Aroclor-1268	MG/KG	0.079	0.079	NP	0.15642		0.079	MG/KG	95% UCL-NP	(4)
	delta-BHC	MG/KG	0.0013	0.0014	T	0.0024	J	0.0014	MG/KG	95% UCL-T	(3)
	Dieldrin	MG/KG	0.0090	0.0090	NP	0.11297	J	0.0090	MG/KG	95% UCL-NP	(4)
	Endosulfan II	MG/KG	0.037	0.037	NP	0.44	J	0.037	MG/KG	95% UCL-NP	(4)
	Endosulfan sulfate	MG/KG	0.0027	0.0027	NP	0.00902		0.0027	MG/KG	95% UCL-NP	(4)
	Endrin aldehyde	MG/KG	0.0024	0.0029	T	0.011	J	0.0029	MG/KG	95% UCL-T	(3)
	Endrin Ketone	MG/KG	0.0038	0.0038	NP	0.034		0.0038	MG/KG	95% UCL-NP	(4)
	gamma-Chlordane	MG/KG	0.0097	0.017	T	0.074	J	0.017	MG/KG	95% UCL-T	(3)
	Technical Chlordane	MG/KG	0.52	0.65	N	0.85181		0.65	MG/KG	95% UCL-N	(2)
	Inorganics										
	Antimony	MG/KG	2.3	4.8	T	13.7	J	4.8	MG/KG	95% UCL-T	(3)
	Arsenic	MG/KG	5.8	5.8	NP	18	J	5.8	MG/KG	95% UCL-NP	(4)
	Cadmium	MG/KG	1.2	1.2	NP	5.2	J	1.2	MG/KG	95% UCL-NP	(4)
	Chromium	MG/KG	142	238	T	536	J	238	MG/KG	95% UCL-T	(3)

Table 3.6.RME
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Sediment

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
	Lead	MG/KG	329	488	T	1090		488	MG/KG	95% UCL-T	(3)
	Manganese	MG/KG	430	531	T	1966		531	MG/KG	95% UCL-T	(3)
	Mercury	MG/KG	0.47	0.97	T	3.6	J	0.97	MG/KG	95% UCL-T	(3)
	Nickel	MG/KG	26.7	26.7	NP	94.6		26.7	MG/KG	95% UCL-NP	(4)
	Thallium	MG/KG	7.3	7.3	NP	6.8	J	6.8	MG/KG	Max	(5)
	Vanadium	MG/KG	36.2	45.9	T	89.3		45.9	MG/KG	95% UCL-T	(3)
	Dioxins/Furans										
	HCX		0.0271	6.94	T	0.365	J	0.365	MG/KG	Max	(5)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.00574	0.00574	NP	0.073	J	0.00574	MG/KG	95% UCL-NP	(4)
	Toxicity Equivalency (PCB Congeners) - Mammals	MG/KG	0.000000112	NC		0.000000112		0.000000112	MG/KG	Max	(5)
LYMAN MILL	**Semivolatile Organics**										
	2-Methylnaphthalene	MG/KG	0.9	0.9	NP	0.1	J	0.1	MG/KG	Max	(5)
	4-Chloro-3-methylphenol	MG/KG	1.1	1.4	N	2.2	J	1.4	MG/KG	95% UCL-N	(2)
	4-Nitrophenol	MG/KG	2.5	2.5	NP	2.2	J	2.2	MG/KG	Max	(5)
	Acenaphthylene	MG/KG	0.9	0.9	NP	0.42856		0.42856	MG/KG	Max	(5)
	Benzo(a)anthracene	MG/KG	1.4	2.8	T	5.5	J	2.8	MG/KG	95% UCL-T	(3)
	Benzo(a)pyrene	MG/KG	1.4	2.9	T	6.17711		2.9	MG/KG	95% UCL-T	(3)
	Benzo(b)fluoranthene	MG/KG	2.1	4.5	T	13	J*	4.5	MG/KG	95% UCL-T	(3)
	Benzo(g,h,i)perylene	MG/KG	1.3	3.0	T	4.85176		3.0	MG/KG	95% UCL-T	(3)
	Benzo(k)fluoranthene	MG/KG	1.1	2.1	T	7.30225		2.1	MG/KG	95% UCL-T	(3)
	bis(2-Ethylhexyl)phthalate	MG/KG	2.6	5.2	T	50	J*	5.2	MG/KG	95% UCL-T	(3)
	Dibenzo(a,h)anthracene	MG/KG	0.77	1.1	T	1.0694		1.0694	MG/KG	Max	(5)
	Indeno(1,2,3-cd)pyrene	MG/KG	1.3	2.7	T	5.25309		2.7	MG/KG	95% UCL-T	(3)
	N-Nitroso-di-n-propylamine	MG/KG	1.1	1.3	N	1.4	J	1.3	MG/KG	95% UCL-N	(2)
	Pentachlorophenol	MG/KG	2.6	2.6	NP	1.4	J	1.4	MG/KG	Max	(5)
	Phenanthrene	MG/KG	1.5	2.8	T	8.37861		2.8	MG/KG	95% UCL-T	(3)
	Pesticides/PCBs										
	alpha-Chlordane	MG/KG	0.016	0.032	T	0.14075		0.032	MG/KG	95% UCL-T	(3)
	Aroclor-1254	MG/KG	0.27	0.49	T	2.2	J	0.49	MG/KG	95% UCL-T	(3)
	Aroclor-1260	MG/KG	0.024	0.027	T	0.043	J	0.027	MG/KG	95% UCL-T	(3)
	Aroclor-1268	MG/KG	0.12	NC		0.31379	J	0.31379	MG/KG	Max	(5)
	Dieldrin	MG/KG	0.0038	0.0044	T	0.017	P	0.0044	MG/KG	95% UCL-T	(3)

Table 3.6.RME
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Sediment

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
	Endosulfan II	MG/KG	0.004	0.005	T	0.017	P	0.005	MG/KG	95% UCL-T	(3)
	Endosulfan sulfate	MG/KG	0.003	0.003	NP	0.01055		0.003	MG/KG	95% UCL-NP	(4)
	gamma-Chlordane	MG/KG	0.0089	0.015	T	0.06988		0.015	MG/KG	95% UCL-T	(3)
	Technical Chlordane	MG/KG	1.29	NC		2.21273		2.21273	MG/KG	Max	(5)
	Inorganics										
	Antimony	MG/KG	1.3	3.1	T	5.3	J	3.1	MG/KG	95% UCL-T	(3)
	Arsenic	MG/KG	5.2	6.4	T	13.2	J	6.4	MG/KG	95% UCL-T	(3)
	Cadmium	MG/KG	2.1	2.1	NP	23.9		2.1	MG/KG	95% UCL-NP	(4)
	Chromium	MG/KG	98.9	200	T	310	J	200	MG/KG	95% UCL-T	(3)
	Lead	MG/KG	235.6	375.1	T	721	J	375.1	MG/KG	95% UCL-T	(3)
	Manganese	MG/KG	554	843	T	1970		843	MG/KG	95% UCL-T	(3)
	Mercury	MG/KG	0.29	0.62	T	0.946		0.62	MG/KG	95% UCL-T	(3)
	Nickel	MG/KG	32.8	69.2	T	187	J	69.2	MG/KG	95% UCL-T	(3)
	Thallium	MG/KG	0.58	0.58	NP	0.883	J	0.58	MG/KG	95% UCL-NP	(4)
	Vanadium	MG/KG	35.5	42.4	T	91.7	J	42.4	MG/KG	95% UCL-T	(3)
	Dioxins/Furans										
	HCX	MG/KG	0.0135	0.0135	NP	0.167	J	0.0135	MG/KG	95% UCL-NP	(4)
	Toxicity Equivalency (PCB Congeners) - Mammals	MG/KG	0.000033	NC		0.0000649		0.0000649	MG/KG	Max	(5)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.00179	0.0361	T	0.00803		0.00803	MG/KG	Max	(5)
MANTON	**Semivolatile Organics**										
	Benzo(a)anthracene	MG/KG	0.15	NC		0.3	J	0.3	MG/KG	Max	(5)
	Benzo(a)pyrene	MG/KG	0.18	NC		0.37	J	0.37	MG/KG	Max	(5)
	Benzo(b)fluoranthene	MG/KG	0.31	NC		0.64	J	0.64	MG/KG	Max	(5)
	Benzo(g,h,i)perylene	MG/KG	0.11	NC		0.22	J	0.22	MG/KG	Max	(5)
	Benzo(k)fluoranthene	MG/KG	0.18	NC		0.2	J	0.2	MG/KG	Max	(5)
	bis(2-Ethylhexyl)phthalate	MG/KG	0.31	NC		0.43	J	0.43	MG/KG	Max	(5)
	Indeno(1,2,3-cd)pyrene	MG/KG	0.15	NC		0.29	J	0.29	MG/KG	Max	(5)
	Phenanthrene	MG/KG	0.14	NC		0.3	J	0.3	MG/KG	Max	(5)
	Pesticides/PCBs										
	alpha-Chlordane	MG/KG	0.0022	NC		0.004		0.004	MG/KG	Max	(5)
	gamma-Chlordane	MG/KG	0.0025	NC		0.005		0.005	MG/KG	Max	(5)

Table 3.6.RME
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Sediment

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic (1)	Rationale
	Inorganics									
	Arsenic	MG/KG	0.77	NC	0.97	J	0.97	MG/KG	Max	(5)
	Cadmium	MG/KG	0.68	NC	0.96	J	0.96	MG/KG	Max	(5)
	Chromium	MG/KG	13.4	NC	18.6	J	18.6	MG/KG	Max	(5)
	Lead	MG/KG	45.9	NC	91	J	91	MG/KG	Max	(5)
	Manganese	MG/KG	128	NC	219	J	219	MG/KG	Max	(5)
	Vanadium	MG/KG	5.7	NC	7.1		7.1	MG/KG	Max	(5)
	Dioxins/Furans									
	HCX	MG/KG	0.000117	NC	0.000263	J	0.000263	MG/KG	Max	(5)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.000433	NC	0.000999		0.000999	MG/KG	Max	(5)
DYERVILLE	**Semivolatile Organics**									
	2-Methylnaphthalene	MG/KG	0.12	NC	0.031	J	0.031	MG/KG	Max	(5)
	Acenaphthylene	MG/KG	0.16	NC	0.27		0.27	MG/KG	Max	(5)
	Benzo(a)anthracene	MG/KG	1.4	NC	2.6		2.6	MG/KG	Max	(5)
	Benzo(a)pyrene	MG/KG	1.4	NC	2.2		2.2	MG/KG	Max	(5)
	Benzo(b)fluoranthene	MG/KG	2.5	NC	4	J	4	MG/KG	Max	(5)
	Benzo(g,h,i)perylene	MG/KG	1.1	NC	1.6	J*	1.6	MG/KG	Max	(5)
	Benzo(k)fluoranthene	MG/KG	0.71	NC	1.1		1.1	MG/KG	Max	(5)
	bis(2-Ethylhexyl)phthalate	MG/KG	1.1	NC	1.6		1.6	MG/KG	Max	(5)
	Dibenzo(a,h)anthracene	MG/KG	0.20	NC	0.32	J	0.32	MG/KG	Max	(5)
	Indeno(1,2,3-cd)pyrene	MG/KG	1.4	NC	2		2	MG/KG	Max	(5)
	Phenanthrene	MG/KG	1.4	NC	2.9		2.9	MG/KG	Max	(5)
	Pesticides/PCBs									
	alpha-Chlordane	MG/KG	0.0043	NC	0.011		0.011	MG/KG	Max	(5)
	Aroclor-1254	MG/KG	0.49	NC	1.3		1.3	MG/KG	Max	(5)
	Dieldrin	MG/KG	0.0	NC	0.03		0.03	MG/KG	Max	(5)
	Endosulfan sulfate	MG/KG	0.0	NC	0.011		0.011	MG/KG	Max	(5)
	Inorganics									
	Arsenic	MG/KG	4.4	NC	2.1	J	2.1	MG/KG	Max	(5)
	Cadmium	MG/KG	1.7	NC	4	J	4	MG/KG	Max	(5)
	Chromium	MG/KG	155.5	NC	385		385	MG/KG	Max	(5)

Table 3.6.RME
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Sediment

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale
	Lead	MG/KG	159.6	NC	307	307	MG/KG	Max	(5)
	Manganese	MG/KG	332	NC	598	598	MG/KG	Max	(5)
	Mercury	MG/KG	0.40	NC	1.06	1.06	MG/KG	Max	(5)
	Nickel	MG/KG	19.0	NC	35	35	MG/KG	Max	(5)
	Vanadium	MG/KG	16.0	NC	28.4	28.4	MG/KG	Max	(5)
	Dioxins/Furans								
	HCX	MG/KG	0.000173	NC	0.000448	0.000448	MG/KG	Max	(5)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.000110	NC	0.000152	0.000152	MG/KG	Max	(5)
	Toxicity Equivalency (PCB Congeners) - Mammals	MG/KG	0.000000025	NC	0.0000000253	0.0000000253	MG/KG	Max	(5)

(1) Chemicals of potential concern are identified in Table 2.6 and Table 2.15 for site exposure areas and reference/background areas respectively.
(2) 95% UCL-N: 95% Upper Concentration Limit on the mean, normal distribution
(3) 95% UCL-T: 95% Upper Concentration Limit on the mean, lognormal distribution
(4) 95% UCL-NP: 95% Upper Concentration Limit on the mean, nonparametric distribution. Arithmetic mean used to approximate the 95% UCL for nonparametric data.
(5) Max: Maximum detected concentration, applied if fewer than 10 samples (95% UCL not calculated), or if the 95% UCL is greater than the maximum concentration.

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

Qualifier Definitions
J = Value is estimated

MG/KG = milligrams per kilogram
NC = Not Calculated
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: MJM

Table 3.7.RME
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Bank Soil

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Bank Soil

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic (1)	Rationale
GREYSTONE	**Semivolatile Organics**									
	2-Methylnaphthalene	MG/KG	0.1071	NC	0.17022	J	0.17022	MG/KG	Max	(3)
	Acenaphthylene	MG/KG	0.31765	NC	0.49749		0.49749	MG/KG	Max	(3)
	Benzo(a)anthracene	MG/KG	3.09372	NC	3.41086		3.41086	MG/KG	Max	(3)
	Benzo(a)pyrene	MG/KG	3.07718	NC	3.41803		3.41803	MG/KG	Max	(3)
	Benzo(b)fluoranthene	MG/KG	3.45207	NC	4.28861		4.28861	MG/KG	Max	(3)
	Benzo(g,h,i)perylene	MG/KG	2.336	NC	2.87139		2.87139	MG/KG	Max	(3)
	Dibenzo(a,h)anthracene	MG/KG	0.61485	NC	0.72851		0.72851	MG/KG	Max	(3)
	Indeno(1,2,3-cd)pyrene	MG/KG	2.51886	NC	3.0929		3.0929	MG/KG	Max	(3)
	Phenanthrene	MG/KG	3.95543	NC	5.30136		5.30136	MG/KG	Max	(3)
	Pesticides/PCBs									
	alpha-Chlordane	MG/KG	0.0178	NC	0.03592		0.03592	MG/KG	Max	(3)
	Aroclor-1254	MG/KG	0.51998	NC	0.83872		0.83872	MG/KG	Max	(3)
	Aroclor-1268	MG/KG	0.08389	NC	0.13953	J	0.13953	MG/KG	Max	(3)
	Endosulfan Sulfate	MG/KG	0.00650	NC	0.01269	J	0.01269	MG/KG	Max	(3)
	Technical Chlordane	MG/KG	0.4307	NC	0.73538		0.73538	MG/KG	Max	(3)
	Inorganics									
	Aluminum	MG/KG	15899	NC	21793	J	21793	MG/KG	Max	(3)
	Arsenic	MG/KG	7.72	NC	12.2		12.2	MG/KG	Max	(3)
	Chromium	MG/KG	231	NC	291		291	MG/KG	Max	(3)
	Copper	MG/KG	205	NC	324		324	MG/KG	Max	(3)
	Lead	MG/KG	450	NC	591		591	MG/KG	Max	(3)
	Manganese	MG/KG	1841	NC	4126		4126	MG/KG	Max	(3)
	Mercury	MG/KG	0.582	NC	0.811		0.811	MG/KG	Max	(3)
	Molybdenum	MG/KG	54.0	NC	87.7	J	87.7	MG/KG	Max	(3)
	Nickel	MG/KG	120	NC	387		387	MG/KG	Max	(3)
	Thallium	MG/KG	0.461	NC	0.585		0.585	MG/KG	Max	(3)
	Vanadium	MG/KG	82.3	NC	103		103	MG/KG	Max	(3)
	Dioxins/Furans									
	HCX	MG/KG	0.000193	NC	0.000417		0.000417	MG/KG	Max	(3)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.0000549	NC	0.000109		0.000109	MG/KG	Max	(3)

Table 3.7.RME
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Bank Soil

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Bank Soil

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale
ALLENDALE	Dioxins/Furans								
	2,3,7,8-TCDD	MG/KG	0.00027	0.00027 NP	0.00151	0.00027	MG/KG	95% UCL-NP	(2)

(1) Chemicals of potential concern are identified in Table 2.7 and Table 2.16 for site exposure areas and reference/background areas respectively
(2) 95% UCL-NP 95% Upper Concentration Limit on the mean, nonparametric distribution Arithmetic mean used to approximate the 95% UCL for nonparametric data.
(3) Max. Maximum detected concentration, applied if fewer than 10 samples (95% UCL not calculated), or if the 95% UCL is greater than the maximum concentration

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed The data are therefore assumed to be non-parametrically distributed
N - The Shapiro-Wilk W Test indicates that the data are normally distributed

MG/KG = milligrams per kilogram
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by KJA
Checked by MJM

Table 3.8.RME
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Fogarty Center

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale
FOGARTY CENTER	**Semivolatile Organics**								
	2-Methylnaphthalene	MG/KG	0.522	NC	1.56	1.56	MG/KG	Max	(2)
	Acenaphthylene	MG/KG	0.0575	NC	0.152	0.152	MG/KG	Max	(2)
	Benzo(a)anthracene	MG/KG	2.53	NC	7.3	7.3	MG/KG	Max	(2)
	Benzo(a)pyrene	MG/KG	1.78	NC	5.12	5.12	MG/KG	Max	(2)
	Benzo(b)fluoranthene	MG/KG	1.82	NC	5.14	5.14	MG/KG	Max	(2)
	Benzo(g,h,i)perylene	MG/KG	1.13	NC	3.17	3.17	MG/KG	Max	(2)
	Dibenzo(a,h)anthracene	MG/KG	0.244	NC	0.668	0.668	MG/KG	Max	(2)
	Indeno(1,2,3-cd)pyrene	MG/KG	1.27	NC	3.57 J	3.57	MG/KG	Max	(2)
	Phenanthrene	MG/KG	8.29	NC	24.6	24.6	MG/KG	Max	(2)
	Pesticides/PCBs								
	alpha-Chlordane	MG/KG	0.0419	NC	0.0888	0.0888	MG/KG	Max	(2)
	Aroclor-1254	MG/KG	0.470	NC	0.938	0.938	MG/KG	Max	(2)
	Endosulfan II	MG/KG	0.0120	NC	0.032	0.032	MG/KG	Max	(2)
	Endosulfan Sulfate	MG/KG	0.000393	NC	0.00108	0.00108	MG/KG	Max	(2)
	gamma-Chlordane	MG/KG	0.0339	NC	0.0762	0.0762	MG/KG	Max	(2)
	Technical Chlordane	MG/KG	0.677	NC	0.943	0.943	MG/KG	Max	(2)
	Inorganics								
	Aluminum	MG/KG	20067	NC	24800 J	24800	MG/KG	Max	(2)
	Arsenic	MG/KG	10.4	NC	11.5	11.5	MG/KG	Max	(2)
	Manganese	MG/KG	443	NC	478	478	MG/KG	Max	(2)
	Mercury	MG/KG	0.206	NC	0.258	0.258	MG/KG	Max	(2)
	Dioxins								
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.00000557	NC	0.00000664	0.00000664	MG/KG	Max	(2)

(1) Chemicals of potential concern are identified in Table 2.8.

(2) Max: Maximum detected concentration, applied if fewer than 10 samples (95% UCL not calculated), or if the 95% UCL is greater than the maximum concentration

Qualifier Definitions:

J = Value is estimated.

Table 3.8.RME
Medium-Specific Exposure Point Concentration Summary - Reasonable Maximum Exposure
Fogarty Center

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale

MG/KG = milligrams per kilogram
NC = Not Calculated
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by KJA
Checked by MJM

Table 3.1.CT
Medium-Specific Exposure Point Concentration Summary - Central Tendency
American Eel

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: American Eel
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
ASSAPUMPSET	**Semivolatile Organics**										
	Acenaphthylene	MG/KG	0.000943	NC		0.00179		0.000943	MG/KG	Mean	(5)
	Phenanthrene	MG/KG	0.00246	NC		0.00876		0.00246	MG/KG	Mean	(5)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.00461	NC		0.00828	J	0.00461	MG/KG	Mean	(5)
	4,4'-DDE	MG/KG	0.0176	NC		0.0373	J	0.0176	MG/KG	Mean	(5)
	alpha-Chlordane	MG/KG	0.0025	NC		0.00487	J	0.0025	MG/KG	Mean	(5)
	Aroclor-1254	MG/KG	0.03178	NC		0.10246	J	0.03178	MG/KG	Mean	(5)
	Dieldrin	MG/KG	0.0013	NC		0.00246	J	0.0013	MG/KG	Mean	(5)
	gamma-Chlordane	MG/KG	0.00089	NC		0.00185	J	0.00089	MG/KG	Mean	(5)
	Heptachlor Epoxide	MG/KG	0.00077	NC		0.00138	J	0.00077	MG/KG	Mean	(5)
	Technical Chlordane	MG/KG	0.11622	NC		0.16108	J	0.11622	MG/KG	Mean	(5)
	Inorganics										
	Lead	MG/KG	0.0466	NC		0.0893	J	0.0466	MG/KG	Mean	(5)
	Mercury	MG/KG	0.0926	NC		0.14		0.0926	MG/KG	Mean	(5)
	Mercury (methyl)	MG/KG	0.0889	NC		0.137		0.0889	MG/KG	Mean	(5)
	Zinc	MG/KG	16.9	NC		26.2		16.9	MG/KG	Mean	(5)
	Dioxins										
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.000000555	NC		0.00000178		0.000000555	MG/KG	Mean	(5)
GREYSTONE	**Semivolatile Organics**										
	Acenaphthylene	MG/KG	0.00104	0.00121	N	0.00155		0.00121	MG/KG	95% UCL-N	(2)
	Benzo(a)pyrene	MG/KG	0.00132	0.00132	NP	0.00457		0.00132	MG/KG	95% UCL-NP	(4)
	Benzo(b)fluoranthene	MG/KG	0.00149	0.00149	NP	0.00533		0.00149	MG/KG	95% UCL-NP	(4)
	Dibenzo(a,h)anthracene	MG/KG	0.000799	0.000799	NP	0.00156		0.000799	MG/KG	95% UCL-NP	(4)
	Indeno(1,2,3-cd)pyrene	MG/KG	0.00132	0.00132	NP	0.00432		0.00132	MG/KG	95% UCL-NP	(4)
	Phenanthrene	MG/KG	0.00286	0.00475	T	0.00689		0.00475	MG/KG	95% UCL-T	(3)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.0128	0.0150	T	0.0163	J	0.0150	MG/KG	95% UCL-T	(3)
	4,4'-DDE	MG/KG	0.03161	0.03161	NP	0.0439	J	0.03161	MG/KG	95% UCL-NP	(4)
	alpha-Chlordane	MG/KG	0.0140	0.0170	N	0.0222	J	0.0170	MG/KG	95% UCL-N	(2)

Table 3.1.CT
Medium-Specific Exposure Point Concentration Summary - Central Tendency
American Eel

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: American Eel
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
	Aroclor-1254	MG/KG	0.20781	0.25318	T	0.2928	J	0.25318	MG/KG	95% UCL-T	(3)
	Aroclor-1268	MG/KG	0.1022	0.1251	T	0.14591	J	0.1251	MG/KG	95% UCL-T	(3)
	Dieldrin	MG/KG	0.00353	0.00353	NP	0.00885	J	0.00353	MG/KG	95% UCL-NP	(4)
	gamma-Chlordane	MG/KG	0.0055	0.0069	N	0.00902	J	0.0069	MG/KG	95% UCL-N	(2)
	Heptachlor Epoxide	MG/KG	0.0012	0.0012	NP	0.0026	J	0.0012	MG/KG	95% UCL-NP	(4)
	Technical Chlordane	MG/KG	0.26541	0.31695	N	0.41089	J	0.31695	MG/KG	95% UCL-N	(2)
	Inorganics										
	Lead	MG/KG	0.214	6.36	T	1.47		0.214	MG/KG	Mean	(5)
	Mercury	MG/KG	0.0706	0.0706	NP	0.227		0.0706	MG/KG	95% UCL-NP	(4)
	Mercury (methyl)	MG/KG	0.0825	0.165	T	0.234		0.165	MG/KG	95% UCL-T	(3)
	Zinc	MG/KG	33.4	41.5	T	53.3	J	41.5	MG/KG	95% UCL-T	(3)
	Dioxins										
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.000000609	0.000000747	T	0.000000851		0.000000747	MG/KG	95% UCL-T	(3)
ALLENDALE	**Semivolatile Organics**										
	Acenaphthylene	MG/KG	0.0013	0.0013	NP	0.00187		0.0013	MG/KG	95% UCL-NP	(4)
	Phenanthrene	MG/KG	0.00807	0.00807	NP	0.01063		0.00807	MG/KG	95% UCL-NP	(4)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.0131	0.0131	NP	0.04205		0.0131	MG/KG	95% UCL-NP	(4)
	4,4'-DDE	MG/KG	0.0210	0.0210	NP	0.03305		0.0210	MG/KG	95% UCL-NP	(4)
	4,4'-DDT	MG/KG	0.00386	0.00892	T	0.01106		0.00892	MG/KG	95% UCL-T	(3)
	alpha-Chlordane	MG/KG	0.0192	0.0192	NP	0.06327		0.0192	MG/KG	95% UCL-NP	(4)
	Aroclor-1254	MG/KG	0.65474	0.88187	N	1.15576		0.88187	MG/KG	95% UCL-N	(2)
	Aroclor-1268	MG/KG	0.01504	0.01504	NP	0.07747	J	0.01504	MG/KG	95% UCL-NP	(4)
	beta-BHC	MG/KG	0.00062	0.00062	NP	0.00072	J	0.00062	MG/KG	95% UCL-NP	(4)
	Dieldrin	MG/KG	0.00667	0.00912	N	0.01448		0.00912	MG/KG	95% UCL-N	(2)
	Endosulfan Sulfate	MG/KG	0.00158	0.00158	NP	0.00999		0.00158	MG/KG	95% UCL-NP	(4)
	Endrin Aldehyde	MG/KG	0.001	0.001	NP	0.0008		0.001	MG/KG	95% UCL-NP	(4)
	gamma-Chlordane	MG/KG	0.00712	0.00712	NP	0.02296		0.00712	MG/KG	95% UCL-NP	(4)
	Heptachlor	MG/KG	0.000678	0.000678	NP	0.00129		0.000678	MG/KG	95% UCL-NP	(4)
	Heptachlor Epoxide	MG/KG	0.0015	0.0015	NP	0.00446		0.0015	MG/KG	95% UCL-NP	(4)

Table 3.1.CT
Medium-Specific Exposure Point Concentration Summary - Central Tendency
American Eel

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: American Eel
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
	Technical Chlordane	MG/KG	0.2615	0.2615	NP	0.76253		0.2615	MG/KG	95% UCL-NP	(4)
	Inorganics										
	Cadmium	MG/KG	0.0971	0.0971	NP	0.248		0.0971	MG/KG	95% UCL-NP	(4)
	Lead	MG/KG	0.428	0.580	N	0.952	J	0.580	MG/KG	95% UCL-N	(2)
	Manganese	MG/KG	3.51	5.04	T	7.7	J	5.04	MG/KG	95% UCL-T	(3)
	Mercury	MG/KG	0.111	0.153	N	0.24		0.153	MG/KG	95% UCL-N	(2)
	Mercury (methyl)	MG/KG	0.134	0.269	T	0.471		0.269	MG/KG	95% UCL-T	(3)
	Dioxins										
	HCX	MG/KG	0.0000582	0.0000778	N	0.00011	J	0.0000778	MG/KG	95% UCL-N	(2)
	Toxicity Equivalency (PCB Congeners) - Mammals	MG/KG	0.0000356	NC		0.000042		0.0000356	MG/KG	Mean	(5)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.000111	0.000111	NP	0.000308		0.000111	MG/KG	95% UCL-NP	(4)
LYMAN MILL	**Semivolatile Organics**										
	Acenaphthylene	MG/KG	0.00193	0.00193	NP	0.00294		0.00193	MG/KG	95% UCL-NP	(4)
	Benzo(a)pyrene	MG/KG	0.000962	0.000962	NP	0.00382		0.000962	MG/KG	95% UCL-NP	(4)
	Benzo(b)fluoranthene	MG/KG	0.00119	0.00119	NP	0.00577		0.00119	MG/KG	95% UCL-NP	(4)
	Dibenzo(a,h)anthracene	MG/KG	0.00065	0.00065	NP	0.00075	J	0.00065	MG/KG	95% UCL-NP	(4)
	Phenanthrene	MG/KG	0.01554	0.02012	T	0.02717		0.02012	MG/KG	95% UCL-T	(3)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.01469	0.01469	NP	0.02072	J	0.01469	MG/KG	95% UCL-NP	(4)
	4,4'-DDE	MG/KG	0.04451	0.04451	NP	0.07891	J	0.04451	MG/KG	95% UCL-NP	(4)
	4,4'-DDT	MG/KG	0.00238	0.00337	N	0.00566	J	0.00337	MG/KG	95% UCL-N	(2)
	alpha-Chlordane	MG/KG	0.02007	0.02007	NP	0.04272		0.02007	MG/KG	95% UCL-NP	(4)
	Aroclor-1254	MG/KG	0.70316	0.95861	T	1.17773	J	0.95861	MG/KG	95% UCL-T	(3)
	beta-BHC	MG/KG	0.0012	0.0018	T	0.00255	J	0.0018	MG/KG	95% UCL-T	(3)
	Dieldrin	MG/KG	0.00789	0.00789	NP	0.01115	J	0.00789	MG/KG	95% UCL-NP	(4)
	gamma-Chlordane	MG/KG	0.00859	0.00859	NP	0.01605		0.00859	MG/KG	95% UCL-NP	(4)
	Heptachlor Epoxide	MG/KG	0.00227	0.00227	NP	0.00559		0.00227	MG/KG	95% UCL-NP	(4)
	Technical Chlordane	MG/KG	0.44722	0.44722	NP	0.76577		0.44722	MG/KG	95% UCL-NP	(4)
	Inorganics										
	Cadmium	MG/KG	0.026	0.026	NP	0.0425	J	0.026	MG/KG	95% UCL-NP	(4)
	Lead	MG/KG	0.27	0.38	T	0.473	J	0.38	MG/KG	95% UCL-T	(3)

Table 3.1.CT
Medium-Specific Exposure Point Concentration Summary - Central Tendency
American Eel

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: American Eel
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
	Manganese	MG/KG	3.50	4.98	T	7.65		4.98	MG/KG	95% UCL-T	(3)
	Mercury	MG/KG	0.0349	0.0349	NP	0.0756		0.0349	MG/KG	95% UCL-NP	(4)
	Mercury (methyl)	MG/KG	0.0367	0.0367	NP	0.0673		0.0367	MG/KG	95% UCL-NP	(4)
	Dioxins										
	HCX	MG/KG	0.0000571	0.0000805	T	0.00011	J	0.0000805	MG/KG	95% UCL-T	(3)
	Toxicity Equivalency (PCB Congeners) - Mammals	MG/KG	0.0000323	NC		0.0000604		0.0000323	MG/KG	Mean	(5)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.000141	0.000181	N	0.000248		0.000181	MG/KG	95% UCL-N	(2)
DYERVILLE	**Semivolatile Organics**										
	Acenaphthylene	MG/KG	0.00076	NC		0.00094	J	0.00076	MG/KG	Mean	(5)
	Dibenzo(a,h)anthracene	MG/KG	0.00068	NC		0.00017	J	0.00017	MG/KG	Max	(6)
	Phenanthrene	MG/KG	0.00490	NC		0.00632		0.00490	MG/KG	Mean	(5)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.03543	NC		0.04068		0.03543	MG/KG	Mean	(5)
	4,4'-DDE	MG/KG	0.0110	NC		0.01474		0.0110	MG/KG	Mean	(5)
	4,4'-DDT	MG/KG	0.0119	NC		0.01467		0.0119	MG/KG	Mean	(5)
	alpha-Chlordane	MG/KG	0.01440	NC		0.01914		0.01440	MG/KG	Mean	(5)
	Aroclor-1254	MG/KG	0.37026	NC		0.4495		0.37026	MG/KG	Mean	(5)
	Dieldrin	MG/KG	0.00852	NC		0.01086		0.00852	MG/KG	Mean	(5)
	gamma-Chlordane	MG/KG	0.00574	NC		0.0068		0.00574	MG/KG	Mean	(5)
	Heptachlor Epoxide	MG/KG	0.00184	NC		0.00228		0.00184	MG/KG	Mean	(5)
	Technical Chlordane	MG/KG	0.31006	NC		0.38798		0.31006	MG/KG	Mean	(5)
	Inorganics										
	Cadmium	MG/KG	0.157	NC		0.261		0.157	MG/KG	Mean	(5)
	Lead	MG/KG	0.341	NC		0.562		0.341	MG/KG	Mean	(5)
	Manganese	MG/KG	12.6	NC		23	J	12.6	MG/KG	Mean	(5)
	Mercury	MG/KG	0.102	NC		0.113		0.102	MG/KG	Mean	(5)
	Mercury (methyl)	MG/KG	0.117	NC		0.122		0.117	MG/KG	Mean	(5)

Table 3.1.CT
Medium-Specific Exposure Point Concentration Summary - Central Tendency
American Eel

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: American Eel
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale
	Dioxins								
	HCX	MG/KG	0.0000296	NC	0.0000343 J	0.0000296	MG/KG	Mean	(5)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.0000522	0.000111 NP	0.0000757	0.000111	MG/KG	95% UCL-NP	(4)

(1) Chemicals of potential concern are identified in Table 2.1 and Table 2.9 for site exposure areas and reference/background areas respectively.
(2) 95% UCL-N: 95% Upper Concentration Limit on the mean, normal distribution
(3) 95% UCL-T: 95% Upper Concentration Limit on the mean, lognormal distribution
(4) 95% UCL-NP: 95% Upper Concentration Limit on the mean, nonparametric distribution. Arithmetic mean used to approximate the 95% UCL for nonparametric data.
(5) Mean: Arithmetic Mean, applied if fewer than 10 samples (95% UCL not calculated), or if the 95% UCL is greater than the maximum concentration.
(6) Max: Maximum, applied in the special case where the arithmetic mean has been selected, but because of elevated detection limits in non-detects, it is greater than the maximum detected concentration.

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

Qualifier Definitions:

J = Value is estimated.

MG/KG = milligrams per kilogram
NC = Not Calculated
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: MJM

Table 3.2.CT
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Largemouth Bass

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Largemouth Bass
Exposure Medium: Fillet

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
ASSAPUMPSET	**Semivolatile Organics**										
	Acenaphthylene	MG/KG	0.0003	NC		0.00032	J	0.0003	MG/KG	Mean	(5)
	Benzo(a)pyrene	MG/KG	0.000849	NC		0.00128	J	0.000849	MG/KG	Mean	(5)
	Phenanthrene	MG/KG	0.00108	NC		0.00119		0.00108	MG/KG	Mean	(5)
	Pesticides/PCBs										
	4,4'-DDE	MG/KG	0.00467	NC		0.00932		0.00467	MG/KG	Mean	(5)
	alpha-Chlordane	MG/KG	0.0003	NC		0.00031	J	0.00031	MG/KG	Max	(6)
	Inorganics										
	Mercury	MG/KG	0.254	NC		0.315	J	0.254	MG/KG	Mean	(5)
	Mercury (methyl)	MG/KG	0.3	NC		0.379		0.3	MG/KG	Mean	(5)
	Dioxins										
	HCX	MG/KG	0.0000264	NC		0.00000535	J	0.00000535	MG/KG	Max	(6)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.00000182	NC		0.00000278		0.00000182	MG/KG	Mean	(5)
GREYSTONE	**Semivolatile Organics**										
	Acenaphthylene	MG/KG	0.0004	0.0009	T	0.00047	J	0.0004	MG/KG	Mean	(5)
	Phenanthrene	MG/KG	0.0009	0.001	T	0.00147		0.001	MG/KG	95% UCL-T	(3)
	Pesticides/PCBs										
	4,4'-DDE	MG/KG	0.00681	0.0157	T	0.02122	J	0.0157	MG/KG	95% UCL-T	(3)
	alpha-Chlordane	MG/KG	0.00064	0.00064	NP	0.0018		0.00064	MG/KG	95% UCL-NP	(4)
	Aroclor-1254	MG/KG	0.0378	0.0766	T	0.10139		0.0766	MG/KG	95% UCL-T	(3)
	Aroclor-1268	MG/KG	0.0302	0.0750	T	0.08518		0.0750	MG/KG	95% UCL-T	(3)
	Dieldrin	MG/KG	0.00035	0.00035	NP	0.00042	J	0.00035	MG/KG	95% UCL-NP	(4)
	gamma-Chlordane	MG/KG	0.0004	0.0007	T	0.00076		0.0007	MG/KG	95% UCL-T	(3)
	Technical Chlordane	MG/KG	0.0352	0.0352	NP	0.01794	J	0.01794	MG/KG	Max	(6)
	Inorganics										
	Mercury	MG/KG	0.419	0.419	NP	0.708	J	0.419	MG/KG	95% UCL-NP	(4)
	Mercury (methyl)	MG/KG	0.398	0.625	T	0.652		0.625	MG/KG	95% UCL-T	(3)
	Dioxins										
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.000000208	0.000000240	T	0.000000313		0.000000240	MG/KG	95% UCL-T	(3)
LYMAN MILL	**Semivolatile Organics**										
	Acenaphthylene	MG/KG	0.0002	0.0004	N	0.00062	J	0.0004	MG/KG	95% UCL-N	(2)
	Benzo(a)pyrene	MG/KG	0.000704	0.000704	NP	0.00373		0.000704	MG/KG	95% UCL-NP	(4)
	Benzo(b)fluoranthene	MG/KG	0.0008	0.0008	NP	0.00509		0.0008	MG/KG	95% UCL-NP	(4)
	Benzo(g,h,i)perylene	MG/KG	0.000703	0.000703	NP	0.00372		0.000703	MG/KG	95% UCL-NP	(4)
	Dibenzo(a,h)anthracene	MG/KG	0.00038	0.00038	NP	0.0008	J	0.00038	MG/KG	95% UCL-NP	(4)
	Phenanthrene	MG/KG	0.0014	0.0014	NP	0.00712	J	0.0014	MG/KG	95% UCL-NP	(4)

Table 3.2.CT
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Largemouth Bass

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Largemouth Bass
Exposure Medium: Fillet

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
	Pesticides/PCBs										
	4,4'-DDE	MG/KG	0.01037	0.01037	NP	0.0391		0.01037	MG/KG	95% UCL-NP	(4)
	alpha-Chlordane	MG/KG	0.002	0.002	NP	0.0099		0.002	MG/KG	95% UCL-NP	(4)
	Aroclor-1254	MG/KG	0.2166	0.2166	NP	0.59434	J	0.2166	MG/KG	95% UCL-NP	(4)
	Aroclor-1268	MG/KG	0.0127	0.0127	NP	0.05476	J	0.0127	MG/KG	95% UCL-NP	(4)
	Dieldrin	MG/KG	0.00061	0.00061	NP	0.00255		0.00061	MG/KG	95% UCL-NP	(4)
	gamma-Chlordane	MG/KG	0.00086	0.00086	NP	0.0038		0.00086	MG/KG	95% UCL-NP	(4)
	Technical Chlordane	MG/KG	0.03671	0.03671	NP	0.1365	J	0.03671	MG/KG	95% UCL-NP	(4)
	Inorganics										
	Lead	MG/KG	0.0066	0.0090	N	0.0144	J	0.0090	MG/KG	95% UCL-N	(2)
	Mercury	MG/KG	0.154	0.269	T	0.398		0.269	MG/KG	95% UCL-T	(3)
	Mercury (methyl)	MG/KG	0.236	0.236	NP	0.41		0.236	MG/KG	95% UCL-NP	(4)
	Dioxins										
	HCX	MG/KG	0.0000131	0.0000131	NP	0.00000649	J	0.00000649	MG/KG	Max	(6)
	Toxicity Equivalency (PCB) - Mammals	MG/KG	0.00000453	NC		0.0000109		0.00000453	MG/KG	Mean	(5)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.0000217	0.0000315	T	0.0000442		0.0000315	MG/KG	95% UCL-T	(3)
MANTON	**Semivolatile Organics**										
	Acenaphthylene	MG/KG	0.00030	NC		0.00041	J	0.00030	MG/KG	Mean	(5)
	Dibenzo(a,h)anthracene	MG/KG	0.00030	NC		0.00022	J	0.00022	MG/KG	Max	(6)
	Phenanthrene	MG/KG	0.00293	NC		0.00498		0.00293	MG/KG	Mean	(5)
	Pesticides/PCBs										
	4,4'-DDE	MG/KG	0.0089	NC		0.01235		0.0089	MG/KG	Mean	(5)
	alpha-Chlordane	MG/KG	0.0014	NC		0.00263		0.0014	MG/KG	Mean	(5)
	Aroclor-1254	MG/KG	0.1247	NC		0.22052		0.1247	MG/KG	Mean	(5)
	Aroclor-1268	MG/KG	0.03292	NC		0.06755		0.03292	MG/KG	Mean	(5)
	Dieldrin	MG/KG	0.0005	NC		0.00057		0.0005	MG/KG	Mean	(5)
	Endosulfan Sulfate	MG/KG	0.00096	NC		0.0019		0.00096	MG/KG	Mean	(5)
	gamma-Chlordane	MG/KG	0.00052	NC		0.00096	J	0.00052	MG/KG	Mean	(5)
	Technical Chlordane	MG/KG	0.04062	NC		0.06498	J	0.04062	MG/KG	Mean	(5)
	Inorganics										
	Lead	MG/KG	0.0113	NC		0.0119	J	0.0113	MG/KG	Mean	(5)
	Mercury	MG/KG	0.185	NC		0.259		0.185	MG/KG	Mean	(5)
	Mercury (methyl)	MG/KG	0.149	NC		0.278		0.149	MG/KG	Mean	(5)

Table 3.2.CT
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Largemouth Bass

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Largemouth Bass
Exposure Medium: Fillet

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale
	Dioxins								
	HCX	MG/KG	0.0000163	NC	0.00000536 J	0.00000536	MG/KG	Max	(6)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.0000186	NC	0.000031	0.0000186	MG/KG	Mean	(5)

(1) Chemicals of potential concern are identified in Table 2.2 and Table 2.10 for site exposure areas and reference/background areas respectively
(2) 95% UCL-N: 95% Upper Concentration Limit on the mean, normal distribution
(3) 95% UCL-T: 95% Upper Concentration Limit on the mean, lognormal distribution
(4) 95% UCL-NP: 95% Upper Concentration Limit on the mean, nonparametric distribution. Arithmetic mean used to approximate the 95% UCL for nonparametric data.
(5) Mean: Arithmetic Mean, applied if fewer than 10 samples (95% UCL not calculated), or if the 95% UCL is greater than the maximum concentration.
(6) Max: Maximum, applied in the special case where the arithmetic mean has been selected, but because of elevated detection limits in non-detects, it is greater than the maximum detected concentration.

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

Qualifier Definitions.
J = Value is estimated.

MG/KG = milligrams per kilogram
NC = Not Calculated
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: MJM

Table 3.3.CT
Medium-Specific Exposure Point Concentration Summary - Central Tendency
White Sucker

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: White Sucker, Brown Bullhead
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
ASSAPUMPSET	***Semivolatile Organics***										
BROWN BULLHEAD	Acenaphthylene	MG/KG	0.00091	NC		0.00122	J	0.00091	MG/KG	Mean	(5)
USED AS A SURROGATE	Benzo(a)anthracene	MG/KG	0.00334	NC		0.00808		0.00334	MG/KG	Mean	(5)
FOR WHITE SUCKER IN	Benzo(a)pyrene	MG/KG	0.00329	NC		0.00791		0.00329	MG/KG	Mean	(5)
THIS AREA	Benzo(b)fluoranthene	MG/KG	0.004177	NC		0.01058		0.004177	MG/KG	Mean	(5)
	Benzo(g,h,i)perylene	MG/KG	0.00219	NC		0.00462		0.00219	MG/KG	Mean	(5)
	Dibenzo(a,h)anthracene	MG/KG	0.00108	NC		0.00129	J	0.00108	MG/KG	Mean	(5)
	Indeno(1,2,3-cd)pyrene	MG/KG	0.00283	NC		0.00653		0.00283	MG/KG	Mean	(5)
	Phenanthrene	MG/KG	0.0071	NC		0.00776		0.0071	MG/KG	Mean	(5)
	Pesticides/PCBs										
	4,4'-DDE	MG/KG	0.0127	NC		0.02374		0.0127	MG/KG	Mean	(5)
	alpha-Chlordane	MG/KG	0.00174	NC		0.00288		0.00174	MG/KG	Mean	(5)
	gamma-Chlordane	MG/KG	0.00094	NC		0.0013	J	0.00094	MG/KG	Mean	(5)
	Inorganics										
	Lead	MG/KG	0.0894	NC		0.129	J	0.0894	MG/KG	Mean	(5)
	Mercury	MG/KG	0.077	NC		0.137	J	0.077	MG/KG	Mean	(5)
	Mercury (methyl)	MG/KG	0.0775	NC		0.145		0.0775	MG/KG	Mean	(5)
	Dioxins										
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.00000216	NC		0.00000258		0.00000216	MG/KG	Mean	(5)
GREYSTONE	**Semivolatile Organics**										
	Acenaphthylene	MG/KG	0.00388	0.00482	N	0.00706		0.00482	MG/KG	95% UCL-N	(2)
	Benzo(a)pyrene	MG/KG	0.00112	0.00112	NP	0.00273		0.00112	MG/KG	95% UCL-NP	(4)
	Benzo(g,h,i)perylene	MG/KG	0.000988	0.000988	NP	0.00138	J	0.000988	MG/KG	95% UCL-NP	(4)
	Phenanthrene	MG/KG	0.0172	0.0172	NP	0.02832		0.0172	MG/KG	95% UCL-NP	(4)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.0174	0.0218	T	0.02488		0.0218	MG/KG	95% UCL-T	(3)
	4,4'-DDE	MG/KG	0.04306	0.05130	N	0.06803		0.05130	MG/KG	95% UCL-N	(2)
	4,4'-DDT	MG/KG	0.00626	0.00626	NP	0.01314	J	0.00626	MG/KG	95% UCL-NP	(4)
	alpha-Chlordane	MG/KG	0.02094	0.02431	T	0.02862		0.02431	MG/KG	95% UCL-T	(3)
	Aroclor-1254	MG/KG	0.20236	0.20236	NP	0.35135		0.20236	MG/KG	95% UCL-NP	(4)
	Aroclor-1268	MG/KG	0.05512	0.05512	NP	0.16789		0.05512	MG/KG	95% UCL-NP	(4)
	Dieldrin	MG/KG	0.00417	0.00417	NP	0.02346		0.00417	MG/KG	95% UCL-NP	(4)
	gamma-Chlordane	MG/KG	0.0112	0.0112	NP	0.01453		0.0112	MG/KG	95% UCL-NP	(4)
	Heptachlor Epoxide	MG/KG	0.00081	0.00081	NP	0.00123	J	0.00081	MG/KG	95% UCL-NP	(4)
	Technical Chlordane	MG/KG	0.2820	0.2820	NP	0.34491		0.2820	MG/KG	95% UCL-NP	(4)

Table 3.3.CT
Medium-Specific Exposure Point Concentration Summary - Central Tendency
White Sucker

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: White Sucker, Brown Bullhead
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
	Inorganics										
	Lead	MG/KG	0.012	0.012	NP	0.022	J	0.012	MG/KG	95% UCL-NP	(4)
	Mercury	MG/KG	0.190	0.190	NP	0.278		0.190	MG/KG	95% UCL-NP	(4)
	Mercury (methyl)	MG/KG	0.193	0.193	NP	0.299		0.193	MG/KG	95% UCL-NP	(4)
	Dioxins										
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.00000211	0.00000310	T	0.00000395		0.00000310	MG/KG	95% UCL-T	(3)
ALLENDALE	**Semivolatile Organics**										
	Acenaphthylene	MG/KG	0.00215	0.00268	T	0.00387		0.00268	MG/KG	95% UCL-T	(3)
	Benzo(a)anthracene	MG/KG	0.0013	0.0022	T	0.00301		0.0022	MG/KG	95% UCL-T	(3)
	Benzo(a)pyrene	MG/KG	0.0010	0.0024	T	0.00279		0.0024	MG/KG	95% UCL-T	(3)
	Benzo(b)fluoranthene	MG/KG	0.0012	0.0025	T	0.00401		0.0025	MG/KG	95% UCL-T	(3)
	Benzo(g,h,i)perylene	MG/KG	0.000632	0.000632	NP	0.00243		0.000632	MG/KG	95% UCL-NP	(4)
	Dibenzo(a,h)anthracene	MG/KG	0.00027	0.00040	T	0.00069		0.00040	MG/KG	95% UCL-T	(3)
	Indeno(1,2,3-cd)pyrene	MG/KG	0.00079	0.00079	NP	0.00267		0.00079	MG/KG	95% UCL-NP	(4)
	Phenanthrene	MG/KG	0.00958	0.0114	N	0.01451		0.01143	MG/KG	95% UCL-N	(2)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.0126	0.0126	NP	0.03498	J	0.0126	MG/KG	95% UCL-NP	(4)
	4,4'-DDE	MG/KG	0.02869	0.02869	NP	0.05383	J	0.02869	MG/KG	95% UCL-NP	(4)
	4,4'-DDT	MG/KG	0.00686	0.00686	NP	0.02462	J	0.00686	MG/KG	95% UCL-NP	(4)
	alpha-Chlordane	MG/KG	0.0168	0.0236	T	0.03511	J	0.0236	MG/KG	95% UCL-T	(3)
	Aroclor-1254	MG/KG	1.5832	2.8888	T	3.24344	J	2.8888	MG/KG	95% UCL-T	(3)
	Aroclor-1268	MG/KG	0.02949	0.03843	T	0.05274	J	0.03843	MG/KG	95% UCL-T	(3)
	Dieldrin	MG/KG	0.00537	0.00866	T	0.0099	J	0.00866	MG/KG	95% UCL-T	(3)
	gamma-Chlordane	MG/KG	0.0089	0.0089	NP	0.0247	J	0.0089	MG/KG	95% UCL-NP	(4)
	Heptachlor Epoxide	MG/KG	0.00061	0.00070	N	0.00083	J	0.00070	MG/KG	95% UCL-N	(2)
	Technical Chlordane	MG/KG	0.346	0.674	T	1.24742	J	0.674	MG/KG	95% UCL-T	(3)
	Inorganics										
	Chromium	MG/KG	0.112	0.112	NP	0.229	J	0.112	MG/KG	95% UCL-NP	(4)
	Lead	MG/KG	0.16	0.39	T	0.349		0.16	MG/KG	Mean	(5)
	Mercury	MG/KG	0.136	0.136	NP	0.216		0.136	MG/KG	95% UCL-NP	(4)
	Mercury (methyl)	MG/KG	0.147	0.147	NP	0.225		0.147	MG/KG	95% UCL-NP	(4)
	Dioxins										
	HCX	MG/KG	0.0000472	0.0000615	N	0.0000893	J	0.0000615	MG/KG	95% UCL-N	(2)
	Toxicity Equivalency (PCB Congeners) - Mammals	MG/KG	0.0000195	NC		0.0000215		0.0000195	MG/KG	Mean	(5)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.000346	0.000491	N	0.000802		0.000491	MG/KG	95% UCL-N	(2)

Table 3.3.CT
Medium-Specific Exposure Point Concentration Summary - Central Tendency
White Sucker

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: White Sucker, Brown Bullhead
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
LYMAN MILL	**Semivolatile Organics**										
	Acenaphthylene	MG/KG	0.00297	0.00355	T	0.00458		0.00355	MG/KG	95% UCL-T	(3)
	Benzo(a)anthracene	MG/KG	0.00447	0.00946	T	0.01173		0.00946	MG/KG	95% UCL-T	(3)
	Benzo(a)pyrene	MG/KG	0.0049	0.024	T	0.01469		0.0049	MG/KG	Mean	(5)
	Benzo(b)fluoranthene	MG/KG	0.0067	0.0067	NP	0.02077		0.0067	MG/KG	95% UCL-NP	(4)
	Benzo(g,h,i)perylene	MG/KG	0.00376	0.0191	T	0.01143		0.00376	MG/KG	Mean	(5)
	Dibenzo(a,h)anthracene	MG/KG	0.0010	0.0027	T	0.00273		0.0027	MG/KG	95% UCL-T	(3)
	Indeno(1,2,3-cd)pyrene	MG/KG	0.0043	0.034	T	0.01347		0.0043	MG/KG	Mean	(5)
	Phenanthrene	MG/KG	0.0154	0.0212	T	0.02954		0.0212	MG/KG	95% UCL-T	(3)
	Pesticides/PCBs										
	4,4'-DDD	MG/KG	0.03866	0.06351	T	0.0668	J	0.06351	MG/KG	95% UCL-T	(3)
	4,4'-DDE	MG/KG	0.1309	0.2134	T	0.28651	J	0.2134	MG/KG	95% UCL-T	(3)
	4,4'-DDT	MG/KG	0.0037	0.0052	N	0.00847	J	0.0052	MG/KG	95% UCL-N	(2)
	alpha-Chlordane	MG/KG	0.03963	0.04690	N	0.05956	J	0.04690	MG/KG	95% UCL-N	(2)
	Aroclor-1254	MG/KG	4.19359	5.21365	T	7.09977	J	5.21365	MG/KG	95% UCL-T	(3)
	Aroclor-1268	MG/KG	0.03590	0.04370	T	0.04566	J	0.04370	MG/KG	95% UCL-T	(3)
	Dieldrin	MG/KG	0.00556	0.00862	T	0.00971	J	0.00862	MG/KG	95% UCL-T	(3)
	gamma-Chlordane	MG/KG	0.02921	0.02921	NP	0.0408	J	0.02921	MG/KG	95% UCL-NP	(4)
	Heptachlor Epoxide	MG/KG	0.0014	0.0017	T	0.002	J	0.0017	MG/KG	95% UCL-T	(3)
	Technical Chlordane	MG/KG	1.3657	2.5751	T	2.61185	J	2.5751	MG/KG	95% UCL-T	(3)
	Inorganics										
	Arsenic	MG/KG	0.0276	0.0276	NP	0.0715		0.0276	MG/KG	95% UCL-NP	(4)
	Chromium	MG/KG	0.270	0.378	T	0.513		0.378	MG/KG	95% UCL-T	(3)
	Lead	MG/KG	0.428	0.594	N	1.01	J	0.594	MG/KG	95% UCL-N	(2)
	Mercury	MG/KG	0.0984	0.118	T	0.157		0.1175	MG/KG	95% UCL-T	(3)
	Mercury (methyl)	MG/KG	0.0927	0.109	T	0.139		0.1087	MG/KG	95% UCL-T	(3)
	Dioxins										
	HCX	MG/KG	0.0000548	0.0000548	NP	0.0000814	J	0.0000548	MG/KG	95% UCL-NP	(4)
	Toxicity Equivalency (PCB Congeners) - Mammals	MG/KG	0.0000401	NC		0.0000503		0.0000401	MG/KG	Mean	(5)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.000580	0.000898	T	0.00137		0.000898	MG/KG	95% UCL-T	(3)

(1) Chemicals of potential concern are identified in Table 2.4 and Table 2.12 for site exposure areas and reference/background areas respecitively
Chemicals of potential concern for Brown Bullhead area identified in Table 2.13
(2) 95% UCL-N 95% Upper Concentration Limit on the mean, normal distribution
(3) 95% UCL-T 95% Upper Concentration Limit on the mean, lognormal distribution
(4) 95% UCL-NP 95% Upper Concentration Limit on the mean, nonparametric distribution Arithmetic mean used to approximate the 95% UCL for nonparametric data.

Table 3.3.CT
Medium-Specific Exposure Point Concentration Summary - Central Tendency
White Sucker

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: White Sucker, Brown Bullhead
Exposure Medium: Whole Body

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale

(5) Mean - Arithmetic Mean, applied if fewer than 10 samples (95% UCL not calculated), or if the 95% UCL is greater than the maximum concentration.

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

Qualifier Definitions:
J = Value is estimated.

MG/KG = milligrams per kilogram
NC = Not Calculated
EPC = Exposure Point Concentration
UCL = *Upper Confidence Limit on the arithmetic mean*

Prepared by: KJA
Checked by: MJM

Table 3.4.CT
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Combined Fish

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Biota
Exposure Medium: Combined Fish Diet

Exposure Point	Chemical of Potential Concern (1)	Units	Exposure Point Concentration American Eel			Exposure Point Concentration White Sucker / Brown Bullhead			Exposure Point Concentration Largemouth Bass			Exposure Point Concentration Combined Fish Diet (7)
			Value	Statistic (1)	Rationale	Value	Statistic (1)	Rationale	Value	Statistic (1)	Rationale	Value
ASSAPUMPSET	**Semivolatile Organics**											
	Acenaphthylene	MG/KG	0.000943	Mean	(5)	0.00091	Mean	(5)	0.0003	Mean	(5)	0.0007
	Benzo(a)anthracene	MG/KG	0.000638	Mean	(7)	0.00334	Mean	(5)	0.00072	Mean	(7)	0.0016
	Benzo(a)pyrene	MG/KG	0.000666	Mean	(7)	0.00329	Mean	(5)	0.000849	Mean	(5)	0.00160
	Benzo(b)fluoranthene	MG/KG	0.000688	Mean	(7)	0.004177	Mean	(5)	0.00072	Mean	(7)	0.0019
	Benzo(g,h,i)perylene	MG/KG	0.000638	Mean	(7)	0.00219	Mean	(5)	0.00359	Mean	(7)	0.00214
	Dibenzo(a,h)anthracene	MG/KG	0.000626	Mean	(7)	0.00108	Mean	(5)	0.00022	Max	(6) A	0.00064
	Indeno(1,2,3-cd)pyrene	MG/KG	0.000667	Mean	(7)	0.00283	Mean	(5)	0.00072	Mean	(7)	0.0014
	Phenanthrene	MG/KG	0.00246	Mean	(5)	0.0071	Mean	(5)	0.00108	Mean	(5)	0.0035
	Pesticides/PCBs											
	4,4'-DDD	MG/KG	0.00461	Mean	(5)	0.00236	Mean	(5) A	0.000631	Mean	(5) A	0.00254
	4,4'-DDE	MG/KG	0.0176	Mean	(5)	0.0127	Mean	(5)	0.00467	Mean	(5)	0.0117
	alpha-Chlordane	MG/KG	0.0025	Mean	(5)	0.00174	Mean	(5)	0.00031	Max	(6)	0.0015
	Aroclor-1254	MG/KG	0.03178	Mean	(5)	0.009712	Mean	(7)	0.007184	Mean	(7)	0.01622
	Dieldrin	MG/KG	0.0013	Mean	(5)	0.000778	Mean	(7)	0.00058	Mean	(7)	0.0009
	gamma-Chlordane	MG/KG	0.00089	Mean	(5)	0.00094	Mean	(5)	0.00058	Mean	(7)	0.00080
	Heptachlor Epoxide	MG/KG	0.00077	Mean	(5)	0.000778	Mean	(7)	0.00058	Mean	(7)	0.00071
	Technical Chlordane	MG/KG	0.11622	Mean	(5)	0.097115	Mean	(7)	0.07183	Mean	(7)	0.0951
	Inorganics											
	Lead	MG/KG	0.0466	Mean	(5)	0.0894	Mean	(5)	0.0110	Mean	(7)	0.0490
	Mercury	MG/KG	0.0926	Mean	(5)	0.077	Mean	(5)	0.254	Mean	(5)	0.14
	Mercury (methyl)	MG/KG	0.0889	Mean	(5)	0.0775	Mean	(5)	0.3	Mean	(5)	0.1
	Zinc	MG/KG	16.9	Mean	(5)	9.78	Mean	(5) A	6.80	Mean	(5) A	11.1
	Dioxins											
	HCX	MG/KG	0.00000997	Mean	(7)	0.000009948	Mean	(7)	0.000005350	Max	(6)	0.00000842
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.000000555	Mean	(5)	0.00000216	Mean	(5)	0.00000182	Mean	(5)	0.00000151
GREYSTONE	**Semivolatile Organics**											
	Acenaphthylene	MG/KG	0.00121	95% UCL-N	(2)	0.00482	95% UCL-N	(2)	0.0004	Mean	(5)	0.002
	Benzo(a)pyrene	MG/KG	0.00132	95% UCL-NP	(4)	0.00112	95% UCL-NP	(4)	0.00051	Mean	(7)	0.00099
	Benzo(b)fluoranthene	MG/KG	0.00149	95% UCL-NP	(4)	0.00148	95% UCL-NP	(4) A	0.00051	Mean	(7)	0.0012
	Benzo(g,h,i)perylene	MG/KG	0.00125	Mean	(7)	0.000988	95% UCL-NP	(4)	0.00051	Mean	(7)	0.00092
	Dibenzo(a,h)anthracene	MG/KG	0.000799	95% UCL-NP	(4)	0.00039	Max	(6) A	0.00051	Mean	(7)	0.00057
	Indeno(1,2,3-cd)pyrene	MG/KG	0.00132	95% UCL-NP	(4)	0.000945	Mean	(7)	0.00051	Mean	(7)	0.00092
	Phenanthrene	MG/KG	0.00475	95% UCL-T	(3)	0.0172	95% UCL-NP	(4)	0.001	95% UCL-T	(3)	0.008
	Pesticides/PCBs											
	4,4'-DDD	MG/KG	0.0150	95% UCL-T	(3)	0.0218	95% UCL-T	(3)	0.00078	95% UCL-NP	(4) A	0.013

Table 3.4.CT
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Combined Fish

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe Current/Future
Medium Biota
Exposure Medium Combined Fish Diet

Exposure Point	Chemical of Potential Concern (1)	Units	Exposure Point Concentration American Eel			Exposure Point Concentration White Sucker / Brown Bullhead			Exposure Point Concentration Largemouth Bass			Exposure Point Concentration Combined Fish Diet (7)
			Value	Statistic (1)	Rationale	Value	Statistic (1)	Rationale	Value	Statistic (1)	Rationale	Value
	4,4'-DDE	MG/KG	0.03161	95% UCL-NP	(4)	0.05130	95% UCL-N	(2)	0.0157	95% UCL-T	(3)	0.0329
	4,4'-DDT	MG/KG	0.0020	95% UCL-NP	(4) A	0.00626	95% UCL-NP	(4)	0.0006	95% UCL-T	(3) A	0.003
	alpha-Chlordane	MG/KG	0.0170	95% UCL-N	(2)	0.02431	95% UCL-T	(3)	0.00064	95% UCL-NP	(4)	0.014
	Aroclor-1254	MG/KG	0.25318	95% UCL-T	(3)	0.20236	95% UCL-NP	(4)	0.0766	95% UCL-T	(3)	0.177
	Aroclor-1268	MG/KG	0.1251	95% UCL-T	(3)	0.05512	95% UCL-NP	(4)	0.0750	95% UCL-T	(3)	0.0851
	Dieldrin	MG/KG	0.00353	95% UCL-NP	(4)	0.00417	95% UCL-NP	(4)	0.00035	95% UCL-NP	(4)	0.0027
	gamma-Chlordane	MG/KG	0.0069	95% UCL-N	(2)	0.0112	95% UCL-NP	(4)	0.0007	95% UCL-T	(3)	0.006
	Heptachlor Epoxide	MG/KG	0.0012	95% UCL-NP	(4)	0.00081	95% UCL-NP	(4)	0.0004	Mean	(7)	0.0008
	Technical Chlordane	MG/KG	0.31695	95% UCL-N	(2)	0.2820	95% UCL-NP	(4)	0.01794	Max	(6)	0.2056
	Inorganics											
	Lead	MG/KG	0.214	Mean	(5)	0.012	95% UCL-NP	(4)	0.00967	Mean	(7)	0.079
	Mercury	MG/KG	0.0706	95% UCL-NP	(4)	0.190	95% UCL-NP	(4)	0.419	95% UCL-NP	(4)	0.226
	Mercury (methyl)	MG/KG	0.165	95% UCL-T	(3)	0.193	95% UCL-NP	(4)	0.625	95% UCL-T	(3)	0.328
	Zinc	MG/KG	41.5	95% UCL-T	(3)	18	95% UCL-T	(3) A	7.36	95% UCL-T	(3) A	22
	Dioxins											
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.000000747	95% UCL-T	(3)	0.00000310	95% UCL-T	(3)	0.000000240	95% UCL-T	(3)	0.00000136
ALLENDALE	**Semivolatile Organics**											
	Acenaphthylene	MG/KG	0.0013	95% UCL-NP	(4)	0.00268	95% UCL-T	(3)	NS	NS	NS	0.0020
	Benzo(a)anthracene	MG/KG	0.000676	Mean	(7)	0.0022	95% UCL-T	(3)	NS	NS	NS	0.0014
	Benzo(a)pyrene	MG/KG	0.000666	Mean	(7)	0.0024	95% UCL-T	(3)	NS	NS	NS	0.0015
	Benzo(b)fluoranthene	MG/KG	0.000768	Mean	(7)	0.0025	95% UCL-T	(3)	NS	NS	NS	0.0016
	Benzo(g,h,i)perylene	MG/KG	0.000667	Mean	(7)	0.000632	95% UCL-NP	(4)	NS	NS	NS	0.000650
	Dibenzo(a,h)anthracene	MG/KG	0.000647	Mean	(7)	0.00040	95% UCL-T	(3)	NS	NS	NS	0.00053
	Indeno(1,2,3-cd)pyrene	MG/KG	0.00067	Mean	(7)	0.00079	95% UCL-NP	(4)	NS	NS	NS	0.00073
	Phenanthrene	MG/KG	0.00807	95% UCL-NP	(4)	0.01143	95% UCL-N	(2)	NS	NS	NS	0.00975
	Pesticides/PCBs											
	4,4'-DDD	MG/KG	0.0131	95% UCL-NP	(4)	0.0126	95% UCL-NP	(4)	NS	NS	NS	0.0128
	4,4'-DDE	MG/KG	0.0210	95% UCL-NP	(4)	0.02869	95% UCL-NP	(4)	NS	NS	NS	0.0249
	4,4'-DDT	MG/KG	0.00892	95% UCL-T	(3)	0.00686	95% UCL-NP	(4)	NS	NS	NS	0.00789
	alpha-Chlordane	MG/KG	0.0192	95% UCL-NP	(4)	0.0236	95% UCL-T	(3)	NS	NS	NS	0.0214
	Aroclor-1254	MG/KG	0.88187	95% UCL-N	(2)	2.8888	95% UCL-T	(3)	NS	NS	NS	1.8853
	Aroclor-1268	MG/KG	0.01504	95% UCL-NP	(4)	0.03843	95% UCL-T	(3)	NS	NS	NS	0.02673
	beta-BHC	MG/KG	0.00062	95% UCL-NP	(4)	0.0003	Mean	(7)	NS	NS	NS	0.0005
	Dieldrin	MG/KG	0.00912	95% UCL-N	(2)	0.00866	95% UCL-T	(3)	NS	NS	NS	0.00889
	Endosulfan Sulfate	MG/KG	0.00158	95% UCL-NP	(4)	0.0003	Mean	(7)	NS	NS	NS	0.001
	Endrin Aldehyde	MG/KG	0.001	95% UCL-NP	(4)	0.0003	Mean	(7)	NS	NS	NS	0.0005

Table 3.4.CT
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Combined Fish

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Biota
Exposure Medium: Combined Fish Diet

Exposure Point	Chemical of Potential Concern (1)	Units	Exposure Point Concentration American Eel			Exposure Point Concentration White Sucker / Brown Bullhead			Exposure Point Concentration Largemouth Bass			Exposure Point Concentration Combined Fish Diet (7)
			Value	Statistic (1)	Rationale	Value	Statistic (1)	Rationale	Value	Statistic (1)	Rationale	Value
	gamma-Chlordane	MG/KG	0.00712	95% UCL-NP	(4)	0.0089	95% UCL-NP	(4)	NS	NS	NS	0.0080
	Heptachlor	MG/KG	0.000678	95% UCL-NP	(4)	0.0003	Mean	(7)	NS	NS	NS	0.000507
	Heptachlor Epoxide	MG/KG	0.0015	95% UCL-NP	(4)	0.00070	95% UCL-N	(2)	NS	NS	NS	0.0011
	Technical Chlordane	MG/KG	0.2615	95% UCL-NP	(4)	0.674	95% UCL-T	(3)	NS	NS	NS	0.468
	Inorganics											
	Cadmium	MG/KG	0.0971	95% UCL-NP	(4)	0.0316	95% UCL-T	(3) A	NS	NS	NS	0.064
	Chromium	MG/KG	0.0933	95% UCL-T	(3) A	0.112	95% UCL-NP	(4)	NS	NS	NS	0.103
	Lead	MG/KG	0.580	95% UCL-N	(2)	0.16	Mean	(5)	NS	NS	NS	0.37
	Manganese	MG/KG	5.04	95% UCL-T	(3)	8.36	95% UCL-N	(2) A	NS	NS	NS	6.70
	Mercury	MG/KG	0.153	95% UCL-N	(2)	0.136	95% UCL-NP	(4)	NS	NS	NS	0.144
	Mercury (methyl)	MG/KG	0.269	95% UCL-T	(3)	0.147	95% UCL-NP	(4)	NS	NS	NS	0.208
	Dioxins											
	HCX	MG/KG	0.0000778	95% UCL-N	(2)	0.0000615	95% UCL-N	(2)	NS	NS	NS	0.0000696
	Toxicity Equivalency (PCB Congeners) - Mammals	MG/KG	0.0000356	Mean	(5)	0.0000195	Mean	(5)	NS	NS	NS	0.0000275
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.000111	95% UCL-NP	(4)	0.000491	95% UCL-N	(2)	NS	NS	NS	0.000301
LYMAN MILL	**Semivolatile Organics**											
	Acenaphthylene	MG/KG	0.00193	95% UCL-NP	(4)	0.00355	95% UCL-T	(3)	0.0004	95% UCL-N	(2)	0.002
	Benzo(a)anthracene	MG/KG	0.000946	95% UCL-NP	(4) A	0.00946	95% UCL-T	(3)	0.00288	95% UCL-T	(3) A	0.00443
	Benzo(a)pyrene	MG/KG	0.000962	95% UCL-NP	(4)	0.0049	Mean	(5)	0.000704	95% UCL-NP	(4)	0.0022
	Benzo(b)fluoranthene	MG/KG	0.00119	95% UCL-NP	(4)	0.0067	95% UCL-NP	(4)	0.0008	95% UCL-NP	(4)	0.003
	Benzo(g,h,i)perylene	MG/KG	0.000645	Mean	(7)	0.00376	Mean	(5)	0.000703	95% UCL-NP	(4)	0.00170
	Dibenzo(a,h)anthracene	MG/KG	0.00065	95% UCL-NP	(4)	0.0027	95% UCL-T	(3)	0.00038	95% UCL-NP	(4)	0.0012
	Indeno(1,2,3-cd)pyrene	MG/KG	0.000918	95% UCL-NP	(4) A	0.0043	Mean	(5)	0.000579	95% UCL-NP	(4) A	0.0019
	Phenanthrene	MG/KG	0.02012	95% UCL-T	(3)	0.0212	95% UCL-T	(3)	0.0014	95% UCL-NP	(4)	0.014
	Pesticides/PCBs											
	4,4'-DDD	MG/KG	0.01469	95% UCL-NP	(4)	0.06351	95% UCL-T	(3)	0.0020	95% UCL-NP	(4) A	0.027
	4,4'-DDE	MG/KG	0.04451	95% UCL-NP	(4)	0.2134	95% UCL-T	(3)	0.01037	95% UCL-NP	(4)	0.08941
	4,4'-DDT	MG/KG	0.00337	95% UCL-N	(2)	0.0052	95% UCL-N	(2)	0.0008	95% UCL-NP	(4) A	0.003
	alpha-Chlordane	MG/KG	0.02007	95% UCL-NP	(4)	0.04690	95% UCL-N	(2)	0.002	95% UCL-NP	(4)	0.02
	Aroclor-1254	MG/KG	0.95861	95% UCL-T	(3)	5.21365	95% UCL-T	(3)	0.2166	95% UCL-NP	(4)	2.130
	Aroclor-1268	MG/KG	0.008058	Mean	(7)	0.04370	95% UCL-T	(3)	0.0127	95% UCL-NP	(4)	0.0215
	beta-BHC	MG/KG	0.0018	95% UCL-T	(3)	0.0003	Mean	(7)	0.00032	Mean	(7)	0.0008
	Dieldrin	MG/KG	0.00789	95% UCL-NP	(4)	0.00862	95% UCL-T	(3)	0.00061	95% UCL-NP	(4)	0.0057
	gamma-Chlordane	MG/KG	0.00859	95% UCL-NP	(4)	0.02921	95% UCL-NP	(4)	0.00086	95% UCL-NP	(4)	0.013
	Heptachlor Epoxide	MG/KG	0.00227	95% UCL-NP	(4)	0.0017	95% UCL-T	(3)	0.00032	Mean	(7)	0.0014
	Technical Chlordane	MG/KG	0.44722	95% UCL-NP	(4)	2.5751	95% UCL-T	(3)	0.03671	95% UCL-NP	(4)	1.020

Table 3.4.CT
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Combined Fish

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North Providence, Rhode Island

Scenario Timeframe Current/Future
Medium: Biota
Exposure Medium: Combined Fish Diet

Exposure Point	Chemical of Potential Concern (1)	Units	Exposure Point Concentration American Eel			Exposure Point Concentration White Sucker / Brown Bullhead			Exposure Point Concentration Largemouth Bass			Exposure Point Concentration Combined Fish Diet (7)
			Value	Statistic (1)	Rationale	Value	Statistic (1)	Rationale	Value	Statistic (1)	Rationale	Value
	Inorganics											
	Arsenic	MG/KG	0.024	Mean	(7)	0.0276	95% UCL-NP	(4)	0.019	Mean	(7)	0.024
	Cadmium	MG/KG	0.026	95% UCL-NP	(4)	0.0228	95% UCL-T	(3) A	0.00304	Max	(6) A	0.017
	Chromium	MG/KG	0.131	95% UCL-NP	(4) A	0.378	95% UCL-T	(3)	0.0828	Max	(6) A	0.197
	Lead	MG/KG	0.38	95% UCL-T	(3)	0.594	95% UCL-N	(2)	0.0090	95% UCL-N	(2)	0.33
	Manganese	MG/KG	4.98	95% UCL-T	(3)	7.49	95% UCL-NP	(4) A	0.46	95% UCL-T	(3) A	4.31
	Mercury	MG/KG	0.0349	95% UCL-NP	(4)	0.1175	95% UCL-T	(3)	0.269	95% UCL-T	(3)	0.141
	Mercury (methyl)	MG/KG	0.0367	95% UCL-NP	(4)	0.1087	95% UCL-T	(3)	0.236	95% UCL-NP	(4)	0.127
	Dioxins											
	HCX	MG/KG	0.0000805	95% UCL-T	(3)	0.0000548	95% UCL-NP	(4)	0.00000649	Max	(6)	0.0000473
	Toxicity Equivalency (PCB Congeners) - Mammals	MG/KG	0.0000323	Mean	(5)	0.0000401	Mean	(5)	0.00000453	Mean	(5)	0.0000257
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.000181	95% UCL-N	(2)	0.000898	95% UCL-T	(3)	0.0000315	95% UCL-T	(3)	0.000370
MANTON	**Semivolatile Organics**											
	Acenaphthylene	MG/KG	NS	NS	NS	NS	NS	NS	0.00030	Mean	(5)	0.00030
	Dibenzo(a,h)anthracene	MG/KG	NS	NS	NS	NS	NS	NS	0.00022	Max	(6)	0.00022
	Phenanthrene	MG/KG	NS	NS	NS	NS	NS	NS	0.00293	Mean	(5)	0.00293
	Pesticides/PCBs											
	4,4'-DDE	MG/KG	NS	NS	NS	NS	NS	NS	0.0089	Mean	(5)	0.0089
	alpha-Chlordane	MG/KG	NS	NS	NS	NS	NS	NS	0.0014	Mean	(5)	0.0014
	Aroclor-1254	MG/KG	NS	NS	NS	NS	NS	NS	0.1247	Mean	(5)	0.1247
	Aroclor-1268	MG/KG	NS	NS	NS	NS	NS	NS	0.03292	Mean	(5)	0.03292
	Dieldrin	MG/KG	NS	NS	NS	NS	NS	NS	0.0005	Mean	(5)	0.0005
	Endosulfan Sulfate	MG/KG	NS	NS	NS	NS	NS	NS	0.00096	Mean	(5)	0.00096
	gamma-Chlordane	MG/KG	NS	NS	NS	NS	NS	NS	0.00052	Mean	(5)	0.00052
	Technical Chlordane	MG/KG	NS	NS	NS	NS	NS	NS	0.04062	Mean	(5)	0.04062
	Inorganics											
	Lead	MG/KG	NS	NS	NS	NS	NS	NS	0.0113	Mean	(5)	0.0113
	Mercury	MG/KG	NS	NS	NS	NS	NS	NS	0.185	Mean	(5)	0.185
	Mercury (methyl)	MG/KG	NS	NS	NS	NS	NS	NS	0.149	Mean	(5)	0.149
	Dioxins											
	HCX	MG/KG	NS	NS	NS	NS	NS	NS	0.00000536	Max	(6)	0.00000536
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	NS	NS	NS	NS	NS	NS	0.0000186	Mean	(5)	0.0000186
DYERVILLE	**Semivolatile Organics**											
	Acenaphthylene	MG/KG	0.00076	Mean	(5)	NS	NS	NS	NS	NS	NS	0.00076
	Dibenzo(a,h)anthracene	MG/KG	0.00017	Max	(6)	NS	NS	NS	NS	NS	NS	0.00017
	Phenanthrene	MG/KG	0.00490	Mean	(5)	NS	NS	NS	NS	NS	NS	0.00490

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Combined Fish

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North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Biota
Exposure Medium: Combined Fish Diet

Exposure Point	Chemical of Potential Concern (1)	Units	Exposure Point Concentration American Eel			Exposure Point Concentration White Sucker / Brown Bullhead			Exposure Point Concentration Largemouth Bass			Exposure Point Concentration Combined Fish Diet (7)
			Value	Statistic (1)	Rationale	Value	Statistic (1)	Rationale	Value	Statistic (1)	Rationale	Value
	Pesticides/PCBs											
	4,4'-DDD	MG/KG	0.03543	Mean	(5)	NS	NS	NS	NS	NS	NS	0.03543
	4,4'-DDE	MG/KG	0.0110	Mean	(5)	NS	NS	NS	NS	NS	NS	0.0110
	4,4'-DDT	MG/KG	0.0119	Mean	(5)	NS	NS	NS	NS	NS	NS	0.0119
	alpha-Chlordane	MG/KG	0.01440	Mean	(5)	NS	NS	NS	NS	NS	NS	0.01440
	Aroclor-1254	MG/KG	0.37026	Mean	(5)	NS	NS	NS	NS	NS	NS	0.37026
	Dieldrin	MG/KG	0.00852	Mean	(5)	NS	NS	NS	NS	NS	NS	0.00852
	gamma-Chlordane	MG/KG	0.00574	Mean	(5)	NS	NS	NS	NS	NS	NS	0.00574
	Heptachlor Epoxide	MG/KG	0.00184	Mean	(5)	NS	NS	NS	NS	NS	NS	0.00184
	Technical Chlordane	MG/KG	0.31006	Mean	(5)	NS	NS	NS	NS	NS	NS	0.31006
	Inorganics											
	Cadmium	MG/KG	0.157	Mean	(5)	NS	NS	NS	NS	NS	NS	0.157
	Lead	MG/KG	0.341	Mean	(5)	NS	NS	NS	NS	NS	NS	0.341
	Manganese	MG/KG	12.6	Mean	(5)	NS	NS	NS	NS	NS	NS	12.6
	Mercury	MG/KG	0.102	Mean	(5)	NS	NS	NS	NS	NS	NS	0.102
	Mercury (methyl)	MG/KG	0.117	Mean	(5)	NS	NS	NS	NS	NS	NS	0.117
	Dioxins											
	HCX	MG/KG	0.0000296	Mean	(5)	NS	NS	NS	NS	NS	NS	0.0000296
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.000111	95% UCL-NP	(4)	NS	NS	NS	NS	NS	NS	0.000111

Notes:

(1) Chemicals of potential concern are identified in Tables 2.1, 2.2, and 2.3 for site exposure areas and in Tables 2.8, 2.9, and 2.10 for reference/background areas.
(2) 95% UCL-N: 95% Upper Concentration Limit on the mean, normal distribution
(3) 95% UCL-T: 95% Upper Concentration Limit on the mean, lognormal distribution
(4) 95% UCL-NP: 95% Upper Concentration Limit on the mean, nonparametric distribution. Arithmetic mean used to approximate the 95% UCL for nonparametric data.
(5) Mean: Arithmetic Mean, applied if fewer than 10 samples (95% UCL not calculated), or if the 95% UCL is greater than the maximum concentration.
(6) Max: Maximum detected concentration, applied if fewer than 10 samples (95% UCL not calculated), or if the 95% UCL is greater than the maximum concentration
(7) Combined Fish Diet EPCs were calculated by averaging the EPC values for each chemical across all sampled species.
A - Chemical was not selected as a chemical of potential concern for that species. EPC was calculated in order to average combined fish EPCs for all species.

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed
NS - Not Sampled

MG/KG = milligrams per kilogram
NC = Not Calculated
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: RAR

Table 3.5.CT
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Surface Water

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale
ASSAPUMPSET	Inorganics								
	Arsenic	MG/L	0.00175	NC	0.000491	0.000491	MG/L	Max	(6)
	Manganese	MG/L	0.135	NC	0.166	0.135	MG/L	Mean	(5)
	Mercury	MG/L	0.0000511	NC	0.00000215	0.00000215	MG/L	Max	(6)
	Nitrite-N	MG/L	0.00510	NC	0.0051	0.00510	MG/L	Mean	(5)
	Dioxins/Furans								
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/L	0.00000000534	NC	0.00000000534	0.00000000534	MG/L	Mean	(5)
GREYSTONE	Inorganics								
	Arsenic	MG/L	0.00136	NC	0.00055	0.00055	MG/L	Max	(6)
	Manganese	MG/L	0.131	NC	0.144	0.131	MG/L	Mean	(5)
	Mercury	MG/L	0.0000346	NC	0.00000193	0.00000193	MG/L	Max	(6)
	Nitrite-N	MG/L	0.128	NC	0.13	0.128	MG/L	Mean	(5)
	Dioxins/Furans								
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/L	0.00000000326	NC	0.00000000564	0.00000000326	MG/L	Mean	(5)
ALLENDALE	Volatile Organics								
	Tetrachloroethene	MG/L	0.00055	NC	0.0007 J	0.00055	MG/L	Mean	(5)
	Semivolatile Organics								
	bis(2-Ethylhexyl)phthalate	MG/L	0.0048	0.0048 NP	0.001 J	0.001	MG/L	Max	(6)
	Pesticides/PCBs								
	Aldrin	MG/L	0.000017	0.000017 NP	0.000011 J	0.000011	MG/L	Max	(6)
	alpha-Chlordane	MG/L	0.000019	0.000019 NP	0.00000069 J	0.00000069	MG/L	Max	(6)
	delta-BHC	MG/L	0.000017	0.000017 NP	0.0000096 J	0.0000096	MG/L	Max	(6)
	Endosulfan Sulfate	MG/L	0.000035	0.000035 NP	0.0000026 J	0.0000026	MG/L	Max	(6)
	Endrin Aldehyde	MG/L	0.000031	0.000031 NP	0.0000028 J	0.0000028	MG/L	Max	(6)
	gamma-Chlordane	MG/L	0.000019	0.000019 NP	0.00000075 J	0.00000075	MG/L	Max	(6)

Table 3.5.CT
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Surface Water

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
	Inorganics										
	Arsenic	MG/L	0.0032	0.0075	T	0.0125		0.0075	MG/L	95% UCL-T	(3)
	Barium	MG/L	0.045	0.045	NP	0.271		0.045	MG/L	95% UCL-NP	(4)
	Chromium	MG/L	0.0052	0.027	T	0.042		0.027	MG/L	95% UCL-T	(3)
	Lead	MG/L	0.013	0.013	NP	0.156		0.013	MG/L	95% UCL-NP	(4)
	Manganese	MG/L	0.42	0.42	NP	2.6		0.42	MG/L	95% UCL-NP	(4)
	Mercury	MG/L	0.000054	0.000054	NP	0.00000319		0.00000319	MG/L	Max	(6)
	Thallium	MG/L	0.0032	3.2	T	0.0145		0.0032	MG/L	Mean	(5)
	Nitrate	MG/L	0.76	NC		0.773		0.76	MG/L	Mean	(5)
	Nitrite-N	MG/L	0.12	NC		0.139		0.12	MG/L	Mean	(5)
	Dioxins/Furans										
	HCX	MG/L	0.000000247	NC		0.000000271	J	0.00000024719	MG/L	Mean	(5)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/L	0.000000385	0.000000385	NP	0.00000409		0.000000385	MG/L	95% UCL-NP	(4)
LYMAN MILL	**Semivolatile Organics**										
	Acenaphthylene	MG/L	0.0042	0.0042	NP	0.00000132	J	0.00000132	MG/L	Max	(5)
	bis(2-Ethylhexyl)phthalate	MG/L	0.017	0.017	NP	0.16	*	0.017	MG/L	95% UCL-NP	(3)
	Pesticides/PCBs										
	Aldrin	MG/L	0.000023	0.000023	NP	0.000069		0.000023	MG/L	95% UCL-NP	(3)
	alpha-Chlordane	MG/L	0.000021	0.000021	NP	0.000019	J	0.000019	MG/L	Max	(5)
	Endosulfan Sulfate	MG/L	0.000039	0.000039	NP	0.0000032	J	0.0000032	MG/L	Max	(5)
	Endrin Aldehyde	MG/L	0.000026	NC		0.000005	J	0.000005	MG/L	Max	(5)
	gamma-Chlordane	MG/L	0.000021	0.000021	NP	0.000021	J	0.000021	MG/L	95% UCL-NP	(3)
	Inorganics										
	Arsenic	MG/L	0.0023	0.0046	T	0.0092	J	0.0046	MG/L	95% UCL-T	(2)
	Barium	MG/L	0.021	0.021	NP	0.0311		0.021	MG/L	95% UCL-NP	(3)
	Chromium	MG/L	0.0023	0.0023	NP	0.0063		0.0023	MG/L	95% UCL-NP	(3)
	Lead	MG/L	0.0044	0.0044	NP	0.0218		0.0044	MG/L	95% UCL-NP	(3)
	Manganese	MG/L	0.13	0.13	NP	0.436		0.13	MG/L	95% UCL-NP	(3)
	Mercury	MG/L	0.000063	0.000063	NP	0.00000394		0.00000394	MG/L	Max	(5)
	Thallium	MG/L	0.0022	0.0022	NP	0.0077	J	0.0022	MG/L	95% UCL-NP	(3)
	Nitrate	MG/L	0.76	NC		0.765		0.76	MG/L	Mean	(4)
	Nitrite-N	MG/L	0.084	NC		0.0865		0.084	MG/L	Mean	(4)

Table 3.5.CT
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Surface Water

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale
	Dioxins/Furans								
	HCX	MG/L	0.0000000406	NC	0.0000000809	0.0000000406	MG/L	Mean	(4)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/L	0.000000120	0.00000146 T	0.000000861	0.000000120	MG/L	Mean	(5)

(1) Chemicals of potential concern are identified in Table 2.5 and Table 2.14 for site exposure areas and reference/background areas respectively.
(2) 95% UCL-T: 95% Upper Concentration Limit on the mean, lognormal distribution
(3) 95% UCL-NP: 95% Upper Concentration Limit on the mean, nonparametric distribution. Arithmetic mean used to approximate the 95% UCL for nonparametric data.
(4) Mean: Arithmetic Mean, applied if fewer than 10 samples (95% UCL not calculated), or if the 95% UCL is greater than the maximum concentration.
(5) Max: Maximum, applied in the special case where the arithmetic mean has been selected, but because of elevated detection limits in non-detects, it is greater than the maximum detected concentration.

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

Qualifier Definitions:
J = Value is estimated.

MG/L = milligrams per liter
NC = Not Calculated
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: MJM

Table 3.6.CT
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Sediment

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic (1)	Rationale
ASSAPUMPSET	**Semivolatile Organics**									
	2-Methylnaphthalene	MG/KG	0.22	NC	0.01855		0.01855	MG/KG	Max	(6)
	Acenaphthylene	MG/KG	0.19	NC	0.0589		0.0589	MG/KG	Max	(6)
	Benzo(a)anthracene	MG/KG	0.52	NC	1		0.52	MG/KG	Mean	(5)
	Benzo(a)pyrene	MG/KG	0.53	NC	0.84		0.53	MG/KG	Mean	(5)
	Benzo(b)fluoranthene	MG/KG	0.63	NC	1.4		0.63	MG/KG	Mean	(5)
	Benzo(g,h,i)perylene	MG/KG	0.40	NC	0.59468		0.40	MG/KG	Mean	(5)
	Dibenzo(a,h)anthracene	MG/KG	0.15	NC	0.17898		0.15	MG/KG	Mean	(5)
	Indeno(1,2,3-cd)pyrene	MG/KG	0.43	NC	0.65		0.43	MG/KG	Mean	(5)
	Phenanthrene	MG/KG	0.54	NC	0.79474		0.54	MG/KG	Mean	(5)
	Pesticides/PCBs									
	alpha-Chlordane	MG/KG	0.0013	NC	0.00133	J	0.00133	MG/KG	Max	(6)
	Aroclor-1254	MG/KG	0.032	NC	0.05755		0.032	MG/KG	Mean	(5)
	Aroclor-1268	MG/KG	0.023	NC	0.04166		0.023	MG/KG	Mean	(5)
	gamma-Chlordane	MG/KG	0.0012	NC	0.00065	J	0.00065	MG/KG	Max	(6)
	Technical Chlordane	MG/KG	0.11	NC	0.15253	J	0.11	MG/KG	Mean	(5)
	Inorganics									
	Aluminum	MG/KG	9841	NC	21774	J	9841	MG/KG	Mean	(5)
	Arsenic	MG/KG	2.7	NC	5.21	J	2.7	MG/KG	Mean	(5)
	Cadmium	MG/KG	0.37	NC	0.858		0.37	MG/KG	Mean	(5)
	Chromium	MG/KG	10.4	NC	17.5	J	10.4	MG/KG	Mean	(5)
	Copper	MG/KG	11.8	NC	18.3	J	11.8	MG/KG	Mean	(5)
	Lead	MG/KG	40.5	NC	88.6	J	40.5	MG/KG	Mean	(5)
	Manganese	MG/KG	711	NC	1590		711	MG/KG	Mean	(5)
	Mercury	MG/KG	0.051	NC	0.114		0.051	MG/KG	Mean	(5)
	Nickel	MG/KG	10.1	NC	20	J	10.1	MG/KG	Mean	(5)
	Thallium	MG/KG	0.43	NC	0.354	J	0.354	MG/KG	Max	(6)
	Vanadium	MG/KG	17.0	NC	32		17.0	MG/KG	Mean	(5)
	Dioxins/Furans									
	HCX	MG/KG	0.0000172	NC	0.0000172	J	0.0000172	MG/KG	Mean	(5)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.00000379	NC	0.00000773		0.00000379	MG/KG	Mean	(5)

Table 3.6.CT
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Sediment

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
GREYSTONE	**Semivolatile Organics**										
	2-Methylnaphthalene	MG/KG	1.1	NC		0.07478	J	0.07478	MG/KG	Max	(6)
	Acenaphthylene	MG/KG	1.1	NC		0.19279	J	0.19279	MG/KG	Max	(6)
	Benzo(a)anthracene	MG/KG	1.5	NC		3.5		1.5	MG/KG	Mean	(5)
	Benzo(a)pyrene	MG/KG	1.4	NC		3.1		1.4	MG/KG	Mean	(5)
	Benzo(b)fluoranthene	MG/KG	1.5	NC		3.1		1.5	MG/KG	Mean	(5)
	Benzo(g,h,i)perylene	MG/KG	0.9	NC		2.07671	J	0.86	MG/KG	Mean	(5)
	Dibenzo(a,h)anthracene	MG/KG	1.0	NC		0.77	J	0.77	MG/KG	Max	(6)
	Indeno(1,2,3-cd)pyrene	MG/KG	1.0	NC		2.18335	J	1.0	MG/KG	Mean	(5)
	Phenanthrene	MG/KG	2.1	NC		4.8		2.1	MG/KG	Mean	(5)
	Pesticides/PCBs										
	alpha-Chlordane	MG/KG	0.0061	0.0061	NP	0.01746	J	0.0061	MG/KG	95% UCL-NP	(4)
	Aroclor-1254	MG/KG	0.1	0.5	T	0.38		0.15	MG/KG	Mean	(5)
	Aroclor-1268	MG/KG	0.14	NC		0.24667		0.14	MG/KG	Mean	(5)
	gamma-Chlordane	MG/KG	0.005	0.005	NP	0.01016		0.0048	MG/KG	95% UCL-NP	(4)
	Technical Chlordane	MG/KG	0.4015	NC		0.62618		0.40	MG/KG	Mean	(5)
	Inorganics										
	Aluminum	MG/KG	8210	15554	T	24690	J	15554	MG/KG	95% UCL-T	(3)
	Antimony	MG/KG	0.73	4.3	T	4.3	J	0.73	MG/KG	Mean	(5)
	Arsenic	MG/KG	3.9	9.6	T	13.5		9.6	MG/KG	95% UCL-T	(3)
	Cadmium	MG/KG	0.81	10.4	T	4.35		0.81	MG/KG	Mean	(5)
	Chromium	MG/KG	99.3	601	T	271		99.3	MG/KG	Mean	(5)
	Copper	MG/KG	72.8	650	T	436		72.8	MG/KG	Mean	(5)
	Lead	MG/KG	179	179	NP	570		179	MG/KG	95% UCL-NP	(4)
	Manganese	MG/KG	599	599	NP	1990		599	MG/KG	95% UCL-NP	(4)
	Mercury	MG/KG	0.21	1.0	T	0.757		0.21	MG/KG	Mean	(5)
	Nickel	MG/KG	31.2	142	T	261		142	MG/KG	95% UCL-T	(3)
	Thallium	MG/KG	0.37	0.37	NP	0.71	J	0.37	MG/KG	95% UCL-NP	(4)
	Vanadium	MG/KG	37.6	79.0	T	129		79.0	MG/KG	95% UCL-T	(3)
	Dioxins/Furans										
	HCX	MG/KG	0.0000325	NC		0.000154	J	0.0000325	MG/KG	Mean	(5)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.0000348	0.000121	T	0.000179		0.000121	MG/KG	95% UCL-T	(3)
	Toxicity Equivalency (PCB Congeners) - Mammals	MG/KG	0.0000249	NC		0.0000249		0.0000249	MG/KG	Mean	(5)

Table 3.6.CT
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Sediment

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
ALLENDALE	**Semivolatile Organics**										
	2-Methylnaphthalene	MG/KG	1.6	3.7	T	0.13608		0.13608	MG/KG	Max	(6)
	Acenaphthylene	MG/KG	1.6	1.9	N	0.97	J	0.97	MG/KG	Max	(6)
	Benzo(a)anthracene	MG/KG	2.2	3.4	T	8.4		3.4	MG/KG	95% UCL-T	(3)
	Benzo(a)pyrene	MG/KG	2.3	4.0	T	9.2		4.0	MG/KG	95% UCL-T	(3)
	Benzo(b)fluoranthene	MG/KG	2.8	4.4	T	9.5		4.4	MG/KG	95% UCL-T	(3)
	Benzo(g,h,i)perylene	MG/KG	2.0	2.0	NP	7		2.0	MG/KG	95% UCL-NP	(4)
	Benzo(k)fluoranthene	MG/KG	2.6	3.9	T	9.2		3.9	MG/KG	95% UCL-T	(3)
	bis(2-Ethylhexyl)phthalate	MG/KG	2.3	3.2	T	12		3.2	MG/KG	95% UCL-T	(3)
	Dibenzo(a,h)anthracene	MG/KG	1.4	2.0	T	2.6	J	2.0	MG/KG	95% UCL-T	(3)
	Indeno(1,2,3-cd)pyrene	MG/KG	1.9	3.2	T	6.8	J	3.2	MG/KG	95% UCL-T	(3)
	Pentachlorophenol	MG/KG	4.6	6.5	T	18	J	6.5	MG/KG	95% UCL-T	(3)
	Phenanthrene	MG/KG	2.9	4.8	T	12		4.8	MG/KG	95% UCL-T	(3)
	Pesticides/PCBs										
	alpha-Chlordane	MG/KG	0.0113	0.0113	NP	0.062		0.0113	MG/KG	95% UCL-NP	(4)
	Aroclor-1254	MG/KG	1.5	2.4	T	27		2.4	MG/KG	95% UCL-T	(3)
	Aroclor-1260	MG/KG	0.20	0.20	NP	0.27	J	0.20	MG/KG	95% UCL-NP	(4)
	Aroclor-1268	MG/KG	0.079	0.079	NP	0.15642		0.079	MG/KG	95% UCL-NP	(4)
	delta-BHC	MG/KG	0.0013	0.0014	T	0.0024	J	0.0014	MG/KG	95% UCL-T	(3)
	Dieldrin	MG/KG	0.0090	0.0090	NP	0.11297	J	0.0090	MG/KG	95% UCL-NP	(4)
	Endosulfan II	MG/KG	0.037	0.037	NP	0.44	J	0.037	MG/KG	95% UCL-NP	(4)
	Endosulfan sulfate	MG/KG	0.0027	0.0027	NP	0.00902		0.0027	MG/KG	95% UCL-NP	(4)
	Endrin aldehyde	MG/KG	0.0024	0.0029	T	0.011	J	0.0029	MG/KG	95% UCL-T	(3)
	Endrin Ketone	MG/KG	0.0038	0.0038	NP	0.034		0.0038	MG/KG	95% UCL-NP	(4)
	gamma-Chlordane	MG/KG	0.0097	0.017	T	0.074	J	0.017	MG/KG	95% UCL-T	(3)
	Technical Chlordane	MG/KG	0.52	0.65	N	0.85181		0.65	MG/KG	95% UCL-N	(2)
	Inorganics										
	Antimony	MG/KG	2.3	4.8	T	13.7	J	4.8	MG/KG	95% UCL-T	(3)
	Arsenic	MG/KG	5.8	5.8	NP	18	J	5.8	MG/KG	95% UCL-NP	(4)
	Cadmium	MG/KG	1.2	1.2	NP	5.2	J	1.2	MG/KG	95% UCL-NP	(4)
	Chromium	MG/KG	142	238	T	536	J	238	MG/KG	95% UCL-T	(3)

Table 3.6.CT
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Sediment

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
	Lead	MG/KG	329	488	T	1090		488	MG/KG	95% UCL-T	(3)
	Manganese	MG/KG	430	531	T	1966		531	MG/KG	95% UCL-T	(3)
	Mercury	MG/KG	0.47	0.97	T	3.6	J	0.97	MG/KG	95% UCL-T	(3)
	Nickel	MG/KG	26.7	26.7	NP	94.6		26.7	MG/KG	95% UCL-NP	(4)
	Thallium	MG/KG	7.3	7.3	NP	6.8	J	6.8	MG/KG	Max	(6)
	Vanadium	MG/KG	36.2	45.9	T	89.3		45.9	MG/KG	95% UCL-T	(3)
	Dioxins/Furans										
	HCX	MG/KG	0.0271	6.94	T	0.365	J	0.0271	MG/KG	Mean	(5)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.00571	0.00574	NP	0.073	J	0.00574	MG/KG	95% UCL-NP	(4)
	Toxicity Equivalency (PCB Congeners) - Mammals	MG/KG	0.00000011	NC		0.000000112		0.00000011	MG/KG	Mean	(5)
LYMAN MILL	**Semivolatile Organics**										
	2-Methylnaphthalene	MG/KG	0.9	0.9	NP	0.1	J	0.1	MG/KG	Max	(6)
	4-Chloro-3-methylphenol	MG/KG	1.1	1.4	N	2.2	J	1.4	MG/KG	95% UCL-N	(2)
	4-Nitrophenol	MG/KG	2.5	2.5	NP	2.2	J	2.2	MG/KG	Max	(6)
	Acenaphthylene	MG/KG	0.9	0.9	NP	0.42856		0.42856	MG/KG	Max	(6)
	Benzo(a)anthracene	MG/KG	1.4	2.8	T	5.5	J	2.8	MG/KG	95% UCL-T	(3)
	Benzo(a)pyrene	MG/KG	1.4	2.9	T	6.17711		2.9	MG/KG	95% UCL-T	(3)
	Benzo(b)fluoranthene	MG/KG	2.1	4.5	T	13	J*	4.5	MG/KG	95% UCL-T	(3)
	Benzo(g,h,i)perylene	MG/KG	1.3	3.0	T	4.85176		3.0	MG/KG	95% UCL-T	(3)
	Benzo(k)fluoranthene	MG/KG	1.1	2.1	T	7.30225		2.1	MG/KG	95% UCL-T	(3)
	bis(2-Ethylhexyl)phthalate	MG/KG	2.6	5.2	T	50	J*	5.2	MG/KG	95% UCL-T	(3)
	Dibenzo(a,h)anthracene	MG/KG	0.77	1.1	T	1.0694		0.77	MG/KG	Mean	(5)
	Indeno(1,2,3-cd)pyrene	MG/KG	1.3	2.7	T	5.25309		2.7	MG/KG	95% UCL-T	(3)
	N-Nitroso-di-n-propylamine	MG/KG	1.1	1.3	N	1.4	J	1.3	MG/KG	95% UCL-N	(2)
	Pentachlorophenol	MG/KG	2.6	2.6	NP	1.4	J	1.4	MG/KG	Max	(6)
	Phenanthrene	MG/KG	1.5	2.8	T	8.37861		2.8	MG/KG	95% UCL-T	(3)
	Pesticides/PCBs										
	alpha-Chlordane	MG/KG	0.016	0.032	T	0.14075		0.032	MG/KG	95% UCL-T	(3)
	Aroclor-1254	MG/KG	0.27	0.49	T	2.2	J	0.49	MG/KG	95% UCL-T	(3)
	Aroclor-1260	MG/KG	0.024	0.027	T	0.043	J	0.027	MG/KG	95% UCL-T	(3)
	Aroclor-1268	MG/KG	0.12	NC		0.31379	J	0.12	MG/KG	Mean	(5)
	Dieldrin	MG/KG	0.0038	0.0044	T	0.017	P	0.0044	MG/KG	95% UCL-T	(3)

Table 3.6.CT
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Sediment

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)		Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
								Value	Units	Statistic (1)	Rationale
	Endosulfan II	MG/KG	0.004	0.005	T	0.017	P	0.005	MG/KG	95% UCL-T	(3)
	Endosulfan sulfate	MG/KG	0.0029	0.0029	NP	0.01055		0.0029	MG/KG	95% UCL-NP	(4)
	gamma-Chlordane	MG/KG	0.0089	0.015	T	0.06988		0.015	MG/KG	95% UCL-T	(3)
	Technical Chlordane	MG/KG	1.3	NC		2.21273		1.29	MG/KG	Mean	(5)
	Inorganics										
	Antimony	MG/KG	1.3	3.1	T	5.3	J	3.1	MG/KG	95% UCL-T	(3)
	Arsenic	MG/KG	5.2	6.4	T	13.2	J	6.4	MG/KG	95% UCL-T	(3)
	Cadmium	MG/KG	2.1	2.1	NP	23.9		2.1	MG/KG	95% UCL-NP	(4)
	Chromium	MG/KG	98.9	200	T	310	J	200	MG/KG	95% UCL-T	(3)
	Lead	MG/KG	236	375	T	721	J	375	MG/KG	95% UCL-T	(3)
	Manganese	MG/KG	553.5	843	T	1970		843	MG/KG	95% UCL-T	(3)
	Mercury	MG/KG	0.29	0.62	T	0.946		0.62	MG/KG	95% UCL-T	(3)
	Nickel	MG/KG	32.8	69.2	T	187	J	69.2	MG/KG	95% UCL-T	(3)
	Thallium	MG/KG	0.58	0.58	NP	0.883	J	0.58	MG/KG	95% UCL-NP	(4)
	Vanadium	MG/KG	35.5	42.4	T	91.7	J	42.4	MG/KG	95% UCL-T	(3)
	Dioxins/Furans										
	HCX	MG/KG	0.0135	0.0135	NP	0.167	J	0.0135	MG/KG	95% UCL-NP	(4)
	Toxicity Equivalency (PCB Congeners) - Mammals	MG/KG	0.0000332	NC		0.0000649		0.000033	MG/KG	Mean	(5)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.00179	0.0361	T	0.00803		0.00179	MG/KG	Mean	(5)
MANTON	**Semivolatile Organics**										
	Benzo(a)anthracene	MG/KG	0.15	NC		0.3	J	0.15	MG/KG	Mean	(5)
	Benzo(a)pyrene	MG/KG	0.18	NC		0.37	J	0.18	MG/KG	Mean	(5)
	Benzo(b)fluoranthene	MG/KG	0.31	NC		0.64	J	0.31	MG/KG	Mean	(5)
	Benzo(g,h,i)perylene	MG/KG	0.11	NC		0.22	J	0.11	MG/KG	Mean	(5)
	Benzo(k)fluoranthene	MG/KG	0.18	NC		0.2	J	0.18	MG/KG	Mean	(5)
	bis(2-Ethylhexyl)phthalate	MG/KG	0.31	NC		0.43	J	0.31	MG/KG	Mean	(5)
	Indeno(1,2,3-cd)pyrene	MG/KG	0.15	NC		0.29	J	0.15	MG/KG	Mean	(5)
	Phenanthrene	MG/KG	0.14	NC		0.3	J	0.14	MG/KG	Mean	(5)
	Pesticides/PCBs										
	alpha-Chlordane	MG/KG	0.0022	NC		0.004		0.0022	MG/KG	Mean	(5)
	gamma-Chlordane	MG/KG	0.0025	NC		0.005		0.0025	MG/KG	Mean	(5)

Table 3.6.CT
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Sediment

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)		Exposure Point Concentration			
							Value	Units	Statistic (1)	Rationale
	Inorganics									
	Arsenic	MG/KG	0.77	NC	0.97	J	0.77	MG/KG	Mean	(5)
	Cadmium	MG/KG	0.68	NC	0.96	J	0.68	MG/KG	Mean	(5)
	Chromium	MG/KG	13.4	NC	18.6	J	13.4	MG/KG	Mean	(5)
	Lead	MG/KG	45.9	NC	91	J	45.9	MG/KG	Mean	(5)
	Manganese	MG/KG	128	NC	219	J	128	MG/KG	Mean	(5)
	Vanadium	MG/KG	5.7	NC	7.1		5.7	MG/KG	Mean	(5)
	Dioxins/Furans									
	HCX	MG/KG	0.000117	NC	0.000263	J	0.000117	MG/KG	Mean	(5)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.000433	NC	0.000999		0.000433	MG/KG	Mean	(5)
DYERVILLE	**Semivolatile Organics**									
	2-Methylnaphthalene	MG/KG	0.12	NC	0.031	J	0.031	MG/KG	Max	(6)
	Acenaphthylene	MG/KG	0.16	NC	0.27		0.16	MG/KG	Mean	(5)
	Benzo(a)anthracene	MG/KG	1.4	NC	2.6		1.4	MG/KG	Mean	(5)
	Benzo(a)pyrene	MG/KG	1.4	NC	2.2		1.4	MG/KG	Mean	(5)
	Benzo(b)fluoranthene	MG/KG	2.5	NC	4	J	2.5	MG/KG	Mean	(5)
	Benzo(g,h,i)perylene	MG/KG	1.1	NC	1.6	J*	1.1	MG/KG	Mean	(5)
	Benzo(k)fluoranthene	MG/KG	0.71	NC	1.1		0.71	MG/KG	Mean	(5)
	bis(2-Ethylhexyl)phthalate	MG/KG	1.1	NC	1.6		1.1	MG/KG	Mean	(5)
	Dibenzo(a,h)anthracene	MG/KG	0.20	NC	0.32	J	0.20	MG/KG	Mean	(5)
	Indeno(1,2,3-cd)pyrene	MG/KG	1.4	NC	2		1.4	MG/KG	Mean	(5)
	Phenanthrene	MG/KG	1.4	NC	2.9		1.4	MG/KG	Mean	(5)
	Pesticides/PCBs									
	alpha-Chlordane	MG/KG	0.0043	NC	0.011		0.0043	MG/KG	Mean	(5)
	Aroclor-1254	MG/KG	0.49	NC	1.3		0.49	MG/KG	Mean	(5)
	Dieldrin	MG/KG	0.012	NC	0.03		0.012	MG/KG	Mean	(5)
	Endosulfan sulfate	MG/KG	0.0052	NC	0.011		0.0052	MG/KG	Mean	(5)
	Inorganics									
	Arsenic	MG/KG	4.4	NC	2.1	J	2.1	MG/KG	Max	(6)
	Cadmium	MG/KG	1.7	NC	4	J	1.7	MG/KG	Mean	(5)
	Chromium	MG/KG	156	NC	385		156	MG/KG	Mean	(5)

Table 3.6.CT
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Sediment

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale
	Lead	MG/KG	160	NC	307	160	MG/KG	Mean	(5)
	Manganese	MG/KG	332	NC	598	332	MG/KG	Mean	(5)
	Mercury	MG/KG	0.40	NC	1.06	0.40	MG/KG	Mean	(5)
	Nickel	MG/KG	19.0	NC	35	19.0	MG/KG	Mean	(5)
	Vanadium	MG/KG	16.0	NC	28.4	16.0	MG/KG	Mean	(5)
	Dioxins/Furans								
	HCX	MG/KG	0.000173	NC	0.000448	0.000173	MG/KG	Mean	(5)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.000110	NC	0.000152	0.000110	MG/KG	Mean	(5)
	Toxicity Equivalency (PCB Congeners) - Mammals	MG/KG	0.000000025	NC	0.0000000253	0.0000000253	MG/KG	Mean	(5)

(1) Chemicals of potential concern are identified in Table 2.6 and Table 2.15 for site exposure areas and reference/background areas respectively
(2) 95% UCL-N: 95% Upper Concentration Limit on the mean, normal distribution
(3) 95% UCL-T 95% Upper Concentration Limit on the mean, lognormal distribution
(4) 95% UCL-NP: 95% Upper Concentration Limit on the mean, nonparametric distribution. Arithmetic mean used to approximate the 95% UCL for nonparametric data.
(5) Mean. Arithmetic Mean, applied if fewer than 10 samples (95% UCL not calculated), or if the 95% UCL is greater than the maximum concentration.
(6) Max Maximum, applied in the special case where the arithmetic mean has been selected, but because of elevated detection limits in non-detects, it is greater than the maximum detected concentration.

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed.
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

Qualifier Definitions:
J = Value is estimated.

MG/KG = milligrams per kilogram
NC = Not Calculated
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by KJA
Checked by MJM

Table 3.7.CT
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Bank Soil

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Bank Soil

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale
GREYSTONE	**Semivolatile Organics**								
	2-Methylnaphthalene	MG/KG	0.1071	NC	0.17022 J	0.1071	MG/KG	Mean	(3)
	Acenaphthylene	MG/KG	0.31765	NC	0.49749	0.31765	MG/KG	Mean	(3)
	Benzo(a)anthracene	MG/KG	3.09372	NC	3.41086	3.09372	MG/KG	Mean	(3)
	Benzo(a)pyrene	MG/KG	3.07718	NC	3.41803	3.07718	MG/KG	Mean	(3)
	Benzo(b)fluoranthene	MG/KG	3.45207	NC	4.28861	3.45207	MG/KG	Mean	(3)
	Benzo(g,h,i)perylene	MG/KG	2.336	NC	2.87139	2.336	MG/KG	Mean	(3)
	Dibenzo(a,h)anthracene	MG/KG	0.61485	NC	0.72851	0.61485	MG/KG	Mean	(3)
	Indeno(1,2,3-cd)pyrene	MG/KG	2.51886	NC	3.0929	2.51886	MG/KG	Mean	(3)
	Phenanthrene	MG/KG	3.95543	NC	5.30136	3.95543	MG/KG	Mean	(3)
	Pesticides/PCBs								
	alpha-Chlordane	MG/KG	0.0178	NC	0.03592	0.0178	MG/KG	Mean	(3)
	Aroclor-1254	MG/KG	0.51998	NC	0.83872	0.51998	MG/KG	Mean	(3)
	Aroclor-1268	MG/KG	0.08389	NC	0.13953 J	0.08389	MG/KG	Mean	(3)
	Endosulfan Sulfate	MG/KG	0.00650	NC	0.01269 J	0.00650	MG/KG	Mean	(3)
	Technical Chlordane	MG/KG	0.4307	NC	0.73538	0.4307	MG/KG	Mean	(3)
	Inorganics								
	Aluminum	MG/KG	15899	NC	21793 J	15899	MG/KG	Mean	(3)
	Arsenic	MG/KG	7.72	NC	12.2	7.72	MG/KG	Mean	(3)
	Chromium	MG/KG	231	NC	291	231	MG/KG	Mean	(3)
	Copper	MG/KG	205	NC	324	205	MG/KG	Mean	(3)
	Lead	MG/KG	450	NC	591	450	MG/KG	Mean	(3)
	Manganese	MG/KG	1841	NC	4126	1841	MG/KG	Mean	(3)
	Mercury	MG/KG	0.582	NC	0.811	0.582	MG/KG	Mean	(3)
	Molybdenum	MG/KG	54.0	NC	87.7 J	54.0	MG/KG	Mean	(3)
	Nickel	MG/KG	120	NC	387	120	MG/KG	Mean	(3)
	Thallium	MG/KG	0.461	NC	0.585	0.461	MG/KG	Mean	(3)
	Vanadium	MG/KG	82.3	NC	103	82.3	MG/KG	Mean	(3)
	Dioxins/Furans								
	HCX	MG/KG	0.000193	NC	0.000417	0.000193	MG/KG	Mean	(3)
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.0000549	NC	0.000109	0.0000549	MG/KG	Mean	(3)

Table 3.7.CT
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Bank Soil

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Bank Soil

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale
ALLENDALE	Dioxins/Furans								
	2,3,7,8-TCDD	MG/KG	0.00027	0.00027 NP	0.00151	0.00027	MG/KG	95% UCL-NP	(2)

(1) Chemicals of potential concern are identified in Table 2.7 and Table 2.16 for site exposure areas and reference/background areas respectively.
(2) 95% UCL-NP: 95% Upper Concentration Limit on the mean, nonparametric distribution. Arithmetic mean used to approximate the 95% UCL for nonparametric data
(3) Mean. Arithmetic Mean, applied if fewer than 10 samples (95% UCL not calculated), or if the 95% UCL is greater than the maximum concentration

T - The Shapiro-Wilk W Test indicates that the data are log-normally distributed.
NP - The Shapiro-Wilk W Test indicates that the data are neither normally nor log-normally distributed. The data are therefore assumed to be non-parametrically distributed
N - The Shapiro-Wilk W Test indicates that the data are normally distributed.

MG/KG = milligrams per kilogram
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: MJM

Table 3.8.CT
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Fogarty Center

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale
FOGARTY CENTER	**Semivolatile Organics**								
	2-Methylnaphthalene	MG/KG	0.522	NC	1.56	0.522	MG/KG	Mean	(2)
	Acenaphthylene	MG/KG	0.0575	NC	0.152	0.0575	MG/KG	Mean	(2)
	Benzo(a)anthracene	MG/KG	2.53	NC	7.3	2.53	MG/KG	Mean	(2)
	Benzo(a)pyrene	MG/KG	1.78	NC	5.12	1.78	MG/KG	Mean	(2)
	Benzo(b)fluoranthene	MG/KG	1.82	NC	5.14	1.82	MG/KG	Mean	(2)
	Benzo(g,h,i)perylene	MG/KG	1.13	NC	3.17	1.13	MG/KG	Mean	(2)
	Dibenzo(a,h)anthracene	MG/KG	0.244	NC	0.668	0.244	MG/KG	Mean	(2)
	Indeno(1,2,3-cd)pyrene	MG/KG	1.27	NC	3.57 J	1.27	MG/KG	Mean	(2)
	Phenanthrene	MG/KG	8.29	NC	24.6	8.29	MG/KG	Mean	(2)
	Pesticides/PCBs								
	alpha-Chlordane	MG/KG	0.0419	NC	0.0888	0.0419	MG/KG	Mean	(2)
	Aroclor-1254	MG/KG	0.470	NC	0.938	0.470	MG/KG	Mean	(2)
	Endosulfan II	MG/KG	0.0120	NC	0.032	0.0120	MG/KG	Mean	(2)
	Endosulfan Sulfate	MG/KG	0.000393	NC	0.00108	0.000393	MG/KG	Mean	(2)
	gamma-Chlordane	MG/KG	0.0339	NC	0.0762	0.0339	MG/KG	Mean	(2)
	Technical Chlordane	MG/KG	0.677	NC	0.943	0.677	MG/KG	Mean	(2)
	Inorganics								
	Aluminum	MG/KG	20067	NC	24800 J	20067	MG/KG	Mean	(2)
	Arsenic	MG/KG	10.4	NC	11.5	10.4	MG/KG	Mean	(2)
	Manganese	MG/KG	443	NC	478	443	MG/KG	Mean	(2)
	Mercury	MG/KG	0.206	NC	0.258	0.206	MG/KG	Mean	(2)
	Dioxins								
	Toxicity Equivalency (Dioxins/Furans) - Mammals	MG/KG	0.00000557	NC	0.00000664	0.00000557	MG/KG	Mean	(2)

(1) Chemicals of potential concern are identified in Table 2.8.

(2) Mean: Arithmetic Mean, applied if fewer than 10 samples (95% UCL not calculated), or if the 95% UCL is greater than the maximum concentration.

Qualifier Definitions:

J = Value is estimated.

Table 3.8.CT
Medium-Specific Exposure Point Concentration Summary - Central Tendency
Fogarty Center

Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Potential Concern (1)	Units	Arithmetic Mean	95% UCL (distribution)	Maximum Detected Concentration (qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (1)	Rationale

MG/KG = milligrams per kilogram
NC = Not Calculated
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit on the arithmetic mean

Prepared by: KJA
Checked by: MJM

Table 4.1.RME
Values Used For Daily Intake Calculations
Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

SCENARIO TIMEFRAME: CURRENT/FUTURE
MEDIUM: BIOTA
EXPOSURE MEDIUM: COMBINED FISH DIET

EXPOSURE ROUTE	RECEPTOR POPULATION	RECEPTOR AGE	EXPOSURE POINT	PARAMETER CODE	PARAMETER DEFINITION	VALUE	UNITS	RATIONALE/ REFERENCE	INTAKE EQUATION/ MODEL NAME
INGESTION	RESIDENT	ADULT	ASSAPUMPSET POND	CB	CHEMICAL CONCENTRATION IN BIOTA	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
			GREYSTONE MILL POND	IR-B	INGESTION RATE OF BIOTA	14	g/day	Exposure Assessment[f]	CB x IR-B x FI x EF x ED x CF x 1/BW x 1/AT
			ALLENDALE POND	FI	FRACTION INGESTED	1	unitless	Assumption	
			LYMAN MILL POND	EF	EXPOSURE FREQUENCY	350	day/yr	USEPA, 1994	
			MANTON REACH	ED	EXPOSURE DURATION	12	yr	USEPA, 1994[i]	
			DYERVILLE REACH	BW	BODY WEIGHT	70	kg	USEPA, 1997	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1997	
				CF	CONVERSION FACTOR	0.001	kg/g		
		ADOLESCENT	ASSAPUMPSET POND	CB	CHEMICAL CONCENTRATION IN BIOTA	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
			GREYSTONE MILL POND	IR-B	INGESTION RATE OF BIOTA	9.3	g/day	Exposure Assessment[f]	CB x IR-B x FI x EF x ED x CF x 1/BW x 1/AT
			ALLENDALE POND	FI	FRACTION INGESTED	1	unitless	Assumption	
			LYMAN MILL POND	EF	EXPOSURE FREQUENCY	350	day/yr	USEPA, 1994	
			MANTON REACH	ED	EXPOSURE DURATION	12	yr	USEPA, 1994[i]	
			DYERVILLE REACH	BW	BODY WEIGHT	45	kg	USEPA, 1997	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1997	
				CF	CONVERSION FACTOR	0.001	kg/g		
		CHILD	ASSAPUMPSET POND	CB	CHEMICAL CONCENTRATION IN BIOTA	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
			GREYSTONE MILL POND	IR-B	INGESTION RATE OF BIOTA	4.7	g/day	Exposure Assessment[f]	CB x IR-B x FI x EF x ED x CF x 1/BW x 1/AT
			ALLENDALE POND	FI	FRACTION INGESTED	1	unitless	Assumption	
			LYMAN MILL POND	EF	EXPOSURE FREQUENCY	350	day/yr	USEPA, 1994	
			MANTON REACH	ED	EXPOSURE DURATION	6	yr	USEPA, 1994[i]	
			DYERVILLE REACH	BW	BODY WEIGHT	15	kg	USEPA, 1997	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	2190	day	USEPA, 1997	
				CF	CONVERSION FACTOR	0.001	kg/g		
	RECREATIONAL ANGLER	ADULT	ASSAPUMPSET POND	CB	CHEMICAL CONCENTRATION IN BIOTA	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
			GREYSTONE MILL POND	IR-B	INGESTION RATE OF BIOTA	14	g/day	Exposure Assessment[f]	CB x IR-B x FI x EF x ED x CF x 1/BW x 1/AT
			ALLENDALE POND	FI	FRACTION INGESTED	1	unitless	Assumption	
			LYMAN MILL POND	EF	EXPOSURE FREQUENCY	350	day/yr	USEPA, 1994	
			MANTON REACH	ED	EXPOSURE DURATION	12	yr	USEPA, 1994[i]	
			DYERVILLE REACH	BW	BODY WEIGHT	70	kg	USEPA, 1997	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1997	
				CF	CONVERSION FACTOR	0.001	kg/g		
		ADOLESCENT	ASSAPUMPSET POND	CB	CHEMICAL CONCENTRATION IN BIOTA	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
			GREYSTONE MILL POND	IR-B	INGESTION RATE OF BIOTA	9.3	g/day	Exposure Assessment[f]	CB x IR-B x FI x EF x ED x CF x 1/BW x 1/AT
			ALLENDALE POND	FI	FRACTION INGESTED	1	unitless	Assumption	
			LYMAN MILL POND	EF	EXPOSURE FREQUENCY	350	day/yr	USEPA, 1994	
			MANTON REACH	ED	EXPOSURE DURATION	12	yr	USEPA, 1994[i]	
			DYERVILLE REACH	BW	BODY WEIGHT	45	kg	USEPA, 1997	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1997	
				CF	CONVERSION FACTOR	0.001	kg/g		
		CHILD	ASSAPUMPSET POND	CB	CHEMICAL CONCENTRATION IN BIOTA	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
			GREYSTONE MILL POND	IR-B	INGESTION RATE OF BIOTA	4.7	g/day	Exposure Assessment[f]	CB x IR-B x FI x EF x ED x CF x 1/BW x 1/AT
			ALLENDALE POND	FI	FRACTION INGESTED	1	unitless	Assumption	
			LYMAN MILL POND	EF	EXPOSURE FREQUENCY	350	day/yr	USEPA, 1994	
			MANTON REACH	ED	EXPOSURE DURATION	6	yr	USEPA, 1994[i]	
			DYERVILLE REACH	BW	BODY WEIGHT	15	kg	USEPA, 1997	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	2190	day	USEPA, 1997	
				CF	CONVERSION FACTOR	0.001	kg/g		

Table 4.1.RME
Values Used For Daily Intake Calculations
Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

SCENARIO TIMEFRAME: CURRENT/FUTURE
MEDIUM: BIOTA
EXPOSURE MEDIUM: COMBINED FISH DIET

EXPOSURE ROUTE	RECEPTOR POPULATION	RECEPTOR AGE	EXPOSURE POINT	PARAMETER CODE	PARAMETER DEFINITION	VALUE	UNITS	RATIONALE/ REFERENCE	INTAKE EQUATION/ MODEL NAME

USEPA, 1989. "Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (Part A)"; Office of Emergency and Remedial Response; EPA-540/1-89/002 (interim final); Washington, D.C., December.
USEPA, 1994. "Risk Updates No. 2"; USEPA Region I, Waste Management Division; August. Values from "Attachment 2" to Risk Updates No. 2.
USEPA, 1997. "Exposure Factors Handbook, Volume 1"; Office of Research and Development; EPA-600/P-95/002Fa; Washington, D.C., August.

[1] = The total RME exposure duration is 30 years, consistent with USEPA, 1994 The allocation of exposure duration for the three age groups is based on professional judgement.
[2] = Values derived in the Exposure Assessment section of this report.

Prepared by: SGH
Checked by: RAR

Table 4.2.RME
Values Used For Daily Intake Calculations
Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

SCENARIO TIMEFRAME: CURRENT/FUTURE
MEDIUM: SURFACE WATER
EXPOSURE MEDIUM: SURFACE WATER

EXPOSURE ROUTE	RECEPTOR POPULATION	RECEPTOR AGE	EXPOSURE POINT	PARAMETER CODE	PARAMETER DEFINITION	VALUE	UNITS	RATIONALE/ REFERENCE	INTAKE EQUATION/ MODEL NAME
INGESTION	RESIDENT	ADULT (age: 19 and above) (Swimming and Wading)	ASSAPUMPSET POND	CW	CHEMICAL CONCENTRATION IN WATER	chemical-specific	mg/L	EPC Table	INTAKE INGESTION
			GREYSTONE MILL POND	IRW	INGESTION RATE OF WATER	0.05	L/hour	USEPA, 1988	CW x IRW x FI x ET x EF x ED x CBW x EAT
			ALLENDALE POND	FI	FRACTION INGESTED	1	unitless	Professional Judgement	
			LYMAN MILL POND	EF	EXPOSURE FREQUENCY	52	event/yr	Professional Judgement	
			MANTON REACH	ED	EXPOSURE DURATION	12	yr	USEPA, 1994	
			DYERVILLE REACH	ET	EXPOSURE TIME	1	hour/event	USEPA, 1997	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				ATC	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				ATN	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1989	
		ADOLESCENT (ages 7 - 18) (Swimming and Wading)	ASSAPUMPSET POND	CW	CHEMICAL CONCENTRATION IN WATER	chemical-specific	mg/L	EPC Table	INTAKE INGESTION
			GREYSTONE MILL POND	IRW	INGESTION RATE OF WATER	0.05	L/hour	USEPA, 1988	CW x IRW x FI x ET x EF x ED x CBW x EAT
			ALLENDALE POND	FI	FRACTION INGESTED	1	unitless	Professional Judgement	
			LYMAN MILL POND	EF	EXPOSURE FREQUENCY	52	event/yr	Professional Judgement	
			MANTON REACH	ED	EXPOSURE DURATION	12	yr	USEPA, 1994	
			DYERVILLE REACH	ET	EXPOSURE TIME	1	hours/event	USEPA, 1997	
				BW	BODY WEIGHT	45	kg	USEPA, 1997	
				ATC	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				ATN	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1989	
		CHILD (age: 1 - 6) (Wading only)	ASSAPUMPSET POND	CW	CHEMICAL CONCENTRATION IN WATER	chemical-specific	mg/L	EPC Table	INTAKE INGESTION =
			GREYSTONE MILL POND	IRW	INGESTION RATE OF WATER	0.05	L/hour	USEPA, 1988	CW x IRW x FI x ET x EF x ED x CBW x EAT
			ALLENDALE POND	FI	FRACTION INGESTED	1	unitless	Professional Judgement	
			LYMAN MILL POND	EF	EXPOSURE FREQUENCY	52	event/yr	Professional Judgement	
			MANTON REACH	ED	EXPOSURE DURATION	6	yr	USEPA, 1994	
			DYERVILLE REACH	ET	EXPOSURE TIME	1	hours/event	USEPA, 1997	
				BW	BODY WEIGHT	15	kg	USEPA, 1994	
				ATC	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				ATN	AVERAGING TIME (NONCANCER)	2190	day	USEPA, 1989	
	RECREATIONAL ANGLER	ADULT (age: 19 and above) (Wading only)	ASSAPUMPSET POND	CW	CHEMICAL CONCENTRATION IN WATER	chemical-specific	mg/L	EPC Table	INTAKE INGESTION =
			GREYSTONE MILL POND	IRW	INGESTION RATE OF WATER	0.005	L/hour	USEPA, 1988	CW x IRW x FI x ET x EF x ED x CBW x EAT
			ALLENDALE POND	FI	FRACTION INGESTED	1	unitless	Professional Judgement	
			LYMAN MILL POND	EF	EXPOSURE FREQUENCY	14	event/yr	Professional Judgement	
			MANTON REACH	ED	EXPOSURE DURATION	12	yr	USEPA, 1994	
			DYERVILLE REACH	ET	EXPOSURE TIME	1	hours/event	Professional Judgement	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				ATC	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				ATN	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1989	
		ADOLESCENT (ages 7 - 18) (Wading only)	ASSAPUMPSET POND	CW	CHEMICAL CONCENTRATION IN WATER	chemical-specific	mg/L	EPC Table	INTAKE INGESTION
			GREYSTONE MILL POND	IRW	INGESTION RATE OF WATER	0.005	L/hour	USEPA, 1988	CW x IRW x FI x ET x EF x ED x CBW x EAT
			ALLENDALE POND	FI	FRACTION INGESTED	1	unitless	Professional Judgement	
			LYMAN MILL POND	EF	EXPOSURE FREQUENCY	14	event/yr	Professional Judgement	
			MANTON REACH	ED	EXPOSURE DURATION	12	yr	USEPA, 1994	
			DYERVILLE REACH	ET	EXPOSURE TIME	1	hours/event	Professional Judgement	
				BW	BODY WEIGHT	45	kg	USEPA, 1997	
				ATC	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				ATN	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1989	

Table 4.2.RME
Values Used For Daily Intake Calculations
Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

SCENARIO TIMEFRAME: CURRENT/FUTURE
MEDIUM: SURFACE WATER
EXPOSURE MEDIUM: SURFACE WATER

EXPOSURE ROUTE	RECEPTOR POPULATION	RECEPTOR AGE	EXPOSURE POINT	PARAMETER CODE	PARAMETER DEFINITION	VALUE	UNITS	RATIONALE/ REFERENCE	INTAKE EQUATION/ MODEL NAME
DERMAL	RESIDENT	ADULT (ages 19 and above) (Swimming and Wading)	ASSAPUMPSET POND	CW	CHEMICAL CONCENTRATION IN WATER	chemical specific	mg/l	EPC Table	INTAKE-DERMAL
			GREYSTONE MILL POND	PC event	PERMEABILITY CONSTANT PER EVENT	chemical-specific	cm	USEPA, 2001	CW x SA x PC event x ET x ED x CF x BW x ATAT
			ALLENDALE POND	SA	SKIN SURFACE AREA AVAILABLE FOR CO	8145	cm2	USEPA, 2001[4]	PC event = PC x ET, calculated in PC event table
			LYMAN MILL POND	ET	EXPOSURE TIME	1	hr/event	USEPA, 1997[5]	
			MANTON REACH	EF	EXPOSURE FREQUENCY	52	event/yr	Professional Judgement[1]	
			DYERVILLE REACH	ED	EXPOSURE DURATION	12	yr	USEPA, 1994[1]	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				ATC	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				ATN	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.001	l/cm3		
		ADOLESCENT (ages 7 - 18) (Swimming and Wading)	ASSAPUMPSET POND	CW	CHEMICAL CONCENTRATION IN WATER	chemical-specific	mg/l	EPC Table	INTAKE-DERMAL =
			GREYSTONE MILL POND	PC event	PERMEABILITY CONSTANT PER EVENT	chemical-specific	cm	USEPA, 2001	CW x SA x PC event x EF x ED x CF x BW x ATAT
			ALLENDALE POND	SA	SKIN SURFACE AREA AVAILABLE FOR CO	6320	cm2	USEPA, 2001	PC event = PC x ET, calculated in PC event table
			LYMAN MILL POND	ET	EXPOSURE TIME	1	hr/event	USEPA, 1997[5]	
			MANTON REACH	EF	EXPOSURE FREQUENCY	52	event/yr	Professional Judgement[1]	
			DYERVILLE REACH	ED	EXPOSURE DURATION	12	yr	USEPA, 1994[1]	
				BW	BODY WEIGHT	45	kg	USEPA, 1997	
				ATC	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				ATN	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.001	l/cm3		
		CHILD (ages 1 - 6) (Wading only)	ASSAPUMPSET POND	CW	CHEMICAL CONCENTRATION IN WATER	chemical-specific	mg/l	EPC Table	INTAKE-DERMAL
			GREYSTONE MILL POND	PC event	PERMEABILITY CONSTANT PER EVENT	chemical-specific	cm	USEPA, 2001	CW x SA x PC event x EF x ED x CF x BW x ATAT
			ALLENDALE POND	SA	SKIN SURFACE AREA AVAILABLE FOR CO	2678	cm2	USEPA, 1997	PC event = PC x ET, calculated in PC event table
			LYMAN MILL POND	ET	EXPOSURE TIME	1	hr/event	USEPA, 1997[5]	
			MANTON REACH	EF	EXPOSURE FREQUENCY	52	event/yr	Professional Judgement	
			DYERVILLE REACH	ED	EXPOSURE DURATION	6	yr	USEPA, 1994	
				BW	BODY WEIGHT	15	kg	USEPA, 1994	
				ATC	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				ATN	AVERAGING TIME (NONCANCER)	2190	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.001	l/cm3		
	RECREATIONAL ANGLER	ADULT (ages 19 and above) (Wading only)	ASSAPUMPSET POND	CW	CHEMICAL CONCENTRATION IN WATER	chemical specific	mg/l	EPC Table	INTAKE-DERMAL =
			GREYSTONE MILL POND	PC event	PERMEABILITY CONSTANT PER EVENT	chemical specific	cm	USEPA, 2001	CW x SA x PC event x EF x ED x CF x BW x ATAT
			ALLENDALE POND	SA	SKIN SURFACE AREA AVAILABLE FOR CO	8700	cm2	USEPA, 1997[4]	PC event = PC x ET, calculated in PC event table
			LYMAN MILL POND	ET	EXPOSURE TIME	1	hr/event	Professional Judgement[1]	
			MANTON REACH	EF	EXPOSURE FREQUENCY	13	event/yr	Professional Judgement[1]	
			DYERVILLE REACH	ED	EXPOSURE DURATION	12	yr	USEPA, 1994[1]	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				ATC	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				ATN	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.001	l/cm3		
		ADOLESCENT (ages 7 - 18) (Wading only)	ASSAPUMPSET POND	CW	CHEMICAL CONCENTRATION IN WATER	chemical-specific	mg/l	EPC Table	INTAKE-DERMAL
			GREYSTONE MILL POND	PC event	PERMEABILITY CONSTANT PER EVENT	chemical-specific	cm	USEPA, 2001	CW x SA x PC event x EF x ED x CF x BW x ATAT
			ALLENDALE POND	SA	SKIN SURFACE AREA AVAILABLE FOR CO	6260	cm2	USEPA, 1997[4]	PC event = PC x ET, calculated in PC event table
			LYMAN MILL POND	ET	EXPOSURE TIME	1	hr/event	Professional Judgement[1]	
			MANTON REACH	EF	EXPOSURE FREQUENCY	13	event/yr	Professional Judgement[1]	
			DYERVILLE REACH	ED	EXPOSURE DURATION	12	yr	USEPA, 1994[1]	
				BW	BODY WEIGHT	45	kg	USEPA, 1997	
				ATC	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				ATN	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.001	l/cm3		

Table 4.2.RME
Values Used For Daily Intake Calculations
Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

SCENARIO TIMEFRAME: CURRENT/FUTURE
MEDIUM: SURFACE WATER
EXPOSURE MEDIUM: SURFACE WATER

EXPOSURE ROUTE	RECEPTOR POPULATION	RECEPTOR AGE	EXPOSURE POINT	PARAMETER CODE	PARAMETER DEFINITION	VALUE	UNITS	RATIONALE/ REFERENCE	INTAKE EQUATION/ MODEL NAME

USEPA, 1988. "Superfund Exposure Assessment Manual". Office of Remedial Response, EPA-540-1-88/001, Washington, D.C.
USEPA, 1989. "Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (Part A)", Office of Emergency and Remedial Response, EPA-540-1-89/002 (interim final), Washington, D.C., December.
USEPA, 1994. "Risk Updates No. 2". USEPA Region 1, Waste Management Division, August. Values from "Attachment 2" to Risk Updates No. 2.
USEPA, 1997. "Exposure Factors Handbook, Volume 1". Office of Research and Development, EPA-600/P-95/002Fa, Washington, D.C.; August.
USEPA, 2001. "Risk Assessment Guidance for Superfund. Volume I. Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim". EPA/540/R/99/005.

1 - Value for swimming used.
2 - 100% of daily incidental intake of surface water is attributable to incidental ingestion at the Site.
3 - Receptor assumed to visit area to wade or swim 4 days per week, June through August. Wading is expected to occur 3 of the 4 days each week and swimming 1 of the days each week. Sediment contact would only occur during wading (not swimming) activities. The child value is based on assumed wading exposure 4 days per week, June through August (the child is assumed to wade while adolescents and adults are swimming).
4 - Representing ages 19 and above of a 30-year residential exposure duration.
5 - Recommended value for swimming exposures.
6 - The total RME exposure duration is 30 years, consistent with USEPA, 1994. The allocation of exposure duration for the three age groups is based on professional judgement.
7 - Values are the average of 50th percentile body weights for males and females, ages 7 through 18.
8 - Value represents a weighted average for swimming and wading scenarios. Whole body surface area values used for exposures during swimming (13 days): value for the adolescent is the average of 50th percentile whole body surface areas of males ages 7 through 18 (14,200 cm²). Surface area values used for exposure during wading (39 days) are the 50th percentile surface areas of males ages 7 through 18 for the hands, lower legs and feet (3,574 cm²). Whole-body surface area values used for exposures during swimming (13 days): value for the adult is 18,000 cm². Surface area values used for exposure during wading (39 days) for the adult assume hands, lower legs and feet (4,860 cm²).
9 - Values are the average of 50th percentile body surface areas for body parts that may substantially contact surface water while wading (one or more of: hands, legs, and feet) for males, ages 7 through 18.
10 - It is assumed that anglers would wade during fishing. Incidental ingestion of surface water during this activity is assumed to be 0 cm. 1.10 - value for swimming exposures (USEPA, 1988) is used.
11 - Value based on assumed exposure 1 day per week, June through August. Potential contact with surface water and sediment would not occur during months when the weather and water temperature are colder.
12 - It is assumed that wading to catch fish may occur for one hour (recreational) and two hours (subsistence).
13 - Value based on assumed exposure 6 days per week, May through September, under assumption that subsistence anglers would fish year-round, except during fall/winter temperatures.
14 - It is assumed that receptors may wade during fishing. Exposure to water assumed to occur across feet, legs, and hands. Values are the average of 50th percentile body surface areas for these body parts for ages indicated.

mg - milligrams
cm² - square centimeters
cm³ - cubic centimeters
L - liter
kg - kilograms

Prepared by: KLA
Checked by: RMR

Table 4.3.RME
Values Used For Daily Intake Calculations
Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

SCENARIO TIMEFRAME: CURRENT/FUTURE
MEDIUM: SEDIMENT
EXPOSURE MEDIUM: SEDIMENT

EXPOSURE ROUTE	RECEPTOR POPULATION	RECEPTOR AGE	EXPOSURE POINT	PARAMETER CODE	PARAMETER DEFINITION	VALUE	UNITS	RATIONALE/ REFERENCE	INTAKE EQUATION/ MODEL NAME
INGESTION	RESIDENT	ADULT	ASSAPUMPSET POND	CS	CHEMICAL CONCENTRATION IN SEDIMEN	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
		(ages 19 and above)	GREYSTONE MILL POND	IR-S	INGESTION RATE OF SEDIMENT	100	mg/day	USEPA, 1994[1]	CS x IR-S x FI x EF x ED x CF x 1/BW x 1/AT
			ALLENDALE POND	FI	FRACTION INGESTED	1	unitless	Professional Judgement	
			LYMAN MILL POND	EF	EXPOSURE FREQUENCY	39	day/yr	Professional Judgement[3]	
			MANTON REACH	ED	EXPOSURE DURATION	12	yr	USEPA, 1994[4,5]	
			DYERVILLE REACH	BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
		ADOLESCENT	ASSAPUMPSET POND	CS	CHEMICAL CONCENTRATION IN SEDIMEN	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
		(ages 7 - 18)	GREYSTONE MILL POND	IR-S	INGESTION RATE OF SEDIMENT	100	mg/day	USEPA, 1994[1]	CS x IR-S x FI x EF x ED x CF x 1/BW x 1/AT
			ALLENDALE POND	FI	FRACTION INGESTED	1	unitless	Professional Judgement	
			LYMAN MILL POND	EF	EXPOSURE FREQUENCY	39	day/yr	Professional Judgement[3]	
			MANTON REACH	ED	EXPOSURE DURATION	12	yr	USEPA, 1994[5]	
			DYERVILLE REACH	BW	BODY WEIGHT	45	kg	USEPA, 1997[6]	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
		CHILD	ASSAPUMPSET POND	CS	CHEMICAL CONCENTRATION IN SEDIMEN	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
		(ages 1 - 6)	GREYSTONE MILL POND	IR-S	INGESTION RATE OF SEDIMENT	200	mg/day	USEPA, 1994[1]	CS x IR-S x FI x EF x ED x CF x 1/BW x 1/AT
			ALLENDALE POND	FI	FRACTION INGESTED	1	unitless	Professional Judgement	
			LYMAN MILL POND	EF	EXPOSURE FREQUENCY	52	day/yr	Professional Judgement[3]	
			MANTON REACH	ED	EXPOSURE DURATION	6	yr	USEPA, 1994[5]	
			DYERVILLE REACH	BW	BODY WEIGHT	15	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	2190	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
	RECREATIONAL ANGLER	ADULT	ASSAPUMPSET POND	CS	CHEMICAL CONCENTRATION IN SEDIMEN	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
		(ages 19 and above)	GREYSTONE MILL POND	IR-S	INGESTION RATE OF SEDIMENT	100	mg/day	USEPA, 1994[1]	CS x IR-S x FI x EF x ED x CF x 1/BW x 1/AT
			ALLENDALE POND	FI	FRACTION INGESTED	0.5	unitless	Professional Judgement[2]	
			LYMAN MILL POND	EF	EXPOSURE FREQUENCY	13	day/yr	Professional Judgement[11]	
			MANTON REACH	ED	EXPOSURE DURATION	12	yr	USEPA, 1994[5]	
			DYERVILLE REACH	BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
		ADOLESCENT	ASSAPUMPSET POND	CS	CHEMICAL CONCENTRATION IN SEDIMEN	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
		(ages 7 - 18)	GREYSTONE MILL POND	IR-S	INGESTION RATE OF SEDIMENT	100	mg/day	USEPA, 1994[1]	CS x IR-S x FI x EF x ED x CF x 1/BW x 1/AT
			ALLENDALE POND	FI	FRACTION INGESTED	0.5	unitless	Professional Judgement[2]	
			LYMAN MILL POND	EF	EXPOSURE FREQUENCY	13	day/yr	Professional Judgement[11]	
			MANTON REACH	ED	EXPOSURE DURATION	12	yr	USEPA, 1994[5]	
			DYERVILLE REACH	BW	BODY WEIGHT	45	kg	USEPA, 1997[6]	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		

Table 4.3.RME
Values Used For Daily Intake Calculations
Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

SCENARIO TIMEFRAME: CURRENT/FUTURE
MEDIUM: SEDIMENT
EXPOSURE MEDIUM: SEDIMENT

EXPOSURE ROUTE	RECEPTOR POPULATION	RECEPTOR AGE	EXPOSURE POINT	PARAMETER CODE	PARAMETER DEFINITION	VALUE	UNITS	RATIONALE/ REFERENCE	INTAKE EQUATION/ MODEL NAME
DERMAL	RESIDENT	ADULT	ASSAPUMPSET POND	CS	CHEMICAL CONCENTRATION IN SEDIME	chemical-specific	mg/kg	EPC Table	INTAKE-DERMAL =
		(ages 19 and above)	GREYSTONE MILL POND	AF	ADHERENCE FACTOR	0.07	mg/cm2	USEPA, 2001[9]	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
		(Wading)	ALLENDALE POND	AbF	ABSORPTION FACTOR	chemical-specific	unitless	USEPA, 2001[9]	
			LYMAN MILL POND	SA	SKIN SURFACE AREA AVAILABLE FOR C(	4860	cm2/day	USEPA, 1997[7]	Where DAevent =
			MANTON REACH	EV	EVENT DAY	1	unitless	Professional Judgement	CS x AF x AbF x CF
			DYERVILLE REACH	EF	EXPOSURE FREQUENCY	39	day/yr	Professional Judgement[1]	
				ED	EXPOSURE DURATION	12	yr	USEPA, 1994[4,5]	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
		ADOLESCENT	ASSAPUMPSET POND	CS	CHEMICAL CONCENTRATION IN SEDIME	chemical-specific	mg/kg	EPC Table	INTAKE-DERMAL =
		(ages 7 - 18)	GREYSTONE MILL POND	AF	ADHERENCE FACTOR	0.2	mg/cm2	USEPA, 2001[9]	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
		(Wading)	ALLENDALE POND	AbF	ABSORPTION FACTOR	chemical-specific	unitless	USEPA, 2001[9]	
			LYMAN MILL POND	SA	SKIN SURFACE AREA AVAILABLE FOR C(	3574	cm2/day	USEPA, 1997[7]	Where DAevent =
			MANTON REACH	EV	EVENT DAY	1	unitless	Professional Judgement	CS x AF x AbF x CF
			DYERVILLE REACH	EF	EXPOSURE FREQUENCY	39	day/yr	Professional Judgement[1]	
				ED	EXPOSURE DURATION	12	yr	USEPA, 1994[5]	
				BW	BODY WEIGHT	45	kg	USEPA, 1997[6]	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
		CHILD	ASSAPUMPSET POND	CS	CHEMICAL CONCENTRATION IN SEDIME	chemical-specific	mg/kg	EPC Table	INTAKE-DERMAL =
		(ages 1 - 6)	GREYSTONE MILL POND	AF	ADHERENCE FACTOR	0.2	mg/cm2	USEPA, 2001[9]	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
		(Wading)	ALLENDALE POND	AbF	ABSORPTION FACTOR	chemical-specific	unitless	USEPA, 2001[9]	
			LYMAN MILL POND	SA	SKIN SURFACE AREA AVAILABLE FOR C(	2800	cm2/day	USEPA, 2001[10]	Where DAevent =
			MANTON REACH	EV	EVENT DAY	1	unitless	Professional Judgement	CS x AF x AbF x CF
			DYERVILLE REACH	EF	EXPOSURE FREQUENCY	52	day/yr	Professional Judgement[1]	
				ED	EXPOSURE DURATION	6	yr	USEPA, 1994[5]	
				BW	BODY WEIGHT	15	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	2190	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
	RECREATIONAL ANGLER	ADULT	ASSAPUMPSET POND	CS	CHEMICAL CONCENTRATION IN SEDIME	chemical-specific	mg/kg	EPC Table	INTAKE-DERMAL =
		(ages 19 and above)	GREYSTONE MILL POND	AF	ADHERENCE FACTOR	0.07	mg/cm2	USEPA, 2001[9]	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
			ALLENDALE POND	AbF	ABSORPTION FACTOR	chemical-specific	unitless	USEPA, 2001[9]	
			LYMAN MILL POND	SA	SKIN SURFACE AREA AVAILABLE FOR C(	4860	cm2/day	USEPA, 1997[7]	Where DAevent =
			MANTON REACH	EV	EVENT DAY	1	unitless	Professional Judgement	CS x AF x AbF x CF
			DYERVILLE REACH	EF	EXPOSURE FREQUENCY	13	day/yr	Professional Judgement[11]	
				ED	EXPOSURE DURATION	12	yr	USEPA, 1994[5]	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		

Table 4.3.RME
Values Used For Daily Intake Calculations
Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

SCENARIO TIMEFRAME: CURRENT/FUTURE
MEDIUM: SEDIMENT
EXPOSURE MEDIUM: SEDIMENT

EXPOSURE ROUTE	RECEPTOR POPULATION	RECEPTOR AGE	EXPOSURE POINT	PARAMETER CODE	PARAMETER DEFINITION	VALUE	UNITS	RATIONALE/ REFERENCE	INTAKE EQUATION/ MODEL NAME
DERMAL	RECREATIONAL ANGLER	ADOLESCENT	ASSAPUMPSET POND	CS	CHEMICAL CONCENTRATION IN SEDIMEN	chemical-specific	mg/kg	EPC Table	INTAKE-DERMAL =
(cont)	(cont)	(ages 7 - 18)	GREYSTONE MILL POND	AF	ADHERENCE FACTOR	0.2	mg/cm2	USEPA, 2001[9]	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
			ALLENDALE POND	AbF	ABSORPTION FACTOR	chemical-specific	unitless	USEPA, 2001[10]	
			LYMAN MILL POND	SA	SKIN SURFACE AREA AVAILABLE FOR CO	3574	cm2/day	USEPA, 1997[7]	Where DAevent =
			MANTON REACH	EV	EVENT DAY	1	unitless	Professional Judgement	CS x AF x AbF x CF
			DYERVILLE REACH	EF	EXPOSURE FREQUENCY	13	day/yr	Professional Judgement[11]	
				ED	EXPOSURE DURATION	12	yr	USEPA, 1994[5]	
				BW	BODY WEIGHT	45	kg	USEPA, 1997[6]	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		

USEPA, 1989. "Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (Part A)"; Office of Emergency and Remedial Response, EPA-540/1-89/002 (interim final); Washington, D.C., December.
USEPA, 1994. "Risk Updates No. 2"; USEPA Region I, Waste Management Division; August. Values from "Attachment 2" to Risk Updates No. 2.
USEPA, 1997 "Exposure Factors Handbook, Volume 1", Office of Research and Development, EPA-600/P-95/002Fa, Washington, D.C ; August.
USEPA, 2001 "Risk Assessment Guidance for Superfund. Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005

1 - Soil ingestion rate used because ingestion rates for sediment are not available.
2 - 50% of daily incidental intake of soil and sediment is attributable to incidental sediment ingestion
3 - Receptor assumed to visit area to wade or swim 4 days per week, June through August. Wading is expected to occur 3 of the 4 days each week and swimming 1 of the days each week. Sediment contact would only occur during wading (not swimming) activities. The child value is based on assumed wading exposure 4 days per week, June through August (the child is assumed to wade while adolescents and adults are swimming).
4 - Representing ages 19 and above of a 30-year residential exposure duration
5 - The total RME exposure duration is 30 years, consistent with USEPA, 1994. The allocation of exposure duration for the three age groups is based on professional judgement.
6 - Values are the average of 50th percentile body weights for males and females ages 7 through 18.
7 - Values are the average of 50th percentile body surface areas (sum of areas for hands, lower legs, and feet) for males in the various age groups indicated.
8 - Values for residential exposure to soil used as conservative estimate of potential sediment adherence; sediment is submerged, so adherence is unlikely.
9 - Values are provided (Table 3-4 of USEPA, 2001) for arsenic, cadmium, chlordane, 2,4-D, DDT (used for DDD, DDE), TCDD, lindane (used for other BHC isomers), PAHs, PCBs, and pentachlorophenol. A single value is listed for all other SVOCs. No values are listed for VOCs, other pesticides, or other inorganics and, subsequently, no value will be assigned to the ABSd term for COPCs falling into those categories.
10 - Value is the residential soil RME value; it is used to accommodate the possibility that a young child may play in shallow water and contact sediment over more body parts than just feet, lower legs, and hands.
11 - Value based on assumed exposure 1 day per week, June through August. Potential contact with surface water and sediment would not occur during months when the weather and water temperature are colder.
12 - Value based on assumed exposure 6 days per week, May through September. Potential contact with surface water and sediment would not occur during months when the weather and water temperature are colder.

mg - milligrams
cm^2 - square centimeters
kg - kilograms

Prepared by: KJA
Checked by: RAR

Table 4.4.RME
Values Used For Daily Intake Calculations
Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

SCENARIO TIMEFRAME: CURRENT/FUTURE
MEDIUM: SOIL
EXPOSURE MEDIUM: BANK SURFACE SOIL

EXPOSURE ROUTE	RECEPTOR POPULATION	RECEPTOR AGE	EXPOSURE POINT	PARAMETER CODE	PARAMETER DEFINITION	VALUE	UNITS	RATIONALE/ REFERENCE	INTAKE EQUATION/ MODEL NAME
INGESTION	RESIDENT	ADULT	GREYSTONE MILL POND	CS	CHEMICAL CONCENTRATION IN SOIL	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
		(ages 19 and above)	ALLENDALE POND	IR-S	INGESTION RATE OF SOIL	100	mg/day	USEPA, 1994[1]	CS x IR-S x FI x EF x ED x CF x 1/BW x 1/AT
				FI	FRACTION INGESTED	1	unitless	Professional Judgement	
				EF	EXPOSURE FREQUENCY	78	day/yr	Professional Judgement[5]	
				ED	EXPOSURE DURATION	12	yr	USEPA, 1994[2,4]	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
		ADOLESCENT	GREYSTONE MILL POND	CS	CHEMICAL CONCENTRATION IN SOIL	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
		(ages 7 - 18)	ALLENDALE POND	IR-S	INGESTION RATE OF SOIL	100	mg/day	USEPA, 1994[1]	CS x IR-S x FI x EF x ED x CF x 1/BW x 1/AT
				FI	FRACTION INGESTED	1	unitless	Professional Judgement	
				EF	EXPOSURE FREQUENCY	78	day/yr	Professional Judgement[5]	
				ED	EXPOSURE DURATION	12	yr	USEPA, 1994[4]	
				BW	BODY WEIGHT	45	kg	USEPA, 1997[6]	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
		CHILD	GREYSTONE MILL POND	CS	CHEMICAL CONCENTRATION IN SOIL	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
		(ages 1 - 6)	ALLENDALE POND	IR-S	INGESTION RATE OF SOIL	200	mg/day	USEPA, 1994[1]	CS x IR-S x FI x EF x ED x CF x 1/BW x 1/AT
				FI	FRACTION INGESTED	1	unitless	Professional Judgement	
				EF	EXPOSURE FREQUENCY	78	day/yr	Professional Judgement[5]	
				ED	EXPOSURE DURATION	6	yr	USEPA, 1994[4]	
				BW	BODY WEIGHT	15	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	2190	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
	RECREATIONAL ANGLER	ADULT	GREYSTONE MILL POND	CS	CHEMICAL CONCENTRATION IN SOIL	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
		(ages 19 and above)	ALLENDALE POND	IR-S	INGESTION RATE OF SOIL	100	mg/day	USEPA, 1994[1]	CS x IR-S x FI x EF x ED x CF x 1/BW x 1/AT
				FI	FRACTION INGESTED	0.5	unitless	Professional Judgement[7]	
				EF	EXPOSURE FREQUENCY	13	day/yr	Professional Judgement[11]	
				ED	EXPOSURE DURATION	12	yr	USEPA, 1994[4]	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
		ADOLESCENT	GREYSTONE MILL POND	CS	CHEMICAL CONCENTRATION IN SOIL	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
		(ages 7 - 18)	ALLENDALE POND	IR-S	INGESTION RATE OF SOIL	100	mg/day	USEPA, 1994[1]	CS x IR-S x FI x EF x ED x CF x 1/BW x 1/AT
				FI	FRACTION INGESTED	0.5	unitless	Professional Judgement[7]	
				EF	EXPOSURE FREQUENCY	13	day/yr	Professional Judgement[11]	
				ED	EXPOSURE DURATION	12	yr	USEPA, 1994[4]	
				BW	BODY WEIGHT	45	kg	USEPA, 1997[6]	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		

Table 4.4.RME
Values Used For Daily Intake Calculations
Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

SCENARIO TIMEFRAME: CURRENT/FUTURE
MEDIUM: SOIL
EXPOSURE MEDIUM: BANK SURFACE SOIL

EXPOSURE ROUTE	RECEPTOR POPULATION	RECEPTOR AGE	EXPOSURE POINT	PARAMETER CODE	PARAMETER DEFINITION	VALUE	UNITS	RATIONALE/ REFERENCE	INTAKE EQUATION/ MODEL NAME
DERMAL	RESIDENT	ADULT	GREYSTONE MILL POND	CS	CHEMICAL CONCENTRATION IN SOIL	chemical-specific	mg/kg	EPC Table	INTAKE-DERMAL =
		(ages 19 and above)	ALLENDALE POND	AF	ADHERENCE FACTOR	0.07	mg/cm2	USEPA, 2001[8]	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				AbF	ABSORPTION FACTOR	chemical-specific	unitless	USEPA, 2001[9]	
				SA	SKIN SURFACE AREA AVAILABLE FOR CO	5700	cm2/day	USEPA, 2001[10]	Where DAevent =
				EV	EVENT DAY	1	unitless	Professional Judgement	CS x AF x AbF x CF
				EF	EXPOSURE FREQUENCY	78	day/yr	Professional Judgement[1]	
				ED	EXPOSURE DURATION	12	yr	USEPA, 1994[2,3]	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
		ADOLESCENT	GREYSTONE MILL POND	CS	CHEMICAL CONCENTRATION IN SOIL	chemical-specific	mg/kg	EPC Table	INTAKE-DERMAL =
		(ages 7 - 18)	ALLENDALE POND	AF	ADHERENCE FACTOR	0.2	mg/cm2	USEPA, 2001[8]	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				AbF	ABSORPTION FACTOR	chemical-specific	unitless	USEPA, 2001[9]	
				SA	SKIN SURFACE AREA AVAILABLE FOR CO	4800	cm2/day	USEPA, 1997[7]	Where DAevent =
				EV	EVENT DAY	1	unitless	Professional Judgement	CS x AF x AbF x CF
				EF	EXPOSURE FREQUENCY	78	day/yr	Professional Judgement[1]	
				ED	EXPOSURE DURATION	12	yr	USEPA, 1994[3]	
				BW	BODY WEIGHT	45	kg	USEPA, 1997[6]	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
		CHILD	GREYSTONE MILL POND	CS	CHEMICAL CONCENTRATION IN SOIL	chemical-specific	mg/kg	EPC Table	INTAKE-DERMAL =
		(ages 1 - 6)	ALLENDALE POND	AF	ADHERENCE FACTOR	0.2	mg/cm2	USEPA, 2001[8]	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				AbF	ABSORPTION FACTOR	chemical-specific	unitless	USEPA, 2001[9]	
				SA	SKIN SURFACE AREA AVAILABLE FOR CO	2800	cm2/day	USEPA, 2001[10]	Where DAevent =
				EV	EVENT DAY	1	unitless	Professional Judgement	CS x AF x AbF x CF
				EF	EXPOSURE FREQUENCY	78	day/yr	Professional Judgement[1]	
				ED	EXPOSURE DURATION	6	yr	USEPA, 1994[4]	
				BW	BODY WEIGHT	15	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	2190	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
	RECREATIONAL ANGLER	ADULT	GREYSTONE MILL POND	CS	CHEMICAL CONCENTRATION IN SOIL	chemical-specific	mg/kg	EPC Table	INTAKE-DERMAL =
		(ages 19 and above)	ALLENDALE POND	AF	ADHERENCE FACTOR	0.07	mg/cm2	USEPA, 2001[8]	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				AbF	ABSORPTION FACTOR	chemical-specific	unitless	USEPA, 2001[9]	
				SA	SKIN SURFACE AREA AVAILABLE FOR CO	5700	cm2/day	USEPA, 2001[10]	Where DAevent =
				EV	EVENT DAY	1	unitless	Professional Judgement	CS x AF x AbF x CF
				EF	EXPOSURE FREQUENCY	13	day/yr	Professional Judgement[11]	
				ED	EXPOSURE DURATION	12	yr	USEPA, 1994[3]	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		

Table 4.4.RME
Values Used For Daily Intake Calculations
Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

SCENARIO TIMEFRAME: CURRENT/FUTURE
MEDIUM: SOIL
EXPOSURE MEDIUM: BANK SURFACE SOIL

EXPOSURE ROUTE	RECEPTOR POPULATION	RECEPTOR AGE	EXPOSURE POINT	PARAMETER CODE	PARAMETER DEFINITION	VALUE	UNITS	RATIONALE/ REFERENCE	INTAKE EQUATION/ MODEL NAME
DERMAL	RECREATIONAL ANGLER	ADOLESCENT	GREYSTONE MILL POND	CS	CHEMICAL CONCENTRATION IN SOIL	chemical-specific	mg/kg	EPC Table	INTAKE-DERMAL =
(cont)	(cont)	(ages 7 - 18)	ALLENDALE POND	AF	ADHERENCE FACTOR	0.2	mg/cm2	USEPA, 2001[8]	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				AbF	ABSORPTION FACTOR	chemical-specific	unitless	USEPA, 2001[9]	
				SA	SKIN SURFACE AREA AVAILABLE FOR CO	4800	cm2/day	USEPA, 1997[7]	Where DAevent =
				EV	EVENT DAY	1	unitless	Professional Judgement	CS x AF x AbF x CF
				EF	EXPOSURE FREQUENCY	13	day/yr	Professional Judgement[11]	
				ED	EXPOSURE DURATION	12	yr	USEPA, 1994[5]	
				BW	BODY WEIGHT	45	kg	USEPA, 1997[6]	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		

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

USEPA, 1994. "Risk Updates No. 2", USEPA Region I, Waste Management Division; August Values from "Attachment 2" to Risk Updates No. 2.

USEPA, 1997 "Exposure Factors Handbook, Volume 1"; Office of Research and Development, EPA-600/P-95/002Fa, Washington, D.C.; August

USEPA, 2001 "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005

1 - Soil ingestion rate used.
2 - 50% of daily incidental intake of soil and sediment is attributable to incidental ingestion of soil at bank
3 - Value based on exposure during wading, swimming, and walking/exploring banks (4 days per week June - August), and walking/exploring banks (2 days per week May, Sept, Oct)
4 - Representing ages 19 and above of a 30-year residential exposure duration.
5 - The total RME exposure duration is 30 years, consistent with USEPA, 1994. The allocation of exposure duration for the three age groups is based on professional judgement.
6 - Values are the average of 50th percentile body weights for males and females ages 7 through 18.
7 - Values are the average of 50th percentile body surface areas (sum of areas for face, hands, forearms, lower legs, and feet) for males in the various age groups indicated.
8 - Values for residential exposure to soil used as conservative estimate of potential soil adherence associated with recreational walking/exploring.
9 - Values are provided (Table 3-4 of USEPA, 2001) for arsenic, cadmium, chlordane, 2,4-D, DDT (used for DDD, DDE), TCDD, lindane (used for other BHC isomers), PAHs, PCBs, and pentachlorophenol A single value is listed for all other SVOCs. No values are listed for VOCs, other pesticides, or other inorganics and, subsequently, no value will be assigned to the ABSd term for COPCs falling into those categories.
10 - Values for residential exposure to soil used as conservative estimate of potential surface area exposed to soil during recreational walking/exploring.
11 - Contact with soil assumed to occur when accessing water bodies for angling (assumed exposure 1 day per week, June through August).
12 - Contact with soil assumed to occur when accessing water bodies for angling; this is assumed to occur 6 days per week, April through November

mg - milligrams
cm^2 - square centimeters
kg - kilograms

Prepared by: KJA
Checked by: RAR

Table 4.5.RME
Values Used For Daily Intake Calculations
Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

SCENARIO TIMEFRAME: CURRENT/FUTURE
MEDIUM: SOIL
EXPOSURE MEDIUM: SURFACE SOIL

EXPOSURE ROUTE	RECEPTOR POPULATION	RECEPTOR AGE	EXPOSURE POINT	PARAMETER CODE	PARAMETER DEFINITION	VALUE	UNITS	RATIONALE/ REFERENCE	INTAKE EQUATION/ MODEL NAME
INGESTION	COMMERCIAL / INDUSTRIAL WORKER	ADULT	FOGARTY CENTER	CS	CHEMICAL CONCENTRATION IN SOIL	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
				IR-S	INGESTION RATE OF SOIL	100	mg/day	USEPA, 1994[1]	CS x IR-S x FI x EF x ED x CF x 1/BW x 1/AT
				FI	FRACTION INGESTED	0.5	unitless	Professional Judgement[2]	
				EF	EXPOSURE FREQUENCY	150	day/yr	USEPA, 1994	
				ED	EXPOSURE DURATION	25	yr	USEPA, 1994	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	9125	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
DERMAL	COMMERCIAL / INDUSTRIAL WORKER	ADULT	FOGARTY CENTER	CS	CHEMICAL CONCENTRATION IN SOIL	chemical-specific	mg/kg	EPC Table	INTAKE-DERMAL =
				AF	ADHERENCE FACTOR	0.2	mg/cm2	USEPA, 2001[1]	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				AbF	ABSORPTION FACTOR	chemical-specific	unitless	USEPA, 2001[3]	
				SA	SKIN SURFACE AREA AVAILABLE FOR CC	3300	cm2/day	USEPA, 2001	Where DAevent =
				EV	EVENT DAY	1	unitless	Professional Judgement	CS x AF x AbF x CF
				EF	EXPOSURE FREQUENCY	150	day/yr	USEPA, 1994	
				ED	EXPOSURE DURATION	25	yr	USEPA, 1994	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	9125	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		

USEPA, 1989 "Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (Part A)"; Office of Emergency and Remedial Response; EPA-540/1-89/002 (interim final); Washington, D.C., December.
USEPA, 1994 "Risk Updates No. 2"; USEPA Region I, Waste Management Division; August. Values from "Attachment 2" to Risk Updates No 2.
USEPA, 1997 "Exposure Factors Handbook, Volume 1"; Office of Research and Development; EPA-600/P-95/002Fa; Washington, D.C ; August.
USEPA, 2001. "Risk Assessment Guidance for Superfund Volume I. Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim EPA/540/R/99/005
1 - Soil ingestion rate used.
2 - 50% of daily incidental intake of soil and sediment is attributable to incidental ingestion of soil at bank.
3 - Values are provided (Table 3-4 of USEPA, 2001) for arsenic, cadmium, chlordane, 2,4-D, DDT (used for DDD, DDE), TCDD, lindane (used for other BHC isomers), PAHs, PCBs, and pentachlorophenol A single value is listed for all other SVOCs. No values are listed for VOCs, other pesticides, or other inorganics and, subsequently, no value will be assigned to the ABSd term for COPCs falling into those categories.

mg - milligrams
cm^2 - square centimeters
kg - kilograms

Prepared by: KJA
Checked by: RAR

Table 4.1.CT
Values Used For Daily Intake Calculations
Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

SCENARIO TIMEFRAME: CURRENT/FUTURE
MEDIUM: BIOTA
EXPOSURE MEDIUM: COMBINED FISH DIET

EXPOSURE ROUTE	RECEPTOR POPULATION	RECEPTOR AGE	EXPOSURE POINT	PARAMETER CODE	PARAMETER DEFINITION	VALUE	UNITS	RATIONALE/ REFERENCE	INTAKE EQUATION/ MODEL NAME
INGESTION	RESIDENT	ADULT	ASSAPUMPSET POND	CB	CHEMICAL CONCENTRATION IN BIOTA	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
			GREYSTONE MILL POND	IR-B	INGESTION RATE OF BIOTA	8.9	g/day	Exposure Assessment	CB x IR-B x FI x EF x ED x CF x 1/BW x 1/AT
			ALLENDALE POND	FI	FRACTION INGESTED	1	unitless	Assumption	
			LYMAN MILL POND	EF	EXPOSURE FREQUENCY	350	day/yr	USEPA, 1994	
			MANTON REACH	ED	EXPOSURE DURATION	4	yr	USEPA, 1994[1]	
			DYERVILLE REACH	BW	BODY WEIGHT	70	kg	USEPA, 1997	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1460	day	USEPA, 1997	
				CF	CONVERSION FACTOR	0.001	kg/g		
		ADOLESCENT	ASSAPUMPSET POND	CB	CHEMICAL CONCENTRATION IN BIOTA	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
			GREYSTONE MILL POND	IR-B	INGESTION RATE OF BIOTA	5.9	g/day	Exposure Assessment	CB x IR-B x FI x EF x ED x CF x 1/BW x 1/AT
			ALLENDALE POND	FI	FRACTION INGESTED	1	unitless	Assumption	
			LYMAN MILL POND	EF	EXPOSURE FREQUENCY	350	day/yr	USEPA, 1994	
			MANTON REACH	ED	EXPOSURE DURATION	3	yr	USEPA, 1994[1]	
			DYERVILLE REACH	BW	BODY WEIGHT	45	kg	USEPA, 1997	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1095	day	USEPA, 1997	
				CF	CONVERSION FACTOR	0.001	kg/g		
		CHILD	ASSAPUMPSET POND	CB	CHEMICAL CONCENTRATION IN BIOTA	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
			GREYSTONE MILL POND	IR-B	INGESTION RATE OF BIOTA	3.0	g/day	Exposure Assessment	CB x IR-B x FI x EF x ED x CF x 1/BW x 1/AT
			ALLENDALE POND	FI	FRACTION INGESTED	1	unitless	Assumption	
			LYMAN MILL POND	EF	EXPOSURE FREQUENCY	350	day/yr	USEPA, 1994	
			MANTON REACH	ED	EXPOSURE DURATION	2	yr	USEPA, 1994[1]	
			DYERVILLE REACH	BW	BODY WEIGHT	15	kg	USEPA, 1997	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	730	day	USEPA, 1997	
				CF	CONVERSION FACTOR	0.001	kg/g		
	RECREATIONAL ANGLER	ADULT	ASSAPUMPSET POND	CB	CHEMICAL CONCENTRATION IN BIOTA	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
			GREYSTONE MILL POND	IR-B	INGESTION RATE OF BIOTA	8.9	g/day	Exposure Assessment	CB x IR-B x FI x EF x ED x CF x 1/BW x 1/AT
			ALLENDALE POND	FI	FRACTION INGESTED	1	unitless	Assumption	
			LYMAN MILL POND	EF	EXPOSURE FREQUENCY	350	day/yr	USEPA, 1994	
			MANTON REACH	ED	EXPOSURE DURATION	4	yr	USEPA, 1994[1]	
			DYERVILLE REACH	BW	BODY WEIGHT	70	kg	USEPA, 1997	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1460	day	USEPA, 1997	
				CF	CONVERSION FACTOR	0.001	kg/g		
		ADOLESCENT	ASSAPUMPSET POND	CB	CHEMICAL CONCENTRATION IN BIOTA	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
			GREYSTONE MILL POND	IR-B	INGESTION RATE OF BIOTA	5.9	g/day	Exposure Assessment	CB x IR-B x FI x EF x ED x CF x 1/BW x 1/AT
			ALLENDALE POND	FI	FRACTION INGESTED	1	unitless	Assumption	
			LYMAN MILL POND	EF	EXPOSURE FREQUENCY	350	day/yr	USEPA, 1994	
			MANTON REACH	ED	EXPOSURE DURATION	3	yr	USEPA, 1994[1]	
			DYERVILLE REACH	BW	BODY WEIGHT	45	kg	USEPA, 1997	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1095	day	USEPA, 1997	
				CF	CONVERSION FACTOR	0.001	kg/g		
		CHILD	ASSAPUMPSET POND	CB	CHEMICAL CONCENTRATION IN BIOTA	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
			GREYSTONE MILL POND	IR-B	INGESTION RATE OF BIOTA	3.0	g/day	Exposure Assessment	CB x IR-B x FI x EF x ED x CF x 1/BW x 1/AT
			ALLENDALE POND	FI	FRACTION INGESTED	1	unitless	Assumption	
			LYMAN MILL POND	EF	EXPOSURE FREQUENCY	350	day/yr	USEPA, 1994	
			MANTON REACH	ED	EXPOSURE DURATION	2	yr	USEPA, 1994[1]	
			DYERVILLE REACH	BW	BODY WEIGHT	15	kg	USEPA, 1997	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	730	day	USEPA, 1997	
				CF	CONVERSION FACTOR	0.001	kg/g		

Table 4.1.CT
Values Used For Daily Intake Calculations
Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

SCENARIO TIMEFRAME: CURRENT/FUTURE
MEDIUM: BIOTA
EXPOSURE MEDIUM: COMBINED FISH DIET

EXPOSURE ROUTE	RECEPTOR POPULATION	RECEPTOR AGE	EXPOSURE POINT	PARAMETER CODE	PARAMETER DEFINITION	VALUE	UNITS	RATIONALE/ REFERENCE	INTAKE EQUATION/ MODEL NAME

USEPA, 1989. "Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (Part A)"; Office of Emergency and Remedial Response; EPA-540/1-89/002 (interim final); Washington, D.C., December.
USEPA, 1994. "Risk Updates No. 2"; USEPA Region I, Waste Management Division; August. Values from "Attachment 2" to Risk Updates No. 2.
USEPA, 1997. "Exposure Factors Handbook, Volume 1"; Office of Research and Development; EPA-600/P-95/002Fa; Washington, D.C.; August.

[1] = The total CT exposure duration is 9 years, consistent with USEPA, 1994. The allocation of exposure duration for the three age groups is based on professional judgement.
[2] = Values derived in the Exposure Assessment section of this report.

Prepared by: SGH
Checked by: RAR

Table 4.2.CT
Values Used For Daily Intake Calculations
Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

SCENARIO TIMEFRAME: CURRENT/FUTURE
MEDIUM: SURFACE WATER
EXPOSURE MEDIUM: SURFACE WATER

EXPOSURE ROUTE	RECEPTOR POPULATION	RECEPTOR AGE	EXPOSURE POINT	PARAMETER CODE	PARAMETER DEFINITION	VALUE	UNITS	RATIONALE/ REFERENCE	INTAKE EQUATION/ MODEL NAME
INGESTION	RESIDENT	ADULT	ASSAPUMPSET POND	CW	CHEMICAL CONCENTRATION IN WATER	chemical-specific	mg/l	EPC Table	INTAKE-INGESTION =
		(ages 19 and above)	GREYSTONE MILL POND	IR-W	INGESTION RATE OF WATER	0.025	l/hour	USEPA, 1988[1]	CW x IR-W x FI x ET x EF x ED x 1/BW x 1/AT
		(Swimming	ALLENDALE POND	FI	FRACTION INGESTED	1	unitless	Professional Judgement[2]	
		and	LYMAN MILL POND	EF	EXPOSURE FREQUENCY	26	event/yr	Professional Judgement[3]	
		Wading)	MANTON REACH	ED	EXPOSURE DURATION	4	yr	USEPA, 1994[4]	
			DYERVILLE REACH	ET	EXPOSURE TIME	1	hours/event	USEPA, 1997[5]	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1460	day	USEPA, 1989	
		ADOLESCENT	ASSAPUMPSET POND	CW	CHEMICAL CONCENTRATION IN WATER	chemical-specific	mg/l	EPC Table	INTAKE-INGESTION =
		(ages 7 - 18)	GREYSTONE MILL POND	IR-W	INGESTION RATE OF WATER	0.025	l/hour	USEPA, 1988[1]	CW x IR-W x FI x ET x EF x ED x 1/BW x 1/AT
		(Swimming	ALLENDALE POND	FI	FRACTION INGESTED	1	unitless	Professional Judgement[2]	
		and	LYMAN MILL POND	EF	EXPOSURE FREQUENCY	26	event/yr	Professional Judgement[3]	
		Wading)	MANTON REACH	ED	EXPOSURE DURATION	3	yr	USEPA, 1994[4]	
			DYERVILLE REACH	ET	EXPOSURE TIME	1	hours/event	USEPA, 1997[5]	
				BW	BODY WEIGHT	45	kg	USEPA, 1997[6]	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1095	day	USEPA, 1989	
		CHILD	ASSAPUMPSET POND	CW	CHEMICAL CONCENTRATION IN WATER	chemical-specific	mg/l	EPC Table	INTAKE-INGESTION =
		(ages 1 - 6)	GREYSTONE MILL POND	IR-W	INGESTION RATE OF WATER	0.025	l/hour	USEPA, 1988[1]	CW x IR-W x FI x ET x EF x ED x 1/BW x 1/AT
		(Wading only)	ALLENDALE POND	FI	FRACTION INGESTED	1	unitless	Professional Judgement[2]	
			LYMAN MILL POND	EF	EXPOSURE FREQUENCY	26	event/yr	Professional Judgement[3]	
			MANTON REACH	ED	EXPOSURE DURATION	2	yr	USEPA, 1994[4]	
			DYERVILLE REACH	ET	EXPOSURE TIME	1	hours/event	USEPA, 1997[5]	
				BW	BODY WEIGHT	15	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	730	day	USEPA, 1989	
	RECREATIONAL ANGLER	ADULT	ASSAPUMPSET POND	CW	CHEMICAL CONCENTRATION IN WATER	chemical-specific	mg/l	EPC Table	INTAKE-INGESTION =
		(ages 19 and above)	GREYSTONE MILL POND	IR-W	INGESTION RATE OF WATER	0.0025	l/hour	USEPA, 1988[7]	CW x IR-W x FI x ET x EF x ED x 1/BW x 1/AT
		(Wading only)	ALLENDALE POND	FI	FRACTION INGESTED	1	unitless	Professional Judgement[2]	
			LYMAN MILL POND	EF	EXPOSURE FREQUENCY	6	event/yr	Professional Judgement[10]	
			MANTON REACH	ED	EXPOSURE DURATION	4	yr	USEPA, 1994[4,15]	
			DYERVILLE REACH	ET	EXPOSURE TIME	1	hours/event	Professional Judgement[11]	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1460	day	USEPA, 1989	
		ADOLESCENT	ASSAPUMPSET POND	CW	CHEMICAL CONCENTRATION IN WATER	chemical-specific	mg/l	EPC Table	INTAKE-INGESTION =
		(ages 7 - 18)	GREYSTONE MILL POND	IR-W	INGESTION RATE OF WATER	0.0025	l/hour	USEPA, 1988[7]	CW x IR-W x FI x ET x EF x ED x 1/BW x 1/AT
		(Wading only)	ALLENDALE POND	FI	FRACTION INGESTED	1	unitless	Professional Judgement[2]	
			LYMAN MILL POND	EF	EXPOSURE FREQUENCY	6	event/yr	Professional Judgement[10]	
			MANTON REACH	ED	EXPOSURE DURATION	3	yr	USEPA, 1994[4,15]	
			DYERVILLE REACH	ET	EXPOSURE TIME	1	hours/event	Professional Judgement[11]	
				BW	BODY WEIGHT	45	kg	USEPA, 1997[6]	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1095	day	USEPA, 1989	

Table 4.2.CT
Values Used For Daily Intake Calculations
Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

SCENARIO TIMEFRAME: CURRENT/FUTURE
MEDIUM: SURFACE WATER
EXPOSURE MEDIUM: SURFACE WATER

EXPOSURE ROUTE	RECEPTOR POPULATION	RECEPTOR AGE	EXPOSURE POINT	PARAMETER CODE	PARAMETER DEFINITION	VALUE	UNITS	RATIONALE/ REFERENCE	INTAKE EQUATION/ MODEL NAME
DERMAL	RESIDENT	ADULT	ASSAPUMPSET POND	CW	CHEMICAL CONCENTRATION IN WATER	chemical-specific	mg/l	EPC Table	INTAKE-DERMAL =
		(ages 19 and above)	GREYSTONE MILL POND	PCevent	PERMEABILITY CONSTANT PER EVENT	chemical-specific	cm	USEPA, 2001	CW x SA x PCevent x EF x ED x CF x 1/BW x 1/AT
		(Swimming	ALLENDALE POND	SA	SKIN SURFACE AREA AVAILABLE FOR CO	11430	cm2	USEPA, 2001[7]	PCevent = PC x ET; calculated in PCevent table
		and	LYMAN MILL POND	ET	EXPOSURE TIME	1	hr/event	USEPA, 1997[5]	
		Wading)	MANTON REACH	EF	EXPOSURE FREQUENCY	26	event/yr	Professional Judgement[1]	
			DYERVILLE REACH	ED	EXPOSURE DURATION	4	yr	USEPA, 1994[4]	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1460	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.001	l/cm3		
		ADOLESCENT	ASSAPUMPSET POND	CW	CHEMICAL CONCENTRATION IN WATER	chemical-specific	mg/l	EPC Table	INTAKE-DERMAL =
		(ages 7 - 18)	GREYSTONE MILL POND	PCevent	PERMEABILITY CONSTANT PER EVENT	chemical-specific	cm	USEPA, 2001	CW x SA x PCevent x EF x ED x CF x 1/BW x 1/AT
		(Swimming	ALLENDALE POND	SA	SKIN SURFACE AREA AVAILABLE FOR CO	8887	cm2	USEPA, 2001[7]	PCevent = PC x ET; calculated in PCevent table
		and	LYMAN MILL POND	ET	EXPOSURE TIME	1	hr/event	USEPA, 1997[5]	
		Wading)	MANTON REACH	EF	EXPOSURE FREQUENCY	26	event/yr	Professional Judgement[1]	
			DYERVILLE REACH	ED	EXPOSURE DURATION	3	yr	USEPA, 1994[4]	
				BW	BODY WEIGHT	45	kg	USEPA, 1997[6]	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1095	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.001	l/cm3		
		CHILD	ASSAPUMPSET POND	CW	CHEMICAL CONCENTRATION IN WATER	chemical-specific	mg/l	EPC Table	INTAKE-DERMAL =
		(ages 1 - 6)	GREYSTONE MILL POND	PCevent	PERMEABILITY CONSTANT PER EVENT	chemical-specific	cm	USEPA, 2001	CW x SA x PCevent x EF x ED x CF x 1/BW x 1/AT
		(Wading only)	ALLENDALE POND	SA	SKIN SURFACE AREA AVAILABLE FOR CO	2678	cm2	USEPA, 1997[6]	PCevent = PC x ET; calculated in PCevent table
			LYMAN MILL POND	ET	EXPOSURE TIME	1	hr/event	USEPA, 1997[5]	
			MANTON REACH	EF	EXPOSURE FREQUENCY	26	event/yr	Professional Judgement[1]	
			DYERVILLE REACH	ED	EXPOSURE DURATION	2	yr	USEPA, 1994[4]	
				BW	BODY WEIGHT	15	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	730	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.001	l/cm3		
	RECREATIONAL ANGLER	ADULT	ASSAPUMPSET POND	CW	CHEMICAL CONCENTRATION IN WATER	chemical-specific	mg/l	EPC Table	INTAKE-DERMAL =
		(ages 19 and above)	GREYSTONE MILL POND	PCevent	PERMEABILITY CONSTANT PER EVENT	chemical-specific	cm	USEPA, 2001	CW x SA x PCevent x EF x ED x CF x 1/BW x 1/AT
		(Wading only)	ALLENDALE POND	SA	SKIN SURFACE AREA AVAILABLE FOR CO	8700	cm2	USEPA, 1997[14]	PCevent = PC x ET; calculated in PCevent table
			LYMAN MILL POND	ET	EXPOSURE TIME	1	hr/event	Professional Judgement[13]	
			MANTON REACH	EF	EXPOSURE FREQUENCY	6	event/yr	Professional Judgement[10]	
			DYERVILLE REACH	ED	EXPOSURE DURATION	4	yr	USEPA, 1994[4,15]	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1460	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.001	l/cm3		
		ADOLESCENT	ASSAPUMPSET POND	CW	CHEMICAL CONCENTRATION IN WATER	chemical-specific	mg/l	EPC Table	INTAKE-DERMAL =
		(ages 7 - 18)	GREYSTONE MILL POND	PCevent	PERMEABILITY CONSTANT PER EVENT	chemical-specific	cm	USEPA, 2001	CW x SA x PCevent x EF x ED x CF x 1/BW x 1/AT
		(Wading only)	ALLENDALE POND	SA	SKIN SURFACE AREA AVAILABLE FOR CO	6260	cm2	USEPA, 1997[14]	PCevent = PC x ET; calculated in PCevent table
			LYMAN MILL POND	ET	EXPOSURE TIME	1	hr/event	Professional Judgement[13]	
			MANTON REACH	EF	EXPOSURE FREQUENCY	6	event/yr	Professional Judgement[10]	
			DYERVILLE REACH	ED	EXPOSURE DURATION	3	yr	USEPA, 1994[4,15]	
				BW	BODY WEIGHT	45	kg	USEPA, 1997[6]	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1095	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.001	l/cm3		

Table 4.2.CT
Values Used For Daily Intake Calculations
Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

SCENARIO TIMEFRAME: CURRENT/FUTURE
MEDIUM: SURFACE WATER
EXPOSURE MEDIUM: SURFACE WATER

EXPOSURE ROUTE	RECEPTOR POPULATION	RECEPTOR AGE	EXPOSURE POINT	PARAMETER CODE	PARAMETER DEFINITION	VALUE	UNITS	RATIONALE/ REFERENCE	INTAKE EQUATION/ MODEL NAME

USEPA, 1988. Superfund Exposure Assessment Manual. Office of Remedial Response, EPA/540/1-88/001; Washington, D.C.
USEPA, 1989. "Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A)", Office of Emergency and Remedial Response; EPA-540/1-89/002 (interim final); Washington, D.C., December.
USEPA, 1994. "Risk Updates No. 2", USEPA Region I, Waste Management Division; August. Values from "Attachment 2" to Risk Updates No. 2.
USEPA, 1997. "Exposure Factors Handbook, Volume 1", Office of Research and Development; EPA-600/P-95/002Fa, Washington, D.C., August.
USEPA, 2001. "Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005
1 - One-half the value for swimming used, use of one-half the RME value is based on USEPA Region I guidance that specifies use of 1/2 RME value as the CT value for soil ingestion (USEPA, 1994)
2 - 100% of daily incidental intake of surface water is attributable to incidental ingestion at the Site
3 - Receptor assumed to visit area to wade or swim 2 days per week, June through August. Wading is expected to occur 1 of the 2 days each week and swimming 1 of the days each week. Sediment contact would only occur during wading (not swimming) activities. The child value is based on assumed wading exposure 2 days per week, June through August (the child is assumed to wade while adolescents and adults are swimming).
4 - The total CT exposure duration is 9 years, consistent with USEPA, 1994. The allocation of exposure duration for the three age groups is based on professional judgement.
5 - Recommended value for swimming exposures
6 - Values are the average of 50th percentile body weights for males and females ages 7 - 18
7 - Value represents a weighted average for swimming and wading scenarios. Whole-body surface area values used for exposures during swimming (13 days); value for the adolescent is the average of 50th percentile whole-body surface areas of males ages 7 through 18 (14,200 cm^2). Surface area values used for exposure during wading (13 days) are the 50th percentile surface areas of males ages 7 though 18 for the hands, lower legs and feet (3,574 cm^2) Whole-body surface area values used for exposures during swimming (13 days); value for the adult is 18,000 cm^2. Surface area values used for exposure during wading (13 days) for the adult assume hands, lower legs and feet (4,860 cm^2)
8 - Values are the average of 50th percentile body surface areas for body parts that may substantially contact surface water while wading (sum of areas for hands, legs, and feet) for males ages 1 through 6.
9 - It is assumed that anglers would wade during fishing; incidental ingestion of surface water during this activity assumed to occur. 1/10 CT value for swimming exposures is used.
10 - Value based on assumed exposure 1 day every other week, June through August. Potential contact with surface water and sediment would not occur during months when the weather and water temperature are colder.
11 - It is assumed that a recreational angler would not wade for more than one hour.
12 - Value assumes that one-half of subsistence fishing occurs at the Site; therefore, one-half of an assumed exposure 6 days per week, May through September.
13 - It is assumed that wading to catch fish may occur for two hours.
14 - It is assumed that receptors may wade during fishing. Exposure to water assumed to occur across feet, legs, and hands. Values are the average of 50th percentile body surface areas for those body parts for ages indicated.
15 - Representing ages 7 - 18 (12 years) and ages 19 and above (12 years) of a 30-year residential exposure duration (the young child, representing the first 6 years, is not evaluated for the angling activity).

mg - milligrams
cm^2 - square centimeters
cm^3 - cubic centimeters
l - liter
kg - kilograms

Prepared by: KJA
Checked by: RAR

Table 4.3.CT
Values Used For Daily Intake Calculations
Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

SCENARIO TIMEFRAME: *CURRENT/FUTURE*
MEDIUM: SEDIMENT
EXPOSURE MEDIUM: SEDIMENT

EXPOSURE ROUTE	RECEPTOR POPULATION	RECEPTOR AGE	EXPOSURE POINT	PARAMETER CODE	PARAMETER DEFINITION	VALUE	UNITS	RATIONALE/ REFERENCE	INTAKE EQUATION/ MODEL NAME
INGESTION	RESIDENT	ADULT	ASSAPUMPSET POND	CS	CHEMICAL CONCENTRATION IN SEDIMEN	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
		(ages 19 and above)	GREYSTONE MILL POND	IR-S	INGESTION RATE OF SEDIMENT	50	mg/day	USEPA, 1994[1]	CS x IR-S x FI x EF x ED x CF x 1/BW x 1/AT
			ALLENDALE POND	FI	FRACTION INGESTED	1	unitless	Professional Judgement	
			LYMAN MILL POND	EF	EXPOSURE FREQUENCY	13	day/yr	Professional Judgement[3]	
			MANTON REACH	ED	EXPOSURE DURATION	4	yr	USEPA, 1994[4]	
			DYERVILLE REACH	BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1460	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
		ADOLESCENT	ASSAPUMPSET POND	CS	CHEMICAL CONCENTRATION IN SEDIMEN	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
		(ages 7 - 18)	GREYSTONE MILL POND	IR-S	INGESTION RATE OF SEDIMENT	50	mg/day	USEPA, 1994[1]	CS x IR-S x FI x EF x ED x CF x 1/BW x 1/AT
			ALLENDALE POND	FI	FRACTION INGESTED	1	unitless	Professional Judgement	
			LYMAN MILL POND	EF	EXPOSURE FREQUENCY	13	day/yr	Professional Judgement[3]	
			MANTON REACH	ED	EXPOSURE DURATION	3	yr	USEPA, 1994[4]	
			DYERVILLE REACH	BW	BODY WEIGHT	45	kg	USEPA, 1997[5]	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1095	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
		CHILD	ASSAPUMPSET POND	CS	CHEMICAL CONCENTRATION IN SEDIMEN	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
		(ages 1 - 6)	GREYSTONE MILL POND	IR-S	INGESTION RATE OF SEDIMENT	100	mg/day	USEPA, 1994[1]	CS x IR-S x FI x EF x ED x CF x 1/BW x 1/AT
			ALLENDALE POND	FI	FRACTION INGESTED	1	unitless	Professional Judgement	
			LYMAN MILL POND	EF	EXPOSURE FREQUENCY	26	day/yr	Professional Judgement[3]	
			MANTON REACH	ED	EXPOSURE DURATION	2	yr	USEPA, 1994[4]	
			DYERVILLE REACH	BW	BODY WEIGHT	15	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	730	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
	RECREATIONAL ANGLER	ADULT	ASSAPUMPSET POND	CS	CHEMICAL CONCENTRATION IN SEDIMEN	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
		(ages 19 and above)	GREYSTONE MILL POND	IR-S	INGESTION RATE OF SEDIMENT	50	mg/day	USEPA, 1994[1]	CS x IR-S x FI x EF x ED x CF x 1/BW x 1/AT
			ALLENDALE POND	FI	FRACTION INGESTED	0.5	unitless	Professional Judgement[2]	
			LYMAN MILL POND	EF	EXPOSURE FREQUENCY	6	day/yr	Professional Judgement[10]	
			MANTON REACH	ED	EXPOSURE DURATION	4	yr	USEPA, 1994[4,12]	
			DYERVILLE REACH	BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1460	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
		ADOLESCENT	ASSAPUMPSET POND	CS	CHEMICAL CONCENTRATION IN SEDIMEN	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
		(ages 7 - 18)	GREYSTONE MILL POND	IR-S	INGESTION RATE OF SEDIMENT	50	mg/day	USEPA, 1994[1]	CS x IR-S x FI x EF x ED x CF x 1/BW x 1/AT
			ALLENDALE POND	FI	FRACTION INGESTED	0.5	unitless	Professional Judgement[2]	
			LYMAN MILL POND	EF	EXPOSURE FREQUENCY	6	day/yr	Professional Judgement[10]	
			MANTON REACH	ED	EXPOSURE DURATION	3	yr	USEPA, 1994[4,12]	
			DYERVILLE REACH	BW	BODY WEIGHT	45	kg	USEPA, 1997[5]	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1095	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
DERMAL	RESIDENT	ADULT	ASSAPUMPSET POND	CS	CHEMICAL CONCENTRATION IN SEDIMEN	chemical-specific	mg/kg	EPC Table	INTAKE-DERMAL =
		(ages 19 and above)	GREYSTONE MILL POND	AF	ADHERENCE FACTOR	0.01	mg/cm2	USEPA, 2001[7]	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
		(Wading)	ALLENDALE POND	AbF	ABSORPTION FACTOR	chemical-specific	unitless	USEPA, 2001[8]	
			LYMAN MILL POND	SA	SKIN SURFACE AREA AVAILABLE FOR CO	4860	cm2/day	USEPA, 1997[6]	Where DAevent =
			MANTON REACH	EV	EVENT DAY	1	unitless	Professional Judgement	CS x AF x AbF x CF
			DYERVILLE REACH	EF	EXPOSURE FREQUENCY	13	day/yr	Professional Judgement	

Table 4.3.CT
Values Used For Daily Intake Calculations
Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

SCENARIO TIMEFRAME: CURRENT/FUTURE
MEDIUM: SEDIMENT
EXPOSURE MEDIUM: SEDIMENT

EXPOSURE ROUTE	RECEPTOR POPULATION	RECEPTOR AGE	EXPOSURE POINT	PARAMETER CODE	PARAMETER DEFINITION	VALUE	UNITS	RATIONALE/ REFERENCE	INTAKE EQUATION/ MODEL NAME
				ED	EXPOSURE DURATION	4	yr	USEPA, 1994[4]	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1460	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
		ADOLESCENT	ASSAPUMPSET POND	CS	CHEMICAL CONCENTRATION IN SEDIMEN	chemical-specific	mg/kg	EPC Table	INTAKE-DERMAL =
		(ages 7 - 18)	GREYSTONE MILL POND	AF	ADHERENCE FACTOR	0.04	mg/cm2	USEPA, 2001[7]	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
		(Wading)	ALLENDALE POND	AbF	ABSORPTION FACTOR	chemical-specific	unitless	USEPA, 2001[8]	
			LYMAN MILL POND	SA	SKIN SURFACE AREA AVAILABLE FOR CO	3574	cm2/day	USEPA, 1997[6]	Where DAevent =
			MANTON REACH	EV	EVENT DAY	1	unitless	Professional Judgement	CS x AF x AbF x CF
			DYERVILLE REACH	EF	EXPOSURE FREQUENCY	13	day/yr	Professional Judgement[1]	
				ED	EXPOSURE DURATION	3	yr	USEPA, 1994[4]	
				BW	BODY WEIGHT	45	kg	USEPA, 1997[5]	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1095	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
		CHILD	ASSAPUMPSET POND	CS	CHEMICAL CONCENTRATION IN SEDIMEN	chemical-specific	mg/kg	EPC Table	INTAKE-DERMAL =
		(ages 1 - 6)	GREYSTONE MILL POND	AF	ADHERENCE FACTOR	0.04	mg/cm2	USEPA, 2001[7]	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
		(Wading)	ALLENDALE POND	AbF	ABSORPTION FACTOR	chemical-specific	unitless	USEPA, 2001[8]	
			LYMAN MILL POND	SA	SKIN SURFACE AREA AVAILABLE FOR CO	2800	cm2/day	USEPA, 20019	Where DAevent =
			MANTON REACH	EV	EVENT DAY	1	unitless	Professional Judgement	CS x AF x AbF x CF
			DYERVILLE REACH	EF	EXPOSURE FREQUENCY	26	day/yr	Professional Judgement[1]	
				ED	EXPOSURE DURATION	2	yr	USEPA, 1994[4]	
				BW	BODY WEIGHT	15	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	730	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
	RECREATIONAL ANGLER	ADULT	ASSAPUMPSET POND	CS	CHEMICAL CONCENTRATION IN SEDIMEN	chemical-specific	mg/kg	EPC Table	INTAKE-DERMAL =
		(ages 19 and above)	GREYSTONE MILL POND	AF	ADHERENCE FACTOR	0.01	mg/cm2	USEPA, 2001[7]	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
			ALLENDALE POND	AbF	ABSORPTION FACTOR	chemical-specific	unitless	USEPA, 2001[8]	
			LYMAN MILL POND	SA	SKIN SURFACE AREA AVAILABLE FOR CO	4860	cm2/day	USEPA, 1997[6]	Where DAevent =
			MANTON REACH	EV	EVENT DAY	1	unitless	Professional Judgement	CS x AF x AbF x CF
			DYERVILLE REACH	EF	EXPOSURE FREQUENCY	6	day/yr	Professional Judgement[10]	
				ED	EXPOSURE DURATION	4	yr	USEPA, 1994[4,12]	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1460	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
		ADOLESCENT	ASSAPUMPSET POND	CS	CHEMICAL CONCENTRATION IN SEDIMEN	chemical-specific	mg/kg	EPC Table	INTAKE-DERMAL =
		(ages 7 - 18)	GREYSTONE MILL POND	AF	ADHERENCE FACTOR	0.04	mg/cm2	USEPA, 2001[7]	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
			ALLENDALE POND	AbF	ABSORPTION FACTOR	chemical-specific	unitless	USEPA, 2001[8]	
			LYMAN MILL POND	SA	SKIN SURFACE AREA AVAILABLE FOR CO	3574	cm2/day	USEPA, 1997[6]	Where DAevent =
			MANTON REACH	EV	EVENT DAY	1	unitless	Professional Judgement	CS x AF x AbF x CF
			DYERVILLE REACH	EF	EXPOSURE FREQUENCY	6	day/yr	Professional Judgement[10]	
				ED	EXPOSURE DURATION	3	yr	USEPA, 1994[4,12]	
				BW	BODY WEIGHT	45	kg	USEPA, 1997[5]	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1095	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		

Table 4.3.CT
Values Used For Daily Intake Calculations
Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

SCENARIO TIMEFRAME: CURRENT/FUTURE
MEDIUM: SEDIMENT
EXPOSURE MEDIUM: SEDIMENT

EXPOSURE ROUTE	RECEPTOR POPULATION	RECEPTOR AGE	EXPOSURE POINT	PARAMETER CODE	PARAMETER DEFINITION	VALUE	UNITS	RATIONALE/ REFERENCE	INTAKE EQUATION/ MODEL NAME

USEPA, 1989. "Risk Assessment Guidance for Superfund, Volume 1, *Human Health Evaluation Manual (Part A)*"; *Office of Emergency and Remedial Response*; EPA-540/1-89/002 (interim final), Washington, D C., December.
USEPA, 1994. "Risk Updates No. 2", USEPA Region I, Waste Management Division; August. Values from "Attachment 2" to Risk Updates No. 2.
USEPA, 1997 "Exposure Factors Handbook, Volume 1", Office of Research and Development; EPA-600/P-95/002Fa; Washington, D C., August.
USEPA, 2001. "Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.
1 - CT soil ingestion rate used because ingestion rates for sediment are not available.
2 - 50% of daily incidental intake of soil and sediment is attributable to incidental sediment ingestion
3 - Receptor assumed to visit area to wade or swim 2 days per week, June through August. Wading is expected to occur 1 of the 2 days each week and swimming 1 of the days each week. Sediment contact would only occur during wading (not swimming) activities. The child value is based on assumed wading exposure 2 days per week, June through August (the child is assumed to wade while adolescents and adults are swimming)
4 - The total CT exposure duration is 9 years, consistent with USEPA, 1994 The allocation of exposure duration for the three age groups is based on professional judgement.
5 - Values are the average of 50th percentile body weights for males and females ages 7 - 18.
6 - Values are the average of 50th percentile body surface areas (sum of areas for hands, lower legs, and feet) for males in the various age groups indicated.
7 - CT values for residential exposure to soil used as conservative estimate of potential sediment adherence, sediment is submerged, so adherence is unlikely
8 - Values are provided (Table 3-4 of USEPA, 2001) for arsenic, cadmium, chlordane, 2,4-D, DDT (used for DDD, DDE), TCDD, lindane (used for other BHC isomers), PAHs, PCBs, and pentachlorophenol. A single value is listed for all other SVOCs. No values are listed for VOCs, other pesticides, or other inorganics and, subsequently, no value will be assigned to the ABSd term for COPCs falling into those categories.
9 - Value is the residential soil CT value, it is used to accommodate the possibility that a young child may play in shallow water and contact sediment over more body parts than just feet, lower legs, and hands.
10 - Value based on assumed exposure 1 day every other week, June through August. *Potential contact with surface water and sediment would not occur during months when the weather and water temperature are colder*
11 - Value assumes that one-half of subsistence fishing occurs at the Site; therefore, one-half of an assumed exposure 6 days per week, May through September. Potential contact with surface water and sediment would not occur during months when the weather and water temperature are colder.
12 - Representing ages 7 - 18 (12 years) and ages 19 and above (12 years) of a 30-year residential exposure duration (the young child, representing the first 6 years, is not evaluated for the angling activity).

mg - *milligrams*
cm^2 - square centimeters
kg - kilograms

Prepared by: KJA
Checked by: RAR

Table 4.4.CT
Values Used For Daily Intake Calculations
Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

SCENARIO TIMEFRAME: CURRENT/FUTURE
MEDIUM: SOIL
EXPOSURE MEDIUM: BANK SURFACE SOIL

EXPOSURE ROUTE	RECEPTOR POPULATION	RECEPTOR AGE	EXPOSURE POINT	PARAMETER CODE	PARAMETER DEFINITION	VALUE	UNITS	RATIONALE/ REFERENCE	INTAKE EQUATION/ MODEL NAME
INGESTION	RESIDENT	ADULT	GREYSTONE MILL POND	CS	CHEMICAL CONCENTRATION IN SOIL	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
		(ages 19 and above)	ALLENDALE POND	IR-S	INGESTION RATE OF SOIL	50	mg/day	USEPA, 1994[1]	CS x IR-S x FI x EF x ED x CF x 1/BW x 1/AT
				FI	FRACTION INGESTED	1	unitless	Professional Judgement	
				EF	EXPOSURE FREQUENCY	39	day/yr	Professional Judgement[3]	
				ED	EXPOSURE DURATION	4	yr	USEPA, 1994[4]	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1460	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
		ADOLESCENT	GREYSTONE MILL POND	CS	CHEMICAL CONCENTRATION IN SOIL	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
		(ages 7 - 18)	ALLENDALE POND	IR-S	INGESTION RATE OF SOIL	50	mg/day	USEPA, 1994[1]	CS x IR-S x FI x EF x ED x CF x 1/BW x 1/AT
				FI	FRACTION INGESTED	1	unitless	Professional Judgement	
				EF	EXPOSURE FREQUENCY	39	day/yr	Professional Judgement[3]	
				ED	EXPOSURE DURATION	3	yr	USEPA, 1994[4]	
				BW	BODY WEIGHT	45	kg	USEPA, 1997[5]	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1095	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
		CHILD	GREYSTONE MILL POND	CS	CHEMICAL CONCENTRATION IN SOIL	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
		(ages 1 - 6)	ALLENDALE POND	IR-S	INGESTION RATE OF SOIL	100	mg/day	USEPA, 1994[1]	CS x IR-S x FI x EF x ED x CF x 1/BW x 1/AT
				FI	FRACTION INGESTED	1	unitless	Professional Judgement	
				EF	EXPOSURE FREQUENCY	39	day/yr	Professional Judgement[3]	
				ED	EXPOSURE DURATION	2	yr	USEPA, 1994[4]	
				BW	BODY WEIGHT	15	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	730	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
	RECREATIONAL ANGLER	ADULT	GREYSTONE MILL POND	CS	CHEMICAL CONCENTRATION IN SOIL	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
		(ages 19 and above)	ALLENDALE POND	IR-S	INGESTION RATE OF SOIL	50	mg/day	USEPA, 1994[1]	CS x IR-S x FI x EF x ED x CF x 1/BW x 1/AT
				FI	FRACTION INGESTED	0.5	unitless	Professional Judgement[2]	
				EF	EXPOSURE FREQUENCY	6	day/yr	Professional Judgement[10]	
				ED	EXPOSURE DURATION	4	yr	USEPA, 1994[4,12]	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1460	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
		ADOLESCENT	GREYSTONE MILL POND	CS	CHEMICAL CONCENTRATION IN SOIL	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
		(ages 7 - 18)	ALLENDALE POND	IR-S	INGESTION RATE OF SOIL	50	mg/day	USEPA, 1994[1]	CS x IR-S x FI x EF x ED x CF x 1/BW x 1/AT
				FI	FRACTION INGESTED	0.5	unitless	Professional Judgement[2]	
				EF	EXPOSURE FREQUENCY	6	day/yr	Professional Judgement[10]	
				ED	EXPOSURE DURATION	3	yr	USEPA, 1994[4,12]	
				BW	BODY WEIGHT	45	kg	USEPA, 1997[5]	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1095	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		

Table 4.4.CT
Values Used For Daily Intake Calculations
Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

SCENARIO TIMEFRAME: CURRENT/FUTURE
MEDIUM: SOIL
EXPOSURE MEDIUM: BANK SURFACE SOIL

EXPOSURE ROUTE	RECEPTOR POPULATION	RECEPTOR AGE	EXPOSURE POINT	PARAMETER CODE	PARAMETER DEFINITION	VALUE	UNITS	RATIONALE/ REFERENCE	INTAKE EQUATION/ MODEL NAME
DERMAL	RESIDENT	ADULT	GREYSTONE MILL POND	CS	CHEMICAL CONCENTRATION IN SOIL	chemical-specific	mg/kg	EPC Table	INTAKE-DERMAL =
		(ages 19 and above)	ALLENDALE POND	AF	ADHERENCE FACTOR	0.01	mg/cm2	USEPA, 2001[7]	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				AbF	ABSORPTION FACTOR	chemical-specific	unitless	USEPA, 2001[8]	
				SA	SKIN SURFACE AREA AVAILABLE FOR CC	5700	cm2/day	USEPA, 2001[7]	Where DAevent =
				EV	EVENT DAY	1	unitless	Professional Judgement	CS x AF x AbF x CF
				EF	EXPOSURE FREQUENCY	39	day/yr	Professional Judgement[1]	
				ED	EXPOSURE DURATION	4	yr	USEPA, 1994[4]	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1460	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
		ADOLESCENT	GREYSTONE MILL POND	CS	CHEMICAL CONCENTRATION IN SOIL	chemical-specific	mg/kg	EPC Table	INTAKE-DERMAL =
		(ages 7 - 18)	ALLENDALE POND	AF	ADHERENCE FACTOR	0.04	mg/cm2	USEPA, 2001[7]	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				AbF	ABSORPTION FACTOR	chemical-specific	unitless	USEPA, 2001[8]	
				SA	SKIN SURFACE AREA AVAILABLE FOR CC	4800	cm2/day	USEPA, 1997[6]	Where DAevent =
				EV	EVENT DAY	1	unitless	Professional Judgement	CS x AF x AbF x CF
				EF	EXPOSURE FREQUENCY	39	day/yr	Professional Judgement3	
				ED	EXPOSURE DURATION	3	yr	USEPA, 1994[4]	
				BW	BODY WEIGHT	45	kg	USEPA, 1997[5]	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1095	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
		CHILD	GREYSTONE MILL POND	CS	CHEMICAL CONCENTRATION IN SOIL	chemical-specific	mg/kg	EPC Table	INTAKE-DERMAL =
		(ages 1 - 6)	ALLENDALE POND	AF	ADHERENCE FACTOR	0.04	mg/cm2	USEPA, 2001[7]	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				AbF	ABSORPTION FACTOR	chemical-specific	unitless	USEPA, 2001[8]	
				SA	SKIN SURFACE AREA AVAILABLE FOR CC	2800	cm2/day	USEPA, 2001[7]	Where DAevent =
				EV	EVENT DAY	1	unitless	Professional Judgement	CS x AF x AbF x CF
				EF	EXPOSURE FREQUENCY	39	day/yr	Professional Judgement[1]	
				ED	EXPOSURE DURATION	2	yr	USEPA, 1994[4]	
				BW	BODY WEIGHT	15	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	730	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
	RECREATIONAL ANGLER	ADULT	GREYSTONE MILL POND	CS	CHEMICAL CONCENTRATION IN SOIL	chemical-specific	mg/kg	EPC Table	INTAKE-DERMAL =
		(ages 19 and above)	ALLENDALE POND	AF	ADHERENCE FACTOR	0.01	mg/cm2	USEPA, 2001[7]	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				AbF	ABSORPTION FACTOR	chemical-specific	unitless	USEPA, 2001[8]	
				SA	SKIN SURFACE AREA AVAILABLE FOR CC	5700	cm2/day	USEPA, 2001[7]	Where DAevent =
				EV	EVENT DAY	1	unitless	Professional Judgement	CS x AF x AbF x CF
				EF	EXPOSURE FREQUENCY	6	day/yr	Professional Judgement[11]	
				ED	EXPOSURE DURATION	4	yr	USEPA, 1994[4,12]	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1460	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
		ADOLESCENT	GREYSTONE MILL POND	CS	CHEMICAL CONCENTRATION IN SOIL	chemical-specific	mg/kg	EPC Table	INTAKE-DERMAL =
		(ages 7 - 18)	ALLENDALE POND	AF	ADHERENCE FACTOR	0.04	mg/cm2	USEPA, 2001[7]	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				AbF	ABSORPTION FACTOR	chemical-specific	unitless	USEPA, 2001[8]	
				SA	SKIN SURFACE AREA AVAILABLE FOR CC	4800	cm2/day	USEPA, 1997[6]	Where DAevent =
				EV	EVENT DAY	1	unitless	Professional Judgement	CS x AF x AbF x CF
				EF	EXPOSURE FREQUENCY	6	day/yr	Professional Judgement[11]	
				ED	EXPOSURE DURATION	3	yr	USEPA, 1994[4,14]	

Table 4.4.CT
Values Used For Daily Intake Calculations
Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

SCENARIO TIMEFRAME: CURRENT/FUTURE
MEDIUM: SOIL
EXPOSURE MEDIUM: BANK SURFACE SOIL

EXPOSURE ROUTE	RECEPTOR POPULATION	RECEPTOR AGE	EXPOSURE POINT	PARAMETER CODE	PARAMETER DEFINITION	VALUE	UNITS	RATIONALE/ REFERENCE	INTAKE EQUATION/ MODEL NAME
				BW	BODY WEIGHT	45	kg	USEPA, 1997[5]	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1095	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		

USEPA, 1989. "Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (Part A)"; Office of Emergency and Remedial Response, EPA-540/1-89/002 (interim final); Washington, D.C., December.
USEPA, 1994. "Risk Updates No. 2", USEPA Region I, Waste Management Division; August. Values from "Attachment 2" to Risk Updates No. 2.
USEPA, 1997. "Exposure Factors Handbook, Volume 1", Office of Research and Development; EPA-600/P-95/002Fa; Washington, D.C., August.
USEPA, 2001. "Risk Assessment Guidance for Superfund. Volume I. Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005
1 - CT soil ingestion rate used.
2 - 50% of daily incidental intake of soil and sediment is attributable to incidental ingestion of soil at bank.
3 - Value based on exposure during wading, swimming, and walking/exploring banks (2 days per week June - August), and walking/exploring banks (1 day per week May, Sept, Oct).
4 - The total CT exposure duration is 9 years, consistent with USEPA, 1994. The allocation of exposure duration for the three age groups is based on professional judgement.
5 - Values are the average of 50th percentile body weights for males and females ages 7 - 18.
6 - Values are the average of 50th percentile body surface areas (sum of areas for face, hands, forearms, lower legs, and feet) for males in the various age groups indicated
7 - CT values for residential exposure to soil used as conservative estimate of potential soil adherence associated with recreational walking/exploring
8 - Values are provided (Table 3-4 of USEPA, 2001) for arsenic, cadmium, chlordane, 2,4-D, DDT (used for DDD, DDE), TCDD, lindane (used for other BHC isomers), PAHs, PCBs, and pentachlorophenol. A single value is listed for all other SVOCs
No values are listed for VOCs, other pesticides, or other inorganics and, subsequently, no value will be assigned to the ABSd term for COPCs falling into those categories
9 - Values for residential exposure to soil used as conservative estimate of potential surface area exposed to soil during recreational walking/exploring
10 - Contact with soil assumed to occur when accessing water bodies for angling (assumed exposure 1 day every other week, June through August)
11 - Value assumes that one-half of subsistence fishing occurs at the Site, therefore, one-half of an assumed exposure 6 days per week, April through November
Potential contact with surface water and sediment would not occur during months when the weather and water temperature are colder.
12 - Representing ages 7 - 18 (12 years) and ages 19 and above (12 years) of a 30-year residential exposure duration (the young child, representing the first 6 years, is not evaluated for the angling activity).

mg - milligrams
cm^2 - square centimeters
kg - kilograms

Prepared by KJA
Checked by RAR

Table 4.5.CT
Values Used For Daily Intake Calculations
Baseline Human Health Risk Assessment - Interim Final
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

SCENARIO TIMEFRAME: CURRENT/FUTURE
MEDIUM: SOIL
EXPOSURE MEDIUM: SURFACE SOIL

EXPOSURE ROUTE	RECEPTOR POPULATION	RECEPTOR AGE	EXPOSURE POINT	PARAMETER CODE	PARAMETER DEFINITION	VALUE	UNITS	RATIONALE/ REFERENCE	INTAKE EQUATION/ MODEL NAME
INGESTION	COMMERCIAL / INDUSTRIAL WORKER	ADULT	FOGARTY CENTER	CS	CHEMICAL CONCENTRATION IN SOIL	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
				IR-S	INGESTION RATE OF SOIL	50	mg/day	USEPA, 1994[1]	CS x IR-S x FI x EF x ED x CF x 1/BW x 1/AT
				FI	FRACTION INGESTED	0.5	unitless	Professional Judgement[2]	
				EF	EXPOSURE FREQUENCY	150	day/yr	USEPA, 1994	
				ED	EXPOSURE DURATION	9	yr	USEPA, 2001	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	3285	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
DERMAL	COMMERCIAL / INDUSTRIAL WORKER	ADULT	FOGARTY CENTER	CS	CHEMICAL CONCENTRATION IN SOIL	chemical-specific	mg/kg	EPC Table	INTAKE-DERMAL =
				AF	ADHERENCE FACTOR	0.02	mg/cm2	USEPA, 2001	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				AbF	ABSORPTION FACTOR	chemical-specific	unitless	USEPA, 2001[3]	
				SA	SKIN SURFACE AREA AVAILABLE FOR CO	3300	cm2/day	USEPA, 2001	Where DAevent =
				EV	EVENT DAY	1	unitless	Professional Judgement	CS x AF x AbF x CF
				EF	EXPOSURE FREQUENCY	150	day/yr	USEPA, 1994	
				ED	EXPOSURE DURATION	9	yr	USEPA, 2001	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	3285	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		

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

USEPA, 1994 "Risk Updates No. 2", USEPA Region I, Waste Management Division; August. Values from "Attachment 2" to Risk Updates No. 2.

USEPA, 1997. "Exposure Factors Handbook, Volume 1", *Office of Research and Development*, EPA-600/P-95/002Fa, Washington, D.C., August.

USEPA, 2001 "Risk Assessment Guidance for Superfund. Volume I. Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005

1 - CT soil ingestion rate used

2 - 50% of daily incidental intake of soil and sediment is attributable to incidental ingestion of soil at bank

3 - Values are provided (Table 3-4 of USEPA, 2001) for arsenic, cadmium, chlordane, 2,4-D, DDT (used for DDD, DDE), TCDD, lindane (used for other BHC isomers), PAHs, PCBs, and pentachlorophenol. A single value is listed for all other SVOCs. *No values are listed for VOCs, other pesticides, or other inorganics and, subsequently, no value will be assigned to the ABSd term for COPCs falling into those categories.*

mg - milligrams
cm^2 - square centimeters
kg - kilograms

Prepared by KJA
Checked by RAR

Table
Non-Cancer Toxicity Data - Oral/Dermal

Baseline Human Health Risk Assessment - Draft
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal (1	Adjusted Dermal RfD (2)		Primary Target Organ or System / Critical Effect	Combined Uncertainty/Modifying Factors	RfD: Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s)
ACID EXTRACTABLE										
4-Chloro-3-methylphenol	chronic	5.0E-03	mg/kg/day	100%	5.0E-03	mg/kg/day	Reproductive system/Increased stillbirths	1,000	Surrogate	
	subchronic	5.0E-03	mg/kg/day	100%	5.0E-03	mg/kg/day	Reproductive system/Increased stillbirths	100	Surrogate	
4-Nitrophenol	chronic	ND							NCEA	April, 2003
	subchronic	ND							NCEA	April, 2003
BASE NEUTRAL COMPOUNDS										
2-Methylnaphthalene	chronic	2.0E-02	mg/kg/day	89%	2.0E-02	mg/kg/day	Pulmonary alveolar proteinosis	3,000	NCEA	April, 2003
	subchronic	2.0E-02	mg/kg/day	89%	2.0E-02	mg/kg/day	Pulmonary alveolar proteinosis	3,000	Chronic	
Acenaphthylene	chronic	6.0E-02	mg/kg/day	89%	6.0E-02	mg/kg/day	Liver/Hepatoxicity	3,000	Surrogate (1)	
	subchronic	6.0E-01	mg/kg/day	89%	6.0E-01	mg/kg/day	Liver/Hepatoxicity	300	Surrogate (1)	
Benzo(a)anthracene	chronic	3.0E-02	mg/kg/day	89%	3.0E-02	mg/kg/day	Kidney/Renal tubluar pathology	3,000	Surrogate (2)	
	subchronic	3.0E-01	mg/kg/day	89%	3.0E-01	mg/kg/day	Kidney/Renal tubluar pathology	300	Surrogate (2)	
Benzo(a)pyrene	chronic	3.0E-02	mg/kg/day	89%	3.0E-02	mg/kg/day	Kidney/Renal tubluar pathology	3,000	Surrogate (2)	
	subchronic	3.0E-01	mg/kg/day	89%	3.0E-01	mg/kg/day	Kidney/Renal tubluar pathology	300	Surrogate (2)	
Benzo(b)fluoranthene	chronic	3.0E-02	mg/kg/day	89%	3.0E-02	mg/kg/day	Kidney/Renal tubluar pathology	3,000	Surrogate (2)	
	subchronic	3.0E-01	mg/kg/day	89%	3.0E-01	mg/kg/day	Kidney/Renal tubluar pathology	300	Surrogate (2)	
Benzo(g,h,i)perylene	chronic	3.0E-02	mg/kg/day	89%	3.0E-02	mg/kg/day	Kidney/Renal tubluar pathology	3,000	Surrogate (2)	
	subchronic	3.0E-01	mg/kg/day	89%	3.0E-01	mg/kg/day	Kidney/Renal tubluar pathology	300	Surrogate (2)	
Benzo(k)fluoranthene	chronic	3.0E-02	mg/kg/day	89%	3.0E-02	mg/kg/day	Kidney/Renal tubluar pathology	3,000	Surrogate (2)	
	subchronic	3.0E-01	mg/kg/day	89%	3.0E-01	mg/kg/day	Kidney/Renal tubluar pathology	300	Surrogate (2)	
Bis(2-ethylhexyl)phthalate (BEHP)	chronic	2.0E-02	mg/kg/day	100%	2.0E-02	mg/kg/day	Liver/Increased liver weight	1,000	IRIS	February, 2003
	subchronic	2.0E-01	mg/kg/day	100%	2.0E-01	mg/kg/day	Liver/Increased liver weight	1,000	IRIS	February, 2003
Dibenzo(a,h)anthracene	chronic	3.0E-02	mg/kg/day	89%	3.0E-02	mg/kg/day	Kidney/Renal tubluar pathology	3,000	Surrogate (2)	
	subchronic	3.0E-01	mg/kg/day	89%	3.0E-01	mg/kg/day	Kidney/Renal tubluar pathology	300	Surrogate (2)	
Indeno(1,2,3-cd)pyrene	chronic	3.0E-02	mg/kg/day	89%	3.0E-02	mg/kg/day	Kidney/Renal tubluar pathology	3,000	Surrogate (2)	
	subchronic	3.0E-01	mg/kg/day	89%	3.0E-01	mg/kg/day	Kidney/Renal tubluar pathology	300	Surrogate (2)	
n-Nitrosodi-n-propylamine	chronic	ND			ND					
	subchronic	ND			ND					
Pentachlorophenol	chronic	3.0E-02	mg/kg/day	76%	3.0E-02	mg/kg/day	Liver/Kidney pathology	100	IRIS	February, 2003
	subchronic	3.0E-02	mg/kg/day	76%	3.0E-02	mg/kg/day	Fetotoxicity	100	HEAST	FY 1997
Phenanthrene	chronic	3.0E-02	mg/kg/day	89%	3.0E-02	mg/kg/day	Kidney/Renal tubluar pathology	3,000	Surrogate (2)	
	subchronic	3.0E-01	mg/kg/day	89%	3.0E-01	mg/kg/day	Kidney/Renal tubluar pathology	300	Surrogate (2)	
INORGANICS/METALS										
Aluminum	chronic	1.0E+00	mg/kg/day	1%	1.0E-02	mg/kg/day	Developmental Toxicity	100	NCEA	April, 2003
	subchronic	1.0E+00	mg/kg/day	1%	1.0E-02	mg/kg/day	Developmental Toxicity	100	Chronic	
Antimony	chronic	4.0E-04	mg/kg/day	15%	6.0E-05	mg/kg/day	Reduced lifespan	1,000	IRIS	February, 2003
	subchronic	4.0E-04	mg/kg/day	15%	6.0E-05	mg/kg/day	Reduced lifespan	1,000	HEAST	FY 1997
Arsenic	chronic	3.0E-04	mg/kg/day	95%	3.0E-04	mg/kg/day	Skin/Keratosis and hyperpigmentation	3	IRIS	February, 2003
	subchronic	3.0E-04	mg/kg/day	95%	3.0E-04	mg/kg/day	Skin/Keratosis and hyperpigmentation	3	HEAST	FY 1997
Barium	chronic	7.0E-02	mg/kg/day	7%	4.9E-03	mg/kg/day	Cardiovascular/Increased blood pressure	3	IRIS	February, 2003
	subchronic	7.0E-02	mg/kg/day	7%	4.9E-03	mg/kg/day	Cardiovascular/Increased blood pressure	3	HEAST	FY 1997
Cadmium (food)	chronic	1.0E-03	mg/kg/day	2.5%	2.5E-05	mg/kg/day	Kidney/Proteinuria	10	IRIS	February, 2003
	subchronic	1.0E-03	mg/kg/day	2.5%	2.5E-05	mg/kg/day	Kidney/Proteinuria	10	Chronic	
Cadmium (water)	chronic	5.0E-04	mg/kg/day	5%	2.5E-05	mg/kg/day	Kidney/Proteinuria	10	IRIS	February, 2003
	subchronic	5.0E-04	mg/kg/day	5%	2.5E-05	mg/kg/day	Kidney/Proteinuria	10	Chronic	
Chromium III	chronic	1.5E+00	mg/kg/day	1.3%	2.0E-02	mg/kg/day	No effects observed	100/10	IRIS	February, 2003
	subchronic	1.5E+00	mg/kg/day	1.3%	2.0E-02	mg/kg/day	No effects observed	100/10	Chronic	
Chromium VI	chronic	3.0E-03	mg/kg/day	2.5%	7.5E-05	mg/kg/day	No effects observed	300	IRIS	February, 2003
	subchronic	2.0E-02	mg/kg/day	2.5%	5.0E-04	mg/kg/day	No effects observed	300	HEAST	FY 1997
Copper	chronic	3.0E-02	mg/kg/day	60.0%	3.0E-02	mg/kg/day	Kidney	1,000	NCEA	April, 2003
	subchronic	3.0E-02	mg/kg/day	60.0%	3.0E-02	mg/kg/day	Kidney	1,000	Chronic	
Lead	chronic	ND								
	subchronic	ND								

Table 5.1
Non-Cancer Toxicity Data - Oral/Dermal

Baseline Human Health Risk Assessment - Draft
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal (1	Adjusted Dermal RfD (2)		Primary Target Organ or System / Critical Effect	Combined Uncertainty/Modifying Factors	RfD: Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s)
Manganese (drinking water)	chronic	2.4E-02	mg/kg/day	4%	9.6E-04	mg/kg/day	No effects observed	1/3	IRIS	February, 2003
	subchronic	2.4E-02	mg/kg/day	4%	9.6E-04	mg/kg/day	No effects observed	1/3	Chronic	
Manganese (food)	chronic	1.4E-01	mg/kg/day	4%	5.6E-03	mg/kg/day	No effects observed	1/1	IRIS	February, 2003
	subchronic	1.4E-01	mg/kg/day	4%	5.6E-03	mg/kg/day	No effects observed	1/1	HEAST	FY 1997
Manganese (soil)	chronic	7.1E-02	mg/kg/day	4%	2.8E-03	mg/kg/day	No effects observed	1/1	IRIS	February, 2003
	subchronic	7.1E-02	mg/kg/day	4%	2.8E-03	mg/kg/day	No effects observed	1/1	Chronic	
Mercury (as inorganic soluble salts)	chronic	3.0E-04	mg/kg/day	7%	2.1E-05	mg/kg/day	Immune system/Autoimmune effects	1,000	IRIS	February, 2003
	subchronic	3.0E-03	mg/kg/day	7%	2.1E-04	mg/kg/day	Immune system/Autoimmune effects	100	HEAST	FY 1997
Mercury (as methyl mercury)	chronic	1.0E-04	mg/kg/day	95%	1.0E-04	mg/kg/day	Developmental effects	10	IRIS	February, 2003
	subchronic	1.0E-04	mg/kg/day	95%	1.0E-04	mg/kg/day	Developmental effects	10	HEAST	FY 1997
Nickel	chronic	2.0E-02	mg/kg/day	4%	8.0E-04	mg/kg/day	Developmental/Decreased body and organ weights	300	IRIS	February, 2003
	subchronic	2.0E-02	mg/kg/day	4%	8.0E-04	mg/kg/day	Developmental/Decreased body and organ weights	300	HEAST	FY 1997
Nitrate	chronic	1.6E+00	mg/kg/day	100%	1.6E+00	mg/kg/day	Hematological/Early clinical signs of methemoglobinemia	1	IRIS	February, 2003
	subchronic	1.6E+00	mg/kg/day	100%	1.6E+00	mg/kg/day	Hematological/Early clinical signs of methemoglobinemia	1	Chronic	
Nitrite	chronic	1.0E-01	mg/kg/day	100%	1.0E-01	mg/kg/day	Hematological/Early clinical signs of methemoglobinemia	1	IRIS	February, 2003
	subchronic	1.0E-01	mg/kg/day	100%	1.0E-01	mg/kg/day	Hematological/Early clinical signs of methemoglobinemia	1	HEAST	FY 1997
Thallium	chronic	8.0E-05	mg/kg/day	100%	8.0E-05	mg/kg/day	No effects observed	3,000	IRIS	February, 2003
	subchronic	8.0E-04	mg/kg/day	100%	8.0E-04	mg/kg/day	No effects observed	300	HEAST	FY 1997
PESTICIDES/PCBs										
4,4'-DDD	chronic	5.0E-04	mg/kg/day	70%	5.0E-04	mg/kg/day	Liver/Liver lesions		Surrogate	
	subchronic	5.0E-04	mg/kg/day	70%	5.0E-04	mg/kg/day	Liver/Liver lesions		Surrogate	
4,4'-DDE	chronic	5.0E-04	mg/kg/day	70%	5.0E-04	mg/kg/day	Liver/Liver lesions		Surrogate	
	subchronic	5.0E-04	mg/kg/day	70%	5.0E-04	mg/kg/day	Liver/Liver lesions		Surrogate	
4,4'-DDT	chronic	5.0E-04	mg/kg/day	70%	5.0E-04	mg/kg/day	Liver/Liver lesions	100	IRIS	February, 2003
	subchronic	5.0E-04	mg/kg/day	70%	5.0E-04	mg/kg/day	Liver/Liver lesions	100	HEAST	FY 1997
Aldrin	chronic	3.0E-05	mg/kg/day	70%	3.0E-05	mg/kg/day	Liver/Liver lesions	1,000	IRIS	February, 2003
	subchronic	3.0E-05	mg/kg/day	70%	3.0E-05	mg/kg/day	Liver/Liver lesions	1,000	HEAST	FY 1997
beta-BHC	chronic	3.0E-04	mg/kg/day	100%	3.0E-04	mg/kg/day	Liver and kidney/Liver and kidney toxicity	1,000	Surrogate	
	subchronic	3.0E-03	mg/kg/day	100%	3.0E-03	mg/kg/day	Liver and kidney/Liver and kidney toxicity	100	Surrogate	
Chlordane (alpha & gamma isomers)	chronic	5.0E-04	mg/kg/day	80%	5.0E-04	mg/kg/day	Liver/Hepatic necrosis	300	IRIS	February, 2003
	subchronic	5.0E-04	mg/kg/day	80%	5.0E-04	mg/kg/day	Liver/Hepatic necrosis	300	Chronic	
delta-BHC	chronic	3.0E-04	mg/kg/day	100%	3.0E-04	mg/kg/day	Liver and kidney/Liver and kidney toxicity	1,000	Surrogate	
	subchronic	3.0E-03	mg/kg/day	100%	3.0E-03	mg/kg/day	Liver and kidney/Liver and kidney toxicity	100	Surrogate	
Dieldrin	chronic	5.0E-05	mg/kg/day	100%	5.0E-05	mg/kg/day	Liver/Liver lesions	100	IRIS	February, 2003
	subchronic	5.0E-05	mg/kg/day	100%	5.0E-05	mg/kg/day	Liver/Liver lesions	100	HEAST	FY 1997
Endosulfan II	chronic	6.0E-03	mg/kg/day	100%	6.0E-03	mg/kg/day	Kidney/Kidney lesions		Surrogate	
	subchronic	6.0E-03	mg/kg/day	100%	6.0E-03	mg/kg/day	Kidney/Kidney lesions		Surrogate	
Endosulfan Sulfate	chronic	6.0E-03	mg/kg/day	100%	6.0E-03	mg/kg/day	Kidney/Kidney lesions		Surrogate	
	subchronic	6.0E-03	mg/kg/day	100%	6.0E-03	mg/kg/day	Kidney/Kidney lesions		Surrogate	
Endrin aldehyde	chronic	3.0E-04	mg/kg/day	100%	3.0E-04	mg/kg/day	Nervous system and liver/Convulsions & liver lesions		Surrogate	
	subchronic	3.0E-04	mg/kg/day	100%	3.0E-04	mg/kg/day	Nervous system and liver/Convulsions & liver lesions		Surrogate	
Endrin ketone	chronic	3.0E-04	mg/kg/day	100%	3.0E-04	mg/kg/day	Nervous system and liver/Convulsions & liver lesions		Surrogate	
	subchronic	3.0E-04	mg/kg/day	100%	3.0E-04	mg/kg/day	Nervous system and liver/Convulsions & liver lesions		Surrogate	
Heptachlor	chronic	5.0E-04	mg/kg/day	100%	5.0E-04	mg/kg/day	Liver/Increased liver weight	300	IRIS	February, 2003
	subchronic	5.0E-04	mg/kg/day	100%	5.0E-04	mg/kg/day	Liver/Increased liver weight	300	HEAST	FY 1997
Heptachlor Epoxide	chronic	1.3E-05	mg/kg/day	100%	1.3E-05	mg/kg/day	Liver/Increased liver weight	1,000	IRIS	February, 2003
	subchronic	1.3E-05	mg/kg/day	100%	1.3E-05	mg/kg/day	Liver/Increased liver weight	1,000	HEAST	FY 1997
Aroclor-1254	chronic	2.0E-05	mg/kg/day	80%	2.0E-05	mg/kg/day	Immune system/Immunotoxicity	300	IRIS	February, 2003
	subchronic	5.0E-05	mg/kg/day	80%	5.0E-05	mg/kg/day	Immune system/Immunotoxicity	300	HEAST	FY 1997
Aroclor 1260	chronic	2.0E-05	mg/kg/day	80%	2.0E-05	mg/kg/day	Immune system/Immunotoxicity	300	Surrogate	
	subchronic	5.0E-05	mg/kg/day	80%	5.0E-05	mg/kg/day	Immune system/Immunotoxicity	300	Surrogate	
Aroclor 1268	chronic	2.0E-05	mg/kg/day	80%	2.0E-05	mg/kg/day	Immune system/Immunotoxicity	300	Surrogate	
	subchronic	5.0E-05	mg/kg/day	80%	5.0E-05	mg/kg/day	Immune system/Immunotoxicity	300	Surrogate	

Non-Cancer Toxicity Data - Oral/Dermal

Baseline Human Health Risk Assessment - Draft
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal (1	Adjusted Dermal RfD (2)		Primary Target Organ or System / Critical Effect	Combined Uncertainty/Modifying Factors	RfD: Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s)
DIOXINS/FURANS										
2,3,7,8-tetrachlorobenzo-p-dioxin (TCDD)	chronic	ND							IRIS	February, 2003
	subchronic	ND								
HCX	chronic									
	subchronic									
VOLATILES										
Tetrachloroethene	chronic	1.0E-02	mg/kg/day	100%	1.0E-02	mg/kg/day	Liver/Hepatotoxicity	1,000	IRIS	February, 2003
	subchronic	1.0E-01	mg/kg/day	100%	1.0E-01	mg/kg/day	Liver/Hepatotoxicity	100	HEAST	FY 1997

Notes:

IRIS = Integrated Risk Information System: February, 2003
HEAST = Health Effects Assessment Summary Tables: FY 1997
NCEA = National Center for Environmental Assessment: April, 2003
NCEA provisional values are obtained from the USEPA Region I
ND = no data available

mg = milligram
kg = kilogram
BW = body weight
chronic - the chronic value is used as the subchronic RfD
surrogate - a value for a closely related chemical is used as the RfD

(1) Values obtained from RAGS Volume 1 (Part E, Supplemental Guidance for Dermal Risk Assessment, Interim Guidance) (EPA, 1999)
Per this guidance, a value of 100% is used for analytes without published values.
(2) Adjusted Dermal RfD = Oral RfD x Oral to Dermal Adjustment Factor Per RAGS Part E (USEPA, 1999), adjustments are only performed for chemicals that have an oral absorption efficiency of less than 50%.

Per USEPA Region I "Risk Updates, No. 5", (August, 1999), Non-carcinogenic PAHs without published RfDs should be evaluated using the published RfD for a structurally similar PAH.
Surrogate (1) - Value for acenaphthene used as a surrogate
Surrogate (2) - Value for pyrene used as a surrogate
RfD for 2-chlorophenol is used as surrogate for 4-Chloro-3-methylphenol
RfD for DDT is used as surrogate for DDD and DDE
RfD for Aroclor 1254 used as surrogate for other PCB congeners with no published RfDs
RfD for Lindane (gamma-BHC) is used as surrogate for beta-BHC and delta-BHC.
RfD for Endosulfan used as surrogate for other endosulfan compounds
RfD for Endrin used as surrogate for other endrin compounds
For Manganese in drinking water: As recommended by USEPA Region I Risk Update, a non-dietary RfD is obtained by subtracting typical dietary intake of manganese (5 mg/kday) from critical dose (10 mg/day). Non-dietary RfD is then adjusted with a modifying factor of 3, as recommended by IRIS for drinking water exposures.
For manganese in non-drinking water media: As recommended by USEPA Region I Risk Update, a non-dietary RfD is obtained by subtracting typical dietary intake of manganese (5 mg/kday) from critical dose (10 mg/day). A modifying factor of 1 is then applied, per USEPA Region 1.
Value for chlordane used for alpha- and gamma- isomers.

Prepared by: RAR
Checked by: KJA

Table 1
Cancer Toxicity Data - Oral/Dermal

Baseline Human Health Risk Assessment - Draft
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal (1)	Absorbed Cancer Slope Factor for Dermal (2)		Weight of Evidence/ Cancer Guideline Description	Oral Cancer Slope Factor	
	Value	Units		Value	Units		Source(s)	Date(s)
ACID EXTRACTABLE COMPOUNDS								
4-Chloro-3-methylphenol						ND		
4-Nitrophenol						D	NCEA	April, 2003
BASE NEUTRAL COMPOUNDS								
2-Methylnaphthalene						ND		
Acenaphthylene						D	IRIS	February, 2003
Benzo(a)anthracene	7.3E-01	$(mg/kg/day)^{-1}$	89%	7.3E-01	$(mg/kg/day)^{-1}$	B2	IRIS A	
Benzo(a)pyrene	7.3E+00	$(mg/kg/day)^{-1}$	89%	7.3E+00	$(mg/kg/day)^{-1}$	B2	IRIS	February, 2003
Benzo(b)fluoranthene	7.3E-01	$(mg/kg/day)^{-1}$	89%	7.3E-01	$(mg/kg/day)^{-1}$	B2	IRIS A	February, 2003
Benzo(g,h,i)perylene						D	IRIS	February, 2003
Benzo(k)fluoranthene	7.3E-02	$(mg/kg/day)^{-1}$	89%	7.3E-02	$(mg/kg/day)^{-1}$	B2	IRIS A	February, 2003
Bis(2-ethylhexyl)phthalate (BEHP)	1.4E-02	$(mg/kg/day)^{-1}$	100%	1.4E-02	$(mg/kg/day)^{-1}$	B2	IRIS A	February, 2003
Dibenzo(a,h)anthracene	7.3E+00	$(mg/kg/day)^{-1}$	89%	7.3E+00	$(mg/kg/day)^{-1}$	B2	IRIS A	February, 2003
Indeno(1,2,3-cd)pyrene	7.3E-01	$(mg/kg/day)^{-1}$	89%	7.3E-01	$(mg/kg/day)^{-1}$	B2	IRIS A	February, 2003
n-Nitrosodi-n-propylamine	7.0E+00	$(mg/kg/day)^{-1}$	100%	7.0E+00	$(mg/kg/day)^{-1}$	B2	IRIS A	February, 2003
Pentachlorophenol	1.2E-01	$(mg/kg/day)^{-1}$	76%	1.2E-01	$(mg/kg/day)^{-1}$	B2	IRIS A	February, 2003
Phenanthrene						D	IRIS	February, 2003
INORGANICS/METALS								
Aluminum						D	NCEA	April, 2003
Antimony						ND		
Arsenic	1.5E+00	$(mg/kg/day)^{-1}$	95%	1.5E+00	$(mg/kg/day)^{-1}$	A	IRIS	February, 2003
Barium						ND		
Cadmium (food)	ND		2.5%	ND		B1	IRIS	February, 2003
Cadmium (water)	ND		5%	ND		B1	IRIS	February, 2003
Chromium III						ND		
Chromium VI						ND		
Copper						D	IRIS	February, 2003
Lead	ND		ND	ND		B2	IRIS	February, 2003

Table 6.1
Cancer Toxicity Data - Oral/Dermal

Baseline Human Health Risk Assessment - Draft
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal (1)	Absorbed Cancer Slope Factor for Dermal (2)		Weight of Evidence/ Cancer Guideline Description	Oral Cancer Slope Factor	
	Value	Units		Value	Units		Source(s)	Date(s)
Manganese (drinking water)						D	IRIS	February, 2003
Manganese (food)						D	IRIS	February, 2003
Manganese (soil)						D	IRIS	February, 2003
Mercury (as mercuric chloride)	ND		7%	ND		C	IRIS	February, 2003
Mercury (as methyl mercury)	ND		95%	ND		C	IRIS	February, 2003
Nickel						ND		
Nitrate						ND	IRIS	February, 2003
Nitrite						ND	IRIS	February, 2003
Thallium						ND		
PESTICIDES/PCBs								
4,4'-DDD	2.4E-01	$(mg/kg/day)^{-1}$	70%	2.4E-01	$(mg/kg/day)^{-1}$	B2	IRIS	February, 2003
4,4'-DDE	3.4E-01	$(mg/kg/day)^{-1}$	70%	3.4E-01	$(mg/kg/day)^{-1}$	B2	IRIS	February, 2003
4,4'-DDT	3.4E-01	$(mg/kg/day)^{-1}$	70%	3.4E-01	$(mg/kg/day)^{-1}$	B2	IRIS	February, 2003
Aldrin	1.7E+01	$(mg/kg/day)^{-1}$	100%	1.7E+01	$(mg/kg/day)^{-1}$	B2	IRIS	February, 2003
beta-BHC	1.8E+00	$(mg/kg/day)^{-1}$	100%	1.8E+00	$(mg/kg/day)^{-1}$	C	IRIS	February, 2003
Chlordane (alpha & gamma isomers)	3.5E-01	$(mg/kg/day)^{-1}$	80%	3.5E-01	$(mg/kg/day)^{-1}$	B2	IRIS	February, 2003
delta-BHC						D	IRIS	February, 2003
Dieldrin	1.6E+01	$(mg/kg/day)^{-1}$	100%	1.6E+01	$(mg/kg/day)^{-1}$	B2	IRIS	February, 2003
Endosulfan II						ND		
Endosulfan Sulfate						ND		
Endrin aldehyde						ND		
Endrin ketone						ND		
Heptachlor	4.5E+00	$(mg/kg/day)^{-1}$	100%	4.5E+00	$(mg/kg/day)^{-1}$	B2	IRIS	February, 2003
Heptachlor Epoxide	9.1E+00	$(mg/kg/day)^{-1}$	100%	9.1E+00	$(mg/kg/day)^{-1}$	B2	IRIS	February, 2003
Aroclor-1254	2.0E+00	$(mg/kg/day)^{-1}$	80%	2.0E+00	$(mg/kg/day)^{-1}$	B2	IRIS	February, 2003
Aroclor 1260	2.0E+00	$(mg/kg/day)^{-1}$	80%	2.0E+00	$(mg/kg/day)^{-1}$	B2	IRIS	February, 2003
Aroclor 1268	2.0E+00	$(mg/kg/day)^{-1}$	80%	2.0E+00	$(mg/kg/day)^{-1}$	B2	IRIS	February, 2003

Tab

Cancer Toxicity Data - Oral/Dermal

Baseline Human Health Risk Assessment - Draft
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal (1)	Absorbed Cancer Slope Factor for Dermal (2)		Weight of Evidence/ Cancer Guideline Description	Oral Cancer Slope Factor	
	Value	Units		Value	Units		Source(s)	Date(s)
DIOXINS/FURANS								
2,3,7,8-tetrachlorobenzo-p-dioxin (TCDD)	1.5E+05	$(mg/kg/day)^{-1}$	70%	1.5E+05	$(mg/kg/day)^{-1}$	B2	HEAST	January-00
HCX (3)								
VOLATILES								
Tetrachloroethene	5.4E-01	$(mg/kg/day)^{-1}$	100%	5.4E-01	$(mg/kg/day)^{-1}$	B2	CalEPA	January-03

Notes:

IRIS = Integrated Risk Information System: February, 2003
HEAST= Health Effects Assessment Summary Tables: FY 1997
NCEA = National Center for Environmental Assessment: April, 2003
NCEA provisional values are obtained from the USEPA Region I
CalEPA = California Environmental Protection Agency table dated 1/31/03

mg = milligram
kg = kilogram
BW = body weight
ND = no data available

(1) Values obtained from RAGS Volume 1 (Part E, Supplemental Guidance for Dermal Risk Assessment, Interim Guidance) (EPA, 1999)
Per this guidance, a value of 100% is used for analytes without published values.
(2) Adjusted Dermal SF = Oral SF / Oral to Dermal Adjustment Factor. Per RAGS Part E (USEPA, 1999), adjustments are only performed for chemicals that have an oral absorption efficiency of less than 50%.
(3) HCX is evaluated by utilizing the cancer slope factor for TCDD and a Toxicity Equivalence Factor of 0.0002.

The value for chlordane is used as surrogate for the isomers.
Slope Factor for Benzo(a)Pyrene used for other carcinogenic PAHs, adjusted by Relative Potency Factors of 1.0 [benzo(a)pyrene, dibenz(a,h)anthracene]; 0.1 [benzo(a)anthracene, benzo(b)flouoranthene, indeno(1,2,3-c,d)pyrene]; 0.01 [benzo(k)fluoranthene]; 0.001 [chrysene]. USEPA Region I Risk Update #2, August 1994.
PCB slope factors are applicable to Aroclors 1016, 1248, 1254, and 1260.

Weight of Evidence:
A - Human carcinogen
B1 - Probable human carcinogen - indicates that limited human data are available
B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as a human carcinogen
E - Evidence of noncarcinogenicity

Prepared by: RAR
Checked by: KJA

TABLE 7.1.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	ASSAPUMPSET POND	INGESTION	2-Methylnaphthalene	0.01855	mg/kg	NC		NC			4.7E-10	mg/kg/day	2.0E-02	mg/kg/day	2.E-08
				Acenaphthylene	0.0589	mg/kg	NC		NC			1.5E-09	mg/kg/day	6.0E-02	mg/kg/day	2.E-08
				Benzo(a)anthracene	1	mg/kg	4.4E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-09	2.5E-08	mg/kg/day	3.0E-02	mg/kg/day	8.E-07
				Benzo(a)pyrene	0.84	mg/kg	3.7E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-08	2.1E-08	mg/kg/day	3.0E-02	mg/kg/day	7.E-07
				Benzo(b)fluoranthene	1.4	mg/kg	6.1E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-09	3.6E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Benzo(g,h,i)perylene	0.59468	mg/kg	NC		NC			1.5E-08	mg/kg/day	3.0E-02	mg/kg/day	5.E-07
				Dibenzo(a,h)anthracene	0.17898	mg/kg	7.8E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	6.E-09	4.6E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Indeno(1,2,3-cd)pyrene	0.65	mg/kg	2.8E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-09	1.7E-08	mg/kg/day	3.0E-02	mg/kg/day	6.E-07
				Phenanthrene	0.79474	mg/kg	NC		NC			2.0E-08	mg/kg/day	3.0E-02	mg/kg/day	7.E-07
				alpha-Chlordane	0.00133	mg/kg	5.8E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-12	3.4E-11	mg/kg/day	5.0E-04	mg/kg/day	7.E-08
				Aroclor-1254	0.05755	mg/kg	2.5E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	5.E-10	1.5E-09	mg/kg/day	2.0E-05	mg/kg/day	7.E-05
				Aroclor-1268	0.04166	mg/kg	1.8E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	4.E-10	1.1E-09	mg/kg/day	2.0E-05	mg/kg/day	5.E-05
				gamma-Chlordane	0.00065	mg/kg	2.8E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-12	1.7E-11	mg/kg/day	5.0E-04	mg/kg/day	3.E-08
				Technical Chlordane	0.15253	mg/kg	6.7E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-10	3.9E-09	mg/kg/day	5.0E-04	mg/kg/day	8.E-06
				Aluminum	21774	mg/kg	NC		NC			5.5E-04	mg/kg/day	1.0E+00	mg/kg/day	6.E-04
				Arsenic	5.21	mg/kg	2.3E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	3.E-08	1.3E-07	mg/kg/day	3.0E-04	mg/kg/day	4.E-04
				Cadmium	0.858	mg/kg	NC		NC			2.2E-08	mg/kg/day	1.0E-03	mg/kg/day	2.E-05
				Chromium	17.5	mg/kg	NC		NC			4.5E-07	mg/kg/day	3.0E-03	mg/kg/day	1.E-04
				Copper	18.3	mg/kg	NC		NC			4.7E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Lead	88.6	mg/kg	3.9E-07	mg/kg/day				2.3E-06	mg/kg/day			
				Manganese	1590	mg/kg	NC		NC			4.0E-05	mg/kg/day	7.1E-02	mg/kg/day	6.E-04
				Mercury	0.114	mg/kg	NC		NC			2.9E-09	mg/kg/day	3.0E-04	mg/kg/day	1.E-05
				Nickel	20	mg/kg	NC		NC			5.1E-07	mg/kg/day	2.0E-02	mg/kg/day	3.E-05
				Thallium	0.354	mg/kg	NC		NC			9.0E-09	mg/kg/day	8.0E-05	mg/kg/day	1.E-04
				Vanadium	32	mg/kg	NC		NC			8.1E-07	mg/kg/day	7.0E-03	mg/kg/day	1.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.00000773	mg/kg	3.4E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	5.E-09	2.0E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								8.E-08					2.E-03
			DERMAL	2-Methylnaphthalene	0.01855	mg/kg	NC		NC			4.2E-10	mg/kg/day	2.0E-02	mg/kg/day	2.E-08
				Acenaphthylene	0.0589	mg/kg	NC		NC			1.3E-09	mg/kg/day	6.0E-02	mg/kg/day	2.E-08
				Benzo(a)anthracene	1	mg/kg	3.9E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-09	2.3E-08	mg/kg/day	3.0E-02	mg/kg/day	8.E-07
				Benzo(a)pyrene	0.84	mg/kg	3.2E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-08	1.9E-08	mg/kg/day	3.0E-02	mg/kg/day	6.E-07
				Benzo(b)fluoranthene	1.4	mg/kg	5.4E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-09	3.2E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Benzo(g,h,i)perylene	0.59468	mg/kg	NC		NC			1.3E-08	mg/kg/day	3.0E-02	mg/kg/day	4.E-07
				Dibenzo(a,h)anthracene	0.17898	mg/kg	6.9E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	5.E-09	4.0E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				Indeno(1,2,3-cd)pyrene	0.65	mg/kg	2.5E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-09	1.5E-08	mg/kg/day	3.0E-02	mg/kg/day	5.E-07
				Phenanthrene	0.79474	mg/kg	NC		NC			1.8E-08	mg/kg/day	3.0E-02	mg/kg/day	6.E-07
				alpha-Chlordane	0.00133	mg/kg	1.6E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	6.E-13	9.2E-12	mg/kg/day	5.0E-04	mg/kg/day	2.E-08
				Aroclor-1254	0.05755	mg/kg	2.4E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	5.E-10	1.4E-09	mg/kg/day	2.0E-05	mg/kg/day	7.E-05
				Aroclor-1268	0.04166	mg/kg	1.7E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-10	1.0E-09	mg/kg/day	2.0E-05	mg/kg/day	5.E-05
				gamma-Chlordane	0.00065	mg/kg	7.7E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-13	4.5E-12	mg/kg/day	5.0E-04	mg/kg/day	9.E-09
				Technical Chlordane	0.15253	mg/kg	1.8E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	6.E-11	1.1E-09	mg/kg/day	5.0E-04	mg/kg/day	2.E-06
				Aluminum	21774	mg/kg	NC		NC			--		1.0E-02	mg/kg/day	
				Arsenic	5.21	mg/kg	4.6E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	7.E-09	2.7E-08	mg/kg/day	3.0E-04	mg/kg/day	9.E-05
				Cadmium	0.858	mg/kg	NC		NC			1.5E-10	mg/kg/day	2.5E-05	mg/kg/day	6.E-06
				Chromium	17.5	mg/kg	NC		NC			--		7.5E-05	mg/kg/day	
				Copper	18.3	mg/kg	NC		NC			--		3.0E-02	mg/kg/day	
				Lead	88.6	mg/kg	--					--				
				Manganese	1590	mg/kg	NC		NC			--		2.8E-03	mg/kg/day	
				Mercury	0.114	mg/kg	NC		NC			--		2.1E-05	mg/kg/day	
				Nickel	20	mg/kg	NC		NC			--		8.0E-04	mg/kg/day	
				Thallium	0.354	mg/kg	NC		NC			--		8.0E-05	mg/kg/day	
				Vanadium	32	mg/kg	NC		NC			--		1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00000773	mg/kg	6.9E-15	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-09	4.0E-14	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-08					2.E-04
		EXPOSURE POINT TOTAL									1.E-07					2.E-03
	EXPOSURE MEDIUM TOTAL										1.E-07					2.E-03
SEDIMENT TOTAL											1.E-07					2.E-03

TABLE 7.1.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SURFACE WATER	SURFACE WATER	ASSAPUMPSET POND	INGESTION	Arsenic	0.000491	mg/l	2.1E-10	mg/kg/day	1.5E+00	mg/kg/day	3.E-10	1.2E-09	mg/kg/day	3.0E-04	mg/kg/day	4 E-06
				Manganese	0.166	mg/l	NC		NC			4.2E-07	mg/kg/day	2.4E-02	mg/kg/day	2.E-05
				Mercury	0.00000215	mg/l	NC		NC			5 5E-12	mg/kg/day	3.0E-04	mg/kg/day	2 E-08
				Nitrite-N	0.0051	mg/l	NC		NC			1.3E-08	mg/kg/day	1 0E-01	mg/kg/day	1 E-07
				Toxicity Equivalency (Dioxins/Furans)	5 34E-09	mg/l	2.3E-15	mg/kg/day	1 5E+05	mg/kg/day	3.E-10	1.4E-14	mg/kg/day			
			EXPOSURE ROUTE TOTAL								7 E-10					2 E-05
			DERMAL	Arsenic	0.000491	mg/l	3.7E-10	mg/kg/day	1.5E+00	mg/kg/day	6.E-10	2 2E-09	mg/kg/day	3 0E-04	mg/kg/day	7 E-06
				Manganese	0.166	mg/l	NC		NC			7.3E-07	mg/kg/day	9 6E-04	mg/kg/day	8.E-04
				Mercury	0 00000215	mg/l	NC		NC			9.5E-12	mg/kg/day	2.1E-05	mg/kg/day	5 E-07
				Nitrite-N	0 0051	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	5.34E-09	mg/l	0.0E+00	mg/kg/day	1 5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								6 E-10					8 E-04
		EXPOSURE POINT TOTAL									1.E-09					8 E-04
	EXPOSURE MEDIUM TOTAL										1.E-09					8.E-04
SURFACE WATER TOTAL											1.E-09					8.E-04
BIOTA	COMBINED FISH DIET	ASSAPUMPSET POND	INGESTION	Acenaphthylene	0.0011	mg/kg	NC		NC			2 1E-07	mg/kg/day	6.0E-02	mg/kg/day	4 E-06
				Benzo(a)anthracene	0.0031	mg/kg	1.0E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-08	5.9E-07	mg/kg/day	3.0E-02	mg/kg/day	2 E-05
				Benzo(a)pyrene	0.00329	mg/kg	1.1E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	8.E-07	6.3E-07	mg/kg/day	3 0E-02	mg/kg/day	2 E-05
				Benzo(b)fluoranthene	0.004	mg/kg	1 3E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	1 E-07	7.7E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Benzo(g,h,i)perylene	0.00295	mg/kg	NC		NC			5.7E-07	mg/kg/day	3.0E-02	mg/kg/day	2 E-05
				Dibenzo(a,h)anthracene	0 00071	mg/kg	2.3E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-07	1 4E-07	mg/kg/day	3 0E-02	mg/kg/day	5 E-06
				Indeno(1,2,3-cd)pyrene	0.0026	mg/kg	8.5E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-08	5.0E-07	mg/kg/day	3 0E-02	mg/kg/day	2 E-05
				Phenanthrene	0.0059	mg/kg	NC		NC			1.1E-06	mg/kg/day	3.0E-02	mg/kg/day	4 E-05
				4,4'-DDD	0.00445	mg/kg	1.5E-07	mg/kg/day	2.4E-01	(mg/kg/day)-1	4.E-08	8.5E-07	mg/kg/day	5 0E-04	mg/kg/day	2 E-03
				4,4'-DDE	0.0235	mg/kg	7.7E-07	mg/kg/day	3 4E-01	(mg/kg/day)-1	3.E-07	4.5E-06	mg/kg/day	5.0E-04	mg/kg/day	9 E-03
				alpha-Chlordane	0.0027	mg/kg	8.9E-08	mg/kg/day	3 5E-01	(mg/kg/day)-1	3.E-08	5 2E-07	mg/kg/day	5.0E-04	mg/kg/day	1 E-03
				Aroclor-1254	0 03979	mg/kg	1.3E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-06	7.6E-06	mg/kg/day	2 0E-05	mg/kg/day	4 E-01
				Dieldrin	0.0013	mg/kg	4.3E-08	mg/kg/day	1.6E+01	(mg/kg/day)-1	7.E-07	2.5E-07	mg/kg/day	5 0E-05	mg/kg/day	5.E-03
				gamma-Chlordane	0 0012	mg/kg	3.9E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-08	2.3E-07	mg/kg/day	5 0E-04	mg/kg/day	5.E-04
				Heptachlor Epoxide	0.00091	mg/kg	3.0E-08	mg/kg/day	9.1E+00	(mg/kg/day)-1	3.E-07	1.7E-07	mg/kg/day	1.3E-05	mg/kg/day	1.E-02
				Technical Chlordane	0 11	mg/kg	3.6E-06	mg/kg/day	3.5E-01	(mg/kg/day)-1	1 E-06	2 1E-05	mg/kg/day	5.0E-04	mg/kg/day	4 E-02
				Lead	0.0764	mg/kg	2.5E-06	mg/kg/day				1 5E-05	mg/kg/day			
				Mercury	0.2	mg/kg	NC		NC			3.8E-05	mg/kg/day	3.0E-04	mg/kg/day	1.E-01
				Mercury (methyl)	0.22	mg/kg	NC		NC			4.2E-05	mg/kg/day	1 0E-04	mg/kg/day	4 E-01
				Zinc	15.7	mg/kg	NC		NC			3.0E-03	mg/kg/day	3.0E-01	mg/kg/day	1 E-02
				Toxicity Equivalency (Dioxins/Furans)	0.00000238	mg/kg	7.8E-11	mg/kg/day	1 5E+05	(mg/kg/day)-1	1.E-05	4.6E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-05					1 0 E+00
		EXPOSURE POINT TOTAL									2.E-05					1.0 E+00
	EXPOSURE MEDIUM TOTAL										2.E-05					1.0.E+00
COMBINED FISH DIET TOTAL											2.E-05					1.0.E+00
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	2.E-05	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				1.0.E+00

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: MJM

TABLE 7.2.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	ASSAPUMPSET POND	INGESTION	2-Methylnaphthalene	0.01855	mg/kg	NC		NC			7.3E-10	mg/kg/day	2.0E-02	mg/kg/day	4.E-08
				Acenaphthylene	0.0589	mg/kg	NC		NC			2.3E-09	mg/kg/day	6.0E-02	mg/kg/day	4.E-08
				Benzo(a)anthracene	1	mg/kg	6.8E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	5.E-09	4.0E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Benzo(a)pyrene	0.84	mg/kg	5.7E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-08	3.3E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Benzo(b)fluoranthene	1.4	mg/kg	9.5E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-09	5.5E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(g,h,i)perylene	0.59468	mg/kg	NC		NC			2.4E-08	mg/kg/day	3.0E-02	mg/kg/day	8.E-07
				Dibenzo(a,h)anthracene	0.17898	mg/kg	1.2E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	9.E-09	7.1E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Indeno(1,2,3-cd)pyrene	0.65	mg/kg	4.4E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-09	2.6E-08	mg/kg/day	3.0E-02	mg/kg/day	9.E-07
				Phenanthrene	0.79474	mg/kg	NC		NC			3.1E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				alpha-Chlordane	0.00133	mg/kg	9.0E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-12	5.3E-11	mg/kg/day	5.0E-04	mg/kg/day	1.E-07
				Aroclor-1254	0.05755	mg/kg	3.9E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	8.E-10	2.3E-09	mg/kg/day	2.0E-05	mg/kg/day	1.E-04
				Aroclor-1268	0.04166	mg/kg	2.8E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	6.E-10	1.6E-09	mg/kg/day	2.0E-05	mg/kg/day	8.E-05
				gamma-Chlordane	0.00065	mg/kg	4.4E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-12	2.6E-11	mg/kg/day	5.0E-04	mg/kg/day	5.E-08
				Technical Chlordane	0.15253	mg/kg	1.0E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-10	6.0E-09	mg/kg/day	5.0E-04	mg/kg/day	1.E-05
				Aluminum	21774	mg/kg	NC		NC			8.6E-04	mg/kg/day	1.0E+00	mg/kg/day	9.E-04
				Arsenic	5.21	mg/kg	3.5E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	5.E-08	2.1E-07	mg/kg/day	3.0E-04	mg/kg/day	7.E-04
				Cadmium	0.858	mg/kg	NC		NC			3.4E-08	mg/kg/day	1.0E-03	mg/kg/day	3.E-05
				Chromium	17.5	mg/kg	NC		NC			6.9E-07	mg/kg/day	3.0E-03	mg/kg/day	2.E-04
				Copper	18.3	mg/kg	NC		NC			7.2E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Lead	88.6	mg/kg	6.0E-07	mg/kg/day				3.5E-06	mg/kg/day			
				Manganese	1590	mg/kg	NC		NC			6.3E-05	mg/kg/day	7.1E-02	mg/kg/day	9.E-04
				Mercury	0.114	mg/kg	NC		NC			4.5E-09	mg/kg/day	3.0E-04	mg/kg/day	2.E-05
				Nickel	20	mg/kg	NC		NC			7.9E-07	mg/kg/day	2.0E-02	mg/kg/day	4.E-05
				Thallium	0.354	mg/kg	NC		NC			1.4E-08	mg/kg/day	8.0E-05	mg/kg/day	2.E-04
				Vanadium	32	mg/kg	NC		NC			1.3E-06	mg/kg/day	7.0E-03	mg/kg/day	2.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.00000773	mg/kg	5.2E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	8.E-09	3.1E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-07					3.E-03
			DERMAL	2-Methylnaphthalene	0.01855	mg/kg	NC		NC			1.4E-09	mg/kg/day	2.0E-02	mg/kg/day	7.E-08
				Acenaphthylene	0.0589	mg/kg	NC		NC			4.3E-09	mg/kg/day	6.0E-02	mg/kg/day	7.E-08
				Benzo(a)anthracene	1	mg/kg	1.3E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	9.E-09	7.4E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(a)pyrene	0.84	mg/kg	1.1E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	8.E-08	6.2E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(b)fluoranthene	1.4	mg/kg	1.8E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	1.0E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(g,h,i)perylene	0.59468	mg/kg	NC		NC			4.4E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Dibenzo(a,h)anthracene	0.17898	mg/kg	2.3E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-08	1.3E-08	mg/kg/day	3.0E-02	mg/kg/day	4.E-07
				Indeno(1,2,3-cd)pyrene	0.65	mg/kg	8.2E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-09	4.8E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Phenanthrene	0.79474	mg/kg	NC		NC			5.8E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				alpha-Chlordane	0.00133	mg/kg	5.2E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-12	3.0E-11	mg/kg/day	5.0E-04	mg/kg/day	6.E-08
				Aroclor-1254	0.05755	mg/kg	7.8E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-09	4.6E-09	mg/kg/day	2.0E-05	mg/kg/day	2.E-04
				Aroclor-1268	0.04166	mg/kg	5.7E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-09	3.3E-09	mg/kg/day	2.0E-05	mg/kg/day	2.E-04
				gamma-Chlordane	0.00065	mg/kg	2.5E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	9.E-13	1.5E-11	mg/kg/day	5.0E-04	mg/kg/day	3.E-08
				Technical Chlordane	0.15253	mg/kg	5.9E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-10	3.5E-09	mg/kg/day	5.0E-04	mg/kg/day	7.E-06
				Aluminum	21774	mg/kg	NC		NC			--		1.0E-02	mg/kg/day	
				Arsenic	5.21	mg/kg	1.5E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	2.E-08	8.8E-08	mg/kg/day	3.0E-04	mg/kg/day	3.E-04
				Cadmium	0.858	mg/kg	NC		NC			4.9E-10	mg/kg/day	2.5E-05	mg/kg/day	2.E-05
				Chromium	17.5	mg/kg	NC		NC			--		7.5E-05	mg/kg/day	
				Copper	18.3	mg/kg	NC		NC			--		3.0E-02	mg/kg/day	
				Lead	88.6	mg/kg	--					--				
				Manganese	1590	mg/kg	NC		NC			--		2.8E-03	mg/kg/day	
				Mercury	0.114	mg/kg	NC		NC			--		2.1E-05	mg/kg/day	
				Nickel	20	mg/kg	NC		NC			--		8.0E-04	mg/kg/day	
				Thallium	0.354	mg/kg	NC		NC			--		8.0E-05	mg/kg/day	
				Vanadium	32	mg/kg	NC		NC			--		1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00000773	mg/kg	2.2E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-09	1.3E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-07					7.E-04
		EXPOSURE POINT TOTAL									3.E-07					4.E-03
	EXPOSURE MEDIUM TOTAL										3.E-07					4.E-03
SEDIMENT TOTAL											3.E-07					4.E-03

TABLE 7.2.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS – REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SURFACE WATER	SURFACE WATER	ASSAPUMPSET POND	INGESTION	Arsenic	0.000491	mg/l	3.3E-10	mg/kg/day	1.5E+00	mg/kg/day	5.E-10	1.9E-09	mg/kg/day	3.0E-04	mg/kg/day	6.E-06
				Manganese	0.166	mg/l	NC		NC			6.6E-07	mg/kg/day	2.4E-02	mg/kg/day	3.E-05
				Mercury	0.00000215	mg/l	NC		NC			8.5E-12	mg/kg/day	3.0E-04	mg/kg/day	3.E-08
				Nitrite-N	0.0051	mg/l	NC		NC			2.0E-08	mg/kg/day	1.0E-01	mg/kg/day	2.E-07
				Toxicity Equivalency (Dioxins/Furans)	5.34E-09	mg/l	3.6E-15	mg/kg/day	1.5E+05	mg/kg/day	5.E-10	2.1E-14	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-09					3.E-05
			DERMAL	Arsenic	0.000491	mg/l	4.2E-10	mg/kg/day	1.5E+00	mg/kg/day	6.E-10	2.4E-09	mg/kg/day	3.0E-04	mg/kg/day	8.E-06
				Manganese	0.166	mg/l	NC		NC			8.2E-07	mg/kg/day	9.6E-04	mg/kg/day	9.E-04
				Mercury	0.00000215	mg/l	NC		NC			1.1E-11	mg/kg/day	2.1E-05	mg/kg/day	5.E-07
				Nitrite-N	0.0051	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	5.34E-09	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								6.E-10					9.E-04
		EXPOSURE POINT TOTAL									2.E-09					9.E-04
	EXPOSURE MEDIUM TOTAL										2.E-09					9.E-04
SURFACE WATER TOTAL											2.E-09					9.E-04
BIOTA	COMBINED FISH DIET	ASSAPUMPSET POND	INGESTION	Acenaphthylene	0.0011	mg/kg	NC		NC			2.2E-07	mg/kg/day	6.0E-02	mg/kg/day	4.E-06
				Benzo(a)anthracene	0.0031	mg/kg	1.1E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-08	6.1E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(a)pyrene	0.00329	mg/kg	1.1E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	8.E-07	6.5E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(b)fluoranthene	0.004	mg/kg	1.4E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-07	7.9E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Benzo(g,h,i)perylene	0.00295	mg/kg	NC		NC			5.8E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Dibenzo(a,h)anthracene	0.00071	mg/kg	2.4E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-07	1.4E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Indeno(1,2,3-cd)pyrene	0.0026	mg/kg	8.8E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-08	5.2E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Phenanthrene	0.0059	mg/kg	NC		NC			1.2E-06	mg/kg/day	3.0E-02	mg/kg/day	4.E-05
				4,4'-DDD	0.00445	mg/kg	1.5E-07	mg/kg/day	2.4E-01	(mg/kg/day)-1	4.E-08	8.8E-07	mg/kg/day	5.0E-04	mg/kg/day	2.E-03
				4,4'-DDE	0.0235	mg/kg	8.0E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	3.E-07	4.7E-06	mg/kg/day	5.0E-04	mg/kg/day	9.E-03
				alpha-Chlordane	0.0027	mg/kg	9.2E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-08	5.4E-07	mg/kg/day	5.0E-04	mg/kg/day	1.E-03
				Aroclor-1254	0.03979	mg/kg	1.4E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-06	7.9E-06	mg/kg/day	2.0E-05	mg/kg/day	4.E-01
				Dieldrin	0.0013	mg/kg	4.4E-08	mg/kg/day	1.6E+01	(mg/kg/day)-1	7.E-07	2.6E-07	mg/kg/day	5.0E-05	mg/kg/day	5.E-03
				gamma-Chlordane	0.0012	mg/kg	4.1E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-08	2.4E-07	mg/kg/day	5.0E-04	mg/kg/day	5.E-04
				Heptachlor Epoxide	0.00091	mg/kg	3.1E-08	mg/kg/day	9.1E+00	(mg/kg/day)-1	3.E-07	1.8E-07	mg/kg/day	1.3E-05	mg/kg/day	1.E-02
				Technical Chlordane	0.11	mg/kg	3.7E-06	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-06	2.2E-05	mg/kg/day	5.0E-04	mg/kg/day	4.E-02
				Lead	0.0764	mg/kg	2.6E-06	mg/kg/day				1.5E-05	mg/kg/day			
				Mercury	0.2	mg/kg	NC		NC			4.0E-05	mg/kg/day	3.0E-04	mg/kg/day	1.E-01
				Mercury (methyl)	0.22	mg/kg	NC		NC			4.4E-05	mg/kg/day	1.0E-04	mg/kg/day	4.E-01
				Zinc	15.7	mg/kg	NC		NC			3.1E-03	mg/kg/day	3.0E-01	mg/kg/day	1.E-02
				Toxicity Equivalency (Dioxins/Furans)	0.00000238	mg/kg	8.1E-11	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-05	4.7E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-05					1.0.E+00
		EXPOSURE POINT TOTAL									2.E-05					1.0.E+00
	EXPOSURE MEDIUM TOTAL										2.E-05					1.0.E+00
COMBINED FISH DIET TOTAL											2.E-05					1.0.E+00
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	2.E-05				TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA	1.1.E+00

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: RAR
Checked by: KJA

TABLE 7.4.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	ASSAPUMPSET POND	INGESTION	2-Methylnaphthalene	0.01855	mg/kg	NC		NC			2.8E-09	mg/kg/day	2.0E-02	mg/kg/day	1.E-07
				Acenaphthylene	0.0589	mg/kg	NC		NC			9.0E-09	mg/kg/day	6.0E-02	mg/kg/day	1.E-07
				Benzo(a)anthracene	1	mg/kg	2.6E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.5E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Benzo(a)pyrene	0.84	mg/kg	2.2E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-07	1.3E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Benzo(b)fluoranthene	1.4	mg/kg	3.7E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-08	2.1E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Benzo(g,h,i)perylene	0.59468	mg/kg	NC		NC			9.1E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Dibenzo(a,h)anthracene	0.17898	mg/kg	4.7E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-08	2.7E-08	mg/kg/day	3.0E-02	mg/kg/day	9.E-07
				Indeno(1,2,3-cd)pyrene	0.65	mg/kg	1.7E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	9.9E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Phenanthrene	0.79474	mg/kg	NC		NC			1.2E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				alpha-Chlordane	0.00133	mg/kg	3.5E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-11	2.0E-10	mg/kg/day	5.0E-04	mg/kg/day	4.E-07
				Aroclor-1254	0.05755	mg/kg	1.5E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-09	8.8E-09	mg/kg/day	2.0E-05	mg/kg/day	4.E-04
				Aroclor-1268	0.04166	mg/kg	1.1E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-09	6.4E-09	mg/kg/day	2.0E-05	mg/kg/day	3.E-04
				gamma-Chlordane	0.00065	mg/kg	1.7E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	6.E-12	9.9E-11	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				Technical Chlordane	0.15253	mg/kg	4.0E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-09	2.3E-08	mg/kg/day	5.0E-04	mg/kg/day	5.E-05
				Aluminum	21774	mg/kg	NC		NC			3.3E-03	mg/kg/day	1.0E+00	mg/kg/day	3.E-03
				Arsenic	5.21	mg/kg	1.4E-07	mg/kg/day	1.5E+00	(mg/kg/day)-1	2.E-07	8.0E-07	mg/kg/day	3.0E-04	mg/kg/day	3.E-03
				Cadmium	0.858	mg/kg	NC		NC			1.3E-07	mg/kg/day	1.0E-03	mg/kg/day	1.E-04
				Chromium	17.5	mg/kg	NC		NC			2.7E-06	mg/kg/day	3.0E-03	mg/kg/day	9.E-04
				Copper	18.3	mg/kg	NC		NC			2.8E-06	mg/kg/day	3.0E-02	mg/kg/day	9.E-05
				Lead	88.6	mg/kg	2.3E-06	mg/kg/day				1.4E-05	mg/kg/day			
				Manganese	1590	mg/kg	NC		NC			2.4E-04	mg/kg/day	7.1E-02	mg/kg/day	3.E-03
				Mercury	0.114	mg/kg	NC		NC			1.7E-08	mg/kg/day	3.0E-04	mg/kg/day	6.E-05
				Nickel	20	mg/kg	NC		NC			3.1E-06	mg/kg/day	2.0E-02	mg/kg/day	2.E-04
				Thallium	0.354	mg/kg	NC		NC			5.4E-08	mg/kg/day	8.0E-05	mg/kg/day	7.E-04
				Vanadium	32	mg/kg	NC		NC			4.9E-06	mg/kg/day	7.0E-03	mg/kg/day	7.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.00000773	mg/kg	2.0E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-08	1.2E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-07					1.E-02
			DERMAL	2-Methylnaphthalene	0.01855	mg/kg	NC		NC			1.3E-09	mg/kg/day	2.0E-02	mg/kg/day	6.E-08
				Acenaphthylene	0.0589	mg/kg	NC		NC			4.0E-09	mg/kg/day	6.0E-02	mg/kg/day	7.E-08
				Benzo(a)anthracene	1	mg/kg	1.2E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-09	6.8E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(a)pyrene	0.84	mg/kg	9.7E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	7.E-08	5.7E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(b)fluoranthene	1.4	mg/kg	1.6E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	9.5E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(g,h,i)perylene	0.59468	mg/kg	NC		NC			4.0E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Dibenzo(a,h)anthracene	0.17898	mg/kg	2.1E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-08	1.2E-08	mg/kg/day	3.0E-02	mg/kg/day	4.E-07
				Indeno(1,2,3-cd)pyrene	0.65	mg/kg	7.5E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	5.E-09	4.4E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Phenanthrene	0.79474	mg/kg	NC		NC			5.4E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				alpha-Chlordane	0.00133	mg/kg	4.7E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-12	2.8E-11	mg/kg/day	5.0E-04	mg/kg/day	6.E-08
				Aroclor-1254	0.05755	mg/kg	7.2E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-09	4.2E-09	mg/kg/day	2.0E-05	mg/kg/day	2.E-04
				Aroclor-1268	0.04166	mg/kg	5.2E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-09	3.0E-09	mg/kg/day	2.0E-05	mg/kg/day	2.E-04
				gamma-Chlordane	0.00065	mg/kg	2.3E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	8.E-13	1.4E-11	mg/kg/day	5.0E-04	mg/kg/day	3.E-08
				Technical Chlordane	0.15253	mg/kg	5.4E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-10	3.2E-09	mg/kg/day	5.0E-04	mg/kg/day	6.E-06
				Aluminum	21774	mg/kg	NC		NC			--		1.0E-02	mg/kg/day	
				Arsenic	5.21	mg/kg	1.4E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	2.E-08	8.1E-08	mg/kg/day	3.0E-04	mg/kg/day	3.E-04
				Cadmium	0.858	mg/kg	NC		NC			4.5E-10	mg/kg/day	2.5E-05	mg/kg/day	2.E-05
				Chromium	17.5	mg/kg	NC		NC			--		7.5E-05	mg/kg/day	
				Copper	18.3	mg/kg	NC		NC			--		3.0E-02	mg/kg/day	
				Lead	88.6	mg/kg	--					--				
				Manganese	1590	mg/kg	NC		NC			--		2.8E-03	mg/kg/day	
				Mercury	0.114	mg/kg	NC		NC			--		2.1E-05	mg/kg/day	
				Nickel	20	mg/kg	NC		NC			--		8.0E-04	mg/kg/day	
				Thallium	0.354	mg/kg	NC		NC			--		8.0E-05	mg/kg/day	
				Vanadium	32	mg/kg	NC		NC			--		1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00000773	mg/kg	2.1E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-09	1.2E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-07					7.E-04
		EXPOSURE POINT TOTAL									6.E-07					1.E-02
	EXPOSURE MEDIUM TOTAL										6.E-07					1.E-02
SEDIMENT TOTAL											6.E-07					1.E-02

TABLE 7.4.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SURFACE WATER	SURFACE WATER	ASSAPUMPSET POND	INGESTION	Arsenic	0.000491	mg/l	8.6E-09	mg/kg/day	1.5E+00	mg/kg/day	1.E-08	5.0E-08	mg/kg/day	3.0E-04	mg/kg/day	2.E-04
				Manganese	0.166	mg/l	NC		NC			1.7E-05	mg/kg/day	2.4E-02	mg/kg/day	7.E-04
				Mercury	0.00000215	mg/l	NC		NC			2.2E-10	mg/kg/day	3.0E-04	mg/kg/day	7.E-07
				Nitrite-N	0.0051	mg/l	NC		NC			5.2E-07	mg/kg/day	1.0E-01	mg/kg/day	5.E-06
				Toxicity Equivalency (Dioxins/Furans)	5.34E-09	mg/l	9.3E-14	mg/kg/day	1.5E+05	mg/kg/day	1.E-08	5.4E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-08					9.E-04
			DERMAL	Arsenic	0.000491	mg/l	1.4E-09	mg/kg/day	1.5E+00	mg/kg/day	2.E-09	8.1E-09	mg/kg/day	3.0E-04	mg/kg/day	3.E-05
				Manganese	0.166	mg/l	NC		NC			2.8E-06	mg/kg/day	9.6E-04	mg/kg/day	3.E-03
				Mercury	0.00000215	mg/l	NC		NC			3.6E-11	mg/kg/day	2.1E-05	mg/kg/day	2.E-06
				Nitrite-N	0.0051	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	5.34E-09	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-09					3.E-03
		EXPOSURE POINT TOTAL									3.E-08					4.E-03
	EXPOSURE MEDIUM TOTAL										3.E-08					4.E-03
SURFACE WATER TOTAL											3.E-08					4.E-03
BIOTA	COMBINED FISH DIET	ASSAPUMPSET POND	INGESTION	Acenaphthylene	0.0011	mg/kg	NC		NC			2.1E-07	mg/kg/day	6.0E-02	mg/kg/day	4.E-06
				Benzo(a)anthracene	0.0031	mg/kg	1.0E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-08	5.9E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(a)pyrene	0.00329	mg/kg	1.1E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	8.E-07	6.3E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(b)fluoranthene	0.004	mg/kg	1.3E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-07	7.7E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Benzo(g,h,i)perylene	0.00295	mg/kg	NC		NC			5.7E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Dibenzo(a,h)anthracene	0.00071	mg/kg	2.3E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-07	1.4E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Indeno(1,2,3-cd)pyrene	0.0026	mg/kg	8.5E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-08	5.0E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Phenanthrene	0.0059	mg/kg	NC		NC			1.1E-06	mg/kg/day	3.0E-02	mg/kg/day	4.E-05
				4,4'-DDD	0.00445	mg/kg	1.5E-07	mg/kg/day	2.4E-01	(mg/kg/day)-1	4.E-08	8.5E-07	mg/kg/day	5.0E-04	mg/kg/day	2.E-03
				4,4'-DDE	0.0235	mg/kg	7.7E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	3.E-07	4.5E-06	mg/kg/day	5.0E-04	mg/kg/day	9.E-03
				alpha-Chlordane	0.0027	mg/kg	8.9E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-08	5.2E-07	mg/kg/day	5.0E-04	mg/kg/day	1.E-03
				Aroclor-1254	0.03979	mg/kg	1.3E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-06	7.6E-06	mg/kg/day	2.0E-05	mg/kg/day	4.E-01
				Dieldrin	0.0013	mg/kg	4.3E-08	mg/kg/day	1.6E+01	(mg/kg/day)-1	7.E-07	2.5E-07	mg/kg/day	5.0E-05	mg/kg/day	5.E-03
				gamma-Chlordane	0.0012	mg/kg	3.9E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-08	2.3E-07	mg/kg/day	5.0E-04	mg/kg/day	5.E-04
				Heptachlor Epoxide	0.00091	mg/kg	3.0E-08	mg/kg/day	9.1E+00	(mg/kg/day)-1	3.E-07	1.7E-07	mg/kg/day	1.3E-05	mg/kg/day	1.E-02
				Technical Chlordane	0.11	mg/kg	3.6E-06	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-06	2.1E-05	mg/kg/day	5.0E-04	mg/kg/day	4.E-02
				Lead	0.0764	mg/kg	2.5E-06	mg/kg/day				1.5E-05	mg/kg/day			
				Mercury	0.2	mg/kg	NC		NC			3.8E-05	mg/kg/day	3.0E-04	mg/kg/day	1.E-01
				Mercury (methyl)	0.22	mg/kg	NC		NC			4.2E-05	mg/kg/day	1.0E-04	mg/kg/day	4.E-01
				Zinc	15.7	mg/kg	NC		NC			3.0E-03	mg/kg/day	3.0E-01	mg/kg/day	1.E-02
				Toxicity Equivalency (Dioxins/Furans)	0.00000238	mg/kg	7.8E-11	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-05	4.6E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-05					1.0E+00
		EXPOSURE POINT TOTAL									2.E-05					1.0E+00
	EXPOSURE MEDIUM TOTAL										2.E-05					1.0E+00
COMBINED FISH DIET TOTAL											2.E-05					1.0.E+00
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	2.E-05	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				1.0.E+00

NOTES
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

Prepared by: RAR
Checked by: KJA

TABLE 7.5.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS – REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	ASSAPUMPSET POND	INGESTION	2-Methylnaphthalene	0.01855	mg/kg	NC		NC			4.4E-09	mg/kg/day	2.0E-02	mg/kg/day	2.E-07
				Acenaphthylene	0.0589	mg/kg	NC		NC			1.4E-08	mg/kg/day	6.0E-02	mg/kg/day	2.E-07
				Benzo(a)anthracene	1	mg/kg	4.1E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-08	2.4E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				Benzo(a)pyrene	0.84	mg/kg	3.4E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-07	2.0E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Benzo(b)fluoranthene	1.4	mg/kg	5.7E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-08	3.3E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(g,h,i)perylene	0.59468	mg/kg	NC		NC			1.4E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Dibenzo(a,h)anthracene	0.17898	mg/kg	7.3E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	5.E-08	4.2E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Indeno(1,2,3-cd)pyrene	0.65	mg/kg	2.6E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.5E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Phenanthrene	0.79474	mg/kg	NC		NC			1.9E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				alpha-Chlordane	0.00133	mg/kg	5.4E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-11	3.2E-10	mg/kg/day	5.0E-04	mg/kg/day	6.E-07
				Aroclor-1254	0.05755	mg/kg	2.3E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	5.E-09	1.4E-08	mg/kg/day	2.0E-05	mg/kg/day	7.E-04
				Aroclor-1268	0.04166	mg/kg	1.7E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-09	9.9E-09	mg/kg/day	2.0E-05	mg/kg/day	5.E-04
				gamma-Chlordane	0.00065	mg/kg	2.6E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	9.E-12	1.5E-10	mg/kg/day	5.0E-04	mg/kg/day	3.E-07
				Technical Chlordane	0.15253	mg/kg	6.2E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-09	3.6E-08	mg/kg/day	5.0E-04	mg/kg/day	7.E-05
				Aluminum	21774	mg/kg	NC		NC			5.2E-03	mg/kg/day	1.0E+00	mg/kg/day	5.E-03
				Arsenic	5.21	mg/kg	2.1E-07	mg/kg/day	1.5E+00	(mg/kg/day)-1	3.E-07	1.2E-06	mg/kg/day	3.0E-04	mg/kg/day	4.E-03
				Cadmium	0.858	mg/kg	NC		NC			2.0E-07	mg/kg/day	1.0E-03	mg/kg/day	2.E-04
				Chromium	17.5	mg/kg	NC		NC			4.2E-06	mg/kg/day	3.0E-03	mg/kg/day	1.E-03
				Copper	18.3	mg/kg	NC		NC			4.3E-06	mg/kg/day	3.0E-02	mg/kg/day	1.E-04
				Lead	88.6	mg/kg	3.6E-06	mg/kg/day				2.1E-05	mg/kg/day			
				Manganese	1590	mg/kg	NC		NC			3.8E-04	mg/kg/day	7.1E-02	mg/kg/day	5.E-03
				Mercury	0.114	mg/kg	NC		NC			2.7E-08	mg/kg/day	3.0E-04	mg/kg/day	9.E-05
				Nickel	20	mg/kg	NC		NC			4.7E-06	mg/kg/day	2.0E-02	mg/kg/day	2.E-04
				Thallium	0.354	mg/kg	NC		NC			8.4E-08	mg/kg/day	8.0E-05	mg/kg/day	1.E-03
				Vanadium	32	mg/kg	NC		NC			7.6E-06	mg/kg/day	7.0E-03	mg/kg/day	1.E-03
				Toxicity Equivalency (Dioxins/Furans	0.00000773	mg/kg	3.1E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	5.E-08	1.8E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								8.E-07					2.E-02
			DERMAL	2-Methylnaphthalene	0.01855	mg/kg	NC		NC			4.1E-09	mg/kg/day	2.0E-02	mg/kg/day	2.E-07
				Acenaphthylene	0.0589	mg/kg	NC		NC			1.3E-08	mg/kg/day	6.0E-02	mg/kg/day	2.E-07
				Benzo(a)anthracene	1	mg/kg	3.8E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-08	2.2E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Benzo(a)pyrene	0.84	mg/kg	3.2E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-07	1.9E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Benzo(b)fluoranthene	1.4	mg/kg	5.3E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-08	3.1E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(g,h,i)perylene	0.59468	mg/kg	NC		NC			1.3E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Dibenzo(a,h)anthracene	0.17898	mg/kg	6.8E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	5.E-08	3.9E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Indeno(1,2,3-cd)pyrene	0.65	mg/kg	2.5E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.4E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Phenanthrene	0.79474	mg/kg	NC		NC			1.8E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				alpha-Chlordane	0.00133	mg/kg	1.5E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	5.E-12	9.0E-11	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				Aroclor-1254	0.05755	mg/kg	2.3E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	5.E-09	1.4E-08	mg/kg/day	2.0E-05	mg/kg/day	7.E-04
				Aroclor-1268	0.04166	mg/kg	1.7E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-09	9.9E-09	mg/kg/day	2.0E-05	mg/kg/day	5.E-04
				gamma-Chlordane	0.00065	mg/kg	7.6E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-12	4.4E-11	mg/kg/day	5.0E-04	mg/kg/day	9.E-08
				Technical Chlordane	0.15253	mg/kg	1.8E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	6.E-10	1.0E-08	mg/kg/day	5.0E-04	mg/kg/day	2.E-05
				Aluminum	21774	mg/kg	NC		NC			--		1.0E-02	mg/kg/day	
				Arsenic	5.21	mg/kg	4.5E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	7.E-08	2.7E-07	mg/kg/day	3.0E-04	mg/kg/day	9.E-04
				Cadmium	0.858	mg/kg	NC		NC			1.5E-09	mg/kg/day	2.5E-05	mg/kg/day	6.E-05
				Chromium	17.5	mg/kg	NC		NC			--		7.5E-05	mg/kg/day	
				Copper	18.3	mg/kg	NC		NC			--		3.0E-02	mg/kg/day	
				Lead	88.6	mg/kg	--					--				
				Manganese	1590	mg/kg	NC		NC			--		2.8E-03	mg/kg/day	
				Mercury	0.114	mg/kg	NC		NC			--		2.1E-05	mg/kg/day	
				Nickel	20	mg/kg	NC		NC			--		8.0E-04	mg/kg/day	
				Thallium	0.354	mg/kg	NC		NC			--		8.0E-05	mg/kg/day	
				Vanadium	32	mg/kg	NC		NC			--		1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans	0.00000773	mg/kg	6.7E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-08	3.9E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-07					2.E-03
		EXPOSURE POINT TOTAL									1.E-06					2.E-02
	EXPOSURE MEDIUM TOTAL										1.E-06					2.E-02
SEDIMENT TOTAL											1.E-06					2.E-02

TABLE 7.5.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SURFACE WATER	SURFACE WATER	ASSAPUMPSET POND	INGESTION	Arsenic	0.000491	mg/l	1.3E-08	mg/kg/day	1.5E+00	mg/kg/day	2.E-08	7.8E-08	mg/kg/day	3.0E-04	mg/kg/day	3.E-04
				Manganese	0.166	mg/l	NC		NC			2.6E-05	mg/kg/day	2.4E-02	mg/kg/day	1.E-03
				Mercury	0.00000215	mg/l	NC		NC			3.4E-10	mg/kg/day	3.0E-04	mg/kg/day	1.E-06
				Nitrite-N	0.0051	mg/l	NC		NC			8.1E-07	mg/kg/day	1.0E-01	mg/kg/day	8.E-06
				Toxicity Equivalency (Dioxins/Furans	5.34E-09	mg/l	1.4E-13	mg/kg/day	1.5E+05	mg/kg/day	2.E-08	8.5E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-08					1.E-03
			DERMAL	Arsenic	0.000491	mg/l	1.7E-09	mg/kg/day	1.5E+00	mg/kg/day	2.E-09	9.7E-09	mg/kg/day	3.0E-04	mg/kg/day	3.E-05
				Manganese	0.166	mg/l	NC		NC			3.3E-06	mg/kg/day	9.6E-04	mg/kg/day	3.E-03
				Mercury	0.00000215	mg/l	NC		NC			4.2E-11	mg/kg/day	2.1E-05	mg/kg/day	2.E-06
				Nitrite-N	0.0051	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans	5.34E-09	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-09					3.E-03
		EXPOSURE POINT TOTAL									4.E-08					5.E-03
	EXPOSURE MEDIUM TOTAL										4.E-08					5.E-03
SURFACE WATER TOTAL											4.E-08					5.E-03
BIOTA	COMBINED FISH DIET	ASSAPUMPSET POND	INGESTION	Acenaphthylene	0.0011	mg/kg	NC		NC			2.2E-07	mg/kg/day	6.0E-02	mg/kg/day	4.E-06
				Benzo(a)anthracene	0.0031	mg/kg	1.1E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-08	6.1E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(a)pyrene	0.00329	mg/kg	1.1E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	8.E-07	6.5E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(b)fluoranthene	0.004	mg/kg	1.4E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-07	7.9E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Benzo(g,h,i)perylene	0.00295	mg/kg	NC		NC			5.8E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Dibenzo(a,h)anthracene	0.00071	mg/kg	2.4E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-07	1.4E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Indeno(1,2,3-cd)pyrene	0.0026	mg/kg	8.8E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-08	5.2E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Phenanthrene	0.0059	mg/kg	NC		NC			1.2E-06	mg/kg/day	3.0E-02	mg/kg/day	4.E-05
				4,4'-DDD	0.00445	mg/kg	1.5E-07	mg/kg/day	2.4E-01	(mg/kg/day)-1	4.E-08	8.8E-07	mg/kg/day	5.0E-04	mg/kg/day	2.E-03
				4,4'-DDE	0.0235	mg/kg	8.0E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	3.E-07	4.7E-06	mg/kg/day	5.0E-04	mg/kg/day	9.E-03
				alpha-Chlordane	0.0027	mg/kg	9.2E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-08	5.4E-07	mg/kg/day	5.0E-04	mg/kg/day	1.E-03
				Aroclor-1254	0.03979	mg/kg	1.4E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-06	7.9E-06	mg/kg/day	2.0E-05	mg/kg/day	4.E-01
				Dieldrin	0.0013	mg/kg	4.4E-08	mg/kg/day	1.6E+01	(mg/kg/day)-1	7.E-07	2.6E-07	mg/kg/day	5.0E-05	mg/kg/day	5.E-03
				gamma-Chlordane	0.0012	mg/kg	4.1E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-08	2.4E-07	mg/kg/day	5.0E-04	mg/kg/day	5.E-04
				Heptachlor Epoxide	0.00091	mg/kg	3.1E-08	mg/kg/day	9.1E+00	(mg/kg/day)-1	3.E-07	1.8E-07	mg/kg/day	1.3E-05	mg/kg/day	1.E-02
				Technical Chlordane	0.11	mg/kg	3.7E-06	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-06	2.2E-05	mg/kg/day	5.0E-04	mg/kg/day	4.E-02
				Lead	0.0764	mg/kg	2.6E-06	mg/kg/day				1.5E-05	mg/kg/day			
				Mercury	0.2	mg/kg	NC		NC			4.0E-05	mg/kg/day	3.0E-04	mg/kg/day	1.E-01
				Mercury (methyl)	0.22	mg/kg	NC		NC			4.4E-05	mg/kg/day	1.0E-04	mg/kg/day	4.E-01
				Zinc	15.7	mg/kg	NC		NC			3.1E-03	mg/kg/day	3.0E-01	mg/kg/day	1.E-02
				Toxicity Equivalency (Dioxins/Furans	0.00000238	mg/kg	8.1E-11	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-05	4.7E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-05					1.0E+00
		EXPOSURE POINT TOTAL									2.E-05					1.0E+00
	EXPOSURE MEDIUM TOTAL										2.E-05					1.0E+00
COMBINED FISH DIET TOTAL											2.E-05					1.0E+00
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	2.E-05				TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA	1.1E+00

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: RAR
Checked by: KJA

TABLE 7.6.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	ASSAPUMPSET POND	INGESTION	2-Methylnaphthalene	0.01855	mg/kg	NC		NC			3.5E-08	mg/kg/day	2.0E-02	mg/kg/day	2.E-06
				Acenaphthylene	0.0589	mg/kg	NC		NC			1.1E-07	mg/kg/day	6.0E-02	mg/kg/day	2.E-06
				Benzo(a)anthracene	1	mg/kg	1.6E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-07	1.9E-06	mg/kg/day	3.0E-02	mg/kg/day	6.E-05
				Benzo(a)pyrene	0.84	mg/kg	1.4E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-06	1.6E-06	mg/kg/day	3.0E-02	mg/kg/day	5.E-05
				Benzo(b)fluoranthene	1.4	mg/kg	2.3E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-07	2.7E-06	mg/kg/day	3.0E-02	mg/kg/day	9.E-05
				Benzo(g,h,i)perylene	0.59468	mg/kg	NC		NC			1.1E-06	mg/kg/day	3.0E-02	mg/kg/day	4.E-05
				Dibenzo(a,h)anthracene	0.17898	mg/kg	2.9E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-07	3.4E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Indeno(1,2,3-cd)pyrene	0.65	mg/kg	1.1E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-08	1.2E-06	mg/kg/day	3.0E-02	mg/kg/day	4.E-05
				Phenanthrene	0.79474	mg/kg	NC		NC			1.5E-06	mg/kg/day	3.0E-02	mg/kg/day	5.E-05
				alpha-Chlordane	0.00133	mg/kg	2.2E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	8.E-11	2.5E-09	mg/kg/day	5.0E-04	mg/kg/day	5.E-06
				Aroclor-1254	0.05755	mg/kg	9.4E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-08	1.1E-07	mg/kg/day	2.0E-05	mg/kg/day	5.E-03
				Aroclor-1268	0.04166	mg/kg	6.8E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-08	7.9E-08	mg/kg/day	2.0E-05	mg/kg/day	4.E-03
				gamma-Chlordane	0.00065	mg/kg	1.1E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-11	1.2E-09	mg/kg/day	5.0E-04	mg/kg/day	2.E-06
				Technical Chlordane	0.15253	mg/kg	2.5E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	9.E-09	2.9E-07	mg/kg/day	5.0E-04	mg/kg/day	6.E-04
				Aluminum	21774	mg/kg	NC		NC			4.1E-02	mg/kg/day	1.0E+00	mg/kg/day	4.E-02
				Arsenic	5.21	mg/kg	8.5E-07	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-06	9.9E-06	mg/kg/day	3.0E-04	mg/kg/day	3.E-02
				Cadmium	0.858	mg/kg	NC		NC			1.6E-06	mg/kg/day	1.0E-03	mg/kg/day	2.E-03
				Chromium	17.5	mg/kg	NC		NC			3.3E-05	mg/kg/day	3.0E-03	mg/kg/day	1.E-02
				Copper	18.3	mg/kg	NC		NC			3.5E-05	mg/kg/day	3.0E-02	mg/kg/day	1.E-03
				Lead	88.6	mg/kg	1.4E-05	mg/kg/day				1.7E-04	mg/kg/day			
				Manganese	1590	mg/kg	NC		NC			3.0E-03	mg/kg/day	7.1E-02	mg/kg/day	4.E-02
				Mercury	0.114	mg/kg	NC		NC			2.2E-07	mg/kg/day	3.0E-04	mg/kg/day	7.E-04
				Nickel	20	mg/kg	NC		NC			3.8E-05	mg/kg/day	2.0E-02	mg/kg/day	2.E-03
				Thallium	0.354	mg/kg	NC		NC			6.7E-07	mg/kg/day	8.0E-05	mg/kg/day	8.E-03
				Vanadium	32	mg/kg	NC		NC			6.1E-05	mg/kg/day	7.0E-03	mg/kg/day	9.E-03
				Toxicity Equivalency (Dioxins/Furans)	0.00000773	mg/kg	1.3E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-07	1.5E-11	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-06					2.E-01
			DERMAL	2-Methylnaphthalene	0.01855	mg/kg	NC		NC			1.3E-08	mg/kg/day	2.0E-02	mg/kg/day	6.E-07
				Acenaphthylene	0.0589	mg/kg	NC		NC			4.1E-08	mg/kg/day	6.0E-02	mg/kg/day	7.E-07
				Benzo(a)anthracene	1	mg/kg	5.9E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-08	6.9E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(a)pyrene	0.84	mg/kg	5.0E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-07	5.8E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(b)fluoranthene	1.4	mg/kg	8.3E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-08	9.7E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Benzo(g,h,i)perylene	0.59468	mg/kg	NC		NC			4.1E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Dibenzo(a,h)anthracene	0.17898	mg/kg	1.1E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	8.E-08	1.2E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Indeno(1,2,3-cd)pyrene	0.65	mg/kg	3.9E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-08	4.5E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Phenanthrene	0.79474	mg/kg	NC		NC			5.5E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				alpha-Chlordane	0.00133	mg/kg	2.4E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	8.E-12	2.8E-10	mg/kg/day	5.0E-04	mg/kg/day	6.E-07
				Aroclor-1254	0.05755	mg/kg	3.7E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	7.E-09	4.3E-08	mg/kg/day	2.0E-05	mg/kg/day	2.E-03
				Aroclor-1268	0.04166	mg/kg	2.7E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	5.E-09	3.1E-08	mg/kg/day	2.0E-05	mg/kg/day	2.E-03
				gamma-Chlordane	0.00065	mg/kg	1.2E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-12	1.4E-10	mg/kg/day	5.0E-04	mg/kg/day	3.E-07
				Technical Chlordane	0.15253	mg/kg	2.8E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-09	3.2E-08	mg/kg/day	5.0E-04	mg/kg/day	6.E-05
				Aluminum	21774	mg/kg	NC		NC			--		1.0E-02	mg/kg/day	
				Arsenic	5.21	mg/kg	7.1E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-07	8.3E-07	mg/kg/day	3.0E-04	mg/kg/day	3.E-03
				Cadmium	0.858	mg/kg	NC		NC			4.6E-09	mg/kg/day	2.5E-05	mg/kg/day	2.E-04
				Chromium	17.5	mg/kg	NC		NC			--		7.5E-05	mg/kg/day	
				Copper	18.3	mg/kg	NC		NC			--		3.0E-02	mg/kg/day	
				Lead	88.6	mg/kg	--					--				
				Manganese	1590	mg/kg	NC		NC			--		2.8E-03	mg/kg/day	
				Mercury	0.114	mg/kg	NC		NC			--		2.1E-05	mg/kg/day	
				Nickel	20	mg/kg	NC		NC			--		8.0E-04	mg/kg/day	
				Thallium	0.354	mg/kg	NC		NC			--		8.0E-05	mg/kg/day	
				Vanadium	32	mg/kg	NC		NC			--		1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00000773	mg/kg	1.1E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-08	1.2E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								7.E-07					7.E-03
		EXPOSURE POINT TOTAL									4.E-06					2.E-01
	EXPOSURE MEDIUM TOTAL										4.E-06					2.E-01
SEDIMENT TOTAL											4.E-06					2.E-01

TABLE 7.6.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SURFACE WATER	SURFACE WATER	ASSAPUMPSET POND	INGESTION	Arsenic	0.000491	mg/l	2.0E-08	mg/kg/day	1.5E+00	mg/kg/day	3.E-08	2.3E-07	mg/kg/day	3.0E-04	mg/kg/day	8.E-04
				Manganese	0.166	mg/l	NC		NC			7.9E-05	mg/kg/day	2.4E-02	mg/kg/day	3 E-03
				Mercury	0 00000215	mg/l	NC		NC			1 0E-09	mg/kg/day	3.0E-04	mg/kg/day	3 E-06
				Nitrite-N	0.0051	mg/l	NC		NC			2.4E-06	mg/kg/day	1.0E-01	mg/kg/day	2.E-05
				Toxicity Equivalency (Dioxins/Furans)	5.34E-09	mg/l	2 2E-13	mg/kg/day	1.5E+05	mg/kg/day	3.E-08	2.5E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								6 E-08					4 E-03
			DERMAL	Arsenic	0.000491	mg/l	1.1E-09	mg/kg/day	1.5E+00	mg/kg/day	2.E-09	1 2E-08	mg/kg/day	3.0E-04	mg/kg/day	4 E-05
				Manganese	0.166	mg/l	NC		NC			4.2E-06	mg/kg/day	9 6E-04	mg/kg/day	4.E-03
				Mercury	0.00000215	mg/l	NC		NC			5.5E-11	mg/kg/day	2 1E-05	mg/kg/day	3.E-06
				Nitrite-N	0.0051	mg/l	NC		NC			--		1 0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	5 34E-09	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-09					4 E-03
		EXPOSURE POINT TOTAL									6.E-08					9.E-03
	EXPOSURE MEDIUM TOTAL										6.E-08					9 E-03
SURFACE WATER TOTAL											6.E-08					9.E-03
BIOTA	COMBINED FISH DIET	ASSAPUMPSET POND	INGESTION	Acenaphthylene	0.0011	mg/kg	NC		NC			3.3E-07	mg/kg/day	6.0E-02	mg/kg/day	6.E-06
				Benzo(a)anthracene	0.0031	mg/kg	8.0E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-08	9.3E-07	mg/kg/day	3.0E-02	mg/kg/day	3 E-05
				Benzo(a)pyrene	0.00329	mg/kg	8.5E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	6.E-07	9.9E-07	mg/kg/day	3 0E-02	mg/kg/day	3.E-05
				Benzo(b)fluoranthene	0.004	mg/kg	1.0E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	8 E-08	1.2E-06	mg/kg/day	3.0E-02	mg/kg/day	4.E-05
				Benzo(g,h,i)perylene	0.00295	mg/kg	NC		NC			8.9E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Dibenzo(a,h)anthracene	0 00071	mg/kg	1.8E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-07	2.1E-07	mg/kg/day	3 0E-02	mg/kg/day	7.E-06
				Indeno(1,2,3-cd)pyrene	0.0026	mg/kg	6.7E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	5.E-08	7.8E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Phenanthrene	0 0059	mg/kg	NC		NC			1.8E-06	mg/kg/day	3.0E-02	mg/kg/day	6.E-05
				4,4'-DDD	0.00445	mg/kg	1.1E-07	mg/kg/day	2.4E-01	(mg/kg/day)-1	3.E-08	1.3E-06	mg/kg/day	5.0E-04	mg/kg/day	3.E-03
				4,4'-DDE	0 0235	mg/kg	6.1E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	2.E-07	7.1E-06	mg/kg/day	5.0E-04	mg/kg/day	1.E-02
				alpha-Chlordane	0.0027	mg/kg	7.0E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-08	8.1E-07	mg/kg/day	5.0E-04	mg/kg/day	2.E-03
				Aroclor-1254	0.03979	mg/kg	1.0E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-06	1 2E-05	mg/kg/day	2.0E-05	mg/kg/day	6.E-01
				Dieldrin	0 0013	mg/kg	3.3E-08	mg/kg/day	1 6E+01	(mg/kg/day)-1	5 E-07	3.9E-07	mg/kg/day	5.0E-05	mg/kg/day	8 E-03
				gamma-Chlordane	0 0012	mg/kg	3.1E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-08	3 6E-07	mg/kg/day	5.0E-04	mg/kg/day	7 E-04
				Heptachlor Epoxide	0.00091	mg/kg	2 3E-08	mg/kg/day	9 1E+00	(mg/kg/day)-1	2.E-07	2.7E-07	mg/kg/day	1.3E-05	mg/kg/day	2 E-02
				Technical Chlordane	0.11	mg/kg	2 8E-06	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-06	3 3E-05	mg/kg/day	5.0E-04	mg/kg/day	7 E-02
				Lead	0.0764	mg/kg	2 0E-06	mg/kg/day				2.3E-05	mg/kg/day			
				Mercury	0 2	mg/kg	NC		NC			6.0E-05	mg/kg/day	3 0E-04	mg/kg/day	2 E-01
				Mercury (methyl)	0.22	mg/kg	NC		NC			6.6E-05	mg/kg/day	1.0E-04	mg/kg/day	7 E-01
				Zinc	15 7	mg/kg	NC		NC			4.7E-03	mg/kg/day	3 0E-01	mg/kg/day	2.E-02
				Toxicity Equivalency (Dioxins/Furans)	0.00000238	mg/kg	6.1E-11	mg/kg/day	1.5E+05	(mg/kg/day)-1	9.E-06	7.2E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-05					1.6 E+00
		EXPOSURE POINT TOTAL									1.E-05					1.6 E+00
	EXPOSURE MEDIUM TOTAL										1.E-05					1.6.E+00
COMBINED FISH DIET TOTAL											1.E-05					1.6.E+00
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	2.E-05	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				1.8.E+00

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium
-- - Not calculated: dose-response data and/or dermal absorption values are not available

Prepared by: RAR
Checked by: KJA

TABLE 7.7.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS – REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- RECREATIONAL ANGLER- ADULT - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SOIL	SOIL	GREYSTONE MILL POND	INGESTION	2-Methylnaphthalene	0.17022	mg/kg	NC		NC			4.3E-09	mg/kg/day	2.0E-02	mg/kg/day	2.E-07
				Acenaphthylene	0.49749	mg/kg	NC		NC			1.3E-08	mg/kg/day	6.0E-02	mg/kg/day	2.E-07
				Benzo(a)anthracene	3.41086	mg/kg	1.5E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	8.7E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(a)pyrene	3.41803	mg/kg	1.5E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-07	8.7E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(b)fluoranthene	4.28861	mg/kg	1.9E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	1.1E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Benzo(g,h,i)perylene	2.87139	mg/kg	NC		NC			7.3E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Dibenzo(a,h)anthracene	0.72851	mg/kg	3.2E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-08	1.9E-08	mg/kg/day	3.0E-02	mg/kg/day	6.E-07
				Indeno(1,2,3-cd)pyrene	3.0929	mg/kg	1.3E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	7.9E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Phenanthrene	5.30136	mg/kg	NC		NC			1.3E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				alpha-Chlordane	0.03592	mg/kg	1.6E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	5.E-11	9.1E-10	mg/kg/day	5.0E-04	mg/kg/day	2.E-06
				Aroclor-1254	0.83872	mg/kg	3.7E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	7.E-09	2.1E-08	mg/kg/day	2.0E-05	mg/kg/day	1.E-03
				Aroclor-1268	0.13953	mg/kg	6.1E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-09	3.5E-09	mg/kg/day	2.0E-05	mg/kg/day	2.E-04
				Endosulfan Sulfate	0.01269	mg/kg	NC		NC			3.2E-10	mg/kg/day	6.0E-03	mg/kg/day	5.E-08
				Technical Chlordane	0.73538	mg/kg	3.2E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-09	1.9E-08	mg/kg/day	5.0E-04	mg/kg/day	4.E-05
				Aluminum	21793	mg/kg	NC		NC			5.5E-04	mg/kg/day	1.0E+00	mg/kg/day	6.E-04
				Arsenic	12.2	mg/kg	5.3E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	8.E-08	3.1E-07	mg/kg/day	3.0E-04	mg/kg/day	1.E-03
				Chromium	291	mg/kg	NC		NC			7.4E-06	mg/kg/day	3.0E-03	mg/kg/day	2.E-03
				Copper	324	mg/kg	NC		NC			8.2E-06	mg/kg/day	3.0E-02	mg/kg/day	3.E-04
				Lead	591	mg/kg	2.6E-06	mg/kg/day	–			1.5E-05	mg/kg/day			
				Manganese	4126	mg/kg	NC		NC			1.0E-04	mg/kg/day	7.1E-02	mg/kg/day	1.E-03
				Mercury	0.811	mg/kg	NC		NC			2.1E-08	mg/kg/day	3.0E-04	mg/kg/day	7.E-05
				Molybdenum	87.7	mg/kg	NC		NC			2.2E-06	mg/kg/day	5.0E-03	mg/kg/day	4.E-04
				Nickel	387	mg/kg	NC		NC			9.8E-06	mg/kg/day	2.0E-02	mg/kg/day	5.E-04
				Thallium	0.585	mg/kg	NC		NC			1.5E-08	mg/kg/day	8.0E-05	mg/kg/day	2.E-04
				Vanadium	103	mg/kg	NC		NC			2.6E-06	mg/kg/day	7.0E-03	mg/kg/day	4.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.000109	mg/kg	4.8E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	7.E-08	2.8E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-07					9.E-03
			DERMAL	2-Methylnaphthalene	0.17022	mg/kg	NC		NC			4.5E-09	mg/kg/day	2.0E-02	mg/kg/day	2.E-07
				Acenaphthylene	0.49749	mg/kg	NC		NC			1.3E-08	mg/kg/day	6.0E-02	mg/kg/day	2.E-07
				Benzo(a)anthracene	3.41086	mg/kg	1.5E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	9.0E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(a)pyrene	3.41803	mg/kg	1.5E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-07	9.0E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(b)fluoranthene	4.28861	mg/kg	1.9E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	1.1E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Benzo(g,h,i)perylene	2.87139	mg/kg	NC		NC			7.6E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Dibenzo(a,h)anthracene	0.72851	mg/kg	3.3E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-08	1.9E-08	mg/kg/day	3.0E-02	mg/kg/day	6.E-07
				Indeno(1,2,3-cd)pyrene	3.0929	mg/kg	1.4E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	8.2E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Phenanthrene	5.30136	mg/kg	NC		NC			1.4E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				alpha-Chlordane	0.03592	mg/kg	5.0E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-11	2.9E-10	mg/kg/day	5.0E-04	mg/kg/day	6.E-07
				Aroclor-1254	0.83872	mg/kg	4.1E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	8.E-09	2.4E-08	mg/kg/day	2.0E-05	mg/kg/day	1.E-03
				Aroclor-1268	0.13953	mg/kg	6.8E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-09	4.0E-09	mg/kg/day	2.0E-05	mg/kg/day	2.E-04
				Endosulfan Sulfate	0.01269	mg/kg	NC		NC			2.6E-10	mg/kg/day	6.0E-03	mg/kg/day	4.E-08
				Technical Chlordane	0.73538	mg/kg	1.0E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-10	6.0E-09	mg/kg/day	5.0E-04	mg/kg/day	1.E-05
				Aluminum	21793	mg/kg	NC		NC			–		1.0E-02	mg/kg/day	
				Arsenic	12.2	mg/kg	1.3E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	2.E-08	7.4E-08	mg/kg/day	3.0E-04	mg/kg/day	2.E-04
				Chromium	291	mg/kg	NC		NC			–		7.5E-05	mg/kg/day	
				Copper	324	mg/kg	NC		NC			–		3.0E-02	mg/kg/day	
				Lead	591	mg/kg	–		–			–				
				Manganese	4126	mg/kg	NC		NC			–		2.8E-03	mg/kg/day	
				Mercury	0.811	mg/kg	NC		NC			–		2.1E-05	mg/kg/day	
				Molybdenum	87.7	mg/kg	NC		NC			–		5.0E-03	mg/kg/day	
				Nickel	387	mg/kg	NC		NC			–		8.0E-04	mg/kg/day	
				Thallium	0.585	mg/kg	NC		NC			–		8.0E-05	mg/kg/day	
				Vanadium	103	mg/kg	NC		NC			–		1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000109	mg/kg	1.1E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-08	6.6E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-07					2.E-03
		EXPOSURE POINT TOTAL									5.E-07					1.E-02
	EXPOSURE MEDIUM TOTAL										5.E-07					1.E-02
SOIL TOTAL											5.E-07					1.E-02
SEDIMENT	SEDIMENT	GREYSTONE MILL POND	INGESTION	2-Methylnaphthalene	0.07478	mg/kg	NC		NC			1.9E-09	mg/kg/day	2.0E-02	mg/kg/day	1.E-07
				Acenaphthylene	0.19279	mg/kg	NC		NC			4.9E-09	mg/kg/day	6.0E-02	mg/kg/day	8.E-08
				Benzo(a)anthracene	3.5	mg/kg	1.5E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	8.9E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(a)pyrene	3.1	mg/kg	1.4E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-07	7.9E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06

TABLE 7.7.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS – REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- RECREATIONAL ANGLER- ADULT - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Benzo(b)fluoranthene	3.1	mg/kg	1.4E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	7.9E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(g,h,i)perylene	2.07671	mg/kg	NC		NC			5.3E-08	mg/kg/day	3.0E-02	mg/kg/day	2 E-06
				Dibenzo(a,h)anthracene	0.77	mg/kg	3.4E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-08	2.0E-08	mg/kg/day	3.0E-02	mg/kg/day	7 E-07
				Indeno(1,2,3-cd)pyrene	2.18335	mg/kg	9.5E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-09	5.6E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Phenanthrene	4.8	mg/kg	NC		NC			1.2E-07	mg/kg/day	3.0E-02	mg/kg/day	4 E-06
				alpha-Chlordane	0.0061	mg/kg	2.7E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	9 E-12	1.6E-10	mg/kg/day	5.0E-04	mg/kg/day	3 E-07
				Aroclor-1254	0.38	mg/kg	1.7E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-09	9.7E-09	mg/kg/day	2.0E-05	mg/kg/day	5.E-04
				Aroclor-1268	0.24667	mg/kg	1.1E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	2 E-09	6.3E-09	mg/kg/day	2.0E-05	mg/kg/day	3.E-04
				gamma-Chlordane	0.005	mg/kg	2.2E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	8.E-12	1.3E-10	mg/kg/day	5.0E-04	mg/kg/day	3 E-07
				Technical Chlordane	0.62618	mg/kg	2.7E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	1 E-09	1.6E-08	mg/kg/day	5.0E-04	mg/kg/day	3 E-05
				Aluminum	15554	mg/kg	NC		NC			4.0E-04	mg/kg/day	1 0E+00	mg/kg/day	4 E-04
				Antimony	4.3	mg/kg	NC		NC			1.1E-07	mg/kg/day	4.0E-04	mg/kg/day	3.E-04
				Arsenic	9.6	mg/kg	4.2E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	6.E-08	2.4E-07	mg/kg/day	3.0E-04	mg/kg/day	8 E-04
				Cadmium	4.35	mg/kg	NC		NC			1.1E-07	mg/kg/day	1.0E-03	mg/kg/day	1 E-04
				Chromium	271	mg/kg	NC		NC			6.9E-06	mg/kg/day	3.0E-03	mg/kg/day	2 E-03
				Copper	436	mg/kg	NC		NC			1.1E-05	mg/kg/day	3.0E-02	mg/kg/day	4.E-04
				Lead	179	mg/kg	7.8E-07	mg/kg/day				4.6E-06	mg/kg/day			
				Manganese	599	mg/kg	NC		NC			1.5E-05	mg/kg/day	7.1E-02	mg/kg/day	2 E-04
				Mercury	0.757	mg/kg	NC		NC			1.9E-08	mg/kg/day	3.0E-04	mg/kg/day	6 E-05
				Nickel	142	mg/kg	NC		NC			3.6E-06	mg/kg/day	2.0E-02	mg/kg/day	2.E-04
				Thallium	0.37	mg/kg	NC		NC			9.4E-09	mg/kg/day	8.0E-05	mg/kg/day	1 E-04
				Vanadium	79	mg/kg	NC		NC			2.0E-06	mg/kg/day	7.0E-03	mg/kg/day	3 E-04
				Toxicity Equivalency (Dioxins/Furans)	0.00012	mg/kg	5.2E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	8.E-08	3.1E-12	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.0000249	mg/kg	1 1E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-08	6.3E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-07					6 E-03
			DERMAL	2-Methylnaphthalene	0.07478	mg/kg	NC		NC			1.7E-09	mg/kg/day	2.0E-02	mg/kg/day	8 E-08
				Acenaphthylene	0 19279	mg/kg	NC		NC			4 3E-09	mg/kg/day	6.0E-02	mg/kg/day	7.E-08
				Benzo(a)anthracene	3.5	mg/kg	1.4E-08	mg/kg/day	7 3E-01	(mg/kg/day)-1	1.E-08	7.9E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(a)pyrene	3.1	mg/kg	1.2E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	9.E-08	7.0E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(b)fluoranthene	3.1	mg/kg	1.2E-08	mg/kg/day	7 3E-01	(mg/kg/day)-1	9.E-09	7.0E-08	mg/kg/day	3.0E-02	mg/kg/day	2 E-06
				Benzo(g,h,i)perylene	2 07671	mg/kg	NC		NC			4.7E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Dibenzo(a,h)anthracene	0.77	mg/kg	3.0E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-08	1.7E-08	mg/kg/day	3 0E-02	mg/kg/day	6.E-07
				Indeno(1,2,3-cd)pyrene	2 18335	mg/kg	8.4E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	6 E-09	4.9E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Phenanthrene	4.8	mg/kg	NC		NC			1.1E-07	mg/kg/day	3 0E-02	mg/kg/day	4 E-06
				alpha-Chlordane	0 0061	mg/kg	7.2E-12	mg/kg/day	3 5E-01	(mg/kg/day)-1	3.E-12	4 2E-11	mg/kg/day	5 0E-04	mg/kg/day	8 E-08
				Aroclor-1254	0.38	mg/kg	1.6E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-09	9.2E-09	mg/kg/day	2.0E-05	mg/kg/day	5 E-04
				Aroclor-1268	0.24667	mg/kg	1.0E-09	mg/kg/day	2 0E+00	(mg/kg/day)-1	2 E-09	6.0E-09	mg/kg/day	2.0E-05	mg/kg/day	3.E-04
				gamma-Chlordane	0.005	mg/kg	5.9E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	2 E-12	3.5E-11	mg/kg/day	5.0E-04	mg/kg/day	7.E-08
				Technical Chlordane	0.62618	mg/kg	7.4E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-10	4.3E-09	mg/kg/day	5.0E-04	mg/kg/day	9.E-06
				Aluminum	15554	mg/kg	NC		NC			–		1.0E-02	mg/kg/day	
				Antimony	4.3	mg/kg	NC		NC			–		6.0E-05	mg/kg/day	
				Arsenic	9.6	mg/kg	8.5E-09	mg/kg/day	1 5E+00	(mg/kg/day)-1	1.E-08	5.0E-08	mg/kg/day	3.0E-04	mg/kg/day	2.E-04
				Cadmium	4.35	mg/kg	NC		NC			7.5E-10	mg/kg/day	2.5E-05	mg/kg/day	3.E-05
				Chromium	271	mg/kg	NC		NC			–		7.5E-05	mg/kg/day	
				Copper	436	mg/kg	NC		NC			–		3.0E-02	mg/kg/day	
				Lead	179	mg/kg	–					–				
				Manganese	599	mg/kg	NC		NC			–		2.8E-03	mg/kg/day	
				Mercury	0.757	mg/kg	NC		NC			–		2 1E-05	mg/kg/day	
				Nickel	142	mg/kg	NC		NC			–		8 0E-04	mg/kg/day	
				Thallium	0.37	mg/kg	NC		NC			–		8.0E-05	mg/kg/day	
				Vanadium	79	mg/kg	NC		NC			–		1 8E-04	mg/kg/day	

TABLE 7.7.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS – REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- RECREATIONAL ANGLER- ADULT - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Toxicity Equivalency (Dioxins/Furans)	0.00012	mg/kg	1.1E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-08	6.2E-13	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.0000249	mg/kg	2.2E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-09	1.3E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-07					1.E-03
		EXPOSURE POINT TOTAL									5.E-07					7.E-03
	EXPOSURE MEDIUM TOTAL										5.E-07					7.E-03
SEDIMENT TOTAL											5.E-07					7.E-03
SURFACE WATER	SURFACE WATER	GREYSTONE MILL POND	INGESTION	Arsenic	0.00055	mg/l	2.4E-10	mg/kg/day	1.5E+00	mg/kg/day	4.E-10	1.4E-09	mg/kg/day	3.0E-04	mg/kg/day	5.E-06
				Manganese	0.144	mg/l	NC		NC			3.7E-07	mg/kg/day	2.4E-02	mg/kg/day	2.E-05
				Mercury	0.00000193	mg/l	NC		NC			4.9E-12	mg/kg/day	3.0E-04	mg/kg/day	2.E-08
				Nitrite-N	0.13	mg/l	NC		NC			3.3E-07	mg/kg/day	1.0E-01	mg/kg/day	3.E-06
				Toxicity Equivalency (Dioxins/Furans)	5.64E-09	mg/l	2.5E-15	mg/kg/day	1.5E+05	mg/kg/day	4.E-10	1.4E-14	mg/kg/day			
			EXPOSURE ROUTE TOTAL								7.E-10					2.E-05
			DERMAL	Arsenic	0.00055	mg/l	4.2E-10	mg/kg/day	1.5E+00	mg/kg/day	6.E-10	2.4E-09	mg/kg/day	3.0E-04	mg/kg/day	8.E-06
				Manganese	0.144	mg/l	NC		NC			6.4E-07	mg/kg/day	9.6E-04	mg/kg/day	7.E-04
				Mercury	0.00000193	mg/l	NC		NC			8.5E-12	mg/kg/day	2.1E-05	mg/kg/day	4.E-07
				Nitrite-N	0.13	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	5.64E-09	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								6.E-10					7.E-04
		EXPOSURE POINT TOTAL									1.E-09					7.E-04
	EXPOSURE MEDIUM TOTAL										1.E-09					7.E-04
SURFACE WATER TOTAL											1.E-09					7.E-04
BIOTA	COMBINED FISH DIET	GREYSTONE MILL POND	INGESTION	Acenaphthylene	0.0022	mg/kg	NC		NC			4.2E-07	mg/kg/day	6.0E-02	mg/kg/day	7.E-06
				Benzo(a)pyrene	0.00099	mg/kg	3.3E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-07	1.9E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Benzo(g,h,i)perylene	0.0012	mg/kg	NC		NC			2.3E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				Benzo(b)fluoranthene	0.00092	mg/kg	3.0E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.8E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Dibenzo(a,h)anthracene	0.00057	mg/kg	1.9E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-07	1.1E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Indeno(1,2,3-cd)pyrene	0.00092	mg/kg	3.0E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.8E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Phenanthrene	0.008	mg/kg	NC		NC			1.5E-06	mg/kg/day	3.0E-02	mg/kg/day	5.E-05
				4,4'-DDD	0.013	mg/kg	4.3E-07	mg/kg/day	2.4E-01	(mg/kg/day)-1	1.E-07	2.5E-06	mg/kg/day	5.0E-04	mg/kg/day	5.E-03
				4,4'-DDE	0.0329	mg/kg	1.1E-06	mg/kg/day	3.4E-01	(mg/kg/day)-1	4.E-07	6.3E-06	mg/kg/day	5.0E-04	mg/kg/day	1.E-02
				4,4'-DDT	0.003	mg/kg	9.9E-08	mg/kg/day	3.4E-01	(mg/kg/day)-1	3.E-08	5.8E-07	mg/kg/day	5.0E-04	mg/kg/day	1.E-03
				alpha-Chlordane	0.014	mg/kg	4.6E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-07	2.7E-06	mg/kg/day	5.0E-04	mg/kg/day	5.E-03
				Aroclor-1254	0.177	mg/kg	5.8E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-05	3.4E-05	mg/kg/day	2.0E-05	mg/kg/day	2.E+00
				Aroclor-1268	0.0851	mg/kg	2.8E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	6.E-06	1.6E-05	mg/kg/day	2.0E-05	mg/kg/day	8.E-01
				Dieldrin	0.0027	mg/kg	8.9E-08	mg/kg/day	1.6E+01	(mg/kg/day)-1	1.E-06	5.2E-07	mg/kg/day	5.0E-05	mg/kg/day	1.E-02
				gamma-Chlordane	0.006	mg/kg	2.0E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	7.E-08	1.2E-06	mg/kg/day	5.0E-04	mg/kg/day	2.E-03
				Heptachlor Epoxide	0.0008	mg/kg	2.6E-08	mg/kg/day	9.1E+00	(mg/kg/day)-1	2.E-07	1.5E-07	mg/kg/day	1.3E-05	mg/kg/day	1.E-02
				Technical Chlordane	0.2056	mg/kg	6.8E-06	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-06	3.9E-05	mg/kg/day	5.0E-04	mg/kg/day	8.E-02
				Lead	0.5	mg/kg	1.6E-05	mg/kg/day				9.6E-05	mg/kg/day			
				Mercury	0.226	mg/kg	NC		NC			4.3E-05	mg/kg/day	3.0E-04	mg/kg/day	1.E-01
				Mercury (methyl)	0.328	mg/kg	NC		NC			6.3E-05	mg/kg/day	1.0E-04	mg/kg/day	6.E-01
				Zinc	22	mg/kg	NC		NC			4.2E-03	mg/kg/day	3.0E-01	mg/kg/day	1.E-02
				Toxicity Equivalency (Dioxins/Furans)	0.00000136	mg/kg	4.5E-11	mg/kg/day	1.5E+05	(mg/kg/day)-1	7.E-06	2.6E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-05					3.4.E+00
		EXPOSURE POINT TOTAL									3.E-05					3.4.E+00
	EXPOSURE MEDIUM TOTAL										3.E-05					3.4.E+00
COMBINED FISH DIET TOTAL											3.E-05					3.4.E+00
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	3.E-05	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				3.4.E+00

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exponure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: MJM

TABLE 7.8.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- RECREATIONAL ANGLER- OLDER CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		R/D/R/C (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SOIL	SOIL	GREYSTONE MILL POND	INGESTION	2-Methylnaphthalene	0.17022	mg/kg	NC		NC			6.7E-09	mg/kg/day	2.0E-02	mg/kg/day	3.E-07
				Acenaphthylene	0.49749	mg/kg	NC		NC			2.0E-08	mg/kg/day	6.0E-02	mg/kg/day	3.E-07
				Benzo(a)anthracene	3.41086	mg/kg	2.3E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.3E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Benzo(a)pyrene	3.41803	mg/kg	2.3E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-07	1.4E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Benzo(b)fluoranthene	4.28861	mg/kg	2.9E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.7E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Benzo(g,h,i)perylene	2.87139	mg/kg	NC		NC			1.1E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Dibenzo(a,h)anthracene	0.72851	mg/kg	4.9E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-08	2.9E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Indeno(1,2,3-cd)pyrene	3.0929	mg/kg	2.1E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.2E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Phenanthrene	5.30136	mg/kg	NC		NC			2.1E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				alpha-Chlordane	0.03592	mg/kg	2.4E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	9.E-11	1.4E-09	mg/kg/day	5.0E-04	mg/kg/day	3.E-06
				Aroclor-1254	0.83872	mg/kg	5.7E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-08	3.3E-08	mg/kg/day	2.0E-05	mg/kg/day	2.E-03
				Aroclor-1268	0.13953	mg/kg	9.5E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-09	5.5E-09	mg/kg/day	2.0E-05	mg/kg/day	3.E-04
				Endosulfan Sulfate	0.01269	mg/kg	NC		NC			5.0E-10	mg/kg/day	6.0E-03	mg/kg/day	8.E-08
				Technical Chlordane	0.73538	mg/kg	5.0E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-09	2.9E-08	mg/kg/day	5.0E-04	mg/kg/day	6.E-05
				Aluminum	21793	mg/kg	NC		NC			8.6E-04	mg/kg/day	1.0E+00	mg/kg/day	9.E-04
				Arsenic	12.2	mg/kg	8.3E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-07	4.8E-07	mg/kg/day	3.0E-04	mg/kg/day	2.E-03
				Chromium	291	mg/kg	NC		NC			1.2E-05	mg/kg/day	3.0E-03	mg/kg/day	4.E-03
				Copper	324	mg/kg	NC		NC			1.3E-05	mg/kg/day	3.0E-02	mg/kg/day	4.E-04
				Lead	591	mg/kg	4.0E-06	mg/kg/day	--			2.3E-05	mg/kg/day			
				Manganese	4126	mg/kg	NC		NC			1.6E-04	mg/kg/day	7.1E-02	mg/kg/day	2.E-03
				Mercury	0.811	mg/kg	NC		NC			3.2E-08	mg/kg/day	3.0E-04	mg/kg/day	1.E-04
				Molybdenum	87.7	mg/kg	NC		NC			3.5E-06	mg/kg/day	5.0E-03	mg/kg/day	7.E-04
				Nickel	387	mg/kg	NC		NC			1.5E-05	mg/kg/day	2.0E-02	mg/kg/day	8.E-04
				Thallium	0.585	mg/kg	NC		NC			2.3E-08	mg/kg/day	8.0E-05	mg/kg/day	3.E-04
				Vanadium	103	mg/kg	NC		NC			4.1E-06	mg/kg/day	7.0E-03	mg/kg/day	6.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.000109	mg/kg	7.4E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-07	4.3E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-07					1.E-02
			DERMAL	2-Methylnaphthalene	0.17022	mg/kg	NC		NC			1.7E-08	mg/kg/day	2.0E-02	mg/kg/day	8.E-07
				Acenaphthylene	0.49749	mg/kg	NC		NC			4.9E-08	mg/kg/day	6.0E-02	mg/kg/day	8.E-07
				Benzo(a)anthracene	3.41086	mg/kg	5.8E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-08	3.4E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(a)pyrene	3.41803	mg/kg	5.8E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-07	3.4E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(b)fluoranthene	4.28861	mg/kg	7.3E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	5.E-08	4.2E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(g,h,i)perylene	2.87139	mg/kg	NC		NC			2.8E-07	mg/kg/day	3.0E-02	mg/kg/day	9.E-06
				Dibenzo(a,h)anthracene	0.72851	mg/kg	1.2E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	9.E-08	7.2E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Indeno(1,2,3-cd)pyrene	3.0929	mg/kg	5.2E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-08	3.1E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Phenanthrene	5.30136	mg/kg	NC		NC			5.2E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				alpha-Chlordane	0.03592	mg/kg	1.9E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	7.E-11	1.1E-09	mg/kg/day	5.0E-04	mg/kg/day	2.E-06
				Aroclor-1254	0.83872	mg/kg	1.5E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-08	8.9E-08	mg/kg/day	2.0E-05	mg/kg/day	4.E-03
				Aroclor-1268	0.13953	mg/kg	2.5E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	5.E-09	1.5E-08	mg/kg/day	2.0E-05	mg/kg/day	7.E-04
				Endosulfan Sulfate	0.01269	mg/kg	NC		NC			9.6E-10	mg/kg/day	6.0E-03	mg/kg/day	2.E-07
				Technical Chlordane	0.73538	mg/kg	3.8E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-09	2.2E-08	mg/kg/day	5.0E-04	mg/kg/day	4.E-05
				Aluminum	21793	mg/kg	NC		NC			--		1.0E-02	mg/kg/day	
				Arsenic	12.2	mg/kg	4.8E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	7.E-08	2.8E-07	mg/kg/day	3.0E-04	mg/kg/day	9.E-04
				Chromium	291	mg/kg	NC		NC			--		7.5E-05	mg/kg/day	
				Copper	324	mg/kg	NC		NC			--		3.0E-02	mg/kg/day	
				Lead	591	mg/kg	--		--			--				
				Manganese	4126	mg/kg	NC		NC			--		2.8E-03	mg/kg/day	
				Mercury	0.811	mg/kg	NC		NC			--		2.1E-05	mg/kg/day	
				Molybdenum	87.7	mg/kg	NC		NC			--		5.0E-03	mg/kg/day	
				Nickel	387	mg/kg	NC		NC			--		8.0E-04	mg/kg/day	
				Thallium	0.585	mg/kg	NC		NC			--		8.0E-05	mg/kg/day	
				Vanadium	103	mg/kg	NC		NC			--		1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000109	mg/kg	4.3E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	6.E-08	2.5E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								8.E-07					6.E-03
		EXPOSURE POINT TOTAL									1.E-06					2.E-02
	EXPOSURE MEDIUM TOTAL										1.E-06					2.E-02
SOIL TOTAL											1.E-06					2.E-02

TABLE 7.8.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- RECREATIONAL ANGLER- OLDER CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	GREYSTONE MILL POND	INGESTION	2-Methylnaphthalene	0.07478	mg/kg	NC		NC			3.0E-09	mg/kg/day	2.0E-02	mg/kg/day	1.E-07
				Acenaphthylene	0.19279	mg/kg	NC		NC			7.6E-09	mg/kg/day	6.0E-02	mg/kg/day	1.E-07
				Benzo(a)anthracene	3.5	mg/kg	2.4E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.4E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Benzo(a)pyrene	3.1	mg/kg	2.1E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-07	1.2E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Benzo(b)fluoranthene	3.1	mg/kg	2.1E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.2E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Benzo(g,h,i)perylene	2.07671	mg/kg	NC		NC			8.2E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Dibenzo(a,h)anthracene	0.77	mg/kg	5.2E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-08	3.0E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Indeno(1,2,3-cd)pyrene	2.18335	mg/kg	1.5E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	8.6E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Phenanthrene	4.8	mg/kg	NC		NC			1.9E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				alpha-Chlordane	0.0061	mg/kg	4.1E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-11	2.4E-10	mg/kg/day	5.0E-04	mg/kg/day	5.E-07
				Aroclor-1254	0.38	mg/kg	2.6E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	5.E-09	1.5E-08	mg/kg/day	2.0E-05	mg/kg/day	8.E-04
				Aroclor-1268	0.24667	mg/kg	1.7E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-09	9.8E-09	mg/kg/day	2.0E-05	mg/kg/day	5.E-04
				gamma-Chlordane	0.005	mg/kg	3.4E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-11	2.0E-10	mg/kg/day	5.0E-04	mg/kg/day	4.E-07
				Technical Chlordane	0.62618	mg/kg	4.2E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-09	2.5E-08	mg/kg/day	5.0E-04	mg/kg/day	5.E-05
				Aluminum	15554	mg/kg	NC		NC			6.2E-04	mg/kg/day	1.0E+00	mg/kg/day	6.E-04
				Antimony	4.3	mg/kg	NC		NC			1.7E-07	mg/kg/day	4.0E-04	mg/kg/day	4.E-04
				Arsenic	9.6	mg/kg	6.5E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-07	3.8E-07	mg/kg/day	3.0E-04	mg/kg/day	1.E-03
				Cadmium	4.35	mg/kg	NC		NC			1.7E-07	mg/kg/day	1.0E-03	mg/kg/day	2.E-04
				Chromium	271	mg/kg	NC		NC			1.1E-05	mg/kg/day	3.0E-03	mg/kg/day	4.E-03
				Copper	436	mg/kg	NC		NC			1.7E-05	mg/kg/day	3.0E-02	mg/kg/day	6.E-04
				Lead	179	mg/kg	1.2E-06	mg/kg/day				7.1E-06	mg/kg/day			
				Manganese	599	mg/kg	NC		NC			2.4E-05	mg/kg/day	7.1E-02	mg/kg/day	3.E-04
				Mercury	0.757	mg/kg	NC		NC			3.0E-08	mg/kg/day	3.0E-04	mg/kg/day	1.E-04
				Nickel	142	mg/kg	NC		NC			5.6E-06	mg/kg/day	2.0E-02	mg/kg/day	3.E-04
				Thallium	0.37	mg/kg	NC		NC			1.5E-08	mg/kg/day	8.0E-05	mg/kg/day	2.E-04
				Vanadium	79	mg/kg	NC		NC			3.1E-06	mg/kg/day	7.0E-03	mg/kg/day	4.E-04
				Toxicity Equivalency (Dioxins/Furans	0.00012	mg/kg	8.1E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-07	4.7E-12	mg/kg/day			
				Toxicity Equivalency (PCB Congeners	0.0000249	mg/kg	1.7E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-08	9.9E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-07					9.E-03
			DERMAL	2-Methylnaphthalene	0.07478	mg/kg	NC		NC			5.5E-09	mg/kg/day	2.0E-02	mg/kg/day	3.E-07
				Acenaphthylene	0.19279	mg/kg	NC		NC			1.4E-08	mg/kg/day	6.0E-02	mg/kg/day	2.E-07
				Benzo(a)anthracene	3.5	mg/kg	4.4E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-08	2.6E-07	mg/kg/day	3.0E-02	mg/kg/day	9.E-06
				Benzo(a)pyrene	3.1	mg/kg	3.9E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-07	2.3E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				Benzo(b)fluoranthene	3.1	mg/kg	3.9E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-08	2.3E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				Benzo(g,h,i)perylene	2.07671	mg/kg	NC		NC			1.5E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Dibenzo(a,h)anthracene	0.77	mg/kg	9.7E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	7.E-08	5.7E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Indeno(1,2,3-cd)pyrene	2.18335	mg/kg	2.8E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.6E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Phenanthrene	4.8	mg/kg	NC		NC			3.5E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				alpha-Chlordane	0.0061	mg/kg	2.4E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	8.E-12	1.4E-10	mg/kg/day	5.0E-04	mg/kg/day	3.E-07
				Aroclor-1254	0.38	mg/kg	5.2E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-08	3.0E-08	mg/kg/day	2.0E-05	mg/kg/day	2.E-03
				Aroclor-1268	0.24667	mg/kg	3.3E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	7.E-09	2.0E-08	mg/kg/day	2.0E-05	mg/kg/day	1.E-03
				gamma-Chlordane	0.005	mg/kg	1.9E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	7.E-12	1.1E-10	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				Technical Chlordane	0.62618	mg/kg	2.4E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	9.E-10	1.4E-08	mg/kg/day	5.0E-04	mg/kg/day	3.E-05
				Aluminum	15554	mg/kg	NC		NC			--		1.0E-02	mg/kg/day	
				Antimony	4.3	mg/kg	NC		NC			--		6.0E-05	mg/kg/day	
				Arsenic	9.6	mg/kg	2.8E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	4.E-08	1.6E-07	mg/kg/day	3.0E-04	mg/kg/day	5.E-04
				Cadmium	4.35	mg/kg	NC		NC			2.5E-09	mg/kg/day	2.5E-05	mg/kg/day	1.E-04
				Chromium	271	mg/kg	NC		NC			--		7.5E-05	mg/kg/day	
				Copper	436	mg/kg	NC		NC			--		3.0E-02	mg/kg/day	
				Lead	179	mg/kg	--					--				
				Manganese	599	mg/kg	NC		NC			--		2.8E-03	mg/kg/day	
				Mercury	0.757	mg/kg	NC		NC			--		2.1E-05	mg/kg/day	
				Nickel	142	mg/kg	NC		NC			--		8.0E-04	mg/kg/day	
				Thallium	0.37	mg/kg	NC		NC			--		8.0E-05	mg/kg/day	
				Vanadium	79	mg/kg	NC		NC			--		1.8E-04	mg/kg/day	

TABLE 7.8.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- RECREATIONAL ANGLER- OLDER CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Toxicity Equivalency (Dioxins/Furans	0.00012	mg/kg	3.5E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	5.E-08	2.0E-12	mg/kg/day			
				Toxicity Equivalency (PCB Congeners	0.0000249	mg/kg	7.2E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-08	4.2E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								6.E-07					3.E-03
		EXPOSURE POINT TOTAL									1.E-06					1.E-02
	EXPOSURE MEDIUM TOTAL										1.E-06					1.E-02
SEDIMENT TOTAL											1.E-06					1.E-02
SURFACE WATER	SURFACE WATER	GREYSTONE MILL POND	INGESTION	Arsenic	0.00055	mg/l	3.7E-10	mg/kg/day	1.5E+00	mg/kg/day	6.E-10	2.2E-09	mg/kg/day	3.0E-04	mg/kg/day	7.E-06
				Manganese	0.144	mg/l	NC		NC			5.7E-07	mg/kg/day	2.4E-02	mg/kg/day	2.E-05
				Mercury	0.00000193	mg/l	NC		NC			7.6E-12	mg/kg/day	3.0E-04	mg/kg/day	3.E-08
				Nitrite-N	0.13	mg/l	NC		NC			5.1E-07	mg/kg/day	1.0E-01	mg/kg/day	5.E-06
				Toxicity Equivalency (Dioxins/Furans	5.64E-09	mg/l	3.8E-15	mg/kg/day	1.5E+05	mg/kg/day	6.E-10	2.2E-14	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-09					4.E-05
			DERMAL	Arsenic	0.00055	mg/l	4.7E-10	mg/kg/day	1.5E+00	mg/kg/day	7.E-10	2.7E-09	mg/kg/day	3.0E-04	mg/kg/day	9.E-06
				Manganese	0.144	mg/l	NC		NC			7.1E-07	mg/kg/day	9.6E-04	mg/kg/day	7.E-04
				Mercury	0.00000193	mg/l	NC		NC			9.6E-12	mg/kg/day	2.1E-05	mg/kg/day	5.E-07
				Nitrite-N	0.13	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans	5.64E-09	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								7.E-10					8.E-04
		EXPOSURE POINT TOTAL									2.E-09					8.E-04
	EXPOSURE MEDIUM TOTAL										2.E-09					8.E-04
SURFACE WATER TOTAL											2.E-09					8.E-04
BIOTA	COMBINED FISH DIET	GREYSTONE MILL POND	INGESTION	Acenaphthylene	0.0022	mg/kg	NC		NC			4.4E-07	mg/kg/day	6.0E-02	mg/kg/day	7.E-06
				Benzo(a)pyrene	0.00099	mg/kg	3.4E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-07	2.0E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Benzo(g,h,i)perylene	0.0012	mg/kg	NC		NC			2.4E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				Benzo(b)fluoranthene	0.00092	mg/kg	3.1E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.8E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Dibenzo(a,h)anthracene	0.00057	mg/kg	1.9E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-07	1.1E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Indeno(1,2,3-cd)pyrene	0.00092	mg/kg	3.1E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.8E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Phenanthrene	0.008	mg/kg	NC		NC			1.6E-06	mg/kg/day	3.0E-02	mg/kg/day	5.E-05
				4,4'-DDD	0.013	mg/kg	4.4E-07	mg/kg/day	2.4E-01	(mg/kg/day)-1	1.E-07	2.6E-06	mg/kg/day	5.0E-04	mg/kg/day	5.E-03
				4,4'-DDE	0.0329	mg/kg	1.1E-06	mg/kg/day	3.4E-01	(mg/kg/day)-1	4.E-07	6.5E-06	mg/kg/day	5.0E-04	mg/kg/day	1.E-02
				4,4'-DDT	0.003	mg/kg	1.0E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	3.E-08	5.9E-07	mg/kg/day	5.0E-04	mg/kg/day	1.E-03
				alpha-Chlordane	0.014	mg/kg	4.8E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-07	2.8E-06	mg/kg/day	5.0E-04	mg/kg/day	6.E-03
				Aroclor-1254	0.177	mg/kg	6.0E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-05	3.5E-05	mg/kg/day	2.0E-05	mg/kg/day	2.E+00
				Aroclor-1268	0.0851	mg/kg	2.9E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	6.E-06	1.7E-05	mg/kg/day	2.0E-05	mg/kg/day	8.E-01
				Dieldrin	0.0027	mg/kg	9.2E-08	mg/kg/day	1.6E+01	(mg/kg/day)-1	1.E-06	5.4E-07	mg/kg/day	5.0E-05	mg/kg/day	1.E-02
				gamma-Chlordane	0.006	mg/kg	2.0E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	7.E-08	1.2E-06	mg/kg/day	5.0E-04	mg/kg/day	2.E-03
				Heptachlor Epoxide	0.0008	mg/kg	2.7E-08	mg/kg/day	9.1E+00	(mg/kg/day)-1	2.E-07	1.6E-07	mg/kg/day	1.3E-05	mg/kg/day	1.E-02
				Technical Chlordane	0.2056	mg/kg	7.0E-06	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-06	4.1E-05	mg/kg/day	5.0E-04	mg/kg/day	8.E-02
				Lead	0.5	mg/kg	1.7E-05	mg/kg/day				9.9E-05	mg/kg/day			
				Mercury	0.226	mg/kg	NC		NC			4.5E-05	mg/kg/day	3.0E-04	mg/kg/day	1.E-01
				Mercury (methyl)	0.328	mg/kg	NC		NC			6.5E-05	mg/kg/day	1.0E-04	mg/kg/day	7.E-01
				Zinc	22	mg/kg	NC		NC			4.4E-03	mg/kg/day	3.0E-01	mg/kg/day	1.E-02
				Toxicity Equivalency (Dioxins/Furans	0.00000136	mg/kg	4.6E-11	mg/kg/day	1.5E+05	(mg/kg/day)-1	7.E-06	2.7E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-05					3.5.E+00
		EXPOSURE POINT TOTAL									3.E-05					3.5.E+00
	EXPOSURE MEDIUM TOTAL										3.E-05					3.5.E+00
COMBINED FISH DIET TOTAL											3.E-05					3.5.E+00
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	3.E-05	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				3.6.E+00

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available

Prepared by RAR
Checked by KJA

TABLE 7.10.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- RESIDENT- ADULT - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SOIL	SOIL	GREYSTONE MILL POND	INGESTION	2-Methylnaphthalene	0.17022	mg/kg	NC		NC			5.2E-08	mg/kg/day	2.0E-02	mg/kg/day	3 E-06
				Acenaphthylene	0.49749	mg/kg	NC		NC			1.5E-07	mg/kg/day	6.0E-02	mg/kg/day	3 E-06
				Benzo(a)anthracene	3 41086	mg/kg	1 8E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	1 E-07	1 0E-06	mg/kg/day	3 0E-02	mg/kg/day	3 E-05
				Benzo(a)pyrene	3 41803	mg/kg	1 8E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-06	1.0E-06	mg/kg/day	3 0E-02	mg/kg/day	3 E-05
				Benzo(b)fluoranthene	4.28861	mg/kg	2.2E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	2 E-07	1.3E-06	mg/kg/day	3.0E-02	mg/kg/day	4 E-05
				Benzo(g,h,i)perylene	2.87139	mg/kg	NC		NC			8.8E-07	mg/kg/day	3.0E-02	mg/kg/day	3 E-05
				Dibenzo(a,h)anthracene	0.72851	mg/kg	3.8E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-07	2.2E-07	mg/kg/day	3 0E-02	mg/kg/day	7.E-06
				Indeno(1,2,3-cd)pyrene	3.0929	mg/kg	1 6E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-07	9 4E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Phenanthrene	5 30136	mg/kg	NC		NC			1.6E-06	mg/kg/day	3.0E-02	mg/kg/day	5.E-05
				alpha-Chlordane	0.03592	mg/kg	1.9E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	7.E-10	1.1E-08	mg/kg/day	5 0E-04	mg/kg/day	2 E-05
				Aroclor-1254	0.83872	mg/kg	4.4E-08	mg/kg/day	2 0E+00	(mg/kg/day)-1	9.E-08	2.6E-07	mg/kg/day	2.0E-05	mg/kg/day	1 E-02
				Aroclor-1268	0 13953	mg/kg	7 3E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-08	4.3E-08	mg/kg/day	2.0E-05	mg/kg/day	2 E-03
				Endosulfan Sulfate	0 01269	mg/kg	NC		NC			3.9E-09	mg/kg/day	6.0E-03	mg/kg/day	6.E-07
				Technical Chlordane	0.73538	mg/kg	3.8E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	1 E-08	2.2E-07	mg/kg/day	5 0E-04	mg/kg/day	4 E-04
				Aluminum	21793	mg/kg	NC		NC			6.7E-03	mg/kg/day	1.0E+00	mg/kg/day	7.E-03
				Arsenic	12.2	mg/kg	6 4E-07	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-06	3 7E-06	mg/kg/day	3.0E-04	mg/kg/day	1.E-02
				Chromium	291	mg/kg	NC		NC			8.9E-05	mg/kg/day	3.0E-03	mg/kg/day	3 E-02
				Copper	324	mg/kg	NC		NC			9.9E-05	mg/kg/day	3.0E-02	mg/kg/day	3.E-03
				Lead	591	mg/kg	3.1E-05	mg/kg/day	--			1.8E-04	mg/kg/day			
				Manganese	4126	mg/kg	NC		NC			1.3E-03	mg/kg/day	7.1E-02	mg/kg/day	2.E-02
				Mercury	0.811	mg/kg	NC		NC			2 5E-07	mg/kg/day	3.0E-04	mg/kg/day	8.E-04
				Molybdenum	87 7	mg/kg	NC		NC			2.7E-05	mg/kg/day	5.0E-03	mg/kg/day	5 E-03
				Nickel	387	mg/kg	NC		NC			1.2E-04	mg/kg/day	2 0E-02	mg/kg/day	6 E-03
				Thallium	0.585	mg/kg	NC		NC			1.8E-07	mg/kg/day	8.0E-05	mg/kg/day	2.E-03
				Vanadium	103	mg/kg	NC		NC			3.1E-05	mg/kg/day	7.0E-03	mg/kg/day	4 E-03
				Toxicity Equivalency (Dioxins/Furans)	0 000109	mg/kg	5 7E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	9.E-07	3 3E-11	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-06					1.E-01
			DERMAL	2-Methylnaphthalene	0 17022	mg/kg	NC		NC			2.7E-08	mg/kg/day	2.0E-02	mg/kg/day	1 E-06
				Acenaphthylene	0.49749	mg/kg	NC		NC			7.9E-08	mg/kg/day	6.0E-02	mg/kg/day	1 E-06
				Benzo(a)anthracene	3.41086	mg/kg	9.3E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-08	5.4E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(a)pyrene	3.41803	mg/kg	9.3E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	7.E-07	5.4E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(b)fluoranthene	4 28861	mg/kg	1.2E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-08	6.8E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(g,h,i)perylene	2.87139	mg/kg	NC		NC			4.5E-07	mg/kg/day	3.0E-02	mg/kg/day	2 E-05
				Dibenzo(a,h)anthracene	0 72851	mg/kg	2.0E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-07	1.2E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Indeno(1,2,3-cd)pyrene	3.0929	mg/kg	8.4E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-08	4.9E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Phenanthrene	5.30136	mg/kg	NC		NC			8.4E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				alpha-Chlordane	0.03592	mg/kg	3.0E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-10	1 8E-09	mg/kg/day	5.0E-04	mg/kg/day	4.E-06
				Aroclor-1254	0.83872	mg/kg	2.5E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	5.E-08	1.4E-07	mg/kg/day	2.0E-05	mg/kg/day	7 E-03
				Aroclor-1268	0 13953	mg/kg	4 1E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	8.E-09	2.4E-08	mg/kg/day	2.0E-05	mg/kg/day	1.E-03
				Endosulfan Sulfate	0 01269	mg/kg	NC		NC			1.5E-09	mg/kg/day	6.0E-03	mg/kg/day	3.E-07
				Technical Chlordane	0.73538	mg/kg	6.1E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-09	3.6E-08	mg/kg/day	5.0E-04	mg/kg/day	7 E-05
				Aluminum	21793	mg/kg	NC		NC			--		1.0E-02	mg/kg/day	
				Arsenic	12.2	mg/kg	7.6E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-07	4.5E-07	mg/kg/day	3.0E-04	mg/kg/day	1.E-03
				Chromium	291	mg/kg	NC		NC			--		7.5E-05	mg/kg/day	
				Copper	324	mg/kg	NC		NC			--		3.0E-02	mg/kg/day	
				Lead	591	mg/kg	--		--			--				
				Manganese	4126	mg/kg	NC		NC			--		2.8E-03	mg/kg/day	
				Mercury	0.811	mg/kg	NC		NC			--		2.1E-05	mg/kg/day	
				Molybdenum	87.7	mg/kg	NC		NC			--		5.0E-03	mg/kg/day	
				Nickel	387	mg/kg	NC		NC			--		8.0E-04	mg/kg/day	
				Thallium	0.585	mg/kg	NC		NC			--		8.0E-05	mg/kg/day	
				Vanadium	103	mg/kg	NC		NC			--		1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000109	mg/kg	6 8E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-07	4.0E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-06					1.E-02
		EXPOSURE POINT TOTAL									5 E-06					1.E-01
	EXPOSURE MEDIUM TOTAL										5.E-06					1.E-01
SOIL TOTAL											5.E-06					1.E-01

TABLE 7.10.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- RESIDENT- ADULT - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	GREYSTONE MILL POND	INGESTION	2-Methylnaphthalene	0.07478	mg/kg	NC		NC			1.1E-08	mg/kg/day	2.0E-02	mg/kg/day	6.E-07
				Acenaphthylene	0.19279	mg/kg	NC		NC			2.9E-08	mg/kg/day	6.0E-02	mg/kg/day	5.E-07
				Benzo(a)anthracene	3.5	mg/kg	9.2E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-08	5.3E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(a)pyrene	3.1	mg/kg	8.1E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	6.E-07	4.7E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(b)fluoranthene	3.1	mg/kg	8.1E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-08	4.7E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(g,h,i)perylene	2.07671	mg/kg	NC		NC			3.2E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Dibenzo(a,h)anthracene	0.77	mg/kg	2.0E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-07	1.2E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Indeno(1,2,3-cd)pyrene	2.18335	mg/kg	5.7E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-08	3.3E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Phenanthrene	4.8	mg/kg	NC		NC			7.3E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				alpha-Chlordane	0.0061	mg/kg	1.6E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	6.E-11	9.3E-10	mg/kg/day	5.0E-04	mg/kg/day	2.E-06
				Aroclor-1254	0.38	mg/kg	9.9E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-08	5.8E-08	mg/kg/day	2.0E-05	mg/kg/day	3.E-03
				Aroclor-1268	0.24667	mg/kg	6.5E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-08	3.8E-08	mg/kg/day	2.0E-05	mg/kg/day	2.E-03
				gamma-Chlordane	0.005	mg/kg	1.3E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	5.E-11	7.6E-10	mg/kg/day	5.0E-04	mg/kg/day	2.E-06
				Technical Chlordane	0.62618	mg/kg	1.6E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	6.E-09	9.6E-08	mg/kg/day	5.0E-04	mg/kg/day	2.E-04
				Aluminum	15554	mg/kg	NC		NC			2.4E-03	mg/kg/day	1.0E+00	mg/kg/day	2.E-03
				Antimony	4.3	mg/kg	NC		NC			6.6E-07	mg/kg/day	4.0E-04	mg/kg/day	2.E-03
				Arsenic	9.6	mg/kg	2.5E-07	mg/kg/day	1.5E+00	(mg/kg/day)-1	4.E-07	1.5E-06	mg/kg/day	3.0E-04	mg/kg/day	5.E-03
				Cadmium	4.35	mg/kg	NC		NC			6.6E-07	mg/kg/day	1.0E-03	mg/kg/day	7.E-04
				Chromium	271	mg/kg	NC		NC			4.1E-05	mg/kg/day	3.0E-03	mg/kg/day	1.E-02
				Copper	436	mg/kg	NC		NC			6.7E-05	mg/kg/day	3.0E-02	mg/kg/day	2.E-03
				Lead	179	mg/kg	4.7E-06	mg/kg/day				2.7E-05	mg/kg/day			
				Manganese	599	mg/kg	NC		NC			9.1E-05	mg/kg/day	7.1E-02	mg/kg/day	1.E-03
				Mercury	0.757	mg/kg	NC		NC			1.2E-07	mg/kg/day	3.0E-04	mg/kg/day	4.E-04
				Nickel	142	mg/kg	NC		NC			2.2E-05	mg/kg/day	2.0E-02	mg/kg/day	1.E-03
				Thallium	0.37	mg/kg	NC		NC			5.6E-08	mg/kg/day	8.0E-05	mg/kg/day	7.E-04
				Vanadium	79	mg/kg	NC		NC			1.2E-05	mg/kg/day	7.0E-03	mg/kg/day	2.E-03
				Toxicity Equivalency (Dioxins/Furans)	0.00012	mg/kg	3.1E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	5.E-07	1.8E-11	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.0000249	mg/kg	6.5E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-07	3.8E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-06					4.E-02
			DERMAL	2-Methylnaphthalene	0.07478	mg/kg	NC		NC			5.0E-09	mg/kg/day	2.0E-02	mg/kg/day	3.E-07
				Acenaphthylene	0.19279	mg/kg	NC		NC			1.3E-08	mg/kg/day	6.0E-02	mg/kg/day	2.E-07
				Benzo(a)anthracene	3.5	mg/kg	4.1E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-08	2.4E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				Benzo(a)pyrene	3.1	mg/kg	3.6E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-07	2.1E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Benzo(b)fluoranthene	3.1	mg/kg	3.6E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-08	2.1E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Benzo(g,h,i)perylene	2.07671	mg/kg	NC		NC			1.4E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Dibenzo(a,h)anthracene	0.77	mg/kg	8.9E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	7.E-08	5.2E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Indeno(1,2,3-cd)pyrene	2.18335	mg/kg	2.5E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.5E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Phenanthrene	4.8	mg/kg	NC		NC			3.2E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				alpha-Chlordane	0.0061	mg/kg	2.2E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	8.E-12	1.3E-10	mg/kg/day	5.0E-04	mg/kg/day	3.E-07
				Aroclor-1254	0.38	mg/kg	4.7E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	9.E-09	2.8E-08	mg/kg/day	2.0E-05	mg/kg/day	1.E-03
				Aroclor-1268	0.24667	mg/kg	3.1E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	6.E-09	1.8E-08	mg/kg/day	2.0E-05	mg/kg/day	9.E-04
				gamma-Chlordane	0.005	mg/kg	1.8E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	6.E-12	1.0E-10	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				Technical Chlordane	0.62618	mg/kg	2.2E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	8.E-10	1.3E-08	mg/kg/day	5.0E-04	mg/kg/day	3.E-05
				Aluminum	15554	mg/kg	NC		NC			--		1.0E-02	mg/kg/day	
				Antimony	4.3	mg/kg	NC		NC			--		6.0E-05	mg/kg/day	
				Arsenic	9.6	mg/kg	2.6E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	4.E-08	1.5E-07	mg/kg/day	3.0E-04	mg/kg/day	5.E-04
				Cadmium	4.35	mg/kg	NC		NC			2.3E-09	mg/kg/day	2.5E-05	mg/kg/day	9.E-05
				Chromium	271	mg/kg	NC		NC			--		7.5E-05	mg/kg/day	
				Copper	436	mg/kg	NC		NC			--		3.0E-02	mg/kg/day	
				Lead	179	mg/kg	--					--				
				Manganese	599	mg/kg	NC		NC			--		2.8E-03	mg/kg/day	
				Mercury	0.757	mg/kg	NC		NC			--		2.1E-05	mg/kg/day	
				Nickel	142	mg/kg	NC		NC			--		8.0E-04	mg/kg/day	
				Thallium	0.37	mg/kg	NC		NC			--		8.0E-05	mg/kg/day	
				Vanadium	79	mg/kg	NC		NC			--		1.8E-04	mg/kg/day	

TABLE 7.10.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- RESIDENT- ADULT - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Toxicity Equivalency (Dioxins/Furans)	0.00012	mg/kg	3.2E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	5 E-08	1.9E-12	mg/kg/day			
				Toxicity Equivalency (PCB Congeners	0 0000249	mg/kg	6.6E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-08	3.9E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-07					3 E-03
		EXPOSURE POINT TOTAL									2.E-06					4 E-02
	EXPOSURE MEDIUM TOTAL										2 E-06					4 E-02
SEDIMENT TOTAL											2.E-06					4.E-02
SURFACE WATER	SURFACE WATER	GREYSTONE MILL POND	INGESTION	Arsenic	0.00055	mg/l	9.6E-09	mg/kg/day	1 5E+00	mg/kg/day	1 E-08	5 6E-08	mg/kg/day	3 0E-04	mg/kg/day	2.E-04
				Manganese	0 144	mg/l	NC		NC			1.5E-05	mg/kg/day	2.4E-02	mg/kg/day	6.E-04
				Mercury	0.00000193	mg/l	NC		NC			2.0E-10	mg/kg/day	3 0E-04	mg/kg/day	7.E-07
				Nitrite-N	0.13	mg/l	NC		NC			1.3E-05	mg/kg/day	1 0E-01	mg/kg/day	1.E-04
				Toxicity Equivalency (Dioxins/Furans)	5.64E-09	mg/l	9 8E-14	mg/kg/day	1.5E+05	mg/kg/day	1.E-08	5.7E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3 E-08					9.E-04
			DERMAL	Arsenic	0.00055	mg/l	1.6E-09	mg/kg/day	1.5E+00	mg/kg/day	2 E-09	9.1E-09	mg/kg/day	3.0E-04	mg/kg/day	3.E-05
				Manganese	0 144	mg/l	NC		NC			2.4E-06	mg/kg/day	9.6E-04	mg/kg/day	2.E-03
				Mercury	0.00000193	mg/l	NC		NC			3.2E-11	mg/kg/day	2.1E-05	mg/kg/day	2.E-06
				Nitrite-N	0.13	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	5.64E-09	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-09					3.E-03
		EXPOSURE POINT TOTAL									3 E-08					3.E-03
	EXPOSURE MEDIUM TOTAL										3.E-08					3.E-03
SURFACE WATER TOTAL											3.E-08					3.E-03
BIOTA	COMBINED FISH DIET	GREYSTONE MILL POND	INGESTION	Acenaphthylene	0.0022	mg/kg	NC		NC			4.2E-07	mg/kg/day	6.0E-02	mg/kg/day	7 E-06
				Benzo(a)pyrene	0.00099	mg/kg	3.3E-08	mg/kg/day	7 3E+00	(mg/kg/day)-1	2.E-07	1.9E-07	mg/kg/day	3.0E-02	mg/kg/day	6 E-06
				Benzo(g,h,i)perylene	0.0012	mg/kg	NC		NC			2.3E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				Benzo(b)fluoranthene	0 00092	mg/kg	3.0E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.8E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Dibenzo(a,h)anthracene	0.00057	mg/kg	1.9E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-07	1.1E-07	mg/kg/day	3.0E-02	mg/kg/day	4 E-06
				Indeno(1,2,3-cd)pyrene	0.00092	mg/kg	3 0E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.8E-07	mg/kg/day	3 0E-02	mg/kg/day	6.E-06
				Phenanthrene	0.008	mg/kg	NC		NC			1.5E-06	mg/kg/day	3 0E-02	mg/kg/day	5 E-05
				4,4'-DDD	0.013	mg/kg	4.3E-07	mg/kg/day	2 4E-01	(mg/kg/day)-1	1.E-07	2.5E-06	mg/kg/day	5 0E-04	mg/kg/day	5 E-03
				4,4'-DDE	0 0329	mg/kg	1.1E-06	mg/kg/day	3 4E-01	(mg/kg/day)-1	4.E-07	6 3E-06	mg/kg/day	5 0E-04	mg/kg/day	1 E-02
				4,4'-DDT	0.003	mg/kg	9.9E-08	mg/kg/day	3 4E-01	(mg/kg/day)-1	3.E-08	5.8E-07	mg/kg/day	5.0E-04	mg/kg/day	1 E-03
				alpha-Chlordane	0.014	mg/kg	4 6E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	2 E-07	2.7E-06	mg/kg/day	5.0E-04	mg/kg/day	5 E-03
				Aroclor-1254	0.177	mg/kg	5.8E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	1 E-05	3 4E-05	mg/kg/day	2 0E-05	mg/kg/day	2.E+00
				Aroclor-1268	0 0851	mg/kg	2.8E-06	mg/kg/day	2 0E+00	(mg/kg/day)-1	6.E-06	1.6E-05	mg/kg/day	2.0E-05	mg/kg/day	8.E-01
				Dieldrin	0.0027	mg/kg	8 9E-08	mg/kg/day	1 6E+01	(mg/kg/day)-1	1.E-06	5.2E-07	mg/kg/day	5.0E-05	mg/kg/day	1 E-02
				gamma-Chlordane	0.006	mg/kg	2.0E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	7.E-08	1.2E-06	mg/kg/day	5.0E-04	mg/kg/day	2.E-03
				Heptachlor Epoxide	0.0008	mg/kg	2.6E-08	mg/kg/day	9 1E+00	(mg/kg/day)-1	2.E-07	1.5E-07	mg/kg/day	1 3E-05	mg/kg/day	1 E-02
				Technical Chlordane	0.2056	mg/kg	6.8E-06	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-06	3.9E-05	mg/kg/day	5.0E-04	mg/kg/day	8.E-02
				Lead	0 5	mg/kg	1.6E-05	mg/kg/day				9.6E-05	mg/kg/day			
				Mercury	0 226	mg/kg	NC		NC			4 3E-05	mg/kg/day	3 0E-04	mg/kg/day	1.E-01
				Mercury (methyl)	0.328	mg/kg	NC		NC			6.3E-05	mg/kg/day	1 0E-04	mg/kg/day	6 E-01
				Zinc	22	mg/kg	NC		NC			4.2E-03	mg/kg/day	3.0E-01	mg/kg/day	1.E-02
				Toxicity Equivalency (Dioxins/Furans)	0.00000136	mg/kg	4.5E-11	mg/kg/day	1.5E+05	(mg/kg/day)-1	7.E-06	2.6E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-05					3.4.E+00
		EXPOSURE POINT TOTAL									3.E-05					3.4.E+00
	EXPOSURE MEDIUM TOTAL										3.E-05					3.4.E+00
COMBINED FISH DIET TOTAL											3.E-05					3.4.E+00
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	4.E-05				TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA	3.6.E+00

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: RAR
Checked by: KJA

MACTEC Engineering and Consulting, Inc.
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P:\W9-GVT\CDE-NAE\Bettelle\Centredale\T25 - BCRA\BHHRA AUG05 REISSUE\TABLES\TABLES 7&9(&10)\GMP\RME-Resident-Adult-GMPSUMMARY-CALC

8/18/2005

TABLE 7.11.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- RESIDENT- OLDER CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	GREYSTONE MILL POND	INGESTION	2-Methylnaphthalene	0.07478	mg/kg	NC		NC			1.8E-08	mg/kg/day	2.0E-02	mg/kg/day	9 E-07
				Acenaphthylene	0 19279	mg/kg	NC		NC			4.6E-08	mg/kg/day	6.0E-02	mg/kg/day	8.E-07
				Benzo(a)anthracene	3.5	mg/kg	1.4E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-07	8.3E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Benzo(a)pyrene	3.1	mg/kg	1.3E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	9.E-07	7.4E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(b)fluoranthene	3.1	mg/kg	1.3E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	9.E-08	7.4E-07	mg/kg/day	3.0E-02	mg/kg/day	2 E-05
				Benzo(g,h,i)perylene	2.07671	mg/kg	NC		NC			4.9E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Dibenzo(a,h)anthracene	0.77	mg/kg	3.1E-08	mg/kg/day	7 3E+00	(mg/kg/day)-1	2.E-07	1.8E-07	mg/kg/day	3.0E-02	mg/kg/day	6 E-06
				Indeno(1,2,3-cd)pyrene	2.18335	mg/kg	8.9E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-08	5.2E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Phenanthrene	4 8	mg/kg	NC		NC			1.1E-06	mg/kg/day	3.0E-02	mg/kg/day	4.E-05
				alpha-Chlordane	0.0061	mg/kg	2.5E-10	mg/kg/day	3 5E-01	(mg/kg/day)-1	9.E-11	1.4E-09	mg/kg/day	5.0E-04	mg/kg/day	3.E-06
				Aroclor-1254	0.38	mg/kg	1.5E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-08	9.0E-08	mg/kg/day	2.0E-05	mg/kg/day	5.E-03
				Aroclor-1268	0.24667	mg/kg	1.0E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-08	5.9E-08	mg/kg/day	2.0E-05	mg/kg/day	3.E-03
				gamma-Chlordane	0.005	mg/kg	2.0E-10	mg/kg/day	3 5E-01	(mg/kg/day)-1	7.E-11	1.2E-09	mg/kg/day	5.0E-04	mg/kg/day	2.E-06
				Technical Chlordane	0.62618	mg/kg	2.5E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	9.E-09	1.5E-07	mg/kg/day	5.0E-04	mg/kg/day	3 E-04
				Aluminum	15554	mg/kg	NC		NC			3.7E-03	mg/kg/day	1.0E+00	mg/kg/day	4 E-03
				Antimony	4.3	mg/kg	NC		NC			1.0E-06	mg/kg/day	4.0E-04	mg/kg/day	3.E-03
				Arsenic	9.6	mg/kg	3.9E-07	mg/kg/day	1.5E+00	(mg/kg/day)-1	6.E-07	2.3E-06	mg/kg/day	3.0E-04	mg/kg/day	8.E-03
				Cadmium	4.35	mg/kg	NC		NC			1.0E-06	mg/kg/day	1.0E-03	mg/kg/day	1.E-03
				Chromium	271	mg/kg	NC		NC			6.4E-05	mg/kg/day	3.0E-03	mg/kg/day	2 E-02
				Copper	436	mg/kg	NC		NC			1 0E-04	mg/kg/day	3.0E-02	mg/kg/day	3 E-03
				Lead	179	mg/kg	7.3E-06	mg/kg/day				4 3E-05	mg/kg/day			
				Manganese	599	mg/kg	NC		NC			1.4E-04	mg/kg/day	7.1E-02	mg/kg/day	2.E-03
				Mercury	0 757	mg/kg	NC		NC			1.8E-07	mg/kg/day	3.0E-04	mg/kg/day	6 E-04
				Nickel	142	mg/kg	NC		NC			3.4E-05	mg/kg/day	2 0E-02	mg/kg/day	2 E-03
				Thallium	0.37	mg/kg	NC		NC			8.8E-08	mg/kg/day	8 0E-05	mg/kg/day	1.E-03
				Vanadium	79	mg/kg	NC		NC			1 9E-05	mg/kg/day	7 0E-03	mg/kg/day	3 E-03
				Toxicity Equivalency (Dioxins/Furans)	0.00012	mg/kg	4 9E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	7.E-07	2.8E-11	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.0000249	mg/kg	1 0E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	2 E-07	5.9E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-06					6 E-02
			DERMAL	2-Methylnaphthalene	0 07478	mg/kg	NC		NC			1.6E-08	mg/kg/day	2.0E-02	mg/kg/day	8 E-07
				Acenaphthylene	0 19279	mg/kg	NC		NC			4.3E-08	mg/kg/day	6.0E-02	mg/kg/day	7 E-07
				Benzo(a)anthracene	3 5	mg/kg	1.3E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-07	7.7E-07	mg/kg/day	3.0E-02	mg/kg/day	3 E-05
				Benzo(a)pyrene	3 1	mg/kg	1.2E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	9.E-07	6.8E-07	mg/kg/day	3.0E-02	mg/kg/day	2 E-05
				Benzo(b)fluoranthene	3 1	mg/kg	1.2E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	9.E-08	6 8E-07	mg/kg/day	3 0E-02	mg/kg/day	2 E-05
				Benzo(g,h,i)perylene	2 07671	mg/kg	NC		NC			4.6E-07	mg/kg/day	3.0E-02	mg/kg/day	2 E-05
				Dibenzo(a,h)anthracene	0.77	mg/kg	2.9E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	2 E-07	1.7E-07	mg/kg/day	3 0E-02	mg/kg/day	6 E-06
				Indeno(1,2,3-cd)pyrene	2.18335	mg/kg	8 3E-08	mg/kg/day	7 3E-01	(mg/kg/day)-1	6.E-08	4.8E-07	mg/kg/day	3 0E-02	mg/kg/day	2 E-05
				Phenanthrene	4.8	mg/kg	NC		NC			1.1E-06	mg/kg/day	3.0E-02	mg/kg/day	4 E-05
				alpha-Chlordane	0.0061	mg/kg	7.1E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-11	4.1E-10	mg/kg/day	5.0E-04	mg/kg/day	8 E-07
				Aroclor-1254	0 38	mg/kg	1.5E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-08	9.0E-08	mg/kg/day	2.0E-05	mg/kg/day	5.E-03
				Aroclor-1268	0 24667	mg/kg	1 0E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-08	5.9E-08	mg/kg/day	2.0E-05	mg/kg/day	3 E-03
				gamma-Chlordane	0.005	mg/kg	5.8E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-11	3.4E-10	mg/kg/day	5.0E-04	mg/kg/day	7 E-07
				Technical Chlordane	0 62618	mg/kg	7.3E-09	mg/kg/day	3 5E-01	(mg/kg/day)-1	3.E-09	4.3E-08	mg/kg/day	5.0E-04	mg/kg/day	9 E-05
				Aluminum	15554	mg/kg	NC		NC			--		1 0E-02	mg/kg/day	
				Antimony	4.3	mg/kg	NC		NC			--		6.0E-05	mg/kg/day	
				Arsenic	9.6	mg/kg	8 4E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-07	4.9E-07	mg/kg/day	3.0E-04	mg/kg/day	2 E-03
				Cadmium	4 35	mg/kg	NC		NC			7.4E-09	mg/kg/day	2.5E-05	mg/kg/day	3 E-04
				Chromium	271	mg/kg	NC		NC			--		7.5E-05	mg/kg/day	
				Copper	436	mg/kg	NC		NC			--		3 0E-02	mg/kg/day	
				Lead	179	mg/kg	--					--				
				Manganese	599	mg/kg	NC		NC			--		2.8E-03	mg/kg/day	
				Mercury	0 757	mg/kg	NC		NC			--		2.1E-05	mg/kg/day	
				Nickel	142	mg/kg	NC		NC			--		8.0E-04	mg/kg/day	
				Thallium	0.37	mg/kg	NC		NC			--		8.0E-05	mg/kg/day	
				Vanadium	79	mg/kg	NC		NC			--		1.8E-04	mg/kg/day	

TABLE 7.11.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- RESIDENT- OLDER CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Toxicity Equivalency (Dioxins/Furans)	0.00012	mg/kg	1.0E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-07	6.1E-12	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.0000249	mg/kg	2.2E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-08	1.3E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-06					1.E-02
		EXPOSURE POINT TOTAL									5.E-06					7.E-02
	EXPOSURE MEDIUM TOTAL										5.E-06					7.E-02
SEDIMENT TOTAL											5.E-06					7.E-02
SURFACE WATER	SURFACE WATER	GREYSTONE MILL POND	INGESTION	Arsenic	0.00055	mg/l	1.5E-08	mg/kg/day	1.5E+00	mg/kg/day	2.E-08	8.7E-08	mg/kg/day	3.0E-04	mg/kg/day	3.E-04
				Manganese	0.144	mg/l	NC		NC			2.3E-05	mg/kg/day	2.4E-02	mg/kg/day	9.E-04
				Mercury	0.00000193	mg/l	NC		NC			3.1E-10	mg/kg/day	3.0E-04	mg/kg/day	1.E-06
				Nitrite-N	0.13	mg/l	NC		NC			2.1E-05	mg/kg/day	1.0E-01	mg/kg/day	2.E-04
				Toxicity Equivalency (Dioxins/Furans)	5.64E-09	mg/l	1.5E-13	mg/kg/day	1.5E+05	mg/kg/day	2.E-08	8.9E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-08					1.E-03
			DERMAL	Arsenic	0.00055	mg/l	1.9E-09	mg/kg/day	1.5E+00	mg/kg/day	3.E-09	1.1E-08	mg/kg/day	3.0E-04	mg/kg/day	4.E-05
				Manganese	0.144	mg/l	NC		NC			2.8E-06	mg/kg/day	9.6E-04	mg/kg/day	3.E-03
				Mercury	0.00000193	mg/l	NC		NC			3.8E-11	mg/kg/day	2.1E-05	mg/kg/day	2.E-06
				Nitrite-N	0.13	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	5.64E-09	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-09					3.E-03
		EXPOSURE POINT TOTAL									5.E-08					4.E-03
	EXPOSURE MEDIUM TOTAL										5.E-08					4.E-03
SURFACE WATER TOTAL											5.E-08					4.E-03
BIOTA	COMBINED FISH DIET	GREYSTONE MILL POND	INGESTION	Acenaphthylene	0.0022	mg/kg	NC		NC			4.4E-07	mg/kg/day	6.0E-02	mg/kg/day	7.E-06
				Benzo(a)pyrene	0.00099	mg/kg	3.4E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-07	2.0E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Benzo(g,h,i)perylene	0.0012	mg/kg	NC		NC			2.4E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				Benzo(b)fluoranthene	0.00092	mg/kg	3.1E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.8E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Dibenzo(a,h)anthracene	0.00057	mg/kg	1.9E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-07	1.1E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Indeno(1,2,3-cd)pyrene	0.00092	mg/kg	3.1E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.8E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Phenanthrene	0.008	mg/kg	NC		NC			1.6E-06	mg/kg/day	3.0E-02	mg/kg/day	5.E-05
				4,4'-DDD	0.013	mg/kg	4.4E-07	mg/kg/day	2.4E-01	(mg/kg/day)-1	1.E-07	2.6E-06	mg/kg/day	5.0E-04	mg/kg/day	5.E-03
				4,4'-DDE	0.0329	mg/kg	1.1E-06	mg/kg/day	3.4E-01	(mg/kg/day)-1	4.E-07	6.5E-06	mg/kg/day	5.0E-04	mg/kg/day	1.E-02
				4,4'-DDT	0.003	mg/kg	1.0E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	3.E-08	5.9E-07	mg/kg/day	5.0E-04	mg/kg/day	1.E-03
				alpha-Chlordane	0.014	mg/kg	4.8E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-07	2.8E-06	mg/kg/day	5.0E-04	mg/kg/day	6.E-03
				Aroclor-1254	0.177	mg/kg	6.0E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-05	3.5E-05	mg/kg/day	2.0E-05	mg/kg/day	2.E+00
				Aroclor-1268	0.0851	mg/kg	2.9E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	6.E-06	1.7E-05	mg/kg/day	2.0E-05	mg/kg/day	8.E-01
				Dieldrin	0.0027	mg/kg	9.2E-08	mg/kg/day	1.6E+01	(mg/kg/day)-1	1.E-06	5.4E-07	mg/kg/day	5.0E-05	mg/kg/day	1.E-02
				gamma-Chlordane	0.006	mg/kg	2.0E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	7.E-08	1.2E-06	mg/kg/day	5.0E-04	mg/kg/day	2.E-03
				Heptachlor Epoxide	0.0008	mg/kg	2.7E-08	mg/kg/day	9.1E+00	(mg/kg/day)-1	2.E-07	1.6E-07	mg/kg/day	1.3E-05	mg/kg/day	1.E-02
				Technical Chlordane	0.2056	mg/kg	7.0E-06	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-06	4.1E-05	mg/kg/day	5.0E-04	mg/kg/day	8.E-02
				Lead	0.5	mg/kg	1.7E-05	mg/kg/day				9.9E-05	mg/kg/day			
				Mercury	0.226	mg/kg	NC		NC			4.5E-05	mg/kg/day	3.0E-04	mg/kg/day	1.E-01
				Mercury (methyl)	0.328	mg/kg	NC		NC			6.5E-05	mg/kg/day	1.0E-04	mg/kg/day	7.E-01
				Zinc	22	mg/kg	NC		NC			4.4E-03	mg/kg/day	3.0E-01	mg/kg/day	1.E-02
				Toxicity Equivalency (Dioxins/Furans)	0.00000136	mg/kg	4.6E-11	mg/kg/day	1.5E+05	(mg/kg/day)-1	7.E-06	2.7E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-05					3.5.E+00
		EXPOSURE POINT TOTAL									3.E-05					3.5.E+00
	EXPOSURE MEDIUM TOTAL										3.E-05					3.5.E+00
COMBINED FISH DIET TOTAL											3.E-05					3.5.E+00
									TOTAL RECEPTOR RISK ACROSS ALL MEDIA		5.E-05	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				3.8.E+00

NOTES.
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

Prepared by: RAR
Checked by: KJA

TABLE 7.12.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS – REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- RESIDENT- CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/R/C (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SOIL	SOIL	GREYSTONE MILL POND	INGESTION	2-Methylnaphthalene	0.17022	mg/kg	NC		NC			4.9E-07	mg/kg/day	2.0E-02	mg/kg/day	2.E-05
				Acenaphthylene	0.49749	mg/kg	NC		NC			1.4E-06	mg/kg/day	6.0E-02	mg/kg/day	2.E-05
				Benzo(a)anthracene	3.41086	mg/kg	8.3E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-07	9.7E-06	mg/kg/day	3.0E-02	mg/kg/day	3.E-04
				Benzo(a)pyrene	3.41803	mg/kg	8.3E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	6.E-06	9.7E-06	mg/kg/day	3.0E-02	mg/kg/day	3.E-04
				Benzo(b)fluoranthene	4.28861	mg/kg	1.0E-06	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-07	1.2E-05	mg/kg/day	3.0E-02	mg/kg/day	4.E-04
				Benzo(g,h,i)perylene	2.87139	mg/kg	NC		NC			8.2E-06	mg/kg/day	3.0E-02	mg/kg/day	3.E-04
				Dibenzo(a,h)anthracene	0.72851	mg/kg	1.8E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-06	2.1E-06	mg/kg/day	3.0E-02	mg/kg/day	7.E-05
				Indeno(1,2,3-cd)pyrene	3.0929	mg/kg	7.6E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-07	8.8E-06	mg/kg/day	3.0E-02	mg/kg/day	3.E-04
				Phenanthrene	5.30136	mg/kg	NC		NC			1.5E-05	mg/kg/day	3.0E-02	mg/kg/day	5.E-04
				alpha-Chlordane	0.03592	mg/kg	8.8E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-09	1.0E-07	mg/kg/day	5.0E-04	mg/kg/day	2.E-04
				Aroclor-1254	0.83872	mg/kg	2.0E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	4.E-07	2.4E-06	mg/kg/day	2.0E-05	mg/kg/day	1.E-01
				Aroclor-1268	0.13953	mg/kg	3.4E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	7.E-08	4.0E-07	mg/kg/day	2.0E-05	mg/kg/day	2.E-02
				Endosulfan Sulfate	0.01269	mg/kg	NC		NC			3.6E-08	mg/kg/day	6.0E-03	mg/kg/day	6.E-06
				Technical Chlordane	0.73538	mg/kg	1.8E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	6.E-08	2.1E-06	mg/kg/day	5.0E-04	mg/kg/day	4.E-03
				Aluminum	21793	mg/kg	NC		NC			6.2E-02	mg/kg/day	1.0E+00	mg/kg/day	6.E-02
				Arsenic	12.2	mg/kg	3.0E-06	mg/kg/day	1.5E+00	(mg/kg/day)-1	4.E-06	3.5E-05	mg/kg/day	3.0E-04	mg/kg/day	1.E-01
				Chromium	291	mg/kg	NC		NC			8.3E-04	mg/kg/day	3.0E-03	mg/kg/day	3.E-01
				Copper	324	mg/kg	NC		NC			9.2E-04	mg/kg/day	3.0E-02	mg/kg/day	3.E-02
				Lead	591	mg/kg	1.4E-04	mg/kg/day	--			1.7E-03	mg/kg/day			
				Manganese	4126	mg/kg	NC		NC			1.2E-02	mg/kg/day	7.1E-02	mg/kg/day	2.E-01
				Mercury	0.811	mg/kg	NC		NC			2.3E-06	mg/kg/day	3.0E-04	mg/kg/day	8.E-03
				Molybdenum	87.7	mg/kg	NC		NC			2.5E-04	mg/kg/day	5.0E-03	mg/kg/day	5.E-02
				Nickel	387	mg/kg	NC		NC			1.1E-03	mg/kg/day	2.0E-02	mg/kg/day	6.E-02
				Thallium	0.585	mg/kg	NC		NC			1.7E-06	mg/kg/day	8.0E-05	mg/kg/day	2.E-02
				Vanadium	103	mg/kg	NC		NC			2.9E-04	mg/kg/day	7.0E-03	mg/kg/day	4.E-02
				Toxicity Equivalency (Dioxins/Furans)	0.000109	mg/kg	2.7E-11	mg/kg/day	1.5E+05	(mg/kg/day)-1	4.E-06	3.1E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-05					1.E+00
			DERMAL	2-Methylnaphthalene	0.17022	mg/kg	NC		NC			1.8E-07	mg/kg/day	2.0E-02	mg/kg/day	9.E-06
				Acenaphthylene	0.49749	mg/kg	NC		NC			5.2E-07	mg/kg/day	6.0E-02	mg/kg/day	9.E-06
				Benzo(a)anthracene	3.41086	mg/kg	3.0E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-07	3.5E-06	mg/kg/day	3.0E-02	mg/kg/day	1.E-04
				Benzo(a)pyrene	3.41803	mg/kg	3.0E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-06	3.5E-06	mg/kg/day	3.0E-02	mg/kg/day	1.E-04
				Benzo(b)fluoranthene	4.28861	mg/kg	3.8E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-07	4.4E-06	mg/kg/day	3.0E-02	mg/kg/day	1.E-04
				Benzo(g,h,i)perylene	2.87139	mg/kg	NC		NC			3.0E-06	mg/kg/day	3.0E-02	mg/kg/day	1.E-04
				Dibenzo(a,h)anthracene	0.72851	mg/kg	6.5E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	5.E-07	7.6E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Indeno(1,2,3-cd)pyrene	3.0929	mg/kg	2.7E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-07	3.2E-06	mg/kg/day	3.0E-02	mg/kg/day	1.E-04
				Phenanthrene	5.30136	mg/kg	NC		NC			5.5E-06	mg/kg/day	3.0E-02	mg/kg/day	2.E-04
				alpha-Chlordane	0.03592	mg/kg	9.8E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-10	1.1E-08	mg/kg/day	5.0E-04	mg/kg/day	2.E-05
				Aroclor-1254	0.83872	mg/kg	8.0E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-07	9.4E-07	mg/kg/day	2.0E-05	mg/kg/day	5.E-02
				Aroclor-1268	0.13953	mg/kg	1.3E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-08	1.6E-07	mg/kg/day	2.0E-05	mg/kg/day	8.E-03
				Endosulfan Sulfate	0.01269	mg/kg	NC		NC			1.0E-08	mg/kg/day	6.0E-03	mg/kg/day	2.E-06
				Technical Chlordane	0.73538	mg/kg	2.0E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	7.E-09	2.3E-07	mg/kg/day	5.0E-04	mg/kg/day	5.E-04
				Aluminum	21793	mg/kg	NC		NC			--		1.0E-02	mg/kg/day	
				Arsenic	12.2	mg/kg	2.5E-07	mg/kg/day	1.5E+00	(mg/kg/day)-1	4.E-07	2.9E-06	mg/kg/day	3.0E-04	mg/kg/day	1.E-02
				Chromium	291	mg/kg	NC		NC			--		7.5E-05	mg/kg/day	
				Copper	324	mg/kg	NC		NC			--		3.0E-02	mg/kg/day	
				Lead	591	mg/kg	--		--			--				
				Manganese	4126	mg/kg	NC		NC			--		2.8E-03	mg/kg/day	
				Mercury	0.811	mg/kg	NC		NC			--		2.1E-05	mg/kg/day	
				Molybdenum	87.7	mg/kg	NC		NC			--		5.0E-03	mg/kg/day	
				Nickel	387	mg/kg	NC		NC			--		8.0E-04	mg/kg/day	
				Thallium	0.585	mg/kg	NC		NC			--		8.0E-05	mg/kg/day	
				Vanadium	103	mg/kg	NC		NC			--		1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000109	mg/kg	2.2E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-07	2.6E-11	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-06					7.E-02
		EXPOSURE POINT TOTAL									2.E-05					1.E+00
	EXPOSURE MEDIUM TOTAL										2.E-05					1.E+00
SOIL TOTAL											2.E-05					1.E+00

TABLE 7.12.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- RESIDENT- CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	GREYSTONE MILL POND	INGESTION	2-Methylnaphthalene	0.07478	mg/kg	NC		NC			1.4E-07	mg/kg/day	2.0E-02	mg/kg/day	7 E-06
				Acenaphthylene	0.19279	mg/kg	NC		NC			3 7E-07	mg/kg/day	6.0E-02	mg/kg/day	6 E-06
				Benzo(a)anthracene	3.5	mg/kg	5.7E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-07	6.6E-06	mg/kg/day	3.0E-02	mg/kg/day	2.E-04
				Benzo(a)pyrene	3.1	mg/kg	5.0E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-06	5.9E-06	mg/kg/day	3.0E-02	mg/kg/day	2 E-04
				Benzo(b)fluoranthene	3.1	mg/kg	5.0E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-07	5.9E-06	mg/kg/day	3 0E-02	mg/kg/day	2.E-04
				Benzo(g,h,i)perylene	2 07671	mg/kg	NC		NC			3.9E-06	mg/kg/day	3.0E-02	mg/kg/day	1.E-04
				Dibenzo(a,h)anthracene	0.77	mg/kg	1.3E-07	mg/kg/day	7 3E+00	(mg/kg/day)-1	9 E-07	1.5E-06	mg/kg/day	3.0E-02	mg/kg/day	5.E-05
				Indeno(1,2,3-cd)pyrene	2.18335	mg/kg	3.6E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	3 E-07	4.1E-06	mg/kg/day	3.0E-02	mg/kg/day	1 E-04
				Phenanthrene	4.8	mg/kg	NC		NC			9.1E-06	mg/kg/day	3.0E-02	mg/kg/day	3 E-04
				alpha-Chlordane	0.0061	mg/kg	9.9E-10	mg/kg/day	3 5E-01	(mg/kg/day)-1	3.E-10	1 2E-08	mg/kg/day	5.0E-04	mg/kg/day	2.E-05
				Aroclor-1254	0.38	mg/kg	6.2E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-07	7.2E-07	mg/kg/day	2.0E-05	mg/kg/day	4 E-02
				Aroclor-1268	0 24667	mg/kg	4.0E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	8.E-08	4.7E-07	mg/kg/day	2 0E-05	mg/kg/day	2.E-02
				gamma-Chlordane	0.005	mg/kg	8.1E-10	mg/kg/day	3 5E-01	(mg/kg/day)-1	3.E-10	9.5E-09	mg/kg/day	5.0E-04	mg/kg/day	2.E-05
				Technical Chlordane	0 62618	mg/kg	1.0E-07	mg/kg/day	3 5E-01	(mg/kg/day)-1	4 E-08	1 2E-06	mg/kg/day	5.0E-04	mg/kg/day	2.E-03
				Aluminum	15554	mg/kg	NC		NC			3.0E-02	mg/kg/day	1 0E+00	mg/kg/day	3.E-02
				Antimony	4.3	mg/kg	NC		NC			8.2E-06	mg/kg/day	4.0E-04	mg/kg/day	2.E-02
				Arsenic	9.6	mg/kg	1.6E-06	mg/kg/day	1.5E+00	(mg/kg/day)-1	2.E-06	1.8E-05	mg/kg/day	3.0E-04	mg/kg/day	6 E-02
				Cadmium	4 35	mg/kg	NC		NC			8.3E-06	mg/kg/day	1.0E-03	mg/kg/day	8.E-03
				Chromium	271	mg/kg	NC		NC			5.1E-04	mg/kg/day	3.0E-03	mg/kg/day	2.E-01
				Copper	436	mg/kg	NC		NC			8.3E-04	mg/kg/day	3.0E-02	mg/kg/day	3 E-02
				Lead	179	mg/kg	2.9E-05	mg/kg/day				3.4E-04	mg/kg/day			
				Manganese	599	mg/kg	NC		NC			1.1E-03	mg/kg/day	7.1E-02	mg/kg/day	2.E-02
				Mercury	0.757	mg/kg	NC		NC			1.4E-06	mg/kg/day	3.0E-04	mg/kg/day	5.E-03
				Nickel	142	mg/kg	NC		NC			2 7E-04	mg/kg/day	2.0E-02	mg/kg/day	1 E-02
				Thallium	0.37	mg/kg	NC		NC			7.0E-07	mg/kg/day	8.0E-05	mg/kg/day	9.E-03
				Vanadium	79	mg/kg	NC		NC			1.5E-04	mg/kg/day	7.0E-03	mg/kg/day	2 E-02
				Toxicity Equivalency (Dioxins/Furans)	0.00012	mg/kg	2.0E-11	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-06	2.3E-10	mg/kg/day			
				Toxicity Equivalency (PCB Congeners	0.0000249	mg/kg	4.1E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	6 E-07	4.7E-11	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1 E-05					4 E-01
			DERMAL	2-Methylnaphthalene	0.07478	mg/kg	NC		NC			5.2E-08	mg/kg/day	2.0E-02	mg/kg/day	3.E-06
				Acenaphthylene	0 19279	mg/kg	NC		NC			1.3E-07	mg/kg/day	6.0E-02	mg/kg/day	2.E-06
				Benzo(a)anthracene	3.5	mg/kg	2.1E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	2 E-07	2.4E-06	mg/kg/day	3.0E-02	mg/kg/day	8.E-05
				Benzo(a)pyrene	3.1	mg/kg	1.8E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	1 E-06	2.1E-06	mg/kg/day	3.0E-02	mg/kg/day	7.E-05
				Benzo(b)fluoranthene	3 1	mg/kg	1.8E-07	mg/kg/day	7 3E-01	(mg/kg/day)-1	1 E-07	2.1E-06	mg/kg/day	3 0E-02	mg/kg/day	7.E-05
				Benzo(g,h,i)perylene	2.07671	mg/kg	NC		NC			1 4E-06	mg/kg/day	3.0E-02	mg/kg/day	5 E-05
				Dibenzo(a,h)anthracene	0.77	mg/kg	4 6E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-07	5.3E-07	mg/kg/day	3 0E-02	mg/kg/day	2 E-05
				Indeno(1,2,3-cd)pyrene	2.18335	mg/kg	1 3E-07	mg/kg/day	7 3E-01	(mg/kg/day)-1	9.E-08	1 5E-06	mg/kg/day	3.0E-02	mg/kg/day	5 E-05
				Phenanthrene	4.8	mg/kg	NC		NC			3 3E-06	mg/kg/day	3 0E-02	mg/kg/day	1 E-04
				alpha-Chlordane	0 0061	mg/kg	1.1E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	4 E-11	1.3E-09	mg/kg/day	5.0E-04	mg/kg/day	3.E-06
				Aroclor-1254	0.38	mg/kg	2.4E-08	mg/kg/day	2 0E+00	(mg/kg/day)-1	5 E-08	2.8E-07	mg/kg/day	2.0E-05	mg/kg/day	1 E-02
				Aroclor-1268	0.24667	mg/kg	1.6E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	3 E-08	1.8E-07	mg/kg/day	2 0E-05	mg/kg/day	9.E-03
				gamma-Chlordane	0.005	mg/kg	9.1E-11	mg/kg/day	3 5E-01	(mg/kg/day)-1	3 E-11	1.1E-09	mg/kg/day	5.0E-04	mg/kg/day	2.E-06
				Technical Chlordane	0 62618	mg/kg	1.1E-08	mg/kg/day	3 5E-01	(mg/kg/day)-1	4 E-09	1.3E-07	mg/kg/day	5 0E-04	mg/kg/day	3.E-04
				Aluminum	15554	mg/kg	NC		NC			--		1.0E-02	mg/kg/day	
				Antimony	4 3	mg/kg	NC		NC			--		6.0E-05	mg/kg/day	
				Arsenic	9 6	mg/kg	1.3E-07	mg/kg/day	1.5E+00	(mg/kg/day)-1	2.E-07	1.5E-06	mg/kg/day	3.0E-04	mg/kg/day	5.E-03
				Cadmium	4 35	mg/kg	NC		NC			2 3E-08	mg/kg/day	2 5E-05	mg/kg/day	9 E-04
				Chromium	271	mg/kg	NC		NC			--		7.5E-05	mg/kg/day	
				Copper	436	mg/kg	NC		NC			--		3 0E-02	mg/kg/day	
				Lead	179	mg/kg	--					--				
				Manganese	599	mg/kg	NC		NC			--		2.8E-03	mg/kg/day	
				Mercury	0.757	mg/kg	NC		NC			--		2.1E-05	mg/kg/day	
				Nickel	142	mg/kg	NC		NC			--		8.0E-04	mg/kg/day	
				Thallium	0.37	mg/kg	NC		NC			--		8.0E-05	mg/kg/day	
				Vanadium	79	mg/kg	NC		NC			--		1.8E-04	mg/kg/day	

TABLE 7.12.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS – REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- RESIDENT- CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Toxicity Equivalency (Dioxins/Furans)	0.00012	mg/kg	1.6E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-07	1.9E-11	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.0000249	mg/kg	3.4E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	5.E-08	4.0E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-06					3.E-02
		EXPOSURE POINT TOTAL									1.E-05					5.E-01
	EXPOSURE MEDIUM TOTAL										1.E-05					5.E-01
SEDIMENT TOTAL											1.E-05					5.E-01
SURFACE WATER	SURFACE WATER	GREYSTONE MILL POND	INGESTION	Arsenic	0.00055	mg/l	2.2E-08	mg/kg/day	1.5E+00	mg/kg/day	3.E-08	2.6E-07	mg/kg/day	3.0E-04	mg/kg/day	9.E-04
				Manganese	0.144	mg/l	NC		NC			6.8E-05	mg/kg/day	2.4E-02	mg/kg/day	3.E-03
				Mercury	0.00000193	mg/l	NC		NC			9.2E-10	mg/kg/day	3.0E-04	mg/kg/day	3.E-06
				Nitrite-N	0.13	mg/l	NC		NC			6.2E-05	mg/kg/day	1.0E-01	mg/kg/day	6.E-04
				Toxicity Equivalency (Dioxins/Furans)	5.64E-09	mg/l	2.3E-13	mg/kg/day	1.5E+05	mg/kg/day	3.E-08	2.7E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								7.E-08					4.E-03
			DERMAL	Arsenic	0.00055	mg/l	1.2E-09	mg/kg/day	1.5E+00	mg/kg/day	2.E-09	1.4E-08	mg/kg/day	3.0E-04	mg/kg/day	5.E-05
				Manganese	0.144	mg/l	NC		NC			3.7E-06	mg/kg/day	9.6E-04	mg/kg/day	4.E-03
				Mercury	0.00000193	mg/l	NC		NC			4.9E-11	mg/kg/day	2.1E-05	mg/kg/day	2.E-06
				Nitrite-N	0.13	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	5.64E-09	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-09					4.E-03
		EXPOSURE POINT TOTAL									7.E-08					8.E-03
	EXPOSURE MEDIUM TOTAL										7.E-08					8.E-03
SURFACE WATER TOTAL											7.E-08					8.E-03
BIOTA	COMBINED FISH DIET	GREYSTONE MILL POND	INGESTION	Acenaphthylene	0.0022	mg/kg	NC		NC			6.6E-07	mg/kg/day	6.0E-02	mg/kg/day	1.E-05
				Benzo(a)pyrene	0.00099	mg/kg	2.5E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-07	3.0E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(g,h,i)perylene	0.0012	mg/kg	NC		NC			3.6E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(b)fluoranthene	0.00092	mg/kg	2.4E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	2.8E-07	mg/kg/day	3.0E-02	mg/kg/day	9.E-06
				Dibenzo(a,h)anthracene	0.00057	mg/kg	1.5E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-07	1.7E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Indeno(1,2,3-cd)pyrene	0.00092	mg/kg	2.4E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	2.8E-07	mg/kg/day	3.0E-02	mg/kg/day	9.E-06
				Phenanthrene	0.008	mg/kg	NC		NC			2.4E-06	mg/kg/day	3.0E-02	mg/kg/day	8.E-05
				4,4'-DDD	0.013	mg/kg	3.3E-07	mg/kg/day	2.4E-01	(mg/kg/day)-1	8.E-08	3.9E-06	mg/kg/day	5.0E-04	mg/kg/day	8.E-03
				4,4'-DDE	0.0329	mg/kg	8.5E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	3.E-07	9.9E-06	mg/kg/day	5.0E-04	mg/kg/day	2.E-02
				4,4'-DDT	0.003	mg/kg	7.7E-08	mg/kg/day	3.4E-01	(mg/kg/day)-1	3.E-08	9.0E-07	mg/kg/day	5.0E-04	mg/kg/day	2.E-03
				alpha-Chlordane	0.014	mg/kg	3.6E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-07	4.2E-06	mg/kg/day	5.0E-04	mg/kg/day	8.E-03
				Aroclor-1254	0.177	mg/kg	4.6E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	9.E-06	5.3E-05	mg/kg/day	2.0E-05	mg/kg/day	3.E+00
				Aroclor-1268	0.0851	mg/kg	2.2E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	4.E-06	2.6E-05	mg/kg/day	2.0E-05	mg/kg/day	1.E+00
				Dieldrin	0.0027	mg/kg	7.0E-08	mg/kg/day	1.6E+01	(mg/kg/day)-1	1.E-06	8.1E-07	mg/kg/day	5.0E-05	mg/kg/day	2.E-02
				gamma-Chlordane	0.006	mg/kg	1.5E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	5.E-08	1.8E-06	mg/kg/day	5.0E-04	mg/kg/day	4.E-03
				Heptachlor Epoxide	0.0008	mg/kg	2.1E-08	mg/kg/day	9.1E+00	(mg/kg/day)-1	2.E-07	2.4E-07	mg/kg/day	1.3E-05	mg/kg/day	2.E-02
				Technical Chlordane	0.2056	mg/kg	5.3E-06	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-06	6.2E-05	mg/kg/day	5.0E-04	mg/kg/day	1.E-01
				Lead	0.5	mg/kg	1.3E-05	mg/kg/day				1.5E-04	mg/kg/day			
				Mercury	0.226	mg/kg	NC		NC			6.8E-05	mg/kg/day	3.0E-04	mg/kg/day	2.E-01
				Mercury (methyl)	0.328	mg/kg	NC		NC			9.9E-05	mg/kg/day	1.0E-04	mg/kg/day	1.E+00
				Zinc	22	mg/kg	NC		NC			6.6E-03	mg/kg/day	3.0E-01	mg/kg/day	2.E-02
				Toxicity Equivalency (Dioxins/Furans)	0.00000136	mg/kg	3.5E-11	mg/kg/day	1.5E+05	(mg/kg/day)-1	5.E-06	4.1E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-05					5.4.E+00
		EXPOSURE POINT TOTAL									2.E-05					5.4.E+00
	EXPOSURE MEDIUM TOTAL										2.E-05					5.4.E+00
COMBINED FISH DIET TOTAL											2.E-05					5.4.E+00
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	6.E-05	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				6.9.E+00

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

Prepared by: RAR
Checked by: KJA

TABLE 7.13.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SOIL	SOIL	ALLENDALE POND	INGESTION	2,3,7,8-TCDD	0.00027	mg/kg	1.2E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-07	6.9E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-07					--
			DERMAL	2,3,7,8-TCDD	0.00027	mg/kg	2.8E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	4.E-08	1.6E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-08					--
		EXPOSURE POINT TOTAL									2.E-07					0.E+00
	EXPOSURE MEDIUM TOTAL										2.E-07					0.E+00
SOIL TOTAL											2.E-07					0.E+00
SEDIMENT	SEDIMENT	ALLENDALE POND	INGESTION	2-Methylnaphthalene	0.13608	mg/kg	NC		NC			3.5E-09	mg/kg/day	2.0E-02	mg/kg/day	2.E-07
				Acenaphthylene	0.97	mg/kg	NC		NC			2.5E-08	mg/kg/day	6.0E-02	mg/kg/day	4.E-07
				Benzo(a)anthracene	3.4	mg/kg	1.5E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	8.6E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(a)pyrene	4	mg/kg	1.7E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-07	1.0E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(b)fluoranthene	4.4	mg/kg	1.9E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	1.1E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Benzo(g,h,i)perylene	2	mg/kg	NC		NC			5.1E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(k)fluoranthene	3.9	mg/kg	1.7E-08	mg/kg/day	7.3E-02	(mg/kg/day)-1	1.E-09	9.9E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				bis(2-Ethylhexyl)phthalate	3.2	mg/kg	1.4E-08	mg/kg/day	1.4E-02	(mg/kg/day)-1	2.E-10	8.1E-08	mg/kg/day	2.0E-02	mg/kg/day	4.E-06
				Dibenzo(a,h)anthracene	2	mg/kg	8.7E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	6.E-08	5.1E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Indeno(1,2,3-cd)pyrene	3.2	mg/kg	1.4E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	8.1E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Pentachlorophenol	6.5	mg/kg	2.8E-08	mg/kg/day	1.2E-01	(mg/kg/day)-1	3.E-09	1.7E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Phenanthrene	4.8	mg/kg	NC		NC			1.2E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				alpha-Chlordane	0.0113	mg/kg	4.9E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-11	2.9E-10	mg/kg/day	5.0E-04	mg/kg/day	6.E-07
				Aroclor-1254	2.4	mg/kg	1.0E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-08	6.1E-08	mg/kg/day	2.0E-05	mg/kg/day	3.E-03
				Aroclor-1260	0.2	mg/kg	8.7E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-09	5.1E-09	mg/kg/day	2.0E-05	mg/kg/day	3.E-04
				Aroclor-1268	0.079	mg/kg	3.4E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	7.E-10	2.0E-09	mg/kg/day	2.0E-05	mg/kg/day	1.E-04
				delta-BHC	0.0014	mg/kg	NC		NC			3.6E-11	mg/kg/day	3.0E-04	mg/kg/day	1.E-07
				Dieldrin	0.009	mg/kg	3.9E-11	mg/kg/day	1.6E+01	(mg/kg/day)-1	6.E-10	2.3E-10	mg/kg/day	5.0E-05	mg/kg/day	5.E-06
				Endosulfan II	0.037	mg/kg	NC		NC			9.4E-10	mg/kg/day	6.0E-03	mg/kg/day	2.E-07
				Endosulfan sulfate	0.0027	mg/kg	NC		NC			6.9E-11	mg/kg/day	6.0E-03	mg/kg/day	1.E-08
				Endrin aldehyde	0.0029	mg/kg	NC		NC			7.4E-11	mg/kg/day	3.0E-04	mg/kg/day	2.E-07
				Endrin Ketone	0.0038	mg/kg	NC		NC			9.7E-11	mg/kg/day	3.0E-04	mg/kg/day	3.E-07
				gamma-Chlordane	0.017	mg/kg	7.4E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-11	4.3E-10	mg/kg/day	5.0E-04	mg/kg/day	9.E-07
				Technical Chlordane	0.65	mg/kg	2.8E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-09	1.7E-08	mg/kg/day	5.0E-04	mg/kg/day	3.E-05
				Antimony	4.8	mg/kg	NC		NC			1.2E-07	mg/kg/day	4.0E-04	mg/kg/day	3.E-04
				Arsenic	5.8	mg/kg	2.5E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	4.E-08	1.5E-07	mg/kg/day	3.0E-04	mg/kg/day	5.E-04
				Cadmium	1.2	mg/kg	NC		NC			3.1E-08	mg/kg/day	1.0E-03	mg/kg/day	3.E-05
				Chromium	238	mg/kg	NC		NC			6.1E-06	mg/kg/day	3.0E-03	mg/kg/day	2.E-03
				Lead	488	mg/kg	2.1E-06	mg/kg/day	--			1.2E-05	mg/kg/day			
				Manganese	531	mg/kg	NC		NC			1.4E-05	mg/kg/day	7.1E-02	mg/kg/day	2.E-04
				Mercury	0.97	mg/kg	NC		NC			2.5E-08	mg/kg/day	3.0E-04	mg/kg/day	8.E-05
				Nickel	26.7	mg/kg	NC		NC			6.8E-07	mg/kg/day	2.0E-02	mg/kg/day	3.E-05
				Thallium	6.8	mg/kg	NC		NC			1.7E-07	mg/kg/day	8.0E-05	mg/kg/day	2.E-03
				Vanadium	45.9	mg/kg	NC		NC			1.2E-06	mg/kg/day	7.0E-03	mg/kg/day	2.E-04
				Toxicity Equivalency (Dioxins/Furans	0.0057	mg/kg	2.5E-11	mg/kg/day	1.5E+05	(mg/kg/day)-1	4.E-06	1.5E-10	mg/kg/day			
				Toxicity Equivalency (PCB Congeners	0.000000112	mg/kg	4.9E-16	mg/kg/day	1.5E+05	(mg/kg/day)-1	7.E-11	2.8E-15	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-06					9.E-03
			DERMAL	2-Methylnaphthalene	0.13608	mg/kg	NC		NC			3.1E-09	mg/kg/day	2.0E-02	mg/kg/day	2.E-07
				Acenaphthylene	0.97	mg/kg	NC		NC			2.2E-08	mg/kg/day	6.0E-02	mg/kg/day	4.E-07
				Benzo(a)anthracene	3.4	mg/kg	1.3E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	7.7E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(a)pyrene	4	mg/kg	1.5E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-07	9.0E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(b)fluoranthene	4.4	mg/kg	1.7E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	9.9E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(g,h,i)perylene	2	mg/kg	NC		NC			4.5E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(k)fluoranthene	3.9	mg/kg	1.5E-08	mg/kg/day	7.3E-02	(mg/kg/day)-1	1.E-09	8.8E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				bis(2-Ethylhexyl)phthalate	3.2	mg/kg	9.5E-09	mg/kg/day	1.4E-02	(mg/kg/day)-1	1.E-10	5.5E-08	mg/kg/day	2.0E-02	mg/kg/day	3.E-06
				Dibenzo(a,h)anthracene	2	mg/kg	7.7E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	6.E-08	4.5E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Indeno(1,2,3-cd)pyrene	3.2	mg/kg	1.2E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	9.E-09	7.2E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Pentachlorophenol	6.5	mg/kg	4.8E-08	mg/kg/day	1.2E-01	(mg/kg/day)-1	6.E-09	2.8E-07	mg/kg/day	3.0E-02	mg/kg/day	9.E-06
				Phenanthrene	4.8	mg/kg	NC		NC			1.1E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06

TABLE 7.13.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		R/D/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				alpha-Chlordane	0.0113	mg/kg	1.3E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	5.E-12	7.8E-11	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				Aroclor-1254	2.4	mg/kg	1.0E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-08	5.8E-08	mg/kg/day	2.0E-05	mg/kg/day	3.E-03
				Aroclor-1260	0.2	mg/kg	8.3E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-09	4.8E-09	mg/kg/day	2.0E-05	mg/kg/day	2.E-04
				Aroclor-1268	0.079	mg/kg	3.3E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	7.E-10	1.9E-09	mg/kg/day	2.0E-05	mg/kg/day	1.E-04
				delta-BHC	0.0014	mg/kg	NC		NC			2.4E-11	mg/kg/day	3.0E-04	mg/kg/day	8.E-08
				Dieldrin	0.009	mg/kg	2.7E-11	mg/kg/day	1.6E+01	(mg/kg/day)-1	4.E-10	1.6E-10	mg/kg/day	5.0E-05	mg/kg/day	3.E-06
				Endosulfan II	0.037	mg/kg	NC		NC			6.4E-10	mg/kg/day	6.0E-03	mg/kg/day	1.E-07
				Endosulfan sulfate	0.0027	mg/kg	NC		NC			4.7E-11	mg/kg/day	6.0E-03	mg/kg/day	8.E-09
				Endrin aldehyde	0.0029	mg/kg	NC		NC			5.0E-11	mg/kg/day	3.0E-04	mg/kg/day	2.E-07
				Endrin Ketone	0.0038	mg/kg	NC		NC			6.6E-11	mg/kg/day	3.0E-04	mg/kg/day	2.E-07
				gamma-Chlordane	0.017	mg/kg	2.0E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	7.E-12	1.2E-10	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				Technical Chlordane	0.65	mg/kg	7.7E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-10	4.5E-09	mg/kg/day	5.0E-04	mg/kg/day	9.E-06
				Antimony	4.8	mg/kg	NC		NC					6.0E-05	mg/kg/day	
				Arsenic	5.8	mg/kg	5.2E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	8.E-09	3.0E-08	mg/kg/day	3.0E-04	mg/kg/day	1.E-04
				Cadmium	1.2	mg/kg	NC		NC			2.1E-10	mg/kg/day	2.5E-05	mg/kg/day	8.E-06
				Chromium	238	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	488	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	531	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Mercury	0.97	mg/kg	NC		NC					2.1E-05	mg/kg/day	
				Nickel	26.7	mg/kg	NC		NC					8.0E-04	mg/kg/day	
				Thallium	6.8	mg/kg	NC		NC					8.0E-05	mg/kg/day	
				Vanadium	45.9	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans	0.0057	mg/kg	5.1E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	8.E-07	3.0E-11	mg/kg/day			
				Toxicity Equivalency (PCB Congener	0.000000112	mg/kg	1.0E-16	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-11	5.8E-16	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-06					3.E-03
		EXPOSURE POINT TOTAL									5.E-06					1.E-02
	EXPOSURE MEDIUM TOTAL										5.E-06					1.E-02
SEDIMENT TOTAL											5.E-06					1.E-02
SURFACE WATER	SURFACE WATER	ALLENDALE POND	INGESTION	Tetrachloroethene	0.0007	mg/l	3.1E-10	mg/kg/day	5.4E-01	mg/kg/day	2.E-10	1.8E-09	mg/kg/day	1.0E-02	mg/kg/day	2.E-07
				bis(2-Ethylhexyl)phthalate	0.001	mg/l	4.4E-10	mg/kg/day	1.4E-02	mg/kg/day	6.E-12	2.5E-09	mg/kg/day	2.0E-02	mg/kg/day	1.E-07
				Aldrin	0.000011	mg/l	4.8E-12	mg/kg/day	1.7E+01	mg/kg/day	8.E-11	2.8E-11	mg/kg/day	3.0E-05	mg/kg/day	9.E-07
				alpha-Chlordane	0.00000069	mg/l	3.0E-13	mg/kg/day	3.5E-01	mg/kg/day	1.E-13	1.8E-12	mg/kg/day	5.0E-04	mg/kg/day	4.E-09
				delta-BHC	0.0000096	mg/l	NC		NC			2.4E-11	mg/kg/day	3.0E-04	mg/kg/day	8.E-08
				Endosulfan Sulfate	0.0000026	mg/l	NC		NC			6.6E-12	mg/kg/day	6.0E-03	mg/kg/day	1.E-09
				Endrin Aldehyde	0.0000028	mg/l	NC		NC			7.1E-12	mg/kg/day	3.0E-04	mg/kg/day	2.E-08
				gamma-Chlordane	0.00000075	mg/l	3.3E-13	mg/kg/day	3.5E-01	mg/kg/day	1.E-13	1.9E-12	mg/kg/day	5.0E-04	mg/kg/day	4.E-09
				Arsenic	0.0075	mg/l	3.3E-09	mg/kg/day	1.5E+00	mg/kg/day	5.E-09	1.9E-08	mg/kg/day	3.0E-04	mg/kg/day	6.E-05
				Barium	0.045	mg/l	NC		NC			1.1E-07	mg/kg/day	7.0E-02	mg/kg/day	2.E-06
				Chromium	0.027	mg/l	NC		NC			6.9E-08	mg/kg/day	3.0E-03	mg/kg/day	2.E-05
				Lead	0.013	mg/l	5.7E-09	mg/kg/day	--			3.3E-08	mg/kg/day			
				Manganese	0.42	mg/l	NC		NC			1.1E-06	mg/kg/day	2.4E-02	mg/kg/day	4.E-05
				Mercury	0.00000319	mg/l	NC		NC			8.1E-12	mg/kg/day	3.0E-04	mg/kg/day	3.E-08
				Thallium	0.0145	mg/l	NC		NC			3.7E-08	mg/kg/day	8.0E-05	mg/kg/day	5.E-04
				Nitrate	0.773	mg/l	NC		NC			2.0E-06	mg/kg/day	1.6E+00	mg/kg/day	1.E-06
				Nitrite-N	0.139	mg/l	NC		NC			3.5E-07	mg/kg/day	1.0E-01	mg/kg/day	4.E-06
				Toxicity Equivalency (Dioxins/Furans	0.000000385	mg/l	1.7E-13	mg/kg/day	1.5E+05	mg/kg/day	3.E-08	9.8E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-08					6.E-04
			DERMAL	Tetrachloroethene	0.0007	mg/l	4.9E-08	mg/kg/day	5.4E-01	mg/kg/day	3.E-08	2.9E-07	mg/kg/day	1.0E-02	mg/kg/day	3.E-05
				bis(2-Ethylhexyl)phthalate	0.001	mg/l	1.8E-07	mg/kg/day	1.4E-02	mg/kg/day	3.E-09	1.1E-06	mg/kg/day	2.0E-02	mg/kg/day	5.E-05
				Aldrin	0.000011	mg/l	1.2E-10	mg/kg/day	1.7E+01	mg/kg/day	2.E-09	6.8E-10	mg/kg/day	3.0E-05	mg/kg/day	2.E-05
				alpha-Chlordane	0.00000069	mg/l	1.7E-10	mg/kg/day	3.5E-01	mg/kg/day	6.E-11	1.0E-09	mg/kg/day	5.0E-04	mg/kg/day	2.E-06
				delta-BHC	0.0000096	mg/l	NC		NC			2.6E-09	mg/kg/day	3.0E-04	mg/kg/day	9.E-06
				Endosulfan Sulfate	0.0000026	mg/l	NC		NC			--		6.0E-03	mg/kg/day	

TABLE 7.13.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Endrin Aldehyde	0.0000028	mg/l	NC		NC			1.4E-09	mg/kg/day	3.0E-04	mg/kg/day	5.E-06
				gamma-Chlordane	0.00000075	mg/l	1.9E-10	mg/kg/day	3.5E-01	mg/kg/day	7.E-11	1.1E-09	mg/kg/day	5.0E-04	mg/kg/day	2.E-06
				Arsenic	0.0075	mg/l	5.7E-09	mg/kg/day	1.5E+00	mg/kg/day	9.E-09	3.3E-08	mg/kg/day	3.0E-04	mg/kg/day	1.E-04
				Barium	0.045	mg/l	NC		NC			2.0E-07	mg/kg/day	4.9E-03	mg/kg/day	4.E-05
				Chromium	0.027	mg/l	NC		NC			2.4E-07	mg/kg/day	7.5E-05	mg/kg/day	3.E-03
				Lead	0.013	mg/l	--		--			--				
				Manganese	0.42	mg/l	NC		NC			1.9E-06	mg/kg/day	9.6E-04	mg/kg/day	2.E-03
				Mercury	0.00000319	mg/l	NC		NC			1.4E-11	mg/kg/day	2.1E-05	mg/kg/day	7.E-07
				Thallium	0.0145	mg/l	NC		NC			6.4E-08	mg/kg/day	8.0E-05	mg/kg/day	8.E-04
				Nitrate	0.773	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.139	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans	0.000000385	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-08					6.E-03
		EXPOSURE POINT TOTAL									7.E-08					7.E-03
	EXPOSURE MEDIUM TOTAL										7.E-08					7.E-03
SURFACE WATER TOTAL											7.E-08					7.E-03
BIOTA	COMBINED FISH DIET	ALLENDALE POND	INGESTION	Acenaphthylene	0.002	mg/kg	NC		NC			3.8E-07	mg/kg/day	6.0E-02	mg/kg/day	6.E-06
				Benzo(a)anthracene	0.0014	mg/kg	4.6E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-08	2.7E-07	mg/kg/day	3.0E-02	mg/kg/day	9.E-06
				Benzo(a)pyrene	0.0015	mg/kg	4.9E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-07	2.9E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(b)fluoranthene	0.0016	mg/kg	5.3E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-08	3.1E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(g,h,i)perylene	0.00065	mg/kg	NC		NC			1.2E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Dibenzo(a,h)anthracene	0.00053	mg/kg	1.7E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-07	1.0E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Indeno(1,2,3-cd)pyrene	0.00073	mg/kg	2.4E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.4E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Phenanthrene	0.00975	mg/kg	NC		NC			1.9E-06	mg/kg/day	3.0E-02	mg/kg/day	6.E-05
				4,4'-DDD	0.0128	mg/kg	4.2E-07	mg/kg/day	2.4E-01	(mg/kg/day)-1	1.E-07	2.5E-06	mg/kg/day	5.0E-04	mg/kg/day	5.E-03
				4,4'-DDE	0.0249	mg/kg	8.2E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	3.E-07	4.8E-06	mg/kg/day	5.0E-04	mg/kg/day	1.E-02
				4,4'-DDT	0.00789	mg/kg	2.6E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	9.E-08	1.5E-06	mg/kg/day	5.0E-04	mg/kg/day	3.E-03
				alpha-Chlordane	0.0214	mg/kg	7.0E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-07	4.1E-06	mg/kg/day	5.0E-04	mg/kg/day	8.E-03
				Aroclor-1254	1.8853	mg/kg	6.2E-05	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-04	3.6E-04	mg/kg/day	2.0E-05	mg/kg/day	2.E+01
				Aroclor-1268	0.02673	mg/kg	8.8E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-06	5.1E-06	mg/kg/day	2.0E-05	mg/kg/day	3.E-01
				beta-BHC	0.0005	mg/kg	1.6E-08	mg/kg/day	1.8E+00	(mg/kg/day)-1	3.E-08	9.6E-08	mg/kg/day	3.0E-04	mg/kg/day	3.E-04
				Dieldrin	0.00889	mg/kg	2.9E-07	mg/kg/day	1.6E+01	(mg/kg/day)-1	5.E-06	1.7E-06	mg/kg/day	5.0E-05	mg/kg/day	3.E-02
				Endosulfan Sulfate	0.001	mg/kg	NC		NC			1.9E-07	mg/kg/day	6.0E-03	mg/kg/day	3.E-05
				Endrin Aldehyde	0.0005	mg/kg	NC		NC			9.6E-08	mg/kg/day	3.0E-04	mg/kg/day	3.E-04
				gamma-Chlordane	0.008	mg/kg	2.6E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	9.E-08	1.5E-06	mg/kg/day	5.0E-04	mg/kg/day	3.E-03
				Heptachlor	0.0005	mg/kg	1.6E-08	mg/kg/day	4.5E+00	(mg/kg/day)-1	7.E-08	9.6E-08	mg/kg/day	5.0E-04	mg/kg/day	2.E-04
				Heptachlor Epoxide	0.0011	mg/kg	3.6E-08	mg/kg/day	9.1E+00	(mg/kg/day)-1	3.E-07	2.1E-07	mg/kg/day	1.3E-05	mg/kg/day	2.E-02
				Technical Chlordane	0.468	mg/kg	1.5E-05	mg/kg/day	3.5E-01	(mg/kg/day)-1	5.E-06	9.0E-05	mg/kg/day	5.0E-04	mg/kg/day	2.E-01
				Cadmium	0.0644	mg/kg	NC		NC			1.2E-05	mg/kg/day	1.0E-03	mg/kg/day	1.E-02
				Chromium	0.103	mg/kg	NC		NC			2.0E-05	mg/kg/day	3.0E-03	mg/kg/day	7.E-03
				Lead	0.464	mg/kg	1.5E-05	mg/kg/day	--			8.9E-05	mg/kg/day			
				Manganese	6.7	mg/kg	NC		NC			1.3E-03	mg/kg/day	1.4E-01	mg/kg/day	9.E-03
				Mercury	0.144	mg/kg	NC		NC			2.8E-05	mg/kg/day	3.0E-04	mg/kg/day	9.E-02
				Mercury (methyl)	0.208	mg/kg	NC		NC			4.0E-05	mg/kg/day	1.0E-04	mg/kg/day	4.E-01
				Toxicity Equivalency (PCB Congeners	0.000032	mg/kg	1.1E-09	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-04	6.1E-09	mg/kg/day			
				Toxicity Equivalency (Dioxins/Furans	0.000301	mg/kg	9.9E-09	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-03	5.8E-08	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-03					1.9E+01
		EXPOSURE POINT TOTAL									2.E-03					1.9.E+01
	EXPOSURE MEDIUM TOTAL										2.E-03					1.9E+01
COMBINED FISH DIET TOTAL											2.E-03					1.9.E+01
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	2.E-03	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				1.9.E+01

NOTES
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated. dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by MJM

MACTEC Engineering and Consulting, Inc.
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P:\W9-GVT\COS-NAE\Battelle\Centredale\T25 - BCRA\BHHRA AUG05 REISSUE\TABLES\TABLES 7&9(&10)\APC\RME-RecAngler-Adult-APCS\SUMMARY-CALC

8/18/2005

TABLE 7.14.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		R/D/R/C (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SOIL	SOIL	ALLENDALE POND	INGESTION	2,3,7,8-TCDD	0.00027	mg/kg	1.8E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-07	1.1E-11	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-07					--
			DERMAL	2,3,7,8-TCDD	0.00027	mg/kg	1.1E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-07	6.2E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-07					--
		EXPOSURE POINT TOTAL									4.E-07					0.E+00
	EXPOSURE MEDIUM TOTAL										4.E-07					0.E+00
SOIL TOTAL											4.E-07					0.E+00
SEDIMENT	SEDIMENT	ALLENDALE POND	INGESTION	2-Methylnaphthalene	0.13608	mg/kg	NC		NC			5.4E-09	mg/kg/day	2.0E-02	mg/kg/day	3.E-07
				Acenaphthylene	0.97	mg/kg	NC		NC			3.8E-08	mg/kg/day	6.0E-02	mg/kg/day	6.E-07
				Benzo(a)anthracene	3.4	mg/kg	2.3E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.3E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Benzo(a)pyrene	4	mg/kg	2.7E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-07	1.6E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Benzo(b)fluoranthene	4.4	mg/kg	3.0E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.7E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Benzo(g,h,i)perylene	2	mg/kg	NC		NC			7.9E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(k)fluoranthene	3.9	mg/kg	2.6E-08	mg/kg/day	7.3E-02	(mg/kg/day)-1	2.E-09	1.5E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				bis(2-Ethylhexyl)phthalate	3.2	mg/kg	2.2E-08	mg/kg/day	1.4E-02	(mg/kg/day)-1	3.E-10	1.3E-07	mg/kg/day	2.0E-02	mg/kg/day	6.E-06
				Dibenzo(a,h)anthracene	2	mg/kg	1.4E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-07	7.9E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Indeno(1,2,3-cd)pyrene	3.2	mg/kg	2.2E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.3E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Pentachlorophenol	6.5	mg/kg	4.4E-08	mg/kg/day	1.2E-01	(mg/kg/day)-1	5.E-09	2.6E-07	mg/kg/day	3.0E-02	mg/kg/day	9.E-06
				Phenanthrene	4.8	mg/kg	NC		NC			1.9E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				alpha-Chlordane	0.0113	mg/kg	7.7E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-11	4.5E-10	mg/kg/day	5.0E-04	mg/kg/day	9.E-07
				Aroclor-1254	2.4	mg/kg	1.6E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-08	9.5E-08	mg/kg/day	2.0E-05	mg/kg/day	5.E-03
				Aroclor-1260	0.2	mg/kg	1.4E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-09	7.9E-09	mg/kg/day	2.0E-05	mg/kg/day	4.E-04
				Aroclor-1268	0.079	mg/kg	5.4E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-09	3.1E-09	mg/kg/day	2.0E-05	mg/kg/day	2.E-04
				delta-BHC	0.0014	mg/kg	NC		NC			5.5E-11	mg/kg/day	3.0E-04	mg/kg/day	2.E-07
				Dieldrin	0.009	mg/kg	6.1E-11	mg/kg/day	1.6E+01	(mg/kg/day)-1	1.E-09	3.6E-10	mg/kg/day	5.0E-05	mg/kg/day	7.E-06
				Endosulfan II	0.037	mg/kg	NC		NC			1.5E-09	mg/kg/day	6.0E-03	mg/kg/day	2.E-07
				Endosulfan sulfate	0.0027	mg/kg	NC		NC			1.1E-10	mg/kg/day	6.0E-03	mg/kg/day	2.E-08
				Endrin aldehyde	0.0029	mg/kg	NC		NC			1.1E-10	mg/kg/day	3.0E-04	mg/kg/day	4.E-07
				Endrin Ketone	0.0038	mg/kg	NC		NC			1.5E-10	mg/kg/day	3.0E-04	mg/kg/day	5.E-07
				gamma-Chlordane	0.017	mg/kg	1.2E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-11	6.7E-10	mg/kg/day	5.0E-04	mg/kg/day	1.E-06
				Technical Chlordane	0.65	mg/kg	4.4E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-09	2.6E-08	mg/kg/day	5.0E-04	mg/kg/day	5.E-05
				Antimony	4.8	mg/kg	NC		NC			1.9E-07	mg/kg/day	4.0E-04	mg/kg/day	5.E-04
				Arsenic	5.8	mg/kg	3.9E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	6.E-08	2.3E-07	mg/kg/day	3.0E-04	mg/kg/day	8.E-04
				Cadmium	1.2	mg/kg	NC		NC			4.7E-08	mg/kg/day	1.0E-03	mg/kg/day	5.E-05
				Chromium	238	mg/kg	NC		NC			9.4E-06	mg/kg/day	3.0E-03	mg/kg/day	3.E-03
				Lead	488	mg/kg	3.3E-06	mg/kg/day	--			1.9E-05	mg/kg/day			
				Manganese	531	mg/kg	NC		NC			2.1E-05	mg/kg/day	7.1E-02	mg/kg/day	3.E-04
				Mercury	0.97	mg/kg	NC		NC			3.8E-08	mg/kg/day	3.0E-04	mg/kg/day	1.E-04
				Nickel	26.7	mg/kg	NC		NC			1.1E-06	mg/kg/day	2.0E-02	mg/kg/day	5.E-05
				Thallium	6.8	mg/kg	NC		NC			2.7E-07	mg/kg/day	8.0E-05	mg/kg/day	3.E-03
				Vanadium	45.9	mg/kg	NC		NC			1.8E-06	mg/kg/day	7.0E-03	mg/kg/day	3.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.0057	mg/kg	3.9E-11	mg/kg/day	1.5E+05	(mg/kg/day)-1	6.E-06	2.3E-10	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.000000112	mg/kg	7.6E-16	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-10	4.4E-15	mg/kg/day			
			EXPOSURE ROUTE TOTAL								6.E-06					1.E-02
			DERMAL	2-Methylnaphthalene	0.13608	mg/kg	NC		NC			1.0E-08	mg/kg/day	2.0E-02	mg/kg/day	5.E-07
				Acenaphthylene	0.97	mg/kg	NC		NC			7.1E-08	mg/kg/day	6.0E-02	mg/kg/day	1.E-06
				Benzo(a)anthracene	3.4	mg/kg	4.3E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-08	2.5E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				Benzo(a)pyrene	4	mg/kg	5.0E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-07	2.9E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(b)fluoranthene	4.4	mg/kg	5.5E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-08	3.2E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(g,h,i)perylene	2	mg/kg	NC		NC			1.5E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Benzo(k)fluoranthene	3.9	mg/kg	4.9E-08	mg/kg/day	7.3E-02	(mg/kg/day)-1	4.E-09	2.9E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				bis(2-Ethylhexyl)phthalate	3.2	mg/kg	3.1E-08	mg/kg/day	1.4E-02	(mg/kg/day)-1	4.E-10	1.8E-07	mg/kg/day	2.0E-02	mg/kg/day	9.E-06
				Dibenzo(a,h)anthracene	2	mg/kg	2.5E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-07	1.5E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Indeno(1,2,3-cd)pyrene	3.2	mg/kg	4.0E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-08	2.4E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				Pentachlorophenol	6.5	mg/kg	1.6E-07	mg/kg/day	1.2E-01	(mg/kg/day)-1	2.E-08	9.2E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Phenanthrene	4.8	mg/kg	NC		NC			3.5E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05

TABLE 7.14.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				alpha-Chlordane	0.0113	mg/kg	4.4E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-11	2.6E-10	mg/kg/day	5.0E-04	mg/kg/day	5.E-07
				Aroclor-1254	2.4	mg/kg	3.3E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	7.E-08	1.9E-07	mg/kg/day	2.0E-05	mg/kg/day	1.E-02
				Aroclor-1260	0.2	mg/kg	2.7E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	5.E-09	1.6E-08	mg/kg/day	2.0E-05	mg/kg/day	8.E-04
				Aroclor-1268	0.079	mg/kg	1.1E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-09	6.3E-09	mg/kg/day	2.0E-05	mg/kg/day	3.E-04
				delta-BHC	0.0014	mg/kg	NC		NC			7.9E-11	mg/kg/day	3.0E-04	mg/kg/day	3.E-07
				Dieldrin	0.009	mg/kg	8.7E-11	mg/kg/day	1.6E+01	(mg/kg/day)-1	1.E-09	5.1E-10	mg/kg/day	5.0E-05	mg/kg/day	1.E-05
				Endosulfan II	0.037	mg/kg	NC		NC			2.1E-09	mg/kg/day	6.0E-03	mg/kg/day	3.E-07
				Endosulfan sulfate	0.0027	mg/kg	NC		NC			1.5E-10	mg/kg/day	6.0E-03	mg/kg/day	3.E-08
				Endrin aldehyde	0.0029	mg/kg	NC		NC			1.6E-10	mg/kg/day	3.0E-04	mg/kg/day	5.E-07
				Endrin Ketone	0.0038	mg/kg	NC		NC			2.1E-10	mg/kg/day	3.0E-04	mg/kg/day	7.E-07
				gamma-Chlordane	0.017	mg/kg	6.6E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-11	3.8E-10	mg/kg/day	5.0E-04	mg/kg/day	8.E-07
				Technical Chlordane	0.65	mg/kg	2.5E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	9.E-10	1.5E-08	mg/kg/day	5.0E-04	mg/kg/day	3.E-05
				Antimony	4.8	mg/kg	NC		NC					6.0E-05	mg/kg/day	
				Arsenic	5.8	mg/kg	1.7E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	3.E-08	9.8E-08	mg/kg/day	3.0E-04	mg/kg/day	3.E-04
				Cadmium	1.2	mg/kg	NC		NC			6.8E-10	mg/kg/day	2.5E-05	mg/kg/day	3.E-05
				Chromium	238	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	488	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	531	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Mercury	0.97	mg/kg	NC		NC					2.3E-05	mg/kg/day	
				Nickel	26.7	mg/kg	NC		NC					8.0E-04	mg/kg/day	
				Thallium	6.8	mg/kg	NC		NC					8.0E-05	mg/kg/day	
				Vanadium	45.9	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	*0.0057*	mg/kg	*1.7E-11*	mg/kg/day	*1.5E+05*	(mg/kg/day)-1	*2.E-06*	*9.7E-11*	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.000000112	mg/kg	3.3E-16	mg/kg/day	1.5E+05	(mg/kg/day)-1	5.E-11	1.9E-15	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-06					1.E-02
		EXPOSURE POINT TOTAL									1.E-05					3.E-02
	EXPOSURE MEDIUM TOTAL										1.E-05					3.E-02
SEDIMENT TOTAL											1.E-05					3.E-02
SURFACE WATER	SURFACE WATER	ALLENDALE POND	INGESTION	Tetrachloroethene	0.0007	mg/l	4.7E-10	mg/kg/day	5.4E-01	mg/kg/day	3.E-10	2.8E-09	mg/kg/day	1.0E-02	mg/kg/day	3.E-07
				bis(2-Ethylhexyl)phthalate	0.001	mg/l	6.8E-10	mg/kg/day	1.4E-02	mg/kg/day	9.E-12	4.0E-09	mg/kg/day	2.0E-02	mg/kg/day	2.E-07
				Aldrin	0.000011	mg/l	7.5E-12	mg/kg/day	1.7E+01	mg/kg/day	1.E-10	4.4E-11	mg/kg/day	3.0E-05	mg/kg/day	1.E-06
				alpha-Chlordane	0.00000069	mg/l	4.7E-13	mg/kg/day	3.5E-01	mg/kg/day	2.E-13	2.7E-12	mg/kg/day	5.0E-04	mg/kg/day	5.E-09
				delta-BHC	0.0000096	mg/l	NC		NC			3.8E-11	mg/kg/day	3.0E-04	mg/kg/day	1.E-07
				Endosulfan Sulfate	0.0000026	mg/l	NC		NC			1.0E-11	mg/kg/day	6.0E-03	mg/kg/day	2.E-09
				Endrin Aldehyde	0.0000028	mg/l	NC		NC			1.1E-11	mg/kg/day	3.0E-04	mg/kg/day	4.E-08
				gamma-Chlordane	0.00000075	mg/l	5.1E-13	mg/kg/day	3.5E-01	mg/kg/day	2.E-13	3.0E-12	mg/kg/day	5.0E-04	mg/kg/day	6.E-09
				Arsenic	0.0075	mg/l	5.1E-09	mg/kg/day	1.5E+00	mg/kg/day	8.E-09	3.0E-08	mg/kg/day	3.0E-04	mg/kg/day	1.E-04
				Barium	0.045	mg/l	NC		NC			1.8E-07	mg/kg/day	7.0E-02	mg/kg/day	3.E-06
				Chromium	0.027	mg/l	NC		NC			1.1E-07	mg/kg/day	3.0E-03	mg/kg/day	4.E-05
				Lead	0.013	mg/l	8.8E-09	mg/kg/day	--			5.1E-08	mg/kg/day			
				Manganese	0.42	mg/l	NC		NC			1.7E-06	mg/kg/day	2.4E-02	mg/kg/day	7.E-05
				Mercury	0.00000319	mg/l	NC		NC			1.3E-11	mg/kg/day	3.0E-04	mg/kg/day	4.E-08
				Thallium	0.0145	mg/l	NC		NC			5.7E-08	mg/kg/day	8.0E-05	mg/kg/day	7.E-04
				Nitrate	0.773	mg/l	NC		NC			3.1E-06	mg/kg/day	1.6E+00	mg/kg/day	2.E-06
				Nitrite-N	0.139	mg/l	NC		NC			5.5E-07	mg/kg/day	1.0E-01	mg/kg/day	6.E-06
				Toxicity Equivalency (Dioxins/Furans)	0.000000385	mg/l	2.6E-13	mg/kg/day	1.5E+05	mg/kg/day	4.E-08	1.5E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-08					9.E-04
			DERMAL	Tetrachloroethene	0.0007	mg/l	5.5E-08	mg/kg/day	5.4E-01	mg/kg/day	3.E-08	3.2E-07	mg/kg/day	1.0E-02	mg/kg/day	3.E-05
				bis(2-Ethylhexyl)phthalate	0.001	mg/l	2.1E-07	mg/kg/day	1.4E-02	mg/kg/day	3.E-09	1.2E-06	mg/kg/day	2.0E-02	mg/kg/day	6.E-05
				Aldrin	0.000011	mg/l	1.3E-10	mg/kg/day	1.7E+01	mg/kg/day	2.E-09	7.6E-10	mg/kg/day	3.0E-05	mg/kg/day	3.E-05
				alpha-Chlordane	0.00000069	mg/l	1.9E-10	mg/kg/day	3.5E-01	mg/kg/day	7.E-11	1.1E-09	mg/kg/day	5.0E-04	mg/kg/day	2.E-06
				delta-BHC	0.0000096	mg/l	NC		NC			2.9E-09	mg/kg/day	3.0E-04	mg/kg/day	1.E-05
				Endosulfan Sulfate	0.0000026	mg/l	NC		NC			--		6.0E-03	mg/kg/day	

TABLE 7.14.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS – REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Endrin Aldehyde	0.0000028	mg/l	NC		NC			1.5E-09	mg/kg/day	3.0E-04	mg/kg/day	5 E-06
				gamma-Chlordane	0.00000075	mg/l	2.1E-10	mg/kg/day	3.5E-01	mg/kg/day	7.E-11	1.2E-09	mg/kg/day	5.0E-04	mg/kg/day	2 E-06
				Arsenic	0.0075	mg/l	6.4E-09	mg/kg/day	1.5E+00	mg/kg/day	1.E-08	3.7E-08	mg/kg/day	3 0E-04	mg/kg/day	1 E-04
				Barium	0.045	mg/l	NC		NC			2.2E-07	mg/kg/day	4.9E-03	mg/kg/day	5 E-05
				Chromium	0.027	mg/l	NC		NC			2.7E-07	mg/kg/day	7.5E-05	mg/kg/day	4.E-03
				Lead	0.013	mg/l	--		--			--				
				Manganese	0.42	mg/l	NC		NC			2.1E-06	mg/kg/day	9 6E-04	mg/kg/day	2 E-03
				Mercury	0.00000319	mg/l	NC		NC			1.6E-11	mg/kg/day	2 1E-05	mg/kg/day	8 E-07
				Thallium	0.0145	mg/l	NC		NC			7.2E-08	mg/kg/day	8.0E-05	mg/kg/day	9 E-04
				Nitrate	0.773	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.139	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000000385	mg/l	0.0E+00	mg/kg/day	1 5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4 E-08					7 E-03
		EXPOSURE POINT TOTAL									9 E-08					8 E-03
	EXPOSURE MEDIUM TOTAL										9.E-08					8.E-03
SURFACE WATER TOTAL											9.E-08					8.E-03
BIOTA	COMBINED FISH DIET	ALLENDALE POND	INGESTION	Acenaphthylene	0.002	mg/kg	NC		NC			4 0E-07	mg/kg/day	6 0E-02	mg/kg/day	7.E-06
				Benzo(a)anthracene	0.0014	mg/kg	4.8E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-08	2.8E-07	mg/kg/day	3.0E-02	mg/kg/day	9 E-06
				Benzo(a)pyrene	0.0015	mg/kg	5.1E-08	mg/kg/day	7 3E+00	(mg/kg/day)-1	4.E-07	3 0E-07	mg/kg/day	3 0E-02	mg/kg/day	1.E-05
				Benzo(b)fluoranthene	0.0016	mg/kg	5.4E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-08	3.2E-07	mg/kg/day	3 0E-02	mg/kg/day	1.E-05
				Benzo(g,h,i)perylene	0 00065	mg/kg	NC		NC			1 3E-07	mg/kg/day	3 0E-02	mg/kg/day	4.E-06
				Dibenzo(a,h)anthracene	0.00053	mg/kg	1.8E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-07	1 1E-07	mg/kg/day	3.0E-02	mg/kg/day	4 E-06
				Indeno(1,2,3-cd)pyrene	0.00073	mg/kg	2.5E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.4E-07	mg/kg/day	3.0E-02	mg/kg/day	5 E-06
				Phenanthrene	0 00975	mg/kg	NC		NC			1.9E-06	mg/kg/day	3.0E-02	mg/kg/day	6 E-05
				4,4'-DDD	0 0128	mg/kg	4 3E-07	mg/kg/day	2.4E-01	(mg/kg/day)-1	1 E-07	2 5E-06	mg/kg/day	5.0E-04	mg/kg/day	5 E-03
				4,4'-DDE	0 0249	mg/kg	8.5E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	3.E-07	4.9E-06	mg/kg/day	5.0E-04	mg/kg/day	1 E-02
				4,4'-DDT	0.00789	mg/kg	2.7E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	9 E-08	1.6E-06	mg/kg/day	5.0E-04	mg/kg/day	3.E-03
				alpha-Chlordane	0 0214	mg/kg	7.3E-07	mg/kg/day	3 5E-01	(mg/kg/day)-1	3.E-07	4.2E-06	mg/kg/day	5.0E-04	mg/kg/day	8.E-03
				Aroclor-1254	1.8853	mg/kg	6.4E-05	mg/kg/day	2.0E+00	(mg/kg/day)-1	1 E-04	3.7E-04	mg/kg/day	2.0E-05	mg/kg/day	2.E+01
				Aroclor-1268	0 02673	mg/kg	9 1E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-06	5.3E-06	mg/kg/day	2.0E-05	mg/kg/day	3.E-01
				beta-BHC	0.0005	mg/kg	1 7E-08	mg/kg/day	1.8E+00	(mg/kg/day)-1	3.E-08	9.9E-08	mg/kg/day	3.0E-04	mg/kg/day	3.E-04
				Dieldrin	0.00889	mg/kg	3.0E-07	mg/kg/day	1.6E+01	(mg/kg/day)-1	5.E-06	1.8E-06	mg/kg/day	5.0E-05	mg/kg/day	4.E-02
				Endosulfan Sulfate	0.001	mg/kg	NC		NC			2.0E-07	mg/kg/day	6.0E-03	mg/kg/day	3.E-05
				Endrin Aldehyde	0.0005	mg/kg	NC		NC			9.9E-08	mg/kg/day	3.0E-04	mg/kg/day	3.E-04
				gamma-Chlordane	0.008	mg/kg	2.7E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-07	1.6E-06	mg/kg/day	5 0E-04	mg/kg/day	3.E-03
				Heptachlor	0.0005	mg/kg	1.7E-08	mg/kg/day	4.5E+00	(mg/kg/day)-1	8.E-08	9.9E-08	mg/kg/day	5.0E-04	mg/kg/day	2.E-04
				Heptachlor Epoxide	0.0011	mg/kg	3.7E-08	mg/kg/day	9.1E+00	(mg/kg/day)-1	3.E-07	2.2E-07	mg/kg/day	1 3E-05	mg/kg/day	2.E-02
				Technical Chlordane	0.468	mg/kg	1.6E-05	mg/kg/day	3.5E-01	(mg/kg/day)-1	6.E-06	9.3E-05	mg/kg/day	5.0E-04	mg/kg/day	2.E-01
				Cadmium	0.0644	mg/kg	NC		NC			1.3E-05	mg/kg/day	1.0E-03	mg/kg/day	1.E-02
				Chromium	0.103	mg/kg	NC		NC			2.0E-05	mg/kg/day	3.0E-03	mg/kg/day	7.E-03
				Lead	0.464	mg/kg	1.6E-05	mg/kg/day	--			9.2E-05	mg/kg/day			
				Manganese	6.7	mg/kg	NC		NC			1.3E-03	mg/kg/day	1.4E-01	mg/kg/day	9 E-03
				Mercury	0 144	mg/kg	NC		NC			2.9E-05	mg/kg/day	3.0E-04	mg/kg/day	1.E-01
				Mercury (methyl)	0.208	mg/kg	NC		NC			4.1E-05	mg/kg/day	1.0E-04	mg/kg/day	4 E-01
				Toxicity Equivalency (PCB Congeners)	0 000032	mg/kg	1.1E-09	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-04	6.3E-09	mg/kg/day			
				Toxicity Equivalency (Dioxins/Furans)	0 000301	mg/kg	1.0E-08	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-03	6.0E-08	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-03					2 0 E+01
		EXPOSURE POINT TOTAL									2.E-03					2 0.E+01
	EXPOSURE MEDIUM TOTAL										2.E-03					2.0.E+01
COMBINED FISH DIET TOTAL											2.E-03					2.0.E+01
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	2.E-03				TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA	2.0.E+01

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: MJM

TABLE 7.16.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS – REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SOIL	SOIL	ALLENDALE POND	INGESTION	2,3,7,8-TCDD	0.00027	mg/kg	1.4E-11	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-06	8.2E-11	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-06					--
			DERMAL	2,3,7,8-TCDD	0.00027	mg/kg	1.7E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-07	9.9E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-07					--
		EXPOSURE POINT TOTAL									2.E-06					0.E+00
	EXPOSURE MEDIUM TOTAL										2.E-06					0.E+00
SOIL TOTAL											2.E-06					0.E+00
SEDIMENT	SEDIMENT	ALLENDALE POND	INGESTION	2-Methylnaphthalene	0.13608	mg/kg	NC		NC			2.1E-08	mg/kg/day	2.0E-02	mg/kg/day	1.E-06
				Acenaphthylene	0.97	mg/kg	NC		NC			1.5E-07	mg/kg/day	6.0E-02	mg/kg/day	2.E-06
				Benzo(a)anthracene	3.4	mg/kg	8.9E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-08	5.2E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(a)pyrene	4	mg/kg	1.0E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	8.E-07	6.1E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(b)fluoranthene	4.4	mg/kg	1.2E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-08	6.7E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(g,h,i)perylene	2	mg/kg	NC		NC			3.1E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(k)fluoranthene	3.9	mg/kg	1.0E-07	mg/kg/day	7.3E-02	(mg/kg/day)-1	7.E-09	6.0E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				bis(2-Ethylhexyl)phthalate	3.2	mg/kg	8.4E-08	mg/kg/day	1.4E-02	(mg/kg/day)-1	1.E-09	4.9E-07	mg/kg/day	2.0E-02	mg/kg/day	2.E-05
				Dibenzo(a,h)anthracene	2	mg/kg	5.2E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-07	3.1E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Indeno(1,2,3-cd)pyrene	3.2	mg/kg	8.4E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-08	4.9E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Pentachlorophenol	6.5	mg/kg	1.7E-07	mg/kg/day	1.2E-01	(mg/kg/day)-1	2.E-08	9.9E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Phenanthrene	4.8	mg/kg	NC		NC			7.3E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				alpha-Chlordane	0.0113	mg/kg	3.0E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-10	1.7E-09	mg/kg/day	5.0E-04	mg/kg/day	3.E-06
				Aroclor-1254	2.4	mg/kg	6.3E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-07	3.7E-07	mg/kg/day	2.0E-05	mg/kg/day	2.E-02
				Aroclor-1260	0.2	mg/kg	5.2E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-08	3.1E-08	mg/kg/day	2.0E-05	mg/kg/day	2.E-03
				Aroclor-1268	0.079	mg/kg	2.1E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	4.E-09	1.2E-08	mg/kg/day	2.0E-05	mg/kg/day	6.E-04
				delta-BHC	0.0014	mg/kg	NC		NC			2.1E-10	mg/kg/day	3.0E-04	mg/kg/day	7.E-07
				Dieldrin	0.009	mg/kg	2.4E-10	mg/kg/day	1.6E+01	(mg/kg/day)-1	4.E-09	1.4E-09	mg/kg/day	5.0E-05	mg/kg/day	3.E-05
				Endosulfan II	0.037	mg/kg	NC		NC			5.6E-09	mg/kg/day	6.0E-03	mg/kg/day	9.E-07
				Endosulfan sulfate	0.0027	mg/kg	NC		NC			4.1E-10	mg/kg/day	6.0E-03	mg/kg/day	7.E-08
				Endrin aldehyde	0.0029	mg/kg	NC		NC			4.4E-10	mg/kg/day	3.0E-04	mg/kg/day	1.E-06
				Endrin Ketone	0.0038	mg/kg	NC		NC			5.8E-10	mg/kg/day	3.0E-04	mg/kg/day	2.E-06
				gamma-Chlordane	0.017	mg/kg	4.4E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-10	2.6E-09	mg/kg/day	5.0E-04	mg/kg/day	5.E-06
				Technical Chlordane	0.65	mg/kg	1.7E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	6.E-09	9.9E-08	mg/kg/day	5.0E-04	mg/kg/day	2.E-04
				Antimony	4.8	mg/kg	NC		NC			7.3E-07	mg/kg/day	4.0E-04	mg/kg/day	2.E-03
				Arsenic	5.8	mg/kg	1.5E-07	mg/kg/day	1.5E+00	(mg/kg/day)-1	2.E-07	8.9E-07	mg/kg/day	3.0E-04	mg/kg/day	3.E-03
				Cadmium	1.2	mg/kg	NC		NC			1.8E-07	mg/kg/day	1.0E-03	mg/kg/day	2.E-04
				Chromium	238	mg/kg	NC		NC			3.6E-05	mg/kg/day	3.0E-03	mg/kg/day	1.E-02
				Lead	488	mg/kg	1.3E-05	mg/kg/day	--			7.4E-05	mg/kg/day			
				Manganese	531	mg/kg	NC		NC			8.1E-05	mg/kg/day	7.1E-02	mg/kg/day	1.E-03
				Mercury	0.97	mg/kg	NC		NC			1.5E-07	mg/kg/day	3.0E-04	mg/kg/day	5.E-04
				Nickel	26.7	mg/kg	NC		NC			4.1E-06	mg/kg/day	2.0E-02	mg/kg/day	2.E-04
				Thallium	6.8	mg/kg	NC		NC			1.0E-06	mg/kg/day	8.0E-05	mg/kg/day	1.E-02
				Vanadium	45.9	mg/kg	NC		NC			7.0E-06	mg/kg/day	7.0E-03	mg/kg/day	1.E-03
				Toxicity Equivalency (Dioxins/Furans)	0.0057	mg/kg	1.5E-10	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-05	8.7E-10	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.000000112	mg/kg	2.9E-15	mg/kg/day	1.5E+05	(mg/kg/day)-1	4.E-10	1.7E-14	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-05					5.E-02
			DERMAL	2-Methylnaphthalene	0.13608	mg/kg	NC		NC			9.2E-09	mg/kg/day	2.0E-02	mg/kg/day	5.E-07
				Acenaphthylene	0.97	mg/kg	NC		NC			6.5E-08	mg/kg/day	6.0E-02	mg/kg/day	1.E-06
				Benzo(a)anthracene	3.4	mg/kg	3.9E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-08	2.3E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				Behzo(a)pyrene	4	mg/kg	4.6E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-07	2.7E-07	mg/kg/day	3.0E-02	mg/kg/day	9.E-06
				Benzo(b)fluoranthene	4.4	mg/kg	5.1E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-08	3.0E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(g,h,i)perylene	2	mg/kg	NC		NC			1.4E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Benzo(k)fluoranthene	3.9	mg/kg	4.5E-08	mg/kg/day	7.3E-02	(mg/kg/day)-1	3.E-09	2.6E-07	mg/kg/day	3.0E-02	mg/kg/day	9.E-06
				bis(2-Ethylhexyl)phthalate	3.2	mg/kg	2.8E-08	mg/kg/day	1.4E-02	(mg/kg/day)-1	4.E-10	1.7E-07	mg/kg/day	2.0E-02	mg/kg/day	8.E-06
				Dibenzo(a,h)anthracene	2	mg/kg	2.3E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-07	1.4E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Indeno(1,2,3-cd)pyrene	3.2	mg/kg	3.7E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-08	2.2E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Pentachlorophenol	6.5	mg/kg	1.4E-07	mg/kg/day	1.2E-01	(mg/kg/day)-1	2.E-08	8.4E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Phenanthrene	4.8	mg/kg	NC		NC			3.2E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05

TABLE 7.16.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				alpha-Chlordane	0.0113	mg/kg	4.0E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-11	2.3E-10	mg/kg/day	5.0E-04	mg/kg/day	5.E-07
				Aroclor-1254	2.4	mg/kg	3.0E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	6.E-08	1.7E-07	mg/kg/day	2.0E-05	mg/kg/day	9.E-03
				Aroclor-1260	0.2	mg/kg	2.5E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	5.E-09	1.5E-08	mg/kg/day	2.0E-05	mg/kg/day	7.E-04
				Aroclor-1268	0.079	mg/kg	9.8E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-09	5.7E-09	mg/kg/day	2.0E-05	mg/kg/day	3.E-04
				delta-BHC	0.0014	mg/kg	NC		NC			7.3E-11	mg/kg/day	3.0E-04	mg/kg/day	2.E-07
				Dieldrin	0.009	mg/kg	8.0E-11	mg/kg/day	1.6E+01	(mg/kg/day)-1	1.E-09	4.7E-10	mg/kg/day	5.0E-05	mg/kg/day	9.E-06
				Endosulfan II	0.037	mg/kg	NC		NC			1.9E-09	mg/kg/day	6.0E-03	mg/kg/day	3.E-07
				Endosulfan sulfate	0.0027	mg/kg	NC		NC			1.4E-10	mg/kg/day	6.0E-03	mg/kg/day	2.E-08
				Endrin aldehyde	0.0029	mg/kg	NC		NC			1.5E-10	mg/kg/day	3.0E-04	mg/kg/day	5.E-07
				Endrin Ketone	0.0038	mg/kg	NC		NC			2.0E-10	mg/kg/day	3.0E-04	mg/kg/day	7.E-07
				gamma-Chlordane	0.017	mg/kg	6.1E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-11	3.5E-10	mg/kg/day	5.0E-04	mg/kg/day	7.E-07
				Technical Chlordane	0.65	mg/kg	2.3E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	8.E-10	1.4E-08	mg/kg/day	5.0E-04	mg/kg/day	3.E-05
				Antimony	4.8	mg/kg	NC		NC					6.0E-05	mg/kg/day	
				Arsenic	5.8	mg/kg	1.5E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	2.E-08	9.0E-08	mg/kg/day	3.0E-04	mg/kg/day	3.E-04
				Cadmium	1.2	mg/kg	NC		NC			6.2E-10	mg/kg/day	2.5E-05	mg/kg/day	2.E-05
				Chromium	238	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	488	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	531	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Mercury	0.97	mg/kg	NC		NC					2.1E-05	mg/kg/day	
				Nickel	26.7	mg/kg	NC		NC					8.0E-04	mg/kg/day	
				Thallium	6.8	mg/kg	NC		NC					8.0E-05	mg/kg/day	
				Vanadium	45.9	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.0057	mg/kg	1.5E-11	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-06	8.9E-11	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.000000112	mg/kg	3.0E-16	mg/kg/day	1.5E+05	(mg/kg/day)-1	4.E-11	1.7E-15	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-06					1.E-02
		EXPOSURE POINT TOTAL									3.E-05					6.E-02
	EXPOSURE MEDIUM TOTAL										3.E-05					6.E-02
SEDIMENT TOTAL											3.E-05					6.E-02
SURFACE WATER	SURFACE WATER	ALLENDALE POND	INGESTION	Tetrachloroethene	0.0007	mg/l	1.2E-08	mg/kg/day	5.4E-01	mg/kg/day	7.E-09	7.1E-08	mg/kg/day	1.0E-02	mg/kg/day	7.E-06
				bis(2-Ethylhexyl)phthalate	0.001	mg/l	1.7E-08	mg/kg/day	1.4E-02	mg/kg/day	2.E-10	1.0E-07	mg/kg/day	2.0E-02	mg/kg/day	5.E-06
				Aldrin	0.000011	mg/l	1.9E-10	mg/kg/day	1.7E+01	mg/kg/day	3.E-09	1.1E-09	mg/kg/day	3.0E-05	mg/kg/day	4.E-05
				alpha-Chlordane	0.00000069	mg/l	1.2E-11	mg/kg/day	3.5E-01	mg/kg/day	4.E-12	7.0E-11	mg/kg/day	5.0E-04	mg/kg/day	1.E-07
				delta-BHC	0.0000096	mg/l	NC		NC			9.8E-10	mg/kg/day	3.0E-04	mg/kg/day	3.E-06
				Endosulfan Sulfate	0.0000026	mg/l	NC		NC			2.6E-10	mg/kg/day	6.0E-03	mg/kg/day	4.E-08
				Endrin Aldehyde	0.0000028	mg/l	NC		NC			2.8E-10	mg/kg/day	3.0E-04	mg/kg/day	9.E-07
				gamma-Chlordane	0.00000075	mg/l	1.3E-11	mg/kg/day	3.5E-01	mg/kg/day	5.E-12	7.6E-11	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				Arsenic	0.0075	mg/l	1.3E-07	mg/kg/day	1.5E+00	mg/kg/day	2.E-07	7.6E-07	mg/kg/day	3.0E-04	mg/kg/day	3.E-03
				Barium	0.045	mg/l	NC		NC			4.6E-06	mg/kg/day	7.0E-02	mg/kg/day	7.E-05
				Chromium	0.027	mg/l	NC		NC			2.7E-06	mg/kg/day	3.0E-03	mg/kg/day	9.E-04
				Lead	0.013	mg/l	2.3E-07	mg/kg/day	--			1.3E-06	mg/kg/day			
				Manganese	0.42	mg/l	NC		NC			4.3E-05	mg/kg/day	2.4E-02	mg/kg/day	2.E-03
				Mercury	0.00000319	mg/l	NC		NC			3.2E-10	mg/kg/day	3.0E-04	mg/kg/day	1.E-06
				Thallium	0.0145	mg/l	NC		NC			1.5E-06	mg/kg/day	8.0E-05	mg/kg/day	2.E-02
				Nitrate	0.773	mg/l	NC		NC			7.9E-05	mg/kg/day	1.6E+00	mg/kg/day	5.E-05
				Nitrite-N	0.139	mg/l	NC		NC			1.4E-05	mg/kg/day	1.0E-01	mg/kg/day	1.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.000000385	mg/l	6.7E-12	mg/kg/day	1.5E+05	mg/kg/day	1.E-06	3.9E-11	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-06					2.E-02
			DERMAL	Tetrachloroethene	0.0007	mg/l	1.8E-07	mg/kg/day	5.4E-01	mg/kg/day	1.E-07	1.1E-06	mg/kg/day	1.0E-02	mg/kg/day	1.E-04
				bis(2-Ethylhexyl)phthalate	0.001	mg/l	6.9E-07	mg/kg/day	1.4E-02	mg/kg/day	1.E-08	4.0E-06	mg/kg/day	2.0E-02	mg/kg/day	2.E-04
				Aldrin	0.000011	mg/l	4.4E-10	mg/kg/day	1.7E+01	mg/kg/day	7.E-09	2.6E-09	mg/kg/day	3.0E-05	mg/kg/day	9.E-05
				alpha-Chlordane	0.00000069	mg/l	6.4E-10	mg/kg/day	3.5E-01	mg/kg/day	2.E-10	3.7E-09	mg/kg/day	5.0E-04	mg/kg/day	7.E-06
				delta-BHC	0.0000096	mg/l	NC		NC			9.7E-09	mg/kg/day	3.0E-04	mg/kg/day	3.E-05
				Endosulfan Sulfate	0.0000026	mg/l	NC		NC			--		6.0E-03	mg/kg/day	

TABLE 7.16.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Endrin Aldehyde	0.0000028	mg/l	NC		NC			5.1E-09	mg/kg/day	3.0E-04	mg/kg/day	2.E-05
				gamma-Chlordane	0.00000075	mg/l	7.0E-10	mg/kg/day	3.5E-01	mg/kg/day	2.E-10	4.1E-09	mg/kg/day	5.0E-04	mg/kg/day	8.E-06
				Arsenic	0.0075	mg/l	2.1E-08	mg/kg/day	1.5E+00	mg/kg/day	3.E-08	1.2E-07	mg/kg/day	3.0E-04	mg/kg/day	4.E-04
				Barium	0.045	mg/l	NC		NC			7.5E-07	mg/kg/day	4.9E-03	mg/kg/day	2.E-04
				Chromium	0.027	mg/l	NC		NC			9.0E-07	mg/kg/day	7.5E-05	mg/kg/day	1.E-02
				Lead	0.013	mg/l	--		--			--				
				Manganese	0.42	mg/l	NC		NC			7.0E-06	mg/kg/day	9.6E-04	mg/kg/day	7.E-03
				Mercury	0.00000319	mg/l	NC		NC			5.3E-11	mg/kg/day	2.1E-05	mg/kg/day	3.E-06
				Thallium	0.0145	mg/l	NC		NC			2.4E-07	mg/kg/day	8.0E-05	mg/kg/day	3.E-03
				Nitrate	0.773	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.139	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000000385	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-07					2.E-02
		EXPOSURE POINT TOTAL									1.E-06					5.E-02
	EXPOSURE MEDIUM TOTAL										1.E-06					5.E-02
SURFACE WATER TOTAL											1.E-06					5.E-02
BIOTA	COMBINED FISH DIET	ALLENDALE POND	INGESTION	Acenaphthylene	0.002	mg/kg	NC		NC			3.8E-07	mg/kg/day	6.0E-02	mg/kg/day	6.E-06
				Benzo(a)anthracene	0.0014	mg/kg	4.6E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-08	2.7E-07	mg/kg/day	3.0E-02	mg/kg/day	9.E-06
				Benzo(a)pyrene	0.0015	mg/kg	4.9E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-07	2.9E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(b)fluoranthene	0.0016	mg/kg	5.3E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-08	3.1E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(g,h,i)perylene	0.00065	mg/kg	NC		NC			1.2E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Dibenzo(a,h)anthracene	0.00053	mg/kg	1.7E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-07	1.0E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Indeno(1,2,3-cd)pyrene	0.00073	mg/kg	2.4E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.4E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Phenanthrene	0.00975	mg/kg	NC		NC			1.9E-06	mg/kg/day	3.0E-02	mg/kg/day	6.E-05
				4,4'-DDD	0.0128	mg/kg	4.2E-07	mg/kg/day	2.4E-01	(mg/kg/day)-1	1.E-07	2.5E-06	mg/kg/day	5.0E-04	mg/kg/day	5.E-03
				4,4'-DDE	0.0249	mg/kg	8.2E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	3.E-07	4.8E-06	mg/kg/day	5.0E-04	mg/kg/day	1.E-02
				4,4'-DDT	0.00789	mg/kg	2.6E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	9.E-08	1.5E-06	mg/kg/day	5.0E-04	mg/kg/day	3.E-03
				alpha-Chlordane	0.0214	mg/kg	7.0E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-07	4.1E-06	mg/kg/day	5.0E-04	mg/kg/day	8.E-03
				Aroclor-1254	1.8853	mg/kg	6.2E-05	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-04	3.6E-04	mg/kg/day	2.0E-05	mg/kg/day	2.E+01
				Aroclor-1268	0.02673	mg/kg	8.8E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-06	5.1E-06	mg/kg/day	2.0E-05	mg/kg/day	3.E-01
				beta-BHC	0.0005	mg/kg	1.6E-08	mg/kg/day	1.8E+00	(mg/kg/day)-1	3.E-08	9.6E-08	mg/kg/day	3.0E-04	mg/kg/day	3.E-04
				Dieldrin	0.00889	mg/kg	2.9E-07	mg/kg/day	1.6E+01	(mg/kg/day)-1	5.E-06	1.7E-06	mg/kg/day	5.0E-05	mg/kg/day	3.E-02
				Endosulfan Sulfate	0.001	mg/kg	NC		NC			1.9E-07	mg/kg/day	6.0E-03	mg/kg/day	3.E-05
				Endrin Aldehyde	0.0005	mg/kg	NC		NC			9.6E-08	mg/kg/day	3.0E-04	mg/kg/day	3.E-04
				gamma-Chlordane	0.008	mg/kg	2.6E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	9.E-08	1.5E-06	mg/kg/day	5.0E-04	mg/kg/day	3.E-03
				Heptachlor	0.0005	mg/kg	1.6E-08	mg/kg/day	4.5E+00	(mg/kg/day)-1	7.E-08	9.6E-08	mg/kg/day	5.0E-04	mg/kg/day	2.E-04
				Heptachlor Epoxide	0.0011	mg/kg	3.6E-08	mg/kg/day	9.1E+00	(mg/kg/day)-1	3.E-07	2.1E-07	mg/kg/day	1.3E-05	mg/kg/day	2.E-02
				Technical Chlordane	0.468	mg/kg	1.5E-05	mg/kg/day	3.5E-01	(mg/kg/day)-1	5.E-06	9.0E-05	mg/kg/day	5.0E-04	mg/kg/day	2.E-01
				Cadmium	0.0644	mg/kg	NC		NC			1.2E-05	mg/kg/day	1.0E-03	mg/kg/day	1.E-02
				Chromium	0.103	mg/kg	NC		NC			2.0E-05	mg/kg/day	3.0E-03	mg/kg/day	7.E-03
				Lead	0.464	mg/kg	1.5E-05	mg/kg/day	--			8.9E-05	mg/kg/day			
				Manganese	6.7	mg/kg	NC		NC			1.3E-03	mg/kg/day	1.4E-01	mg/kg/day	9.E-03
				Mercury	0.144	mg/kg	NC		NC			2.8E-05	mg/kg/day	3.0E-04	mg/kg/day	9.E-02
				Mercury (methyl)	0.208	mg/kg	NC		NC			4.0E-05	mg/kg/day	1.0E-04	mg/kg/day	4.E-01
				Toxicity Equivalency (PCB Congeners)	0.000032	mg/kg	1.1E-09	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-04	6.1E-09	mg/kg/day			
				Toxicity Equivalency (Dioxins/Furans)	0.000301	mg/kg	9.9E-09	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-03	5.8E-08	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-03					1.9.E+01
		EXPOSURE POINT TOTAL									2.E-03					1.9.E+01
	EXPOSURE MEDIUM TOTAL										2.E-03					1.9.E+01
COMBINED FISH DIET TOTAL											2.E-03					1.9.E+01
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	2.E-03	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				1.9.E+01

NOTES
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated: dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: MJM

TABLE 7.17.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SOIL	SOIL	ALLENDALE POND	INGESTION	2,3,7,8-TCDD	0.00027	mg/kg	2.2E-11	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-06	1.3E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-06					--
			DERMAL	2,3,7,8-TCDD	0.00027	mg/kg	6.3E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	9.E-07	3.7E-11	mg/kg/day			
			EXPOSURE ROUTE TOTAL								9.E-07					--
		EXPOSURE POINT TOTAL									4.E-06					0.E+00
	EXPOSURE MEDIUM TOTAL										4.E-06					0.E+00
SOIL TOTAL											4.E-06					0.E+00
SEDIMENT	SEDIMENT	ALLENDALE POND	INGESTION	2-Methylnaphthalene	0.13608	mg/kg	NC		NC			3.2E-08	mg/kg/day	2.0E-02	mg/kg/day	2.E-06
				Acenaphthylene	0.97	mg/kg	NC		NC			2.3E-07	mg/kg/day	6.0E-02	mg/kg/day	4.E-06
				Benzo(a)anthracene	3.4	mg/kg	1.4E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-07	8.1E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Benzo(a)pyrene	4	mg/kg	1.6E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-06	9.5E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Benzo(b)fluoranthene	4.4	mg/kg	1.8E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-07	1.0E-06	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Benzo(g,h,i)perylene	2	mg/kg	NC		NC			4.7E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(k)fluoranthene	3.9	mg/kg	1.6E-07	mg/kg/day	7.3E-02	(mg/kg/day)-1	1.E-08	9.3E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				bis(2-Ethylhexyl)phthalate	3.2	mg/kg	1.3E-07	mg/kg/day	1.4E-02	(mg/kg/day)-1	2.E-09	7.6E-07	mg/kg/day	2.0E-02	mg/kg/day	4.E-05
				Dibenzo(a,h)anthracene	2	mg/kg	8.1E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	6.E-07	4.7E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Indeno(1,2,3-cd)pyrene	3.2	mg/kg	1.3E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-07	7.6E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Pentachlorophenol	6.5	mg/kg	2.6E-07	mg/kg/day	1.2E-01	(mg/kg/day)-1	3.E-08	1.5E-06	mg/kg/day	3.0E-02	mg/kg/day	5.E-05
				Phenanthrene	4.8	mg/kg	NC		NC			1.1E-06	mg/kg/day	3.0E-02	mg/kg/day	4.E-05
				alpha-Chlordane	0.0113	mg/kg	4.6E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-10	2.7E-09	mg/kg/day	5.0E-04	mg/kg/day	5.E-06
				Aroclor-1254	2.4	mg/kg	9.8E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-07	5.7E-07	mg/kg/day	2.0E-05	mg/kg/day	3.E-02
				Aroclor-1260	0.2	mg/kg	8.1E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-08	4.7E-08	mg/kg/day	2.0E-05	mg/kg/day	2.E-03
				Aroclor-1268	0.079	mg/kg	3.2E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	6.E-09	1.9E-08	mg/kg/day	2.0E-05	mg/kg/day	9.E-04
				delta-BHC	0.0014	mg/kg	NC		NC			3.3E-10	mg/kg/day	3.0E-04	mg/kg/day	1.E-06
				Dieldrin	0.009	mg/kg	3.7E-10	mg/kg/day	1.6E+01	(mg/kg/day)-1	6.E-09	2.1E-09	mg/kg/day	5.0E-05	mg/kg/day	4.E-05
				Endosulfan II	0.037	mg/kg	NC		NC			8.8E-09	mg/kg/day	6.0E-03	mg/kg/day	1.E-06
				Endosulfan sulfate	0.0027	mg/kg	NC		NC			6.4E-10	mg/kg/day	6.0E-03	mg/kg/day	1.E-07
				Endrin aldehyde	0.0029	mg/kg	NC		NC			6.9E-10	mg/kg/day	3.0E-04	mg/kg/day	2.E-06
				Endrin Ketone	0.0038	mg/kg	NC		NC			9.0E-10	mg/kg/day	3.0E-04	mg/kg/day	3.E-06
				gamma-Chlordane	0.017	mg/kg	6.9E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-10	4.0E-09	mg/kg/day	5.0E-04	mg/kg/day	8.E-06
				Technical Chlordane	0.65	mg/kg	2.6E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	9.E-09	1.5E-07	mg/kg/day	5.0E-04	mg/kg/day	3.E-04
				Antimony	4.8	mg/kg	NC		NC			1.1E-06	mg/kg/day	4.0E-04	mg/kg/day	3.E-03
				Arsenic	5.8	mg/kg	2.4E-07	mg/kg/day	1.5E+00	(mg/kg/day)-1	4.E-07	1.4E-06	mg/kg/day	3.0E-04	mg/kg/day	5.E-03
				Cadmium	1.2	mg/kg	NC		NC			2.8E-07	mg/kg/day	1.0E-03	mg/kg/day	3.E-04
				Chromium	238	mg/kg	NC		NC			5.7E-05	mg/kg/day	3.0E-03	mg/kg/day	2.E-02
				Lead	488	mg/kg	2.0E-05	mg/kg/day	--			1.2E-04	mg/kg/day			
				Manganese	531	mg/kg	NC		NC			1.3E-04	mg/kg/day	7.1E-02	mg/kg/day	2.E-03
				Mercury	0.97	mg/kg	NC		NC			2.3E-07	mg/kg/day	3.0E-04	mg/kg/day	8.E-04
				Nickel	26.7	mg/kg	NC		NC			6.3E-06	mg/kg/day	2.0E-02	mg/kg/day	3.E-04
				Thallium	6.8	mg/kg	NC		NC			1.6E-06	mg/kg/day	8.0E-05	mg/kg/day	2.E-02
				Vanadium	45.9	mg/kg	NC		NC			1.1E-05	mg/kg/day	7.0E-03	mg/kg/day	2.E-03
				Toxicity Equivalency (Dioxins/Furans)	0.0057	mg/kg	2.3E-10	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-05	1.4E-09	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.0000001 12	mg/kg	4.6E-15	mg/kg/day	1.5E+05	(mg/kg/day)-1	7.E-10	2.7E-14	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-05					8.E-02
			DERMAL	2-Methylnaphthalene	0.13608	mg/kg	NC		NC			3.0E-08	mg/kg/day	2.0E-02	mg/kg/day	2.E-06
				Acenaphthylene	0.97	mg/kg	NC		NC			2.1E-07	mg/kg/day	6.0E-02	mg/kg/day	4.E-06
				Benzo(a)anthracene	3.4	mg/kg	1.3E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	9.E-08	7.5E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Benzo(a)pyrene	4	mg/kg	1.5E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-06	8.8E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Benzo(b)fluoranthene	4.4	mg/kg	1.7E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-07	9.7E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Benzo(g,h,i)perylene	2	mg/kg	NC		NC			4.4E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(k)fluoranthene	3.9	mg/kg	1.5E-07	mg/kg/day	7.3E-02	(mg/kg/day)-1	1.E-08	8.6E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				bis(2-Ethylhexyl)phthalate	3.2	mg/kg	9.3E-08	mg/kg/day	1.4E-02	(mg/kg/day)-1	1.E-09	5.4E-07	mg/kg/day	2.0E-02	mg/kg/day	3.E-05
				Dibenzo(a,h)anthracene	2	mg/kg	7.6E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	6.E-07	4.4E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Indeno(1,2,3-cd)pyrene	3.2	mg/kg	1.2E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	9.E-08	7.1E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Pentachlorophenol	6.5	mg/kg	4.7E-07	mg/kg/day	1.2E-01	(mg/kg/day)-1	6.E-08	2.8E-06	mg/kg/day	3.0E-02	mg/kg/day	9.E-05
				Phenanthrene	4.8	mg/kg	NC		NC			1.1E-06	mg/kg/day	3.0E-02	mg/kg/day	4.E-05

TABLE 7.17.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS – REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				alpha-Chlordane	0.0113	mg/kg	1.3E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	5.E-11	7.7E-10	mg/kg/day	5.0E-04	mg/kg/day	2.E-06
				Aroclor-1254	2.4	mg/kg	9.8E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-07	5.7E-07	mg/kg/day	2.0E-05	mg/kg/day	3.E-02
				Aroclor-1260	0.2	mg/kg	8.1E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-08	4.8E-08	mg/kg/day	2.0E-05	mg/kg/day	2.E-03
				Aroclor-1268	0.079	mg/kg	3.2E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	6.E-09	1.9E-08	mg/kg/day	2.0E-05	mg/kg/day	9.E-04
				delta-BHC	0.0014	mg/kg	NC		NC			2.4E-10	mg/kg/day	3.0E-04	mg/kg/day	8.E-07
				Dieldrin	0.009	mg/kg	2.6E-10	mg/kg/day	1.6E+01	(mg/kg/day)-1	4.E-09	1.5E-09	mg/kg/day	5.0E-05	mg/kg/day	3.E-05
				Endosulfan II	0.037	mg/kg	NC		NC			6.3E-09	mg/kg/day	6.0E-03	mg/kg/day	1.E-06
				Endosulfan sulfate	0.0027	mg/kg	NC		NC			4.6E-10	mg/kg/day	6.0E-03	mg/kg/day	8.E-08
				Endrin aldehyde	0.0029	mg/kg	NC		NC			4.9E-10	mg/kg/day	3.0E-04	mg/kg/day	2.E-06
				Endrin Ketone	0.0038	mg/kg	NC		NC			6.4E-10	mg/kg/day	3.0E-04	mg/kg/day	2.E-06
				gamma-Chlordane	0.017	mg/kg	2.0E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	7.E-11	1.2E-09	mg/kg/day	5.0E-04	mg/kg/day	2.E-06
				Technical Chlordane	0.65	mg/kg	7.6E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-09	4.4E-08	mg/kg/day	5.0E-04	mg/kg/day	9.E-05
				Antimony	4.8	mg/kg	NC		NC					6.0E-05	mg/kg/day	
				Arsenic	5.8	mg/kg	5.1E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	8.E-08	3.0E-07	mg/kg/day	3.0E-04	mg/kg/day	1.E-03
				Cadmium	1.2	mg/kg	NC		NC			2.0E-09	mg/kg/day	2.5E-05	mg/kg/day	8.E-05
				Chromium	238	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	488	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	531	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Mercury	0.97	mg/kg	NC		NC					2.1E-05	mg/kg/day	
				Nickel	26.7	mg/kg	NC		NC					8.0E-04	mg/kg/day	
				Thallium	6.8	mg/kg	NC		NC					8.0E-05	mg/kg/day	
				Vanadium	45.9	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.0057	mg/kg	5.0E-11	mg/kg/day	1.5E+05	(mg/kg/day)-1	7.E-06	2.9E-10	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.000000112	mg/kg	9.8E-16	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-10	5.7E-15	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-05					3.E-02
		EXPOSURE POINT TOTAL									5.E-05					1.E-01
	EXPOSURE MEDIUM TOTAL										5.E-05					1.E-01
SEDIMENT TOTAL											5.E-05					1.E-01
SURFACE WATER	SURFACE WATER	ALLENDALE POND	INGESTION	Tetrachloroethene	0.0007	mg/l	1.9E-08	mg/kg/day	5.4E-01	mg/kg/day	1.E-08	1.1E-07	mg/kg/day	1.0E-02	mg/kg/day	1.E-05
				bis(2-Ethylhexyl)phthalate	0.001	mg/l	2.7E-08	mg/kg/day	1.4E-02	mg/kg/day	4.E-10	1.6E-07	mg/kg/day	2.0E-02	mg/kg/day	8.E-06
				Aldrin	0.000011	mg/l	3.0E-10	mg/kg/day	1.7E+01	mg/kg/day	5.E-09	1.7E-09	mg/kg/day	3.0E-05	mg/kg/day	6.E-05
				alpha-Chlordane	0.00000069	mg/l	1.9E-11	mg/kg/day	3.5E-01	mg/kg/day	7.E-12	1.1E-10	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				delta-BHC	0.0000096	mg/l	NC		NC			1.5E-09	mg/kg/day	3.0E-04	mg/kg/day	5.E-06
				Endosulfan Sulfate	0.0000026	mg/l	NC		NC			4.1E-10	mg/kg/day	6.0E-03	mg/kg/day	7.E-08
				Endrin Aldehyde	0.0000028	mg/l	NC		NC			4.4E-10	mg/kg/day	3.0E-04	mg/kg/day	1.E-06
				gamma-Chlordane	0.00000075	mg/l	2.0E-11	mg/kg/day	3.5E-01	mg/kg/day	7.E-12	1.2E-10	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				Arsenic	0.0075	mg/l	2.0E-07	mg/kg/day	1.5E+00	mg/kg/day	3.E-07	1.2E-06	mg/kg/day	3.0E-04	mg/kg/day	4.E-03
				Barium	0.045	mg/l	NC		NC			7.1E-06	mg/kg/day	7.0E-02	mg/kg/day	1.E-04
				Chromium	0.027	mg/l	NC		NC			4.3E-06	mg/kg/day	3.0E-03	mg/kg/day	1.E-03
				Lead	0.013	mg/l	3.5E-07	mg/kg/day	--			2.1E-06	mg/kg/day			
				Manganese	0.42	mg/l	NC		NC			6.6E-05	mg/kg/day	2.4E-02	mg/kg/day	3.E-03
				Mercury	0.00000319	mg/l	NC		NC			5.0E-10	mg/kg/day	3.0E-04	mg/kg/day	2.E-06
				Thallium	0.0145	mg/l	NC		NC			2.3E-06	mg/kg/day	8.0E-05	mg/kg/day	3.E-02
				Nitrate	0.773	mg/l	NC		NC			1.2E-04	mg/kg/day	1.6E+00	mg/kg/day	8.E-05
				Nitrite-N	0.139	mg/l	NC		NC			2.2E-05	mg/kg/day	1.0E-01	mg/kg/day	2.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.000000385	mg/l	1.0E-11	mg/kg/day	1.5E+05	mg/kg/day	2.E-06	6.1E-11	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-06					4.E-02
			DERMAL	Tetrachloroethene	0.0007	mg/l	2.2E-07	mg/kg/day	5.4E-01	mg/kg/day	1.E-07	1.3E-06	mg/kg/day	1.0E-02	mg/kg/day	1.E-04
				bis(2-Ethylhexyl)phthalate	0.001	mg/l	8.2E-07	mg/kg/day	1.4E-02	mg/kg/day	1.E-08	4.8E-06	mg/kg/day	2.0E-02	mg/kg/day	2.E-04
				Aldrin	0.000011	mg/l	5.2E-10	mg/kg/day	1.7E+01	mg/kg/day	9.E-09	3.0E-09	mg/kg/day	3.0E-05	mg/kg/day	1.E-04
				alpha-Chlordane	0.00000069	mg/l	7.6E-10	mg/kg/day	3.5E-01	mg/kg/day	3.E-10	4.4E-09	mg/kg/day	5.0E-04	mg/kg/day	9.E-06
				delta-BHC	0.0000096	mg/l	NC		NC			1.2E-08	mg/kg/day	3.0E-04	mg/kg/day	4.E-05
				Endosulfan Sulfate	0.0000026	mg/l	NC		NC			--		6.0E-03	mg/kg/day	

TABLE 7.17.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Endrin Aldehyde	0.0000028	mg/l	NC		NC			6.1E-09	mg/kg/day	3.0E-04	mg/kg/day	2 E-05
				gamma-Chlordane	0 00000075	mg/l	8.3E-10	mg/kg/day	3.5E-01	mg/kg/day	3.E-10	4.8E-09	mg/kg/day	5.0E-04	mg/kg/day	1.E-05
				Arsenic	0.0075	mg/l	2.5E-08	mg/kg/day	1 5E+00	mg/kg/day	4 E-08	1.5E-07	mg/kg/day	3.0E-04	mg/kg/day	5.E-04
				Barium	0 045	mg/l	NC		NC			8.9E-07	mg/kg/day	4.9E-03	mg/kg/day	2 E-04
				Chromium	0 027	mg/l	NC		NC			1.1E-06	mg/kg/day	7.5E-05	mg/kg/day	1 E-02
				Lead	0 013	mg/l	--		--			--				
				Manganese	0 42	mg/l	NC		NC			8.3E-06	mg/kg/day	9.6E-04	mg/kg/day	9 E-03
				Mercury	0 00000319	mg/l	NC		NC			6.3E-11	mg/kg/day	2.1E-05	mg/kg/day	3 E-06
				Thallium	0.0145	mg/l	NC		NC			2.9E-07	mg/kg/day	8.0E-05	mg/kg/day	4.E-03
				Nitrate	0 773	mg/l	NC		NC			--		1 6E+00	mg/kg/day	
				Nitrite-N	0 139	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0 000000385	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-07					3.E-02
		EXPOSURE POINT TOTAL									2 E-06					6.E-02
	EXPOSURE MEDIUM TOTAL										2 E-06					6.E-02
SURFACE WATER TOTAL											2.E-06					6.E-02
BIOTA	COMBINED FISH DIET	ALLENDALE POND	INGESTION	Acenaphthylene	0 002	mg/kg	NC		NC			4 0E-07	mg/kg/day	6 0E-02	mg/kg/day	7.E-06
				Benzo(a)anthracene	0 0014	mg/kg	4 8E-08	mg/kg/day	7 3E-01	(mg/kg/day)-1	3.E-08	2.8E-07	mg/kg/day	3 0E-02	mg/kg/day	9.E-06
				Benzo(a)pyrene	0 0015	mg/kg	5.1E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-07	3 0E-07	mg/kg/day	3 0E-02	mg/kg/day	1 E-05
				Benzo(b)fluoranthene	0 0016	mg/kg	5.4E-08	mg/kg/day	7 3E-01	(mg/kg/day)-1	4.E-08	3.2E-07	mg/kg/day	3.0E-02	mg/kg/day	1 E-05
				Benzo(g,h,i)perylene	0.00065	mg/kg	NC		NC			1.3E-07	mg/kg/day	3 0E-02	mg/kg/day	4 E-06
				Dibenzo(a,h)anthracene	0.00053	mg/kg	1 8E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-07	1.1E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Indeno(1,2,3-cd)pyrene	0.00073	mg/kg	2.5E-08	mg/kg/day	7 3E-01	(mg/kg/day)-1	2.E-08	1.4E-07	mg/kg/day	3.0E-02	mg/kg/day	5 E-06
				Phenanthrene	0 00975	mg/kg	NC		NC			1.9E-06	mg/kg/day	3.0E-02	mg/kg/day	6 E-05
				4,4'-DDD	0.0128	mg/kg	4.3E-07	mg/kg/day	2 4E-01	(mg/kg/day)-1	1.E-07	2.5E-06	mg/kg/day	5.0E-04	mg/kg/day	5 E-03
				4,4'-DDE	0.0249	mg/kg	8.5E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	3.E-07	4.9E-06	mg/kg/day	5.0E-04	mg/kg/day	1 E-02
				4,4'-DDT	0.00789	mg/kg	2.7E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	9.E-08	1.6E-06	mg/kg/day	5 0E-04	mg/kg/day	3.E-03
				alpha-Chlordane	0.0214	mg/kg	7.3E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-07	4.2E-06	mg/kg/day	5.0E-04	mg/kg/day	8.E-03
				Aroclor-1254	1.8853	mg/kg	6.4E-05	mg/kg/day	2 0E+00	(mg/kg/day)-1	1.E-04	3.7E-04	mg/kg/day	2.0E-05	mg/kg/day	2 E+01
				Aroclor-1268	0.02673	mg/kg	9.1E-07	mg/kg/day	2 0E+00	(mg/kg/day)-1	2.E-06	5.3E-06	mg/kg/day	2 0E-05	mg/kg/day	3 E-01
				beta-BHC	0.0005	mg/kg	1.7E-08	mg/kg/day	1.8E+00	(mg/kg/day)-1	3.E-08	9.9E-08	mg/kg/day	3.0E-04	mg/kg/day	3 E-04
				Dieldrin	0.00889	mg/kg	3.0E-07	mg/kg/day	1.6E+01	(mg/kg/day)-1	5.E-06	1.8E-06	mg/kg/day	5.0E-05	mg/kg/day	4 E-02
				Endosulfan Sulfate	0 001	mg/kg	NC		NC			2.0E-07	mg/kg/day	6.0E-03	mg/kg/day	3 E-05
				Endrin Aldehyde	0.0005	mg/kg	NC		NC			9.9E-08	mg/kg/day	3.0E-04	mg/kg/day	3.E-04
				gamma-Chlordane	0.008	mg/kg	2.7E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-07	1.6E-06	mg/kg/day	5.0E-04	mg/kg/day	3.E-03
				Heptachlor	0.0005	mg/kg	1.7E-08	mg/kg/day	4.5E+00	(mg/kg/day)-1	8.E-08	9.9E-08	mg/kg/day	5.0E-04	mg/kg/day	2.E-04
				Heptachlor Epoxide	0 0011	mg/kg	3.7E-08	mg/kg/day	9.1E+00	(mg/kg/day)-1	3.E-07	2.2E-07	mg/kg/day	1.3E-05	mg/kg/day	2.E-02
				Technical Chlordane	0.468	mg/kg	1.6E-05	mg/kg/day	3.5E-01	(mg/kg/day)-1	6.E-06	9.3E-05	mg/kg/day	5.0E-04	mg/kg/day	2.E-01
				Cadmium	0.0644	mg/kg	NC		NC			1.3E-05	mg/kg/day	1.0E-03	mg/kg/day	1.E-02
				Chromium	0.103	mg/kg	NC		NC			2.0E-05	mg/kg/day	3.0E-03	mg/kg/day	7.E-03
				Lead	0.464	mg/kg	1.6E-05	mg/kg/day	--			9.2E-05	mg/kg/day			
				Manganese	6.7	mg/kg	NC		NC			1.3E-03	mg/kg/day	1.4E-01	mg/kg/day	9.E-03
				Mercury	0.144	mg/kg	NC		NC			2.9E-05	mg/kg/day	3 0E-04	mg/kg/day	1.E-01
				Mercury (methyl)	0.208	mg/kg	NC		NC			4.1E-05	mg/kg/day	1.0E-04	mg/kg/day	4.E-01
				Toxicity Equivalency (PCB Congeners)	0 000032	mg/kg	1.1E-09	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-04	6.3E-09	mg/kg/day			
				Toxicity Equivalency (Dioxins/Furans)	0.000301	mg/kg	1.0E-08	mg/kg/day	1.5E+05	(mg/kg/day)-1	2 E-03	6.0E-08	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-03					2.0.E+01
		EXPOSURE POINT TOTAL									2 E-03					2.0 E+01
	EXPOSURE MEDIUM TOTAL										2.E-03					2.0 E+01
COMBINED FISH DIET TOTAL											2.E-03					2.0.E+01
							TOTAL RECEPTOR RISK ACROSS ALL MEDIA				2.E-03	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				2.0.E+01

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available

Prepared by: KJA
Checked by: MJM

TABLE 7.18.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SOIL	SOIL	ALLENDALE POND	INGESTION	2,3,7,8-TCDD	0.00027	mg/kg	6.6E-11	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-05	7.7E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-05					--
			DERMAL	2,3,7,8-TCDD	0.00027	mg/kg	5.5E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	8.E-07	6.5E-11	mg/kg/day			
			EXPOSURE ROUTE TOTAL								8.E-07					--
		EXPOSURE POINT TOTAL									1.E-05					0.E+00
	EXPOSURE MEDIUM TOTAL										1.E-05					0.E+00
SOIL TOTAL											1.E-05					0.E+00
SEDIMENT	SEDIMENT	ALLENDALE POND	INGESTION	2-Methylnaphthalene	0.13608	mg/kg	NC		NC			2.6E-07	mg/kg/day	2.0E-02	mg/kg/day	1.E-05
				Acenaphthylene	0.97	mg/kg	NC		NC			1.8E-06	mg/kg/day	6.0E-02	mg/kg/day	3.E-05
				Benzo(a)anthracene	3.4	mg/kg	5.5E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-07	6.5E-06	mg/kg/day	3.0E-02	mg/kg/day	2.E-04
				Benzo(a)pyrene	4	mg/kg	6.5E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	5.E-06	7.6E-06	mg/kg/day	3.0E-02	mg/kg/day	3.E-04
				Benzo(b)fluoranthene	4.4	mg/kg	7.2E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	5.E-07	8.4E-06	mg/kg/day	3.0E-02	mg/kg/day	3.E-04
				Benzo(g,h,i)perylene	2	mg/kg	NC		NC			3.8E-06	mg/kg/day	3.0E-02	mg/kg/day	1.E-04
				Benzo(k)fluoranthene	3.9	mg/kg	6.3E-07	mg/kg/day	7.3E-02	(mg/kg/day)-1	5.E-08	7.4E-06	mg/kg/day	3.0E-02	mg/kg/day	2.E-04
				bis(2-Ethylhexyl)phthalate	3.2	mg/kg	5.2E-07	mg/kg/day	1.4E-02	(mg/kg/day)-1	7.E-09	6.1E-06	mg/kg/day	2.0E-02	mg/kg/day	3.E-04
				Dibenzo(a,h)anthracene	2	mg/kg	3.3E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-06	3.8E-06	mg/kg/day	3.0E-02	mg/kg/day	1.E-04
				Indeno(1,2,3-cd)pyrene	3.2	mg/kg	5.2E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-07	6.1E-06	mg/kg/day	3.0E-02	mg/kg/day	2.E-04
				Pentachlorophenol	6.5	mg/kg	1.1E-06	mg/kg/day	1.2E-01	(mg/kg/day)-1	1.E-07	1.2E-05	mg/kg/day	3.0E-02	mg/kg/day	4.E-04
				Phenanthrene	4.8	mg/kg	NC		NC			9.1E-06	mg/kg/day	3.0E-02	mg/kg/day	3.E-04
				alpha-Chlordane	0.0113	mg/kg	1.8E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	6.E-10	2.1E-08	mg/kg/day	5.0E-04	mg/kg/day	4.E-05
				Aroclor-1254	2.4	mg/kg	3.9E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	8.E-07	4.6E-06	mg/kg/day	2.0E-05	mg/kg/day	2.E-01
				Aroclor-1260	0.2	mg/kg	3.3E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	7.E-08	3.8E-07	mg/kg/day	2.0E-05	mg/kg/day	2.E-02
				Aroclor-1268	0.079	mg/kg	1.3E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-08	1.5E-07	mg/kg/day	2.0E-05	mg/kg/day	8.E-03
				delta-BHC	0.0014	mg/kg	NC		NC			2.7E-09	mg/kg/day	3.0E-04	mg/kg/day	9.E-06
				Dieldrin	0.009	mg/kg	1.5E-09	mg/kg/day	1.6E+01	(mg/kg/day)-1	2.E-08	1.7E-08	mg/kg/day	5.0E-05	mg/kg/day	3.E-04
				Endosulfan II	0.037	mg/kg	NC		NC			7.0E-08	mg/kg/day	6.0E-03	mg/kg/day	1.E-05
				Endosulfan sulfate	0.0027	mg/kg	NC		NC			5.1E-09	mg/kg/day	6.0E-03	mg/kg/day	9.E-07
				Endrin aldehyde	0.0029	mg/kg	NC		NC			5.5E-09	mg/kg/day	3.0E-04	mg/kg/day	2.E-05
				Endrin Ketone	0.0038	mg/kg	NC		NC			7.2E-09	mg/kg/day	3.0E-04	mg/kg/day	2.E-05
				gamma-Chlordane	0.017	mg/kg	2.8E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-09	3.2E-08	mg/kg/day	5.0E-04	mg/kg/day	6.E-05
				Technical Chlordane	0.65	mg/kg	1.1E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-08	1.2E-06	mg/kg/day	5.0E-04	mg/kg/day	2.E-03
				Antimony	4.8	mg/kg	NC		NC			9.1E-06	mg/kg/day	4.0E-04	mg/kg/day	2.E-02
				Arsenic	5.8	mg/kg	9.4E-07	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-06	1.1E-05	mg/kg/day	3.0E-04	mg/kg/day	4.E-02
				Cadmium	1.2	mg/kg	NC		NC			2.3E-06	mg/kg/day	1.0E-03	mg/kg/day	2.E-03
				Chromium	238	mg/kg	NC		NC			4.5E-04	mg/kg/day	3.0E-03	mg/kg/day	2.E-01
				Lead	488	mg/kg	7.9E-05	mg/kg/day	--			9.3E-04	mg/kg/day			
				Manganese	531	mg/kg	NC		NC			1.0E-03	mg/kg/day	7.1E-02	mg/kg/day	1.E-02
				Mercury	0.97	mg/kg	NC		NC			1.8E-06	mg/kg/day	3.0E-04	mg/kg/day	6.E-03
				Nickel	26.7	mg/kg	NC		NC			5.1E-05	mg/kg/day	2.0E-02	mg/kg/day	3.E-03
				Thallium	6.8	mg/kg	NC		NC			1.3E-05	mg/kg/day	8.0E-05	mg/kg/day	2.E-01
				Vanadium	45.9	mg/kg	NC		NC			8.7E-05	mg/kg/day	7.0E-03	mg/kg/day	1.E-02
				Toxicity Equivalency (Dioxins/Furans)	0.0057	mg/kg	9.3E-10	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-04	1.1E-08	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.000000112	mg/kg	1.8E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-09	2.1E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-04					7.E-01
			DERMAL	2-Methylnaphthalene	0.13608	mg/kg	NC		NC			9.4E-08	mg/kg/day	2.0E-02	mg/kg/day	5.E-06
				Acenaphthylene	0.97	mg/kg	NC		NC			6.7E-07	mg/kg/day	6.0E-02	mg/kg/day	1.E-05
				Benzo(a)anthracene	3.4	mg/kg	2.0E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-07	2.4E-06	mg/kg/day	3.0E-02	mg/kg/day	8.E-05
				Benzo(a)pyrene	4	mg/kg	2.4E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-06	2.8E-06	mg/kg/day	3.0E-02	mg/kg/day	9.E-05
				Benzo(b)fluoranthene	4.4	mg/kg	2.6E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-07	3.0E-06	mg/kg/day	3.0E-02	mg/kg/day	1.E-04
				Benzo(g,h,i)perylene	2	mg/kg	NC		NC			1.4E-06	mg/kg/day	3.0E-02	mg/kg/day	5.E-05
				Benzo(k)fluoranthene	3.9	mg/kg	2.3E-07	mg/kg/day	7.3E-02	(mg/kg/day)-1	2.E-08	2.7E-06	mg/kg/day	3.0E-02	mg/kg/day	9.E-05
				bis(2-Ethylhexyl)phthalate	3.2	mg/kg	1.5E-07	mg/kg/day	1.4E-02	(mg/kg/day)-1	2.E-09	1.7E-06	mg/kg/day	2.0E-02	mg/kg/day	9.E-05
				Dibenzo(a,h)anthracene	2	mg/kg	1.2E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	9.E-07	1.4E-06	mg/kg/day	3.0E-02	mg/kg/day	5.E-05
				Indeno(1,2,3-cd)pyrene	3.2	mg/kg	1.9E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-07	2.2E-06	mg/kg/day	3.0E-02	mg/kg/day	7.E-05
				Pentachlorophenol	6.5	mg/kg	7.4E-07	mg/kg/day	1.2E-01	(mg/kg/day)-1	9.E-08	8.6E-06	mg/kg/day	3.0E-02	mg/kg/day	3.E-04
				Phenanthrene	4.8	mg/kg	NC		NC			3.3E-06	mg/kg/day	3.0E-02	mg/kg/day	1.E-04

TABLE 7.18.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION VALUE	INTAKE/EXPOSURE CONCENTRATION UNITS	CSF/UNIT RISK VALUE	CSF/UNIT RISK UNITS	CANCER RISK	INTAKE/EXPOSURE CONCENTRATION VALUE	INTAKE/EXPOSURE CONCENTRATION UNITS	RfD/RfC (1) VALUE	RfD/RfC (1) UNITS	HAZARD QUOTIENT
				alpha-Chlordane	0.0113	mg/kg	2.1E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	7.E-11	2.4E-09	mg/kg/day	5.0E-04	mg/kg/day	5.E-06
				Aroclor-1254	2.4	mg/kg	1.5E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-07	1.8E-06	mg/kg/day	2.0E-05	mg/kg/day	9.E-02
				Aroclor-1260	0.2	mg/kg	1.3E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-08	1.5E-07	mg/kg/day	2.0E-05	mg/kg/day	7.E-03
				Aroclor-1268	0.079	mg/kg	5.0E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-08	5.9E-08	mg/kg/day	2.0E-05	mg/kg/day	3.E-03
				delta-BHC	0.0014	mg/kg	NC		NC			7.4E-10	mg/kg/day	3.0E-04	mg/kg/day	2.E-06
				Dieldrin	0.009	mg/kg	4.1E-10	mg/kg/day	1.6E+01	(mg/kg/day)-1	7.E-09	4.8E-09	mg/kg/day	5.0E-05	mg/kg/day	1.E-04
				Endosulfan II	0.037	mg/kg	NC		NC			2.0E-08	mg/kg/day	6.0E-03	mg/kg/day	3.E-06
				Endosulfan sulfate	0.0027	mg/kg	NC		NC			1.4E-09	mg/kg/day	6.0E-03	mg/kg/day	2.E-07
				Endrin aldehyde	0.0029	mg/kg	NC		NC			1.5E-09	mg/kg/day	3.0E-04	mg/kg/day	5.E-06
				Endrin Ketone	0.0038	mg/kg	NC		NC			2.0E-09	mg/kg/day	3.0E-04	mg/kg/day	7.E-06
				gamma-Chlordane	0.017	mg/kg	3.1E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-10	3.6E-09	mg/kg/day	5.0E-04	mg/kg/day	7.E-06
				Technical Chlordane	0.65	mg/kg	1.2E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-09	1.4E-07	mg/kg/day	5.0E-04	mg/kg/day	3.E-04
				Antimony	4.8	mg/kg	NC		NC					6.0E-05	mg/kg/day	
				Arsenic	5.8	mg/kg	7.9E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-07	9.3E-07	mg/kg/day	3.0E-04	mg/kg/day	3.E-03
				Cadmium	1.2	mg/kg	NC		NC			6.4E-09	mg/kg/day	2.5E-05	mg/kg/day	3.E-04
				Chromium	238	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	488	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	531	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Mercury	0.97	mg/kg	NC		NC					2.1E-05	mg/kg/day	
				Nickel	26.7	mg/kg	NC		NC					8.0E-04	mg/kg/day	
				Thallium	6.8	mg/kg	NC		NC					8.0E-05	mg/kg/day	
				Vanadium	45.9	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.0057	mg/kg	7.8E-11	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-05	9.1E-10	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.000000112	mg/kg	1.5E-15	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-10	1.8E-14	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-05					1.E-01
		EXPOSURE POINT TOTAL									2.E-04					8.E-01
	EXPOSURE MEDIUM TOTAL										2.E-04					8.E-01
SEDIMENT TOTAL											2.E-04					8.E-01
SURFACE WATER	SURFACE WATER	ALLENDALE POND	INGESTION	Tetrachloroethene	0.0007	mg/l	2.8E-08	mg/kg/day	5.4E-01	mg/kg/day	2.E-08	3.3E-07	mg/kg/day	1.0E-02	mg/kg/day	3.E-05
				bis(2-Ethylhexyl)phthalate	0.001	mg/l	4.1E-08	mg/kg/day	1.4E-02	mg/kg/day	6.E-10	4.7E-07	mg/kg/day	2.0E-02	mg/kg/day	2.E-05
				Aldrin	0.000011	mg/l	4.5E-10	mg/kg/day	1.7E+01	mg/kg/day	8.E-09	5.2E-09	mg/kg/day	3.0E-05	mg/kg/day	2.E-04
				alpha-Chlordane	0.00000069	mg/l	2.8E-11	mg/kg/day	3.5E-01	mg/kg/day	1.E-11	3.3E-10	mg/kg/day	5.0E-04	mg/kg/day	7.E-07
				delta-BHC	0.0000096	mg/l	NC		NC			4.6E-09	mg/kg/day	3.0E-04	mg/kg/day	2.E-05
				Endosulfan Sulfate	0.0000026	mg/l	NC		NC			1.2E-09	mg/kg/day	6.0E-03	mg/kg/day	2.E-07
				Endrin Aldehyde	0.0000028	mg/l	NC		NC			1.3E-09	mg/kg/day	3.0E-04	mg/kg/day	4.E-06
				gamma-Chlordane	0.00000075	mg/l	3.1E-11	mg/kg/day	3.5E-01	mg/kg/day	1.E-11	3.6E-10	mg/kg/day	5.0E-04	mg/kg/day	7.E-07
				Arsenic	0.0075	mg/l	3.1E-07	mg/kg/day	1.5E+00	mg/kg/day	5.E-07	3.6E-06	mg/kg/day	3.0E-04	mg/kg/day	1.E-02
				Barium	0.045	mg/l	NC		NC			2.1E-05	mg/kg/day	7.0E-02	mg/kg/day	3.E-04
				Chromium	0.027	mg/l	NC		NC			1.3E-05	mg/kg/day	3.0E-03	mg/kg/day	4.E-03
				Lead	0.013	mg/l	5.3E-07	mg/kg/day	--			6.2E-06	mg/kg/day			
				Manganese	0.42	mg/l	NC		NC			2.0E-04	mg/kg/day	2.4E-02	mg/kg/day	8.E-03
				Mercury	0.00000319	mg/l	NC		NC			1.5E-09	mg/kg/day	3.0E-04	mg/kg/day	5.E-06
				Thallium	0.0145	mg/l	NC		NC			6.9E-06	mg/kg/day	8.0E-05	mg/kg/day	9.E-02
				Nitrate	0.773	mg/l	NC		NC			3.7E-04	mg/kg/day	1.6E+00	mg/kg/day	2.E-04
				Nitrite-N	0.139	mg/l	NC		NC			6.6E-05	mg/kg/day	1.0E-01	mg/kg/day	7.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.000000385	mg/l	1.6E-11	mg/kg/day	1.5E+05	mg/kg/day	2.E-06	1.8E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-06					1.E-01
			DERMAL	Tetrachloroethene	0.0007	mg/l	1.4E-07	mg/kg/day	5.4E-01	mg/kg/day	8.E-08	1.6E-06	mg/kg/day	1.0E-02	mg/kg/day	2.E-04
				bis(2-Ethylhexyl)phthalate	0.001	mg/l	5.3E-07	mg/kg/day	1.4E-02	mg/kg/day	7.E-09	6.2E-06	mg/kg/day	2.0E-02	mg/kg/day	3.E-04
				Aldrin	0.000011	mg/l	3.4E-10	mg/kg/day	1.7E+01	mg/kg/day	6.E-09	3.9E-09	mg/kg/day	3.0E-05	mg/kg/day	1.E-04
				alpha-Chlordane	0.00000069	mg/l	4.9E-10	mg/kg/day	3.5E-01	mg/kg/day	2.E-10	5.7E-09	mg/kg/day	5.0E-04	mg/kg/day	1.E-05
				delta-BHC	0.0000096	mg/l	NC		NC			1.5E-08	mg/kg/day	3.0E-04	mg/kg/day	5.E-05
				Endosulfan Sulfate	0.0000026	mg/l	NC		NC			--		6.0E-03	mg/kg/day	

TABLE 7.18.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Endrin Aldehyde	0.0000028	mg/l	NC		NC			7.9E-09	mg/kg/day	3.0E-04	mg/kg/day	3 E-05
				gamma-Chlordane	0.00000075	mg/l	5 3E-10	mg/kg/day	3.5E-01	mg/kg/day	2.E-10	6.2E-09	mg/kg/day	5.0E-04	mg/kg/day	1.E-05
				Arsenic	0.0075	mg/l	1.6E-08	mg/kg/day	1.5E+00	mg/kg/day	2.E-08	1 9E-07	mg/kg/day	3 0E-04	mg/kg/day	6.E-04
				Barium	0.045	mg/l	NC		NC			1.1E-06	mg/kg/day	4 9E-03	mg/kg/day	2.E-04
				Chromium	0.027	mg/l	NC		NC			1.4E-06	mg/kg/day	7.5E-05	mg/kg/day	2.E-02
				Lead	0.013	mg/l	--		--			--				
				Manganese	0 42	mg/l	NC		NC			1.1E-05	mg/kg/day	9.6E-04	mg/kg/day	1 E-02
				Mercury	0.00000319	mg/l	NC		NC			8.1E-11	mg/kg/day	2.1E-05	mg/kg/day	4 E-06
				Thallium	0.0145	mg/l	NC		NC			3.7E-07	mg/kg/day	8.0E-05	mg/kg/day	5.E-03
				Nitrate	0.773	mg/l	NC		NC			--		1 6E+00	mg/kg/day	
				Nitrite-N	0.139	mg/l	NC		NC			--		1 0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000000385	mg/l	0 0E+00	mg/kg/day	1 5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1 E-07					4 E-02
		EXPOSURE POINT TOTAL									3.E-06					1 E-01
	EXPOSURE MEDIUM TOTAL										3 E-06					1.E-01
SURFACE WATER TOTAL											3.E-06					1.E-01
BIOTA	COMBINED FISH DIET	ALLENDALE POND	INGESTION	Acenaphthylene	0.002	mg/kg	NC		NC			6 0E-07	mg/kg/day	6.0E-02	mg/kg/day	1 E-05
				Benzo(a)anthracene	0.0014	mg/kg	3.6E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-08	4 2E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(a)pyrene	0.0015	mg/kg	3 9E-08	mg/kg/day	7 3E+00	(mg/kg/day)-1	3.E-07	4.5E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(b)fluoranthene	0.0016	mg/kg	4 1E-08	mg/kg/day	7 3E-01	(mg/kg/day)-1	3 E-08	4 8E-07	mg/kg/day	3 0E-02	mg/kg/day	2 E-05
				Benzo(g,h,i)perylene	0.00065	mg/kg	NC		NC			2.0E-07	mg/kg/day	3.0E-02	mg/kg/day	7 E-06
				Dibenzo(a,h)anthracene	0.00053	mg/kg	1.4E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	1 E-07	1.6E-07	mg/kg/day	3.0E-02	mg/kg/day	5 E-06
				Indeno(1,2,3-cd)pyrene	0.00073	mg/kg	1.9E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	2.2E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Phenanthrene	0 00975	mg/kg	NC		NC			2.9E-06	mg/kg/day	3.0E-02	mg/kg/day	1.E-04
				4,4'-DDD	0.0128	mg/kg	3.3E-07	mg/kg/day	2 4E-01	(mg/kg/day)-1	8.E-08	3.8E-06	mg/kg/day	5.0E-04	mg/kg/day	8.E-03
				4,4'-DDE	0.0249	mg/kg	6.4E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	2.E-07	7.5E-06	mg/kg/day	5.0E-04	mg/kg/day	1.E-02
				4,4'-DDT	0.00789	mg/kg	2.0E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	7.E-08	2.4E-06	mg/kg/day	5.0E-04	mg/kg/day	5.E-03
				alpha-Chlordane	0.0214	mg/kg	5 5E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-07	6 4E-06	mg/kg/day	5.0E-04	mg/kg/day	1.E-02
				Aroclor-1254	1.8853	mg/kg	4.9E-05	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-04	5.7E-04	mg/kg/day	2.0E-05	mg/kg/day	3.E+01
				Aroclor-1268	0 02673	mg/kg	6.9E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-06	8.0E-06	mg/kg/day	2.0E-05	mg/kg/day	4.E-01
				beta-BHC	0 0005	mg/kg	1.3E-08	mg/kg/day	1.8E+00	(mg/kg/day)-1	2.E-08	1.5E-07	mg/kg/day	3.0E-04	mg/kg/day	5 E-04
				Dieldrin	0 00889	mg/kg	2.3E-07	mg/kg/day	1.6E+01	(mg/kg/day)-1	4.E-06	2.7E-06	mg/kg/day	5.0E-05	mg/kg/day	5.E-02
				Endosulfan Sulfate	0 001	mg/kg	NC		NC			3.0E-07	mg/kg/day	6 0E-03	mg/kg/day	5.E-05
				Endrin Aldehyde	0.0005	mg/kg	NC		NC			1.5E-07	mg/kg/day	3.0E-04	mg/kg/day	5.E-04
				gamma-Chlordane	0 008	mg/kg	2 1E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	7.E-08	2.4E-06	mg/kg/day	5.0E-04	mg/kg/day	5 E-03
				Heptachlor	0.0005	mg/kg	1.3E-08	mg/kg/day	4 5E+00	(mg/kg/day)-1	6.E-08	1.5E-07	mg/kg/day	5.0E-04	mg/kg/day	3.E-04
				Heptachlor Epoxide	0.0011	mg/kg	2 8E-08	mg/kg/day	9 1E+00	(mg/kg/day)-1	3.E-07	3.3E-07	mg/kg/day	1.3E-05	mg/kg/day	3.E-02
				Technical Chlordane	0.468	mg/kg	1.2E-05	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-06	1.4E-04	mg/kg/day	5.0E-04	mg/kg/day	3 E-01
				Cadmium	0 0644	mg/kg	NC		NC			1.9E-05	mg/kg/day	1 0E-03	mg/kg/day	2 E-02
				Chromium	0 103	mg/kg	NC		NC			3 1E-05	mg/kg/day	3 0E-03	mg/kg/day	1.E-02
				Lead	0 464	mg/kg	1.2E-05	mg/kg/day	--			1.4E-04	mg/kg/day			
				Manganese	6.7	mg/kg	NC		NC			2.0E-03	mg/kg/day	1.4E-01	mg/kg/day	1.E-02
				Mercury	0.144	mg/kg	NC		NC			4.3E-05	mg/kg/day	3.0E-04	mg/kg/day	1.E-01
				Mercury (methyl)	0.208	mg/kg	NC		NC			6.2E-05	mg/kg/day	1.0E-04	mg/kg/day	6.E-01
				Toxicity Equivalency (PCB Congeners)	0 000032	mg/kg	8.2E-10	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-04	9.6E-09	mg/kg/day			
				Toxicity Equivalency (Dioxins/Furans)	0.000301	mg/kg	7.8E-09	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-03	9.0E-08	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1 E-03					3 0 E+01
		EXPOSURE POINT TOTAL									1.E-03					3.0.E+01
	EXPOSURE MEDIUM TOTAL										1 E-03					3 0 E+01
COMBINED FISH DIET TOTAL											1.E-03					3.0.E+01
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	2.E-03				TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA	3.1.E+01

NOTES
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: MJM

TABLE 7.19.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	LYMAN MILL POND	INGESTION	2-Methylnaphthalene	0.1	mg/kg	NC		NC			2.5E-09	mg/kg/day	2.0E-02	mg/kg/day	1 E-07
				4-Chloro-3-methylphenol	1.3	mg/kg	NC		NC			3 3E-08	mg/kg/day	5.0E-03	mg/kg/day	7 E-06
				4-Nitrophenol	2.2	mg/kg	NC		NC			5 6E-08	mg/kg/day			
				Acenaphthylene	0.42856	mg/kg	NC		NC			1.1E-08	mg/kg/day	6.0E-02	mg/kg/day	2 E-07
				Benzo(a)anthracene	2.8	mg/kg	1.2E-08	mg/kg/day	7 3E-01	(mg/kg/day)-1	9 E-09	7.1E-08	mg/kg/day	3 0E-02	mg/kg/day	2 E-06
				Benzo(a)pyrene	2.9	mg/kg	1.3E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	9.E-08	7.4E-08	mg/kg/day	3.0E-02	mg/kg/day	2 E-06
				Benzo(b)fluoranthene	4.5	mg/kg	2.0E-08	mg/kg/day	7 3E-01	(mg/kg/day)-1	1.E-08	1 1E-07	mg/kg/day	3.0E-02	mg/kg/day	4 E-06
				Benzo(g,h,i)perylene	3	mg/kg	NC		NC			7.6E-08	mg/kg/day	3.0E-02	mg/kg/day	3 E-06
				Benzo(k)fluoranthene	2.1	mg/kg	9 2E-09	mg/kg/day	7 3E-02	(mg/kg/day)-1	7 E-10	5.3E-08	mg/kg/day	3.0E-02	mg/kg/day	2 E-06
				bis(2-Ethylhexyl)phthalate	5 2	mg/kg	2.3E-08	mg/kg/day	1.4E-02	(mg/kg/day)-1	3.E-10	1.3E-07	mg/kg/day	2.0E-02	mg/kg/day	7.E-06
				Dibenzo(a,h)anthracene	1 0694	mg/kg	4.7E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-08	2.7E-08	mg/kg/day	3.0E-02	mg/kg/day	9.E-07
				Indeno(1,2,3-cd)pyrene	2 7	mg/kg	1.2E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	9.E-09	6.9E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				N-Nitroso-di-n-propylamine	1 3	mg/kg	5.7E-09	mg/kg/day	7.0E+00	(mg/kg/day)-1	4.E-08	3.3E-08	mg/kg/day			
				Pentachlorophenol	1 4	mg/kg	6.1E-09	mg/kg/day	1.2E-01	(mg/kg/day)-1	7.E-10	3.6E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Phenanthrene	2.8	mg/kg	NC		NC			7 1E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				alpha-Chlordane	0.032	mg/kg	1.4E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	5.E-11	8.1E-10	mg/kg/day	5.0E-04	mg/kg/day	2.E-06
				Aroclor-1254	0.49	mg/kg	2.1E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	4.E-09	1.2E-08	mg/kg/day	2.0E-05	mg/kg/day	6.E-04
				Aroclor-1260	0.027	mg/kg	1.2E-10	mg/kg/day	2 0E+00	(mg/kg/day)-1	2.E-10	6.9E-10	mg/kg/day	2.0E-05	mg/kg/day	3.E-05
				Aroclor-1268	0.31379	mg/kg	1.4E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-09	8.0E-09	mg/kg/day	2.0E-05	mg/kg/day	4.E-04
				Dieldrin	0.0044	mg/kg	1 9E-11	mg/kg/day	1.6E+01	(mg/kg/day)-1	3.E-10	1.1E-10	mg/kg/day	5.0E-05	mg/kg/day	2.E-06
				Endosulfan II	0 005	mg/kg	NC		NC			1.3E-10	mg/kg/day	6.0E-03	mg/kg/day	2.E-08
				Endosulfan sulfate	0.0029	mg/kg	NC		NC			7.4E-11	mg/kg/day	6 0E-03	mg/kg/day	1.E-08
				gamma-Chlordane	0.015	mg/kg	6 5E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-11	3.8E-10	mg/kg/day	5.0E-04	mg/kg/day	8.E-07
				Technical Chlordane	2.21273	mg/kg	9.7E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-09	5.6E-08	mg/kg/day	5.0E-04	mg/kg/day	1.E-04
				Antimony	3.1	mg/kg	NC		NC			7.9E-08	mg/kg/day	4.0E-04	mg/kg/day	2.E-04
				Arsenic	6.4	mg/kg	2.8E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	4.E-08	1.6E-07	mg/kg/day	3.0E-04	mg/kg/day	5 E-04
				Cadmium	2 1	mg/kg	NC		NC			5.3E-08	mg/kg/day	1.0E-03	mg/kg/day	5.E-05
				Chromium	200	mg/kg	NC		NC			5.1E-06	mg/kg/day	3.0E-03	mg/kg/day	2.E-03
				Lead	375	mg/kg	1.6E-06	mg/kg/day	--			9.5E-06	mg/kg/day			
				Manganese	843	mg/kg	NC		NC			2.1E-05	mg/kg/day	7.1E-02	mg/kg/day	3 E-04
				Mercury	0.62	mg/kg	NC		NC			1.6E-08	mg/kg/day	3.0E-04	mg/kg/day	5.E-05
				Nickel	69.2	mg/kg	NC		NC			1.8E-06	mg/kg/day	2.0E-02	mg/kg/day	9.E-05
				Thallium	0.58	mg/kg	NC		NC			1.5E-08	mg/kg/day	8.0E-05	mg/kg/day	2.E-04
				Vanadium	42.4	mg/kg	NC		NC			1.1E-06	mg/kg/day	7.0E-03	mg/kg/day	2.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.00803	mg/kg	3.5E-11	mg/kg/day	1.5E+05	(mg/kg/day)-1	5.E-06	2.0E-10	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.0000649	mg/kg	2.8E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	4.E-08	1.7E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								6.E-06					4 E-03
			DERMAL	2-Methylnaphthalene	0.1	mg/kg	NC		NC			2.3E-09	mg/kg/day	2.0E-02	mg/kg/day	1.E-07
				4-Chloro-3-methylphenol	1.3	mg/kg	NC		NC			2.3E-08	mg/kg/day	5.0E-03	mg/kg/day	5.E-06
				4-Nitrophenol	2.2	mg/kg	NC		NC			3.8E-08	mg/kg/day			
				Acenaphthylene	0.42856	mg/kg	NC		NC			9.6E-09	mg/kg/day	6.0E-02	mg/kg/day	2 E-07
				Benzo(a)anthracene	2.8	mg/kg	1.1E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-09	6.3E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(a)pyrene	2.9	mg/kg	1.1E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	8.E-08	6.5E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(b)fluoranthene	4.5	mg/kg	1 7E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	1.0E-07	mg/kg/day	3 0E-02	mg/kg/day	3.E-06
				Benzo(g,h,i)perylene	3	mg/kg	NC		NC			6.8E-08	mg/kg/day	3 0E-02	mg/kg/day	2.E-06
				Benzo(k)fluoranthene	2.1	mg/kg	8.1E-09	mg/kg/day	7.3E-02	(mg/kg/day)-1	6.E-10	4.7E-08	mg/kg/day	3.0E-02	mg/kg/day	2 E-06
				bis(2-Ethylhexyl)phthalate	5.2	mg/kg	1.5E-08	mg/kg/day	1.4E-02	(mg/kg/day)-1	2.E-10	9.0E-08	mg/kg/day	2.0E-02	mg/kg/day	5 E-06
				Dibenzo(a,h)anthracene	1 0694	mg/kg	4.1E-09	mg/kg/day	7 3E+00	(mg/kg/day)-1	3.E-08	2.4E-08	mg/kg/day	3.0E-02	mg/kg/day	8 E-07
				Indeno(1,2,3-cd)pyrene	2.7	mg/kg	1.0E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-09	6.1E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				N-Nitroso-di-n-propylamine	1.3	mg/kg	3.9E-09	mg/kg/day	7.0E+00	(mg/kg/day)-1	3.E-08	2.3E-08	mg/kg/day			
				Pentachlorophenol	1.4	mg/kg	1.0E-08	mg/kg/day	1.2E-01	(mg/kg/day)-1	1.E-09	6.1E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Phenanthrene	2.8	mg/kg	NC		NC			6.3E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				alpha-Chlordane	0.032	mg/kg	3 8E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	1 E-11	2.2E-10	mg/kg/day	5.0E-04	mg/kg/day	4.E-07
				Aroclor-1254	0 49	mg/kg	2.0E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	4.E-09	1.2E-08	mg/kg/day	2.0E-05	mg/kg/day	6.E-04
				Aroclor-1260	0 027	mg/kg	1.1E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-10	6.5E-10	mg/kg/day	2.0E-05	mg/kg/day	3.E-05
				Aroclor-1268	0 31379	mg/kg	1.3E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-09	7.6E-09	mg/kg/day	2.0E-05	mg/kg/day	4.E-04
				Dieldrin	0.0044	mg/kg	1.3E-11	mg/kg/day	1.6E+01	(mg/kg/day)-1	2.E-10	7 6E-11	mg/kg/day	5.0E-05	mg/kg/day	2.E-06
				Endosulfan II	0.005	mg/kg	NC		NC			8.7E-11	mg/kg/day	6.0E-03	mg/kg/day	1.E-08
				Endosulfan sulfate	0 0029	mg/kg	NC		NC			5.0E-11	mg/kg/day	6.0E-03	mg/kg/day	8.E-09
				gamma-Chlordane	0.015	mg/kg	1.8E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	6.E-12	1.0E-10	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				Technical Chlordane	2.21273	mg/kg	2.6E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	9.E-10	1.5E-08	mg/kg/day	5.0E-04	mg/kg/day	3.E-05
				Antimony	3.1	mg/kg	NC		NC					6.0E-05	mg/kg/day	

TABLE 7.19.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Arsenic	6.4	mg/kg	5.7E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	9.E-09	3.3E-08	mg/kg/day	3.0E-04	mg/kg/day	1.E-04
				Cadmium	2.1	mg/kg	NC		NC			3.6E-10	mg/kg/day	2.5E-05	mg/kg/day	1.E-05
				Chromium	200	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	375	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	843	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Mercury	0.62	mg/kg	NC		NC					2.1E-05	mg/kg/day	
				Nickel	69.2	mg/kg	NC		NC					8.0E-04	mg/kg/day	
				Thallium	0.58	mg/kg	NC		NC					8.0E-05	mg/kg/day	
				Vanadium	42.4	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00803	mg/kg	7.1E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-06	4.2E-11	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.0000649	mg/kg	5.8E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	9.E-09	3.4E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-06					1.E-03
		EXPOSURE POINT TOTAL									7.E-06					6.E-03
	EXPOSURE MEDIUM TOTAL										7.E-06					6.E-03
SEDIMENT TOTAL											7.E-06					6.E-03
SURFACE WATER	SURFACE WATER	LYMAN MILL POND	INGESTION	Acenaphthylene	0.00000132	mg/l	NC		NC			3.4E-12	mg/kg/day	6.0E-02	mg/kg/day	6.E-11
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	7.4E-09	mg/kg/day	1.4E-02	mg/kg/day	1.E-10	4.3E-08	mg/kg/day	2.0E-02	mg/kg/day	2.E-06
				Aldrin	0.000023	mg/l	1.0E-11	mg/kg/day	1.7E+01	mg/kg/day	2.E-10	5.9E-11	mg/kg/day	3.0E-05	mg/kg/day	2.E-06
				alpha-Chlordane	0.000019	mg/l	8.3E-12	mg/kg/day	3.5E-01	mg/kg/day	3.E-12	4.8E-11	mg/kg/day	5.0E-04	mg/kg/day	1.E-07
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			8.1E-12	mg/kg/day	6.0E-03	mg/kg/day	1.E-09
				Endrin Aldehyde	0.000005	mg/l	NC		NC			1.3E-11	mg/kg/day	3.0E-04	mg/kg/day	4.E-08
				gamma-Chlordane	0.000021	mg/l	9.2E-12	mg/kg/day	3.5E-01	mg/kg/day	3.E-12	5.3E-11	mg/kg/day	5.0E-04	mg/kg/day	1.E-07
				Arsenic	0.0046	mg/l	2.0E-09	mg/kg/day	1.5E+00	mg/kg/day	3.E-09	1.2E-08	mg/kg/day	3.0E-04	mg/kg/day	4.E-05
				Barium	0.021	mg/l	NC		NC			5.3E-08	mg/kg/day	7.0E-02	mg/kg/day	8.E-07
				Chromium	0.0023	mg/l	NC		NC			5.9E-09	mg/kg/day	3.0E-03	mg/kg/day	2.E-06
				Lead	0.0044	mg/l	1.9E-09	mg/kg/day	--			1.1E-08	mg/kg/day			
				Manganese	0.13	mg/l	NC		NC			3.3E-07	mg/kg/day	2.4E-02	mg/kg/day	1.E-05
				Mercury	0.00000394	mg/l	NC		NC			1.0E-11	mg/kg/day	3.0E-04	mg/kg/day	3.E-08
				Thallium	0.0022	mg/l	NC		NC			5.6E-09	mg/kg/day	8.0E-05	mg/kg/day	7.E-05
				Nitrate	0.765	mg/l	NC		NC			1.9E-06	mg/kg/day	1.6E+00	mg/kg/day	1.E-06
				Nitrite-N	0.0865	mg/l	NC		NC			2.2E-07	mg/kg/day	1.0E-01	mg/kg/day	2.E-06
				Toxicity Equivalency (Dioxins/Furans)	0.000000861	mg/l	3.8E-13	mg/kg/day	1.5E+05	mg/kg/day	6.E-08	2.2E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								6.E-08					1.E-04
			DERMAL	Acenaphthylene	0.00000132	mg/l	NC		NC			--		6.0E-02	mg/kg/day	
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	3.1E-06	mg/kg/day	1.4E-02	mg/kg/day	4.E-08	1.8E-05	mg/kg/day	2.0E-02	mg/kg/day	9.E-04
				Aldrin	0.000023	mg/l	2.4E-10	mg/kg/day	1.7E+01	mg/kg/day	4.E-09	1.4E-09	mg/kg/day	3.0E-05	mg/kg/day	5.E-05
				alpha-Chlordane	0.000019	mg/l	4.7E-09	mg/kg/day	3.5E-01	mg/kg/day	2.E-09	2.7E-08	mg/kg/day	5.0E-04	mg/kg/day	5.E-05
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			--		6.0E-03	mg/kg/day	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			2.4E-09	mg/kg/day	3.0E-04	mg/kg/day	8.E-06
				gamma-Chlordane	0.000021	mg/l	5.2E-09	mg/kg/day	3.5E-01	mg/kg/day	2.E-09	3.0E-08	mg/kg/day	5.0E-04	mg/kg/day	6.E-05
				Arsenic	0.0046	mg/l	3.5E-09	mg/kg/day	1.5E+00	mg/kg/day	5.E-09	2.0E-08	mg/kg/day	3.0E-04	mg/kg/day	7.E-05
				Barium	0.021	mg/l	NC		NC			9.3E-08	mg/kg/day	4.9E-03	mg/kg/day	2.E-05
				Chromium	0.0023	mg/l	NC		NC			2.0E-08	mg/kg/day	7.5E-05	mg/kg/day	3.E-04
				Lead	0.0044	mg/l	--		--			--				
				Manganese	0.13	mg/l	NC		NC			5.8E-07	mg/kg/day	9.6E-04	mg/kg/day	6.E-04
				Mercury	0.00000394	mg/l	NC		NC			1.7E-11	mg/kg/day	2.1E-05	mg/kg/day	8.E-07
				Thallium	0.0022	mg/l	NC		NC			9.7E-09	mg/kg/day	8.0E-05	mg/kg/day	1.E-04
				Nitrate	0.765	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.0865	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000000861	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								6.E-08					2.E-03
		EXPOSURE POINT TOTAL									1.E-07					2.E-03
	EXPOSURE MEDIUM TOTAL										1.E-07					2.E-03
SURFACE WATER TOTAL											1.E-07					2.E-03

TABLE 7.19.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
BIOTA	COMBINED FISH DIET	LYMAN MILL POND	INGESTION	Acenaphthylene	0.002	mg/kg	NC		NC			3.8E-07	mg/kg/day	6.0E-02	mg/kg/day	6.E-06
				Benzo(a)anthracene	0.00443	mg/kg	1.5E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-07	8.5E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Benzo(a)pyrene	0.00545	mg/kg	1.8E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-06	1.0E-06	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Benzo(b)fluoranthene	0.003	mg/kg	9.9E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-08	5.8E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(g,h,i)perylene	0.00426	mg/kg	NC		NC			8.2E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Dibenzo(a,h)anthracene	0.0012	mg/kg	3.9E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-07	2.3E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				Indeno(1,2,3-cd)pyrene	0.00499	mg/kg	1.6E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-07	9.6E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Phenanthrene	0.014	mg/kg	NC		NC			2.7E-06	mg/kg/day	3.0E-02	mg/kg/day	9.E-05
				4,4'-DDD	0.027	mg/kg	8.9E-07	mg/kg/day	2.4E-01	(mg/kg/day)-1	2.E-07	5.2E-06	mg/kg/day	5.0E-04	mg/kg/day	1.E-02
				4,4'-DDE	0.08941	mg/kg	2.9E-06	mg/kg/day	3.4E-01	(mg/kg/day)-1	1.E-06	1.7E-05	mg/kg/day	5.0E-04	mg/kg/day	3.E-02
				4,4'-DDT	0.003	mg/kg	9.9E-08	mg/kg/day	3.4E-01	(mg/kg/day)-1	3.E-08	5.8E-07	mg/kg/day	5.0E-04	mg/kg/day	1.E-03
				alpha-Chlordane	0.02	mg/kg	6.6E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-07	3.8E-06	mg/kg/day	5.0E-04	mg/kg/day	8.E-03
				Aroclor-1254	2.13	mg/kg	7.0E-05	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-04	4.1E-04	mg/kg/day	2.0E-05	mg/kg/day	2.E+01
				Aroclor-1268	0.0215	mg/kg	7.1E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-06	4.1E-06	mg/kg/day	2.0E-05	mg/kg/day	2.E-01
				beta-BHC	0.0008	mg/kg	2.6E-08	mg/kg/day	1.8E+00	(mg/kg/day)-1	5.E-08	1.5E-07	mg/kg/day	3.0E-04	mg/kg/day	5.E-04
				Dieldrin	0.0057	mg/kg	1.9E-07	mg/kg/day	1.6E+01	(mg/kg/day)-1	3.E-06	1.1E-06	mg/kg/day	5.0E-05	mg/kg/day	2.E-02
				gamma-Chlordane	0.013	mg/kg	4.3E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-07	2.5E-06	mg/kg/day	5.0E-04	mg/kg/day	5.E-03
				Heptachlor Epoxide	0.0014	mg/kg	4.6E-08	mg/kg/day	9.1E+00	(mg/kg/day)-1	4.E-07	2.7E-07	mg/kg/day	1.3E-05	mg/kg/day	2.E-02
				Technical Chlordane	1.02	mg/kg	3.4E-05	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-05	2.0E-04	mg/kg/day	5.0E-04	mg/kg/day	4.E-01
				Arsenic	0.024	mg/kg	7.9E-07	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-06	4.6E-06	mg/kg/day	3.0E-04	mg/kg/day	2.E-02
				Cadmium	0.017	mg/kg	NC		NC			3.3E-06	mg/kg/day	1.0E-03	mg/kg/day	3.E-03
				Chromium	0.197	mg/kg	NC		NC			3.8E-05	mg/kg/day	3.0E-03	mg/kg/day	1.E-02
				Lead	0.33	mg/kg	1.1E-05	mg/kg/day	--			6.3E-05	mg/kg/day			
				Manganese	4.31	mg/kg	NC		NC			8.3E-04	mg/kg/day	1.4E-01	mg/kg/day	6.E-03
				Mercury	0.141	mg/kg	NC		NC			2.7E-05	mg/kg/day	3.0E-04	mg/kg/day	9.E-02
				Mercury (methyl)	0.127	mg/kg	NC		NC			2.4E-05	mg/kg/day	1.0E-04	mg/kg/day	2.E-01
				Toxicity Equivalency (PCB Congeners)	*0.0000405*	*mg/kg*	*1.3E-09*	*mg/kg/day*	*1.5E+05*	*(mg/kg/day)-1*	*2.E-04*	*7.8E-09*	*mg/kg/day*			
				Toxicity Equivalency (Dioxins/Furans)	0.00037	mg/kg	1.2E-08	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-03	7.1E-08	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-03					2.1.E+01
		EXPOSURE POINT TOTAL									2.E-03					2.1.E+01
	EXPOSURE MEDIUM TOTAL										2.E-03					2.1.E+01
COMBINED FISH DIET TOTAL											2.E-03					2.1.E+01
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	2.E-03				TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA	2.2.E+01

NOTES.
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by KJA
Checked by MJM

TABLE 7.20.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	LYMAN MILL POND	INGESTION	2-Methylnaphthalene	0.1	mg/kg	NC		NC			4.0E-09	mg/kg/day	2.0E-02	mg/kg/day	2.E-07
				4-Chloro-3-methylphenol	1.3	mg/kg	NC		NC			5.1E-08	mg/kg/day	5.0E-03	mg/kg/day	1.E-05
				4-Nitrophenol	2.2	mg/kg	NC		NC			8.7E-08	mg/kg/day			
				Acenaphthylene	0.42856	mg/kg	NC		NC			1.7E-08	mg/kg/day	6.0E-02	mg/kg/day	3.E-07
				Benzo(a)anthracene	2.8	mg/kg	1.9E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	1.1E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Benzo(a)pyrene	2.9	mg/kg	2.0E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-07	1.1E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Benzo(b)fluoranthene	4.5	mg/kg	3.1E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.8E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Benzo(g,h,i)perylene	3	mg/kg	NC		NC			1.2E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Benzo(k)fluoranthene	2.1	mg/kg	1.4E-08	mg/kg/day	7.3E-02	(mg/kg/day)-1	1.E-09	8.3E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				bis(2-Ethylhexyl)phthalate	5.2	mg/kg	3.5E-08	mg/kg/day	1.4E-02	(mg/kg/day)-1	5.E-10	2.1E-07	mg/kg/day	2.0E-02	mg/kg/day	1.E-05
				Dibenzo(a,h)anthracene	1.0694	mg/kg	7.3E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	5.E-08	4.2E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Indeno(1,2,3-cd)pyrene	2.7	mg/kg	1.8E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	1.1E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				N-Nitroso-di-n-propylamine	1.3	mg/kg	8.8E-09	mg/kg/day	7.0E+00	(mg/kg/day)-1	6.E-08	5.1E-08	mg/kg/day			
				Pentachlorophenol	1.4	mg/kg	9.5E-09	mg/kg/day	1.2E-01	(mg/kg/day)-1	1.E-09	5.5E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Phenanthrene	2.8	mg/kg	NC		NC			1.1E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				alpha-Chlordane	0.032	mg/kg	2.2E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	8.E-11	1.3E-09	mg/kg/day	5.0E-04	mg/kg/day	3.E-06
				Aroclor-1254	0.49	mg/kg	3.3E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	7.E-09	1.9E-08	mg/kg/day	2.0E-05	mg/kg/day	1.E-03
				Aroclor-1260	0.027	mg/kg	1.8E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	4.E-10	1.1E-09	mg/kg/day	2.0E-05	mg/kg/day	5.E-05
				Aroclor-1268	0.31379	mg/kg	2.1E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	4.E-09	1.2E-08	mg/kg/day	2.0E-05	mg/kg/day	6.E-04
				Dieldrin	0.0044	mg/kg	3.0E-11	mg/kg/day	1.6E+01	(mg/kg/day)-1	5.E-10	1.7E-10	mg/kg/day	5.0E-05	mg/kg/day	3.E-06
				Endosulfan II	0.005	mg/kg	NC		NC			2.0E-10	mg/kg/day	6.0E-03	mg/kg/day	3.E-08
				Endosulfan sulfate	0.0029	mg/kg	NC		NC			1.1E-10	mg/kg/day	6.0E-03	mg/kg/day	2.E-08
				gamma-Chlordane	0.015	mg/kg	1.0E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-11	5.9E-10	mg/kg/day	5.0E-04	mg/kg/day	1.E-06
				Technical Chlordane	2.21273	mg/kg	1.5E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	5.E-09	8.8E-08	mg/kg/day	5.0E-04	mg/kg/day	2.E-04
				Antimony	3.1	mg/kg	NC		NC			1.2E-07	mg/kg/day	4.0E-04	mg/kg/day	3.E-04
				Arsenic	6.4	mg/kg	4.3E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	7.E-08	2.5E-07	mg/kg/day	3.0E-04	mg/kg/day	8.E-04
				Cadmium	2.1	mg/kg	NC		NC			8.3E-08	mg/kg/day	1.0E-03	mg/kg/day	8.E-05
				Chromium	200	mg/kg	NC		NC			7.9E-06	mg/kg/day	3.0E-03	mg/kg/day	3.E-03
				Lead	375	mg/kg	2.5E-06	mg/kg/day	--			1.5E-05	mg/kg/day			
				Manganese	843	mg/kg	NC		NC			3.3E-05	mg/kg/day	7.1E-02	mg/kg/day	5.E-04
				Mercury	0.62	mg/kg	NC		NC			2.5E-08	mg/kg/day	3.0E-04	mg/kg/day	8.E-05
				Nickel	69.2	mg/kg	NC		NC			2.7E-06	mg/kg/day	2.0E-02	mg/kg/day	1.E-04
				Thallium	0.58	mg/kg	NC		NC			2.3E-08	mg/kg/day	8.0E-05	mg/kg/day	3.E-04
				Vanadium	42.4	mg/kg	NC		NC			1.7E-06	mg/kg/day	7.0E-03	mg/kg/day	2.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.00803	mg/kg	5.4E-11	mg/kg/day	1.5E+05	(mg/kg/day)-1	8.E-06	3.2E-10	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.0000649	mg/kg	4.4E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	7.E-08	2.6E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								9.E-06					7.E-03
			DERMAL	2-Methylnaphthalene	0.1	mg/kg	NC		NC			7.4E-09	mg/kg/day	2.0E-02	mg/kg/day	4.E-07
				4-Chloro-3-methylphenol	1.3	mg/kg	NC		NC			7.4E-08	mg/kg/day	5.0E-03	mg/kg/day	1.E-05
				4-Nitrophenol	2.2	mg/kg	NC		NC			1.2E-07	mg/kg/day			
				Acenaphthylene	0.42856	mg/kg	NC		NC			3.2E-08	mg/kg/day	6.0E-02	mg/kg/day	5.E-07
				Benzo(a)anthracene	2.8	mg/kg	3.5E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-08	2.1E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Benzo(a)pyrene	2.9	mg/kg	3.7E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-07	2.1E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Benzo(b)fluoranthene	4.5	mg/kg	5.7E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-08	3.3E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(g,h,i)perylene	3	mg/kg	NC		NC			2.2E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Benzo(k)fluoranthene	2.1	mg/kg	2.6E-08	mg/kg/day	7.3E-02	(mg/kg/day)-1	2.E-09	1.5E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				bis(2-Ethylhexyl)phthalate	5.2	mg/kg	5.0E-08	mg/kg/day	1.4E-02	(mg/kg/day)-1	7.E-10	2.9E-07	mg/kg/day	2.0E-02	mg/kg/day	1.E-05
				Dibenzo(a,h)anthracene	1.0694	mg/kg	1.3E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-07	7.9E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Indeno(1,2,3-cd)pyrene	2.7	mg/kg	3.4E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	2.0E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				N-Nitroso-di-n-propylamine	1.3	mg/kg	1.3E-08	mg/kg/day	7.0E+00	(mg/kg/day)-1	9.E-08	7.4E-08	mg/kg/day			
				Pentachlorophenol	1.4	mg/kg	3.4E-08	mg/kg/day	1.2E-01	(mg/kg/day)-1	4.E-09	2.0E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Phenanthrene	2.8	mg/kg	NC		NC			2.1E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				alpha-Chlordane	0.032	mg/kg	1.2E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-11	7.2E-10	mg/kg/day	5.0E-04	mg/kg/day	1.E-06
				Aroclor-1254	0.49	mg/kg	6.7E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-08	3.9E-08	mg/kg/day	2.0E-05	mg/kg/day	2.E-03
				Aroclor-1260	0.027	mg/kg	3.7E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	7.E-10	2.1E-09	mg/kg/day	2.0E-05	mg/kg/day	1.E-04
				Aroclor-1268	0.31379	mg/kg	4.3E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	9.E-09	2.5E-08	mg/kg/day	2.0E-05	mg/kg/day	1.E-03
				Dieldrin	0.0044	mg/kg	4.3E-11	mg/kg/day	1.6E+01	(mg/kg/day)-1	7.E-10	2.5E-10	mg/kg/day	5.0E-05	mg/kg/day	5.E-06
				Endosulfan II	0.005	mg/kg	NC		NC			2.8E-10	mg/kg/day	6.0E-03	mg/kg/day	5.E-08
				Endosulfan sulfate	0.0029	mg/kg	NC		NC			1.6E-10	mg/kg/day	6.0E-03	mg/kg/day	3.E-08
				gamma-Chlordane	0.015	mg/kg	5.8E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-11	3.4E-10	mg/kg/day	5.0E-04	mg/kg/day	7.E-07
				Technical Chlordane	2.21273	mg/kg	8.6E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-09	5.0E-08	mg/kg/day	5.0E-04	mg/kg/day	1.E-04
				Antimony	3.1	mg/kg	NC		NC					6.0E-05	mg/kg/day	
				Arsenic	6.4	mg/kg	1.9E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	3.E-08	1.1E-07	mg/kg/day	3.0E-04	mg/kg/day	4.E-04
				Cadmium	2.1	mg/kg	NC		NC			1.2E-09	mg/kg/day	2.5E-05	mg/kg/day	5.E-05

TABLE 7.20.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Chromium	200	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	375	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	843	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Mercury	0.62	mg/kg	NC		NC					2.1E-05	mg/kg/day	
				Nickel	69.2	mg/kg	NC		NC					8.0E-04	mg/kg/day	
				Thallium	0.58	mg/kg	NC		NC					8.0E-05	mg/kg/day	
				Vanadium	42.4	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00803	mg/kg	2.3E-11	mg/kg/day	1.5E+05	(mg/kg/day)-1	4.E-06	1.4E-10	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.0000649	mg/kg	1.9E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-08	1.1E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-06					4.E-03
		EXPOSURE POINT TOTAL									1.E-05					1.E-02
	EXPOSURE MEDIUM TOTAL										1.E-05					1.E-02
SEDIMENT TOTAL											1.E-05					1.E-02
SURFACE WATER	SURFACE WATER	LYMAN MILL POND	INGESTION	Acenaphthylene	0.00000132	mg/l	NC		NC			5.2E-12	mg/kg/day	6.0E-02	mg/kg/day	9.E-11
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	1.2E-08	mg/kg/day	1.4E-02	mg/kg/day	2.E-10	6.7E-08	mg/kg/day	2.0E-02	mg/kg/day	3.E-06
				Aldrin	0.000023	mg/l	1.6E-11	mg/kg/day	1.7E+01	mg/kg/day	3.E-10	9.1E-11	mg/kg/day	3.0E-05	mg/kg/day	3.E-06
				alpha-Chlordane	0.000019	mg/l	1.3E-11	mg/kg/day	3.5E-01	mg/kg/day	5.E-12	7.5E-11	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			1.3E-11	mg/kg/day	6.0E-03	mg/kg/day	2.E-09
				Endrin Aldehyde	0.000005	mg/l	NC		NC			2.0E-11	mg/kg/day	3.0E-04	mg/kg/day	7.E-08
				gamma-Chlordane	0.000021	mg/l	1.4E-11	mg/kg/day	3.5E-01	mg/kg/day	5.E-12	8.3E-11	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				Arsenic	0.0046	mg/l	3.1E-09	mg/kg/day	1.5E+00	mg/kg/day	5.E-09	1.8E-08	mg/kg/day	3.0E-04	mg/kg/day	6.E-05
				Barium	0.021	mg/l	NC		NC			8.3E-08	mg/kg/day	7.0E-02	mg/kg/day	1.E-06
				Chromium	0.0023	mg/l	NC		NC			9.1E-09	mg/kg/day	3.0E-03	mg/kg/day	3.E-06
				Lead	0.0044	mg/l	3.0E-09	mg/kg/day	--			1.7E-08	mg/kg/day			
				Manganese	0.13	mg/l	NC		NC			5.1E-07	mg/kg/day	2.4E-02	mg/kg/day	2.E-05
				Mercury	0.00000394	mg/l	NC		NC			1.6E-11	mg/kg/day	3.0E-04	mg/kg/day	5.E-08
				Thallium	0.0022	mg/l	NC		NC			8.7E-09	mg/kg/day	8.0E-05	mg/kg/day	1.E-04
				Nitrate	0.765	mg/l	NC		NC			3.0E-06	mg/kg/day	1.6E+00	mg/kg/day	2.E-06
				Nitrite-N	0.0865	mg/l	NC		NC			3.4E-07	mg/kg/day	1.0E-01	mg/kg/day	3.E-06
				Toxicity Equivalency (Dioxins/Furans)	0.000000861	mg/l	5.8E-13	mg/kg/day	1.5E+05	mg/kg/day	9.E-08	3.4E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								9.E-08					2.E-04
			DERMAL	Acenaphthylene	0.00000132	mg/l	NC		NC			--		6.0E-02	mg/kg/day	
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	3.5E-06	mg/kg/day	1.4E-02	mg/kg/day	5.E-08	2.0E-05	mg/kg/day	2.0E-02	mg/kg/day	1.E-03
				Aldrin	0.000023	mg/l	2.7E-10	mg/kg/day	1.7E+01	mg/kg/day	5.E-09	1.6E-09	mg/kg/day	3.0E-05	mg/kg/day	5.E-05
				alpha-Chlordane	0.000019	mg/l	5.3E-09	mg/kg/day	3.5E-01	mg/kg/day	2.E-09	3.1E-08	mg/kg/day	5.0E-04	mg/kg/day	6.E-05
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			--		6.0E-03	mg/kg/day	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			2.7E-09	mg/kg/day	3.0E-04	mg/kg/day	9.E-06
				gamma-Chlordane	0.000021	mg/l	5.8E-09	mg/kg/day	3.5E-01	mg/kg/day	2.E-09	3.4E-08	mg/kg/day	5.0E-04	mg/kg/day	7.E-05
				Arsenic	0.0046	mg/l	3.9E-09	mg/kg/day	1.5E+00	mg/kg/day	6.E-09	2.3E-08	mg/kg/day	3.0E-04	mg/kg/day	8.E-05
				Barium	0.021	mg/l	NC		NC			1.0E-07	mg/kg/day	4.9E-03	mg/kg/day	2.E-05
				Chromium	0.0023	mg/l	NC		NC			2.3E-08	mg/kg/day	7.5E-05	mg/kg/day	3.E-04
				Lead	0.0044	mg/l	--		--			--				
				Manganese	0.13	mg/l	NC		NC			6.4E-07	mg/kg/day	9.6E-04	mg/kg/day	7.E-04
				Mercury	0.00000394	mg/l	NC		NC			2.0E-11	mg/kg/day	2.1E-05	mg/kg/day	9.E-07
				Thallium	0.0022	mg/l	NC		NC			1.1E-08	mg/kg/day	8.0E-05	mg/kg/day	1.E-04
				Nitrate	0.765	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.0865	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000000861	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								6.E-08					2.E-03
		EXPOSURE POINT TOTAL									2.E-07					3.E-03
	EXPOSURE MEDIUM TOTAL										2.E-07					3.E-03
SURFACE WATER TOTAL											2.E-07					3.E-03

TABLE 7.20.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
BIOTA	COMBINED FISH DIET	LYMAN MILL POND	INGESTION	Acenaphthylene	0.002	mg/kg	NC		NC			4.0E-07	mg/kg/day	6.0E-02	mg/kg/day	7 E-06
				Benzo(a)anthracene	0.00443	mg/kg	1 5E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	1 E-07	8 8E-07	mg/kg/day	3 0E-02	mg/kg/day	3.E-05
				Benzo(a)pyrene	0.00545	mg/kg	1.9E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-06	1.1E-06	mg/kg/day	3 0E-02	mg/kg/day	4.E-05
				Benzo(b)fluoranthene	0.003	mg/kg	1.0E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-08	5 9E-07	mg/kg/day	3 0E-02	mg/kg/day	2 E-05
				Benzo(g,h,i)perylene	0.00426	mg/kg	NC		NC			8 4E-07	mg/kg/day	3 0E-02	mg/kg/day	3 E-05
				Dibenzo(a,h)anthracene	0.0012	mg/kg	4.1E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-07	2.4E-07	mg/kg/day	3 0E-02	mg/kg/day	8 E-06
				Indeno(1,2,3-cd)pyrene	0.00499	mg/kg	1.7E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-07	9.9E-07	mg/kg/day	3 0E-02	mg/kg/day	3 E-05
				Phenanthrene	0.014	mg/kg	NC		NC			2.8E-06	mg/kg/day	3.0E-02	mg/kg/day	9 E-05
				4,4'-DDD	0.027	mg/kg	9 2E-07	mg/kg/day	2.4E-01	(mg/kg/day)-1	2.E-07	5.4E-06	mg/kg/day	5.0E-04	mg/kg/day	1 E-02
				4,4'-DDE	0.08941	mg/kg	3.0E-06	mg/kg/day	3.4E-01	(mg/kg/day)-1	1.E-06	1.8E-05	mg/kg/day	5.0E-04	mg/kg/day	4.E-02
				4,4'-DDT	0.003	mg/kg	1.0E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	3.E-08	5 9E-07	mg/kg/day	5.0E-04	mg/kg/day	1.E-03
				alpha-Chlordane	0 02	mg/kg	6.8E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-07	4.0E-06	mg/kg/day	5.0E-04	mg/kg/day	8 E-03
				Aroclor-1254	2.13	mg/kg	7 2E-05	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-04	4.2E-04	mg/kg/day	2.0E-05	mg/kg/day	2 E+01
				Aroclor-1268	0.0215	mg/kg	7.3E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-06	4.3E-06	mg/kg/day	2.0E-05	mg/kg/day	2 E-01
				beta-BHC	0.0008	mg/kg	2.7E-08	mg/kg/day	1.8E+00	(mg/kg/day)-1	5.E-08	1.6E-07	mg/kg/day	3.0E-04	mg/kg/day	5.E-04
				Dieldrin	0.0057	mg/kg	1.9E-07	mg/kg/day	1.6E+01	(mg/kg/day)-1	3.E-06	1.1E-06	mg/kg/day	5.0E-05	mg/kg/day	2.E-02
				gamma-Chlordane	0.013	mg/kg	4.4E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-07	2 6E-06	mg/kg/day	5.0E-04	mg/kg/day	5.E-03
				Heptachlor Epoxide	0.0014	mg/kg	4.8E-08	mg/kg/day	9.1E+00	(mg/kg/day)-1	4.E-07	2.8E-07	mg/kg/day	1.3E-05	mg/kg/day	2.E-02
				Technical Chlordane	1.02	mg/kg	3.5E-05	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-05	2.0E-04	mg/kg/day	5.0E-04	mg/kg/day	4 E-01
				Arsenic	0.024	mg/kg	8.2E-07	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-06	4.8E-06	mg/kg/day	3.0E-04	mg/kg/day	2.E-02
				Cadmium	0.017	mg/kg	NC		NC			3.4E-06	mg/kg/day	1 0E-03	mg/kg/day	3.E-03
				Chromium	0.197	mg/kg	NC		NC			3.9E-05	mg/kg/day	3.0E-03	mg/kg/day	1 E-02
				Lead	0.33	mg/kg	1.1E-05	mg/kg/day	--			6.5E-05	mg/kg/day			
				Manganese	4.31	mg/kg	NC		NC			8.5E-04	mg/kg/day	1.4E-01	mg/kg/day	6 E-03
				Mercury	0.141	mg/kg	NC		NC			2.8E-05	mg/kg/day	3.0E-04	mg/kg/day	9.E-02
				Mercury (methyl)	0.127	mg/kg	NC		NC			2.5E-05	mg/kg/day	1.0E-04	mg/kg/day	3 E-01
				Toxicity Equivalency (PCB Congeners)	0.0000405	mg/kg	1 4E-09	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-04	8.0E-09	mg/kg/day			
				Toxicity Equivalency (Dioxins/Furans)	0.00037	mg/kg	1.3E-08	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-03	7.3E-08	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-03					2.2 E+01
		EXPOSURE POINT TOTAL									2.E-03					2 2 E+01
	EXPOSURE MEDIUM TOTAL										2.E-03					2 2 E+01
COMBINED FISH DIET TOTAL											2.E-03					2.2.E+01
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	2.E-03	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				2.2.E+01

NOTES
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated: dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: MJM

TABLE 7.22.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	LYMAN MILL POND	INGESTION	2-Methylnaphthalene	0.1	mg/kg	NC		NC			1.5E-08	mg/kg/day	2.0E-02	mg/kg/day	8.E-07
				4-Chloro-3-methylphenol	1.3	mg/kg	NC		NC			2.0E-07	mg/kg/day	5.0E-03	mg/kg/day	4 E-05
				4-Nitrophenol	2.2	mg/kg	NC		NC			3.4E-07	mg/kg/day			
				Acenaphthylene	0.42856	mg/kg	NC		NC			6.5E-08	mg/kg/day	6.0E-02	mg/kg/day	1 E-06
				Benzo(a)anthracene	2.8	mg/kg	7.3E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	5.E-08	4.3E-07	mg/kg/day	3.0E-02	mg/kg/day	1 E-05
				Benzo(a)pyrene	2.9	mg/kg	7.6E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	6.E-07	4.4E-07	mg/kg/day	3.0E-02	mg/kg/day	1 E-05
				Benzo(b)fluoranthene	4.5	mg/kg	1.2E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	9 E-08	6.9E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(g,h,i)perylene	3	mg/kg	NC		NC			4.6E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(k)fluoranthene	2.1	mg/kg	5.5E-08	mg/kg/day	7.3E-02	(mg/kg/day)-1	4.E-09	3.2E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				bis(2-Ethylhexyl)phthalate	5.2	mg/kg	1.4E-07	mg/kg/day	1.4E-02	(mg/kg/day)-1	2.E-09	7.9E-07	mg/kg/day	2.0E-02	mg/kg/day	4 E-05
				Dibenzo(a,h)anthracene	1.0694	mg/kg	2.8E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-07	1.6E-07	mg/kg/day	3.0E-02	mg/kg/day	5 E-06
				Indeno(1,2,3-cd)pyrene	2.7	mg/kg	7.1E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	5.E-08	4.1E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				N-Nitroso-di-n-propylamine	1.3	mg/kg	3.4E-08	mg/kg/day	7.0E+00	(mg/kg/day)-1	2.E-07	2.0E-07	mg/kg/day			
				Pentachlorophenol	1.4	mg/kg	3.7E-08	mg/kg/day	1.2E-01	(mg/kg/day)-1	4.E-09	2.1E-07	mg/kg/day	3.0E-02	mg/kg/day	7 E-06
				Phenanthrene	2.8	mg/kg	NC		NC			4.3E-07	mg/kg/day	3.0E-02	mg/kg/day	1 E-05
				alpha-Chlordane	0.032	mg/kg	8.4E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-10	4.9E-09	mg/kg/day	5.0E-04	mg/kg/day	1 E-05
				Aroclor-1254	0.49	mg/kg	1.3E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-08	7.5E-08	mg/kg/day	2.0E-05	mg/kg/day	4.E-03
				Aroclor-1260	0.027	mg/kg	7.1E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	1 E-09	4.1E-09	mg/kg/day	2.0E-05	mg/kg/day	2.E-04
				Aroclor-1268	0.31379	mg/kg	8.2E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-08	4.8E-08	mg/kg/day	2.0E-05	mg/kg/day	2.E-03
				Dieldrin	0.0044	mg/kg	1.2E-10	mg/kg/day	1.6E+01	(mg/kg/day)-1	2.E-09	6.7E-10	mg/kg/day	5.0E-05	mg/kg/day	1 E-05
				Endosulfan II	0.005	mg/kg	NC		NC			7.6E-10	mg/kg/day	6.0E-03	mg/kg/day	1 E-07
				Endosulfan sulfate	0.0029	mg/kg	NC		NC			4.4E-10	mg/kg/day	6.0E-03	mg/kg/day	7 E-08
				gamma-Chlordane	0.015	mg/kg	3.9E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-10	2.3E-09	mg/kg/day	5.0E-04	mg/kg/day	5 E-06
				Technical Chlordane	2.21273	mg/kg	5.8E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-08	3.4E-07	mg/kg/day	5.0E-04	mg/kg/day	7 E-04
				Antimony	3.1	mg/kg	NC		NC			4.7E-07	mg/kg/day	4.0E-04	mg/kg/day	1 E-03
				Arsenic	6.4	mg/kg	1.7E-07	mg/kg/day	1.5E+00	(mg/kg/day)-1	3 E-07	9.8E-07	mg/kg/day	3.0E-04	mg/kg/day	3 E-03
				Cadmium	2.1	mg/kg	NC		NC			3.2E-07	mg/kg/day	1.0E-03	mg/kg/day	3 E-04
				Chromium	200	mg/kg	NC		NC			3.1E-05	mg/kg/day	3.0E-03	mg/kg/day	1.E-02
				Lead	375	mg/kg	9.8E-06	mg/kg/day	--			5.7E-05	mg/kg/day			
				Manganese	843	mg/kg	NC		NC			1.3E-04	mg/kg/day	7.1E-02	mg/kg/day	2.E-03
				Mercury	0.62	mg/kg	NC		NC			9.5E-08	mg/kg/day	3.0E-04	mg/kg/day	3.E-04
				Nickel	69.2	mg/kg	NC		NC			1.1E-05	mg/kg/day	2.0E-02	mg/kg/day	5.E-04
				Thallium	0.58	mg/kg	NC		NC			8.9E-08	mg/kg/day	8.0E-05	mg/kg/day	1.E-03
				Vanadium	42.4	mg/kg	NC		NC			6.5E-06	mg/kg/day	7.0E-03	mg/kg/day	9.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.00803	mg/kg	2.1E-10	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-05	1.2E-09	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.0000649	mg/kg	1.7E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-07	9.9E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-05					3.E-02
			DERMAL	2-Methylnaphthalene	0.1	mg/kg	NC		NC			6.8E-09	mg/kg/day	2.0E-02	mg/kg/day	3 E-07
				4-Chloro-3-methylphenol	1.3	mg/kg	NC		NC			6.8E-08	mg/kg/day	5.0E-03	mg/kg/day	1.E-05
				4-Nitrophenol	2.2	mg/kg	NC		NC			1.1E-07	mg/kg/day			
				Acenaphthylene	0.42856	mg/kg	NC		NC			2.9E-08	mg/kg/day	6.0E-02	mg/kg/day	5.E-07
				Benzo(a)anthracene	2.8	mg/kg	3.2E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.9E-07	mg/kg/day	3.0E-02	mg/kg/day	6 E-06
				Benzo(a)pyrene	2.9	mg/kg	3.4E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-07	2.0E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Benzo(b)fluoranthene	4.5	mg/kg	5.2E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-08	3.0E-07	mg/kg/day	3.0E-02	mg/kg/day	1 E-05
				Benzo(g,h,i)perylene	3	mg/kg	NC		NC			2.0E-07	mg/kg/day	3.0E-02	mg/kg/day	7 E-06
				Benzo(k)fluoranthene	2.1	mg/kg	2.4E-08	mg/kg/day	7.3E-02	(mg/kg/day)-1	2.E-09	1.4E-07	mg/kg/day	3.0E-02	mg/kg/day	5 E-06
				bis(2-Ethylhexyl)phthalate	5.2	mg/kg	4.6E-08	mg/kg/day	1.4E-02	(mg/kg/day)-1	6.E-10	2.7E-07	mg/kg/day	2.0E-02	mg/kg/day	1 E-05
				Dibenzo(a,h)anthracene	1.0694	mg/kg	1.2E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	9.E-08	7.2E-08	mg/kg/day	3.0E-02	mg/kg/day	2 E-06
				Indeno(1,2,3-cd)pyrene	2.7	mg/kg	3.1E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.8E-07	mg/kg/day	3.0E-02	mg/kg/day	6 E-06
				N-Nitroso-di-n-propylamine	1.3	mg/kg	1.2E-08	mg/kg/day	7.0E+00	(mg/kg/day)-1	8.E-08	6.8E-08	mg/kg/day			
				Pentachlorophenol	1.4	mg/kg	3.1E-08	mg/kg/day	1.2E-01	(mg/kg/day)-1	4.E-09	1.8E-07	mg/kg/day	3.0E-02	mg/kg/day	6 E-06
				Phenanthrene	2.8	mg/kg	NC		NC			1.9E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				alpha-Chlordane	0.032	mg/kg	1.1E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-11	6.6E-10	mg/kg/day	5.0E-04	mg/kg/day	1.E-06
				Aroclor-1254	0.49	mg/kg	6.1E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-08	3.6E-08	mg/kg/day	2.0E-05	mg/kg/day	2.E-03
				Aroclor-1260	0.027	mg/kg	3.4E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	7.E-10	2.0E-09	mg/kg/day	2.0E-05	mg/kg/day	1 E-04
				Aroclor-1268	0.31379	mg/kg	3.9E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	8.E-09	2.3E-08	mg/kg/day	2.0E-05	mg/kg/day	1 E-03
				Dieldrin	0.0044	mg/kg	3.9E-11	mg/kg/day	1.6E+01	(mg/kg/day)-1	6.E-10	2.3E-10	mg/kg/day	5.0E-05	mg/kg/day	5.E-06
				Endosulfan II	0.005	mg/kg	NC		NC			2.6E-10	mg/kg/day	6.0E-03	mg/kg/day	4 E-08
				Endosulfan sulfate	0.0029	mg/kg	NC		NC			1.5E-10	mg/kg/day	6.0E-03	mg/kg/day	3 E-08

TABLE 7.22.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				gamma-Chlordane	0.015	mg/kg	5.3E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-11	3.1E-10	mg/kg/day	5.0E-04	mg/kg/day	6.E-07
				Technical Chlordane	2.21273	mg/kg	7.9E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-09	4.6E-08	mg/kg/day	5.0E-04	mg/kg/day	9 E-05
				Antimony	3.1	mg/kg	NC		NC					6.0E-05	mg/kg/day	
				Arsenic	6.4	mg/kg	1.7E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	3.E-08	1.0E-07	mg/kg/day	3 0E-04	mg/kg/day	3.E-04
				Cadmium	2.1	mg/kg	NC		NC			1.1E-09	mg/kg/day	2 5E-05	mg/kg/day	4 E-05
				Chromium	200	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	375	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	843	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Mercury	0.62	mg/kg	NC		NC					2 1E-05	mg/kg/day	
				Nickel	69.2	mg/kg	NC		NC					8 0E-04	mg/kg/day	
				Thallium	0 58	mg/kg	NC		NC					8 0E-05	mg/kg/day	
				Vanadium	42.4	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00803	mg/kg	2.1E-11	mg/kg/day	1 5E+05	(mg/kg/day)-1	3.E-06	1 3E-10	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.0000649	mg/kg	1 7E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-08	1.0E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4 E-06					4 E-03
		EXPOSURE POINT TOTAL									4 E-05					3 E-02
	EXPOSURE MEDIUM TOTAL										4.E-05					3 E-02
SEDIMENT TOTAL											4.E-05					3.E-02
SURFACE WATER	SURFACE WATER	LYMAN MILL POND	INGESTION	Acenaphthylene	0 00000132	mg/l	NC		NC			1.3E-10	mg/kg/day	6.0E-02	mg/kg/day	2.E-09
				bis(2-Ethylhexyl)phthalate	0 017	mg/l	3.0E-07	mg/kg/day	1.4E-02	mg/kg/day	4.E-09	1.7E-06	mg/kg/day	2.0E-02	mg/kg/day	9 E-05
				Aldrin	0 000023	mg/l	4.0E-10	mg/kg/day	1.7E+01	mg/kg/day	7.E-09	2.3E-09	mg/kg/day	3.0E-05	mg/kg/day	8.E-05
				alpha-Chlordane	0.000019	mg/l	3.3E-10	mg/kg/day	3.5E-01	mg/kg/day	1 E-10	1.9E-09	mg/kg/day	5.0E-04	mg/kg/day	4.E-06
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			3.3E-10	mg/kg/day	6.0E-03	mg/kg/day	5.E-08
				Endrin Aldehyde	0.000005	mg/l	NC		NC			5.1E-10	mg/kg/day	3.0E-04	mg/kg/day	2.E-06
				gamma-Chlordane	0.000021	mg/l	3.7E-10	mg/kg/day	3.5E-01	mg/kg/day	1.E-10	2.1E-09	mg/kg/day	5.0E-04	mg/kg/day	4.E-06
				Arsenic	0.0046	mg/l	8 0E-08	mg/kg/day	1 5E+00	mg/kg/day	1.E-07	4.7E-07	mg/kg/day	3.0E-04	mg/kg/day	2.E-03
				Barium	0.021	mg/l	NC		NC			2.1E-06	mg/kg/day	7.0E-02	mg/kg/day	3.E-05
				Chromium	0.0023	mg/l	NC		NC			2.3E-07	mg/kg/day	3.0E-03	mg/kg/day	8.E-05
				Lead	0.0044	mg/l	7.7E-08	mg/kg/day	--			4.5E-07	mg/kg/day			
				Manganese	0.13	mg/l	NC		NC			1.3E-05	mg/kg/day	2.4E-02	mg/kg/day	6 E-04
				Mercury	0.00000394	mg/l	NC		NC			4.0E-10	mg/kg/day	3.0E-04	mg/kg/day	1 E-06
				Thallium	0.0022	mg/l	NC		NC			2 2E-07	mg/kg/day	8 0E-05	mg/kg/day	3.E-03
				Nitrate	0.765	mg/l	NC		NC			7 8E-05	mg/kg/day	1 6E+00	mg/kg/day	5.E-05
				Nitrite-N	0.0865	mg/l	NC		NC			8.8E-06	mg/kg/day	1.0E-01	mg/kg/day	9 E-05
				Toxicity Equivalency (Dioxins/Furans)	0 000000861	mg/l	1 5E-11	mg/kg/day	1 5E+05	mg/kg/day	2.E-06	8.8E-11	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-06					5 E-03
			DERMAL	Acenaphthylene	0.00000132	mg/l	NC		NC			--		6.0E-02	mg/kg/day	
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	1.2E-05	mg/kg/day	1.4E-02	mg/kg/day	2.E-07	6 8E-05	mg/kg/day	2 0E-02	mg/kg/day	3 E-03
				Aldrin	0.000023	mg/l	9.2E-10	mg/kg/day	1.7E+01	mg/kg/day	2.E-08	5.4E-09	mg/kg/day	3.0E-05	mg/kg/day	2 E-04
				alpha-Chlordane	0.000019	mg/l	1.8E-08	mg/kg/day	3 5E-01	mg/kg/day	6.E-09	1.0E-07	mg/kg/day	5 0E-04	mg/kg/day	2 E-04
				Endosulfan Sulfate	0 0000032	mg/l	NC		NC			--		6 0E-03	mg/kg/day	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			9 2E-09	mg/kg/day	3.0E-04	mg/kg/day	3.E-05
				gamma-Chlordane	0.000021	mg/l	2.0E-08	mg/kg/day	3.5E-01	mg/kg/day	7.E-09	1.1E-07	mg/kg/day	5.0E-04	mg/kg/day	2.E-04
				Arsenic	0.0046	mg/l	1 3E-08	mg/kg/day	1.5E+00	mg/kg/day	2.E-08	7.6E-08	mg/kg/day	3.0E-04	mg/kg/day	3 E-04
				Barium	0 021	mg/l	NC		NC			3.5E-07	mg/kg/day	4 9E-03	mg/kg/day	7 E-05
				Chromium	0.0023	mg/l	NC		NC			7.6E-08	mg/kg/day	7 5E-05	mg/kg/day	1.E-03
				Lead	0.0044	mg/l	--		--			--				
				Manganese	0 13	mg/l	NC		NC			2.2E-06	mg/kg/day	9.6E-04	mg/kg/day	2 E-03
				Mercury	0.00000394	mg/l	NC		NC			6.5E-11	mg/kg/day	2.1E-05	mg/kg/day	3.E-06
				Thallium	0.0022	mg/l	NC		NC			3.6E-08	mg/kg/day	8.0E-05	mg/kg/day	5.E-04
				Nitrate	0.765	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.0865	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000000861	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-07					8.E-03
		EXPOSURE POINT TOTAL									3.E-06					1 E-02
	EXPOSURE MEDIUM TOTAL										3.E-06					1 E-02
SURFACE WATER TOTAL											3.E-06					1.E-02

TABLE 7.22.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
BIOTA	COMBINED FISH DIET	LYMAN MILL POND	INGESTION	Acenaphthylene	0.002	mg/kg	NC		NC			3.8E-07	mg/kg/day	6.0E-02	mg/kg/day	6 E-06
				Benzo(a)anthracene	0.00443	mg/kg	1.5E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-07	8.5E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Benzo(a)pyrene	0.00545	mg/kg	1.8E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-06	1.0E-06	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Benzo(b)fluoranthene	0.003	mg/kg	9.9E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-08	5.8E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(g,h,i)perylene	0.00426	mg/kg	NC		NC			8.2E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Dibenzo(a,h)anthracene	0.0012	mg/kg	3.9E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-07	2.3E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				Indeno(1,2,3-cd)pyrene	0.00499	mg/kg	1.6E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-07	9.6E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Phenanthrene	0.014	mg/kg	NC		NC			2.7E-06	mg/kg/day	3.0E-02	mg/kg/day	9.E-05
				4,4'-DDD	0.027	mg/kg	8.9E-07	mg/kg/day	2.4E-01	(mg/kg/day)-1	2.E-07	5.2E-06	mg/kg/day	5.0E-04	mg/kg/day	1.E-02
				4,4'-DDE	0.08941	mg/kg	2.9E-06	mg/kg/day	3.4E-01	(mg/kg/day)-1	1.E-06	1.7E-05	mg/kg/day	5.0E-04	mg/kg/day	3.E-02
				4,4'-DDT	0.003	mg/kg	9.9E-08	mg/kg/day	3.4E-01	(mg/kg/day)-1	3.E-08	5.8E-07	mg/kg/day	5.0E-04	mg/kg/day	1.E-03
				alpha-Chlordane	0.02	mg/kg	6.6E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-07	3.8E-06	mg/kg/day	5.0E-04	mg/kg/day	8.E-03
				Aroclor-1254	2.13	mg/kg	7.0E-05	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-04	4.1E-04	mg/kg/day	2.0E-05	mg/kg/day	2.E+01
				Aroclor-1268	0.0215	mg/kg	7.1E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-06	4.1E-06	mg/kg/day	2.0E-05	mg/kg/day	2.E-01
				beta-BHC	0.0008	mg/kg	2.6E-08	mg/kg/day	1.8E+00	(mg/kg/day)-1	5.E-08	1.5E-07	mg/kg/day	3.0E-04	mg/kg/day	5.E-04
				Dieldrin	0.0057	mg/kg	1.9E-07	mg/kg/day	1.6E+01	(mg/kg/day)-1	3.E-06	1.1E-06	mg/kg/day	5.0E-05	mg/kg/day	2.E-02
				gamma-Chlordane	0.013	mg/kg	4.3E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-07	2.5E-06	mg/kg/day	5.0E-04	mg/kg/day	5.E-03
				Heptachlor Epoxide	0.0014	mg/kg	4.6E-08	mg/kg/day	9.1E+00	(mg/kg/day)-1	4.E-07	2.7E-07	mg/kg/day	1.3E-05	mg/kg/day	2.E-02
				Technical Chlordane	1.02	mg/kg	3.4E-05	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-05	2.0E-04	mg/kg/day	5.0E-04	mg/kg/day	4.E-01
				Arsenic	0.024	mg/kg	7.9E-07	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-06	4.6E-06	mg/kg/day	3.0E-04	mg/kg/day	2.E-02
				Cadmium	0.017	mg/kg	NC		NC			3.3E-06	mg/kg/day	1.0E-03	mg/kg/day	3.E-03
				Chromium	0.197	mg/kg	NC		NC			3.8E-05	mg/kg/day	3.0E-03	mg/kg/day	1.E-02
				Lead	0.33	mg/kg	1.1E-05	mg/kg/day	--			6.3E-05	mg/kg/day			
				Manganese	4.31	mg/kg	NC		NC			8.3E-04	mg/kg/day	1.4E-01	mg/kg/day	6.E-03
				Mercury	0.141	mg/kg	NC		NC			2.7E-05	mg/kg/day	3.0E-04	mg/kg/day	9.E-02
				Mercury (methyl)	0.127	mg/kg	NC		NC			2.4E-05	mg/kg/day	1.0E-04	mg/kg/day	2.E-01
				Toxicity Equivalency (PCB Congeners	0.0000405	mg/kg	1.3E-09	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-04	7.8E-09	mg/kg/day			
				Toxicity Equivalency (Dioxins/Furans)	0.00037	mg/kg	1.2E-08	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-03	7.1E-08	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-03					2.1.E+01
		EXPOSURE POINT TOTAL									2.E-03					2.1.E+01
	EXPOSURE MEDIUM TOTAL										2.E-03					2.1.E+01
COMBINED FISH DIET TOTAL											2.E-03					2.1.E+01
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	2.E-03				TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA	2.2.E+01

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated: dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: MJM

TABLE 7.23.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	LYMAN MILL POND	INGESTION	2-Methylnaphthalene	0.1	mg/kg	NC		NC			2.4E-08	mg/kg/day	2.0E-02	mg/kg/day	1.E-06
				4-Chloro-3-methylphenol	1.3	mg/kg	NC		NC			3.1E-07	mg/kg/day	5.0E-03	mg/kg/day	6.E-05
				4-Nitrophenol	2.2	mg/kg	NC		NC			5.2E-07	mg/kg/day			
				Acenaphthylene	0.42856	mg/kg	NC		NC			1.0E-07	mg/kg/day	6.0E-02	mg/kg/day	2.E-06
				Benzo(a)anthracene	2.8	mg/kg	1.1E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-08	6.6E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(a)pyrene	2.9	mg/kg	1.2E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	9.E-07	6.9E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(b)fluoranthene	4.5	mg/kg	1.8E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-07	1.1E-06	mg/kg/day	3.0E-02	mg/kg/day	4.E-05
				Benzo(g,h,i)perylene	3	mg/kg	NC		NC			7.1E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(k)fluoranthene	2.1	mg/kg	8.5E-08	mg/kg/day	7.3E-02	(mg/kg/day)-1	6.E-09	5.0E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				bis(2-Ethylhexyl)phthalate	5.2	mg/kg	2.1E-07	mg/kg/day	1.4E-02	(mg/kg/day)-1	3.E-09	1.2E-06	mg/kg/day	2.0E-02	mg/kg/day	6.E-05
				Dibenzo(a,h)anthracene	1.0694	mg/kg	4.4E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-07	2.5E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				Indeno(1,2,3-cd)pyrene	2.7	mg/kg	1.1E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-08	6.4E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				N-Nitroso-di-n-propylamine	1.3	mg/kg	5.3E-08	mg/kg/day	7.0E+00	(mg/kg/day)-1	4.E-07	3.1E-07	mg/kg/day			
				Pentachlorophenol	1.4	mg/kg	5.7E-08	mg/kg/day	1.2E-01	(mg/kg/day)-1	7.E-09	3.3E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Phenanthrene	2.8	mg/kg	NC		NC			6.6E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				alpha-Chlordane	0.032	mg/kg	1.3E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	5.E-10	7.6E-09	mg/kg/day	5.0E-04	mg/kg/day	2.E-05
				Aroclor-1254	0.49	mg/kg	2.0E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	4.E-08	1.2E-07	mg/kg/day	2.0E-05	mg/kg/day	6.E-03
				Aroclor-1260	0.027	mg/kg	1.1E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-09	6.4E-09	mg/kg/day	2.0E-05	mg/kg/day	3.E-04
				Aroclor-1268	0.31379	mg/kg	1.3E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-08	7.5E-08	mg/kg/day	2.0E-05	mg/kg/day	4.E-03
				Dieldrin	0.0044	mg/kg	1.8E-10	mg/kg/day	1.6E+01	(mg/kg/day)-1	3.E-09	1.0E-09	mg/kg/day	5.0E-05	mg/kg/day	2.E-05
				Endosulfan II	0.005	mg/kg	NC		NC			1.2E-09	mg/kg/day	6.0E-03	mg/kg/day	2.E-07
				Endosulfan sulfate	0.0029	mg/kg	NC		NC			6.9E-10	mg/kg/day	6.0E-03	mg/kg/day	1.E-07
				gamma-Chlordane	0.015	mg/kg	6.1E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-10	3.6E-09	mg/kg/day	5.0E-04	mg/kg/day	7.E-06
				Technical Chlordane	2.21273	mg/kg	9.0E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-08	5.3E-07	mg/kg/day	5.0E-04	mg/kg/day	1.E-03
				Antimony	3.1	mg/kg	NC		NC			7.4E-07	mg/kg/day	4.0E-04	mg/kg/day	2.E-03
				Arsenic	6.4	mg/kg	2.6E-07	mg/kg/day	1.5E+00	(mg/kg/day)-1	4.E-07	1.5E-06	mg/kg/day	3.0E-04	mg/kg/day	5.E-03
				Cadmium	2.1	mg/kg	NC		NC			5.0E-07	mg/kg/day	1.0E-03	mg/kg/day	5.E-04
				Chromium	200	mg/kg	NC		NC			4.7E-05	mg/kg/day	3.0E-03	mg/kg/day	2.E-02
				Lead	375	mg/kg	1.5E-05	mg/kg/day	--			8.9E-05	mg/kg/day			
				Manganese	843	mg/kg	NC		NC			2.0E-04	mg/kg/day	7.1E-02	mg/kg/day	3.E-03
				Mercury	0.62	mg/kg	NC		NC			1.5E-07	mg/kg/day	3.0E-04	mg/kg/day	5.E-04
				Nickel	69.2	mg/kg	NC		NC			1.6E-05	mg/kg/day	2.0E-02	mg/kg/day	8.E-04
				Thallium	0.58	mg/kg	NC		NC			1.4E-07	mg/kg/day	8.0E-05	mg/kg/day	2.E-03
				Vanadium	42.4	mg/kg	NC		NC			1.0E-05	mg/kg/day	7.0E-03	mg/kg/day	1.E-03
				Toxicity Equivalency (Dioxins/Furans)	0.00803	mg/kg	3.3E-10	mg/kg/day	1.5E+05	(mg/kg/day)-1	5.E-05	1.9E-09	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.0000649	mg/kg	2.6E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	4.E-07	1.5E-11	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-05					4.E-02
			DERMAL	2-Methylnaphthalene	0.1	mg/kg	NC		NC			2.2E-08	mg/kg/day	2.0E-02	mg/kg/day	1.E-06
				4-Chloro-3-methylphenol	1.3	mg/kg	NC		NC			2.2E-07	mg/kg/day	5.0E-03	mg/kg/day	4.E-05
				4-Nitrophenol	2.2	mg/kg	NC		NC			3.7E-07	mg/kg/day			
				Acenaphthylene	0.42856	mg/kg	NC		NC			9.5E-08	mg/kg/day	6.0E-02	mg/kg/day	2.E-06
				Benzo(a)anthracene	2.8	mg/kg	1.1E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-08	6.2E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(a)pyrene	2.9	mg/kg	1.1E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	8.E-07	6.4E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(b)fluoranthene	4.5	mg/kg	1.7E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-07	9.9E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Benzo(g,h,i)perylene	3	mg/kg	NC		NC			6.6E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(k)fluoranthene	2.1	mg/kg	7.9E-08	mg/kg/day	7.3E-02	(mg/kg/day)-1	6.E-09	4.6E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				bis(2-Ethylhexyl)phthalate	5.2	mg/kg	1.5E-07	mg/kg/day	1.4E-02	(mg/kg/day)-1	2.E-09	8.8E-07	mg/kg/day	2.0E-02	mg/kg/day	4.E-05
				Dibenzo(a,h)anthracene	1.0694	mg/kg	4.0E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-07	2.4E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				Indeno(1,2,3-cd)pyrene	2.7	mg/kg	1.0E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-08	6.0E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				N-Nitroso-di-n-propylamine	1.3	mg/kg	3.8E-08	mg/kg/day	7.0E+00	(mg/kg/day)-1	3.E-07	2.2E-07	mg/kg/day			
				Pentachlorophenol	1.4	mg/kg	1.0E-07	mg/kg/day	1.2E-01	(mg/kg/day)-1	1.E-08	5.9E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Phenanthrene	2.8	mg/kg	NC		NC			6.2E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				alpha-Chlordane	0.032	mg/kg	3.7E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-10	2.2E-09	mg/kg/day	5.0E-04	mg/kg/day	4.E-06
				Aroclor-1254	0.49	mg/kg	2.0E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	4.E-08	1.2E-07	mg/kg/day	2.0E-05	mg/kg/day	6.E-03
				Aroclor-1260	0.027	mg/kg	1.1E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-09	6.4E-09	mg/kg/day	2.0E-05	mg/kg/day	3.E-04
				Aroclor-1268	0.31379	mg/kg	1.3E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-08	7.5E-08	mg/kg/day	2.0E-05	mg/kg/day	4.E-03
				Dieldrin	0.0044	mg/kg	1.3E-10	mg/kg/day	1.6E+01	(mg/kg/day)-1	2.E-09	7.5E-10	mg/kg/day	5.0E-05	mg/kg/day	1.E-05
				Endosulfan II	0.005	mg/kg	NC		NC			8.5E-10	mg/kg/day	6.0E-03	mg/kg/day	1.E-07
				Endosulfan sulfate	0.0029	mg/kg	NC		NC			4.9E-10	mg/kg/day	6.0E-03	mg/kg/day	8.E-08

TABLE 7.23.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				gamma-Chlordane	0.015	mg/kg	1.7E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	6.E-11	1.0E-09	mg/kg/day	5.0E-04	mg/kg/day	2.E-06
				Technical Chlordane	2.21273	mg/kg	2.6E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	9.E-09	1.5E-07	mg/kg/day	5.0E-04	mg/kg/day	3.E-04
				Antimony	3.1	mg/kg	NC		NC					6.0E-05	mg/kg/day	
				Arsenic	6.4	mg/kg	5.6E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	8.E-08	3.3E-07	mg/kg/day	3.0E-04	mg/kg/day	1.E-03
				Cadmium	2.1	mg/kg	NC		NC			3.6E-09	mg/kg/day	2.5E-05	mg/kg/day	1.E-04
				Chromium	200	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	375	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	843	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Mercury	0.62	mg/kg	NC		NC					2.1E-05	mg/kg/day	
				Nickel	69.2	mg/kg	NC		NC					8.0E-04	mg/kg/day	
				Thallium	0.58	mg/kg	NC		NC					8.0E-05	mg/kg/day	
				Vanadium	42.4	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00803	mg/kg	7.0E-11	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-05	4.1E-10	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.0000649	mg/kg	5.7E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	8.E-08	3.3E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-05					1.E-02
		EXPOSURE POINT TOTAL									6.E-05					5.E-02
	EXPOSURE MEDIUM TOTAL										6.E-05					5.E-02
SEDIMENT TOTAL											6.E-05					5.E-02
SURFACE WATER	SURFACE WATER	LYMAN MILL POND	INGESTION	Acenaphthylene	0.00000132	mg/l	NC		NC			2.1E-10	mg/kg/day	6.0E-02	mg/kg/day	3.E-09
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	4.6E-07	mg/kg/day	1.4E-02	mg/kg/day	6.E-09	2.7E-06	mg/kg/day	2.0E-02	mg/kg/day	1.E-04
				Aldrin	0.000023	mg/l	6.2E-10	mg/kg/day	1.7E+01	mg/kg/day	1.E-08	3.6E-09	mg/kg/day	3.0E-05	mg/kg/day	1.E-04
				alpha-Chlordane	0.000019	mg/l	5.2E-10	mg/kg/day	3.5E-01	mg/kg/day	2.E-10	3.0E-09	mg/kg/day	5.0E-04	mg/kg/day	6.E-06
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			5.1E-10	mg/kg/day	6.0E-03	mg/kg/day	8.E-08
				Endrin Aldehyde	0.000005	mg/l	NC		NC			7.9E-10	mg/kg/day	3.0E-04	mg/kg/day	3.E-06
				gamma-Chlordane	0.000021	mg/l	5.7E-10	mg/kg/day	3.5E-01	mg/kg/day	2.E-10	3.3E-09	mg/kg/day	5.0E-04	mg/kg/day	7.E-06
				Arsenic	0.0046	mg/l	1.2E-07	mg/kg/day	1.5E+00	mg/kg/day	2.E-07	7.3E-07	mg/kg/day	3.0E-04	mg/kg/day	2.E-03
				Barium	0.021	mg/l	NC		NC			3.3E-06	mg/kg/day	7.0E-02	mg/kg/day	5.E-05
				Chromium	0.0023	mg/l	NC		NC			3.6E-07	mg/kg/day	3.0E-03	mg/kg/day	1.E-04
				Lead	0.0044	mg/l	1.2E-07	mg/kg/day	--			7.0E-07	mg/kg/day			
				Manganese	0.13	mg/l	NC		NC			2.1E-05	mg/kg/day	2.4E-02	mg/kg/day	9.E-04
				Mercury	0.00000394	mg/l	NC		NC			6.2E-10	mg/kg/day	3.0E-04	mg/kg/day	2.E-06
				Thallium	0.0022	mg/l	NC		NC			3.5E-07	mg/kg/day	8.0E-05	mg/kg/day	4.E-03
				Nitrate	0.765	mg/l	NC		NC			1.2E-04	mg/kg/day	1.6E+00	mg/kg/day	8.E-05
				Nitrite-N	0.0865	mg/l	NC		NC			1.4E-05	mg/kg/day	1.0E-01	mg/kg/day	1.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.000000861	mg/l	2.3E-11	mg/kg/day	1.5E+05	mg/kg/day	4.E-06	1.4E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-06					8.E-03
			DERMAL	Acenaphthylene	0.00000132	mg/l	NC		NC			--		6.0E-02	mg/kg/day	
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	1.4E-05	mg/kg/day	1.4E-02	mg/kg/day	2.E-07	8.1E-05	mg/kg/day	2.0E-02	mg/kg/day	4.E-03
				Aldrin	0.000023	mg/l	1.1E-09	mg/kg/day	1.7E+01	mg/kg/day	2.E-08	6.4E-09	mg/kg/day	3.0E-05	mg/kg/day	2.E-04
				alpha-Chlordane	0.000019	mg/l	2.1E-08	mg/kg/day	3.5E-01	mg/kg/day	7.E-09	1.2E-07	mg/kg/day	5.0E-04	mg/kg/day	2.E-04
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			--		6.0E-03	mg/kg/day	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			1.1E-08	mg/kg/day	3.0E-04	mg/kg/day	4.E-05
				gamma-Chlordane	0.000021	mg/l	2.3E-08	mg/kg/day	3.5E-01	mg/kg/day	8.E-09	1.4E-07	mg/kg/day	5.0E-04	mg/kg/day	3.E-04
				Arsenic	0.0046	mg/l	1.6E-08	mg/kg/day	1.5E+00	mg/kg/day	2.E-08	9.1E-08	mg/kg/day	3.0E-04	mg/kg/day	3.E-04
				Barium	0.021	mg/l	NC		NC			4.1E-07	mg/kg/day	4.9E-03	mg/kg/day	8.E-05
				Chromium	0.0023	mg/l	NC		NC			9.1E-08	mg/kg/day	7.5E-05	mg/kg/day	1.E-03
				Lead	0.0044	mg/l	--		--			--				
				Manganese	0.13	mg/l	NC		NC			2.6E-06	mg/kg/day	9.6E-04	mg/kg/day	3.E-03
				Mercury	0.00000394	mg/l	NC		NC			7.8E-11	mg/kg/day	2.1E-05	mg/kg/day	4.E-06
				Thallium	0.0022	mg/l	NC		NC			4.3E-08	mg/kg/day	8.0E-05	mg/kg/day	5.E-04
				Nitrate	0.765	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.0865	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000000861	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-07					1.E-02
		EXPOSURE POINT TOTAL									4.E-06					2.E-02
	EXPOSURE MEDIUM TOTAL										4.E-06					2.E-02
SURFACE WATER TOTAL											4.E-06					2.E-02

TABLE 7.23.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS – REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
BIOTA	COMBINED FISH DIET	LYMAN MILL POND	INGESTION	Acenaphthylene	0.002	mg/kg	NC		NC			4.0E-07	mg/kg/day	6.0E-02	mg/kg/day	7.E-06
				Benzo(a)anthracene	0.00443	mg/kg	1.5E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-07	8.8E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Benzo(a)pyrene	0.00545	mg/kg	1.9E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-06	1.1E-06	mg/kg/day	3.0E-02	mg/kg/day	4.E-05
				Benzo(b)fluoranthene	0.003	mg/kg	1.0E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-08	5.9E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(g,h,i)perylene	0.00426	mg/kg	NC		NC			8.4E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Dibenzo(a,h)anthracene	0.0012	mg/kg	4.1E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-07	2.4E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				Indeno(1,2,3-cd)pyrene	0.00499	mg/kg	1.7E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-07	9.9E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Phenanthrene	0.014	mg/kg	NC		NC			2.8E-06	mg/kg/day	3.0E-02	mg/kg/day	9.E-05
				4,4'-DDD	0.027	mg/kg	9.2E-07	mg/kg/day	2.4E-01	(mg/kg/day)-1	2.E-07	5.4E-06	mg/kg/day	5.0E-04	mg/kg/day	1.E-02
				4,4'-DDE	0.08941	mg/kg	3.0E-06	mg/kg/day	3.4E-01	(mg/kg/day)-1	1.E-06	1.8E-05	mg/kg/day	5.0E-04	mg/kg/day	4.E-02
				4,4'-DDT	0.003	mg/kg	1.0E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	3.E-08	5.9E-07	mg/kg/day	5.0E-04	mg/kg/day	1.E-03
				alpha-Chlordane	0.02	mg/kg	6.8E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-07	4.0E-06	mg/kg/day	5.0E-04	mg/kg/day	8.E-03
				Aroclor-1254	2.13	mg/kg	7.2E-05	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-04	4.2E-04	mg/kg/day	2.0E-05	mg/kg/day	2.E+01
				Aroclor-1268	0.0215	mg/kg	7.3E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-06	4.3E-06	mg/kg/day	2.0E-05	mg/kg/day	2.E-01
				beta-BHC	0.0008	mg/kg	2.7E-08	mg/kg/day	1.8E+00	(mg/kg/day)-1	5.E-08	1.6E-07	mg/kg/day	3.0E-04	mg/kg/day	5.E-04
				Dieldrin	0.0057	mg/kg	1.9E-07	mg/kg/day	1.6E+01	(mg/kg/day)-1	3.E-06	1.1E-06	mg/kg/day	5.0E-05	mg/kg/day	2.E-02
				gamma-Chlordane	0.013	mg/kg	4.4E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-07	2.6E-06	mg/kg/day	5.0E-04	mg/kg/day	5.E-03
				Heptachlor Epoxide	0.0014	mg/kg	4.8E-08	mg/kg/day	9.1E+00	(mg/kg/day)-1	4.E-07	2.8E-07	mg/kg/day	1.3E-05	mg/kg/day	2.E-02
				Technical Chlordane	1.02	mg/kg	3.5E-05	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-05	2.0E-04	mg/kg/day	5.0E-04	mg/kg/day	4.E-01
				Arsenic	0.024	mg/kg	8.2E-07	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-06	4.8E-06	mg/kg/day	3.0E-04	mg/kg/day	2.E-02
				Cadmium	0.017	mg/kg	NC		NC			3.4E-06	mg/kg/day	1.0E-03	mg/kg/day	3.E-03
				Chromium	0.197	mg/kg	NC		NC			3.9E-05	mg/kg/day	3.0E-03	mg/kg/day	1.E-02
				Lead	0.33	mg/kg	1.1E-05	mg/kg/day	--			6.5E-05	mg/kg/day			
				Manganese	4.31	mg/kg	NC		NC			8.5E-04	mg/kg/day	1.4E-01	mg/kg/day	6.E-03
				Mercury	0.141	mg/kg	NC		NC			2.8E-05	mg/kg/day	3.0E-04	mg/kg/day	9.E-02
				Mercury (methyl)	0.127	mg/kg	NC		NC			2.5E-05	mg/kg/day	1.0E-04	mg/kg/day	3.E-01
				Toxicity Equivalency (PCB Congeners	0.0000405	mg/kg	1.4E-09	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-04	8.0E-09	mg/kg/day			
				Toxicity Equivalency (Dioxins/Furans)	0.00037	mg/kg	1.3E-08	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-03	7.3E-08	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-03					2.2.E+01
		EXPOSURE POINT TOTAL									2.E-03					2.2.E+01
	EXPOSURE MEDIUM TOTAL										2.E-03					2.2.E+01
COMBINED FISH DIET TOTAL											2.E-03					2.2.E+01
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	2.E-03				TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA	2.2.E+01

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: MJM

TABLE 7.24.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	LYMAN MILL POND	INGESTION	2-Methylnaphthalene	0.1	mg/kg	NC		NC			1.9E-07	mg/kg/day	2.0E-02	mg/kg/day	9 E-06
				4-Chloro-3-methylphenol	1 3	mg/kg	NC		NC			2 5E-06	mg/kg/day	5 0E-03	mg/kg/day	5 E-04
				4-Nitrophenol	2 2	mg/kg	NC		NC			4.2E-06	mg/kg/day			
				Acenaphthylene	0.42856	mg/kg	NC		NC			8 1E-07	mg/kg/day	6.0E-02	mg/kg/day	1 E-05
				Benzo(a)anthracene	2.8	mg/kg	4 6E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-07	5.3E-06	mg/kg/day	3.0E-02	mg/kg/day	2 E-04
				Benzo(a)pyrene	2.9	mg/kg	4.7E-07	mg/kg/day	7 3E+00	(mg/kg/day)-1	3.E-06	5.5E-06	mg/kg/day	3 0E-02	mg/kg/day	2 E-04
				Benzo(b)fluoranthene	4.5	mg/kg	7.3E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	5.E-07	8 5E-06	mg/kg/day	3 0E-02	mg/kg/day	3.E-04
				Benzo(g,h,i)perylene	3	mg/kg	NC		NC			5 7E-06	mg/kg/day	3 0E-02	mg/kg/day	2 E-04
				Benzo(k)fluoranthene	2.1	mg/kg	3.4E-07	mg/kg/day	7 3E-02	(mg/kg/day)-1	2 E-08	4 0E-06	mg/kg/day	3 0E-02	mg/kg/day	1 E-04
				bis(2-Ethylhexyl)phthalate	5 2	mg/kg	8 5E-07	mg/kg/day	1 4E-02	(mg/kg/day)-1	1.E-08	9 9E-06	mg/kg/day	2 0E-02	mg/kg/day	5 E-04
				Dibenzo(a,h)anthracene	1.0694	mg/kg	1.7E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	1 E-06	2 0E-06	mg/kg/day	3 0E-02	mg/kg/day	7 E-05
				Indeno(1,2,3-cd)pyrene	2.7	mg/kg	4.4E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-07	5.1E-06	mg/kg/day	3.0E-02	mg/kg/day	2 E-04
				N-Nitroso-di-n-propylamine	1.3	mg/kg	2 1E-07	mg/kg/day	7 0E+00	(mg/kg/day)-1	1 E-06	2 5E-06	mg/kg/day			
				Pentachlorophenol	1.4	mg/kg	2 3E-07	mg/kg/day	1.2E-01	(mg/kg/day)-1	3.E-08	2.7E-06	mg/kg/day	3.0E-02	mg/kg/day	9 E-05
				Phenanthrene	2.8	mg/kg	NC		NC			5.3E-06	mg/kg/day	3.0E-02	mg/kg/day	2.E-04
				alpha-Chlordane	0.032	mg/kg	5.2E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-09	6.1E-08	mg/kg/day	5.0E-04	mg/kg/day	1.E-04
				Aroclor-1254	0 49	mg/kg	8.0E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-07	9.3E-07	mg/kg/day	2.0E-05	mg/kg/day	5.E-02
				Aroclor-1260	0.027	mg/kg	4.4E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	9.E-09	5.1E-08	mg/kg/day	2.0E-05	mg/kg/day	3.E-03
				Aroclor-1268	0.31379	mg/kg	5.1E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	1 E-07	6.0E-07	mg/kg/day	2.0E-05	mg/kg/day	3.E-02
				Dieldrin	0.0044	mg/kg	7 2E-10	mg/kg/day	1.6E+01	(mg/kg/day)-1	1.E-08	8.4E-09	mg/kg/day	5.0E-05	mg/kg/day	2 E-04
				Endosulfan II	0.005	mg/kg	NC		NC			9 5E-09	mg/kg/day	6.0E-03	mg/kg/day	2.E-06
				Endosulfan sulfate	0.0029	mg/kg	NC		NC			5.5E-09	mg/kg/day	6.0E-03	mg/kg/day	9 E-07
				gamma-Chlordane	0.015	mg/kg	2.4E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	9.E-10	2.8E-08	mg/kg/day	5.0E-04	mg/kg/day	6.E-05
				Technical Chlordane	2 21273	mg/kg	3.6E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-07	4.2E-06	mg/kg/day	5.0E-04	mg/kg/day	8.E-03
				Antimony	3.1	mg/kg	NC		NC			5.9E-06	mg/kg/day	4.0E-04	mg/kg/day	1.E-02
				Arsenic	6.4	mg/kg	1.0E-06	mg/kg/day	1.5E+00	(mg/kg/day)-1	2.E-06	1.2E-05	mg/kg/day	3.0E-04	mg/kg/day	4.E-02
				Cadmium	2.1	mg/kg	NC		NC			4 0E-06	mg/kg/day	1 0E-03	mg/kg/day	4 E-03
				Chromium	200	mg/kg	NC		NC			3.8E-04	mg/kg/day	3.0E-03	mg/kg/day	1 E-01
				Lead	375	mg/kg	6 1E-05	mg/kg/day	--			7.1E-04	mg/kg/day			
				Manganese	843	mg/kg	NC		NC			1.6E-03	mg/kg/day	7.1E-02	mg/kg/day	2.E-02
				Mercury	0.62	mg/kg	NC		NC			1.2E-06	mg/kg/day	3.0E-04	mg/kg/day	4.E-03
				Nickel	69 2	mg/kg	NC		NC			1.3E-04	mg/kg/day	2.0E-02	mg/kg/day	7.E-03
				Thallium	0.58	mg/kg	NC		NC			1.1E-06	mg/kg/day	8.0E-05	mg/kg/day	1.E-02
				Vanadium	42.4	mg/kg	NC		NC			8.1E-05	mg/kg/day	7.0E-03	mg/kg/day	1.E-02
				Toxicity Equivalency (Dioxins/Furans)	0.00803	mg/kg	1.3E-09	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-04	1.5E-08	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.0000649	mg/kg	1.1E-11	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-06	1.2E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-04					3 E-01
			DERMAL	2-Methylnaphthalene	0.1	mg/kg	NC		NC			6.9E-08	mg/kg/day	2.0E-02	mg/kg/day	3.E-06
				4-Chloro-3-methylphenol	1.3	mg/kg	NC		NC			6.9E-07	mg/kg/day	5.0E-03	mg/kg/day	1.E-04
				4-Nitrophenol	2.2	mg/kg	NC		NC			1.2E-06	mg/kg/day			
				Acenaphthylene	0.42856	mg/kg	NC		NC			3.0E-07	mg/kg/day	6.0E-02	mg/kg/day	5.E-06
				Benzo(a)anthracene	2.8	mg/kg	1.7E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-07	1.9E-06	mg/kg/day	3.0E-02	mg/kg/day	6.E-05
				Benzo(a)pyrene	2.9	mg/kg	1.7E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-06	2.0E-06	mg/kg/day	3.0E-02	mg/kg/day	7.E-05
				Benzo(b)fluoranthene	4.5	mg/kg	2.7E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-07	3.1E-06	mg/kg/day	3.0E-02	mg/kg/day	1.E-04
				Benzo(g,h,i)perylene	3	mg/kg	NC		NC			2.1E-06	mg/kg/day	3.0E-02	mg/kg/day	7 E-05
				Benzo(k)fluoranthene	2.1	mg/kg	1.2E-07	mg/kg/day	7.3E-02	(mg/kg/day)-1	9.E-09	1.5E-06	mg/kg/day	3.0E-02	mg/kg/day	5.E-05
				bis(2-Ethylhexyl)phthalate	5 2	mg/kg	2.4E-07	mg/kg/day	1.4E-02	(mg/kg/day)-1	3.E-09	2.8E-06	mg/kg/day	2.0E-02	mg/kg/day	1.E-04
				Dibenzo(a,h)anthracene	1.0694	mg/kg	6.3E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	5.E-07	7.4E-07	mg/kg/day	3 0E-02	mg/kg/day	2 E-05
				Indeno(1,2,3-cd)pyrene	2.7	mg/kg	1.6E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-07	1.9E-06	mg/kg/day	3.0E-02	mg/kg/day	6.E-05
				N-Nitroso-di-n-propylamine	1.3	mg/kg	5.9E-08	mg/kg/day	7.0E+00	(mg/kg/day)-1	4.E-07	6.9E-07	mg/kg/day			
				Pentachlorophenol	1.4	mg/kg	1.6E-07	mg/kg/day	1 2E-01	(mg/kg/day)-1	2 E-08	1.9E-06	mg/kg/day	3.0E-02	mg/kg/day	6.E-05
				Phenanthrene	2 8	mg/kg	NC		NC			1.9E-06	mg/kg/day	3.0E-02	mg/kg/day	6.E-05
				alpha-Chlordane	0 032	mg/kg	5 8E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-10	6 8E-09	mg/kg/day	5 0E-04	mg/kg/day	1.E-05
				Aroclor-1254	0.49	mg/kg	3 1E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	6.E-08	3.6E-07	mg/kg/day	2.0E-05	mg/kg/day	2.E-02
				Aroclor-1260	0.027	mg/kg	1.7E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-09	2.0E-08	mg/kg/day	2 0E-05	mg/kg/day	1.E-03
				Aroclor-1268	0 31379	mg/kg	2.0E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	4.E-08	2.3E-07	mg/kg/day	2.0E-05	mg/kg/day	1 E-02
				Dieldrin	0.0044	mg/kg	2.0E-10	mg/kg/day	1.6E+01	(mg/kg/day)-1	3.E-09	2 3E-09	mg/kg/day	5.0E-05	mg/kg/day	5 E-05
				Endosulfan II	0 005	mg/kg	NC		NC			2 7E-09	mg/kg/day	6 0E-03	mg/kg/day	4.E-07
				Endosulfan sulfate	0.0029	mg/kg	NC		NC			1.5E-09	mg/kg/day	6.0E-03	mg/kg/day	3 E-07
				gamma-Chlordane	0.015	mg/kg	2.7E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-10	3.2E-09	mg/kg/day	5.0E-04	mg/kg/day	6.E-06
				Technical Chlordane	2.21273	mg/kg	4.0E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	1 E-08	4.7E-07	mg/kg/day	5.0E-04	mg/kg/day	9.E-04
				Antimony	3.1	mg/kg	NC		NC					6 0E-05	mg/kg/day	

TABLE 7.24.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Arsenic	6.4	mg/kg	8.8E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-07	1.0E-06	mg/kg/day	3.0E-04	mg/kg/day	3.E-03
				Cadmium	2.1	mg/kg	NC		NC			1.1E-08	mg/kg/day	2.5E-05	mg/kg/day	4.E-04
				Chromium	200	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	375	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	843	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Mercury	0.62	mg/kg	NC		NC					2.1E-05	mg/kg/day	
				Nickel	69.2	mg/kg	NC		NC					8.0E-04	mg/kg/day	
				Thallium	0.58	mg/kg	NC		NC					8.0E-05	mg/kg/day	
				Vanadium	42.4	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00803	mg/kg	1.1E-10	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-05	1.3E-09	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.0000649	mg/kg	8.9E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-07	1.0E-11	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-05					4.E-02
		EXPOSURE POINT TOTAL									2.E-04					4.E-01
	EXPOSURE MEDIUM TOTAL										2.E-04					4.E-01
SEDIMENT TOTAL											2.E-04					4.E-01
SURFACE WATER	SURFACE WATER	LYMAN MILL POND	INGESTION	Acenaphthylene	0.00000132	mg/l	NC		NC			6.3E-10	mg/kg/day	6.0E-02	mg/kg/day	1.E-08
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	6.9E-07	mg/kg/day	1.4E-02	mg/kg/day	1.E-08	8.1E-06	mg/kg/day	2.0E-02	mg/kg/day	4.E-04
				Aldrin	0.000023	mg/l	9.4E-10	mg/kg/day	1.7E+01	mg/kg/day	2.E-08	1.1E-08	mg/kg/day	3.0E-05	mg/kg/day	4.E-04
				alpha-Chlordane	0.000019	mg/l	7.7E-10	mg/kg/day	3.5E-01	mg/kg/day	3.E-10	9.0E-09	mg/kg/day	5.0E-04	mg/kg/day	2.E-05
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			1.5E-09	mg/kg/day	6.0E-03	mg/kg/day	3.E-07
				Endrin Aldehyde	0.000005	mg/l	NC		NC			2.4E-09	mg/kg/day	3.0E-04	mg/kg/day	8.E-06
				gamma-Chlordane	0.000021	mg/l	8.5E-10	mg/kg/day	3.5E-01	mg/kg/day	3.E-10	1.0E-08	mg/kg/day	5.0E-04	mg/kg/day	2.E-05
				Arsenic	0.0046	mg/l	1.9E-07	mg/kg/day	1.5E+00	mg/kg/day	3.E-07	2.2E-06	mg/kg/day	3.0E-04	mg/kg/day	7.E-03
				Barium	0.021	mg/l	NC		NC			1.0E-05	mg/kg/day	7.0E-02	mg/kg/day	1.E-04
				Chromium	0.0023	mg/l	NC		NC			1.1E-06	mg/kg/day	3.0E-03	mg/kg/day	4.E-04
				Lead	0.0044	mg/l	1.8E-07	mg/kg/day	--			2.1E-06	mg/kg/day			
				Manganese	0.13	mg/l	NC		NC			6.2E-05	mg/kg/day	2.4E-02	mg/kg/day	3.E-03
				Mercury	0.00000394	mg/l	NC		NC			1.9E-09	mg/kg/day	3.0E-04	mg/kg/day	6.E-06
				Thallium	0.0022	mg/l	NC		NC			1.0E-06	mg/kg/day	8.0E-05	mg/kg/day	1.E-02
				Nitrate	0.765	mg/l	NC		NC			3.6E-04	mg/kg/day	1.6E+00	mg/kg/day	2.E-04
				Nitrite-N	0.0865	mg/l	NC		NC			4.1E-05	mg/kg/day	1.0E-01	mg/kg/day	4.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.000000861	mg/l	3.5E-11	mg/kg/day	1.5E+05	mg/kg/day	5.E-06	4.1E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								6.E-06					2.E-02
			DERMAL	Acenaphthylene	0.00000132	mg/l	NC		NC			--		6.0E-02	mg/kg/day	
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	9.0E-06	mg/kg/day	1.4E-02	mg/kg/day	1.E-07	1.0E-04	mg/kg/day	2.0E-02	mg/kg/day	5.E-03
				Aldrin	0.000023	mg/l	7.0E-10	mg/kg/day	1.7E+01	mg/kg/day	1.E-08	8.2E-09	mg/kg/day	3.0E-05	mg/kg/day	3.E-04
				alpha-Chlordane	0.000019	mg/l	1.4E-08	mg/kg/day	3.5E-01	mg/kg/day	5.E-09	1.6E-07	mg/kg/day	5.0E-04	mg/kg/day	3.E-04
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			--		6.0E-03	mg/kg/day	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			1.4E-08	mg/kg/day	3.0E-04	mg/kg/day	5.E-05
				gamma-Chlordane	0.000021	mg/l	1.5E-08	mg/kg/day	3.5E-01	mg/kg/day	5.E-09	1.7E-07	mg/kg/day	5.0E-04	mg/kg/day	3.E-04
				Arsenic	0.0046	mg/l	1.0E-08	mg/kg/day	1.5E+00	mg/kg/day	2.E-08	1.2E-07	mg/kg/day	3.0E-04	mg/kg/day	4.E-04
				Barium	0.021	mg/l	NC		NC			5.3E-07	mg/kg/day	4.9E-03	mg/kg/day	1.E-04
				Chromium	0.0023	mg/l	NC		NC			1.2E-07	mg/kg/day	7.5E-05	mg/kg/day	2.E-03
				Lead	0.0044	mg/l	--		--			--				
				Manganese	0.13	mg/l	NC		NC			3.3E-06	mg/kg/day	9.6E-04	mg/kg/day	3.E-03
				Mercury	0.00000394	mg/l	NC		NC			1.0E-10	mg/kg/day	2.1E-05	mg/kg/day	5.E-06
				Thallium	0.0022	mg/l	NC		NC			5.6E-08	mg/kg/day	8.0E-05	mg/kg/day	7.E-04
				Nitrate	0.765	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.0865	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000000861	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-07					1.E-02
		EXPOSURE POINT TOTAL									6.E-06					4.E-02
	EXPOSURE MEDIUM TOTAL										6.E-06					4.E-02
SURFACE WATER TOTAL											6.E-06					4.E-02

TABLE 7.24.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
BIOTA	COMBINED FISH DIET	LYMAN MILL POND	INGESTION	Acenaphthylene	0.002	mg/kg	NC		NC			6.0E-07	mg/kg/day	6.0E-02	mg/kg/day	1.E-05
				Benzo(a)anthracene	0.00443	mg/kg	1.1E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-08	1.3E-06	mg/kg/day	3.0E-02	mg/kg/day	4.E-05
				Benzo(a)pyrene	0.00545	mg/kg	1.4E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-06	1.6E-06	mg/kg/day	3.0E-02	mg/kg/day	5.E-05
				Benzo(b)fluoranthene	0.003	mg/kg	7.7E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-08	9.0E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Benzo(g,h,i)perylene	0.00426	mg/kg	NC		NC			1.3E-06	mg/kg/day	3.0E-02	mg/kg/day	4.E-05
				Dibenzo(a,h)anthracene	0.0012	mg/kg	3.1E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-07	3.6E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Indeno(1,2,3-cd)pyrene	0.00499	mg/kg	1.3E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	9.E-08	1.5E-06	mg/kg/day	3.0E-02	mg/kg/day	5.E-05
				Phenanthrene	0.014	mg/kg	NC		NC			4.2E-06	mg/kg/day	3.0E-02	mg/kg/day	1.E-04
				4,4'-DDD	0.027	mg/kg	7.0E-07	mg/kg/day	2.4E-01	(mg/kg/day)-1	2.E-07	8.1E-06	mg/kg/day	5.0E-04	mg/kg/day	2.E-02
				4,4'-DDE	0.08941	mg/kg	2.3E-06	mg/kg/day	3.4E-01	(mg/kg/day)-1	8.E-07	2.7E-05	mg/kg/day	5.0E-04	mg/kg/day	5.E-02
				4,4'-DDT	0.003	mg/kg	7.7E-08	mg/kg/day	3.4E-01	(mg/kg/day)-1	3.E-08	9.0E-07	mg/kg/day	5.0E-04	mg/kg/day	2.E-03
				alpha-Chlordane	0.02	mg/kg	5.2E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-07	6.0E-06	mg/kg/day	5.0E-04	mg/kg/day	1.E-02
				Aroclor-1254	2.13	mg/kg	5.5E-05	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-04	6.4E-04	mg/kg/day	2.0E-05	mg/kg/day	3.E+01
				Aroclor-1268	0.0215	mg/kg	5.5E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-06	6.5E-06	mg/kg/day	2.0E-05	mg/kg/day	3.E-01
				beta-BHC	0.0008	mg/kg	2.1E-08	mg/kg/day	1.8E+00	(mg/kg/day)-1	4.E-08	2.4E-07	mg/kg/day	3.0E-04	mg/kg/day	8.E-04
				Dieldrin	0.0057	mg/kg	1.5E-07	mg/kg/day	1.6E+01	(mg/kg/day)-1	2.E-06	1.7E-06	mg/kg/day	5.0E-05	mg/kg/day	3.E-02
				gamma-Chlordane	0.013	mg/kg	3.3E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-07	3.9E-06	mg/kg/day	5.0E-04	mg/kg/day	8.E-03
				Heptachlor Epoxide	0.0014	mg/kg	3.6E-08	mg/kg/day	9.1E+00	(mg/kg/day)-1	3.E-07	4.2E-07	mg/kg/day	1.3E-05	mg/kg/day	3.E-02
				Technical Chlordane	1.02	mg/kg	2.6E-05	mg/kg/day	3.5E-01	(mg/kg/day)-1	9.E-06	3.1E-04	mg/kg/day	5.0E-04	mg/kg/day	6.E-01
				Arsenic	0.024	mg/kg	6.2E-07	mg/kg/day	1.5E+00	(mg/kg/day)-1	9.E-07	7.2E-06	mg/kg/day	3.0E-04	mg/kg/day	2.E-02
				Cadmium	0.017	mg/kg	NC		NC			5.1E-06	mg/kg/day	1.0E-03	mg/kg/day	5.E-03
				Chromium	0.197	mg/kg	NC		NC			5.9E-05	mg/kg/day	3.0E-03	mg/kg/day	2.E-02
				Lead	0.33	mg/kg	8.5E-06	mg/kg/day	--			9.9E-05	mg/kg/day			
				Manganese	4.31	mg/kg	NC		NC			1.3E-03	mg/kg/day	1.4E-01	mg/kg/day	9.E-03
				Mercury	0.141	mg/kg	NC		NC			4.2E-05	mg/kg/day	3.0E-04	mg/kg/day	1.E-01
				Mercury (methyl)	0.127	mg/kg	NC		NC			3.8E-05	mg/kg/day	1.0E-04	mg/kg/day	4.E-01
				Toxicity Equivalency (PCB Congeners)	0.0000405	mg/kg	1.0E-09	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-04	1.2E-08	mg/kg/day			
				Toxicity Equivalency (Dioxins/Furans)	0.00037	mg/kg	9.5E-09	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-03	1.1E-07	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-03					3.4.E+01
		EXPOSURE POINT TOTAL									2.E-03					3.4.E+01
	EXPOSURE MEDIUM TOTAL										2.E-03					3.4.E+01
COMBINED FISH DIET TOTAL											2.E-03					3.4.E+01
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	2.E-03				TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA	3.4.E+01

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalallable from the sources used to obtain dose-response data for this risk assessment
NC - Not carcinogenic by this exposure route.
NA - Not applicable: exposure route not applicable for this chemical/exposure medium.
-- - Not calculated: dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: MJM

TABLE 7.25.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	MANTON POND	INGESTION	Benzo(a)anthracene	0.3	mg/kg	1.3E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-09	7.6E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				Benzo(a)pyrene	0.37	mg/kg	1.6E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-08	9.4E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				Benzo(b)fluoranthene	0.64	mg/kg	2.8E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-09	1.6E-08	mg/kg/day	3.0E-02	mg/kg/day	5.E-07
				Benzo(g,h,i)perylene	0.22	mg/kg	NC		NC			5.6E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Benzo(k)fluoranthene	0.2	mg/kg	8.7E-10	mg/kg/day	7.3E-02	(mg/kg/day)-1	6.E-11	5.1E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				bis(2-Ethylhexyl)phthalate	0.43	mg/kg	1.9E-09	mg/kg/day	1.4E-02	(mg/kg/day)-1	3.E-11	1.1E-08	mg/kg/day	2.0E-02	mg/kg/day	5.E-07
				Indeno(1,2,3-cd)pyrene	0.29	mg/kg	1.3E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	9.E-10	7.4E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Phenanthrene	0.3	mg/kg	NC		NC			7.6E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				alpha-Chlordane	0.004	mg/kg	1.7E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	6.E-12	1.0E-10	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				gamma-Chlordane	0.005	mg/kg	2.2E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	8.E-12	1.3E-10	mg/kg/day	5.0E-04	mg/kg/day	3.E-07
				Arsenic	0.97	mg/kg	4.2E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	6.E-09	2.5E-08	mg/kg/day	3.0E-04	mg/kg/day	8.E-05
				Cadmium	0.96	mg/kg	NC		NC			2.4E-08	mg/kg/day	1.0E-03	mg/kg/day	2.E-05
				Chromium	18.6	mg/kg	NC		NC			4.7E-07	mg/kg/day	3.0E-03	mg/kg/day	2.E-04
				Lead	91	mg/kg	4.0E-07	mg/kg/day	--			2.3E-06	mg/kg/day			
				Manganese	219	mg/kg	NC		NC			5.6E-06	mg/kg/day	7.1E-02	mg/kg/day	8.E-05
				Vanadium	7.1	mg/kg	NC		NC			1.8E-07	mg/kg/day	7.0E-03	mg/kg/day	3.E-05
				Toxicity Equivalency (Dioxins/Furans)	0.000999	mg/kg	4.4E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	7.E-07	2.5E-11	mg/kg/day			
			EXPOSURE ROUTE TOTAL								7.E-07					4.E-04
			DERMAL	Benzo(a)anthracene	0.3	mg/kg	1.2E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-10	6.8E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Benzo(a)pyrene	0.37	mg/kg	1.4E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-08	8.3E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				Benzo(b)fluoranthene	0.64	mg/kg	2.5E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-09	1.4E-08	mg/kg/day	3.0E-02	mg/kg/day	5.E-07
				Benzo(g,h,i)perylene	0.22	mg/kg	NC		NC			5.0E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Benzo(k)fluoranthene	0.2	mg/kg	7.7E-10	mg/kg/day	7.3E-02	(mg/kg/day)-1	6.E-11	4.5E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				bis(2-Ethylhexyl)phthalate	0.43	mg/kg	1.3E-09	mg/kg/day	1.4E-02	(mg/kg/day)-1	2.E-11	7.4E-09	mg/kg/day	2.0E-02	mg/kg/day	4.E-07
				Indeno(1,2,3-cd)pyrene	0.29	mg/kg	1.1E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-10	6.5E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Phenanthrene	0.3	mg/kg	NC		NC			6.8E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				alpha-Chlordane	0.004	mg/kg	4.7E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-12	2.8E-11	mg/kg/day	5.0E-04	mg/kg/day	6.E-08
				gamma-Chlordane	0.005	mg/kg	5.9E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-12	3.5E-11	mg/kg/day	5.0E-04	mg/kg/day	7.E-08
				Arsenic	0.97	mg/kg	8.6E-10	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-09	5.0E-09	mg/kg/day	3.0E-04	mg/kg/day	2.E-05
				Cadmium	0.96	mg/kg	NC		NC			1.7E-10	mg/kg/day	2.5E-05	mg/kg/day	7.E-06
				Chromium	18.6	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	91	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	219	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Vanadium	7.1	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000999	mg/kg	8.9E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-07	5.2E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-07					3.E-05
		EXPOSURE POINT TOTAL									8.E-07					4.E-04
	EXPOSURE MEDIUM TOTAL										8.E-07					4.E-04
SEDIMENT TOTAL											8.E-07					4.E-04
SURFACE WATER	SURFACE WATER	MANTON POND	INGESTION	Acenaphthylene	0.00000132	mg/l	NC		NC			3.4E-12	mg/kg/day	6.0E-02	mg/kg/day	6.E-11
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	7.4E-09	mg/kg/day	1.4E-02	mg/kg/day	1.E-10	4.3E-08	mg/kg/day	2.0E-02	mg/kg/day	2.E-06
				Aldrin	0.000023	mg/l	1.0E-11	mg/kg/day	1.7E+01	mg/kg/day	2.E-10	5.9E-11	mg/kg/day	3.0E-05	mg/kg/day	2.E-06
				alpha-Chlordane	0.000019	mg/l	8.3E-12	mg/kg/day	3.5E-01	mg/kg/day	3.E-12	4.8E-11	mg/kg/day	5.0E-04	mg/kg/day	1.E-07
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			8.1E-12	mg/kg/day	6.0E-03	mg/kg/day	1.E-09
				Endrin Aldehyde	0.000005	mg/l	NC		NC			1.3E-11	mg/kg/day	3.0E-04	mg/kg/day	4.E-08
				gamma-Chlordane	0.000021	mg/l	9.2E-12	mg/kg/day	3.5E-01	mg/kg/day	3.E-12	5.3E-11	mg/kg/day	5.0E-04	mg/kg/day	1.E-07
				Arsenic	0.0046	mg/l	2.0E-09	mg/kg/day	1.5E+00	mg/kg/day	3.E-09	1.2E-08	mg/kg/day	3.0E-04	mg/kg/day	4.E-05
				Barium	0.021	mg/l	NC		NC			5.3E-08	mg/kg/day	7.0E-02	mg/kg/day	8.E-07
				Chromium	0.0023	mg/l	NC		NC			5.9E-09	mg/kg/day	3.0E-03	mg/kg/day	2.E-06
				Lead	0.0044	mg/l	1.9E-09	mg/kg/day	--			1.1E-08	mg/kg/day			
				Manganese	0.13	mg/l	NC		NC			3.3E-07	mg/kg/day	2.4E-02	mg/kg/day	1.E-05
				Mercury	0.00000394	mg/l	NC		NC			1.0E-11	mg/kg/day	3.0E-04	mg/kg/day	3.E-08
				Thallium	0.0022	mg/l	NC		NC			5.6E-09	mg/kg/day	8.0E-05	mg/kg/day	7.E-05
				Nitrate	0.765	mg/l	NC		NC			1.9E-06	mg/kg/day	1.6E+00	mg/kg/day	1.E-06
				Nitrite-N	0.0865	mg/l	NC		NC			2.2E-07	mg/kg/day	1.0E-01	mg/kg/day	2.E-06

TABLE 7.25.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Toxicity Equivalency (Dioxins/Furans)	0.000000861	mg/l	3.8E-13	mg/kg/day	1.5E+05	mg/kg/day	6.E-08	2.2E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								6.E-08					1.E-04
			DERMAL	Acenaphthylene	0.00000132	mg/l	NC		NC			--		6.0E-02	mg/kg/day	
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	3.1E-06	mg/kg/day	1.4E-02	mg/kg/day	4.E-08	1.8E-05	mg/kg/day	2.0E-02	mg/kg/day	9.E-04
				Aldrin	0.000023	mg/l	2.4E-10	mg/kg/day	1.7E+01	mg/kg/day	4.E-09	1.4E-09	mg/kg/day	3.0E-05	mg/kg/day	5.E-05
				alpha-Chlordane	0.000019	mg/l	4.7E-09	mg/kg/day	3.5E-01	mg/kg/day	2.E-09	2.7E-08	mg/kg/day	5.0E-04	mg/kg/day	5.E-05
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			--		6.0E-03	mg/kg/day	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			2.4E-09	mg/kg/day	3.0E-04	mg/kg/day	8.E-06
				gamma-Chlordane	0.000021	mg/l	5.2E-09	mg/kg/day	3.5E-01	mg/kg/day	2.E-09	3.0E-08	mg/kg/day	5.0E-04	mg/kg/day	6.E-05
				Arsenic	0.0046	mg/l	3.5E-09	mg/kg/day	1.5E+00	mg/kg/day	5.E-09	2.0E-08	mg/kg/day	3.0E-04	mg/kg/day	7.E-05
				Barium	0.021	mg/l	NC		NC			9.3E-08	mg/kg/day	4.9E-03	mg/kg/day	2.E-05
				Chromium	0.0023	mg/l	NC		NC			2.0E-08	mg/kg/day	7.5E-05	mg/kg/day	3.E-04
				Lead	0.0044	mg/l	--		--			--				
				Manganese	0.13	mg/l	NC		NC			5.8E-07	mg/kg/day	9.6E-04	mg/kg/day	6.E-04
				Mercury	0.00000394	mg/l	NC		NC			1.7E-11	mg/kg/day	2.1E-05	mg/kg/day	8.E-07
				Thallium	0.0022	mg/l	NC		NC			9.7E-09	mg/kg/day	8.0E-05	mg/kg/day	1.E-04
				Nitrate	0.765	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.0865	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000000861	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								6.E-08					2.E-03
		EXPOSURE POINT TOTAL									1.E-07					2.E-03
	EXPOSURE MEDIUM TOTAL										1.E-07					2.E-03
SURFACE WATER TOTAL											1.E-07					2.E-03
BIOTA	COMBINED FISH DIET	MANTON POND	INGESTION	Acenaphthylene	0.00041	mg/kg	NC		NC			7.9E-08	mg/kg/day	6.0E-02	mg/kg/day	1.E-06
				Dibenzo(a,h)anthracene	0.000226	mg/kg	7.4E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	5.E-08	4.3E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Phenanthrene	0.00498	mg/kg	NC		NC			9.6E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				4,4'-DDE	0.01235	mg/kg	4.1E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	1.E-07	2.4E-06	mg/kg/day	5.0E-04	mg/kg/day	5.E-03
				alpha-Chlordane	0.00263	mg/kg	8.6E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-08	5.0E-07	mg/kg/day	5.0E-04	mg/kg/day	1.E-03
				Aroclor-1254	0.22052	mg/kg	7.2E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-05	4.2E-05	mg/kg/day	2.0E-05	mg/kg/day	2.E+00
				Aroclor-1268	0.06755	mg/kg	2.2E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	4.E-06	1.3E-05	mg/kg/day	2.0E-05	mg/kg/day	6.E-01
				Dieldrin	0.00057	mg/kg	1.9E-08	mg/kg/day	1.6E+01	(mg/kg/day)-1	3.E-07	1.1E-07	mg/kg/day	5.0E-05	mg/kg/day	2.E-03
				Endosulfan Sulfate	0.0019	mg/kg	NC		NC			3.6E-07	mg/kg/day	6.0E-03	mg/kg/day	6.E-05
				gamma-Chlordane	0.00096	mg/kg	3.2E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-08	1.8E-07	mg/kg/day	5.0E-04	mg/kg/day	4.E-04
				Technical Chlordane	0.06498	mg/kg	2.1E-06	mg/kg/day	3.5E-01	(mg/kg/day)-1	7.E-07	1.2E-05	mg/kg/day	5.0E-04	mg/kg/day	2.E-02
				Lead	0.0119	mg/kg	3.9E-07	mg/kg/day	--			2.3E-06	mg/kg/day			
				Mercury	0.259	mg/kg	NC		NC			5.0E-05	mg/kg/day	3.0E-04	mg/kg/day	2.E-01
				Mercury (methyl)	0.278	mg/kg	NC		NC			5.3E-05	mg/kg/day	1.0E-04	mg/kg/day	5.E-01
				Toxicity Equivalency (Dioxins/Furans)	0.000031	mg/kg	1.0E-09	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-04	5.9E-09	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-04					3.E+00
		EXPOSURE POINT TOTAL									2.E-04					3.E+00
	EXPOSURE MEDIUM TOTAL										2.E-04					3.E+00
COMBINED FISH DIET TOTAL											2.E-04					3.E+00
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	2.E-04				TOTAL RECEPTOR HAZARD ACROSS ALL MED	3.5.E+00

NOTES
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

Prepared by KJA
Checked by RAR

TABLE 7.26.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	MANTON POND	INGESTION	Benzo(a)anthracene	0.3	mg/kg	2.0E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-09	1.2E-08	mg/kg/day	3.0E-02	mg/kg/day	4 E-07
				Benzo(a)pyrene	0.37	mg/kg	2.5E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-08	1.5E-08	mg/kg/day	3 0E-02	mg/kg/day	5.E-07
				Benzo(b)fluoranthene	0.64	mg/kg	4.3E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-09	2 5E-08	mg/kg/day	3.0E-02	mg/kg/day	8.E-07
				Benzo(g,h,i)perylene	0.22	mg/kg	NC		NC			8.7E-09	mg/kg/day	3.0E-02	mg/kg/day	3 E-07
				Benzo(k)fluoranthene	0.2	mg/kg	1.4E-09	mg/kg/day	7.3E-02	(mg/kg/day)-1	1.E-10	7.9E-09	mg/kg/day	3 0E-02	mg/kg/day	3.E-07
				bis(2-Ethylhexyl)phthalate	0.43	mg/kg	2.9E-09	mg/kg/day	1 4E-02	(mg/kg/day)-1	4.E-11	1.7E-08	mg/kg/day	2.0E-02	mg/kg/day	9.E-07
				Indeno(1,2,3-cd)pyrene	0.29	mg/kg	2.0E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-09	1.1E-08	mg/kg/day	3 0E-02	mg/kg/day	4.E-07
				Phenanthrene	0.3	mg/kg	NC		NC			1.2E-08	mg/kg/day	3.0E-02	mg/kg/day	4.E-07
				alpha-Chlordane	0.004	mg/kg	2.7E-11	mg/kg/day	3 5E-01	(mg/kg/day)-1	9.E-12	1.6E-10	mg/kg/day	5.0E-04	mg/kg/day	3.E-07
				gamma-Chlordane	0.005	mg/kg	3.4E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-11	2.0E-10	mg/kg/day	5.0E-04	mg/kg/day	4.E-07
				Arsenic	0.97	mg/kg	6.6E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-08	3.8E-08	mg/kg/day	3.0E-04	mg/kg/day	1.E-04
				Cadmium	0.96	mg/kg	NC		NC			3.8E-08	mg/kg/day	1.0E-03	mg/kg/day	4 E-05
				Chromium	18.6	mg/kg	NC		NC			7.4E-07	mg/kg/day	3.0E-03	mg/kg/day	2.E-04
				Lead	91	mg/kg	6.2E-07	mg/kg/day	–			3.6E-06	mg/kg/day			
				Manganese	219	mg/kg	NC		NC			8.7E-06	mg/kg/day	7.1E-02	mg/kg/day	1 E-04
				Vanadium	7.1	mg/kg	NC		NC			2.8E-07	mg/kg/day	7.0E-03	mg/kg/day	4.E-05
				Toxicity Equivalency (Dioxins/Furans)	0 000999	mg/kg	6.8E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-06	4.0E-11	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-06					6.E-04
			DERMAL	Benzo(a)anthracene	0.3	mg/kg	3.8E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-09	2.2E-08	mg/kg/day	3.0E-02	mg/kg/day	7.E-07
				Benzo(a)pyrene	0.37	mg/kg	4.7E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-08	2.7E-08	mg/kg/day	3.0E-02	mg/kg/day	9 E-07
				Benzo(b)fluoranthene	0.64	mg/kg	8.1E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-09	4.7E-08	mg/kg/day	3.0E-02	mg/kg/day	2 E-06
				Benzo(g,h,i)perylene	0.22	mg/kg	NC		NC			1.6E-08	mg/kg/day	3.0E-02	mg/kg/day	5 E-07
				Benzo(k)fluoranthene	0.2	mg/kg	2.5E-09	mg/kg/day	7.3E-02	(mg/kg/day)-1	2.E-10	1.5E-08	mg/kg/day	3.0E-02	mg/kg/day	5.E-07
				bis(2-Ethylhexyl)phthalate	0 43	mg/kg	4.2E-09	mg/kg/day	1 4E-02	(mg/kg/day)-1	6.E-11	2.4E-08	mg/kg/day	2.0E-02	mg/kg/day	1 E-06
				Indeno(1,2,3-cd)pyrene	0 29	mg/kg	3.7E-09	mg/kg/day	7 3E-01	(mg/kg/day)-1	3.E-09	2.1E-08	mg/kg/day	3.0E-02	mg/kg/day	7 E-07
				Phenanthrene	0.3	mg/kg	NC		NC			2.2E-08	mg/kg/day	3.0E-02	mg/kg/day	7 E-07
				alpha-Chlordane	0 004	mg/kg	1.6E-11	mg/kg/day	3 5E-01	(mg/kg/day)-1	5.E-12	9 1E-11	mg/kg/day	5.0E-04	mg/kg/day	2 E-07
				gamma-Chlordane	0 005	mg/kg	1.9E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	7.E-12	1.1E-10	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				Arsenic	0 97	mg/kg	2.8E-09	mg/kg/day	1 5E+00	(mg/kg/day)-1	4.E-09	1.6E-08	mg/kg/day	3.0E-04	mg/kg/day	5 E-05
				Cadmium	0.96	mg/kg	NC		NC			5.4E-10	mg/kg/day	2.5E-05	mg/kg/day	2.E-05
				Chromium	18.6	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	91	mg/kg	0.0E+00	mg/kg/day	–							
				Manganese	219	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Vanadium	7.1	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000999	mg/kg	2.9E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	4.E-07	1.7E-11	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-07					8 E-05
		EXPOSURE POINT TOTAL									2 E-06					7 E-04
	EXPOSURE MEDIUM TOTAL										2.E-06					7 E-04
SEDIMENT TOTAL											2.E-06					7.E-04
SURFACE WATER	SURFACE WATER	MANTON POND	INGESTION	Acenaphthylene	0.00000132	mg/l	NC		NC			5.2E-12	mg/kg/day	6.0E-02	mg/kg/day	9.E-11
				bis(2-Ethylhexyl)phthalate	0 017	mg/l	1.2E-08	mg/kg/day	1.4E-02	mg/kg/day	2.E-10	6.7E-08	mg/kg/day	2.0E-02	mg/kg/day	3 E-06
				Aldrin	0.000023	mg/l	1.6E-11	mg/kg/day	1.7E+01	mg/kg/day	3.E-10	9.1E-11	mg/kg/day	3.0E-05	mg/kg/day	3 E-06
				alpha-Chlordane	0.000019	mg/l	1.3E-11	mg/kg/day	3.5E-01	mg/kg/day	5 E-12	7.5E-11	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				Endosulfan Sulfate	0 0000032	mg/l	NC		NC			1.3E-11	mg/kg/day	6 0E-03	mg/kg/day	2 E-09
				Endrin Aldehyde	0.000005	mg/l	NC		NC			2.0E-11	mg/kg/day	3.0E-04	mg/kg/day	7.E-08
				gamma-Chlordane	0 000021	mg/l	1.4E-11	mg/kg/day	3 5E-01	mg/kg/day	5 E-12	8.3E-11	mg/kg/day	5.0E-04	mg/kg/day	2 E-07
				Arsenic	0.0046	mg/l	3.1E-09	mg/kg/day	1.5E+00	mg/kg/day	5.E-09	1.8E-08	mg/kg/day	3.0E-04	mg/kg/day	6 E-05
				Barium	0 021	mg/l	NC		NC			8.3E-08	mg/kg/day	7.0E-02	mg/kg/day	1 E-06
				Chromium	0.0023	mg/l	NC		NC			9.1E-09	mg/kg/day	3.0E-03	mg/kg/day	3 E-06
				Lead	0 0044	mg/l	3.0E-09	mg/kg/day	–			1 7E-08	mg/kg/day			
				Manganese	0.13	mg/l	NC		NC			5.1E-07	mg/kg/day	2.4E-02	mg/kg/day	2.E-05
				Mercury	0.00000394	mg/l	NC		NC			1.6E-11	mg/kg/day	3.0E-04	mg/kg/day	5.E-08
				Thallium	0.0022	mg/l	NC		NC			8.7E-09	mg/kg/day	8 0E-05	mg/kg/day	1.E-04
				Nitrate	0.765	mg/l	NC		NC			3.0E-06	mg/kg/day	1.6E+00	mg/kg/day	2.E-06
				Nitrite-N	0 0865	mg/l	NC		NC			3.4E-07	mg/kg/day	1.0E-01	mg/kg/day	3.E-06
				Toxicity Equivalency (Dioxins/Furans)	0.000000861	mg/l	5.8E-13	mg/kg/day	1.5E+05	mg/kg/day	9.E-08	3.4E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								9.E-08					2 E-04

TABLE 7.26.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
			DERMAL	Acenaphthylene	0.00000132	mg/l	NC		NC			--		6.0E-02	mg/kg/day	
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	3.5E-06	mg/kg/day	1.4E-02	mg/kg/day	5.E-08	2.0E-05	mg/kg/day	2.0E-02	mg/kg/day	1.E-03
				Aldrin	0.000023	mg/l	2.7E-10	mg/kg/day	1.7E+01	mg/kg/day	5.E-09	1.6E-09	mg/kg/day	3.0E-05	mg/kg/day	5.E-05
				alpha-Chlordane	0.000019	mg/l	5.3E-09	mg/kg/day	3.3E-01	mg/kg/day	2.E-09	3.1E-08	mg/kg/day	5.0E-04	mg/kg/day	6.E-05
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			--		6.0E-03	mg/kg/day	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			2.7E-09	mg/kg/day	3.0E-04	mg/kg/day	9.E-06
				gamma-Chlordane	0.000021	mg/l	5.8E-09	mg/kg/day	3.5E-01	mg/kg/day	2.E-09	3.4E-08	mg/kg/day	5.0E-04	mg/kg/day	7.E-05
				Arsenic	0.0046	mg/l	3.9E-09	mg/kg/day	1.5E+00	mg/kg/day	6.E-09	2.3E-08	mg/kg/day	3.0E-04	mg/kg/day	8.E-05
				Barium	0.021	mg/l	NC		NC			1.0E-07	mg/kg/day	4.9E-03	mg/kg/day	2.E-05
				Chromium	0.0023	mg/l	NC		NC			2.3E-08	mg/kg/day	7.5E-05	mg/kg/day	3.E-04
				Lead	0.0044	mg/l	--		--			--				
				Manganese	0.13	mg/l	NC		NC			6.4E-07	mg/kg/day	9.6E-04	mg/kg/day	7.E-04
				Mercury	0.00000394	mg/l	NC		NC			2.0E-11	mg/kg/day	2.1E-05	mg/kg/day	9.E-07
				Thallium	0.0022	mg/l	NC		NC			1.1E-08	mg/kg/day	8.0E-05	mg/kg/day	1.E-04
				Nitrate	0.765	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.0865	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000000861	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								6.E-08					2.E-03
		EXPOSURE POINT TOTAL									2.E-07					3.E-03
	EXPOSURE MEDIUM TOTAL										2.E-07					3.E-03
SURFACE WATER TOTAL											2.E-07					3.E-03
BIOTA	COMBINED FISH DIET	MANTON POND	INGESTION	Acenaphthylene	0.00041	mg/kg	NC		NC			8.1E-08	mg/kg/day	6.0E-02	mg/kg/day	1.E-06
				Dibenzo(a,h)anthracene	0.000226	mg/kg	7.7E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	6.E-08	4.5E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Phenanthrene	0.00498	mg/kg	NC		NC			9.9E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				4,4'-DDE	0.01235	mg/kg	4.2E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	1.E-07	2.4E-06	mg/kg/day	5.0E-04	mg/kg/day	5.E-03
				alpha-Chlordane	0.00263	mg/kg	8.9E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-08	5.2E-07	mg/kg/day	5.0E-04	mg/kg/day	1.E-03
				Aroclor-1254	0.22052	mg/kg	7.5E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-05	4.4E-05	mg/kg/day	2.0E-05	mg/kg/day	2.E+00
				Aroclor-1268	0.06755	mg/kg	2.3E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	5.E-06	1.3E-05	mg/kg/day	2.0E-05	mg/kg/day	7.E-01
				Dieldrin	0.00057	mg/kg	1.9E-08	mg/kg/day	1.6E+01	(mg/kg/day)-1	3.E-07	1.1E-07	mg/kg/day	5.0E-05	mg/kg/day	2.E-03
				Endosulfan Sulfate	0.0019	mg/kg	NC		NC			3.8E-07	mg/kg/day	6.0E-03	mg/kg/day	6.E-05
				gamma-Chlordane	0.00096	mg/kg	3.3E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-08	1.9E-07	mg/kg/day	5.0E-04	mg/kg/day	4.E-04
				Technical Chlordane	0.06498	mg/kg	2.2E-06	mg/kg/day	3.5E-01	(mg/kg/day)-1	8.E-07	1.3E-05	mg/kg/day	5.0E-04	mg/kg/day	3.E-02
				Lead	0.0119	mg/kg	4.0E-07	mg/kg/day	--			2.4E-06	mg/kg/day			
				Mercury	0.259	mg/kg	NC		NC			5.1E-05	mg/kg/day	3.0E-04	mg/kg/day	2.E-01
				Mercury (methyl)	0.278	mg/kg	NC		NC			5.5E-05	mg/kg/day	1.0E-04	mg/kg/day	6.E-01
				Toxicity Equivalency (Dioxins/Furans)	0.000031	mg/kg	1.1E-09	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-04	6.1E-09	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-04					4.E+00
		EXPOSURE POINT TOTAL									2.E-04					4.E+00
	EXPOSURE MEDIUM TOTAL										2.E-04					4.E+00
COMBINED FISH DIET TOTAL											2.E-04					4.E+00
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	2.E-04	TOTAL RECEPTOR HAZARD ACROSS ALL MED				3.6.E+00

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

Prepared by:	KJA
Checked by:	RAR

TABLE 7.28.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	MANTON POND	INGESTION	Benzo(a)anthracene	0.3	mg/kg	7.9E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-09	4.6E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(a)pyrene	0.37	mg/kg	9.7E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	7.E-08	5.6E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(b)fluoranthene	0.64	mg/kg	1.7E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	9.8E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(g,h,i)perylene	0.22	mg/kg	NC		NC			3.4E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Benzo(k)fluoranthene	0.2	mg/kg	5.2E-09	mg/kg/day	7.3E-02	(mg/kg/day)-1	4.E-10	3.1E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				bis(2-Ethylhexyl)phthalate	0.43	mg/kg	1.1E-08	mg/kg/day	1.4E-02	(mg/kg/day)-1	2.E-10	6.6E-08	mg/kg/day	2.0E-02	mg/kg/day	3.E-06
				Indeno(1,2,3-cd)pyrene	0.29	mg/kg	7.6E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-09	4.4E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Phenanthrene	0.3	mg/kg	NC		NC			4.6E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				alpha-Chlordane	0.004	mg/kg	1.0E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-11	6.1E-10	mg/kg/day	5.0E-04	mg/kg/day	1.E-06
				gamma-Chlordane	0.005	mg/kg	1.3E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	5.E-11	7.6E-10	mg/kg/day	5.0E-04	mg/kg/day	2.E-06
				Arsenic	0.97	mg/kg	2.5E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	4.E-08	1.5E-07	mg/kg/day	3.0E-04	mg/kg/day	5.E-04
				Cadmium	0.96	mg/kg	NC		NC			1.5E-07	mg/kg/day	1.0E-03	mg/kg/day	1.E-04
				Chromium	18.6	mg/kg	NC		NC			2.8E-06	mg/kg/day	3.0E-03	mg/kg/day	9.E-04
				Lead	91	mg/kg	2.4E-06	mg/kg/day	–			1.4E-05	mg/kg/day			
				Manganese	219	mg/kg	NC		NC			3.3E-05	mg/kg/day	7.1E-02	mg/kg/day	5.E-04
				Vanadium	7.1	mg/kg	NC		NC			1.1E-06	mg/kg/day	7.0E-03	mg/kg/day	2.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.000999	mg/kg	2.6E-11	mg/kg/day	1.5E+05	(mg/kg/day)-1	4.E-06	1.5E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-06					2.E-03
			DERMAL	Benzo(a)anthracene	0.3	mg/kg	3.5E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-09	2.0E-08	mg/kg/day	3.0E-02	mg/kg/day	7.E-07
				Benzo(a)pyrene	0.37	mg/kg	4.3E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-08	2.5E-08	mg/kg/day	3.0E-02	mg/kg/day	8.E-07
				Benzo(b)fluoranthene	0.64	mg/kg	7.4E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	5.E-09	4.3E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Benzo(g,h,i)perylene	0.22	mg/kg	NC		NC			1.5E-08	mg/kg/day	3.0E-02	mg/kg/day	5.E-07
				Benzo(k)fluoranthene	0.2	mg/kg	2.3E-09	mg/kg/day	7.3E-02	(mg/kg/day)-1	2.E-10	1.4E-08	mg/kg/day	3.0E-02	mg/kg/day	5.E-07
				bis(2-Ethylhexyl)phthalate	0.43	mg/kg	3.8E-09	mg/kg/day	1.4E-02	(mg/kg/day)-1	5.E-11	2.2E-08	mg/kg/day	2.0E-02	mg/kg/day	1.E-06
				Indeno(1,2,3-cd)pyrene	0.29	mg/kg	3.4E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-09	2.0E-08	mg/kg/day	3.0E-02	mg/kg/day	7.E-07
				Phenanthrene	0.3	mg/kg	NC		NC			2.0E-08	mg/kg/day	3.0E-02	mg/kg/day	7.E-07
				alpha-Chlordane	0.004	mg/kg	1.4E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	5.E-12	8.3E-11	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				gamma-Chlordane	0.005	mg/kg	1.8E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	6.E-12	1.0E-10	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				Arsenic	0.97	mg/kg	2.6E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	4.E-09	1.5E-08	mg/kg/day	3.0E-04	mg/kg/day	5.E-05
				Cadmium	0.96	mg/kg	NC		NC			5.0E-10	mg/kg/day	2.5E-05	mg/kg/day	2.E-05
				Chromium	18.6	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	91	mg/kg	0.0E+00	mg/kg/day	–							
				Manganese	219	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Vanadium	7.1	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000999	mg/kg	2.7E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	4.E-07	1.6E-11	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-07					8.E-05
		EXPOSURE POINT TOTAL									4.E-06					2.E-03
	EXPOSURE MEDIUM TOTAL										4.E-06					2.E-03
SEDIMENT TOTAL											4.E-06					2.E-03
SURFACE WATER	SURFACE WATER	MANTON POND	INGESTION	Acenaphthylene	0.00000132	mg/l	NC		NC			1.3E-10	mg/kg/day	6.0E-02	mg/kg/day	2.E-09
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	3.0E-07	mg/kg/day	1.4E-02	mg/kg/day	4.E-09	1.7E-06	mg/kg/day	2.0E-02	mg/kg/day	9.E-05
				Aldrin	0.000023	mg/l	4.0E-10	mg/kg/day	1.7E+01	mg/kg/day	7.E-09	2.3E-09	mg/kg/day	3.0E-05	mg/kg/day	8.E-05
				alpha-Chlordane	0.000019	mg/l	3.3E-10	mg/kg/day	3.5E-01	mg/kg/day	1.E-10	1.9E-09	mg/kg/day	5.0E-04	mg/kg/day	4.E-06
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			3.3E-10	mg/kg/day	6.0E-03	mg/kg/day	5.E-08
				Endrin Aldehyde	0.000005	mg/l	NC		NC			5.1E-10	mg/kg/day	3.0E-04	mg/kg/day	2.E-06
				gamma-Chlordane	0.000021	mg/l	3.7E-10	mg/kg/day	3.5E-01	mg/kg/day	1.E-10	2.1E-09	mg/kg/day	5.0E-04	mg/kg/day	4.E-06
				Arsenic	0.0046	mg/l	8.0E-08	mg/kg/day	1.5E+00	mg/kg/day	1.E-07	4.7E-07	mg/kg/day	3.0E-04	mg/kg/day	2.E-03
				Barium	0.021	mg/l	NC		NC			2.1E-06	mg/kg/day	7.0E-02	mg/kg/day	3.E-05
				Chromium	0.0023	mg/l	NC		NC			2.3E-07	mg/kg/day	3.0E-03	mg/kg/day	8.E-05
				Lead	0.0044	mg/l	7.7E-08	mg/kg/day	–			4.5E-07	mg/kg/day			
				Manganese	0.13	mg/l	NC		NC			1.3E-05	mg/kg/day	2.4E-02	mg/kg/day	6.E-04
				Mercury	0.00000394	mg/l	NC		NC			4.0E-10	mg/kg/day	3.0E-04	mg/kg/day	1.E-06
				Thallium	0.0022	mg/l	NC		NC			2.2E-07	mg/kg/day	8.0E-05	mg/kg/day	3.E-03
				Nitrate	0.765	mg/l	NC		NC			7.8E-05	mg/kg/day	1.6E+00	mg/kg/day	5.E-05
				Nitrite-N	0.0865	mg/l	NC		NC			8.8E-06	mg/kg/day	1.0E-01	mg/kg/day	9.E-05
				Toxicity Equivalency (Dioxins/Furans)	0.000000861	mg/l	1.5E-11	mg/kg/day	1.5E+05	mg/kg/day	2.E-06	8.8E-11	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-06					5.E-03

TABLE 7.28.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
			DERMAL	Acenaphthylene	0.00000132	mg/l	NC		NC			--		6.0E-02	mg/kg/day	
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	1.2E-05	mg/kg/day	1.4E-02	mg/kg/day	2 E-07	6.8E-05	mg/kg/day	2.0E-02	mg/kg/day	3.E-03
				Aldrin	0.000023	mg/l	9.2E-10	mg/kg/day	1.7E+01	mg/kg/day	2.E-08	5.4E-09	mg/kg/day	3.0E-05	mg/kg/day	2.E-04
				alpha-Chlordane	0.000019	mg/l	1 8E-08	mg/kg/day	3.5E-01	mg/kg/day	6.E-09	1.0E-07	mg/kg/day	5.0E-04	mg/kg/day	2.E-04
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			--		6.0E-03	mg/kg/day	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			9.2E-09	mg/kg/day	3.0E-04	mg/kg/day	3.E-05
				gamma-Chlordane	0.000021	mg/l	2.0E-08	mg/kg/day	3.5E-01	mg/kg/day	7.E-09	1.1E-07	mg/kg/day	5.0E-04	mg/kg/day	2 E-04
				Arsenic	0.0046	mg/l	1.3E-08	mg/kg/day	1.5E+00	mg/kg/day	2.E-08	7.6E-08	mg/kg/day	3.0E-04	mg/kg/day	3.E-04
				Barium	0.021	mg/l	NC		NC			3.5E-07	mg/kg/day	4 9E-03	mg/kg/day	7 E-05
				Chromium	0.0023	mg/l	NC		NC			7.6E-08	mg/kg/day	7 5E-05	mg/kg/day	1 E-03
				Lead	0.0044	mg/l	--		--			--				
				Manganese	0 13	mg/l	NC		NC			2 2E-06	mg/kg/day	9.6E-04	mg/kg/day	2.E-03
				Mercury	0.00000394	mg/l	NC		NC			6.5E-11	mg/kg/day	2 1E-05	mg/kg/day	3 E-06
				Thallium	0.0022	mg/l	NC		NC			3.6E-08	mg/kg/day	8.0E-05	mg/kg/day	5 E-04
				Nitrate	0.765	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0 0865	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000000861	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2 E-07					8.E-03
		EXPOSURE POINT TOTAL									3.E-06					1.E-02
	EXPOSURE MEDIUM TOTAL										3.E-06					1.E-02
SURFACE WATER TOTAL											3.E-06					1.E-02
BIOTA	COMBINED FISH DIET	MANTON POND	INGESTION	Acenaphthylene	0.00041	mg/kg	NC		NC			7.9E-08	mg/kg/day	6.0E-02	mg/kg/day	1 E-06
				Dibenzo(a,h)anthracene	0.000226	mg/kg	7 4E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	5 E-08	4 3E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Phenanthrene	0.00498	mg/kg	NC		NC			9.6E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				4,4'-DDE	0 01235	mg/kg	4.1E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	1.E-07	2.4E-06	mg/kg/day	5.0E-04	mg/kg/day	5 E-03
				alpha-Chlordane	0.00263	mg/kg	8.6E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-08	5.0E-07	mg/kg/day	5.0E-04	mg/kg/day	1 E-03
				Aroclor-1254	0.22052	mg/kg	7.2E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-05	4.2E-05	mg/kg/day	2.0E-05	mg/kg/day	2.E+00
				Aroclor-1268	0.06755	mg/kg	2.2E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	4.E-06	1.3E-05	mg/kg/day	2 0E-05	mg/kg/day	6 E-01
				Dieldrin	0.00057	mg/kg	1.9E-08	mg/kg/day	1.6E+01	(mg/kg/day)-1	3.E-07	1.1E-07	mg/kg/day	5.0E-05	mg/kg/day	2.E-03
				Endosulfan Sulfate	0.0019	mg/kg	NC		NC			3.6E-07	mg/kg/day	6 0E-03	mg/kg/day	6.E-05
				gamma-Chlordane	0.00096	mg/kg	3.2E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	1 E-08	1 8E-07	mg/kg/day	5.0E-04	mg/kg/day	4.E-04
				Technical Chlordane	0.06498	mg/kg	2.1E-06	mg/kg/day	3 5E-01	(mg/kg/day)-1	7 E-07	1 2E-05	mg/kg/day	5.0E-04	mg/kg/day	2.E-02
				Lead	0.0119	mg/kg	3.9E-07	mg/kg/day	--			2.3E-06	mg/kg/day			
				Mercury	0.259	mg/kg	NC		NC			5.0E-05	mg/kg/day	3 0E-04	mg/kg/day	2 E-01
				Mercury (methyl)	0.278	mg/kg	NC		NC			5 3E-05	mg/kg/day	1 0E-04	mg/kg/day	5 E-01
				Toxicity Equivalency (Dioxins/Furans)	0.000031	mg/kg	1.0E-09	mg/kg/day	1.5E+05	(mg/kg/day)-1	2 E-04	5.9E-09	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2 E-04					3 E+00
		EXPOSURE POINT TOTAL									2.E-04					3.E+00
	EXPOSURE MEDIUM TOTAL										2.E-04					3 E+00
COMBINED FISH DIET TOTAL											2.E-04					3.E+00
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	2.E-04	TOTAL RECEPTOR HAZARD ACROSS ALL MED				3.5.E+00

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TABLE 7.29.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	MANTON POND	INGESTION	Benzo(a)anthracene	0.3	mg/kg	1.2E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	9.E-09	7.1E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(a)pyrene	0.37	mg/kg	1.5E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-07	8.8E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(b)fluoranthene	0.64	mg/kg	2.6E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.5E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Benzo(g,h,i)perylene	0.22	mg/kg	NC		NC			5.2E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(k)fluoranthene	0.2	mg/kg	8.1E-09	mg/kg/day	7.3E-02	(mg/kg/day)-1	6.E-10	4.7E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				bis(2-Ethylhexyl)phthalate	0.43	mg/kg	1.8E-08	mg/kg/day	1.4E-02	(mg/kg/day)-1	2.E-10	1.0E-07	mg/kg/day	2.0E-02	mg/kg/day	5.E-06
				Indeno(1,2,3-cd)pyrene	0.29	mg/kg	1.2E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	9.E-09	6.9E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Phenanthrene	0.3	mg/kg	NC		NC			7.1E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				alpha-Chlordane	0.004	mg/kg	1.6E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	6.E-11	9.5E-10	mg/kg/day	5.0E-04	mg/kg/day	2.E-06
				gamma-Chlordane	0.005	mg/kg	2.0E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	7.E-11	1.2E-09	mg/kg/day	5.0E-04	mg/kg/day	2.E-06
				Arsenic	0.97	mg/kg	3.9E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	6.E-08	2.3E-07	mg/kg/day	3.0E-04	mg/kg/day	8.E-04
				Cadmium	0.96	mg/kg	NC		NC			2.3E-07	mg/kg/day	1.0E-03	mg/kg/day	2.E-04
				Chromium	18.6	mg/kg	NC		NC			4.4E-06	mg/kg/day	3.0E-03	mg/kg/day	1.E-03
				Lead	91	mg/kg	3.7E-06	mg/kg/day	--			2.2E-05	mg/kg/day			
				Manganese	219	mg/kg	NC		NC			5.2E-05	mg/kg/day	7.1E-02	mg/kg/day	7.E-04
				Vanadium	7.1	mg/kg	NC		NC			1.7E-06	mg/kg/day	7.0E-03	mg/kg/day	2.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.000999	mg/kg	4.1E-11	mg/kg/day	1.5E+05	(mg/kg/day)-1	6.E-06	2.4E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								6.E-06					3.E-03
			DERMAL	Benzo(a)anthracene	0.3	mg/kg	1.1E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-09	6.6E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(a)pyrene	0.37	mg/kg	1.4E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-07	8.2E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(b)fluoranthene	0.64	mg/kg	2.4E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.4E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Benzo(g,h,i)perylene	0.22	mg/kg	NC		NC			4.9E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(k)fluoranthene	0.2	mg/kg	7.6E-09	mg/kg/day	7.3E-02	(mg/kg/day)-1	6.E-10	4.4E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				bis(2-Ethylhexyl)phthalate	0.43	mg/kg	1.3E-08	mg/kg/day	1.4E-02	(mg/kg/day)-1	2.E-10	7.3E-08	mg/kg/day	2.0E-02	mg/kg/day	4.E-06
				Indeno(1,2,3-cd)pyrene	0.29	mg/kg	1.1E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-09	6.4E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Phenanthrene	0.3	mg/kg	NC		NC			6.6E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				alpha-Chlordane	0.004	mg/kg	4.7E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-11	2.7E-10	mg/kg/day	5.0E-04	mg/kg/day	5.E-07
				gamma-Chlordane	0.005	mg/kg	5.8E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-11	3.4E-10	mg/kg/day	5.0E-04	mg/kg/day	7.E-07
				Arsenic	0.97	mg/kg	8.5E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-08	4.9E-08	mg/kg/day	3.0E-04	mg/kg/day	2.E-04
				Cadmium	0.96	mg/kg	NC		NC			1.6E-09	mg/kg/day	2.5E-05	mg/kg/day	7.E-05
				Chromium	18.6	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	91	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	219	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Vanadium	7.1	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000999	mg/kg	8.7E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-06	5.1E-11	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-06					3.E-04
		EXPOSURE POINT TOTAL									8.E-06					4.E-03
	EXPOSURE MEDIUM TOTAL										8.E-06					4.E-03
SEDIMENT TOTAL											8.E-06					4.E-03
SURFACE WATER	SURFACE WATER	MANTON POND	INGESTION	Acenaphthylene	0.00000132	mg/l	NC		NC			2.1E-10	mg/kg/day	6.0E-02	mg/kg/day	3.E-09
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	4.6E-07	mg/kg/day	1.4E-02	mg/kg/day	6.E-09	2.7E-06	mg/kg/day	2.0E-02	mg/kg/day	1.E-04
				Aldrin	0.000023	mg/l	6.2E-10	mg/kg/day	1.7E+01	mg/kg/day	1.E-08	3.6E-09	mg/kg/day	3.0E-05	mg/kg/day	1.E-04
				alpha-Chlordane	0.000019	mg/l	5.2E-10	mg/kg/day	3.5E-01	mg/kg/day	2.E-10	3.0E-09	mg/kg/day	5.0E-04	mg/kg/day	6.E-06
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			5.1E-10	mg/kg/day	6.0E-03	mg/kg/day	8.E-08
				Endrin Aldehyde	0.000005	mg/l	NC		NC			7.9E-10	mg/kg/day	3.0E-04	mg/kg/day	3.E-06
				gamma-Chlordane	0.000021	mg/l	5.7E-10	mg/kg/day	3.5E-01	mg/kg/day	2.E-10	3.3E-09	mg/kg/day	5.0E-04	mg/kg/day	7.E-06
				Arsenic	0.0046	mg/l	1.2E-07	mg/kg/day	1.5E+00	mg/kg/day	2.E-07	7.3E-07	mg/kg/day	3.0E-04	mg/kg/day	2.E-03
				Barium	0.021	mg/l	NC		NC			3.3E-06	mg/kg/day	7.0E-02	mg/kg/day	5.E-05
				Chromium	0.0023	mg/l	NC		NC			3.6E-07	mg/kg/day	3.0E-03	mg/kg/day	1.E-04
				Lead	0.0044	mg/l	1.2E-07	mg/kg/day	--			7.0E-07	mg/kg/day			
				Manganese	0.13	mg/l	NC		NC			2.1E-05	mg/kg/day	2.4E-02	mg/kg/day	9.E-04
				Mercury	0.00000394	mg/l	NC		NC			6.2E-10	mg/kg/day	3.0E-04	mg/kg/day	2.E-06
				Thallium	0.0022	mg/l	NC		NC			3.5E-07	mg/kg/day	8.0E-05	mg/kg/day	4.E-03
				Nitrate	0.765	mg/l	NC		NC			1.2E-04	mg/kg/day	1.6E+00	mg/kg/day	8.E-05
				Nitrite-N	0.0865	mg/l	NC		NC			1.4E-05	mg/kg/day	1.0E-01	mg/kg/day	1.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.000000861	mg/l	2.3E-11	mg/kg/day	1.5E+05	mg/kg/day	4.E-06	1.4E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-06					8.E-03

TABLE 7.29.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
			DERMAL	Acenaphthylene	0.00000132	mg/l	NC		NC			--		6.0E-02	mg/kg/day	
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	1.4E-05	mg/kg/day	1.4E-02	mg/kg/day	2.E-07	8.1E-05	mg/kg/day	2.0E-02	mg/kg/day	4.E-03
				Aldrin	0.000023	mg/l	1.1E-09	mg/kg/day	1.7E+01	mg/kg/day	2.E-08	6.4E-09	mg/kg/day	3.0E-05	mg/kg/day	2.E-04
				alpha-Chlordane	0.000019	mg/l	2.1E-08	mg/kg/day	3.5E-01	mg/kg/day	7.E-09	1.2E-07	mg/kg/day	5.0E-04	mg/kg/day	2.E-04
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			--		6.0E-03	mg/kg/day	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			1.1E-08	mg/kg/day	3.0E-04	mg/kg/day	4.E-05
				gamma-Chlordane	0.000021	mg/l	2.3E-08	mg/kg/day	3.5E-01	mg/kg/day	8.E-09	1.4E-07	mg/kg/day	5.0E-04	mg/kg/day	3.E-04
				Arsenic	0.0046	mg/l	1.6E-08	mg/kg/day	1.5E+00	mg/kg/day	2.E-08	9.1E-08	mg/kg/day	3.0E-04	mg/kg/day	3.E-04
				Barium	0.021	mg/l	NC		NC			4.1E-07	mg/kg/day	4.9E-03	mg/kg/day	8.E-05
				Chromium	0.0023	mg/l	NC		NC			9.1E-08	mg/kg/day	7.5E-05	mg/kg/day	1.E-03
				Lead	0.0044	mg/l	--		--			--				
				Manganese	0.13	mg/l	NC		NC			2.6E-06	mg/kg/day	9.6E-04	mg/kg/day	3.E-03
				Mercury	0.00000394	mg/l	NC		NC			7.8E-11	mg/kg/day	2.1E-05	mg/kg/day	4.E-06
				Thallium	0.0022	mg/l	NC		NC			4.3E-08	mg/kg/day	8.0E-05	mg/kg/day	5.E-04
				Nitrate	0.765	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.0865	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000000861	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-07					1.E-02
		EXPOSURE POINT TOTAL									4.E-06					2.E-02
	EXPOSURE MEDIUM TOTAL										4.E-06					2.E-02
SURFACE WATER TOTAL											4.E-06					2.E-02
BIOTA	COMBINED FISH DIET	MANTON POND	INGESTION	Acenaphthylene	0.00041	mg/kg	NC		NC			8.1E-08	mg/kg/day	6.0E-02	mg/kg/day	1.E-06
				Dibenzo(a,h)anthracene	0.000226	mg/kg	7.7E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	6.E-08	4.5E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Phenanthrene	0.00498	mg/kg	NC		NC			9.9E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				4,4'-DDE	0.01235	mg/kg	4.2E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	1.E-07	2.4E-06	mg/kg/day	5.0E-04	mg/kg/day	5.E-03
				alpha-Chlordane	0.00263	mg/kg	8.9E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-08	5.2E-07	mg/kg/day	5.0E-04	mg/kg/day	1.E-03
				Aroclor-1254	0.22052	mg/kg	7.5E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-05	4.4E-05	mg/kg/day	2.0E-05	mg/kg/day	2.E+00
				Aroclor-1268	0.06755	mg/kg	2.3E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	5.E-06	1.3E-05	mg/kg/day	2.0E-05	mg/kg/day	7.E-01
				Dieldrin	0.00057	mg/kg	1.9E-08	mg/kg/day	1.6E+01	(mg/kg/day)-1	3.E-07	1.1E-07	mg/kg/day	5.0E-05	mg/kg/day	2.E-03
				Endosulfan Sulfate	0.0019	mg/kg	NC		NC			3.8E-07	mg/kg/day	6.0E-03	mg/kg/day	6.E-05
				gamma-Chlordane	0.00096	mg/kg	3.3E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-08	1.9E-07	mg/kg/day	5.0E-04	mg/kg/day	4.E-04
				Technical Chlordane	0.06498	mg/kg	2.2E-06	mg/kg/day	3.5E-01	(mg/kg/day)-1	8.E-07	1.3E-05	mg/kg/day	5.0E-04	mg/kg/day	3.E-02
				Lead	0.0119	mg/kg	4.0E-07	mg/kg/day	--			2.4E-06	mg/kg/day			
				Mercury	0.259	mg/kg	NC		NC			5.1E-05	mg/kg/day	3.0E-04	mg/kg/day	2.E-01
				Mercury (methyl)	0.278	mg/kg	NC		NC			5.5E-05	mg/kg/day	1.0E-04	mg/kg/day	6.E-01
				Toxicity Equivalency (Dioxins/Furans)	0.000031	mg/kg	1.1E-09	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-04	6.1E-09	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-04					4.E+00
		EXPOSURE POINT TOTAL									2.E-04					4.E+00
	EXPOSURE MEDIUM TOTAL										2.E-04					4.E+00
COMBINED FISH DIET TOTAL											2.E-04					4.E+00
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	2.E-04				TOTAL RECEPTOR HAZARD ACROSS ALL MED	3.6.E+00

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TABLE 7.30.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	MANTON POND	INGESTION	Benzo(a)anthracene	0.3	mg/kg	4.9E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-08	5.7E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(a)pyrene	0.37	mg/kg	6.0E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-07	7.0E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(b)fluoranthene	0.64	mg/kg	1.0E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-08	1.2E-06	mg/kg/day	3.0E-02	mg/kg/day	4.E-05
				Benzo(g,h,i)perylene	0.22	mg/kg	NC		NC			4.2E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(k)fluoranthene	0.2	mg/kg	3.3E-08	mg/kg/day	7.3E-02	(mg/kg/day)-1	2.E-09	3.8E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				bis(2-Ethylhexyl)phthalate	0.43	mg/kg	7.0E-08	mg/kg/day	1.4E-02	(mg/kg/day)-1	1.E-09	8.2E-07	mg/kg/day	2.0E-02	mg/kg/day	4.E-05
				Indeno(1,2,3-cd)pyrene	0.29	mg/kg	4.7E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-08	5.5E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Phenanthrene	0.3	mg/kg	NC		NC			5.7E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				alpha-Chlordane	0.004	mg/kg	6.5E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-10	7.6E-09	mg/kg/day	5.0E-04	mg/kg/day	2.E-05
				gamma-Chlordane	0.005	mg/kg	8.1E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-10	9.5E-09	mg/kg/day	5.0E-04	mg/kg/day	2.E-05
				Arsenic	0.97	mg/kg	1.6E-07	mg/kg/day	1.5E+00	(mg/kg/day)-1	2.E-07	1.8E-06	mg/kg/day	3.0E-04	mg/kg/day	6.E-03
				Cadmium	0.96	mg/kg	NC		NC			1.8E-06	mg/kg/day	1.0E-03	mg/kg/day	2.E-03
				Chromium	18.6	mg/kg	NC		NC			3.5E-05	mg/kg/day	3.0E-03	mg/kg/day	1.E-02
				Lead	91	mg/kg	1.5E-05	mg/kg/day	--			1.7E-04	mg/kg/day			
				Manganese	219	mg/kg	NC		NC			4.2E-04	mg/kg/day	7.1E-02	mg/kg/day	6.E-03
				Vanadium	7.1	mg/kg	NC		NC			1.3E-05	mg/kg/day	7.0E-03	mg/kg/day	2.E-03
				Toxicity Equivalency (Dioxins/Furans)	0.000999	mg/kg	1.6E-10	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-05	1.9E-09	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-05					3.E-02
			DERMAL	Benzo(a)anthracene	0.3	mg/kg	1.8E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	2.1E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Benzo(a)pyrene	0.37	mg/kg	2.2E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-07	2.6E-07	mg/kg/day	3.0E-02	mg/kg/day	9.E-06
				Benzo(b)fluoranthene	0.64	mg/kg	3.8E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-08	4.4E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(g,h,i)perylene	0.22	mg/kg	NC		NC			1.5E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Benzo(k)fluoranthene	0.2	mg/kg	1.2E-08	mg/kg/day	7.3E-02	(mg/kg/day)-1	9.E-10	1.4E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				bis(2-Ethylhexyl)phthalate	0.43	mg/kg	2.0E-08	mg/kg/day	1.4E-02	(mg/kg/day)-1	3.E-10	2.3E-07	mg/kg/day	2.0E-02	mg/kg/day	1.E-05
				Indeno(1,2,3-cd)pyrene	0.29	mg/kg	1.7E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	2.0E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Phenanthrene	0.3	mg/kg	NC		NC			2.1E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				alpha-Chlordane	0.004	mg/kg	7.3E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-11	8.5E-10	mg/kg/day	5.0E-04	mg/kg/day	2.E-06
				gamma-Chlordane	0.005	mg/kg	9.1E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-11	1.1E-09	mg/kg/day	5.0E-04	mg/kg/day	2.E-06
				Arsenic	0.97	mg/kg	1.3E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	2.E-08	1.5E-07	mg/kg/day	3.0E-04	mg/kg/day	5.E-04
				Cadmium	0.96	mg/kg	NC		NC			5.1E-09	mg/kg/day	2.5E-05	mg/kg/day	2.E-04
				Chromium	18.6	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	91	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	219	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Vanadium	7.1	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000999	mg/kg	1.4E-11	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-06	1.6E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-06					8.E-04
		EXPOSURE POINT TOTAL									3.E-05					3.E-02
	EXPOSURE MEDIUM TOTAL										3.E-05					3.E-02
SEDIMENT TOTAL											3.E-05					3.E-02
SURFACE WATER	SURFACE WATER	MANTON POND	INGESTION	Acenaphthylene	0.00000132	mg/l	NC		NC			6.3E-10	mg/kg/day	6.0E-02	mg/kg/day	1.E-08
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	6.9E-07	mg/kg/day	1.4E-02	mg/kg/day	1.E-08	8.1E-06	mg/kg/day	2.0E-02	mg/kg/day	4.E-04
				Aldrin	0.000023	mg/l	9.4E-10	mg/kg/day	1.7E+01	mg/kg/day	2.E-08	1.1E-08	mg/kg/day	3.0E-05	mg/kg/day	4.E-04
				alpha-Chlordane	0.000019	mg/l	7.7E-10	mg/kg/day	3.5E-01	mg/kg/day	3.E-10	9.0E-09	mg/kg/day	5.0E-04	mg/kg/day	2.E-05
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			1.5E-09	mg/kg/day	6.0E-03	mg/kg/day	3.E-07
				Endrin Aldehyde	0.000005	mg/l	NC		NC			2.4E-09	mg/kg/day	3.0E-04	mg/kg/day	8.E-06
				gamma-Chlordane	0.000021	mg/l	8.5E-10	mg/kg/day	3.5E-01	mg/kg/day	3.E-10	1.0E-08	mg/kg/day	5.0E-04	mg/kg/day	2.E-05
				Arsenic	0.0046	mg/l	1.9E-07	mg/kg/day	1.5E+00	mg/kg/day	3.E-07	2.2E-06	mg/kg/day	3.0E-04	mg/kg/day	7.E-03
				Barium	0.021	mg/l	NC		NC			1.0E-05	mg/kg/day	7.0E-02	mg/kg/day	1.E-04
				Chromium	0.0023	mg/l	NC		NC			1.1E-06	mg/kg/day	3.0E-03	mg/kg/day	4.E-04
				Lead	0.0044	mg/l	1.8E-07	mg/kg/day	--			2.1E-06	mg/kg/day			
				Manganese	0.13	mg/l	NC		NC			6.2E-05	mg/kg/day	2.4E-02	mg/kg/day	3.E-03
				Mercury	0.00000394	mg/l	NC		NC			1.9E-09	mg/kg/day	3.0E-04	mg/kg/day	6.E-06
				Thallium	0.0022	mg/l	NC		NC			1.0E-06	mg/kg/day	8.0E-05	mg/kg/day	1.E-02
				Nitrate	0.765	mg/l	NC		NC			3.6E-04	mg/kg/day	1.6E+00	mg/kg/day	2.E-04
				Nitrite-N	0.0865	mg/l	NC		NC			4.1E-05	mg/kg/day	1.0E-01	mg/kg/day	4.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.000000861	mg/l	3.5E-11	mg/kg/day	1.5E+05	mg/kg/day	5.E-06	4.1E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								6.E-06					2.E-02

TABLE 7.30.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
			DERMAL	Acenaphthylene	0.00000132	mg/l	NC		NC			--		6.0E-02	mg/kg/day	
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	9.0E-06	mg/kg/day	1.4E-02	mg/kg/day	1.E-07	1.0E-04	mg/kg/day	2.0E-02	mg/kg/day	5.E-03
				Aldrin	0.000023	mg/l	7.0E-10	mg/kg/day	1.7E+01	mg/kg/day	1.E-08	8.2E-09	mg/kg/day	3.0E-05	mg/kg/day	3.E-04
				alpha-Chlordane	0.000019	mg/l	1.4E-08	mg/kg/day	3.5E-01	mg/kg/day	5.E-09	1.6E-07	mg/kg/day	5.0E-04	mg/kg/day	3.E-04
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			--		6.0E-03	mg/kg/day	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			1.4E-08	mg/kg/day	3.0E-04	mg/kg/day	5.E-05
				gamma-Chlordane	0.000021	mg/l	1.5E-08	mg/kg/day	3.5E-01	mg/kg/day	5.E-09	1.7E-07	mg/kg/day	5.0E-04	mg/kg/day	3.E-04
				Arsenic	0.0046	mg/l	1.0E-08	mg/kg/day	1.5E+00	mg/kg/day	2.E-08	1.2E-07	mg/kg/day	3.0E-04	mg/kg/day	4.E-04
				Barium	0.021	mg/l	NC		NC			5.3E-07	mg/kg/day	4.9E-03	mg/kg/day	1.E-04
				Chromium	0.0023	mg/l	NC		NC			1.2E-07	mg/kg/day	7.5E-05	mg/kg/day	2.E-03
				Lead	0.0044	mg/l	--		--			--				
				Manganese	0.13	mg/l	NC		NC			3.3E-06	mg/kg/day	9.6E-04	mg/kg/day	3.E-03
				Mercury	0.00000394	mg/l	NC		NC			1.0E-10	mg/kg/day	2.1E-05	mg/kg/day	5.E-06
				Thallium	0.0022	mg/l	NC		NC			5.6E-08	mg/kg/day	8.0E-05	mg/kg/day	7.E-04
				Nitrate	0.765	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.0865	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000000861	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-07					1.E-02
		EXPOSURE POINT TOTAL									6.E-06					4.E-02
	EXPOSURE MEDIUM TOTAL										6.E-06					4.E-02
SURFACE WATER TOTAL											6.E-06					4.E-02
BIOTA	COMBINED FISH DIET	MANTON POND	INGESTION	Acenaphthylene	0.00041	mg/kg	NC		NC			1.2E-07	mg/kg/day	6.0E-02	mg/kg/day	2.E-06
				Dibenzo(a,h)anthracene	0.000226	mg/kg	5.8E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-08	6.8E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Phenanthrene	0.00498	mg/kg	NC		NC			1.5E-06	mg/kg/day	3.0E-02	mg/kg/day	5.E-05
				4,4'-DDE	0.01235	mg/kg	3.2E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	1.E-07	3.7E-06	mg/kg/day	5.0E-04	mg/kg/day	7.E-03
				alpha-Chlordane	0.00263	mg/kg	6.8E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-08	7.9E-07	mg/kg/day	5.0E-04	mg/kg/day	2.E-03
				Aroclor-1254	0.22052	mg/kg	5.7E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-05	6.6E-05	mg/kg/day	2.0E-05	mg/kg/day	3.E+00
				Aroclor-1268	0.06755	mg/kg	1.7E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-06	2.0E-05	mg/kg/day	2.0E-05	mg/kg/day	1.E+00
				Dieldrin	0.00057	mg/kg	1.5E-08	mg/kg/day	1.6E+01	(mg/kg/day)-1	2.E-07	1.7E-07	mg/kg/day	5.0E-05	mg/kg/day	3.E-03
				Endosulfan Sulfate	0.0019	mg/kg	NC		NC			5.7E-07	mg/kg/day	6.0E-03	mg/kg/day	1.E-04
				gamma-Chlordane	0.00096	mg/kg	2.5E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	9.E-09	2.9E-07	mg/kg/day	5.0E-04	mg/kg/day	6.E-04
				Technical Chlordane	0.06498	mg/kg	1.7E-06	mg/kg/day	3.5E-01	(mg/kg/day)-1	6.E-07	2.0E-05	mg/kg/day	5.0E-04	mg/kg/day	4.E-02
				Lead	0.0119	mg/kg	3.1E-07	mg/kg/day	--			3.6E-06	mg/kg/day			
				Mercury	0.259	mg/kg	NC		NC			7.8E-05	mg/kg/day	3.0E-04	mg/kg/day	3.E-01
				Mercury (methyl)	0.278	mg/kg	NC		NC			8.4E-05	mg/kg/day	1.0E-04	mg/kg/day	8.E-01
				Toxicity Equivalency (Dioxins/Furans)	0.000031	mg/kg	8.0E-10	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-04	9.3E-09	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-04					5.E+00
		EXPOSURE POINT TOTAL									1.E-04					5.E+00
	EXPOSURE MEDIUM TOTAL										1.E-04					5.E+00
COMBINED FISH DIET TOTAL											1.E-04					5.E+00
TOTAL RECEPTOR RISK ACROSS ALL MEDIA											2.E-04	TOTAL RECEPTOR HAZARD ACROSS ALL MED				5.5.E+00

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TABLE 7.31.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	DYERVILLE POND	INGESTION	2-Methylnaphthalene	0.031	mg/kg	NC		NC			7.9E-10	mg/kg/day	2.0E-02	mg/kg/day	4.E-08
				Acenaphthylene	0.27	mg/kg	NC		NC			6.9E-09	mg/kg/day	6.0E-02	mg/kg/day	1.E-07
				Benzo(a)anthracene	2.6	mg/kg	1.1E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-09	6.6E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(a)pyrene	2.2	mg/kg	9.6E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	7.E-08	5.6E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(b)fluoranthene	4	mg/kg	1.7E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	1.0E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(g,h,i)perylene	1.6	mg/kg	NC		NC			4.1E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Benzo(k)fluoranthene	1.1	mg/kg	4.8E-09	mg/kg/day	7.3E-02	(mg/kg/day)-1	4.E-10	2.8E-08	mg/kg/day	3.0E-02	mg/kg/day	9.E-07
				bis(2-Ethylhexyl)phthalate	1.6	mg/kg	7.0E-09	mg/kg/day	1.4E-02	(mg/kg/day)-1	1.E-10	4.1E-08	mg/kg/day	2.0E-02	mg/kg/day	2.E-06
				Dibenzo(a,h)anthracene	0.32	mg/kg	1.4E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-08	8.1E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				Indeno(1,2,3-cd)pyrene	2	mg/kg	8.7E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-09	5.1E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Phenanthrene	2.9	mg/kg	NC		NC			7.4E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				alpha-Chlordane	0.011	mg/kg	4.8E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-11	2.8E-10	mg/kg/day	5.0E-04	mg/kg/day	6.E-07
				Aroclor-1254	1.3	mg/kg	5.7E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-08	3.3E-08	mg/kg/day	2.0E-05	mg/kg/day	2.E-03
				Dieldrin	0.03	mg/kg	1.3E-10	mg/kg/day	1.6E+01	(mg/kg/day)-1	2.E-09	7.6E-10	mg/kg/day	5.0E-05	mg/kg/day	2.E-05
				Endosulfan sulfate	0.011	mg/kg	NC		NC			2.8E-10	mg/kg/day	6.0E-03	mg/kg/day	5.E-08
				Arsenic	2.1	mg/kg	9.2E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-08	5.3E-08	mg/kg/day	3.0E-04	mg/kg/day	2.E-04
				Cadmium	4	mg/kg	NC		NC			1.0E-07	mg/kg/day	1.0E-03	mg/kg/day	1.E-04
				Chromium	385	mg/kg	NC		NC			9.8E-06	mg/kg/day	3.0E-03	mg/kg/day	3.E-03
				Lead	307	mg/kg	1.3E-06	mg/kg/day	--			7.8E-06	mg/kg/day			
				Manganese	598	mg/kg	NC		NC			1.5E-05	mg/kg/day	7.1E-02	mg/kg/day	2.E-04
				Mercury	1.06	mg/kg	NC		NC			2.7E-08	mg/kg/day	3.0E-04	mg/kg/day	9.E-05
				Nickel	35	mg/kg	NC		NC			8.9E-07	mg/kg/day	2.0E-02	mg/kg/day	4.E-05
				Vanadium	28.4	mg/kg	NC		NC			7.2E-07	mg/kg/day	7.0E-03	mg/kg/day	1.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.000152	mg/kg	6.6E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-07	3.9E-12	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	2.53E-08	mg/kg	1.1E-16	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-11	6.4E-16	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-07					6.E-03
			DERMAL	2-Methylnaphthalene	0.031	mg/kg	NC		NC			7.0E-10	mg/kg/day	2.0E-02	mg/kg/day	3.E-08
				Acenaphthylene	0.27	mg/kg	NC		NC			6.1E-09	mg/kg/day	6.0E-02	mg/kg/day	1.E-07
				Benzo(a)anthracene	2.6	mg/kg	1.0E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-09	5.9E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(a)pyrene	2.2	mg/kg	8.5E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	6.E-08	5.0E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(b)fluoranthene	4	mg/kg	1.5E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	9.0E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(g,h,i)perylene	1.6	mg/kg	NC		NC			3.6E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Benzo(k)fluoranthene	1.1	mg/kg	4.2E-09	mg/kg/day	7.3E-02	(mg/kg/day)-1	3.E-10	2.5E-08	mg/kg/day	3.0E-02	mg/kg/day	8.E-07
				bis(2-Ethylhexyl)phthalate	1.6	mg/kg	4.7E-09	mg/kg/day	1.4E-02	(mg/kg/day)-1	7.E-11	2.8E-08	mg/kg/day	2.0E-02	mg/kg/day	1.E-06
				Dibenzo(a,h)anthracene	0.32	mg/kg	1.2E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	9.E-09	7.2E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Indeno(1,2,3-cd)pyrene	2	mg/kg	7.7E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-09	4.5E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Phenanthrene	2.9	mg/kg	NC		NC			6.5E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				alpha-Chlordane	0.011	mg/kg	1.3E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	5.E-12	7.6E-11	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				Aroclor-1254	1.3	mg/kg	5.4E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-08	3.2E-08	mg/kg/day	2.0E-05	mg/kg/day	2.E-03
				Dieldrin	0.03	mg/kg	8.9E-11	mg/kg/day	1.6E+01	(mg/kg/day)-1	1.E-09	5.2E-10	mg/kg/day	5.0E-05	mg/kg/day	1.E-05
				Endosulfan sulfate	0.011	mg/kg	NC		NC			1.9E-10	mg/kg/day	6.0E-03	mg/kg/day	3.E-08
				Arsenic	2.1	mg/kg	1.9E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	3.E-09	1.1E-08	mg/kg/day	3.0E-04	mg/kg/day	4.E-05
				Cadmium	4	mg/kg	NC		NC			6.9E-10	mg/kg/day	2.5E-05	mg/kg/day	3.E-05
				Chromium	385	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	307	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	598	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Mercury	1.06	mg/kg	NC		NC					2.1E-05	mg/kg/day	
				Nickel	35	mg/kg	NC		NC					8.0E-04	mg/kg/day	
				Vanadium	28.4	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000152	mg/kg	1.4E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-08	7.9E-13	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	2.53E-08	mg/kg	2.3E-17	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-12	1.3E-16	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-07					2.E-03
		EXPOSURE POINT TOTAL									4.E-07					7.E-03
	EXPOSURE MEDIUM TOTAL										4.E-07					7.E-03
SEDIMENT TOTAL											4.E-07					7.E-03

TABLE 7.31.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		R/D/R/C (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SURFACE WATER	SURFACE WATER	DYERVILLE POND	INGESTION	Acenaphthylene	0.00000132	mg/l	NC		NC			3.4E-12	mg/kg/day	6.0E-02	mg/kg/day	6 E-11
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	7.4E-09	mg/kg/day	1 4E-02	mg/kg/day	1 E-10	4.3E-08	mg/kg/day	2.0E-02	mg/kg/day	2 E-06
				Aldrin	0 000023	mg/l	1.0E-11	mg/kg/day	1.7E+01	mg/kg/day	2 E-10	5 9E-11	mg/kg/day	3.0E-05	mg/kg/day	2 E-06
				alpha-Chlordane	0 000019	mg/l	8.3E-12	mg/kg/day	3.5E-01	mg/kg/day	3 E-12	4 8E-11	mg/kg/day	5 0E-04	mg/kg/day	1 E-07
				Endosulfan Sulfate	0 0000032	mg/l	NC		NC			8.1E-12	mg/kg/day	6.0E-03	mg/kg/day	1 E-09
				Endrin Aldehyde	0 000005	mg/l	NC		NC			1.3E-11	mg/kg/day	3.0E-04	mg/kg/day	4.E-08
				gamma-Chlordane	0.000021	mg/l	9 2E-12	mg/kg/day	3 5E-01	mg/kg/day	3.E-12	5.3E-11	mg/kg/day	5 0E-04	mg/kg/day	1 E-07
				Arsenic	0 0046	mg/l	2 0E-09	mg/kg/day	1 5E+00	mg/kg/day	3 E-09	1.2E-08	mg/kg/day	3.0E-04	mg/kg/day	4 E-05
				Barium	0 021	mg/l	NC		NC			5.3E-08	mg/kg/day	7 0E-02	mg/kg/day	8 E-07
				Chromium	0 0023	mg/l	NC		NC			5.9E-09	mg/kg/day	3 0E-03	mg/kg/day	2 E-06
				Lead	0 0044	mg/l	1.9E-09	mg/kg/day	--			1 1E-08	mg/kg/day			
				Manganese	0 13	mg/l	NC		NC			3.3E-07	mg/kg/day	2.4E-02	mg/kg/day	1 E-05
				Mercury	0 00000394	mg/l	NC		NC			1 0E-11	mg/kg/day	3 0E-04	mg/kg/day	3 E-08
				Thallium	0.0022	mg/l	NC		NC			5 6E-09	mg/kg/day	8 0E-05	mg/kg/day	7 E-05
				Nitrate	0.765	mg/l	NC		NC			1.9E-06	mg/kg/day	1 6E+00	mg/kg/day	1.E-06
				Nitrite-N	0 0865	mg/l	NC		NC			2.2E-07	mg/kg/day	1.0E-01	mg/kg/day	2.E-06
				Toxicity Equivalency (Dioxins/Furans)	0.000000861	mg/l	3 8E-13	mg/kg/day	1 5E+05	mg/kg/day	6.E-08	2.2E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								6.E-08					1 E-04
			DERMAL	Acenaphthylene	0.00000132	mg/l	NC		NC			--		6.0E-02	mg/kg/day	
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	3.1E-06	mg/kg/day	1.4E-02	mg/kg/day	4 E-08	1.8E-05	mg/kg/day	2.0E-02	mg/kg/day	9 E-04
				Aldrin	0.000023	mg/l	2.4E-10	mg/kg/day	1 7E+01	mg/kg/day	4.E-09	1.4E-09	mg/kg/day	3.0E-05	mg/kg/day	5.E-05
				alpha-Chlordane	0.000019	mg/l	4 7E-09	mg/kg/day	3.5E-01	mg/kg/day	2.E-09	2.7E-08	mg/kg/day	5 0E-04	mg/kg/day	5.E-05
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			--		6.0E-03	mg/kg/day	
				Endrin Aldehyde	0 000005	mg/l	NC		NC			2.4E-09	mg/kg/day	3.0E-04	mg/kg/day	8 E-06
				gamma-Chlordane	0 000021	mg/l	5 2E-09	mg/kg/day	3.5E-01	mg/kg/day	2.E-09	3.0E-08	mg/kg/day	5.0E-04	mg/kg/day	6 E-05
				Arsenic	0.0046	mg/l	3.5E-09	mg/kg/day	1 5E+00	mg/kg/day	5.E-09	2.0E-08	mg/kg/day	3 0E-04	mg/kg/day	7 E-05
				Barium	0.021	mg/l	NC		NC			9.3E-08	mg/kg/day	4 9E-03	mg/kg/day	2.E-05
				Chromium	0 0023	mg/l	NC		NC			2.0E-08	mg/kg/day	7 5E-05	mg/kg/day	3 E-04
				Lead	0 0044	mg/l	--		--			--				
				Manganese	0 13	mg/l	NC		NC			5.8E-07	mg/kg/day	9.6E-04	mg/kg/day	6 E-04
				Mercury	0.00000394	mg/l	NC		NC			1.7E-11	mg/kg/day	2.1E-05	mg/kg/day	8 E-07
				Thallium	0 0022	mg/l	NC		NC			9.7E-09	mg/kg/day	8.0E-05	mg/kg/day	1 E-04
				Nitrate	0 765	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0 0865	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0 000000861	mg/l	0.0E+00	mg/kg/day	1 5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								6.E-08					2.E-03
		EXPOSURE POINT TOTAL									1.E-07					2.E-03
	EXPOSURE MEDIUM TOTAL										1 E-07					2.E-03
SURFACE WATER TOTAL											1.E-07					2.E-03
BIOTA	COMBINED FISH DIET	DYERVILLE POND	INGESTION	Acenaphthylene	0.00094	mg/kg	NC		NC			1.8E-07	mg/kg/day	6.0E-02	mg/kg/day	3 E-06
				Dibenzo(a,h)anthracene	0.00017	mg/kg	5.6E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-08	3 3E-08	mg/kg/day	3.0E-02	mg/kg/day	1 E-06
				Phenanthrene	0.00632	mg/kg	NC		NC			1.2E-06	mg/kg/day	3.0E-02	mg/kg/day	4 E-05
				4,4'-DDD	0.04068	mg/kg	1.3E-06	mg/kg/day	2.4E-01	(mg/kg/day)-1	3 E-07	7.8E-06	mg/kg/day	5.0E-04	mg/kg/day	2.E-02
				4,4'-DDE	0 01474	mg/kg	4.8E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	2.E-07	2.8E-06	mg/kg/day	5.0E-04	mg/kg/day	6.E-03
				4,4'-DDT	0.01467	mg/kg	4.8E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	2.E-07	2.8E-06	mg/kg/day	5.0E-04	mg/kg/day	6.E-03
				alpha-Chlordane	0 01914	mg/kg	6.3E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-07	3.7E-06	mg/kg/day	5.0E-04	mg/kg/day	7.E-03
				Aroclor-1254	0.4495	mg/kg	1.5E-05	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-05	8.6E-05	mg/kg/day	2.0E-05	mg/kg/day	4.E+00
				Dieldrin	0.01086	mg/kg	3.6E-07	mg/kg/day	1.6E+01	(mg/kg/day)-1	6.E-06	2.1E-06	mg/kg/day	5.0E-05	mg/kg/day	4.E-02
				gamma-Chlordane	0.0068	mg/kg	2.2E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	8.E-08	1.3E-06	mg/kg/day	5.0E-04	mg/kg/day	3 E-03
				Heptachlor Epoxide	0.00228	mg/kg	7.5E-08	mg/kg/day	9.1E+00	(mg/kg/day)-1	7.E-07	4.4E-07	mg/kg/day	1.3E-05	mg/kg/day	3 E-02
				Technical Chlordane	0.38798	mg/kg	1.3E-05	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-06	7.4E-05	mg/kg/day	5.0E-04	mg/kg/day	1.E-01
				Cadmium	0.261	mg/kg	NC		NC			5.0E-05	mg/kg/day	1.0E-03	mg/kg/day	5.E-02
				Lead	0.562	mg/kg	1.8E-05	mg/kg/day	--			1.1E-04	mg/kg/day			
				Manganese	23	mg/kg	NC		NC			4.4E-03	mg/kg/day	1.4E-01	mg/kg/day	3 E-02
				Mercury	0.113	mg/kg	NC		NC			2.2E-05	mg/kg/day	3.0E-04	mg/kg/day	7.E-02
				Mercury (methyl)	0.122	mg/kg	NC		NC			2.3E-05	mg/kg/day	1.0E-04	mg/kg/day	2.E-01

TABLE 7.31.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Toxicity Equivalency (Dioxins/Furans)	0.0000757	mg/kg	2.5E-09	mg/kg/day	1.5E+05	(mg/kg/day)-1	4 E-04	1.5E-08	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-04					5.0 E+00
		EXPOSURE POINT TOTAL									4 E-04					5.0 E+00
	EXPOSURE MEDIUM TOTAL										4 E-04					5.0 E+00
COMBINED FISH DIET TOTAL											4.E-04					5.0.E+00
TOTAL RECEPTOR RISK ACROSS ALL MEDIA											4.E-04	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				5.0.E+00

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment
NC - Not carcinogenic by this exposure route.
NA - Not applicable: exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: AWS

TABLE 7.32.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	DYERVILLE POND	INGESTION	2-Methylnaphthalene	0.031	mg/kg	NC		NC			1.2E-09	mg/kg/day	2.0E-02	mg/kg/day	6.E-08
				Acenaphthylene	0.27	mg/kg	NC		NC			1.1E-08	mg/kg/day	6.0E-02	mg/kg/day	2.E-07
				Benzo(a)anthracene	2.6	mg/kg	1.8E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	1.0E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(a)pyrene	2.2	mg/kg	1.5E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-07	8.7E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(b)fluoranthene	4	mg/kg	2.7E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.6E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Benzo(g,h,i)perylene	1.6	mg/kg	NC		NC			6.3E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(k)fluoranthene	1.1	mg/kg	7.5E-09	mg/kg/day	7.3E-02	(mg/kg/day)-1	5.E-10	4.4E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				bis(2-Ethylhexyl)phthalate	1.6	mg/kg	1.1E-08	mg/kg/day	1.4E-02	(mg/kg/day)-1	2.E-10	6.3E-08	mg/kg/day	2.0E-02	mg/kg/day	3.E-06
				Dibenzo(a,h)anthracene	0.32	mg/kg	2.2E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-08	1.3E-08	mg/kg/day	3.0E-02	mg/kg/day	4.E-07
				Indeno(1,2,3-cd)pyrene	2	mg/kg	1.4E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	7.9E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Phenanthrene	2.9	mg/kg	NC		NC			1.1E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				alpha-Chlordane	0.011	mg/kg	7.5E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-11	4.4E-10	mg/kg/day	5.0E-04	mg/kg/day	9.E-07
				Aroclor-1254	1.3	mg/kg	8.8E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-08	5.1E-08	mg/kg/day	2.0E-05	mg/kg/day	3.E-03
				Dieldrin	0.03	mg/kg	2.0E-10	mg/kg/day	1.6E+01	(mg/kg/day)-1	3.E-09	1.2E-09	mg/kg/day	5.0E-05	mg/kg/day	2.E-05
				Endosulfan sulfate	0.011	mg/kg	NC		NC			4.4E-10	mg/kg/day	6.0E-03	mg/kg/day	7.E-08
				Arsenic	2.1	mg/kg	1.4E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	2.E-08	8.3E-08	mg/kg/day	3.0E-04	mg/kg/day	3.E-04
				Cadmium	4	mg/kg	NC		NC			1.6E-07	mg/kg/day	1.0E-03	mg/kg/day	2.E-04
				Chromium	385	mg/kg	NC		NC			1.5E-05	mg/kg/day	3.0E-03	mg/kg/day	5.E-03
				Lead	307	mg/kg	2.1E-06	mg/kg/day	–			1.2E-05	mg/kg/day			
				Manganese	598	mg/kg	NC		NC			2.4E-05	mg/kg/day	7.1E-02	mg/kg/day	3.E-04
				Mercury	1.06	mg/kg	NC		NC			4.2E-08	mg/kg/day	3.0E-04	mg/kg/day	1.E-04
				Nickel	35	mg/kg	NC		NC			1.4E-06	mg/kg/day	2.0E-02	mg/kg/day	7.E-05
				Vanadium	28.4	mg/kg	NC		NC			1.1E-06	mg/kg/day	7.0E-03	mg/kg/day	2.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.000152	mg/kg	1.0E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-07	6.0E-12	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	2.53E-08	mg/kg	1.7E-16	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-11	1.0E-15	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-07					9.E-03
			DERMAL	2-Methylnaphthalene	0.031	mg/kg	NC		NC			2.3E-09	mg/kg/day	2.0E-02	mg/kg/day	1.E-07
				Acenaphthylene	0.27	mg/kg	NC		NC			2.0E-08	mg/kg/day	6.0E-02	mg/kg/day	3.E-07
				Benzo(a)anthracene	2.6	mg/kg	3.3E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.9E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Benzo(a)pyrene	2.2	mg/kg	2.8E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-07	1.6E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Benzo(b)fluoranthene	4	mg/kg	5.0E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-08	2.9E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(g,h,i)perylene	1.6	mg/kg	NC		NC			1.2E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Benzo(k)fluoranthene	1.1	mg/kg	1.4E-08	mg/kg/day	7.3E-02	(mg/kg/day)-1	1.E-09	8.1E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				bis(2-Ethylhexyl)phthalate	1.6	mg/kg	1.6E-08	mg/kg/day	1.4E-02	(mg/kg/day)-1	2.E-10	9.1E-08	mg/kg/day	2.0E-02	mg/kg/day	5.E-06
				Dibenzo(a,h)anthracene	0.32	mg/kg	4.0E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-08	2.4E-08	mg/kg/day	3.0E-02	mg/kg/day	8.E-07
				Indeno(1,2,3-cd)pyrene	2	mg/kg	2.5E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.5E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Phenanthrene	2.9	mg/kg	NC		NC			2.1E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				alpha-Chlordane	0.011	mg/kg	4.3E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-11	2.5E-10	mg/kg/day	5.0E-04	mg/kg/day	5.E-07
				Aroclor-1254	1.3	mg/kg	1.8E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	4.E-08	1.0E-07	mg/kg/day	2.0E-05	mg/kg/day	5.E-03
				Dieldrin	0.03	mg/kg	2.9E-10	mg/kg/day	1.6E+01	(mg/kg/day)-1	5.E-09	1.7E-09	mg/kg/day	5.0E-05	mg/kg/day	3.E-05
				Endosulfan sulfate	0.011	mg/kg	NC		NC			6.2E-10	mg/kg/day	6.0E-03	mg/kg/day	1.E-07
				Arsenic	2.1	mg/kg	6.1E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	9.E-09	3.6E-08	mg/kg/day	3.0E-04	mg/kg/day	1.E-04
				Cadmium	4	mg/kg	NC		NC			2.3E-09	mg/kg/day	2.5E-05	mg/kg/day	9.E-05
				Chromium	385	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	307	mg/kg	0.0E+00	mg/kg/day	–							
				Manganese	598	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Mercury	1.06	mg/kg	NC		NC					2.1E-05	mg/kg/day	
				Nickel	35	mg/kg	NC		NC					8.0E-04	mg/kg/day	
				Vanadium	28.4	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000152	mg/kg	4.4E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	7.E-08	2.6E-12	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	2.53E-08	mg/kg	7.4E-17	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-11	4.3E-16	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-07					5.E-03
		EXPOSURE POINT TOTAL									8.E-07					1.E-02
	EXPOSURE MEDIUM TOTAL										8.E-07					1.E-02
SEDIMENT TOTAL											8.E-07					1.E-02

TABLE 7.32.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SURFACE WATER	SURFACE WATER	DYERVILLE POND	INGESTION	Acenaphthylene	0.00000132	mg/l	NC		NC			5.2E-12	mg/kg/day	6.0E-02	mg/kg/day	9.E-11
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	1.2E-08	mg/kg/day	1.4E-02	mg/kg/day	2.E-10	6.7E-08	mg/kg/day	2.0E-02	mg/kg/day	3.E-06
				Aldrin	0.000023	mg/l	1.6E-11	mg/kg/day	1.7E+01	mg/kg/day	3.E-10	9.1E-11	mg/kg/day	3.0E-05	mg/kg/day	3.E-06
				alpha-Chlordane	0.000019	mg/l	1.3E-11	mg/kg/day	3.5E-01	mg/kg/day	5.E-12	7.5E-11	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			1.3E-11	mg/kg/day	6.0E-03	mg/kg/day	2.E-09
				Endrin Aldehyde	0.000005	mg/l	NC		NC			2.0E-11	mg/kg/day	3.0E-04	mg/kg/day	7.E-08
				gamma-Chlordane	0.000021	mg/l	1.4E-11	mg/kg/day	3.5E-01	mg/kg/day	5.E-12	8.3E-11	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				Arsenic	0.0046	mg/l	3.1E-09	mg/kg/day	1.5E+00	mg/kg/day	5.E-09	1.8E-08	mg/kg/day	3.0E-04	mg/kg/day	6.E-05
				Barium	0.021	mg/l	NC		NC			8.3E-08	mg/kg/day	7.0E-02	mg/kg/day	1.E-06
				Chromium	0.0023	mg/l	NC		NC			9.1E-09	mg/kg/day	3.0E-03	mg/kg/day	3.E-06
				Lead	0.0044	mg/l	3.0E-09	mg/kg/day	--			1.7E-08	mg/kg/day			
				Manganese	0.13	mg/l	NC		NC			5.1E-07	mg/kg/day	2.4E-02	mg/kg/day	2.E-05
				Mercury	0.00000394	mg/l	NC		NC			1.6E-11	mg/kg/day	3.0E-04	mg/kg/day	5.E-08
				Thallium	0.0022	mg/l	NC		NC			8.7E-09	mg/kg/day	8.0E-05	mg/kg/day	1.E-04
				Nitrate	0.765	mg/l	NC		NC			3.0E-06	mg/kg/day	1.6E+00	mg/kg/day	2.E-06
				Nitrite-N	0.0865	mg/l	NC		NC			3.4E-07	mg/kg/day	1.0E-01	mg/kg/day	3.E-06
				Toxicity Equivalency (Dioxins/Furans)	0.000000861	mg/l	5.8E-13	mg/kg/day	1.5E+05	mg/kg/day	9.E-08	3.4E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								9.E-08					2.E-04
			DERMAL	Acenaphthylene	0.00000132	mg/l	NC		NC			--		6.0E-02	mg/kg/day	
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	3.5E-06	mg/kg/day	1.4E-02	mg/kg/day	5.E-08	2.0E-05	mg/kg/day	2.0E-02	mg/kg/day	1.E-03
				Aldrin	0.000023	mg/l	2.7E-10	mg/kg/day	1.7E+01	mg/kg/day	5.E-09	1.6E-09	mg/kg/day	3.0E-05	mg/kg/day	5.E-05
				alpha-Chlordane	0.000019	mg/l	5.3E-09	mg/kg/day	3.5E-01	mg/kg/day	2.E-09	3.1E-08	mg/kg/day	5.0E-04	mg/kg/day	6.E-05
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			--		6.0E-03	mg/kg/day	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			2.7E-09	mg/kg/day	3.0E-04	mg/kg/day	9.E-06
				gamma-Chlordane	0.000021	mg/l	5.8E-09	mg/kg/day	3.5E-01	mg/kg/day	2.E-09	3.4E-08	mg/kg/day	5.0E-04	mg/kg/day	7.E-05
				Arsenic	0.0046	mg/l	3.9E-09	mg/kg/day	1.5E+00	mg/kg/day	6.E-09	2.3E-08	mg/kg/day	3.0E-04	mg/kg/day	8.E-05
				Barium	0.021	mg/l	NC		NC			1.0E-07	mg/kg/day	4.9E-03	mg/kg/day	2.E-05
				Chromium	0.0023	mg/l	NC		NC			2.3E-08	mg/kg/day	7.5E-05	mg/kg/day	3.E-04
				Lead	0.0044	mg/l	--		--			--				
				Manganese	0.13	mg/l	NC		NC			6.4E-07	mg/kg/day	9.6E-04	mg/kg/day	7.E-04
				Mercury	0.00000394	mg/l	NC		NC			2.0E-11	mg/kg/day	2.1E-05	mg/kg/day	9.E-07
				Thallium	0.0022	mg/l	NC		NC			1.1E-08	mg/kg/day	8.0E-05	mg/kg/day	1.E-04
				Nitrate	0.765	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.0865	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000000861	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								6.E-08					2.E-03
		EXPOSURE POINT TOTAL									2.E-07					3.E-03
	EXPOSURE MEDIUM TOTAL										2.E-07					3.E-03
SURFACE WATER TOTAL											2.E-07					3.E-03
BIOTA	COMBINED FISH DIET	DYERVILLE POND	INGESTION	Acenaphthylene	0.00094	mg/kg	NC		NC			1.9E-07	mg/kg/day	6.0E-02	mg/kg/day	3.E-06
				Dibenzo(a,h)anthracene	0.00017	mg/kg	5.8E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-08	3.4E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Phenanthrene	0.00632	mg/kg	NC		NC			1.3E-06	mg/kg/day	3.0E-02	mg/kg/day	4.E-05
				4,4'-DDD	0.04068	mg/kg	1.4E-06	mg/kg/day	2.4E-01	(mg/kg/day)-1	3.E-07	8.1E-06	mg/kg/day	5.0E-04	mg/kg/day	2.E-02
				4,4'-DDE	0.01474	mg/kg	5.0E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	2.E-07	2.9E-06	mg/kg/day	5.0E-04	mg/kg/day	6.E-03
				4,4'-DDT	0.01467	mg/kg	5.0E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	2.E-07	2.9E-06	mg/kg/day	5.0E-04	mg/kg/day	6.E-03
				alpha-Chlordane	0.01914	mg/kg	6.5E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-07	3.8E-06	mg/kg/day	5.0E-04	mg/kg/day	8.E-03
				Aroclor-1254	0.4495	mg/kg	1.5E-05	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-05	8.9E-05	mg/kg/day	2.0E-05	mg/kg/day	4.E+00
				Dieldrin	0.01086	mg/kg	3.7E-07	mg/kg/day	1.6E+01	(mg/kg/day)-1	6.E-06	2.2E-06	mg/kg/day	5.0E-05	mg/kg/day	4.E-02
				gamma-Chlordane	0.0068	mg/kg	2.3E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	8.E-08	1.3E-06	mg/kg/day	5.0E-04	mg/kg/day	3.E-03
				Heptachlor Epoxide	0.00228	mg/kg	7.7E-08	mg/kg/day	9.1E+00	(mg/kg/day)-1	7.E-07	4.5E-07	mg/kg/day	1.3E-05	mg/kg/day	3.E-02
				Technical Chlordane	0.38798	mg/kg	1.3E-05	mg/kg/day	3.5E+01	(mg/kg/day)-1	5.E-06	7.7E-05	mg/kg/day	5.0E-04	mg/kg/day	2.E-01
				Cadmium	0.261	mg/kg	NC		NC			5.2E-05	mg/kg/day	1.0E-03	mg/kg/day	5.E-02
				Lead	0.562	mg/kg	1.9E-05	mg/kg/day	--			1.1E-04	mg/kg/day			
				Manganese	23	mg/kg	NC		NC			4.6E-03	mg/kg/day	1.4E-01	mg/kg/day	3.E-02
				Mercury	0.113	mg/kg	NC		NC			2.2E-05	mg/kg/day	3.0E-04	mg/kg/day	7.E-02
				Mercury (methyl)	0.122	mg/kg	NC		NC			2.4E-05	mg/kg/day	1.0E-04	mg/kg/day	2.E-01

TABLE 7.32.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Toxicity Equivalency (Dioxins/Furans)	0.0000757	mg/kg	2.6E-09	mg/kg/day	1.5E+05	(mg/kg/day)-1	4.E-04	1.5E-08	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-04					5.1.E+00
		EXPOSURE POINT TOTAL									4.E-04					5.1.E+00
	EXPOSURE MEDIUM TOTAL										4.E-04					5.1.E+00
COMBINED FISH DIET TOTAL											4.E-04					5.1.E+00
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	4.E-04				TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA	5.1.E+00

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

Prepared by	KJA
Checked by:	AWS

TABLE 7.34.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	DYERVILLE POND	INGESTION	2-Methylnaphthalene	0.031	mg/kg	NC		NC			4.7E-09	mg/kg/day	2.0E-02	mg/kg/day	2.E-07
				Acenaphthylene	0.27	mg/kg	NC		NC			4.1E-08	mg/kg/day	6.0E-02	mg/kg/day	7.E-07
				Benzo(a)anthracene	2.6	mg/kg	6.8E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	5.E-08	4.0E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(a)pyrene	2.2	mg/kg	5.8E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-07	3.4E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(b)fluoranthene	4	mg/kg	1.0E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-08	6.1E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(g,h,i)perylene	1.6	mg/kg	NC		NC			2.4E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				Benzo(k)fluoranthene	1.1	mg/kg	2.9E-08	mg/kg/day	7.3E-02	(mg/kg/day)-1	2.E-09	1.7E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				bis(2-Ethylhexyl)phthalate	1.6	mg/kg	4.2E-08	mg/kg/day	1.4E-02	(mg/kg/day)-1	6.E-10	2.4E-07	mg/kg/day	2.0E-02	mg/kg/day	1.E-05
				Dibenzo(a,h)anthracene	0.32	mg/kg	8.4E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	6.E-08	4.9E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Indeno(1,2,3-cd)pyrene	2	mg/kg	5.2E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-08	3.1E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Phenanthrene	2.9	mg/kg	NC		NC			4.4E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				alpha-Chlordane	0.011	mg/kg	2.9E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-10	1.7E-09	mg/kg/day	5.0E-04	mg/kg/day	3.E-06
				Aroclor-1254	1.3	mg/kg	3.4E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	7.E-08	2.0E-07	mg/kg/day	2.0E-05	mg/kg/day	1.E-02
				Dieldrin	0.03	mg/kg	7.9E-10	mg/kg/day	1.6E+01	(mg/kg/day)-1	1.E-08	4.6E-09	mg/kg/day	5.0E-05	mg/kg/day	9.E-05
				Endosulfan sulfate	0.011	mg/kg	NC		NC			1.7E-09	mg/kg/day	6.0E-03	mg/kg/day	3.E-07
				Arsenic	2.1	mg/kg	5.5E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	8.E-08	3.2E-07	mg/kg/day	3.0E-04	mg/kg/day	1.E-03
				Cadmium	4	mg/kg	NC		NC			6.1E-07	mg/kg/day	1.0E-03	mg/kg/day	6.E-04
				Chromium	385	mg/kg	NC		NC			5.9E-05	mg/kg/day	3.0E-03	mg/kg/day	2.E-02
				Lead	307	mg/kg	8.0E-06	mg/kg/day	--			4.7E-05	mg/kg/day			
				Manganese	598	mg/kg	NC		NC			9.1E-05	mg/kg/day	7.1E-02	mg/kg/day	1.E-03
				Mercury	1.06	mg/kg	NC		NC			1.6E-07	mg/kg/day	3.0E-04	mg/kg/day	5.E-04
				Nickel	35	mg/kg	NC		NC			5.3E-06	mg/kg/day	2.0E-02	mg/kg/day	3.E-04
				Vanadium	28.4	mg/kg	NC		NC			4.3E-06	mg/kg/day	7.0E-03	mg/kg/day	6.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.000152	mg/kg	4.0E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	6.E-07	2.3E-11	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	2.53E-08	mg/kg	6.6E-16	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-10	3.9E-15	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-06					3.E-02
			DERMAL	2-Methylnaphthalene	0.031	mg/kg	NC		NC			2.1E-09	mg/kg/day	2.0E-02	mg/kg/day	1.E-07
				Acenaphthylene	0.27	mg/kg	NC		NC			1.8E-08	mg/kg/day	6.0E-02	mg/kg/day	3.E-07
				Benzo(a)anthracene	2.6	mg/kg	3.0E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.8E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Benzo(a)pyrene	2.2	mg/kg	2.5E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-07	1.5E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Benzo(b)fluoranthene	4	mg/kg	4.6E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-08	2.7E-07	mg/kg/day	3.0E-02	mg/kg/day	9.E-06
				Benzo(g,h,i)perylene	1.6	mg/kg	NC		NC			1.1E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Benzo(k)fluoranthene	1.1	mg/kg	1.3E-08	mg/kg/day	7.3E-02	(mg/kg/day)-1	9.E-10	7.4E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				bis(2-Ethylhexyl)phthalate	1.6	mg/kg	1.4E-08	mg/kg/day	1.4E-02	(mg/kg/day)-1	2.E-10	8.3E-08	mg/kg/day	2.0E-02	mg/kg/day	4.E-06
				Dibenzo(a,h)anthracene	0.32	mg/kg	3.7E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-08	2.2E-08	mg/kg/day	3.0E-02	mg/kg/day	7.E-07
				Indeno(1,2,3-cd)pyrene	2	mg/kg	2.3E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.4E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Phenanthrene	2.9	mg/kg	NC		NC			2.0E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				alpha-Chlordane	0.011	mg/kg	3.9E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-11	2.3E-10	mg/kg/day	5.0E-04	mg/kg/day	5.E-07
				Aroclor-1254	1.3	mg/kg	1.6E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-08	9.5E-08	mg/kg/day	2.0E-05	mg/kg/day	5.E-03
				Dieldrin	0.03	mg/kg	2.7E-10	mg/kg/day	1.6E+01	(mg/kg/day)-1	4.E-09	1.6E-09	mg/kg/day	5.0E-05	mg/kg/day	3.E-05
				Endosulfan sulfate	0.011	mg/kg	NC		NC			5.7E-10	mg/kg/day	6.0E-03	mg/kg/day	1.E-07
				Arsenic	2.1	mg/kg	5.6E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	8.E-09	3.3E-08	mg/kg/day	3.0E-04	mg/kg/day	1.E-04
				Cadmium	4	mg/kg	NC		NC			2.1E-09	mg/kg/day	2.5E-05	mg/kg/day	8.E-05
				Chromium	385	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	307	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	598	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Mercury	1.06	mg/kg	NC		NC					2.1E-05	mg/kg/day	
				Nickel	35	mg/kg	NC		NC					8.0E-04	mg/kg/day	
				Vanadium	28.4	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000152	mg/kg	4.1E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	6.E-08	2.4E-12	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	2.53E-08	mg/kg	6.8E-17	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-11	3.9E-16	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-07					5.E-03
		EXPOSURE POINT TOTAL									2.E-06					4.E-02
	EXPOSURE MEDIUM TOTAL										2.E-06					4.E-02
SEDIMENT TOTAL											2.E-06					4.E-02

TABLE 7.34.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SURFACE WATER	SURFACE WATER	DYERVILLE POND	INGESTION	Acenaphthylene	0.00000132	mg/l	NC		NC			1.3E-10	mg/kg/day	6.0E-02	mg/kg/day	2.E-09
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	3.0E-07	mg/kg/day	1.4E-02	mg/kg/day	4.E-09	1.7E-06	mg/kg/day	2.0E-02	mg/kg/day	9.E-05
				Aldrin	0.000023	mg/l	4.0E-10	mg/kg/day	1.7E+01	mg/kg/day	7.E-09	2.3E-09	mg/kg/day	3.0E-05	mg/kg/day	8.E-05
				alpha-Chlordane	0.000019	mg/l	3.3E-10	mg/kg/day	3.5E-01	mg/kg/day	1.E-10	1.9E-09	mg/kg/day	5.0E-04	mg/kg/day	4.E-06
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			3.3E-10	mg/kg/day	6.0E-03	mg/kg/day	5.E-08
				Endrin Aldehyde	0.000005	mg/l	NC		NC			5.1E-10	mg/kg/day	3.0E-04	mg/kg/day	2.E-06
				gamma-Chlordane	0.000021	mg/l	3.7E-10	mg/kg/day	3.5E-01	mg/kg/day	1.E-10	2.1E-09	mg/kg/day	5.0E-04	mg/kg/day	4.E-06
				Arsenic	0.0046	mg/l	8.0E-08	mg/kg/day	1.5E+00	mg/kg/day	1.E-07	4.7E-07	mg/kg/day	3.0E-04	mg/kg/day	2.E-03
				Barium	0.021	mg/l	NC		NC			2.1E-06	mg/kg/day	7.0E-02	mg/kg/day	3.E-05
				Chromium	0.0023	mg/l	NC		NC			2.3E-07	mg/kg/day	3.0E-03	mg/kg/day	8.E-05
				Lead	0.0044	mg/l	7.7E-08	mg/kg/day	--			4.5E-07	mg/kg/day			
				Manganese	0.13	mg/l	NC		NC			1.3E-05	mg/kg/day	2.4E-02	mg/kg/day	6.E-04
				Mercury	0.00000394	mg/l	NC		NC			4.0E-10	mg/kg/day	3.0E-04	mg/kg/day	1.E-06
				Thallium	0.0022	mg/l	NC		NC			2.2E-07	mg/kg/day	8.0E-05	mg/kg/day	3.E-03
				Nitrate	0.765	mg/l	NC		NC			7.8E-05	mg/kg/day	1.6E+00	mg/kg/day	5.E-05
				Nitrite-N	0.0865	mg/l	NC		NC			8.8E-06	mg/kg/day	1.0E-01	mg/kg/day	9.E-05
				Toxicity Equivalency (Dioxins/Furans)	0.000000861	mg/l	1.3E-11	mg/kg/day	1.5E+05	mg/kg/day	2.E-06	8.8E-11	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-06					5.E-03
			DERMAL	Acenaphthylene	0.00000132	mg/l	NC		NC			--		6.0E-02	mg/kg/day	
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	1.2E-05	mg/kg/day	1.4E-02	mg/kg/day	2.E-07	6.8E-05	mg/kg/day	2.0E-02	mg/kg/day	3.E-03
				Aldrin	0.000023	mg/l	9.2E-10	mg/kg/day	1.7E+01	mg/kg/day	2.E-08	5.4E-09	mg/kg/day	3.0E-05	mg/kg/day	2.E-04
				alpha-Chlordane	0.000019	mg/l	1.8E-08	mg/kg/day	3.5E-01	mg/kg/day	6.E-09	1.0E-07	mg/kg/day	5.0E-04	mg/kg/day	2.E-04
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			--		6.0E-03	mg/kg/day	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			9.2E-09	mg/kg/day	3.0E-04	mg/kg/day	3.E-05
				gamma-Chlordane	0.000021	mg/l	2.0E-08	mg/kg/day	3.5E-01	mg/kg/day	7.E-09	1.1E-07	mg/kg/day	5.0E-04	mg/kg/day	2.E-04
				Arsenic	0.0046	mg/l	1.3E-08	mg/kg/day	1.5E+00	mg/kg/day	2.E-08	7.6E-08	mg/kg/day	3.0E-04	mg/kg/day	3.E-04
				Barium	0.021	mg/l	NC		NC			3.5E-07	mg/kg/day	4.9E-03	mg/kg/day	7.E-05
				Chromium	0.0023	mg/l	NC		NC			7.6E-08	mg/kg/day	7.5E-05	mg/kg/day	1.E-03
				Lead	0.0044	mg/l	--		--			--				
				Manganese	0.13	mg/l	NC		NC			2.2E-06	mg/kg/day	9.6E-04	mg/kg/day	2.E-03
				Mercury	0.00000394	mg/l	NC		NC			6.5E-11	mg/kg/day	2.1E-05	mg/kg/day	3.E-06
				Thallium	0.0022	mg/l	NC		NC			3.6E-08	mg/kg/day	8.0E-05	mg/kg/day	5.E-04
				Nitrate	0.765	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.0865	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000000861	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-07					8.E-03
		EXPOSURE POINT TOTAL									3.E-06					1.E-02
	EXPOSURE MEDIUM TOTAL										3.E-06					1.E-02
SURFACE WATER TOTAL											3.E-06					1.E-02
BIOTA	COMBINED FISH DIET	DYERVILLE POND	INGESTION	Acenaphthylene	0.00094	mg/kg	NC		NC			1.8E-07	mg/kg/day	6.0E-02	mg/kg/day	3.E-06
				Dibenzo(a,h)anthracene	0.00017	mg/kg	5.6E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-08	3.3E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Phenanthrene	0.00632	mg/kg	NC		NC			1.2E-06	mg/kg/day	3.0E-02	mg/kg/day	4.E-05
				4,4'-DDD	0.04068	mg/kg	1.3E-06	mg/kg/day	2.4E-01	(mg/kg/day)-1	3.E-07	7.8E-06	mg/kg/day	5.0E-04	mg/kg/day	2.E-02
				4,4'-DDE	0.01474	mg/kg	4.8E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	2.E-07	2.8E-06	mg/kg/day	5.0E-04	mg/kg/day	6.E-03
				4,4'-DDT	0.01467	mg/kg	4.8E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	2.E-07	2.8E-06	mg/kg/day	5.0E-04	mg/kg/day	6.E-03
				alpha-Chlordane	0.01914	mg/kg	6.3E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-07	3.7E-06	mg/kg/day	5.0E-04	mg/kg/day	7.E-03
				Aroclor-1254	0.4495	mg/kg	1.5E-05	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-05	8.6E-05	mg/kg/day	2.0E-05	mg/kg/day	4.E+00
				Dieldrin	0.01086	mg/kg	3.6E-07	mg/kg/day	1.6E+01	(mg/kg/day)-1	6.E-06	2.1E-06	mg/kg/day	5.0E-05	mg/kg/day	4.E-02
				gamma-Chlordane	0.0068	mg/kg	2.2E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	8.E-08	1.3E-06	mg/kg/day	5.0E-04	mg/kg/day	3.E-03
				Heptachlor Epoxide	0.00228	mg/kg	7.5E-08	mg/kg/day	9.1E+00	(mg/kg/day)-1	7.E-07	4.4E-07	mg/kg/day	1.3E-05	mg/kg/day	3.E-02
				Technical Chlordane	0.38798	mg/kg	1.3E-05	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-06	7.4E-05	mg/kg/day	5.0E-04	mg/kg/day	1.E-01
				Cadmium	0.261	mg/kg	NC		NC			5.0E-05	mg/kg/day	1.0E-03	mg/kg/day	5.E-02
				Lead	0.562	mg/kg	1.8E-05	mg/kg/day	--			1.1E-04	mg/kg/day			
				Manganese	23	mg/kg	NC		NC			4.4E-03	mg/kg/day	1.4E-01	mg/kg/day	3.E-02
				Mercury	0.113	mg/kg	NC		NC			2.2E-05	mg/kg/day	3.0E-04	mg/kg/day	7.E-02
				Mercury (methyl)	0.122	mg/kg	NC		NC			2.3E-05	mg/kg/day	1.0E-04	mg/kg/day	2.E-01

TABLE 7.34.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Toxicity Equivalency (Dioxins/Furans)	0.0000757	mg/kg	2.5E-09	mg/kg/day	1.5E+05	(mg/kg/day)-1	4.E-04	1.5E-08	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-04					5.0.E+00
		EXPOSURE POINT TOTAL									4.E-04					5.0.E+00
	EXPOSURE MEDIUM TOTAL										4.E-04					5.0.E+00
COMBINED FISH DIET TOTAL											4.E-04					5.0.E+00
TOTAL RECEPTOR RISK ACROSS ALL MEDIA											4.E-04	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				5.0.E+00

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalaitable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: AWS

TABLE 7.35.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	DYERVILLE POND	INGESTION	2-Methylnaphthalene	0.031	mg/kg	NC		NC			7.4E-09	mg/kg/day	2.0E-02	mg/kg/day	4.E-07
				Acenaphthylene	0.27	mg/kg	NC		NC			6.4E-08	mg/kg/day	6.0E-02	mg/kg/day	1.E-06
				Benzo(a)anthracene	2.6	mg/kg	1.1E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-08	6.2E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(a)pyrene	2.2	mg/kg	9.0E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	7.E-07	5.2E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(b)fluoranthene	4	mg/kg	1.6E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-07	9.5E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Benzo(g,h,i)perylene	1.6	mg/kg	NC		NC			3.8E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(k)fluoranthene	1.1	mg/kg	4.5E-08	mg/kg/day	7.3E-02	(mg/kg/day)-1	3.E-09	2.6E-07	mg/kg/day	3.0E-02	mg/kg/day	9.E-06
				bis(2-Ethylhexyl)phthalate	1.6	mg/kg	6.5E-08	mg/kg/day	1.4E-02	(mg/kg/day)-1	9.E-10	3.8E-07	mg/kg/day	2.0E-02	mg/kg/day	2.E-05
				Dibenzo(a,h)anthracene	0.32	mg/kg	1.3E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-07	7.6E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Indeno(1,2,3-cd)pyrene	2	mg/kg	8.1E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-08	4.7E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Phenanthrene	2.9	mg/kg	NC		NC			6.9E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				alpha-Chlordane	0.011	mg/kg	4.5E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-10	2.6E-09	mg/kg/day	5.0E-04	mg/kg/day	5.E-06
				Aroclor-1254	1.3	mg/kg	5.3E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-07	3.1E-07	mg/kg/day	2.0E-05	mg/kg/day	2.E-02
				Dieldrin	0.03	mg/kg	1.2E-09	mg/kg/day	1.6E+01	(mg/kg/day)-1	2.E-08	7.1E-09	mg/kg/day	5.0E-05	mg/kg/day	1.E-04
				Endosulfan sulfate	0.011	mg/kg	NC		NC			2.6E-09	mg/kg/day	6.0E-03	mg/kg/day	4.E-07
				Arsenic	2.1	mg/kg	8.5E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-07	5.0E-07	mg/kg/day	3.0E-04	mg/kg/day	2.E-03
				Cadmium	4	mg/kg	NC		NC			9.5E-07	mg/kg/day	1.0E-03	mg/kg/day	9.E-04
				Chromium	385	mg/kg	NC		NC			9.1E-05	mg/kg/day	3.0E-03	mg/kg/day	3.E-02
				Lead	307	mg/kg	1.2E-05	mg/kg/day	–			7.3E-05	mg/kg/day			
				Manganese	598	mg/kg	NC		NC			1.4E-04	mg/kg/day	7.1E-02	mg/kg/day	2.E-03
				Mercury	1.06	mg/kg	NC		NC			2.5E-07	mg/kg/day	3.0E-04	mg/kg/day	8.E-04
				Nickel	35	mg/kg	NC		NC			8.3E-06	mg/kg/day	2.0E-02	mg/kg/day	4.E-04
				Vanadium	28.4	mg/kg	NC		NC			6.7E-06	mg/kg/day	7.0E-03	mg/kg/day	1.E-03
				Toxicity Equivalency (Dioxins/Furans)	0.000152	mg/kg	6.2E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	9.E-07	3.6E-11	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	2.53E-08	mg/kg	1.0E-15	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-10	6.0E-15	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-06					5.E-02
			DERMAL	2-Methylnaphthalene	0.031	mg/kg	NC		NC			6.8E-09	mg/kg/day	2.0E-02	mg/kg/day	3.E-07
				Acenaphthylene	0.27	mg/kg	NC		NC			6.0E-08	mg/kg/day	6.0E-02	mg/kg/day	1.E-06
				Benzo(a)anthracene	2.6	mg/kg	9.8E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-08	5.7E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(a)pyrene	2.2	mg/kg	8.3E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	6.E-07	4.9E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(b)fluoranthene	4	mg/kg	1.5E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-07	8.8E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Benzo(g,h,i)perylene	1.6	mg/kg	NC		NC			3.5E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(k)fluoranthene	1.1	mg/kg	4.2E-08	mg/kg/day	7.3E-02	(mg/kg/day)-1	3.E-09	2.4E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				bis(2-Ethylhexyl)phthalate	1.6	mg/kg	4.7E-08	mg/kg/day	1.4E-02	(mg/kg/day)-1	7.E-10	2.7E-07	mg/kg/day	2.0E-02	mg/kg/day	1.E-05
				Dibenzo(a,h)anthracene	0.32	mg/kg	1.2E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	9.E-08	7.1E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Indeno(1,2,3-cd)pyrene	2	mg/kg	7.6E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-08	4.4E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Phenanthrene	2.9	mg/kg	NC		NC			6.4E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				alpha-Chlordane	0.011	mg/kg	1.3E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-11	7.5E-10	mg/kg/day	5.0E-04	mg/kg/day	1.E-06
				Aroclor-1254	1.3	mg/kg	5.3E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-07	3.1E-07	mg/kg/day	2.0E-05	mg/kg/day	2.E-02
				Dieldrin	0.03	mg/kg	8.7E-10	mg/kg/day	1.6E+01	(mg/kg/day)-1	1.E-08	5.1E-09	mg/kg/day	5.0E-05	mg/kg/day	1.E-04
				Endosulfan sulfate	0.011	mg/kg	NC		NC			1.9E-09	mg/kg/day	6.0E-03	mg/kg/day	3.E-07
				Arsenic	2.1	mg/kg	1.8E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	3.E-08	1.1E-07	mg/kg/day	3.0E-04	mg/kg/day	4.E-04
				Cadmium	4	mg/kg	NC		NC			6.8E-09	mg/kg/day	2.5E-05	mg/kg/day	3.E-04
				Chromium	385	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	307	mg/kg	0.0E+00	mg/kg/day	–							
				Manganese	598	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Mercury	1.06	mg/kg	NC		NC					2.1E-05	mg/kg/day	
				Nickel	35	mg/kg	NC		NC					8.0E-04	mg/kg/day	
				Vanadium	28.4	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000152	mg/kg	1.3E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-07	7.7E-12	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	2.53E-08	mg/kg	2.2E-16	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-11	1.3E-15	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-06					2.E-02
		EXPOSURE POINT TOTAL									3.E-06					7.E-02
	EXPOSURE MEDIUM TOTAL										3.E-06					7.E-02
SEDIMENT TOTAL											3.E-06					7.E-02
SURFACE WATER	SURFACE WATER	DYERVILLE POND	INGESTION	Acenaphthylene	0.000000132	mg/l	NC		NC			2.1E-10	mg/kg/day	6.0E-02	mg/kg/day	3.E-09
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	4.6E-07	mg/kg/day	1.4E-02	mg/kg/day	6.E-09	2.7E-06	mg/kg/day	2.0E-02	mg/kg/day	1.E-04
				Aldrin	0.000023	mg/l	6.2E-10	mg/kg/day	1.7E+01	mg/kg/day	1.E-08	3.6E-09	mg/kg/day	3.0E-05	mg/kg/day	1.E-04
				alpha-Chlordane	0.000019	mg/l	5.2E-10	mg/kg/day	3.5E-01	mg/kg/day	2.E-10	3.0E-09	mg/kg/day	5.0E-04	mg/kg/day	6.E-06
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			5.1E-10	mg/kg/day	6.0E-03	mg/kg/day	8.E-08

TABLE 7.35.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			7.9E-10	mg/kg/day	3.0E-04	mg/kg/day	3.E-06
				gamma-Chlordane	0.000021	mg/l	5.7E-10	mg/kg/day	3.5E-01	mg/kg/day	2.E-10	3.3E-09	mg/kg/day	5.0E-04	mg/kg/day	7.E-06
				Arsenic	0.0046	mg/l	1.2E-07	mg/kg/day	1.5E+00	mg/kg/day	2.E-07	7.3E-07	mg/kg/day	3.0E-04	mg/kg/day	2.E-03
				Barium	0.021	mg/l	NC		NC			3.3E-06	mg/kg/day	7.0E-02	mg/kg/day	5.E-05
				Chromium	0.0023	mg/l	NC		NC			3.6E-07	mg/kg/day	3.0E-03	mg/kg/day	1.E-04
				Lead	0.0044	mg/l	1.2E-07	mg/kg/day	--			7.0E-07	mg/kg/day			
				Manganese	0.13	mg/l	NC		NC			2.1E-05	mg/kg/day	2.4E-02	mg/kg/day	9.E-04
				Mercury	0.00000394	mg/l	NC		NC			6.2E-10	mg/kg/day	3.0E-04	mg/kg/day	2.E-06
				Thallium	0.0022	mg/l	NC		NC			3.5E-07	mg/kg/day	8.0E-05	mg/kg/day	4.E-03
				Nitrate	0.765	mg/l	NC		NC			1.2E-04	mg/kg/day	1.6E+00	mg/kg/day	8.E-05
				Nitrite-N	0.0865	mg/l	NC		NC			1.4E-05	mg/kg/day	1.0E-01	mg/kg/day	1.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.000000861	mg/l	2.3E-11	mg/kg/day	1.5E+05	mg/kg/day	4.E-06	1.4E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-06					8.E-03
			DERMAL	Acenaphthylene	0.00000132	mg/l	NC		NC			--		6.0E-02	mg/kg/day	
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	1.4E-05	mg/kg/day	1.4E-02	mg/kg/day	2.E-07	8.1E-05	mg/kg/day	2.0E-02	mg/kg/day	4.E-03
				Aldrin	0.000023	mg/l	1.1E-09	mg/kg/day	1.7E+01	mg/kg/day	2.E-08	6.4E-09	mg/kg/day	3.0E-05	mg/kg/day	2.E-04
				alpha-Chlordane	0.000019	mg/l	2.1E-08	mg/kg/day	3.5E-01	mg/kg/day	7.E-09	1.2E-07	mg/kg/day	5.0E-04	mg/kg/day	2.E-04
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			--		6.0E-03	mg/kg/day	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			1.1E-08	mg/kg/day	3.0E-04	mg/kg/day	4.E-05
				gamma-Chlordane	0.000021	mg/l	2.3E-08	mg/kg/day	3.5E-01	mg/kg/day	8.E-09	1.4E-07	mg/kg/day	5.0E-04	mg/kg/day	3.E-04
				Arsenic	0.0046	mg/l	1.6E-08	mg/kg/day	1.5E+00	mg/kg/day	2.E-08	9.1E-08	mg/kg/day	3.0E-04	mg/kg/day	3.E-04
				Barium	0.021	mg/l	NC		NC			4.1E-07	mg/kg/day	4.9E-03	mg/kg/day	8.E-05
				Chromium	0.0023	mg/l	NC		NC			9.1E-08	mg/kg/day	7.5E-05	mg/kg/day	1.E-03
				Lead	0.0044	mg/l	--		--			--				
				Manganese	0.13	mg/l	NC		NC			2.6E-06	mg/kg/day	9.6E-04	mg/kg/day	3.E-03
				Mercury	0.00000394	mg/l	NC		NC			7.8E-11	mg/kg/day	2.1E-05	mg/kg/day	4.E-06
				Thallium	0.0022	mg/l	NC		NC			4.3E-08	mg/kg/day	8.0E-05	mg/kg/day	5.E-04
				Nitrate	0.765	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.0865	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000000861	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-07					1.E-02
		EXPOSURE POINT TOTAL									4.E-06					2.E-02
	EXPOSURE MEDIUM TOTAL										4.E-06					2.E-02
SURFACE WATER TOTAL											4.E-06					2.E-02
BIOTA	COMBINED FISH DIET	DYERVILLE POND	INGESTION	Acenaphthylene	0.00094	mg/kg	NC		NC			1.9E-07	mg/kg/day	6.0E-02	mg/kg/day	3.E-06
				Dibenzo(a,h)anthracene	0.00017	mg/kg	5.8E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-08	3.4E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Phenanthrene	0.00632	mg/kg	NC		NC			1.3E-06	mg/kg/day	3.0E-02	mg/kg/day	4.E-05
				4,4'-DDD	0.04068	mg/kg	1.4E-06	mg/kg/day	2.4E-01	(mg/kg/day)-1	3.E-07	8.1E-06	mg/kg/day	5.0E-04	mg/kg/day	2.E-02
				4,4'-DDE	0.01474	mg/kg	5.0E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	2.E-07	2.9E-06	mg/kg/day	5.0E-04	mg/kg/day	6.E-03
				4,4'-DDT	0.01467	mg/kg	5.0E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	2.E-07	2.9E-06	mg/kg/day	5.0E-04	mg/kg/day	6.E-03
				alpha-Chlordane	0.01914	mg/kg	6.5E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-07	3.8E-06	mg/kg/day	5.0E-04	mg/kg/day	8.E-03
				Aroclor-1254	0.4495	mg/kg	1.5E-05	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-05	8.9E-05	mg/kg/day	2.0E-05	mg/kg/day	4.E+00
				Dieldrin	0.01086	mg/kg	3.7E-07	mg/kg/day	1.6E+01	(mg/kg/day)-1	6.E-06	2.2E-06	mg/kg/day	5.0E-05	mg/kg/day	4.E-02
				gamma-Chlordane	0.0068	mg/kg	2.3E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	8.E-08	1.3E-06	mg/kg/day	5.0E-04	mg/kg/day	3.E-03
				Heptachlor Epoxide	0.00228	mg/kg	7.7E-08	mg/kg/day	9.1E+00	(mg/kg/day)-1	7.E-07	4.5E-07	mg/kg/day	1.3E-05	mg/kg/day	3.E-02
				Technical Chlordane	0.38798	mg/kg	1.3E-05	mg/kg/day	3.5E-01	(mg/kg/day)-1	5.E-06	7.7E-05	mg/kg/day	5.0E-04	mg/kg/day	2.E-01
				Cadmium	0.261	mg/kg	NC		NC			5.2E-05	mg/kg/day	1.0E-03	mg/kg/day	5.E-02
				Lead	0.562	mg/kg	1.9E-05	mg/kg/day	--			1.1E-04	mg/kg/day			
				Manganese	23	mg/kg	NC		NC			4.6E-03	mg/kg/day	1.4E-01	mg/kg/day	3.E-02
				Mercury	0.113	mg/kg	NC		NC			2.2E-05	mg/kg/day	3.0E-04	mg/kg/day	7.E-02
				Mercury (methyl)	0.122	mg/kg	NC		NC			2.4E-05	mg/kg/day	1.0E-04	mg/kg/day	2.E-01

TABLE 7.35.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Toxicity Equivalency (Dioxins/Furans)	0 0000757	mg/kg	2.6E-09	mg/kg/day	1 5E+05	(mg/kg/day)-1	4 E-04	1.5E-08	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4 E-04					5.1.E+00
		EXPOSURE POINT TOTAL									4.E-04					5.1.E+00
	EXPOSURE MEDIUM TOTAL										4 E-04					5.1.E+00
COMBINED FISH DIET TOTAL											4.E-04					5.1.E+00
TOTAL RECEPTOR RISK ACROSS ALL MEDIA											4.E-04	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				5.2.E+00

NOTES
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: AWS

TABLE 7.36.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	DYERVILLE POND	INGESTION	2-Methylnaphthalene	0.031	mg/kg	NC		NC			5.9E-08	mg/kg/day	2.0E-02	mg/kg/day	3.E-06
				Acenaphthylene	0.27	mg/kg	NC		NC			5.1E-07	mg/kg/day	6.0E-02	mg/kg/day	9.E-06
				Benzo(a)anthracene	2.6	mg/kg	4.2E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-07	4.9E-06	mg/kg/day	3.0E-02	mg/kg/day	2.E-04
				Benzo(a)pyrene	2.2	mg/kg	3.6E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-06	4.2E-06	mg/kg/day	3.0E-02	mg/kg/day	1.E-04
				Benzo(b)fluoranthene	4	mg/kg	6.5E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	5.E-07	7.6E-06	mg/kg/day	3.0E-02	mg/kg/day	3.E-04
				Benzo(g,h,i)perylene	1.6	mg/kg	NC		NC			3.0E-06	mg/kg/day	3.0E-02	mg/kg/day	1.E-04
				Benzo(k)fluoranthene	1.1	mg/kg	1.8E-07	mg/kg/day	7.3E-02	(mg/kg/day)-1	1.E-08	2.1E-06	mg/kg/day	3.0E-02	mg/kg/day	7.E-05
				bis(2-Ethylhexyl)phthalate	1.6	mg/kg	2.6E-07	mg/kg/day	1.4E-02	(mg/kg/day)-1	4.E-09	3.0E-06	mg/kg/day	2.0E-02	mg/kg/day	2.E-04
				Dibenzo(a,h)anthracene	0.32	mg/kg	5.2E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-07	6.1E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Indeno(1,2,3-cd)pyrene	2	mg/kg	3.3E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-07	3.8E-06	mg/kg/day	3.0E-02	mg/kg/day	1.E-04
				Phenanthrene	2.9	mg/kg	NC		NC			5.5E-06	mg/kg/day	3.0E-02	mg/kg/day	2.E-04
				alpha-Chlordane	0.011	mg/kg	1.8E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	6.E-10	2.1E-08	mg/kg/day	5.0E-04	mg/kg/day	4.E-05
				Aroclor-1254	1.3	mg/kg	2.1E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	4.E-07	2.5E-06	mg/kg/day	2.0E-05	mg/kg/day	1.E-01
				Dieldrin	0.03	mg/kg	4.9E-09	mg/kg/day	1.6E+01	(mg/kg/day)-1	8.E-08	5.7E-08	mg/kg/day	5.0E-05	mg/kg/day	1.E-03
				Endosulfan sulfate	0.011	mg/kg	NC		NC			2.1E-08	mg/kg/day	6.0E-03	mg/kg/day	3.E-06
				Arsenic	2.1	mg/kg	3.4E-07	mg/kg/day	1.5E+00	(mg/kg/day)-1	5.E-07	4.0E-06	mg/kg/day	3.0E-04	mg/kg/day	1.E-02
				Cadmium	4	mg/kg	NC		NC			7.6E-06	mg/kg/day	1.0E-03	mg/kg/day	8.E-03
				Chromium	385	mg/kg	NC		NC			7.3E-04	mg/kg/day	3.0E-03	mg/kg/day	2.E-01
				Lead	307	mg/kg	5.0E-05	mg/kg/day	--			5.8E-04	mg/kg/day			
				Manganese	598	mg/kg	NC		NC			1.1E-03	mg/kg/day	7.1E-02	mg/kg/day	2.E-02
				Mercury	1.06	mg/kg	NC		NC			2.0E-06	mg/kg/day	3.0E-04	mg/kg/day	7.E-03
				Nickel	35	mg/kg	NC		NC			6.6E-05	mg/kg/day	2.0E-02	mg/kg/day	3.E-03
				Vanadium	28.4	mg/kg	NC		NC			5.4E-05	mg/kg/day	7.0E-03	mg/kg/day	8.E-03
				Toxicity Equivalency (Dioxins/Furans)	0.000152	mg/kg	2.5E-11	mg/kg/day	1.5E+05	(mg/kg/day)-1	4.E-06	2.9E-10	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	2.53E-08	mg/kg	4.1E-15	mg/kg/day	1.5E+05	(mg/kg/day)-1	6.E-10	4.8E-14	mg/kg/day			
			EXPOSURE ROUTE TOTAL								9.E-06					4.E-01
			DERMAL	2-Methylnaphthalene	0.031	mg/kg	NC		NC			2.1E-08	mg/kg/day	2.0E-02	mg/kg/day	1.E-06
				Acenaphthylene	0.27	mg/kg	NC		NC			1.9E-07	mg/kg/day	6.0E-02	mg/kg/day	3.E-06
				Benzo(a)anthracene	2.6	mg/kg	1.5E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-07	1.8E-06	mg/kg/day	3.0E-02	mg/kg/day	6.E-05
				Benzo(a)pyrene	2.2	mg/kg	1.3E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-06	1.5E-06	mg/kg/day	3.0E-02	mg/kg/day	5.E-05
				Benzo(b)fluoranthene	4	mg/kg	2.4E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-07	2.8E-06	mg/kg/day	3.0E-02	mg/kg/day	9.E-05
				Benzo(g,h,i)perylene	1.6	mg/kg	NC		NC			1.1E-06	mg/kg/day	3.0E-02	mg/kg/day	4.E-05
				Benzo(k)fluoranthene	1.1	mg/kg	6.5E-08	mg/kg/day	7.3E-02	(mg/kg/day)-1	5.E-09	7.6E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				bis(2-Ethylhexyl)phthalate	1.6	mg/kg	7.3E-08	mg/kg/day	1.4E-02	(mg/kg/day)-1	1.E-09	8.5E-07	mg/kg/day	2.0E-02	mg/kg/day	4.E-05
				Dibenzo(a,h)anthracene	0.32	mg/kg	1.9E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-07	2.2E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Indeno(1,2,3-cd)pyrene	2	mg/kg	1.2E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	9.E-08	1.4E-06	mg/kg/day	3.0E-02	mg/kg/day	5.E-05
				Phenanthrene	2.9	mg/kg	NC		NC			2.0E-06	mg/kg/day	3.0E-02	mg/kg/day	7.E-05
				alpha-Chlordane	0.011	mg/kg	2.0E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	7.E-11	2.3E-09	mg/kg/day	5.0E-04	mg/kg/day	5.E-06
				Aroclor-1254	1.3	mg/kg	8.3E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-07	9.7E-07	mg/kg/day	2.0E-05	mg/kg/day	5.E-02
				Dieldrin	0.03	mg/kg	1.4E-09	mg/kg/day	1.6E+01	(mg/kg/day)-1	2.E-08	1.6E-08	mg/kg/day	5.0E-05	mg/kg/day	3.E-04
				Endosulfan sulfate	0.011	mg/kg	NC		NC			5.9E-09	mg/kg/day	6.0E-03	mg/kg/day	1.E-06
				Arsenic	2.1	mg/kg	2.9E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	4.E-08	3.4E-07	mg/kg/day	3.0E-04	mg/kg/day	1.E-03
				Cadmium	4	mg/kg	NC		NC			2.1E-08	mg/kg/day	2.5E-05	mg/kg/day	9.E-04
				Chromium	385	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	307	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	598	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Mercury	1.06	mg/kg	NC		NC					2.1E-05	mg/kg/day	
				Nickel	35	mg/kg	NC		NC					8.0E-04	mg/kg/day	
				Vanadium	28.4	mg/kg	NC		NC					1.8E-04	mg/kg/day	

TABLE 7.36.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Toxicity Equivalency (Dioxins/Furans)	0.000152	mg/kg	2.1E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-07	2.4E-11	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	2.53E-08	mg/kg	3.5E-16	mg/kg/day	1.5E+05	(mg/kg/day)-1	5.E-11	4.0E-15	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-06					5.E-02
		EXPOSURE POINT TOTAL									1.E-05					5.E-01
	EXPOSURE MEDIUM TOTAL										1.E-05					5.E-01
SEDIMENT TOTAL											1.E-05					5.E-01
SURFACE WATER	SURFACE WATER	DYERVILLE POND	INGESTION	Acenaphthylene	0.00000132	mg/l	NC		NC			6.3E-10	mg/kg/day	6.0E-02	mg/kg/day	1.E-08
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	6.9E-07	mg/kg/day	1.4E-02	mg/kg/day	1.E-08	8.1E-06	mg/kg/day	2.0E-02	mg/kg/day	4.E-04
				Aldrin	0.000023	mg/l	9.4E-10	mg/kg/day	1.7E+01	mg/kg/day	2.E-08	1.1E-08	mg/kg/day	3.0E-05	mg/kg/day	4.E-04
				alpha-Chlordane	0.000019	mg/l	7.7E-10	mg/kg/day	3.5E-01	mg/kg/day	3.E-10	9.0E-09	mg/kg/day	5.0E-04	mg/kg/day	2.E-05
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			1.5E-09	mg/kg/day	6.0E-03	mg/kg/day	3.E-07
				Endrin Aldehyde	0.000005	mg/l	NC		NC			2.4E-09	mg/kg/day	3.0E-04	mg/kg/day	8.E-06
				gamma-Chlordane	0.000021	mg/l	8.5E-10	mg/kg/day	3.5E-01	mg/kg/day	3.E-10	1.0E-08	mg/kg/day	5.0E-04	mg/kg/day	2.E-05
				Arsenic	0.0046	mg/l	1.9E-07	mg/kg/day	1.5E+00	mg/kg/day	3.E-07	2.2E-06	mg/kg/day	3.0E-04	mg/kg/day	7.E-03
				Barium	0.021	mg/l	NC		NC			1.0E-05	mg/kg/day	7.0E-02	mg/kg/day	1.E-04
				Chromium	0.0023	mg/l	NC		NC			1.1E-06	mg/kg/day	3.0E-03	mg/kg/day	4.E-04
				Lead	0.0044	mg/l	1.8E-07	mg/kg/day	--			2.1E-06	mg/kg/day			
				Manganese	0.13	mg/l	NC		NC			6.2E-05	mg/kg/day	2.4E-02	mg/kg/day	3.E-03
				Mercury	0.00000394	mg/l	NC		NC			1.9E-09	mg/kg/day	3.0E-04	mg/kg/day	6.E-06
				Thallium	0.0022	mg/l	NC		NC			1.0E-06	mg/kg/day	8.0E-05	mg/kg/day	1.E-02
				Nitrate	0.765	mg/l	NC		NC			3.6E-04	mg/kg/day	1.6E+00	mg/kg/day	2.E-04
				Nitrite-N	0.0865	mg/l	NC		NC			4.1E-05	mg/kg/day	1.0E-01	mg/kg/day	4.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.000000861	mg/l	3.5E-11	mg/kg/day	1.5E+05	mg/kg/day	5.E-06	4.1E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								6.E-06					2.E-02
			DERMAL	Acenaphthylene	0.00000132	mg/l	NC		NC			--		6.0E-02	mg/kg/day	
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	9.0E-06	mg/kg/day	1.4E-02	mg/kg/day	1.E-07	1.0E-04	mg/kg/day	2.0E-02	mg/kg/day	5.E-03
				Aldrin	0.000023	mg/l	7.0E-10	mg/kg/day	1.7E+01	mg/kg/day	1.E-08	8.2E-09	mg/kg/day	3.0E-05	mg/kg/day	3.E-04
				alpha-Chlordane	0.000019	mg/l	1.4E-08	mg/kg/day	3.5E-01	mg/kg/day	5.E-09	1.6E-07	mg/kg/day	5.0E-04	mg/kg/day	3.E-04
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			--		6.0E-03	mg/kg/day	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			1.4E-08	mg/kg/day	3.0E-04	mg/kg/day	5.E-05
				gamma-Chlordane	0.000021	mg/l	1.5E-08	mg/kg/day	3.5E-01	mg/kg/day	5.E-09	1.7E-07	mg/kg/day	5.0E-04	mg/kg/day	3.E-04
				Arsenic	0.0046	mg/l	1.0E-08	mg/kg/day	1.5E+00	mg/kg/day	2.E-08	1.2E-07	mg/kg/day	3.0E-04	mg/kg/day	4.E-04
				Barium	0.021	mg/l	NC		NC			5.3E-07	mg/kg/day	4.9E-03	mg/kg/day	1.E-04
				Chromium	0.0023	mg/l	NC		NC			1.2E-07	mg/kg/day	7.5E-05	mg/kg/day	2.E-03
				Lead	0.0044	mg/l	--		--			--				
				Manganese	0.13	mg/l	NC		NC			3.3E-06	mg/kg/day	9.6E-04	mg/kg/day	3.E-03
				Mercury	0.00000394	mg/l	NC		NC			1.0E-10	mg/kg/day	2.1E-05	mg/kg/day	5.E-06
				Thallium	0.0022	mg/l	NC		NC			5.6E-08	mg/kg/day	8.0E-05	mg/kg/day	7.E-04
				Nitrate	0.765	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.0865	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000000861	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-07					1.E-02
		EXPOSURE POINT TOTAL									6.E-06					4.E-02
	EXPOSURE MEDIUM TOTAL										6.E-06					4.E-02
SURFACE WATER TOTAL											6.E-06					4.E-02
BIOTA	COMBINED FISH DIET	DYERVILLE POND	INGESTION	Acenaphthylene	0.00094	mg/kg	NC		NC			2.8E-07	mg/kg/day	6.0E-02	mg/kg/day	5.E-06
				Dibenzo(a,h)anthracene	0.00017	mg/kg	4.4E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-08	5.1E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Phenanthrene	0.00632	mg/kg	NC		NC			1.9E-06	mg/kg/day	3.0E-02	mg/kg/day	6.E-05
				4,4'-DDD	0.04068	mg/kg	1.0E-06	mg/kg/day	2.4E-01	(mg/kg/day)-1	3.E-07	1.2E-05	mg/kg/day	5.0E-04	mg/kg/day	2.E-02
				4,4'-DDE	0.01474	mg/kg	3.8E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	1.E-07	4.4E-06	mg/kg/day	5.0E-04	mg/kg/day	9.E-03
				4,4'-DDT	0.01467	mg/kg	3.8E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	1.E-07	4.4E-06	mg/kg/day	5.0E-04	mg/kg/day	9.E-03
				alpha-Chlordane	0.01914	mg/kg	4.9E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-07	5.8E-06	mg/kg/day	5.0E-04	mg/kg/day	1.E-02
				Aroclor-1254	0.4495	mg/kg	1.2E-05	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-05	1.4E-04	mg/kg/day	2.0E-05	mg/kg/day	7.E+00
				Dieldrin	0.01086	mg/kg	2.8E-07	mg/kg/day	1.6E+01	(mg/kg/day)-1	4.E-06	3.3E-06	mg/kg/day	5.0E-05	mg/kg/day	7.E-02
				gamma-Chlordane	0.0068	mg/kg	1.8E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	6.E-08	2.0E-06	mg/kg/day	5.0E-04	mg/kg/day	4.E-03
				Heptachlor Epoxide	0.00228	mg/kg	5.9E-08	mg/kg/day	9.1E+00	(mg/kg/day)-1	5.E-07	6.9E-07	mg/kg/day	1.3E-05	mg/kg/day	5.E-02
				Technical Chlordane	0.38798	mg/kg	1.0E-05	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-06	1.2E-04	mg/kg/day	5.0E-04	mg/kg/day	2.E-01
				Cadmium	0.261	mg/kg	NC		NC			7.8E-05	mg/kg/day	1.0E-03	mg/kg/day	8.E-02

TABLE 7.36.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Lead	0.562	mg/kg	1.4E-05	mg/kg/day	--			1.7E-04	mg/kg/day			
				Manganese	23	mg/kg	NC		NC			6.9E-03	mg/kg/day	1.4E-01	mg/kg/day	5.E-02
				Mercury	0.113	mg/kg	NC		NC			3.4E-05	mg/kg/day	3.0E-04	mg/kg/day	1.E-01
				Mercury (methyl)	0.122	mg/kg	NC		NC			3.7E-05	mg/kg/day	1.0E-04	mg/kg/day	4.E-01
				Toxicity Equivalency (Dioxins/Furans)	0.0000757	mg/kg	1.9E-09	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-04	2.3E-08	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-04					7.8.E+00
		EXPOSURE POINT TOTAL									3.E-04					7.8.E+00
	EXPOSURE MEDIUM TOTAL										3.E-04					7.8.E+00
COMBINED FISH DIET TOTAL											3.E-04					7.8.E+00
TOTAL RECEPTOR RISK ACROSS ALL MEDIA											3.E-04	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				8.3.E+00

NOTES.
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: AWS

TABLE 7.37.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- COMMERCIAL / INDUSTRIAL WORKER- ADULT - FOGARTY CENTER
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: COMMERCIAL / INDUSTRIAL WORKER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SOIL	SOIL	FOGARTY CENTER	INGESTION	2-Methylnaphthalene	1.56	mg/kg	NC		NC			4.6E-07	mg/kg/day	2.0E-02	mg/kg/day	2 E-05
				Acenaphthylene	0.152	mg/kg	NC		NC			4.5E-08	mg/kg/day	6.0E-02	mg/kg/day	7 E-07
				Benzo(a)anthracene	7.3	mg/kg	7.7E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	6 E-07	2.1E-06	mg/kg/day	3.0E-02	mg/kg/day	7 E-05
				Benzo(a)pyrene	5.12	mg/kg	5.4E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	4 E-06	1.5E-06	mg/kg/day	3.0E-02	mg/kg/day	5 E-05
				Benzo(b)fluoranthene	5.14	mg/kg	5.4E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	4 E-07	1.5E-06	mg/kg/day	3.0E-02	mg/kg/day	5 E-05
				Benzo(g,h,i)perylene	3.17	mg/kg	NC		NC			9.3E-07	mg/kg/day	3.0E-02	mg/kg/day	3 E-05
				Dibenzo(a,h)anthracene	0.668	mg/kg	7.0E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	5 E-07	2.0E-07	mg/kg/day	3.0E-02	mg/kg/day	7 E-06
				Indeno(1,2,3-cd)pyrene	3.57	mg/kg	3.7E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	3 E-07	1.0E-06	mg/kg/day	3.0E-02	mg/kg/day	3 E-05
				Phenanthrene	24.6	mg/kg	NC		NC			7.2E-06	mg/kg/day	3.0E-02	mg/kg/day	2 E-04
				alpha-Chlordane	0.0888	mg/kg	9.3E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	3 E-09	2.6E-08	mg/kg/day	5.0E-04	mg/kg/day	5 E-05
				Aroclor-1254	0.938	mg/kg	9.8E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	2 E-07	2.8E-07	mg/kg/day	2.0E-05	mg/kg/day	1 E-02
				Endosulfan II	0.032	mg/kg	NC		NC			9.4E-09	mg/kg/day	6.0E-03	mg/kg/day	2 E-06
				Endosulfan Sulfate	0.00108	mg/kg	NC		NC			3.2E-10	mg/kg/day	6.0E-03	mg/kg/day	5 E-08
				gamma-Chlordane	0.0762	mg/kg	8.0E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	3 E-09	2.2E-08	mg/kg/day	5.0E-04	mg/kg/day	4 E-05
				Technical Chlordane	0.943	mg/kg	9.9E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	3 E-08	2.8E-07	mg/kg/day	5.0E-04	mg/kg/day	6 E-04
				Aluminum	24800	mg/kg	NC		NC			7.3E-03	mg/kg/day	1.0E+00	mg/kg/day	7 E-03
				Arsenic	11.5	mg/kg	1.2E-06	mg/kg/day	1.5E+00	(mg/kg/day)-1	2 E-06	3.4E-06	mg/kg/day	3.0E-04	mg/kg/day	1 E-02
				Manganese	478	mg/kg	NC		NC			1.4E-04	mg/kg/day	7.1E-02	mg/kg/day	2.E-03
				Mercury	0.258	mg/kg	NC		NC			7.6E-08	mg/kg/day	3.0E-04	mg/kg/day	3 E-04
				Toxicity Equivalency (Dioxins/Furans)	0.00000664	mg/kg	7.0E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	1 E-07	1.9E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								8 E-06					4 E-02
			DERMAL	2-Methylnaphthalene	1.56	mg/kg	NC		NC			7.9E-07	mg/kg/day	2.0E-02	mg/kg/day	4 E-05
				Acenaphthylene	0.152	mg/kg	NC		NC			7.7E-08	mg/kg/day	6.0E-02	mg/kg/day	1 E-06
				Benzo(a)anthracene	7.3	mg/kg	1.3E-06	mg/kg/day	7.3E-01	(mg/kg/day)-1	1 E-06	3.7E-06	mg/kg/day	3.0E-02	mg/kg/day	1 E-04
				Benzo(a)pyrene	5.12	mg/kg	9.2E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	7 E-06	2.6E-06	mg/kg/day	3.0E-02	mg/kg/day	9 E-05
				Benzo(b)fluoranthene	5.14	mg/kg	9.2E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	7 E-07	2.6E-06	mg/kg/day	3.0E-02	mg/kg/day	9.E-05
				Benzo(g,h,i)perylene	3.17	mg/kg	NC		NC			1.6E-06	mg/kg/day	3.0E-02	mg/kg/day	5 E-05
				Dibenzo(a,h)anthracene	0.668	mg/kg	1.2E-07	mg/kg/day	7.3E+00	(mg/kg/day)-1	9 E-07	3.4E-07	mg/kg/day	3.0E-02	mg/kg/day	1 E-05
				Indeno(1,2,3-cd)pyrene	3.57	mg/kg	6.4E-07	mg/kg/day	7.3E-01	(mg/kg/day)-1	5 E-07	1.8E-06	mg/kg/day	3.0E-02	mg/kg/day	6 E-05
				Phenanthrene	24.6	mg/kg	NC		NC			1.2E-05	mg/kg/day	3.0E-02	mg/kg/day	4 E-04
				alpha-Chlordane	0.0888	mg/kg	4.9E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	2 E-09	1.4E-08	mg/kg/day	5.0E-04	mg/kg/day	3.E-05
				Aroclor-1254	0.938	mg/kg	1.8E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	4 E-07	5.1E-07	mg/kg/day	2.0E-05	mg/kg/day	3 E-02
				Endosulfan II	0.032	mg/kg	NC		NC			1.2E-08	mg/kg/day	6.0E-03	mg/kg/day	2 E-06
				Endosulfan Sulfate	0.00108	mg/kg	NC		NC			4.2E-10	mg/kg/day	6.0E-03	mg/kg/day	7.E-08
				gamma-Chlordane	0.0762	mg/kg	4.2E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	1 E-09	1.2E-08	mg/kg/day	5.0E-04	mg/kg/day	2 E-05
				Technical Chlordane	0.943	mg/kg	5.2E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-08	1.5E-07	mg/kg/day	5.0E-04	mg/kg/day	3 E-04
				Aluminum	24800	mg/kg	NC		NC			--		1.0E-02	mg/kg/day	
				Arsenic	11.5	mg/kg	4.8E-07	mg/kg/day	1.5E+00	(mg/kg/day)-1	7 E-07	1.3E-06	mg/kg/day	3.0E-04	mg/kg/day	4 E-03
				Manganese	478	mg/kg	NC		NC			--		2.8E-03	mg/kg/day	
				Mercury	0.258	mg/kg	NC		NC			--		2.1E-05	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00000664	mg/kg	2.8E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	4.E-08	7.7E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1 E-05					3 E-02
		EXPOSURE POINT TOTAL									2 E-05					7 E-02
	EXPOSURE MEDIUM TOTAL										2 E-05					7.E-02
SOIL TOTAL											2.E-05					7.E-02
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	2.E-05				TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA	6.7.E-02

NOTES
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route
NA - Not applicable, exposure route not applicable for this chemical/exposure medium
-- - *Not calculated; dose-response data and/or dermal absorption values are not available.*

Prepared by RAR
Checked by KJA

TABLE 7.1.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS – CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	ASSAPUMPSET POND	INGESTION	2-Methylnaphthalene	0.01855	mg/kg	NC		NC			1.1E-10	mg/kg/day	2.0E-02	mg/kg/day	5.E-09
				Acenaphthylene	0.0589	mg/kg	NC		NC			3.5E-10	mg/kg/day	6.0E-02	mg/kg/day	6.E-09
				Benzo(a)anthracene	0.52	mg/kg	1.7E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-10	3.1E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				Benzo(a)pyrene	0.53	mg/kg	1.8E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-09	3.1E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				Benzo(b)fluoranthene	0.63	mg/kg	2.1E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-10	3.7E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				Benzo(g,h,i)perylene	0.4	mg/kg	NC		NC			2.3E-09	mg/kg/day	3.0E-02	mg/kg/day	8.E-08
				Dibenzo(a,h)anthracene	0.15	mg/kg	5.0E-11	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-10	8.8E-10	mg/kg/day	3.0E-02	mg/kg/day	3.E-08
				Indeno(1,2,3-cd)pyrene	0.43	mg/kg	1.4E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-10	2.5E-09	mg/kg/day	3.0E-02	mg/kg/day	8.E-08
				Phenanthrene	0.54	mg/kg	NC		NC			3.2E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				alpha-Chlordane	0.00133	mg/kg	4.5E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-13	7.8E-12	mg/kg/day	5.0E-04	mg/kg/day	2.E-08
				Aroclor-1254	0.032	mg/kg	1.1E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-11	1.9E-10	mg/kg/day	2.0E-05	mg/kg/day	9.E-06
				Aroclor-1268	0.023	mg/kg	7.7E-12	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-11	1.4E-10	mg/kg/day	2.0E-05	mg/kg/day	7.E-06
				gamma-Chlordane	0.00065	mg/kg	2.2E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	8.E-14	3.8E-12	mg/kg/day	5.0E-04	mg/kg/day	8.E-09
				Technical Chlordane	0.11	mg/kg	3.7E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-11	6.5E-10	mg/kg/day	5.0E-04	mg/kg/day	1.E-06
				Aluminum	9841	mg/kg	NC		NC			5.8E-05	mg/kg/day	1.0E+00	mg/kg/day	6.E-05
				Arsenic	2.7	mg/kg	9.1E-10	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-09	1.6E-08	mg/kg/day	3.0E-04	mg/kg/day	5.E-05
				Cadmium	0.37	mg/kg	NC		NC			2.2E-09	mg/kg/day	1.0E-03	mg/kg/day	2.E-06
				Chromium	10.4	mg/kg	NC		NC			6.1E-08	mg/kg/day	3.0E-03	mg/kg/day	2.E-05
				Copper	11.8	mg/kg	NC		NC			6.9E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Lead	40.5	mg/kg	1.4E-08	mg/kg/day				2.4E-07	mg/kg/day			
				Manganese	711	mg/kg	NC		NC			4.2E-06	mg/kg/day	7.1E-02	mg/kg/day	6.E-05
				Mercury	0.051	mg/kg	NC		NC			3.0E-10	mg/kg/day	3.0E-04	mg/kg/day	1.E-06
				Nickel	10.1	mg/kg	NC		NC			5.9E-08	mg/kg/day	2.0E-02	mg/kg/day	3.E-06
				Thallium	0.354	mg/kg	NC		NC			2.1E-09	mg/kg/day	8.0E-05	mg/kg/day	3.E-05
				Vanadium	17	mg/kg	NC		NC			1.0E-07	mg/kg/day	7.0E-03	mg/kg/day	1.E-05
				Toxicity Equivalency (Dioxins/Furans)	0.00000379	mg/kg	1.3E-15	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-10	2.2E-14	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-09					3.E-04
			DERMAL	2-Methylnaphthalene	0.01855	mg/kg	NC		NC			2.8E-11	mg/kg/day	2.0E-02	mg/kg/day	1.E-09
				Acenaphthylene	0.0589	mg/kg	NC		NC			8.7E-11	mg/kg/day	6.0E-02	mg/kg/day	1.E-09
				Benzo(a)anthracene	0.52	mg/kg	4.4E-11	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-11	7.7E-10	mg/kg/day	3.0E-02	mg/kg/day	3.E-08
				Benzo(a)pyrene	0.53	mg/kg	4.5E-11	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-10	7.9E-10	mg/kg/day	3.0E-02	mg/kg/day	3.E-08
				Benzo(b)fluoranthene	0.63	mg/kg	5.3E-11	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-11	9.3E-10	mg/kg/day	3.0E-02	mg/kg/day	3.E-08
				Benzo(g,h,i)perylene	0.4	mg/kg	NC		NC			5.9E-10	mg/kg/day	3.0E-02	mg/kg/day	2.E-08
				Dibenzo(a,h)anthracene	0.15	mg/kg	1.3E-11	mg/kg/day	7.3E+00	(mg/kg/day)-1	9.E-11	2.2E-10	mg/kg/day	3.0E-02	mg/kg/day	7.E-09
				Indeno(1,2,3-cd)pyrene	0.43	mg/kg	3.6E-11	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-11	6.4E-10	mg/kg/day	3.0E-02	mg/kg/day	2.E-08
				Phenanthrene	0.54	mg/kg	NC		NC			8.0E-10	mg/kg/day	3.0E-02	mg/kg/day	3.E-08
				alpha-Chlordane	0.00133	mg/kg	3.5E-14	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-14	6.1E-13	mg/kg/day	5.0E-04	mg/kg/day	1.E-09
				Aroclor-1254	0.032	mg/kg	2.9E-12	mg/kg/day	2.0E+00	(mg/kg/day)-1	6.E-12	5.1E-11	mg/kg/day	2.0E-05	mg/kg/day	3.E-06
				Aroclor-1268	0.023	mg/kg	2.1E-12	mg/kg/day	2.0E+00	(mg/kg/day)-1	4.E-12	3.7E-11	mg/kg/day	2.0E-05	mg/kg/day	2.E-06
				gamma-Chlordane	0.00065	mg/kg	1.7E-14	mg/kg/day	3.5E-01	(mg/kg/day)-1	6.E-15	3.0E-13	mg/kg/day	5.0E-04	mg/kg/day	6.E-10
				Technical Chlordane	0.11	mg/kg	2.9E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-12	5.0E-11	mg/kg/day	5.0E-04	mg/kg/day	1.E-07
				Aluminum	9841	mg/kg	NC		NC			–		1.0E-02	mg/kg/day	
				Arsenic	2.7	mg/kg	5.3E-11	mg/kg/day	1.5E+00	(mg/kg/day)-1	8.E-11	9.2E-10	mg/kg/day	3.0E-04	mg/kg/day	3.E-06
				Cadmium	0.37	mg/kg	NC		NC			4.2E-12	mg/kg/day	2.5E-05	mg/kg/day	2.E-07
				Chromium	10.4	mg/kg	NC		NC			–		7.5E-05	mg/kg/day	
				Copper	11.8	mg/kg	NC		NC			–		3.0E-02	mg/kg/day	
				Lead	40.5	mg/kg	–					–				
				Manganese	711	mg/kg	NC		NC			–		2.8E-03	mg/kg/day	
				Mercury	0.051	mg/kg	NC		NC			–		2.1E-05	mg/kg/day	
				Nickel	10.1	mg/kg	NC		NC			–		8.0E-04	mg/kg/day	
				Thallium	0.354	mg/kg	NC		NC			–		8.0E-05	mg/kg/day	
				Vanadium	17	mg/kg	NC		NC			–		1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00000379	mg/kg	7.4E-17	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-11	1.3E-15	mg/kg/day			
			EXPOSURE ROUTE TOTAL								6.E-10					8.E-06
		EXPOSURE POINT TOTAL									4.E-09					3.E-04
	EXPOSURE MEDIUM TOTAL										4.E-09					3.E-04
SEDIMENT TOTAL											4.E-09					3.E-04

TABLE 7.1.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS – CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SURFACE WATER	SURFACE WATER	ASSAPUMPSET POND	INGESTION	Arsenic	0.000491	mg/l	1.6E-11	mg/kg/day	1.5E+00	mg/kg/day	2.E-11	2.9E-10	mg/kg/day	3.0E-04	mg/kg/day	1 E-06
				Manganese	0.135	mg/l	NC		NC			7.9E-08	mg/kg/day	2 4E-02	mg/kg/day	3 E-06
				Mercury	0.00000215	mg/l	NC		NC			1.3E-12	mg/kg/day	3 0E-04	mg/kg/day	4 E-09
				Nitrite-N	0.0051	mg/l	NC		NC			3.0E-09	mg/kg/day	1 0E-01	mg/kg/day	3 E-08
				Toxicity Equivalency (Dioxins/Furans)	5.34E-09	mg/l	1.8E-16	mg/kg/day	1.5E+05	mg/kg/day	3.E-11	3 1E-15	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-11					4 E-06
			DERMAL	Arsenic	0.000491	mg/l	5.7E-11	mg/kg/day	1 5E+00	mg/kg/day	9.E-11	1.0E-09	mg/kg/day	3 0E-04	mg/kg/day	3 E-06
				Manganese	0.135	mg/l	NC		NC			2.8E-07	mg/kg/day	9 6E-04	mg/kg/day	3 E-04
				Mercury	0.00000215	mg/l	NC		NC			4 4E-12	mg/kg/day	2 1E-05	mg/kg/day	2.E-07
				Nitrite-N	0.0051	mg/l	NC		NC			--		1 0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	5 34E-09	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								9.E-11					3 E-04
		EXPOSURE POINT TOTAL									1.E-10					3.E-04
	EXPOSURE MEDIUM TOTAL										1.E-10					3.E-04
SURFACE WATER TOTAL											1.E-10					3.E-04
BIOTA	COMBINED FISH DIET	ASSAPUMPSET POND	INGESTION	Acenaphthylene	0 000708611	mg/kg	NC		NC			8.6E-08	mg/kg/day	6.0E-02	mg/kg/day	1.E-06
				Benzo(a)anthracene	0.0016	mg/kg	1 1E-08	mg/kg/day	7 3E-01	(mg/kg/day)-1	8.E-09	2 0E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Benzo(a)pyrene	0 0016	mg/kg	1.1E-08	mg/kg/day	7 3E+00	(mg/kg/day)-1	8.E-08	2.0E-07	mg/kg/day	3.0E-02	mg/kg/day	7 E-06
				Benzo(b)fluoranthene	0.0019	mg/kg	1.3E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	2.3E-07	mg/kg/day	3.0E-02	mg/kg/day	8 E-06
				Benzo(g,h,i)perylene	0 00214	mg/kg	NC		NC			2.6E-07	mg/kg/day	3 0E-02	mg/kg/day	9 E-06
				Dibenzo(a,h)anthracene	0 00064	mg/kg	4.5E-09	mg/kg/day	7 3E+00	(mg/kg/day)-1	3.E-08	7.8E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Indeno(1,2,3-cd)pyrene	0 0014	mg/kg	9.8E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	7 E-09	1.7E-07	mg/kg/day	3 0E-02	mg/kg/day	6 E-06
				Phenanthrene	0.0035	mg/kg	NC		NC			4.3E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				4,4'-DDD	0 00254	mg/kg	1.8E-08	mg/kg/day	2.4E-01	(mg/kg/day)-1	4 E-09	3.1E-07	mg/kg/day	5.0E-04	mg/kg/day	6.E-04
				4,4'-DDE	0.0117	mg/kg	8.2E-08	mg/kg/day	3.4E-01	(mg/kg/day)-1	3 E-08	1.4E-06	mg/kg/day	5.0E-04	mg/kg/day	3.E-03
				alpha-Chlordane	0 0015	mg/kg	1.0E-08	mg/kg/day	3 5E-01	(mg/kg/day)-1	4 E-09	1 8E-07	mg/kg/day	5.0E-04	mg/kg/day	4.E-04
				Aroclor-1254	0.01622	mg/kg	1.1E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-07	2.0E-06	mg/kg/day	2.0E-05	mg/kg/day	1.E-01
				Dieldrin	0.0009	mg/kg	6.3E-09	mg/kg/day	1 6E+01	(mg/kg/day)-1	1.E-07	1.1E-07	mg/kg/day	5.0E-05	mg/kg/day	2 E-03
				gamma-Chlordane	0.0008	mg/kg	5.6E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-09	9.8E-08	mg/kg/day	5.0E-04	mg/kg/day	2 E-04
				Heptachlor Epoxide	0.00071	mg/kg	4.9E-09	mg/kg/day	9.1E+00	(mg/kg/day)-1	5.E-08	8.7E-08	mg/kg/day	1.3E-05	mg/kg/day	7 E-03
				Technical Chlordane	0.0951	mg/kg	6.6E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-07	1.2E-05	mg/kg/day	5.0E-04	mg/kg/day	2 E-02
				Lead	0.049	mg/kg	3.4E-07	mg/kg/day				6.0E-06	mg/kg/day			
				Mercury	0.14	mg/kg	NC		NC			1.7E-05	mg/kg/day	3.0E-04	mg/kg/day	6.E-02
				Mercury (methyl)	0.1	mg/kg	NC		NC			1.2E-05	mg/kg/day	1 0E-04	mg/kg/day	1.E-01
				Zinc	11.1	mg/kg	NC		NC			1 4E-03	mg/kg/day	3.0E-01	mg/kg/day	5 E-03
				Toxicity Equivalency (Dioxins/Furans)	0.00000151	mg/kg	1.1E-11	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-06	1.8E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-06					3 2.E-01
		EXPOSURE POINT TOTAL									2.E-06					3 2.E-01
	EXPOSURE MEDIUM TOTAL										2.E-06					3.2.E-01
COMBINED FISH DIET TOTAL											2.E-06					3.2.E-01
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	2.E-06	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				3.2.E-01

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by:	RAR
Checked by:	KJA

TABLE 7.2.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	ASSAPUMPSET POND	INGESTION	2-Methylnaphthalene	0.01855	mg/kg	NC		NC			1.7E-10	mg/kg/day	2.0E-02	mg/kg/day	8.E-09
				Acenaphthylene	0.0589	mg/kg	NC		NC			5.4E-10	mg/kg/day	6.0E-02	mg/kg/day	9.E-09
				Benzo(a)anthracene	0.52	mg/kg	2.0E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-10	4.7E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Benzo(a)pyrene	0.53	mg/kg	2.1E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-09	4.8E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Benzo(b)fluoranthene	0.63	mg/kg	2.5E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-10	5.8E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Benzo(g,h,i)perylene	0.4	mg/kg	NC		NC			3.7E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				Dibenzo(a,h)anthracene	0.15	mg/kg	5.9E-11	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-10	1.4E-09	mg/kg/day	3.0E-02	mg/kg/day	5.E-08
				Indeno(1,2,3-cd)pyrene	0.43	mg/kg	1.7E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-10	3.9E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				Phenanthrene	0.54	mg/kg	NC		NC			4.9E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				alpha-Chlordane	0.00133	mg/kg	5.2E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-13	1.2E-11	mg/kg/day	5.0E-04	mg/kg/day	2.E-08
				Aroclor-1254	0.032	mg/kg	1.3E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-11	2.9E-10	mg/kg/day	2.0E-05	mg/kg/day	1.E-05
				Aroclor-1268	0.023	mg/kg	9.0E-12	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-11	2.1E-10	mg/kg/day	2.0E-05	mg/kg/day	1.E-05
				gamma-Chlordane	0.00065	mg/kg	2.5E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	9.E-14	5.9E-12	mg/kg/day	5.0E-04	mg/kg/day	1.E-08
				Technical Chlordane	0.11	mg/kg	4.3E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-11	1.0E-09	mg/kg/day	5.0E-04	mg/kg/day	2.E-06
				Aluminum	9841	mg/kg	NC		NC			9.0E-05	mg/kg/day	1.0E+00	mg/kg/day	9.E-05
				Arsenic	2.7	mg/kg	1.1E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	2.E-09	2.5E-08	mg/kg/day	3.0E-04	mg/kg/day	8.E-05
				Cadmium	0.37	mg/kg	NC		NC			3.4E-09	mg/kg/day	1.0E-03	mg/kg/day	3.E-06
				Chromium	10.4	mg/kg	NC		NC			9.5E-08	mg/kg/day	3.0E-03	mg/kg/day	3.E-05
				Copper	11.8	mg/kg	NC		NC			1.1E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Lead	40.5	mg/kg	1.6E-08	mg/kg/day				3.7E-07	mg/kg/day			
				Manganese	711	mg/kg	NC		NC			6.5E-06	mg/kg/day	7.1E-02	mg/kg/day	9.E-05
				Mercury	0.051	mg/kg	NC		NC			4.7E-10	mg/kg/day	3.0E-04	mg/kg/day	2.E-06
				Nickel	10.1	mg/kg	NC		NC			9.2E-08	mg/kg/day	2.0E-02	mg/kg/day	5.E-06
				Thallium	0.354	mg/kg	NC		NC			3.2E-09	mg/kg/day	8.0E-05	mg/kg/day	4.E-05
				Vanadium	17	mg/kg	NC		NC			1.6E-07	mg/kg/day	7.0E-03	mg/kg/day	2.E-05
				Toxicity Equivalency (Dioxins/Furans)	0.00000379	mg/kg	1.5E-15	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-10	3.5E-14	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-09					4.E-04
			DERMAL	2-Methylnaphthalene	0.01855	mg/kg	NC		NC			1.3E-10	mg/kg/day	2.0E-02	mg/kg/day	6.E-09
				Acenaphthylene	0.0589	mg/kg	NC		NC			4.0E-10	mg/kg/day	6.0E-02	mg/kg/day	7.E-09
				Benzo(a)anthracene	0.52	mg/kg	1.5E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-10	3.5E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				Benzo(a)pyrene	0.53	mg/kg	1.5E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-09	3.6E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				Benzo(b)fluoranthene	0.63	mg/kg	1.8E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-10	4.3E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				Benzo(g,h,i)perylene	0.4	mg/kg	NC		NC			2.7E-09	mg/kg/day	3.0E-02	mg/kg/day	9.E-08
				Dibenzo(a,h)anthracene	0.15	mg/kg	4.4E-11	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-10	1.0E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-08
				Indeno(1,2,3-cd)pyrene	0.43	mg/kg	1.3E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	9.E-11	2.9E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				Phenanthrene	0.54	mg/kg	NC		NC			3.7E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				alpha-Chlordane	0.00133	mg/kg	1.2E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-14	2.8E-12	mg/kg/day	5.0E-04	mg/kg/day	6.E-09
				Aroclor-1254	0.032	mg/kg	1.0E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-11	2.3E-10	mg/kg/day	2.0E-05	mg/kg/day	1.E-05
				Aroclor-1268	0.023	mg/kg	7.2E-12	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-11	1.7E-10	mg/kg/day	2.0E-05	mg/kg/day	8.E-06
				gamma-Chlordane	0.00065	mg/kg	5.8E-14	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-14	1.4E-12	mg/kg/day	5.0E-04	mg/kg/day	3.E-09
				Technical Chlordane	0.11	mg/kg	9.8E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-12	2.3E-10	mg/kg/day	5.0E-04	mg/kg/day	5.E-07
				Aluminum	9841	mg/kg	NC		NC			--		1.0E-02	mg/kg/day	
				Arsenic	2.7	mg/kg	1.8E-10	mg/kg/day	1.5E+00	(mg/kg/day)-1	3.E-10	4.2E-09	mg/kg/day	3.0E-04	mg/kg/day	1.E-05
				Cadmium	0.37	mg/kg	NC		NC			1.9E-11	mg/kg/day	2.5E-05	mg/kg/day	8.E-07
				Chromium	10.4	mg/kg	NC		NC			--		7.5E-05	mg/kg/day	
				Copper	11.8	mg/kg	NC		NC			--		3.0E-02	mg/kg/day	
				Lead	40.5	mg/kg	--					--				
				Manganese	711	mg/kg	NC		NC			--		2.8E-03	mg/kg/day	
				Mercury	0.051	mg/kg	NC		NC			--		2.1E-05	mg/kg/day	
				Nickel	10.1	mg/kg	NC		NC			--		8.0E-04	mg/kg/day	
				Thallium	0.354	mg/kg	NC		NC			--		8.0E-05	mg/kg/day	
				Vanadium	17	mg/kg	NC		NC			--		1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00000379	mg/kg	2.5E-16	mg/kg/day	1.5E+05	(mg/kg/day)-1	4.E-11	5.9E-15	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-09					4.E-05
		EXPOSURE POINT TOTAL									6.E-09					4.E-04
	EXPOSURE MEDIUM TOTAL										6.E-09					4.E-04
SEDIMENT TOTAL											6.E-09					4.E-04

TABLE 7.2.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SURFACE WATER	SURFACE WATER	ASSAPUMPSET POND	INGESTION	Arsenic	0.000491	mg/l	1.9E-11	mg/kg/day	1.5E+00	mg/kg/day	3.E-11	4.5E-10	mg/kg/day	3.0E-04	mg/kg/day	1.E-06
				Manganese	0.135	mg/l	NC		NC			1.2E-07	mg/kg/day	2.4E-02	mg/kg/day	5.E-06
				Mercury	0.00000215	mg/l	NC		NC			2.0E-12	mg/kg/day	3.0E-04	mg/kg/day	7.E-09
				Nitrite-N	0.0051	mg/l	NC		NC			4.7E-09	mg/kg/day	1.0E-01	mg/kg/day	5.E-08
				Toxicity Equivalency (Dioxins/Furans)	5.34E-09	mg/l	2.1E-16	mg/kg/day	1.5E+05	mg/kg/day	3.E-11	4.9E-15	mg/kg/day			
			EXPOSURE ROUTE TOTAL								6.E-11					7.E-06
			DERMAL	Arsenic	0.000491	mg/l	4.8E-11	mg/kg/day	1.5E+00	mg/kg/day	7.E-11	1.1E-09	mg/kg/day	3.0E-04	mg/kg/day	4.E-06
				Manganese	0.135	mg/l	NC		NC			3.1E-07	mg/kg/day	9.6E-04	mg/kg/day	3.E-04
				Mercury	0.00000215	mg/l	NC		NC			4.9E-12	mg/kg/day	2.1E-05	mg/kg/day	2.E-07
				Nitrite-N	0.0051	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	5.34E-09	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								7.E-11					3.E-04
		EXPOSURE POINT TOTAL									1.E-10					3.E-04
	EXPOSURE MEDIUM TOTAL										1.E-10					3.E-04
SURFACE WATER TOTAL											1.E-10					3.E-04
BIOTA	COMBINED FISH DIET	ASSAPUMPSET POND	INGESTION	Acenaphthylene	0.000708611	mg/kg	NC		NC			8.9E-08	mg/kg/day	6.0E-02	mg/kg/day	1.E-06
				Benzo(a)anthracene	0.0016	mg/kg	8.6E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-09	2.0E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Benzo(a)pyrene	0.0016	mg/kg	8.6E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	6.E-08	2.0E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Benzo(b)fluoranthene	0.0019	mg/kg	1.0E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-09	2.4E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				Benzo(g,h,i)perylene	0.00214	mg/kg	NC		NC			2.7E-07	mg/kg/day	3.0E-02	mg/kg/day	9.E-06
				Dibenzo(a,h)anthracene	0.00064	mg/kg	3.4E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-08	8.0E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Indeno(1,2,3-cd)pyrene	0.0014	mg/kg	7.5E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-09	1.8E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Phenanthrene	0.0035	mg/kg	NC		NC			4.4E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				4,4'-DDD	0.00254	mg/kg	1.4E-08	mg/kg/day	2.4E-01	(mg/kg/day)-1	3.E-09	3.2E-07	mg/kg/day	5.0E-04	mg/kg/day	6.E-04
				4,4'-DDE	0.0117	mg/kg	6.3E-08	mg/kg/day	3.4E-01	(mg/kg/day)-1	2.E-08	1.5E-06	mg/kg/day	5.0E-04	mg/kg/day	3.E-03
				alpha-Chlordane	0.0015	mg/kg	8.1E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-09	1.9E-07	mg/kg/day	5.0E-04	mg/kg/day	4.E-04
				Aroclor-1254	0.01622	mg/kg	8.7E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-07	2.0E-06	mg/kg/day	2.0E-05	mg/kg/day	1.E-01
				Dieldrin	0.0009	mg/kg	4.8E-09	mg/kg/day	1.6E+01	(mg/kg/day)-1	8.E-08	1.1E-07	mg/kg/day	5.0E-05	mg/kg/day	2.E-03
				gamma-Chlordane	0.0008	mg/kg	4.3E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-09	1.0E-07	mg/kg/day	5.0E-04	mg/kg/day	2.E-04
				Heptachlor Epoxide	0.00071	mg/kg	3.8E-09	mg/kg/day	9.1E+00	(mg/kg/day)-1	3.E-08	8.9E-08	mg/kg/day	1.3E-05	mg/kg/day	7.E-03
				Technical Chlordane	0.0951	mg/kg	5.1E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-07	1.2E-05	mg/kg/day	5.0E-04	mg/kg/day	2.E-02
				Lead	0.049	mg/kg	2.6E-07	mg/kg/day				6.2E-06	mg/kg/day			
				Mercury	0.14	mg/kg	NC		NC			1.8E-05	mg/kg/day	3.0E-04	mg/kg/day	6.E-02
				Mercury (methyl)	0.1	mg/kg	NC		NC			1.3E-05	mg/kg/day	1.0E-04	mg/kg/day	1.E-01
				Zinc	11.1	mg/kg	NC		NC			1.4E-03	mg/kg/day	3.0E-01	mg/kg/day	5.E-03
				Toxicity Equivalency (Dioxins/Furans)	0.00000151	mg/kg	8.1E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-06	1.9E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-06					3.3.E-01
		EXPOSURE POINT TOTAL									2.E-06					3.3.E-01
	EXPOSURE MEDIUM TOTAL										2.E-06					3.3.E-01
COMBINED FISH DIET TOTAL											2.E-06					3.3.E-01
									TOTAL RECEPTOR RISK ACROSS ALL MEDIA		2.E-06	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				3.3.E-01

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

Prepared by:	RAR
Checked by:	KJA

TABLE 7.4.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- ADULT- COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	ASSAPUMPSET POND	INGESTION	2-Methylnaphthalene	0.01855	mg/kg	NC		NC			4.7E-10	mg/kg/day	2.0E-02	mg/kg/day	2.E-08
				Acenaphthylene	0.0589	mg/kg	NC		NC			1.5E-09	mg/kg/day	6.0E-02	mg/kg/day	2.E-08
				Benzo(a)anthracene	0.52	mg/kg	7.6E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-10	1.3E-08	mg/kg/day	3.0E-02	mg/kg/day	4.E-07
				Benzo(a)pyrene	0.53	mg/kg	7.7E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	6.E-09	1.3E-08	mg/kg/day	3.0E-02	mg/kg/day	4.E-07
				Benzo(b)fluoranthene	0.63	mg/kg	9.2E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-10	1.6E-08	mg/kg/day	3.0E-02	mg/kg/day	5.E-07
				Benzo(g,h,i)perylene	0.4	mg/kg	NC		NC			1.0E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				Dibenzo(a,h)anthracene	0.15	mg/kg	2.2E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-09	3.8E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				Indeno(1,2,3-cd)pyrene	0.43	mg/kg	6.3E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	5.E-10	1.1E-08	mg/kg/day	3.0E-02	mg/kg/day	4.E-07
				Phenanthrene	0.54	mg/kg	NC		NC			1.4E-08	mg/kg/day	3.0E-02	mg/kg/day	5.E-07
				alpha-Chlordane	0.00133	mg/kg	1.9E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	7.E-13	3.4E-11	mg/kg/day	5.0E-04	mg/kg/day	7.E-08
				Aroclor-1254	0.032	mg/kg	4.7E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	9.E-11	8.1E-10	mg/kg/day	2.0E-05	mg/kg/day	4.E-05
				Aroclor-1268	0.023	mg/kg	3.3E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	7.E-11	5.9E-10	mg/kg/day	2.0E-05	mg/kg/day	3.E-05
				gamma-Chlordane	0.00065	mg/kg	9.4E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-13	1.7E-11	mg/kg/day	5.0E-04	mg/kg/day	3.E-08
				Technical Chlordane	0.11	mg/kg	1.6E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	6.E-11	2.8E-09	mg/kg/day	5.0E-04	mg/kg/day	6.E-06
				Aluminum	9841	mg/kg	NC		NC			2.5E-04	mg/kg/day	1.0E+00	mg/kg/day	3.E-04
				Arsenic	2.7	mg/kg	3.9E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	6.E-09	6.9E-08	mg/kg/day	3.0E-04	mg/kg/day	2.E-04
				Cadmium	0.37	mg/kg	NC		NC			9.4E-09	mg/kg/day	1.0E-03	mg/kg/day	9.E-06
				Chromium	10.4	mg/kg	NC		NC			2.6E-07	mg/kg/day	3.0E-03	mg/kg/day	9.E-05
				Copper	11.8	mg/kg	NC		NC			3.0E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Lead	40.5	mg/kg	5.9E-08	mg/kg/day				1.0E-06	mg/kg/day			
				Manganese	711	mg/kg	NC		NC			1.8E-05	mg/kg/day	7.1E-02	mg/kg/day	3.E-04
				Mercury	0.051	mg/kg	NC		NC			1.3E-09	mg/kg/day	3.0E-04	mg/kg/day	4.E-06
				Nickel	10.1	mg/kg	NC		NC			2.6E-07	mg/kg/day	2.0E-02	mg/kg/day	1.E-05
				Thallium	0.354	mg/kg	NC		NC			9.0E-09	mg/kg/day	8.0E-05	mg/kg/day	1.E-04
				Vanadium	17	mg/kg	NC		NC			4.3E-07	mg/kg/day	7.0E-03	mg/kg/day	6.E-05
				Toxicity Equivalency (Dioxins/Furans)	0.00000379	mg/kg	5.5E-15	mg/kg/day	1.5E+05	(mg/kg/day)-1	8.E-10	9.6E-14	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-08					1.E-03
			DERMAL	2-Methylnaphthalene	0.01855	mg/kg	NC		NC			6.0E-11	mg/kg/day	2.0E-02	mg/kg/day	3.E-09
				Acenaphthylene	0.0589	mg/kg	NC		NC			1.9E-10	mg/kg/day	6.0E-02	mg/kg/day	3.E-09
				Benzo(a)anthracene	0.52	mg/kg	9.6E-11	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-11	1.7E-09	mg/kg/day	3.0E-02	mg/kg/day	6.E-08
				Benzo(a)pyrene	0.53	mg/kg	9.7E-11	mg/kg/day	7.3E+00	(mg/kg/day)-1	7.E-10	1.7E-09	mg/kg/day	3.0E-02	mg/kg/day	6.E-08
				Benzo(b)fluoranthene	0.63	mg/kg	1.2E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-11	2.0E-09	mg/kg/day	3.0E-02	mg/kg/day	7.E-08
				Benzo(g,h,i)perylene	0.4	mg/kg	NC		NC			1.3E-09	mg/kg/day	3.0E-02	mg/kg/day	4.E-08
				Dibenzo(a,h)anthracene	0.15	mg/kg	2.8E-11	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-10	4.8E-10	mg/kg/day	3.0E-02	mg/kg/day	2.E-08
				Indeno(1,2,3-cd)pyrene	0.43	mg/kg	7.9E-11	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-11	1.4E-09	mg/kg/day	3.0E-02	mg/kg/day	5.E-08
				Phenanthrene	0.54	mg/kg	NC		NC			1.7E-09	mg/kg/day	3.0E-02	mg/kg/day	6.E-08
				alpha-Chlordane	0.00133	mg/kg	7.5E-14	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-14	1.3E-12	mg/kg/day	5.0E-04	mg/kg/day	3.E-09
				Aroclor-1254	0.032	mg/kg	6.3E-12	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-11	1.1E-10	mg/kg/day	2.0E-05	mg/kg/day	6.E-06
				Aroclor-1268	0.023	mg/kg	4.5E-12	mg/kg/day	2.0E+00	(mg/kg/day)-1	9.E-12	8.0E-11	mg/kg/day	2.0E-05	mg/kg/day	4.E-06
				gamma-Chlordane	0.00065	mg/kg	3.7E-14	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-14	6.4E-13	mg/kg/day	5.0E-04	mg/kg/day	1.E-09
				Technical Chlordane	0.11	mg/kg	6.2E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-12	1.1E-10	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				Aluminum	9841	mg/kg	NC		NC			--		1.0E-02	mg/kg/day	
				Arsenic	2.7	mg/kg	1.1E-10	mg/kg/day	1.5E+00	(mg/kg/day)-1	2.E-10	2.0E-09	mg/kg/day	3.0E-04	mg/kg/day	7.E-06
				Cadmium	0.37	mg/kg	NC		NC			9.1E-12	mg/kg/day	2.5E-05	mg/kg/day	4.E-07
				Chromium	10.4	mg/kg	NC		NC			--		7.5E-05	mg/kg/day	
				Copper	11.8	mg/kg	NC		NC			--		3.0E-02	mg/kg/day	
				Lead	40.5	mg/kg	--					--				
				Manganese	711	mg/kg	NC		NC			--		2.8E-03	mg/kg/day	
				Mercury	0.051	mg/kg	NC		NC			--		2.1E-05	mg/kg/day	
				Nickel	10.1	mg/kg	NC		NC			--		8.0E-04	mg/kg/day	
				Thallium	0.354	mg/kg	NC		NC			--		8.0E-05	mg/kg/day	
				Vanadium	17	mg/kg	NC		NC			--		1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00000379	mg/kg	1.6E-16	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-11	2.8E-15	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-09					2.E-05
		EXPOSURE POINT TOTAL									2.E-08					1.E-03
	EXPOSURE MEDIUM TOTAL										2.E-08					1.E-03
SEDIMENT TOTAL											2.E-08					1.E-03

TABLE 7.4.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- ADULT- COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SURFACE WATER	SURFACE WATER	ASSAPUMPSET POND	INGESTION	Arsenic	0.000491	mg/l	7.1E-10	mg/kg/day	1.5E+00	mg/kg/day	1 E-09	1.2E-08	mg/kg/day	3.0E-04	mg/kg/day	4 E-05
				Manganese	0 135	mg/l	NC		NC			3.4E-06	mg/kg/day	2.4E-02	mg/kg/day	1 E-04
				Mercury	0.00000215	mg/l	NC		NC			5.5E-11	mg/kg/day	3 0E-04	mg/kg/day	2.E-07
				Nitrite-N	0.0051	mg/l	NC		NC			1 3E-07	mg/kg/day	1 0E-01	mg/kg/day	1 E-06
				Toxicity Equivalency (Dioxins/Furans)	5.34E-09	mg/l	7 8E-15	mg/kg/day	1.5E+05	mg/kg/day	1.E-09	1.4E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-09					2 E-04
			DERMAL	Arsenic	0.000491	mg/l	3.3E-10	mg/kg/day	1.5E+00	mg/kg/day	5.E-10	5.7E-09	mg/kg/day	3.0E-04	mg/kg/day	2 E-05
				Manganese	0 135	mg/l	NC		NC			1.6E-06	mg/kg/day	9.6E-04	mg/kg/day	2.E-03
				Mercury	0.00000215	mg/l	NC		NC			2.5E-11	mg/kg/day	2.1E-05	mg/kg/day	1.E-06
				Nitrite-N	0.0051	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	5.34E-09	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-10					2.E-03
		EXPOSURE POINT TOTAL									3.E-09					2.E-03
	EXPOSURE MEDIUM TOTAL										3 E-09					2.E-03
SURFACE WATER TOTAL											3.E-09					2.E-03
BIOTA	COMBINED FISH DIET	ASSAPUMPSET POND	INGESTION	Acenaphthylene	0.000708611	mg/kg	NC		NC			8.6E-08	mg/kg/day	6.0E-02	mg/kg/day	1.E-06
				Benzo(a)anthracene	0.0016	mg/kg	1.1E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-09	2.0E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Benzo(a)pyrene	0.0016	mg/kg	1.1E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	8.E-08	2.0E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Benzo(b)fluoranthene	0.0019	mg/kg	1.3E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	2.3E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				Benzo(g,h,i)perylene	0.00214	mg/kg	NC		NC			2.6E-07	mg/kg/day	3.0E-02	mg/kg/day	9.E-06
				Dibenzo(a,h)anthracene	0.00064	mg/kg	4.5E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-08	7.8E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Indeno(1,2,3-cd)pyrene	0.0014	mg/kg	9.8E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-09	1.7E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Phenanthrene	0.0035	mg/kg	NC		NC			4.3E-07	mg/kg/day	3.0E-02	mg/kg/day	1 E-05
				4,4'-DDD	0.00254	mg/kg	1.8E-08	mg/kg/day	2 4E-01	(mg/kg/day)-1	4.E-09	3.1E-07	mg/kg/day	5.0E-04	mg/kg/day	6 E-04
				4,4'-DDE	0.0117	mg/kg	8.2E-08	mg/kg/day	3.4E-01	(mg/kg/day)-1	3.E-08	1.4E-06	mg/kg/day	5.0E-04	mg/kg/day	3.E-03
				alpha-Chlordane	0.0015	mg/kg	1.0E-08	mg/kg/day	3 5E-01	(mg/kg/day)-1	4 E-09	1.8E-07	mg/kg/day	5.0E-04	mg/kg/day	4.E-04
				Aroclor-1254	0.01622	mg/kg	1.1E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-07	2.0E-06	mg/kg/day	2 0E-05	mg/kg/day	1.E-01
				Dieldrin	0.0009	mg/kg	6 3E-09	mg/kg/day	1.6E+01	(mg/kg/day)-1	1.E-07	1.1E-07	mg/kg/day	5 0E-05	mg/kg/day	2 E-03
				gamma-Chlordane	0.0008	mg/kg	5 6E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-09	9.8E-08	mg/kg/day	5 0E-04	mg/kg/day	2 E-04
				Heptachlor Epoxide	0.00071	mg/kg	4 9E-09	mg/kg/day	9.1E+00	(mg/kg/day)-1	5.E-08	8.7E-08	mg/kg/day	1.3E-05	mg/kg/day	7.E-03
				Technical Chlordane	0.0951	mg/kg	6.6E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-07	1.2E-05	mg/kg/day	5 0E-04	mg/kg/day	2.E-02
				Lead	0.049	mg/kg	3.4E-07	mg/kg/day				6.0E-06	mg/kg/day			
				Mercury	0 14	mg/kg	NC		NC			1.7E-05	mg/kg/day	3.0E-04	mg/kg/day	6.E-02
				Mercury (methyl)	0.1	mg/kg	NC		NC			1.2E-05	mg/kg/day	1.0E-04	mg/kg/day	1.E-01
				Zinc	11.1	mg/kg	NC		NC			1.4E-03	mg/kg/day	3.0E-01	mg/kg/day	5.E-03
				Toxicity Equivalency (Dioxins/Furans)	0.00000151	mg/kg	1.1E-11	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-06	1.8E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-06					3.2.E-01
		EXPOSURE POINT TOTAL									2.E-06					3.2.E-01
	EXPOSURE MEDIUM TOTAL										2 E-06					3.2.E-01
COMBINED FISH DIET TOTAL											2.E-06					3.2.E-01
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	2.E-06	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				3.2.E-01

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by:	RAR
Checked by	KJA

TABLE 7.5.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- OLDER CHILD- COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	ASSAPUMPSET POND	INGESTION	2-Methylnaphthalene	0.01855	mg/kg	NC		NC			7.3E-10	mg/kg/day	2.0E-02	mg/kg/day	4.E-08
				Acenaphthylene	0.0589	mg/kg	NC		NC			2.3E-09	mg/kg/day	6.0E-02	mg/kg/day	4.E-08
				Benzo(a)anthracene	0.52	mg/kg	8.8E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-10	2.1E-08	mg/kg/day	3.0E-02	mg/kg/day	7.E-07
				Benzo(a)pyrene	0.53	mg/kg	9.0E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	7.E-09	2.1E-08	mg/kg/day	3.0E-02	mg/kg/day	7.E-07
				Benzo(b)fluoranthene	0.63	mg/kg	1.1E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-10	2.5E-08	mg/kg/day	3.0E-02	mg/kg/day	8.E-07
				Benzo(g,h,i)perylene	0.4	mg/kg	NC		NC			1.6E-08	mg/kg/day	3.0E-02	mg/kg/day	5.E-07
				Dibenzo(a,h)anthracene	0.15	mg/kg	2.5E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-09	5.9E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Indeno(1,2,3-cd)pyrene	0.43	mg/kg	7.3E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	5.E-10	1.7E-08	mg/kg/day	3.0E-02	mg/kg/day	6.E-07
				Phenanthrene	0.54	mg/kg	NC		NC			2.1E-08	mg/kg/day	3.0E-02	mg/kg/day	7.E-07
				alpha-Chlordane	0.00133	mg/kg	2.3E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	8.E-13	5.3E-11	mg/kg/day	5.0E-04	mg/kg/day	1.E-07
				Aroclor-1254	0.032	mg/kg	5.4E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-10	1.3E-09	mg/kg/day	2.0E-05	mg/kg/day	6.E-05
				Aroclor-1268	0.023	mg/kg	3.9E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	8.E-11	9.1E-10	mg/kg/day	2.0E-05	mg/kg/day	5.E-05
				gamma-Chlordane	0.00065	mg/kg	1.1E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-13	2.6E-11	mg/kg/day	5.0E-04	mg/kg/day	5.E-08
				Technical Chlordane	0.11	mg/kg	1.9E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	7.E-11	4.4E-09	mg/kg/day	5.0E-04	mg/kg/day	9.E-06
				Aluminum	9841	mg/kg	NC		NC			3.9E-04	mg/kg/day	1.0E+00	mg/kg/day	4.E-04
				Arsenic	2.7	mg/kg	4.6E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	7.E-09	1.1E-07	mg/kg/day	3.0E-04	mg/kg/day	4.E-04
				Cadmium	0.37	mg/kg	NC		NC			1.5E-08	mg/kg/day	1.0E-03	mg/kg/day	1.E-05
				Chromium	10.4	mg/kg	NC		NC			4.1E-07	mg/kg/day	3.0E-03	mg/kg/day	1.E-04
				Copper	11.8	mg/kg	NC		NC			4.7E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Lead	40.5	mg/kg	6.9E-08	mg/kg/day				1.6E-06	mg/kg/day			
				Manganese	711	mg/kg	NC		NC			2.8E-05	mg/kg/day	7.1E-02	mg/kg/day	4.E-04
				Mercury	0.051	mg/kg	NC		NC			2.0E-09	mg/kg/day	3.0E-04	mg/kg/day	7.E-06
				Nickel	10.1	mg/kg	NC		NC			4.0E-07	mg/kg/day	2.0E-02	mg/kg/day	2.E-05
				Thallium	0.354	mg/kg	NC		NC			1.4E-08	mg/kg/day	8.0E-05	mg/kg/day	2.E-04
				Vanadium	17	mg/kg	NC		NC			6.7E-07	mg/kg/day	7.0E-03	mg/kg/day	1.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.00000379	mg/kg	6.4E-15	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-09	1.5E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-08					2.E-03
			DERMAL	2-Methylnaphthalene	0.01855	mg/kg	NC		NC			2.7E-10	mg/kg/day	2.0E-02	mg/kg/day	1.E-08
				Acenaphthylene	0.0589	mg/kg	NC		NC			8.7E-10	mg/kg/day	6.0E-02	mg/kg/day	1.E-08
				Benzo(a)anthracene	0.52	mg/kg	3.3E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-10	7.6E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				Benzo(a)pyrene	0.53	mg/kg	3.3E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-09	7.8E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				Benzo(b)fluoranthene	0.63	mg/kg	4.0E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-10	9.3E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				Benzo(g,h,i)perylene	0.4	mg/kg	NC		NC			5.9E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Dibenzo(a,h)anthracene	0.15	mg/kg	9.5E-11	mg/kg/day	7.3E+00	(mg/kg/day)-1	7.E-10	2.2E-09	mg/kg/day	3.0E-02	mg/kg/day	7.E-08
				Indeno(1,2,3-cd)pyrene	0.43	mg/kg	2.7E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-10	6.3E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Phenanthrene	0.54	mg/kg	NC		NC			7.9E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				alpha-Chlordane	0.00133	mg/kg	2.6E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	9.E-14	6.0E-12	mg/kg/day	5.0E-04	mg/kg/day	1.E-08
				Aroclor-1254	0.032	mg/kg	2.2E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	4.E-11	5.1E-10	mg/kg/day	2.0E-05	mg/kg/day	3.E-05
				Aroclor-1268	0.023	mg/kg	1.6E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-11	3.6E-10	mg/kg/day	2.0E-05	mg/kg/day	2.E-05
				gamma-Chlordane	0.00065	mg/kg	1.3E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-14	2.9E-12	mg/kg/day	5.0E-04	mg/kg/day	6.E-09
				Technical Chlordane	0.11	mg/kg	2.1E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	7.E-12	5.0E-10	mg/kg/day	5.0E-04	mg/kg/day	1.E-06
				Aluminum	9841	mg/kg	NC		NC			--		1.0E-02	mg/kg/day	
				Arsenic	2.7	mg/kg	3.9E-10	mg/kg/day	1.5E+00	(mg/kg/day)-1	6.E-10	9.2E-09	mg/kg/day	3.0E-04	mg/kg/day	3.E-05
				Cadmium	0.37	mg/kg	NC		NC			4.2E-11	mg/kg/day	2.5E-05	mg/kg/day	2.E-06
				Chromium	10.4	mg/kg	NC		NC			--		7.5E-05	mg/kg/day	
				Copper	11.8	mg/kg	NC		NC			--		3.0E-02	mg/kg/day	
				Lead	40.5	mg/kg	--					--				
				Manganese	711	mg/kg	NC		NC			--		2.8E-03	mg/kg/day	
				Mercury	0.051	mg/kg	NC		NC			--		2.1E-05	mg/kg/day	
				Nickel	10.1	mg/kg	NC		NC			--		8.0E-04	mg/kg/day	
				Thallium	0.354	mg/kg	NC		NC			--		8.0E-05	mg/kg/day	
				Vanadium	17	mg/kg	NC		NC			--		1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00000379	mg/kg	5.5E-16	mg/kg/day	1.5E+05	(mg/kg/day)-1	8.E-11	1.3E-14	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-09					8.E-05
		EXPOSURE POINT TOTAL									2.E-08					2.E-03
	EXPOSURE MEDIUM TOTAL										2.E-08					2.E-03
SEDIMENT TOTAL											2.E-08					2.E-03

TABLE 7.5.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS – CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- OLDER CHILD- COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SURFACE WATER	SURFACE WATER	ASSAPUMPSET POND	INGESTION	Arsenic	0.000491	mg/l	8.3E-10	mg/kg/day	1.5E+00	mg/kg/day	1.E-09	1.9E-08	mg/kg/day	3.0E-04	mg/kg/day	6.E-05
				Manganese	0.135	mg/l	NC		NC			5.3E-06	mg/kg/day	2.4E-02	mg/kg/day	2.E-04
				Mercury	0.00000215	mg/l	NC		NC			8.5E-11	mg/kg/day	3.0E-04	mg/kg/day	3.E-07
				Nitrite-N	0.0051	mg/l	NC		NC			2.0E-07	mg/kg/day	1.0E-01	mg/kg/day	2.E-06
				Toxicity Equivalency (Dioxins/Furans)	5.34E-09	mg/l	9.1E-15	mg/kg/day	1.5E+05	mg/kg/day	1.E-09	2.1E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-09					3.E-04
			DERMAL	Arsenic	0.000491	mg/l	3.0E-10	mg/kg/day	1.5E+00	mg/kg/day	4.E-10	6.9E-09	mg/kg/day	3.0E-04	mg/kg/day	2.E-05
				Manganese	0.135	mg/l	NC		NC			1.9E-06	mg/kg/day	9.6E-04	mg/kg/day	2.E-03
				Mercury	0.00000215	mg/l	NC		NC			3.0E-11	mg/kg/day	2.1E-05	mg/kg/day	1.E-06
				Nitrite-N	0.0051	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	5.34E-09	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-10					2.E-03
		EXPOSURE POINT TOTAL									3.E-09					2.E-03
	EXPOSURE MEDIUM TOTAL										3.E-09					2.E-03
SURFACE WATER TOTAL											3.E-09					2.E-03
BIOTA	COMBINED FISH DIET	ASSAPUMPSET POND	INGESTION	Acenaphthylene	0.000708611	mg/kg	NC		NC			8.9E-08	mg/kg/day	6.0E-02	mg/kg/day	1.E-06
				Benzo(a)anthracene	0.0016	mg/kg	8.6E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-09	2.0E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Benzo(a)pyrene	0.0016	mg/kg	8.6E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	6.E-08	2.0E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Benzo(b)fluoranthene	0.0019	mg/kg	1.0E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-09	2.4E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				Benzo(g,h,i)perylene	0.00214	mg/kg	NC		NC			2.7E-07	mg/kg/day	3.0E-02	mg/kg/day	9.E-06
				Dibenzo(a,h)anthracene	0.00064	mg/kg	3.4E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-08	8.0E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Indeno(1,2,3-cd)pyrene	0.0014	mg/kg	7.5E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-09	1.8E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Phenanthrene	0.0035	mg/kg	NC		NC			4.4E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				4,4'-DDD	0.00254	mg/kg	1.4E-08	mg/kg/day	2.4E-01	(mg/kg/day)-1	3.E-09	3.2E-07	mg/kg/day	5.0E-04	mg/kg/day	6.E-04
				4,4'-DDE	0.0117	mg/kg	6.3E-08	mg/kg/day	3.4E-01	(mg/kg/day)-1	2.E-08	1.5E-06	mg/kg/day	5.0E-04	mg/kg/day	3.E-03
				alpha-Chlordane	0.0015	mg/kg	8.1E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-09	1.9E-07	mg/kg/day	5.0E-04	mg/kg/day	4.E-04
				Aroclor-1254	0.01622	mg/kg	8.7E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-07	2.0E-06	mg/kg/day	2.0E-05	mg/kg/day	1.E-01
				Dieldrin	0.0009	mg/kg	4.8E-09	mg/kg/day	1.6E+01	(mg/kg/day)-1	8.E-08	1.1E-07	mg/kg/day	5.0E-05	mg/kg/day	2.E-03
				gamma-Chlordane	0.0008	mg/kg	4.3E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-09	1.0E-07	mg/kg/day	5.0E-04	mg/kg/day	2.E-04
				Heptachlor Epoxide	0.00071	mg/kg	3.8E-09	mg/kg/day	9.1E+00	(mg/kg/day)-1	3.E-08	8.9E-08	mg/kg/day	1.3E-05	mg/kg/day	7.E-03
				Technical Chlordane	0.0951	mg/kg	5.1E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-07	1.2E-05	mg/kg/day	5.0E-04	mg/kg/day	2.E-02
				Lead	0.049	mg/kg	2.6E-07	mg/kg/day				6.2E-06	mg/kg/day			
				Mercury	0.14	mg/kg	NC		NC			1.8E-05	mg/kg/day	3.0E-04	mg/kg/day	6.E-02
				Mercury (methyl)	0.1	mg/kg	NC		NC			1.3E-05	mg/kg/day	1.0E-04	mg/kg/day	1.E-01
				Zinc	11.1	mg/kg	NC		NC			1.4E-03	mg/kg/day	3.0E-01	mg/kg/day	5.E-03
				Toxicity Equivalency (Dioxins/Furans)	0.00000151	mg/kg	8.1E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-06	1.9E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-06					3.3.E-01
		EXPOSURE POINT TOTAL									2.E-06					3.3.E-01
	EXPOSURE MEDIUM TOTAL										2.E-06					3.3.E-01
COMBINED FISH DIET TOTAL											2.E-06					3.3.E-01
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	2.E-06	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				3.3.E-01

NOTES.
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: RAR
Checked by: KJA

TABLE 7.6.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- CHILD - COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		R/D/R/C (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	ASSAPUMPSET POND	INGESTION	2-Methylnaphthalene	0.01855	mg/kg	NC		NC			8.8E-09	mg/kg/day	2.0E-02	mg/kg/day	4.E-07
				Acenaphthylene	0.0589	mg/kg	NC		NC			2.8E-08	mg/kg/day	6.0E-02	mg/kg/day	5.E-07
				Benzo(a)anthracene	0.52	mg/kg	7.1E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	5.E-09	2.5E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				Benzo(a)pyrene	0.53	mg/kg	7.2E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	5.E-08	2.5E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				Benzo(b)fluoranthene	0.63	mg/kg	8.5E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-09	3.0E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(g,h,i)perylene	0.4	mg/kg	NC		NC			1.9E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Dibenzo(a,h)anthracene	0.15	mg/kg	2.0E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-08	7.1E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Indeno(1,2,3-cd)pyrene	0.43	mg/kg	5.8E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-09	2.0E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Phenanthrene	0.54	mg/kg	NC		NC			2.6E-07	mg/kg/day	3.0E-02	mg/kg/day	9.E-06
				alpha-Chlordane	0.00133	mg/kg	1.8E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	6.E-12	6.3E-10	mg/kg/day	5.0E-04	mg/kg/day	1.E-06
				Aroclor-1254	0.032	mg/kg	4.3E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	9.E-10	1.5E-08	mg/kg/day	2.0E-05	mg/kg/day	8.E-04
				Aroclor-1268	0.023	mg/kg	3.1E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	6.E-10	1.1E-08	mg/kg/day	2.0E-05	mg/kg/day	5.E-04
				gamma-Chlordane	0.00065	mg/kg	8.8E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-12	3.1E-10	mg/kg/day	5.0E-04	mg/kg/day	6.E-07
				Technical Chlordane	0.11	mg/kg	1.5E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	5.E-10	5.2E-08	mg/kg/day	5.0E-04	mg/kg/day	1.E-04
				Aluminum	9841	mg/kg	NC		NC			4.7E-03	mg/kg/day	1.0E+00	mg/kg/day	5.E-03
				Arsenic	2.7	mg/kg	3.7E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	5.E-08	1.3E-06	mg/kg/day	3.0E-04	mg/kg/day	4.E-03
				Cadmium	0.37	mg/kg	NC		NC			1.8E-07	mg/kg/day	1.0E-03	mg/kg/day	2.E-04
				Chromium	10.4	mg/kg	NC		NC			4.9E-06	mg/kg/day	3.0E-03	mg/kg/day	2.E-03
				Copper	11.8	mg/kg	NC		NC			5.6E-06	mg/kg/day	3.0E-02	mg/kg/day	2.E-04
				Lead	40.5	mg/kg	5.5E-07	mg/kg/day				1.9E-05	mg/kg/day			
				Manganese	711	mg/kg	NC		NC			3.4E-04	mg/kg/day	7.1E-02	mg/kg/day	5.E-03
				Mercury	0.051	mg/kg	NC		NC			2.4E-08	mg/kg/day	3.0E-04	mg/kg/day	8.E-05
				Nickel	10.1	mg/kg	NC		NC			4.8E-06	mg/kg/day	2.0E-02	mg/kg/day	2.E-04
				Thallium	0.354	mg/kg	NC		NC			1.7E-07	mg/kg/day	8.0E-05	mg/kg/day	2.E-03
				Vanadium	17	mg/kg	NC		NC			8.1E-06	mg/kg/day	7.0E-03	mg/kg/day	1.E-03
				Toxicity Equivalency (Dioxins/Furans)	0.00000379	mg/kg	5.1E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	8.E-09	1.8E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-07					2.E-02
			DERMAL	2-Methylnaphthalene	0.01855	mg/kg	NC		NC			1.3E-09	mg/kg/day	2.0E-02	mg/kg/day	6.E-08
				Acenaphthylene	0.0589	mg/kg	NC		NC			4.1E-09	mg/kg/day	6.0E-02	mg/kg/day	7.E-08
				Benzo(a)anthracene	0.52	mg/kg	1.0E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-10	3.6E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Benzo(a)pyrene	0.53	mg/kg	1.0E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	8.E-09	3.7E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Benzo(b)fluoranthene	0.63	mg/kg	1.2E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	9.E-10	4.4E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Benzo(g,h,i)perylene	0.4	mg/kg	NC		NC			2.8E-08	mg/kg/day	3.0E-02	mg/kg/day	9.E-07
				Dibenzo(a,h)anthracene	0.15	mg/kg	3.0E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-09	1.0E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				Indeno(1,2,3-cd)pyrene	0.43	mg/kg	8.5E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-10	3.0E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Phenanthrene	0.54	mg/kg	NC		NC			3.7E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				alpha-Chlordane	0.00133	mg/kg	8.1E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-13	2.8E-11	mg/kg/day	5.0E-04	mg/kg/day	6.E-08
				Aroclor-1254	0.032	mg/kg	6.8E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-10	2.4E-09	mg/kg/day	2.0E-05	mg/kg/day	1.E-04
				Aroclor-1268	0.023	mg/kg	4.9E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-10	1.7E-09	mg/kg/day	2.0E-05	mg/kg/day	9.E-05
				gamma-Chlordane	0.00065	mg/kg	4.0E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-13	1.4E-11	mg/kg/day	5.0E-04	mg/kg/day	3.E-08
				Technical Chlordane	0.11	mg/kg	6.7E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-11	2.3E-09	mg/kg/day	5.0E-04	mg/kg/day	5.E-06
				Aluminum	9841	mg/kg	NC		NC			--		1.0E-02	mg/kg/day	
				Arsenic	2.7	mg/kg	1.2E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	2.E-09	4.3E-08	mg/kg/day	3.0E-04	mg/kg/day	1.E-04
				Cadmium	0.37	mg/kg	NC		NC			2.0E-10	mg/kg/day	2.5E-05	mg/kg/day	8.E-06
				Chromium	10.4	mg/kg	NC		NC			--		7.5E-05	mg/kg/day	
				Copper	11.8	mg/kg	NC		NC			--		3.0E-02	mg/kg/day	
				Lead	40.5	mg/kg	--					--				
				Manganese	711	mg/kg	NC		NC			--		2.8E-03	mg/kg/day	
				Mercury	0.051	mg/kg	NC		NC			--		2.1E-05	mg/kg/day	
				Nickel	10.1	mg/kg	NC		NC			--		8.0E-04	mg/kg/day	
				Thallium	0.354	mg/kg	NC		NC			--		8.0E-05	mg/kg/day	
				Vanadium	17	mg/kg	NC		NC			--		1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00000379	mg/kg	1.7E-15	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-10	6.0E-14	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-08					4.E-04
		EXPOSURE POINT TOTAL									2.E-07					2.E-02
	EXPOSURE MEDIUM TOTAL										2.E-07					2.E-02
SEDIMENT TOTAL											2.E-07					2.E-02

TABLE 7.6.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- CHILD - COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SURFACE WATER	SURFACE WATER	ASSAPUMPSET POND	INGESTION	Arsenic	0.000491	mg/l	1.7E-09	mg/kg/day	1.5E+00	mg/kg/day	2.E-09	5.8E-08	mg/kg/day	3.0E-04	mg/kg/day	2.E-04
				Manganese	0.135	mg/l	NC		NC			1.6E-05	mg/kg/day	2.4E-02	mg/kg/day	7.E-04
				Mercury	0.00000215	mg/l	NC		NC			2.6E-10	mg/kg/day	3.0E-04	mg/kg/day	9.E-07
				Nitrite-N	0.0051	mg/l	NC		NC			6.1E-07	mg/kg/day	1.0E-01	mg/kg/day	6.E-06
				Toxicity Equivalency (Dioxins/Furans)	5.34E-09	mg/l	1.8E-14	mg/kg/day	1.5E+05	mg/kg/day	3.E-09	6.3E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-09					9.E-04
			DERMAL	Arsenic	0.000491	mg/l	1.8E-10	mg/kg/day	1.5E+00	mg/kg/day	3.E-10	6.2E-09	mg/kg/day	3.0E-04	mg/kg/day	2.E-05
				Manganese	0.135	mg/l	NC		NC			1.7E-06	mg/kg/day	9.6E-04	mg/kg/day	2.E-03
				Mercury	0.00000215	mg/l	NC		NC			2.7E-11	mg/kg/day	2.1E-05	mg/kg/day	1.E-06
				Nitrite-N	0.0051	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	5.34E-09	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-10					2.E-03
		EXPOSURE POINT TOTAL									5.E-09					3.E-03
	EXPOSURE MEDIUM TOTAL										5.E-09					3.E-03
SURFACE WATER TOTAL											5.E-09					3.E-03
BIOTA	COMBINED FISH DIET	ASSAPUMPSET POND	INGESTION	Acenaphthylene	0.000708611	mg/kg	NC		NC			1.4E-07	mg/kg/day	6.0E-02	mg/kg/day	2.E-06
				Benzo(a)anthracene	0.0016	mg/kg	8.8E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-09	3.1E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(a)pyrene	0.0016	mg/kg	8.8E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	6.E-08	3.1E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(b)fluoranthene	0.0019	mg/kg	1.0E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-09	3.6E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(g,h,i)perylene	0.00214	mg/kg	NC		NC			4.1E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Dibenzo(a,h)anthracene	0.00064	mg/kg	3.5E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-08	1.2E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Indeno(1,2,3-cd)pyrene	0.0014	mg/kg	7.7E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-09	2.7E-07	mg/kg/day	3.0E-02	mg/kg/day	9.E-06
				Phenanthrene	0.0035	mg/kg	NC		NC			6.7E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				4,4'-DDD	0.00254	mg/kg	1.4E-08	mg/kg/day	2.4E-01	(mg/kg/day)-1	3.E-09	4.9E-07	mg/kg/day	5.0E-04	mg/kg/day	1.E-03
				4,4'-DDE	0.0117	mg/kg	6.4E-08	mg/kg/day	3.4E-01	(mg/kg/day)-1	2.E-08	2.2E-06	mg/kg/day	5.0E-04	mg/kg/day	4.E-03
				alpha-Chlordane	0.0015	mg/kg	8.2E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-09	2.9E-07	mg/kg/day	5.0E-04	mg/kg/day	6.E-04
				Aroclor-1254	0.01622	mg/kg	8.9E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-07	3.1E-06	mg/kg/day	2.0E-05	mg/kg/day	2.E-01
				Dieldrin	0.0009	mg/kg	4.9E-09	mg/kg/day	1.6E+01	(mg/kg/day)-1	8.E-08	1.7E-07	mg/kg/day	5.0E-05	mg/kg/day	3.E-03
				gamma-Chlordane	0.0008	mg/kg	4.4E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-09	1.5E-07	mg/kg/day	5.0E-04	mg/kg/day	3.E-04
				Heptachlor Epoxide	0.00071	mg/kg	3.9E-09	mg/kg/day	9.1E+00	(mg/kg/day)-1	4.E-08	1.4E-07	mg/kg/day	1.3E-05	mg/kg/day	1.E-02
				Technical Chlordane	0.0951	mg/kg	5.2E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-07	1.8E-05	mg/kg/day	5.0E-04	mg/kg/day	4.E-02
				Lead	0.049	mg/kg	2.7E-07	mg/kg/day				9.4E-06	mg/kg/day			
				Mercury	0.14	mg/kg	NC		NC			2.7E-05	mg/kg/day	3.0E-04	mg/kg/day	9.E-02
				Mercury (methyl)	0.1	mg/kg	NC		NC			1.9E-05	mg/kg/day	1.0E-04	mg/kg/day	2.E-01
				Zinc	11.1	mg/kg	NC		NC			2.1E-03	mg/kg/day	3.0E-01	mg/kg/day	7.E-03
				Toxicity Equivalency (Dioxins/Furans)	0.00000151	mg/kg	8.3E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-06	2.9E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-06					5.0.E-01
		EXPOSURE POINT TOTAL									2.E-06					5.0.E-01
	EXPOSURE MEDIUM TOTAL										2.E-06					5.0.E-01
COMBINED FISH DIET TOTAL											2.E-06					5.0.E-01
									TOTAL RECEPTOR RISK ACROSS ALL MEDIA		2.E-06	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				5.2.E-01

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: RAR
Checked by: KJA

TABLE 7.7.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS – CENTRAL TENDENCY- CURRENT/FUTURE- RECREATIONAL ANGLER- ADULT - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SOIL	SOIL	GREYSTONE MILL POND	INGESTION	2-Methylnaphthalene	0.1071	mg/kg	NC		NC			6.3E-10	mg/kg/day	2.0E-02	mg/kg/day	3.E-08
				Acenaphthylene	0.31765	mg/kg	NC		NC			1.9E-09	mg/kg/day	6.0E-02	mg/kg/day	3.E-08
				Benzo(a)anthracene	3.09372	mg/kg	1.0E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-10	1.8E-08	mg/kg/day	3.0E-02	mg/kg/day	6.E-07
				Benzo(a)pyrene	3.07718	mg/kg	1.0E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	8.E-09	1.8E-08	mg/kg/day	3.0E-02	mg/kg/day	6.E-07
				Benzo(b)fluoranthene	3.45207	mg/kg	1.2E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-10	2.0E-08	mg/kg/day	3.0E-02	mg/kg/day	7.E-07
				Benzo(g,h,i)perylene	2.336	mg/kg	NC		NC			1.4E-08	mg/kg/day	3.0E-02	mg/kg/day	5.E-07
				Dibenzo(a,h)anthracene	0.61485	mg/kg	2.1E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-09	3.6E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				Indeno(1,2,3-cd)pyrene	2.51886	mg/kg	8.5E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-10	1.5E-08	mg/kg/day	3.0E-02	mg/kg/day	5.E-07
				Phenanthrene	3.95543	mg/kg	NC		NC			2.3E-08	mg/kg/day	3.0E-02	mg/kg/day	8.E-07
				alpha-Chlordane	0.0178	mg/kg	6.0E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-12	1.0E-10	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				Aroclor-1254	0.51998	mg/kg	1.7E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-10	3.1E-09	mg/kg/day	2.0E-05	mg/kg/day	2.E-04
				Aroclor-1268	0.08389	mg/kg	2.8E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	6.E-11	4.9E-10	mg/kg/day	2.0E-05	mg/kg/day	2.E-05
				Endosulfan Sulfate	0.0065	mg/kg	NC		NC			3.8E-11	mg/kg/day	6.0E-03	mg/kg/day	6.E-09
				Technical Chlordane	0.4307	mg/kg	1.4E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	5.E-11	2.5E-09	mg/kg/day	5.0E-04	mg/kg/day	5.E-06
				Aluminum	15899	mg/kg	NC		NC			9.3E-05	mg/kg/day	1.0E+00	mg/kg/day	9.E-05
				Arsenic	7.72	mg/kg	2.6E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	4.E-09	4.5E-08	mg/kg/day	3.0E-04	mg/kg/day	2.E-04
				Chromium	231	mg/kg	NC		NC			1.4E-06	mg/kg/day	3.0E-03	mg/kg/day	5.E-04
				Copper	205	mg/kg	NC		NC			1.2E-06	mg/kg/day	3.0E-02	mg/kg/day	4.E-05
				Lead	450	mg/kg	1.5E-07	mg/kg/day	–			2.6E-06	mg/kg/day			
				Manganese	1841	mg/kg	NC		NC			1.1E-05	mg/kg/day	7.1E-02	mg/kg/day	2.E-04
				Mercury	0.582	mg/kg	NC		NC			3.4E-09	mg/kg/day	3.0E-04	mg/kg/day	1.E-05
				Molybdenum	54	mg/kg	NC		NC			3.2E-07	mg/kg/day	5.0E-03	mg/kg/day	6.E-05
				Nickel	120	mg/kg	NC		NC			7.0E-07	mg/kg/day	2.0E-02	mg/kg/day	4.E-05
				Thallium	0.461	mg/kg	NC		NC			2.7E-09	mg/kg/day	8.0E-05	mg/kg/day	3.E-05
				Vanadium	82.3	mg/kg	NC		NC			4.8E-07	mg/kg/day	7.0E-03	mg/kg/day	7.E-05
				Toxicity Equivalency (Dioxins/Furans)	0.0000549	mg/kg	1.8E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-09	3.2E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-08					1.E-03
			DERMAL	2-Methylnaphthalene	0.1071	mg/kg	NC		NC			1.9E-10	mg/kg/day	2.0E-02	mg/kg/day	9.E-09
				Acenaphthylene	0.31765	mg/kg	NC		NC			5.5E-10	mg/kg/day	6.0E-02	mg/kg/day	9.E-09
				Benzo(a)anthracene	3.09372	mg/kg	3.1E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-10	5.4E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Benzo(a)pyrene	3.07718	mg/kg	3.1E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-09	5.4E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Benzo(b)fluoranthene	3.45207	mg/kg	3.4E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-10	6.0E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Benzo(g,h,i)perylene	2.336	mg/kg	NC		NC			4.1E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				Dibenzo(a,h)anthracene	0.61485	mg/kg	6.1E-11	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-10	1.1E-09	mg/kg/day	3.0E-02	mg/kg/day	4.E-08
				Indeno(1,2,3-cd)pyrene	2.51886	mg/kg	2.5E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-10	4.4E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				Phenanthrene	3.95543	mg/kg	NC		NC			6.9E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				alpha-Chlordane	0.0178	mg/kg	5.4E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-13	9.5E-12	mg/kg/day	5.0E-04	mg/kg/day	2.E-08
				Aroclor-1254	0.51998	mg/kg	5.6E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-10	9.7E-10	mg/kg/day	2.0E-05	mg/kg/day	5.E-05
				Aroclor-1268	0.08389	mg/kg	9.0E-12	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-11	1.6E-10	mg/kg/day	2.0E-05	mg/kg/day	8.E-06
				Endosulfan Sulfate	0.0065	mg/kg	NC		NC			8.7E-12	mg/kg/day	6.0E-03	mg/kg/day	1.E-09
				Technical Chlordane	0.4307	mg/kg	1.3E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	5.E-12	2.3E-10	mg/kg/day	5.0E-04	mg/kg/day	5.E-07
				Aluminum	15899	mg/kg	NC		NC			–		1.0E-02	mg/kg/day	
				Arsenic	7.72	mg/kg	1.8E-10	mg/kg/day	1.5E+00	(mg/kg/day)-1	3.E-10	3.1E-09	mg/kg/day	3.0E-04	mg/kg/day	1.E-05
				Chromium	231	mg/kg	NC		NC			–		7.5E-05	mg/kg/day	
				Copper	205	mg/kg	NC		NC			–		3.0E-02	mg/kg/day	
				Lead	450	mg/kg	–		–			–				
				Manganese	1841	mg/kg	NC		NC			–		2.8E-03	mg/kg/day	
				Mercury	0.582	mg/kg	NC		NC			–		2.1E-05	mg/kg/day	
				Molybdenum	54	mg/kg	NC		NC			–		5.0E-03	mg/kg/day	
				Nickel	120	mg/kg	NC		NC			–		8.0E-04	mg/kg/day	
				Thallium	0.461	mg/kg	NC		NC			–		8.0E-05	mg/kg/day	
				Vanadium	82.3	mg/kg	NC		NC			–		1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.0000549	mg/kg	1.3E-15	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-10	2.2E-14	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-09					7.E-05
		EXPOSURE POINT TOTAL									2.E-08					1.E-03
	EXPOSURE MEDIUM TOTAL										2.E-08					1.E-03
SOIL TOTAL											2.E-08					1.E-03

TABLE 7.7.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- CENTRAL TENDENCY- CURRENT/FUTURE- RECREATIONAL ANGLER- ADULT - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		R/D/R/C (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	GREYSTONE MILL POND	INGESTION	2-Methylnaphthalene	0.07478	mg/kg	NC		NC			4.4E-10	mg/kg/day	2.0E-02	mg/kg/day	2.E-08
				Acenaphthylene	0.19279	mg/kg	NC		NC			1.1E-09	mg/kg/day	6.0E-02	mg/kg/day	2.E-08
				Benzo(a)anthracene	1.5	mg/kg	5.0E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-10	8.8E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				Benzo(a)pyrene	1.4	mg/kg	4.7E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-09	8.2E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				Benzo(b)fluoranthene	1.5	mg/kg	5.0E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-10	8.8E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				Benzo(g,h,i)perylene	0.86	mg/kg	NC		NC			5.0E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Dibenzo(a,h)anthracene	0.77	mg/kg	2.6E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-09	4.5E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Indeno(1,2,3-cd)pyrene	1	mg/kg	3.4E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-10	5.9E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Phenanthrene	2.1	mg/kg	NC		NC			1.2E-08	mg/kg/day	3.0E-02	mg/kg/day	4.E-07
				alpha-Chlordane	0.0061	mg/kg	2.0E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	7.E-13	3.6E-11	mg/kg/day	5.0E-04	mg/kg/day	7.E-08
				Aroclor-1254	0.15	mg/kg	5.0E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-10	8.8E-10	mg/kg/day	2.0E-05	mg/kg/day	4.E-05
				Aroclor-1268	0.14	mg/kg	4.7E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	9.E-11	8.2E-10	mg/kg/day	2.0E-05	mg/kg/day	4.E-05
				gamma-Chlordane	0.0048	mg/kg	1.6E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	6.E-13	2.8E-11	mg/kg/day	5.0E-04	mg/kg/day	6.E-08
				Technical Chlordane	0.4	mg/kg	1.3E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	5.E-11	2.3E-09	mg/kg/day	5.0E-04	mg/kg/day	5.E-06
				Aluminum	15554	mg/kg	NC		NC			9.1E-05	mg/kg/day	1.0E+00	mg/kg/day	9.E-05
				Antimony	0.73	mg/kg	NC		NC			4.3E-09	mg/kg/day	4.0E-04	mg/kg/day	1.E-05
				Arsenic	9.6	mg/kg	3.2E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	5.E-09	5.6E-08	mg/kg/day	3.0E-04	mg/kg/day	2.E-04
				Cadmium	0.81	mg/kg	NC		NC			4.8E-09	mg/kg/day	1.0E-03	mg/kg/day	5.E-06
				Chromium	99.3	mg/kg	NC		NC			5.8E-07	mg/kg/day	3.0E-03	mg/kg/day	2.E-04
				Copper	72.8	mg/kg	NC		NC			4.3E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Lead	179	mg/kg	6.0E-08	mg/kg/day				1.1E-06	mg/kg/day			
				Manganese	599	mg/kg	NC		NC			3.5E-06	mg/kg/day	7.1E-02	mg/kg/day	5.E-05
				Mercury	0.21	mg/kg	NC		NC			1.2E-09	mg/kg/day	3.0E-04	mg/kg/day	4.E-06
				Nickel	142	mg/kg	NC		NC			8.3E-07	mg/kg/day	2.0E-02	mg/kg/day	4.E-05
				Thallium	0.37	mg/kg	NC		NC			2.2E-09	mg/kg/day	8.0E-05	mg/kg/day	3.E-05
				Vanadium	79	mg/kg	NC		NC			4.6E-07	mg/kg/day	7.0E-03	mg/kg/day	7.E-05
				Toxicity Equivalency (Dioxins/Furans)	0.000121	mg/kg	4.1E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	6.E-09	7.1E-13	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.0000249	mg/kg	8.4E-15	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-09	1.5E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-08					8.E-04
			DERMAL	2-Methylnaphthalene	0.07478	mg/kg	NC		NC			1.1E-10	mg/kg/day	2.0E-02	mg/kg/day	6.E-09
				Acenaphthylene	0.19279	mg/kg	NC		NC			2.9E-10	mg/kg/day	6.0E-02	mg/kg/day	5.E-09
				Benzo(a)anthracene	1.5	mg/kg	1.3E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	9.E-11	2.2E-09	mg/kg/day	3.0E-02	mg/kg/day	7.E-08
				Benzo(a)pyrene	1.4	mg/kg	1.2E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	9.E-10	2.1E-09	mg/kg/day	3.0E-02	mg/kg/day	7.E-08
				Benzo(b)fluoranthene	1.5	mg/kg	1.3E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	9.E-11	2.2E-09	mg/kg/day	3.0E-02	mg/kg/day	7.E-08
				Benzo(g,h,i)perylene	0.86	mg/kg	NC		NC			1.3E-09	mg/kg/day	3.0E-02	mg/kg/day	4.E-08
				Dibenzo(a,h)anthracene	0.77	mg/kg	6.5E-11	mg/kg/day	7.3E+00	(mg/kg/day)-1	5.E-10	1.1E-09	mg/kg/day	3.0E-02	mg/kg/day	4.E-08
				Indeno(1,2,3-cd)pyrene	1	mg/kg	8.5E-11	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-11	1.5E-09	mg/kg/day	3.0E-02	mg/kg/day	5.E-08
				Phenanthrene	2.1	mg/kg	NC		NC			3.1E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				alpha-Chlordane	0.0061	mg/kg	1.6E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	6.E-14	2.8E-12	mg/kg/day	5.0E-04	mg/kg/day	6.E-09
				Aroclor-1254	0.15	mg/kg	1.4E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-11	2.4E-10	mg/kg/day	2.0E-05	mg/kg/day	1.E-05
				Aroclor-1268	0.14	mg/kg	1.3E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-11	2.2E-10	mg/kg/day	2.0E-05	mg/kg/day	1.E-05
				gamma-Chlordane	0.0048	mg/kg	1.3E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-14	2.2E-12	mg/kg/day	5.0E-04	mg/kg/day	4.E-09
				Technical Chlordane	0.4	mg/kg	1.0E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-12	1.8E-10	mg/kg/day	5.0E-04	mg/kg/day	4.E-07
				Aluminum	15554	mg/kg	NC		NC			–		1.0E-02	mg/kg/day	
				Antimony	0.73	mg/kg	NC		NC			–		6.0E-05	mg/kg/day	
				Arsenic	9.6	mg/kg	1.9E-10	mg/kg/day	1.5E+00	(mg/kg/day)-1	3.E-10	3.3E-09	mg/kg/day	3.0E-04	mg/kg/day	1.E-05
				Cadmium	0.81	mg/kg	NC		NC			9.2E-12	mg/kg/day	2.5E-05	mg/kg/day	4.E-07
				Chromium	99.3	mg/kg	NC		NC			–		7.5E-05	mg/kg/day	
				Copper	72.8	mg/kg	NC		NC			–		3.0E-02	mg/kg/day	
				Lead	179	mg/kg	–					–				
				Manganese	599	mg/kg	NC		NC			–		2.8E-03	mg/kg/day	
				Mercury	0.21	mg/kg	NC		NC			–		2.1E-05	mg/kg/day	
				Nickel	142	mg/kg	NC		NC			–		8.0E-04	mg/kg/day	
				Thallium	0.37	mg/kg	NC		NC			–		8.0E-05	mg/kg/day	
				Vanadium	79	mg/kg	NC		NC			–		1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000121	mg/kg	2.4E-15	mg/kg/day	1.5E+05	(mg/kg/day)-1	4.E-10	4.1E-14	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.0000249	mg/kg	4.9E-16	mg/kg/day	1.5E+05	(mg/kg/day)-1	7.E-11	8.5E-15	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-09					4.E-05
		EXPOSURE POINT TOTAL									2.E-08					8.E-04
	EXPOSURE MEDIUM TOTAL										2.E-08					8.E-04
SEDIMENT TOTAL											2.E-08					8.E-04

TABLE 7.7.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS – CENTRAL TENDENCY- CURRENT/FUTURE- RECREATIONAL ANGLER- ADULT - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SURFACE WATER	SURFACE WATER	GREYSTONE MILL POND	INGESTION	Arsenic	0.00055	mg/l	1.8E-11	mg/kg/day	1.5E+00	mg/kg/day	3.E-11	3.2E-10	mg/kg/day	3.0E-04	mg/kg/day	1 E-06
				Manganese	0.131	mg/l	NC		NC			7.7E-08	mg/kg/day	2.4E-02	mg/kg/day	3.E-06
				Mercury	0.00000193	mg/l	NC		NC			1.1E-12	mg/kg/day	3.0E-04	mg/kg/day	4 E-09
				Nitrite-N	0.128	mg/l	NC		NC			7.5E-08	mg/kg/day	1.0E-01	mg/kg/day	8 E-07
				Toxicity Equivalency (Dioxins/Furans)	3.26E-09	mg/l	1.1E-16	mg/kg/day	1.5E+05	mg/kg/day	2.E-11	1.9E-15	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-11					5 E-06
			DERMAL	Arsenic	0.00055	mg/l	6.4E-11	mg/kg/day	1.5E+00	mg/kg/day	1 E-10	1.1E-09	mg/kg/day	3.0E-04	mg/kg/day	4.E-06
				Manganese	0.131	mg/l	NC		NC			2.7E-07	mg/kg/day	9.6E-04	mg/kg/day	3.E-04
				Mercury	0.00000193	mg/l	NC		NC			3.9E-12	mg/kg/day	2.1E-05	mg/kg/day	2.E-07
				Nitrite-N	0.128	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	3.26E-09	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0 E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-10					3 E-04
		EXPOSURE POINT TOTAL									1.E-10					3 E-04
	EXPOSURE MEDIUM TOTAL										1.E-10					3.E-04
SURFACE WATER TOTAL											1.E-10					3.E-04
BIOTA	COMBINED FISH DIET	GREYSTONE MILL POND	INGESTION	Acenaphthylene	0.002	mg/kg	NC		NC			2.4E-07	mg/kg/day	6.0E-02	mg/kg/day	4 E-06
				Benzo(a)pyrene	0.00099	mg/kg	6.9E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	5.E-08	1.2E-07	mg/kg/day	3.0E-02	mg/kg/day	4 E-06
				Benzo(g,h,i)perylene	0.0012	mg/kg	NC		NC			1.5E-07	mg/kg/day	3.0E-02	mg/kg/day	5 E-06
				Benzo(b)fluoranthene	0.00092	mg/kg	6.4E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	5 E-09	1.1E-07	mg/kg/day	3.0E-02	mg/kg/day	4 E-06
				Dibenzo(a,h)anthracene	0.00057	mg/kg	4.0E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	3 E-08	6.9E-08	mg/kg/day	3.0E-02	mg/kg/day	2 E-06
				Indeno(1,2,3-cd)pyrene	0.00092	mg/kg	6.4E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	5 E-09	1.1E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Phenanthrene	0.008	mg/kg	NC		NC			9.8E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				4,4'-DDD	0.013	mg/kg	9.1E-08	mg/kg/day	2.4E-01	(mg/kg/day)-1	2.E-08	1.6E-06	mg/kg/day	5.0E-04	mg/kg/day	3 E-03
				4,4'-DDE	0.0329	mg/kg	2.3E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	8.E-08	4.0E-06	mg/kg/day	5.0E-04	mg/kg/day	8.E-03
				4,4'-DDT	0.003	mg/kg	2.1E-08	mg/kg/day	3.4E-01	(mg/kg/day)-1	7.E-09	3.7E-07	mg/kg/day	5.0E-04	mg/kg/day	7 E-04
				alpha-Chlordane	0.014	mg/kg	9.8E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-08	1.7E-06	mg/kg/day	5.0E-04	mg/kg/day	3.E-03
				Aroclor-1254	0.177	mg/kg	1.2E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-06	2.2E-05	mg/kg/day	2.0E-05	mg/kg/day	1 E+00
				Aroclor-1268	0.0851	mg/kg	5.9E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-06	1.0E-05	mg/kg/day	2.0E-05	mg/kg/day	5 E-01
				Dieldrin	0.0027	mg/kg	1.9E-08	mg/kg/day	1.6E+01	(mg/kg/day)-1	3.E-07	3.3E-07	mg/kg/day	5.0E-05	mg/kg/day	7.E-03
				gamma-Chlordane	0.006	mg/kg	4.2E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-08	7.3E-07	mg/kg/day	5.0E-04	mg/kg/day	1.E-03
				Heptachlor Epoxide	0.0008	mg/kg	5.6E-09	mg/kg/day	9.1E+00	(mg/kg/day)-1	5.E-08	9.8E-08	mg/kg/day	1.3E-05	mg/kg/day	8 E-03
				Technical Chlordane	0.2056	mg/kg	1.4E-06	mg/kg/day	3.5E-01	(mg/kg/day)-1	5.E-07	2.5E-05	mg/kg/day	5.0E-04	mg/kg/day	5.E-02
				Lead	0.079	mg/kg	5.5E-07	mg/kg/day				9.6E-06	mg/kg/day			
				Mercury	0.226	mg/kg	NC		NC			2.8E-05	mg/kg/day	3.0E-04	mg/kg/day	9.E-02
				Mercury (methyl)	0.328	mg/kg	NC		NC			4.0E-05	mg/kg/day	1.0E-04	mg/kg/day	4.E-01
				Zinc	22	mg/kg	NC		NC			2.7E-03	mg/kg/day	3.0E-01	mg/kg/day	9 E-03
				Toxicity Equivalency (Dioxins/Furans)	0.00000136	mg/kg	9.5E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-06	1.7E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								6.E-06					2.2.E+00
		EXPOSURE POINT TOTAL									6 E-06					2.2.E+00
	EXPOSURE MEDIUM TOTAL										6.E-06					2.2.E+00
COMBINED FISH DIET TOTAL											6.E-06					2.2.E+00
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	6.E-06	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				2.2.E+00

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TABLE 7.8.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS – CENTRAL TENDENCY- CURRENT/FUTURE- RECREATIONAL ANGLER- OLDER CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SOIL	SOIL	GREYSTONE MILL POND	INGESTION	2-Methylnaphthalene	0.1071	mg/kg	NC		NC			9.8E-10	mg/kg/day	2.0E-02	mg/kg/day	5.E-08
				Acenaphthylene	0.31765	mg/kg	NC		NC			2.9E-09	mg/kg/day	6.0E-02	mg/kg/day	5.E-08
				Benzo(a)anthracene	3.09372	mg/kg	1.2E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	9.E-10	2.8E-08	mg/kg/day	3.0E-02	mg/kg/day	9.E-07
				Benzo(a)pyrene	3.07718	mg/kg	1.2E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	9.E-09	2.8E-08	mg/kg/day	3.0E-02	mg/kg/day	9.E-07
				Benzo(b)fluoranthene	3.45207	mg/kg	1.4E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-09	3.2E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Benzo(g,h,i)perylene	2.336	mg/kg	NC		NC			2.1E-08	mg/kg/day	3.0E-02	mg/kg/day	7.E-07
				Dibenzo(a,h)anthracene	0.61485	mg/kg	2.4E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-09	5.6E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Indeno(1,2,3-cd)pyrene	2.51886	mg/kg	9.9E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-10	2.3E-08	mg/kg/day	3.0E-02	mg/kg/day	8.E-07
				Phenanthrene	3.95543	mg/kg	NC		NC			3.6E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				alpha-Chlordane	0.0178	mg/kg	7.0E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-12	1.6E-10	mg/kg/day	5.0E-04	mg/kg/day	3.E-07
				Aroclor-1254	0.51998	mg/kg	2.0E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	4.E-10	4.7E-09	mg/kg/day	2.0E-05	mg/kg/day	2.E-04
				Aroclor-1268	0.08389	mg/kg	3.3E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	7.E-11	7.7E-10	mg/kg/day	2.0E-05	mg/kg/day	4.E-05
				Endosulfan Sulfate	0.0065	mg/kg	NC		NC			5.9E-11	mg/kg/day	6.0E-03	mg/kg/day	1.E-08
				Technical Chlordane	0.4307	mg/kg	1.7E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	6.E-11	3.9E-09	mg/kg/day	5.0E-04	mg/kg/day	8.E-06
				Aluminum	15899	mg/kg	NC		NC			1.5E-04	mg/kg/day	1.0E+00	mg/kg/day	1.E-04
				Arsenic	7.72	mg/kg	3.0E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	5.E-09	7.1E-08	mg/kg/day	3.0E-04	mg/kg/day	2.E-04
				Chromium	231	mg/kg	NC		NC			2.1E-06	mg/kg/day	3.0E-03	mg/kg/day	7.E-04
				Copper	205	mg/kg	NC		NC			1.9E-06	mg/kg/day	3.0E-02	mg/kg/day	6.E-05
				Lead	450	mg/kg	1.8E-07	mg/kg/day	--			4.1E-06	mg/kg/day			
				Manganese	1841	mg/kg	NC		NC			1.7E-05	mg/kg/day	7.1E-02	mg/kg/day	2.E-04
				Mercury	0.582	mg/kg	NC		NC			5.3E-09	mg/kg/day	3.0E-04	mg/kg/day	2.E-05
				Molybdenum	54	mg/kg	NC		NC			4.9E-07	mg/kg/day	5.0E-03	mg/kg/day	1.E-04
				Nickel	120	mg/kg	NC		NC			1.1E-06	mg/kg/day	2.0E-02	mg/kg/day	5.E-05
				Thallium	0.461	mg/kg	NC		NC			4.2E-09	mg/kg/day	8.0E-05	mg/kg/day	5.E-05
				Vanadium	82.3	mg/kg	NC		NC			7.5E-07	mg/kg/day	7.0E-03	mg/kg/day	1.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.0000549	mg/kg	2.1E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-09	5.0E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-08					2.E-03
			DERMAL	2-Methylnaphthalene	0.1071	mg/kg	NC		NC			9.8E-10	mg/kg/day	2.0E-02	mg/kg/day	5.E-08
				Acenaphthylene	0.31765	mg/kg	NC		NC			2.9E-09	mg/kg/day	6.0E-02	mg/kg/day	5.E-08
				Benzo(a)anthracene	3.09372	mg/kg	1.2E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	9.E-10	2.8E-08	mg/kg/day	3.0E-02	mg/kg/day	9.E-07
				Benzo(a)pyrene	3.07718	mg/kg	1.2E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	9.E-09	2.8E-08	mg/kg/day	3.0E-02	mg/kg/day	9.E-07
				Benzo(b)fluoranthene	3.45207	mg/kg	1.3E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-09	3.1E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Benzo(g,h,i)perylene	2.336	mg/kg	NC		NC			2.1E-08	mg/kg/day	3.0E-02	mg/kg/day	7.E-07
				Dibenzo(a,h)anthracene	0.61485	mg/kg	2.4E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-09	5.6E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Indeno(1,2,3-cd)pyrene	2.51886	mg/kg	9.8E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-10	2.3E-08	mg/kg/day	3.0E-02	mg/kg/day	8.E-07
				Phenanthrene	3.95543	mg/kg	NC		NC			3.6E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				alpha-Chlordane	0.0178	mg/kg	2.1E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	7.E-13	5.0E-11	mg/kg/day	5.0E-04	mg/kg/day	1.E-07
				Aroclor-1254	0.51998	mg/kg	2.2E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	4.E-10	5.1E-09	mg/kg/day	2.0E-05	mg/kg/day	3.E-04
				Aroclor-1268	0.08389	mg/kg	3.5E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	7.E-11	8.2E-10	mg/kg/day	2.0E-05	mg/kg/day	4.E-05
				Endosulfan Sulfate	0.0065	mg/kg	NC		NC			4.6E-11	mg/kg/day	6.0E-03	mg/kg/day	8.E-09
				Technical Chlordane	0.4307	mg/kg	5.2E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-11	1.2E-09	mg/kg/day	5.0E-04	mg/kg/day	2.E-06
				Aluminum	15899	mg/kg	NC		NC			--		1.0E-02	mg/kg/day	
				Arsenic	7.72	mg/kg	7.0E-10	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-09	1.6E-08	mg/kg/day	3.0E-04	mg/kg/day	5.E-05
				Chromium	231	mg/kg	NC		NC			--		7.5E-05	mg/kg/day	
				Copper	205	mg/kg	NC		NC			--		3.0E-02	mg/kg/day	
				Lead	450	mg/kg	--		--			--				
				Manganese	1841	mg/kg	NC		NC			--		2.8E-03	mg/kg/day	
				Mercury	0.582	mg/kg	NC		NC			--		2.1E-05	mg/kg/day	
				Molybdenum	54	mg/kg	NC		NC			--		5.0E-03	mg/kg/day	
				Nickel	120	mg/kg	NC		NC			--		8.0E-04	mg/kg/day	
				Thallium	0.461	mg/kg	NC		NC			--		8.0E-05	mg/kg/day	
				Vanadium	82.3	mg/kg	NC		NC			--		1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.0000549	mg/kg	5.0E-15	mg/kg/day	1.5E+05	(mg/kg/day)-1	7.E-10	1.2E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-08					4.E-04
		EXPOSURE POINT TOTAL									4.E-08					2.E-03
	EXPOSURE MEDIUM TOTAL										4.E-08					2.E-03
SOIL TOTAL											4.E-08					2.E-03

TABLE 7.8.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- CENTRAL TENDENCY- CURRENT/FUTURE- RECREATIONAL ANGLER- OLDER CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		R/D/R/C (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	GREYSTONE MILL POND	INGESTION	2-Methylnaphthalene	0.07478	mg/kg	NC		NC			6.8E-10	mg/kg/day	2.0E-02	mg/kg/day	3.E-08
				Acenaphthylene	0.19279	mg/kg	NC		NC			1.8E-09	mg/kg/day	6.0E-02	mg/kg/day	3.E-08
				Benzo(a)anthracene	1.5	mg/kg	5.9E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-10	1.4E-08	mg/kg/day	3.0E-02	mg/kg/day	5.E-07
				Benzo(a)pyrene	1.4	mg/kg	5.5E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-09	1.3E-08	mg/kg/day	3.0E-02	mg/kg/day	4.E-07
				Benzo(b)fluoranthene	1.5	mg/kg	5.9E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-10	1.4E-08	mg/kg/day	3.0E-02	mg/kg/day	5.E-07
				Benzo(g,h,i)perylene	0.86	mg/kg	NC		NC			7.9E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				Dibenzo(a,h)anthracene	0.77	mg/kg	3.0E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-09	7.0E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Indeno(1,2,3-cd)pyrene	1	mg/kg	3.9E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-10	9.1E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				Phenanthrene	2.1	mg/kg	NC		NC			1.9E-08	mg/kg/day	3.0E-02	mg/kg/day	6.E-07
				alpha-Chlordane	0.0061	mg/kg	2.4E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	8.E-13	5.6E-11	mg/kg/day	5.0E-04	mg/kg/day	1.E-07
				Aroclor-1254	0.15	mg/kg	5.9E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-10	1.4E-09	mg/kg/day	2.0E-05	mg/kg/day	7.E-05
				Aroclor-1268	0.14	mg/kg	5.5E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-10	1.3E-09	mg/kg/day	2.0E-05	mg/kg/day	6.E-05
				gamma-Chlordane	0.0048	mg/kg	1.9E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	7.E-13	4.4E-11	mg/kg/day	5.0E-04	mg/kg/day	9.E-08
				Technical Chlordane	0.4	mg/kg	1.6E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	5.E-11	3.7E-09	mg/kg/day	5.0E-04	mg/kg/day	7.E-06
				Aluminum	15554	mg/kg	NC		NC			1.4E-04	mg/kg/day	1.0E+00	mg/kg/day	1.E-04
				Antimony	0.73	mg/kg	NC		NC			6.7E-09	mg/kg/day	4.0E-04	mg/kg/day	2.E-05
				Arsenic	9.6	mg/kg	3.8E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	6.E-09	8.8E-08	mg/kg/day	3.0E-04	mg/kg/day	3.E-04
				Cadmium	0.81	mg/kg	NC		NC			7.4E-09	mg/kg/day	1.0E-03	mg/kg/day	7.E-06
				Chromium	99.3	mg/kg	NC		NC			9.1E-07	mg/kg/day	3.0E-03	mg/kg/day	3.E-04
				Copper	72.8	mg/kg	NC		NC			6.6E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Lead	179	mg/kg	7.0E-08	mg/kg/day				1.6E-06	mg/kg/day			
				Manganese	599	mg/kg	NC		NC			5.5E-06	mg/kg/day	7.1E-02	mg/kg/day	8.E-05
				Mercury	0.21	mg/kg	NC		NC			1.9E-09	mg/kg/day	3.0E-04	mg/kg/day	6.E-06
				Nickel	142	mg/kg	NC		NC			1.3E-06	mg/kg/day	2.0E-02	mg/kg/day	6.E-05
				Thallium	0.37	mg/kg	NC		NC			3.4E-09	mg/kg/day	8.0E-05	mg/kg/day	4.E-05
				Vanadium	79	mg/kg	NC		NC			7.2E-07	mg/kg/day	7.0E-03	mg/kg/day	1.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.000121	mg/kg	4.7E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	7.E-09	1.1E-12	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.0000249	mg/kg	9.7E-15	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-09	2.3E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-08					1.E-03
			DERMAL	2-Methylnaphthalene	0.07478	mg/kg	NC		NC			5.1E-10	mg/kg/day	2.0E-02	mg/kg/day	3.E-08
				Acenaphthylene	0.19279	mg/kg	NC		NC			1.3E-09	mg/kg/day	6.0E-02	mg/kg/day	2.E-08
				Benzo(a)anthracene	1.5	mg/kg	4.4E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-10	1.0E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				Benzo(a)pyrene	1.4	mg/kg	4.1E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-09	9.5E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				Benzo(b)fluoranthene	1.5	mg/kg	4.4E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-10	1.0E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				Benzo(g,h,i)perylene	0.86	mg/kg	NC		NC			5.8E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Dibenzo(a,h)anthracene	0.77	mg/kg	2.2E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-09	5.2E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Indeno(1,2,3-cd)pyrene	1	mg/kg	2.9E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-10	6.8E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Phenanthrene	2.1	mg/kg	NC		NC			1.4E-08	mg/kg/day	3.0E-02	mg/kg/day	5.E-07
				alpha-Chlordane	0.0061	mg/kg	5.5E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-13	1.3E-11	mg/kg/day	5.0E-04	mg/kg/day	3.E-08
				Aroclor-1254	0.15	mg/kg	4.7E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	9.E-11	1.1E-09	mg/kg/day	2.0E-05	mg/kg/day	5.E-05
				Aroclor-1268	0.14	mg/kg	4.4E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	9.E-11	1.0E-09	mg/kg/day	2.0E-05	mg/kg/day	5.E-05
				gamma-Chlordane	0.0048	mg/kg	4.3E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-13	1.0E-11	mg/kg/day	5.0E-04	mg/kg/day	2.E-08
				Technical Chlordane	0.4	mg/kg	3.6E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-11	8.4E-10	mg/kg/day	5.0E-04	mg/kg/day	2.E-06
				Aluminum	15554	mg/kg	NC		NC			--		1.0E-02	mg/kg/day	
				Antimony	0.73	mg/kg	NC		NC			--		6.0E-05	mg/kg/day	
				Arsenic	9.6	mg/kg	6.4E-10	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-09	1.5E-08	mg/kg/day	3.0E-04	mg/kg/day	5.E-05
				Cadmium	0.81	mg/kg	NC		NC			4.2E-11	mg/kg/day	2.5E-05	mg/kg/day	2.E-06
				Chromium	99.3	mg/kg	NC		NC			--		7.5E-05	mg/kg/day	
				Copper	72.8	mg/kg	NC		NC			--		3.0E-02	mg/kg/day	
				Lead	179	mg/kg	--					--				
				Manganese	599	mg/kg	NC		NC			--		2.8E-03	mg/kg/day	
				Mercury	0.21	mg/kg	NC		NC			--		2.1E-05	mg/kg/day	
				Nickel	142	mg/kg	NC		NC			--		8.0E-04	mg/kg/day	
				Thallium	0.37	mg/kg	NC		NC			--		8.0E-05	mg/kg/day	
				Vanadium	79	mg/kg	NC		NC			--		1.8E-04	mg/kg/day	

TABLE 7.8.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- CENTRAL TENDENCY- CURRENT/FUTURE- RECREATIONAL ANGLER- OLDER CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Toxicity Equivalency (Dioxins/Furans)	0.000121	mg/kg	8.1E-15	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-09	1.9E-13	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.0000249	mg/kg	1.7E-15	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-10	3.9E-14	mg/kg/day			
			EXPOSURE ROUTE TOTAL								8.E-09					2.E-04
		EXPOSURE POINT TOTAL									3.E-08					1.E-03
	EXPOSURE MEDIUM TOTAL										3.E-08					1.E-03
SEDIMENT TOTAL											3.E-08					1.E-03
SURFACE WATER	SURFACE WATER	GREYSTONE MILL POND	INGESTION	Arsenic	0.00055	mg/l	2.2E-11	mg/kg/day	1.5E+00	mg/kg/day	3.E-11	5.0E-10	mg/kg/day	3.0E-04	mg/kg/day	2.E-06
				Manganese	0.131	mg/l	NC		NC			1.2E-07	mg/kg/day	2.4E-02	mg/kg/day	5.E-06
				Mercury	0.00000193	mg/l	NC		NC			1.8E-12	mg/kg/day	3.0E-04	mg/kg/day	6.E-09
				Nitrite-N	0.128	mg/l	NC		NC			1.2E-07	mg/kg/day	1.0E-01	mg/kg/day	1.E-06
				Toxicity Equivalency (Dioxins/Furans)	3.26E-09	mg/l	1.3E-16	mg/kg/day	1.5E+05	mg/kg/day	2.E-11	3.0E-15	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-11					8.E-06
			DERMAL	Arsenic	0.00055	mg/l	5.4E-11	mg/kg/day	1.5E+00	mg/kg/day	8.E-11	1.3E-09	mg/kg/day	3.0E-04	mg/kg/day	4.E-06
				Manganese	0.131	mg/l	NC		NC			3.0E-07	mg/kg/day	9.6E-04	mg/kg/day	3.E-04
				Mercury	0.00000193	mg/l	NC		NC			4.4E-12	mg/kg/day	2.1E-05	mg/kg/day	2.E-07
				Nitrite-N	0.128	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	3.26E-09	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								8.E-11					3.E-04
		EXPOSURE POINT TOTAL									1.E-10					3.E-04
	EXPOSURE MEDIUM TOTAL										1.E-10					3.E-04
SURFACE WATER TOTAL											1.E-10					3.E-04
BIOTA	COMBINED FISH DIET	GREYSTONE MILL POND	INGESTION	Acenaphthylene	0.002	mg/kg	NC		NC			2.5E-07	mg/kg/day	6.0E-02	mg/kg/day	4.E-06
				Benzo(a)pyrene	0.00099	mg/kg	5.3E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-08	1.2E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Benzo(g,h,i)perylene	0.0012	mg/kg	NC		NC			1.5E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Benzo(b)fluoranthene	0.00092	mg/kg	5.0E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-09	1.2E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Dibenzo(a,h)anthracene	0.00057	mg/kg	3.1E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-08	7.2E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Indeno(1,2,3-cd)pyrene	0.00092	mg/kg	5.0E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-09	1.2E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Phenanthrene	0.008	mg/kg	NC		NC			1.0E-06	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				4,4'-DDD	0.013	mg/kg	7.0E-08	mg/kg/day	2.4E-01	(mg/kg/day)-1	2.E-08	1.6E-06	mg/kg/day	5.0E-04	mg/kg/day	3.E-03
				4,4'-DDE	0.0329	mg/kg	1.8E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	6.E-08	4.1E-06	mg/kg/day	5.0E-04	mg/kg/day	8.E-03
				4,4'-DDT	0.003	mg/kg	1.6E-08	mg/kg/day	3.4E-01	(mg/kg/day)-1	5.E-09	3.8E-07	mg/kg/day	5.0E-04	mg/kg/day	8.E-04
				alpha-Chlordane	0.014	mg/kg	7.5E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-08	1.8E-06	mg/kg/day	5.0E-04	mg/kg/day	4.E-03
				Aroclor-1254	0.177	mg/kg	9.5E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-06	2.2E-05	mg/kg/day	2.0E-05	mg/kg/day	1.E+00
				Aroclor-1268	0.0851	mg/kg	4.6E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	9.E-07	1.1E-05	mg/kg/day	2.0E-05	mg/kg/day	5.E-01
				Dieldrin	0.0027	mg/kg	1.5E-08	mg/kg/day	1.6E+01	(mg/kg/day)-1	2.E-07	3.4E-07	mg/kg/day	5.0E-05	mg/kg/day	7.E-03
				gamma-Chlordane	0.006	mg/kg	3.2E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-08	7.5E-07	mg/kg/day	5.0E-04	mg/kg/day	2.E-03
				Heptachlor Epoxide	0.0008	mg/kg	4.3E-09	mg/kg/day	9.1E+00	(mg/kg/day)-1	4.E-08	1.0E-07	mg/kg/day	1.3E-05	mg/kg/day	8.E-03
				Technical Chlordane	0.2056	mg/kg	1.1E-06	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-07	2.6E-05	mg/kg/day	5.0E-04	mg/kg/day	5.E-02
				Lead	0.079	mg/kg	4.3E-07	mg/kg/day				9.9E-06	mg/kg/day			
				Mercury	0.226	mg/kg	NC		NC			2.8E-05	mg/kg/day	3.0E-04	mg/kg/day	9.E-02
				Mercury (methyl)	0.328	mg/kg	NC		NC			4.1E-05	mg/kg/day	1.0E-04	mg/kg/day	4.E-01
				Zinc	22	mg/kg	NC		NC			2.8E-03	mg/kg/day	3.0E-01	mg/kg/day	9.E-03
				Toxicity Equivalency (Dioxins/Furans)	0.00000136	mg/kg	7.3E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-06	1.7E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-06					2.2.E+00
		EXPOSURE POINT TOTAL									5.E-06					2.2.E+00
	EXPOSURE MEDIUM TOTAL										5.E-06					2.2.E+00
COMBINED FISH DIET TOTAL											5.E-06					2.2.E+00
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	5.E-06	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				2.3.E+00

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TABLE 7.10.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- ADULT - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SOIL	SOIL	GREYSTONE MILL POND	INGESTION	2-Methylnaphthalene	0.1071	mg/kg	NC		NC			8.2E-09	mg/kg/day	2.0E-02	mg/kg/day	4 E-07
				Acenaphthylene	0.31765	mg/kg	NC		NC			2.4E-08	mg/kg/day	6.0E-02	mg/kg/day	4 E-07
				Benzo(a)anthracene	3.09372	mg/kg	1.3E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	2.4E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				Benzo(a)pyrene	3.07718	mg/kg	1.3E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-07	2.3E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				Benzo(b)fluoranthene	3.45207	mg/kg	1.5E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	2.6E-07	mg/kg/day	3.0E-02	mg/kg/day	9.E-06
				Benzo(g,h,i)perylene	2.336	mg/kg	NC		NC			1.8E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Dibenzo(a,h)anthracene	0.61485	mg/kg	2.7E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-08	4.7E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Indeno(1,2,3-cd)pyrene	2.51886	mg/kg	1.1E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-09	1.9E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Phenanthrene	3.95543	mg/kg	NC		NC			3.0E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				alpha-Chlordane	0.0178	mg/kg	7.8E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-11	1.4E-09	mg/kg/day	5.0E-04	mg/kg/day	3.E-06
				Aroclor-1254	0.51998	mg/kg	2.3E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	5.E-09	4.0E-08	mg/kg/day	2.0E-05	mg/kg/day	2.E-03
				Aroclor-1268	0.08389	mg/kg	3.7E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	7.E-10	6.4E-09	mg/kg/day	2.0E-05	mg/kg/day	3.E-04
				Endosulfan Sulfate	0.0065	mg/kg	NC		NC			5.0E-10	mg/kg/day	6.0E-03	mg/kg/day	8.E-08
				Technical Chlordane	0.4307	mg/kg	1.9E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	7.E-10	3.3E-08	mg/kg/day	5.0E-04	mg/kg/day	7.E-05
				Aluminum	15899	mg/kg	NC		NC			1.2E-03	mg/kg/day	1.0E+00	mg/kg/day	1.E-03
				Arsenic	7.72	mg/kg	3.4E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	5.E-08	5.9E-07	mg/kg/day	3.0E-04	mg/kg/day	2.E-03
				Chromium	231	mg/kg	NC		NC			1.8E-05	mg/kg/day	3.0E-03	mg/kg/day	6.E-03
				Copper	205	mg/kg	NC		NC			1.6E-05	mg/kg/day	3.0E-02	mg/kg/day	5.E-04
				Lead	450	mg/kg	2.0E-06	mg/kg/day	--			3.4E-05	mg/kg/day			
				Manganese	1841	mg/kg	NC		NC			1.4E-04	mg/kg/day	7.1E-02	mg/kg/day	2.E-03
				Mercury	0.582	mg/kg	NC		NC			4.4E-08	mg/kg/day	3.0E-04	mg/kg/day	1.E-04
				Molybdenum	54	mg/kg	NC		NC			4.1E-06	mg/kg/day	5.0E-03	mg/kg/day	8.E-04
				Nickel	120	mg/kg	NC		NC			9.2E-06	mg/kg/day	2.0E-02	mg/kg/day	5.E-04
				Thallium	0.461	mg/kg	NC		NC			3.5E-08	mg/kg/day	8.0E-05	mg/kg/day	4.E-04
				Vanadium	82.3	mg/kg	NC		NC			6.3E-06	mg/kg/day	7.0E-03	mg/kg/day	9.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.0000549	mg/kg	2.4E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	4.E-08	4.2E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-07					2.E-02
			DERMAL	2-Methylnaphthalene	0.1071	mg/kg	NC		NC			1.2E-09	mg/kg/day	2.0E-02	mg/kg/day	6.E-08
				Acenaphthylene	0.31765	mg/kg	NC		NC			3.6E-09	mg/kg/day	6.0E-02	mg/kg/day	6.E-08
				Benzo(a)anthracene	3.09372	mg/kg	2.0E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-09	3.5E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Benzo(a)pyrene	3.07718	mg/kg	2.0E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-08	3.5E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Benzo(b)fluoranthene	3.45207	mg/kg	2.2E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-09	3.9E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Benzo(g,h,i)perylene	2.336	mg/kg	NC		NC			2.6E-08	mg/kg/day	3.0E-02	mg/kg/day	9.E-07
				Dibenzo(a,h)anthracene	0.61485	mg/kg	4.0E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-09	7.0E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Indeno(1,2,3-cd)pyrene	2.51886	mg/kg	1.6E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-09	2.8E-08	mg/kg/day	3.0E-02	mg/kg/day	9.E-07
				Phenanthrene	3.95543	mg/kg	NC		NC			4.5E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				alpha-Chlordane	0.0178	mg/kg	3.5E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-12	6.2E-11	mg/kg/day	5.0E-04	mg/kg/day	1.E-07
				Aroclor-1254	0.51998	mg/kg	3.6E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	7.E-10	6.3E-09	mg/kg/day	2.0E-05	mg/kg/day	3.E-04
				Aroclor-1268	0.08389	mg/kg	5.8E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-10	1.0E-09	mg/kg/day	2.0E-05	mg/kg/day	5.E-05
				Endosulfan Sulfate	0.0065	mg/kg	NC		NC			5.7E-11	mg/kg/day	6.0E-03	mg/kg/day	9.E-09
				Technical Chlordane	0.4307	mg/kg	8.6E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-11	1.5E-09	mg/kg/day	5.0E-04	mg/kg/day	3.E-06
				Aluminum	15899	mg/kg	NC		NC			--		1.0E-02	mg/kg/day	
				Arsenic	7.72	mg/kg	1.2E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	2.E-09	2.0E-08	mg/kg/day	3.0E-04	mg/kg/day	7.E-05
				Chromium	231	mg/kg	NC		NC			--		7.5E-05	mg/kg/day	
				Copper	205	mg/kg	NC		NC			--		3.0E-02	mg/kg/day	
				Lead	450	mg/kg	--		--			--				
				Manganese	1841	mg/kg	NC		NC			--		2.8E-03	mg/kg/day	
				Mercury	0.582	mg/kg	NC		NC			--		2.1E-05	mg/kg/day	
				Molybdenum	54	mg/kg	NC		NC			--		5.0E-03	mg/kg/day	
				Nickel	120	mg/kg	NC		NC			--		8.0E-04	mg/kg/day	
				Thallium	0.461	mg/kg	NC		NC			--		8.0E-05	mg/kg/day	
				Vanadium	82.3	mg/kg	NC		NC			--		1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.0000549	mg/kg	8.2E-15	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-09	1.4E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-08					4.E-04
		EXPOSURE POINT TOTAL									3.E-07					2.E-02
	EXPOSURE MEDIUM TOTAL										3.E-07					2.E-02
SOIL TOTAL											3.E-07					2.E-02

TABLE 7.10.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- ADULT - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	GREYSTONE MILL POND	INGESTION	2-Methylnaphthalene	0.07478	mg/kg	NC		NC			1.9E-09	mg/kg/day	2.0E-02	mg/kg/day	1.E-07
				Acenaphthylene	0.19279	mg/kg	NC		NC			4.9E-09	mg/kg/day	6.0E-02	mg/kg/day	8.E-08
				Benzo(a)anthracene	1.5	mg/kg	2.2E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-09	3.8E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Benzo(a)pyrene	1.4	mg/kg	2.0E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-08	3.6E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Benzo(b)fluoranthene	1.5	mg/kg	2.2E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-09	3.8E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Benzo(g,h,i)perylene	0.86	mg/kg	NC		NC			2.2E-08	mg/kg/day	3.0E-02	mg/kg/day	7.E-07
				Dibenzo(a,h)anthracene	0.77	mg/kg	1.1E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	8.E-09	2.0E-08	mg/kg/day	3.0E-02	mg/kg/day	7.E-07
				Indeno(1,2,3-cd)pyrene	1	mg/kg	1.5E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-09	2.5E-08	mg/kg/day	3.0E-02	mg/kg/day	8.E-07
				Phenanthrene	2.1	mg/kg	NC		NC			5.3E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				alpha-Chlordane	0.0061	mg/kg	8.9E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-12	1.6E-10	mg/kg/day	5.0E-04	mg/kg/day	3.E-07
				Aroclor-1254	0.15	mg/kg	2.2E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	4.E-10	3.8E-09	mg/kg/day	2.0E-05	mg/kg/day	2.E-04
				Aroclor-1268	0.14	mg/kg	2.0E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	4.E-10	3.6E-09	mg/kg/day	2.0E-05	mg/kg/day	2.E-04
				gamma-Chlordane	0.0048	mg/kg	7.0E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-12	1.2E-10	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				Technical Chlordane	0.4	mg/kg	5.8E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-10	1.0E-08	mg/kg/day	5.0E-04	mg/kg/day	2.E-05
				Aluminum	15554	mg/kg	NC		NC			4.0E-04	mg/kg/day	1.0E+00	mg/kg/day	4.E-04
				Antimony	0.73	mg/kg	NC		NC			1.9E-08	mg/kg/day	4.0E-04	mg/kg/day	5.E-05
				Arsenic	9.6	mg/kg	1.4E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	2.E-08	2.4E-07	mg/kg/day	3.0E-04	mg/kg/day	8.E-04
				Cadmium	0.81	mg/kg	NC		NC			2.1E-08	mg/kg/day	1.0E-03	mg/kg/day	2.E-05
				Chromium	99.3	mg/kg	NC		NC			2.5E-06	mg/kg/day	3.0E-03	mg/kg/day	8.E-04
				Copper	72.8	mg/kg	NC		NC			1.9E-06	mg/kg/day	3.0E-02	mg/kg/day	6.E-05
				Lead	179	mg/kg	2.6E-07	mg/kg/day				4.6E-06	mg/kg/day			
				Manganese	599	mg/kg	NC		NC			1.5E-05	mg/kg/day	7.1E-02	mg/kg/day	2.E-04
				Mercury	0.21	mg/kg	NC		NC			5.3E-09	mg/kg/day	3.0E-04	mg/kg/day	2.E-05
				Nickel	142	mg/kg	NC		NC			3.6E-06	mg/kg/day	2.0E-02	mg/kg/day	2.E-04
				Thallium	0.37	mg/kg	NC		NC			9.4E-09	mg/kg/day	8.0E-05	mg/kg/day	1.E-04
				Vanadium	79	mg/kg	NC		NC			2.0E-06	mg/kg/day	7.0E-03	mg/kg/day	3.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.000121	mg/kg	1.8E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-08	3.1E-12	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.0000249	mg/kg	3.6E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	5.E-09	6.3E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								8.E-08					3.E-03
			DERMAL	2-Methylnaphthalene	0.07478	mg/kg	NC		NC			2.4E-10	mg/kg/day	2.0E-02	mg/kg/day	1.E-08
				Acenaphthylene	0.19279	mg/kg	NC		NC			6.2E-10	mg/kg/day	6.0E-02	mg/kg/day	1.E-08
				Benzo(a)anthracene	1.5	mg/kg	2.8E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-10	4.8E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Benzo(a)pyrene	1.4	mg/kg	2.6E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-09	4.5E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Benzo(b)fluoranthene	1.5	mg/kg	2.8E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-10	4.8E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Benzo(g,h,i)perylene	0.86	mg/kg	NC		NC			2.8E-09	mg/kg/day	3.0E-02	mg/kg/day	9.E-08
				Dibenzo(a,h)anthracene	0.77	mg/kg	1.4E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-09	2.5E-09	mg/kg/day	3.0E-02	mg/kg/day	8.E-08
				Indeno(1,2,3-cd)pyrene	1	mg/kg	1.8E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-10	3.2E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				Phenanthrene	2.1	mg/kg	NC		NC			6.8E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				alpha-Chlordane	0.0061	mg/kg	3.4E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-13	6.0E-12	mg/kg/day	5.0E-04	mg/kg/day	1.E-08
				Aroclor-1254	0.15	mg/kg	3.0E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	6.E-11	5.2E-10	mg/kg/day	2.0E-05	mg/kg/day	3.E-05
				Aroclor-1268	0.14	mg/kg	2.8E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	6.E-11	4.8E-10	mg/kg/day	2.0E-05	mg/kg/day	2.E-05
				gamma-Chlordane	0.0048	mg/kg	2.7E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	9.E-14	4.7E-12	mg/kg/day	5.0E-04	mg/kg/day	9.E-09
				Technical Chlordane	0.4	mg/kg	2.3E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	8.E-12	4.0E-10	mg/kg/day	5.0E-04	mg/kg/day	8.E-07
				Aluminum	15554	mg/kg	NC		NC			--		1.0E-02	mg/kg/day	
				Antimony	0.73	mg/kg	NC		NC			--		6.0E-05	mg/kg/day	
				Arsenic	9.6	mg/kg	4.1E-10	mg/kg/day	1.5E+00	(mg/kg/day)-1	6.E-10	7.1E-09	mg/kg/day	3.0E-04	mg/kg/day	2.E-05
				Cadmium	0.81	mg/kg	NC		NC			2.0E-11	mg/kg/day	2.5E-05	mg/kg/day	8.E-07
				Chromium	99.3	mg/kg	NC		NC			--		7.5E-05	mg/kg/day	
				Copper	72.8	mg/kg	NC		NC			--		3.0E-02	mg/kg/day	
				Lead	179	mg/kg	--					--				
				Manganese	599	mg/kg	NC		NC			--		2.8E-03	mg/kg/day	
				Mercury	0.21	mg/kg	NC		NC			--		2.1E-05	mg/kg/day	
				Nickel	142	mg/kg	NC		NC			--		8.0E-04	mg/kg/day	
				Thallium	0.37	mg/kg	NC		NC			--		8.0E-05	mg/kg/day	
				Vanadium	79	mg/kg	NC		NC			--		1.8E-04	mg/kg/day	

TABLE 7.10.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- ADULT - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Toxicity Equivalency (Dioxins/Furans)	0.000121	mg/kg	5.1E-15	mg/kg/day	1.5E+05	(mg/kg/day)-1	8.E-10	9.0E-14	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.0000249	mg/kg	1.1E-15	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-10	1.8E-14	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-09					8.E-05
		EXPOSURE POINT TOTAL									9.E-08					3.E-03
	EXPOSURE MEDIUM TOTAL										9.E-08					3.E-03
SEDIMENT TOTAL											9.E-08					3.E-03
SURFACE WATER	SURFACE WATER	GREYSTONE MILL POND	INGESTION	Arsenic	0.00055	mg/l	8.0E-10	mg/kg/day	1.5E+00	mg/kg/day	1.E-09	1.4E-08	mg/kg/day	3.0E-04	mg/kg/day	5.E-05
				Manganese	0.131	mg/l	NC		NC			3.3E-06	mg/kg/day	2.4E-02	mg/kg/day	1.E-04
				Mercury	0.00000193	mg/l	NC		NC			4.9E-11	mg/kg/day	3.0E-04	mg/kg/day	2.E-07
				Nitrite-N	0.128	mg/l	NC		NC			3.3E-06	mg/kg/day	1.0E-01	mg/kg/day	3.E-05
				Toxicity Equivalency (Dioxins/Furans)	3.26E-09	mg/l	4.7E-15	mg/kg/day	1.5E+05	mg/kg/day	7.E-10	8.3E-14	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-09					2.E-04
			DERMAL	Arsenic	0.00055	mg/l	3.7E-10	mg/kg/day	1.5E+00	mg/kg/day	5.E-10	6.4E-09	mg/kg/day	3.0E-04	mg/kg/day	2.E-05
				Manganese	0.131	mg/l	NC		NC			1.5E-06	mg/kg/day	9.6E-04	mg/kg/day	2.E-03
				Mercury	0.00000193	mg/l	NC		NC			2.2E-11	mg/kg/day	2.1E-05	mg/kg/day	1.E-06
				Nitrite-N	0.128	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	3.26E-09	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-10					2.E-03
		EXPOSURE POINT TOTAL									2.E-09					2.E-03
	EXPOSURE MEDIUM TOTAL										2.E-09					2.E-03
SURFACE WATER TOTAL											2.E-09					2.E-03
BIOTA	COMBINED FISH DIET	GREYSTONE MILL POND	INGESTION	Acenaphthylene	0.002	mg/kg	NC		NC			2.4E-07	mg/kg/day	6.0E-02	mg/kg/day	4.E-06
				Benzo(a)pyrene	0.00099	mg/kg	6.9E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	5.E-08	1.2E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Benzo(g,h,i)perylene	0.0012	mg/kg	NC		NC			1.5E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Benzo(b)fluoranthene	0.00092	mg/kg	6.4E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	5.E-09	1.1E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Dibenzo(a,h)anthracene	0.00057	mg/kg	4.0E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-08	6.9E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Indeno(1,2,3-cd)pyrene	0.00092	mg/kg	6.4E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	5.E-09	1.1E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Phenanthrene	0.008	mg/kg	NC		NC			9.8E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				4,4'-DDD	0.013	mg/kg	9.1E-08	mg/kg/day	2.4E-01	(mg/kg/day)-1	2.E-08	1.6E-06	mg/kg/day	5.0E-04	mg/kg/day	3.E-03
				4,4'-DDE	0.0329	mg/kg	2.3E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	8.E-08	4.0E-06	mg/kg/day	5.0E-04	mg/kg/day	8.E-03
				4,4'-DDT	0.003	mg/kg	2.1E-08	mg/kg/day	3.4E-01	(mg/kg/day)-1	7.E-09	3.7E-07	mg/kg/day	5.0E-04	mg/kg/day	7.E-04
				alpha-Chlordane	0.014	mg/kg	9.8E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-08	1.7E-06	mg/kg/day	5.0E-04	mg/kg/day	3.E-03
				Aroclor-1254	0.177	mg/kg	1.2E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-06	2.2E-05	mg/kg/day	2.0E-05	mg/kg/day	1.E+00
				Aroclor-1268	0.0851	mg/kg	5.9E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-06	1.0E-05	mg/kg/day	2.0E-05	mg/kg/day	5.E-01
				Dieldrin	0.0027	mg/kg	1.9E-08	mg/kg/day	1.6E+01	(mg/kg/day)-1	3.E-07	3.3E-07	mg/kg/day	5.0E-05	mg/kg/day	7.E-03
				gamma-Chlordane	0.006	mg/kg	4.2E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-08	7.3E-07	mg/kg/day	5.0E-04	mg/kg/day	1.E-03
				Heptachlor Epoxide	0.0008	mg/kg	5.6E-09	mg/kg/day	9.1E+00	(mg/kg/day)-1	5.E-08	9.8E-08	mg/kg/day	1.3E-05	mg/kg/day	8.E-03
				Technical Chlordane	0.2056	mg/kg	1.4E-06	mg/kg/day	3.5E-01	(mg/kg/day)-1	5.E-07	2.5E-05	mg/kg/day	5.0E-04	mg/kg/day	5.E-02
				Lead	0.079	mg/kg	5.5E-07	mg/kg/day				9.6E-06	mg/kg/day			
				Mercury	0.226	mg/kg	NC		NC			2.8E-05	mg/kg/day	3.0E-04	mg/kg/day	9.E-02
				Mercury (methyl)	0.328	mg/kg	NC		NC			4.0E-05	mg/kg/day	1.0E-04	mg/kg/day	4.E-01
				Zinc	22	mg/kg	NC		NC			2.7E-03	mg/kg/day	3.0E-01	mg/kg/day	9.E-03
				Toxicity Equivalency (Dioxins/Furans)	0.00000136	mg/kg	9.5E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-06	1.7E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								6.E-06					2.2.E+00
		EXPOSURE POINT TOTAL									6.E-06					2.2.E+00
	EXPOSURE MEDIUM TOTAL										6.E-06					2.2.E+00
COMBINED FISH DIET TOTAL											6.E-06					2.2.E+00
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	7.E-06	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				2.2.E+00

NOTES
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TABLE 7.11.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS – CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- OLDER CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SOIL	SOIL	GREYSTONE MILL POND	INGESTION	2-Methylnaphthalene	0.1071	mg/kg	NC		NC			1.3E-08	mg/kg/day	2.0E-02	mg/kg/day	6.E-07
				Acenaphthylene	0.31765	mg/kg	NC		NC			3.8E-08	mg/kg/day	6.0E-02	mg/kg/day	6.E-07
				Benzo(a)anthracene	3.09372	mg/kg	1.6E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	3.7E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(a)pyrene	3.07718	mg/kg	1.6E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-07	3.7E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(b)fluoranthene	3.45207	mg/kg	1.8E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	4.1E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(g,h,i)perylene	2.336	mg/kg	NC		NC			2.8E-07	mg/kg/day	3.0E-02	mg/kg/day	9.E-06
				Dibenzo(a,h)anthracene	0.61485	mg/kg	3.1E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-08	7.3E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Indeno(1,2,3-cd)pyrene	2.51886	mg/kg	1.3E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	9.E-09	3.0E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Phenanthrene	3.95543	mg/kg	NC		NC			4.7E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				alpha-Chlordane	0.0178	mg/kg	9.1E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-11	2.1E-09	mg/kg/day	5.0E-04	mg/kg/day	4.E-06
				Aroclor-1254	0.51998	mg/kg	2.6E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	5.E-09	6.2E-08	mg/kg/day	2.0E-05	mg/kg/day	3.E-03
				Aroclor-1268	0.08389	mg/kg	4.3E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	9.E-10	1.0E-08	mg/kg/day	2.0E-05	mg/kg/day	5.E-04
				Endosulfan Sulfate	0.0065	mg/kg	NC		NC			7.7E-10	mg/kg/day	6.0E-03	mg/kg/day	1.E-07
				Technical Chlordane	0.4307	mg/kg	2.2E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	8.E-10	5.1E-08	mg/kg/day	5.0E-04	mg/kg/day	1.E-04
				Aluminum	15899	mg/kg	NC		NC			1.9E-03	mg/kg/day	1.0E+00	mg/kg/day	2.E-03
				Arsenic	7.72	mg/kg	3.9E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	6.E-08	9.2E-07	mg/kg/day	3.0E-04	mg/kg/day	3.E-03
				Chromium	231	mg/kg	NC		NC			2.7E-05	mg/kg/day	3.0E-03	mg/kg/day	9.E-03
				Copper	205	mg/kg	NC		NC			2.4E-05	mg/kg/day	3.0E-02	mg/kg/day	8.E-04
				Lead	450	mg/kg	2.3E-06	mg/kg/day	–			5.3E-05	mg/kg/day			
				Manganese	1841	mg/kg	NC		NC			2.2E-04	mg/kg/day	7.1E-02	mg/kg/day	3.E-03
				Mercury	0.582	mg/kg	NC		NC			6.9E-08	mg/kg/day	3.0E-04	mg/kg/day	2.E-04
				Molybdenum	54	mg/kg	NC		NC			6.4E-06	mg/kg/day	5.0E-03	mg/kg/day	1.E-03
				Nickel	120	mg/kg	NC		NC			1.4E-05	mg/kg/day	2.0E-02	mg/kg/day	7.E-04
				Thallium	0.461	mg/kg	NC		NC			5.5E-08	mg/kg/day	8.0E-05	mg/kg/day	7.E-04
				Vanadium	82.3	mg/kg	NC		NC			9.8E-06	mg/kg/day	7.0E-03	mg/kg/day	1.E-03
				Toxicity Equivalency (Dioxins/Furans)	0.0000549	mg/kg	2.8E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	4.E-08	6.5E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-07					3.E-02
			DERMAL	2-Methylnaphthalene	0.1071	mg/kg	NC		NC			6.3E-09	mg/kg/day	2.0E-02	mg/kg/day	3.E-07
				Acenaphthylene	0.31765	mg/kg	NC		NC			1.9E-08	mg/kg/day	6.0E-02	mg/kg/day	3.E-07
				Benzo(a)anthracene	3.09372	mg/kg	7.9E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-09	1.8E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Benzo(a)pyrene	3.07718	mg/kg	7.8E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	6.E-08	1.8E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Benzo(b)fluoranthene	3.45207	mg/kg	8.8E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-09	2.0E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Benzo(g,h,i)perylene	2.336	mg/kg	NC		NC			1.4E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Dibenzo(a,h)anthracene	0.61485	mg/kg	1.6E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-08	3.6E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Indeno(1,2,3-cd)pyrene	2.51886	mg/kg	6.4E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	5.E-09	1.5E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Phenanthrene	3.95543	mg/kg	NC		NC			2.3E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				alpha-Chlordane	0.0178	mg/kg	1.4E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	5.E-12	3.2E-10	mg/kg/day	5.0E-04	mg/kg/day	6.E-07
				Aroclor-1254	0.51998	mg/kg	1.4E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-09	3.3E-08	mg/kg/day	2.0E-05	mg/kg/day	2.E-03
				Aroclor-1268	0.08389	mg/kg	2.3E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	5.E-10	5.4E-09	mg/kg/day	2.0E-05	mg/kg/day	3.E-04
				Endosulfan Sulfate	0.0065	mg/kg	NC		NC			3.0E-10	mg/kg/day	6.0E-03	mg/kg/day	5.E-08
				Technical Chlordane	0.4307	mg/kg	3.4E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-10	7.9E-09	mg/kg/day	5.0E-04	mg/kg/day	2.E-05
				Aluminum	15899	mg/kg	NC		NC			–		1.0E-02	mg/kg/day	
				Arsenic	7.72	mg/kg	4.5E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	7.E-09	1.1E-07	mg/kg/day	3.0E-04	mg/kg/day	4.E-04
				Chromium	231	mg/kg	NC		NC			–		7.5E-05	mg/kg/day	
				Copper	205	mg/kg	NC		NC			–		3.0E-02	mg/kg/day	
				Lead	450	mg/kg	–		–			–				
				Manganese	1841	mg/kg	NC		NC			–		2.8E-03	mg/kg/day	
				Mercury	0.582	mg/kg	NC		NC			–		2.1E-05	mg/kg/day	
				Molybdenum	54	mg/kg	NC		NC			–		5.0E-03	mg/kg/day	
				Nickel	120	mg/kg	NC		NC			–		8.0E-04	mg/kg/day	
				Thallium	0.461	mg/kg	NC		NC			–		8.0E-05	mg/kg/day	
				Vanadium	82.3	mg/kg	NC		NC			–		1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.0000549	mg/kg	3.2E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	5.E-09	7.5E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-07					2.E-03
		EXPOSURE POINT TOTAL									4.E-07					3.E-02
	EXPOSURE MEDIUM TOTAL										4.E-07					3.E-02
SOIL TOTAL											4.E-07					3.E-02

TABLE 7.11.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- OLDER CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	GREYSTONE MILL POND	INGESTION	2-Methylnaphthalene	0.07478	mg/kg	NC		NC			3.0E-09	mg/kg/day	2.0E-02	mg/kg/day	1.E-07
				Acenaphthylene	0.19279	mg/kg	NC		NC			7.6E-09	mg/kg/day	6.0E-02	mg/kg/day	1.E-07
				Benzo(a)anthracene	1.5	mg/kg	2.5E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-09	5.9E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(a)pyrene	1.4	mg/kg	2.4E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-08	5.5E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(b)fluoranthene	1.5	mg/kg	2.5E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-09	5.9E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(g,h,i)perylene	0.86	mg/kg	NC		NC			3.4E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Dibenzo(a,h)anthracene	0.77	mg/kg	1.3E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-08	3.0E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Indeno(1,2,3-cd)pyrene	1	mg/kg	1.7E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-09	4.0E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Phenanthrene	2.1	mg/kg	NC		NC			8.3E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				alpha-Chlordane	0.0061	mg/kg	1.0E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-12	2.4E-10	mg/kg/day	5.0E-04	mg/kg/day	5.E-07
				Aroclor-1254	0.15	mg/kg	2.5E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	5.E-10	5.9E-09	mg/kg/day	2.0E-05	mg/kg/day	3.E-04
				Aroclor-1268	0.14	mg/kg	2.4E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	5.E-10	5.5E-09	mg/kg/day	2.0E-05	mg/kg/day	3.E-04
				gamma-Chlordane	0.0048	mg/kg	8.1E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-12	1.9E-10	mg/kg/day	5.0E-04	mg/kg/day	4.E-07
				Technical Chlordane	0.4	mg/kg	6.8E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-10	1.6E-08	mg/kg/day	5.0E-04	mg/kg/day	3.E-05
				Aluminum	15554	mg/kg	NC		NC			6.2E-04	mg/kg/day	1.0E+00	mg/kg/day	6.E-04
				Antimony	0.73	mg/kg	NC		NC			2.9E-08	mg/kg/day	4.0E-04	mg/kg/day	7.E-05
				Arsenic	9.6	mg/kg	1.6E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	2.E-08	3.8E-07	mg/kg/day	3.0E-04	mg/kg/day	1.E-03
				Cadmium	0.81	mg/kg	NC		NC			3.2E-08	mg/kg/day	1.0E-03	mg/kg/day	3.E-05
				Chromium	99.3	mg/kg	NC		NC			3.9E-06	mg/kg/day	3.0E-03	mg/kg/day	1.E-03
				Copper	72.8	mg/kg	NC		NC			2.9E-06	mg/kg/day	3.0E-02	mg/kg/day	1.E-04
				Lead	179	mg/kg	3.0E-07	mg/kg/day				7.1E-06	mg/kg/day			
				Manganese	599	mg/kg	NC		NC			2.4E-05	mg/kg/day	7.1E-02	mg/kg/day	3.E-04
				Mercury	0.21	mg/kg	NC		NC			8.3E-09	mg/kg/day	3.0E-04	mg/kg/day	3.E-05
				Nickel	142	mg/kg	NC		NC			5.6E-06	mg/kg/day	2.0E-02	mg/kg/day	3.E-04
				Thallium	0.37	mg/kg	NC		NC			1.5E-08	mg/kg/day	8.0E-05	mg/kg/day	2.E-04
				Vanadium	79	mg/kg	NC		NC			3.1E-06	mg/kg/day	7.0E-03	mg/kg/day	4.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.000121	mg/kg	2.1E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-08	4.8E-12	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.0000249	mg/kg	4.2E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	6.E-09	9.9E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								9.E-08					5.E-03
			DERMAL	2-Methylnaphthalene	0.07478	mg/kg	NC		NC			1.1E-09	mg/kg/day	2.0E-02	mg/kg/day	5.E-08
				Acenaphthylene	0.19279	mg/kg	NC		NC			2.8E-09	mg/kg/day	6.0E-02	mg/kg/day	5.E-08
				Benzo(a)anthracene	1.5	mg/kg	9.5E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-10	2.2E-08	mg/kg/day	3.0E-02	mg/kg/day	7.E-07
				Benzo(a)pyrene	1.4	mg/kg	8.8E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	6.E-09	2.1E-08	mg/kg/day	3.0E-02	mg/kg/day	7.E-07
				Benzo(b)fluoranthene	1.5	mg/kg	9.5E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-10	2.2E-08	mg/kg/day	3.0E-02	mg/kg/day	7.E-07
				Benzo(g,h,i)perylene	0.86	mg/kg	NC		NC			1.3E-08	mg/kg/day	3.0E-02	mg/kg/day	4.E-07
				Dibenzo(a,h)anthracene	0.77	mg/kg	4.9E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-09	1.1E-08	mg/kg/day	3.0E-02	mg/kg/day	4.E-07
				Indeno(1,2,3-cd)pyrene	1	mg/kg	6.3E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	5.E-10	1.5E-08	mg/kg/day	3.0E-02	mg/kg/day	5.E-07
				Phenanthrene	2.1	mg/kg	NC		NC			3.1E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				alpha-Chlordane	0.0061	mg/kg	1.2E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-13	2.8E-11	mg/kg/day	5.0E-04	mg/kg/day	6.E-08
				Aroclor-1254	0.15	mg/kg	1.0E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-10	2.4E-09	mg/kg/day	2.0E-05	mg/kg/day	1.E-04
				Aroclor-1268	0.14	mg/kg	9.5E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-10	2.2E-09	mg/kg/day	2.0E-05	mg/kg/day	1.E-04
				gamma-Chlordane	0.0048	mg/kg	9.3E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-13	2.2E-11	mg/kg/day	5.0E-04	mg/kg/day	4.E-08
				Technical Chlordane	0.4	mg/kg	7.8E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-11	1.8E-09	mg/kg/day	5.0E-04	mg/kg/day	4.E-06
				Aluminum	15554	mg/kg	NC		NC			--		1.0E-02	mg/kg/day	
				Antimony	0.73	mg/kg	NC		NC			--		6.0E-05	mg/kg/day	
				Arsenic	9.6	mg/kg	1.4E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	2.E-09	3.3E-08	mg/kg/day	3.0E-04	mg/kg/day	1.E-04
				Cadmium	0.81	mg/kg	NC		NC			9.2E-11	mg/kg/day	2.5E-05	mg/kg/day	4.E-06
				Chromium	99.3	mg/kg	NC		NC			--		7.5E-05	mg/kg/day	
				Copper	72.8	mg/kg	NC		NC			--		3.0E-02	mg/kg/day	
				Lead	179	mg/kg	--					--				
				Manganese	599	mg/kg	NC		NC			--		2.8E-03	mg/kg/day	
				Mercury	0.21	mg/kg	NC		NC			--		2.1E-05	mg/kg/day	
				Nickel	142	mg/kg	NC		NC			--		8.0E-04	mg/kg/day	
				Thallium	0.37	mg/kg	NC		NC			--		8.0E-05	mg/kg/day	
				Vanadium	79	mg/kg	NC		NC			--		1.8E-04	mg/kg/day	

TABLE 7.11.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS – CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- OLDER CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Toxicity Equivalency (Dioxins/Furans)	0.000121	mg/kg	1.8E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-09	4.1E-13	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.0000249	mg/kg	3.6E-15	mg/kg/day	1.5E+05	(mg/kg/day)-1	5.E-10	8.5E-14	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-08					4.E-04
		EXPOSURE POINT TOTAL									1.E-07					6.E-03
	EXPOSURE MEDIUM TOTAL										1.E-07					6.E-03
SEDIMENT TOTAL											1.E-07					6.E-03
SURFACE WATER	SURFACE WATER	GREYSTONE MILL POND	INGESTION	Arsenic	0.00055	mg/l	9.3E-10	mg/kg/day	1.5E+00	mg/kg/day	1.E-09	2.2E-08	mg/kg/day	3.0E-04	mg/kg/day	7.E-05
				Manganese	0.131	mg/l	NC		NC			5.2E-06	mg/kg/day	2.4E-02	mg/kg/day	2.E-04
				Mercury	0.00000193	mg/l	NC		NC			7.6E-11	mg/kg/day	3.0E-04	mg/kg/day	3.E-07
				Nitrite-N	0.128	mg/l	NC		NC			5.1E-06	mg/kg/day	1.0E-01	mg/kg/day	5.E-05
				Toxicity Equivalency (Dioxins/Furans)	3.26E-09	mg/l	5.5E-15	mg/kg/day	1.5E+05	mg/kg/day	8.E-10	1.3E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-09					3.E-04
			DERMAL	Arsenic	0.00055	mg/l	3.3E-10	mg/kg/day	1.5E+00	mg/kg/day	5.E-10	7.7E-09	mg/kg/day	3.0E-04	mg/kg/day	3.E-05
				Manganese	0.131	mg/l	NC		NC			1.8E-06	mg/kg/day	9.6E-04	mg/kg/day	2.E-03
				Mercury	0.00000193	mg/l	NC		NC			2.7E-11	mg/kg/day	2.1E-05	mg/kg/day	1.E-06
				Nitrite-N	0.128	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	3.26E-09	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-10					2.E-03
		EXPOSURE POINT TOTAL									3.E-09					2.E-03
	EXPOSURE MEDIUM TOTAL										3.E-09					2.E-03
SURFACE WATER TOTAL											3.E-09					2.E-03
BIOTA	COMBINED FISH DIET	GREYSTONE MILL POND	INGESTION	Acenaphthylene	0.002	mg/kg	NC		NC			2.5E-07	mg/kg/day	6.0E-02	mg/kg/day	4.E-06
				Benzo(a)pyrene	0.00099	mg/kg	5.3E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-08	1.2E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Benzo(g,h,i)perylene	0.0012	mg/kg	NC		NC			1.5E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Benzo(b)fluoranthene	0.00092	mg/kg	5.0E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-09	1.2E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Dibenzo(a,h)anthracene	0.00057	mg/kg	3.1E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-08	7.2E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Indeno(1,2,3-cd)pyrene	0.00092	mg/kg	5.0E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-09	1.2E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Phenanthrene	0.008	mg/kg	NC		NC			1.0E-06	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				4,4'-DDD	0.013	mg/kg	7.0E-08	mg/kg/day	2.4E-01	(mg/kg/day)-1	2.E-08	1.6E-06	mg/kg/day	5.0E-04	mg/kg/day	3.E-03
				4,4'-DDE	0.0329	mg/kg	1.8E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	6.E-08	4.1E-06	mg/kg/day	5.0E-04	mg/kg/day	8.E-03
				4,4'-DDT	0.003	mg/kg	1.6E-08	mg/kg/day	3.4E-01	(mg/kg/day)-1	5.E-09	3.8E-07	mg/kg/day	5.0E-04	mg/kg/day	8.E-04
				alpha-Chlordane	0.014	mg/kg	7.5E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-08	1.8E-06	mg/kg/day	5.0E-04	mg/kg/day	4.E-03
				Aroclor-1254	0.177	mg/kg	9.5E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-06	2.2E-05	mg/kg/day	2.0E-05	mg/kg/day	1.E+00
				Aroclor-1268	0.0851	mg/kg	4.6E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	9.E-07	1.1E-05	mg/kg/day	2.0E-05	mg/kg/day	5.E-01
				Dieldrin	0.0027	mg/kg	1.5E-08	mg/kg/day	1.6E+01	(mg/kg/day)-1	2.E-07	3.4E-07	mg/kg/day	5.0E-05	mg/kg/day	7.E-03
				gamma-Chlordane	0.006	mg/kg	3.2E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-08	7.5E-07	mg/kg/day	5.0E-04	mg/kg/day	2.E-03
				Heptachlor Epoxide	0.0008	mg/kg	4.3E-09	mg/kg/day	9.1E+00	(mg/kg/day)-1	4.E-08	1.0E-07	mg/kg/day	1.3E-05	mg/kg/day	8.E-03
				Technical Chlordane	0.2056	mg/kg	1.1E-06	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-07	2.6E-05	mg/kg/day	5.0E-04	mg/kg/day	5.E-02
				Lead	0.079	mg/kg	4.3E-07	mg/kg/day				9.9E-06	mg/kg/day			
				Mercury	0.226	mg/kg	NC		NC			2.8E-05	mg/kg/day	3.0E-04	mg/kg/day	9.E-02
				Mercury (methyl)	0.328	mg/kg	NC		NC			4.1E-05	mg/kg/day	1.0E-04	mg/kg/day	4.E-01
				Zinc	22	mg/kg	NC		NC			2.8E-03	mg/kg/day	3.0E-01	mg/kg/day	9.E-03
				Toxicity Equivalency (Dioxins/Furans)	0.00000136	mg/kg	7.3E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-06	1.7E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-06					2.2.E+00
		EXPOSURE POINT TOTAL									5.E-06					2.2.E+00
	EXPOSURE MEDIUM TOTAL										5.E-06					2.2.E+00
COMBINED FISH DIET TOTAL											5.E-06					2.2.E+00
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	5.E-06				TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA	2.3.E+00

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available

Prepared by: KJA
Checked by: RAR

TABLE 7.12.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS – CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SOIL	SOIL	GREYSTONE MILL POND	INGESTION	2-Methylnaphthalene	0.1071	mg/kg	NC		NC			7.6E-08	mg/kg/day	2.0E-02	mg/kg/day	4.E-06
				Acenaphthylene	0.31765	mg/kg	NC		NC			2.3E-07	mg/kg/day	6.0E-02	mg/kg/day	4.E-06
				Benzo(a)anthracene	3.09372	mg/kg	6.3E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	5.E-08	2.2E-06	mg/kg/day	3.0E-02	mg/kg/day	7.E-05
				Benzo(a)pyrene	3.07718	mg/kg	6.3E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	5.E-07	2.2E-06	mg/kg/day	3.0E-02	mg/kg/day	7.E-05
				Benzo(b)fluoranthene	3.45207	mg/kg	7.0E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	5.E-08	2.5E-06	mg/kg/day	3.0E-02	mg/kg/day	8.E-05
				Benzo(g,h,i)perylene	2.336	mg/kg	NC		NC			1.7E-06	mg/kg/day	3.0E-02	mg/kg/day	6.E-05
				Dibenzo(a,h)anthracene	0.61485	mg/kg	1.3E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	9.E-08	4.4E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Indeno(1,2,3-cd)pyrene	2.51886	mg/kg	5.1E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-08	1.8E-06	mg/kg/day	3.0E-02	mg/kg/day	6.E-05
				Phenanthrene	3.95543	mg/kg	NC		NC			2.8E-06	mg/kg/day	3.0E-02	mg/kg/day	9.E-05
				alpha-Chlordane	0.0178	mg/kg	3.6E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-10	1.3E-08	mg/kg/day	5.0E-04	mg/kg/day	3.E-05
				Aroclor-1254	0.51998	mg/kg	1.1E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-08	3.7E-07	mg/kg/day	2.0E-05	mg/kg/day	2.E-02
				Aroclor-1268	0.08389	mg/kg	1.7E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-09	6.0E-08	mg/kg/day	2.0E-05	mg/kg/day	3.E-03
				Endosulfan Sulfate	0.0065	mg/kg	NC		NC			4.6E-09	mg/kg/day	6.0E-03	mg/kg/day	8.E-07
				Technical Chlordane	0.4307	mg/kg	8.8E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-09	3.1E-07	mg/kg/day	5.0E-04	mg/kg/day	6.E-04
				Aluminum	15899	mg/kg	NC		NC			1.1E-02	mg/kg/day	1.0E+00	mg/kg/day	1.E-02
				Arsenic	7.72	mg/kg	1.6E-07	mg/kg/day	1.5E+00	(mg/kg/day)-1	2.E-07	5.5E-06	mg/kg/day	3.0E-04	mg/kg/day	2.E-02
				Chromium	231	mg/kg	NC		NC			1.6E-04	mg/kg/day	3.0E-03	mg/kg/day	5.E-02
				Copper	205	mg/kg	NC		NC			1.5E-04	mg/kg/day	3.0E-02	mg/kg/day	5.E-03
				Lead	450	mg/kg	9.2E-06	mg/kg/day	–			3.2E-04	mg/kg/day			
				Manganese	1841	mg/kg	NC		NC			1.3E-03	mg/kg/day	7.1E-02	mg/kg/day	2.E-02
				Mercury	0.582	mg/kg	NC		NC			4.1E-07	mg/kg/day	3.0E-04	mg/kg/day	1.E-03
				Molybdenum	54	mg/kg	NC		NC			3.8E-05	mg/kg/day	5.0E-03	mg/kg/day	8.E-03
				Nickel	120	mg/kg	NC		NC			8.5E-05	mg/kg/day	2.0E-02	mg/kg/day	4.E-03
				Thallium	0.461	mg/kg	NC		NC			3.3E-07	mg/kg/day	8.0E-05	mg/kg/day	4.E-03
				Vanadium	82.3	mg/kg	NC		NC			5.9E-05	mg/kg/day	7.0E-03	mg/kg/day	8.E-03
				Toxicity Equivalency (Dioxins/Furans)	0.0000549	mg/kg	1.1E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-07	3.9E-11	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-06					2.E-01
			DERMAL	2-Methylnaphthalene	0.1071	mg/kg	NC		NC			1.1E-08	mg/kg/day	2.0E-02	mg/kg/day	6.E-07
				Acenaphthylene	0.31765	mg/kg	NC		NC			3.3E-08	mg/kg/day	6.0E-02	mg/kg/day	5.E-07
				Benzo(a)anthracene	3.09372	mg/kg	9.2E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-09	3.2E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(a)pyrene	3.07718	mg/kg	9.1E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	7.E-08	3.2E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(b)fluoranthene	3.45207	mg/kg	1.0E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-09	3.6E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(g,h,i)perylene	2.336	mg/kg	NC		NC			2.4E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				Dibenzo(a,h)anthracene	0.61485	mg/kg	1.8E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-08	6.4E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Indeno(1,2,3-cd)pyrene	2.51886	mg/kg	7.5E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	5.E-09	2.6E-07	mg/kg/day	3.0E-02	mg/kg/day	9.E-06
				Phenanthrene	3.95543	mg/kg	NC		NC			4.1E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				alpha-Chlordane	0.0178	mg/kg	1.6E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	6.E-12	5.7E-10	mg/kg/day	5.0E-04	mg/kg/day	1.E-06
				Aroclor-1254	0.51998	mg/kg	1.7E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-09	5.8E-08	mg/kg/day	2.0E-05	mg/kg/day	3.E-03
				Aroclor-1268	0.08389	mg/kg	2.7E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	5.E-10	9.4E-09	mg/kg/day	2.0E-05	mg/kg/day	5.E-04
				Endosulfan Sulfate	0.0065	mg/kg	NC		NC			5.2E-10	mg/kg/day	6.0E-03	mg/kg/day	9.E-08
				Technical Chlordane	0.4307	mg/kg	3.9E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-10	1.4E-08	mg/kg/day	5.0E-04	mg/kg/day	3.E-05
				Aluminum	15899	mg/kg	NC		NC			–		1.0E-02	mg/kg/day	
				Arsenic	7.72	mg/kg	5.3E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	8.E-09	1.8E-07	mg/kg/day	3.0E-04	mg/kg/day	6.E-04
				Chromium	231	mg/kg	NC		NC			–		7.5E-05	mg/kg/day	
				Copper	205	mg/kg	NC		NC			–		3.0E-02	mg/kg/day	
				Lead	450	mg/kg	–		–			–				
				Manganese	1841	mg/kg	NC		NC			–		2.8E-03	mg/kg/day	
				Mercury	0.582	mg/kg	NC		NC			–		2.1E-05	mg/kg/day	
				Molybdenum	54	mg/kg	NC		NC			–		5.0E-03	mg/kg/day	
				Nickel	120	mg/kg	NC		NC			–		8.0E-04	mg/kg/day	
				Thallium	0.461	mg/kg	NC		NC			–		8.0E-05	mg/kg/day	
				Vanadium	82.3	mg/kg	NC		NC			–		1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.0000549	mg/kg	3.8E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	6.E-09	1.3E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-07					4.E-03
		EXPOSURE POINT TOTAL									1.E-06					2.E-01
	EXPOSURE MEDIUM TOTAL										1.E-06					2.E-01
SOIL TOTAL											1.E-06					2.E-01

TABLE 7.12.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS – CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		R/D/R/C (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	GREYSTONE MILL POND	INGESTION	2-Methylnaphthalene	0.07478	mg/kg	NC		NC			3.6E-08	mg/kg/day	2.0E-02	mg/kg/day	2.E-06
				Acenaphthylene	0.19279	mg/kg	NC		NC			9.2E-08	mg/kg/day	6.0E-02	mg/kg/day	2.E-06
				Benzo(a)anthracene	1.5	mg/kg	2.0E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	7.1E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(a)pyrene	1.4	mg/kg	1.9E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-07	6.6E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(b)fluoranthene	1.5	mg/kg	2.0E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	7.1E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(g,h,i)perylene	0.86	mg/kg	NC		NC			4.1E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Dibenzo(a,h)anthracene	0.77	mg/kg	1.0E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	8.E-08	3.7E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Indeno(1,2,3-cd)pyrene	1	mg/kg	1.4E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	4.7E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Phenanthrene	2.1	mg/kg	NC		NC			1.0E-06	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				alpha-Chlordane	0.0061	mg/kg	8.3E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-11	2.9E-09	mg/kg/day	5.0E-04	mg/kg/day	6.E-06
				Aroclor-1254	0.15	mg/kg	2.0E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	4.E-09	7.1E-08	mg/kg/day	2.0E-05	mg/kg/day	4.E-03
				Aroclor-1268	0.14	mg/kg	1.9E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	4.E-09	6.6E-08	mg/kg/day	2.0E-05	mg/kg/day	3.E-03
				gamma-Chlordane	0.0048	mg/kg	6.5E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-11	2.3E-09	mg/kg/day	5.0E-04	mg/kg/day	5.E-06
				Technical Chlordane	0.4	mg/kg	5.4E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-09	1.9E-07	mg/kg/day	5.0E-04	mg/kg/day	4.E-04
				Aluminum	15554	mg/kg	NC		NC			7.4E-03	mg/kg/day	1.0E+00	mg/kg/day	7.E-03
				Antimony	0.73	mg/kg	NC		NC			3.5E-07	mg/kg/day	4.0E-04	mg/kg/day	9.E-04
				Arsenic	9.6	mg/kg	1.3E-07	mg/kg/day	1.5E+00	(mg/kg/day)-1	2.E-07	4.6E-06	mg/kg/day	3.0E-04	mg/kg/day	2.E-02
				Cadmium	0.81	mg/kg	NC		NC			3.8E-07	mg/kg/day	1.0E-03	mg/kg/day	4.E-04
				Chromium	99.3	mg/kg	NC		NC			4.7E-05	mg/kg/day	3.0E-03	mg/kg/day	2.E-02
				Copper	72.8	mg/kg	NC		NC			3.5E-05	mg/kg/day	3.0E-02	mg/kg/day	1.E-03
				Lead	179	mg/kg	2.4E-06	mg/kg/day				8.5E-05	mg/kg/day			
				Manganese	599	mg/kg	NC		NC			2.8E-04	mg/kg/day	7.1E-02	mg/kg/day	4.E-03
				Mercury	0.21	mg/kg	NC		NC			1.0E-07	mg/kg/day	3.0E-04	mg/kg/day	3.E-04
				Nickel	142	mg/kg	NC		NC			6.7E-05	mg/kg/day	2.0E-02	mg/kg/day	3.E-03
				Thallium	0.37	mg/kg	NC		NC			1.8E-07	mg/kg/day	8.0E-05	mg/kg/day	2.E-03
				Vanadium	79	mg/kg	NC		NC			3.8E-05	mg/kg/day	7.0E-03	mg/kg/day	5.E-03
				Toxicity Equivalency (Dioxins/Furans)	0.000121	mg/kg	1.6E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-07	5.7E-11	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.0000249	mg/kg	3.4E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	5.E-08	1.2E-11	mg/kg/day			
			EXPOSURE ROUTE TOTAL								8.E-07					6.E-02
			DERMAL	2-Methylnaphthalene	0.07478	mg/kg	NC		NC			5.2E-09	mg/kg/day	2.0E-02	mg/kg/day	3.E-07
				Acenaphthylene	0.19279	mg/kg	NC		NC			1.3E-08	mg/kg/day	6.0E-02	mg/kg/day	2.E-07
				Benzo(a)anthracene	1.5	mg/kg	3.0E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-09	1.0E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(a)pyrene	1.4	mg/kg	2.8E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-08	9.7E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(b)fluoranthene	1.5	mg/kg	3.0E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-09	1.0E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(g,h,i)perylene	0.86	mg/kg	NC		NC			5.9E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Dibenzo(a,h)anthracene	0.77	mg/kg	1.5E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-08	5.3E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Indeno(1,2,3-cd)pyrene	1	mg/kg	2.0E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-09	6.9E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Phenanthrene	2.1	mg/kg	NC		NC			1.5E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				alpha-Chlordane	0.0061	mg/kg	3.7E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-12	1.3E-10	mg/kg/day	5.0E-04	mg/kg/day	3.E-07
				Aroclor-1254	0.15	mg/kg	3.2E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	6.E-10	1.1E-08	mg/kg/day	2.0E-05	mg/kg/day	6.E-04
				Aroclor-1268	0.14	mg/kg	3.0E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	6.E-10	1.0E-08	mg/kg/day	2.0E-05	mg/kg/day	5.E-04
				gamma-Chlordane	0.0048	mg/kg	2.9E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-12	1.0E-10	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				Technical Chlordane	0.4	mg/kg	2.4E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	9.E-11	8.5E-09	mg/kg/day	5.0E-04	mg/kg/day	2.E-05
				Aluminum	15554	mg/kg	NC		NC			--		1.0E-02	mg/kg/day	
				Antimony	0.73	mg/kg	NC		NC			--		6.0E-05	mg/kg/day	
				Arsenic	9.6	mg/kg	4.4E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	7.E-09	1.5E-07	mg/kg/day	3.0E-04	mg/kg/day	5.E-04
				Cadmium	0.81	mg/kg	NC		NC			4.3E-10	mg/kg/day	2.5E-05	mg/kg/day	2.E-05
				Chromium	99.3	mg/kg	NC		NC			--		7.5E-05	mg/kg/day	
				Copper	72.8	mg/kg	NC		NC			--		3.0E-02	mg/kg/day	
				Lead	179	mg/kg	--					--				
				Manganese	599	mg/kg	NC		NC			--		2.8E-03	mg/kg/day	
				Mercury	0.21	mg/kg	NC		NC			--		2.1E-05	mg/kg/day	
				Nickel	142	mg/kg	NC		NC			--		8.0E-04	mg/kg/day	
				Thallium	0.37	mg/kg	NC		NC			--		8.0E-05	mg/kg/day	
				Vanadium	79	mg/kg	NC		NC			--		1.8E-04	mg/kg/day	

TABLE 7.12.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Toxicity Equivalency (Dioxins/Furans)	0.000121	mg/kg	5.5E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	8.E-09	1.9E-12	mg/kg/day			
				Toxicity Equivalency (PCB Congeners	0.0000249	mg/kg	1.1E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-09	4.0E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-08					2.E-03
		EXPOSURE POINT TOTAL									8.E-07					7.E-02
	EXPOSURE MEDIUM TOTAL										8.E-07					7.E-02
SEDIMENT TOTAL											8.E-07					7.E-02
SURFACE WATER	SURFACE WATER	GREYSTONE MILL POND	INGESTION	Arsenic	0.00055	mg/l	1.9E-09	mg/kg/day	1.5E+00	mg/kg/day	3.E-09	6.5E-08	mg/kg/day	3.0E-04	mg/kg/day	2.E-04
				Manganese	0.131	mg/l	NC		NC			1.6E-05	mg/kg/day	2.4E-02	mg/kg/day	6.E-04
				Mercury	0.00000193	mg/l	NC		NC			2.3E-10	mg/kg/day	3.0E-04	mg/kg/day	8.E-07
				Nitrite-N	0.128	mg/l	NC		NC			1.5E-05	mg/kg/day	1.0E-01	mg/kg/day	2.E-04
				Toxicity Equivalency (Dioxins/Furans)	3.26E-09	mg/l	1.1E-14	mg/kg/day	1.5E+05	mg/kg/day	2.E-09	3.9E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-09					1.E-03
			DERMAL	Arsenic	0.00055	mg/l	2.0E-10	mg/kg/day	1.5E+00	mg/kg/day	3.E-10	7.0E-09	mg/kg/day	3.0E-04	mg/kg/day	2.E-05
				Manganese	0.131	mg/l	NC		NC			1.7E-06	mg/kg/day	9.6E-04	mg/kg/day	2.E-03
				Mercury	0.00000193	mg/l	NC		NC			2.5E-11	mg/kg/day	2.1E-05	mg/kg/day	1.E-06
				Nitrite-N	0.128	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	3.26E-09	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-10					2.E-03
		EXPOSURE POINT TOTAL									5.E-09					3.E-03
	EXPOSURE MEDIUM TOTAL										5.E-09					3.E-03
SURFACE WATER TOTAL											5.E-09					3.E-03
BIOTA	COMBINED FISH DIET	GREYSTONE MILL POND	INGESTION	Acenaphthylene	0.002	mg/kg	NC		NC			3.8E-07	mg/kg/day	6.0E-02	mg/kg/day	6.E-06
				Benzo(a)pyrene	0.00099	mg/kg	5.4E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-08	1.9E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Benzo(g,h,i)perylene	0.0012	mg/kg	NC		NC			2.3E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				Benzo(b)fluoranthene	0.00092	mg/kg	5.0E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-09	1.8E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Dibenzo(a,h)anthracene	0.00057	mg/kg	3.1E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-08	1.1E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Indeno(1,2,3-cd)pyrene	0.00092	mg/kg	5.0E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-09	1.8E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Phenanthrene	0.008	mg/kg	NC		NC			1.5E-06	mg/kg/day	3.0E-02	mg/kg/day	5.E-05
				4,4'-DDD	0.013	mg/kg	7.1E-08	mg/kg/day	2.4E-01	(mg/kg/day)-1	2.E-08	2.5E-06	mg/kg/day	5.0E-04	mg/kg/day	5.E-03
				4,4'-DDE	0.0329	mg/kg	1.8E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	6.E-08	6.3E-06	mg/kg/day	5.0E-04	mg/kg/day	1.E-02
				4,4'-DDT	0.003	mg/kg	1.6E-08	mg/kg/day	3.4E-01	(mg/kg/day)-1	6.E-09	5.8E-07	mg/kg/day	5.0E-04	mg/kg/day	1.E-03
				alpha-Chlordane	0.014	mg/kg	7.7E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-08	2.7E-06	mg/kg/day	5.0E-04	mg/kg/day	5.E-03
				Aroclor-1254	0.177	mg/kg	9.7E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-06	3.4E-05	mg/kg/day	2.0E-05	mg/kg/day	2.E+00
				Aroclor-1268	0.0851	mg/kg	4.7E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	9.E-07	1.6E-05	mg/kg/day	2.0E-05	mg/kg/day	8.E-01
				Dieldrin	0.0027	mg/kg	1.5E-08	mg/kg/day	1.6E+01	(mg/kg/day)-1	2.E-07	5.2E-07	mg/kg/day	5.0E-05	mg/kg/day	1.E-02
				gamma-Chlordane	0.006	mg/kg	3.3E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-08	1.2E-06	mg/kg/day	5.0E-04	mg/kg/day	2.E-03
				Heptachlor Epoxide	0.0008	mg/kg	4.4E-09	mg/kg/day	9.1E+00	(mg/kg/day)-1	4.E-08	1.5E-07	mg/kg/day	1.3E-05	mg/kg/day	1.E-02
				Technical Chlordane	0.2056	mg/kg	1.1E-06	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-07	3.9E-05	mg/kg/day	5.0E-04	mg/kg/day	8.E-02
				Lead	0.079	mg/kg	4.3E-07	mg/kg/day				1.5E-05	mg/kg/day			
				Mercury	0.226	mg/kg	NC		NC			4.3E-05	mg/kg/day	3.0E-04	mg/kg/day	1.E-01
				Mercury (methyl)	0.328	mg/kg	NC		NC			6.3E-05	mg/kg/day	1.0E-04	mg/kg/day	6.E-01
				Zinc	22	mg/kg	NC		NC			4.2E-03	mg/kg/day	3.0E-01	mg/kg/day	1.E-02
				Toxicity Equivalency (Dioxins/Furans)	0.00000136	mg/kg	7.5E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-06	2.6E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-06					3.4 E+00
		EXPOSURE POINT TOTAL									5.E-06					3.4 E+00
	EXPOSURE MEDIUM TOTAL										5.E-06					3.4 E+00
COMBINED FISH DIET TOTAL											5.E-06					3.4.E+00
							TOTAL RECEPTOR RISK ACROSS ALL MEDIA				7.E-06	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				3.7.E+00

NOTES.
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TABLE 7.13.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		R/D/R/C (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SOIL	SOIL	ALLENDALE POND	INGESTION	2,3,7,8-TCDD	0.00027	mg/kg	9.1E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-08	1.6E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-08					--
			DERMAL	2,3,7,8-TCDD	0.00027	mg/kg	6.2E-15	mg/kg/day	1.5E+05	(mg/kg/day)-1	9.E-10	1.1E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								9.E-10					--
		EXPOSURE POINT TOTAL									1.E-08					0.E+00
	EXPOSURE MEDIUM TOTAL										1.E-08					0.E+00
SOIL TOTAL											1.E-08					0.E+00
SEDIMENT	SEDIMENT	ALLENDALE POND	INGESTION	2-Methylnaphthalene	0.13608	mg/kg	NC		NC			8.0E-10	mg/kg/day	2.0E-02	mg/kg/day	4.E-08
				Acenaphthylene	0.97	mg/kg	NC		NC			5.7E-09	mg/kg/day	6.0E-02	mg/kg/day	9.E-08
				Benzo(a)anthracene	3.4	mg/kg	1.1E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-10	2.0E-08	mg/kg/day	3.0E-02	mg/kg/day	7.E-07
				Benzo(a)pyrene	4	mg/kg	1.3E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-08	2.3E-08	mg/kg/day	3.0E-02	mg/kg/day	8.E-07
				Benzo(b)fluoranthene	4.4	mg/kg	1.5E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-09	2.6E-08	mg/kg/day	3.0E-02	mg/kg/day	9.E-07
				Benzo(g,h,i)perylene	2	mg/kg	NC		NC			1.2E-08	mg/kg/day	3.0E-02	mg/kg/day	4.E-07
				Benzo(k)fluoranthene	3.9	mg/kg	1.3E-09	mg/kg/day	7.3E-02	(mg/kg/day)-1	1.E-10	2.3E-08	mg/kg/day	3.0E-02	mg/kg/day	8.E-07
				bis(2-Ethylhexyl)phthalate	3.2	mg/kg	1.1E-09	mg/kg/day	1.4E-02	(mg/kg/day)-1	2.E-11	1.9E-08	mg/kg/day	2.0E-02	mg/kg/day	9.E-07
				Dibenzo(a,h)anthracene	2	mg/kg	6.7E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	5.E-09	1.2E-08	mg/kg/day	3.0E-02	mg/kg/day	4.E-07
				Indeno(1,2,3-cd)pyrene	3.2	mg/kg	1.1E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-10	1.9E-08	mg/kg/day	3.0E-02	mg/kg/day	6.E-07
				Pentachlorophenol	6.5	mg/kg	2.2E-09	mg/kg/day	1.2E-01	(mg/kg/day)-1	3.E-10	3.8E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Phenanthrene	4.8	mg/kg	NC		NC			2.8E-08	mg/kg/day	3.0E-02	mg/kg/day	9.E-07
				alpha-Chlordane	0.0113	mg/kg	3.8E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-12	6.6E-11	mg/kg/day	5.0E-04	mg/kg/day	1.E-07
				Aroclor-1254	2.4	mg/kg	8.1E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-09	1.4E-08	mg/kg/day	2.0E-05	mg/kg/day	7.E-04
				Aroclor-1260	0.2	mg/kg	6.7E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-10	1.2E-09	mg/kg/day	2.0E-05	mg/kg/day	6.E-05
				Aroclor-1268	0.079	mg/kg	2.7E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	5.E-11	4.6E-10	mg/kg/day	2.0E-05	mg/kg/day	2.E-05
				delta-BHC	0.0014	mg/kg	NC		NC			8.2E-12	mg/kg/day	3.0E-04	mg/kg/day	3.E-08
				Dieldrin	0.009	mg/kg	3.0E-12	mg/kg/day	1.6E+01	(mg/kg/day)-1	5.E-11	5.3E-11	mg/kg/day	5.0E-05	mg/kg/day	1.E-06
				Endosulfan II	0.037	mg/kg	NC		NC			2.2E-10	mg/kg/day	6.0E-03	mg/kg/day	4.E-08
				Endosulfan sulfate	0.0027	mg/kg	NC		NC			1.6E-11	mg/kg/day	6.0E-03	mg/kg/day	3.E-09
				Endrin aldehyde	0.0029	mg/kg	NC		NC			1.7E-11	mg/kg/day	3.0E-04	mg/kg/day	6.E-08
				Endrin Ketone	0.0038	mg/kg	NC		NC			2.2E-11	mg/kg/day	3.0E-04	mg/kg/day	7.E-08
				gamma-Chlordane	0.017	mg/kg	5.7E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-12	1.0E-10	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				Technical Chlordane	0.65	mg/kg	2.2E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	8.E-11	3.8E-09	mg/kg/day	5.0E-04	mg/kg/day	8.E-06
				Antimony	4.8	mg/kg	NC		NC			2.8E-08	mg/kg/day	4.0E-04	mg/kg/day	7.E-05
				Arsenic	5.8	mg/kg	1.9E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	3.E-09	3.4E-08	mg/kg/day	3.0E-04	mg/kg/day	1.E-04
				Cadmium	1.2	mg/kg	NC		NC			7.0E-09	mg/kg/day	1.0E-03	mg/kg/day	7.E-06
				Chromium	238	mg/kg	NC		NC			1.4E-06	mg/kg/day	3.0E-03	mg/kg/day	5.E-04
				Lead	488	mg/kg	1.6E-07	mg/kg/day	--			2.9E-06	mg/kg/day			
				Manganese	531	mg/kg	NC		NC			3.1E-06	mg/kg/day	7.1E-02	mg/kg/day	4.E-05
				Mercury	0.97	mg/kg	NC		NC			5.7E-09	mg/kg/day	3.0E-04	mg/kg/day	2.E-05
				Nickel	26.7	mg/kg	NC		NC			1.6E-07	mg/kg/day	2.0E-02	mg/kg/day	8.E-06
				Thallium	6.8	mg/kg	NC		NC			4.0E-08	mg/kg/day	8.0E-05	mg/kg/day	5.E-04
				Vanadium	45.9	mg/kg	NC		NC			2.7E-07	mg/kg/day	7.0E-03	mg/kg/day	4.E-05
				Toxicity Equivalency (Dioxins/Furans)	0.0057	mg/kg	1.9E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-07	3.3E-11	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.000000112	mg/kg	3.8E-17	mg/kg/day	1.5E+05	(mg/kg/day)-1	6.E-12	6.6E-16	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-07					2.E-03
			DERMAL	2-Methylnaphthalene	0.13608	mg/kg	NC		NC			2.0E-10	mg/kg/day	2.0E-02	mg/kg/day	1.E-08
				Acenaphthylene	0.97	mg/kg	NC		NC			1.4E-09	mg/kg/day	6.0E-02	mg/kg/day	2.E-08
				Benzo(a)anthracene	3.4	mg/kg	2.9E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-10	5.0E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Benzo(a)pyrene	4	mg/kg	3.4E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-09	5.9E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Benzo(b)fluoranthene	4.4	mg/kg	3.7E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-10	6.5E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Benzo(g,h,i)perylene	2	mg/kg	NC		NC			3.0E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				Benzo(k)fluoranthene	3.9	mg/kg	3.3E-10	mg/kg/day	7.3E-02	(mg/kg/day)-1	2.E-11	5.8E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				bis(2-Ethylhexyl)phthalate	3.2	mg/kg	2.1E-10	mg/kg/day	1.4E-02	(mg/kg/day)-1	3.E-12	3.7E-09	mg/kg/day	2.0E-02	mg/kg/day	2.E-07
				Dibenzo(a,h)anthracene	2	mg/kg	1.7E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-09	3.0E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				Indeno(1,2,3-cd)pyrene	3.2	mg/kg	2.7E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-10	4.7E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Pentachlorophenol	6.5	mg/kg	1.1E-09	mg/kg/day	1.2E-01	(mg/kg/day)-1	1.E-10	1.9E-08	mg/kg/day	3.0E-02	mg/kg/day	6.E-07
				Phenanthrene	4.8	mg/kg	NC		NC			7.1E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07

TABLE 7.13.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				alpha-Chlordane	0.0113	mg/kg	2.9E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-13	5.2E-12	mg/kg/day	5.0E-04	mg/kg/day	1 E-08
				Aroclor-1254	2.4	mg/kg	2.2E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	4.E-10	3.8E-09	mg/kg/day	2.0E-05	mg/kg/day	2.E-04
				Aroclor-1260	0.2	mg/kg	1.8E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	4.E-11	3.2E-10	mg/kg/day	2 0E-05	mg/kg/day	2 E-05
				Aroclor-1268	0.079	mg/kg	7.2E-12	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-11	1.3E-10	mg/kg/day	2.0E-05	mg/kg/day	6 E-06
				delta-BHC	0.0014	mg/kg	NC		NC			1.6E-12	mg/kg/day	3.0E-04	mg/kg/day	5 E-09
				Dieldrin	0.009	mg/kg	5.9E-13	mg/kg/day	1 6E+01	(mg/kg/day)-1	9.E-12	1.0E-11	mg/kg/day	5.0E-05	mg/kg/day	2 E-07
				Endosulfan II	0.037	mg/kg	NC		NC			4.2E-11	mg/kg/day	6.0E-03	mg/kg/day	7.E-09
				Endosulfan sulfate	0.0027	mg/kg	NC		NC			3.1E-12	mg/kg/day	6.0E-03	mg/kg/day	5 E-10
				Endrin aldehyde	0.0029	mg/kg	NC		NC			3.3E-12	mg/kg/day	3.0E-04	mg/kg/day	1.E-08
				Endrin Ketone	0.0038	mg/kg	NC		NC			4.3E-12	mg/kg/day	3 0E-04	mg/kg/day	1.E-08
				gamma-Chlordane	0.017	mg/kg	4.4E-13	mg/kg/day	3 5E-01	(mg/kg/day)-1	2.E-13	7.8E-12	mg/kg/day	5 0E-04	mg/kg/day	2 E-08
				Technical Chlordane	0.65	mg/kg	1.7E-11	mg/kg/day	3 5E-01	(mg/kg/day)-1	6 E-12	3.0E-10	mg/kg/day	5 0E-04	mg/kg/day	6.E-07
				Antimony	4 8	mg/kg	NC		NC					6.0E-05	mg/kg/day	
				Arsenic	5.8	mg/kg	1 1E-10	mg/kg/day	1.5E+00	(mg/kg/day)-1	2.E-10	2 0E-09	mg/kg/day	3.0E-04	mg/kg/day	7 E-06
				Cadmium	1.2	mg/kg	NC		NC			1.4E-11	mg/kg/day	2.5E-05	mg/kg/day	5 E-07
				Chromium	238	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	488	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	531	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Mercury	0.97	mg/kg	NC		NC					2.1E-05	mg/kg/day	
				Nickel	26.7	mg/kg	NC		NC					8.0E-04	mg/kg/day	
				Thallium	6.8	mg/kg	NC		NC					8.0E-05	mg/kg/day	
				Vanadium	45.9	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.0057	mg/kg	1.1E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-08	2.0E-12	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.000000112	mg/kg	2.2E-18	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-13	3.8E-17	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-08					2.E-04
		EXPOSURE POINT TOTAL									3.E-07					2.E-03
	EXPOSURE MEDIUM TOTAL										3.E-07					2.E-03
SEDIMENT TOTAL											3.E-07					2.E-03
SURFACE WATER	SURFACE WATER	ALLENDALE POND	INGESTION	Tetrachloroethene	0.00055	mg/l	1.8E-11	mg/kg/day	5.4E-01	mg/kg/day	1.E-11	3.2E-10	mg/kg/day	1.0E-02	mg/kg/day	3.E-08
				bis(2-Ethylhexyl)phthalate	0.001	mg/l	3.4E-11	mg/kg/day	1.4E-02	mg/kg/day	5.E-13	5.9E-10	mg/kg/day	2.0E-02	mg/kg/day	3.E-08
				Aldrin	0.000011	mg/l	3.7E-13	mg/kg/day	1.7E+01	mg/kg/day	6.E-12	6.5E-12	mg/kg/day	3.0E-05	mg/kg/day	2.E-07
				alpha-Chlordane	0.00000069	mg/l	2.3E-14	mg/kg/day	3.5E-01	mg/kg/day	8.E-15	4.1E-13	mg/kg/day	5.0E-04	mg/kg/day	8.E-10
				delta-BHC	0.0000096	mg/l	NC		NC			5.6E-12	mg/kg/day	3.0E-04	mg/kg/day	2.E-08
				Endosulfan Sulfate	0.0000026	mg/l	NC		NC			1 5E-12	mg/kg/day	6.0E-03	mg/kg/day	3 E-10
				Endrin Aldehyde	0.0000028	mg/l	NC		NC			1.6E-12	mg/kg/day	3.0E-04	mg/kg/day	5.E-09
				gamma-Chlordane	0 00000075	mg/l	2.5E-14	mg/kg/day	3.5E-01	mg/kg/day	9.E-15	4.4E-13	mg/kg/day	5.0E-04	mg/kg/day	9.E-10
				Arsenic	0.0075	mg/l	2.5E-10	mg/kg/day	1.5E+00	mg/kg/day	4.E-10	4.4E-09	mg/kg/day	3.0E-04	mg/kg/day	1.E-05
				Barium	0.045	mg/l	NC		NC			2.6E-08	mg/kg/day	7 0E-02	mg/kg/day	4.E-07
				Chromium	0.027	mg/l	NC		NC			1.6E-08	mg/kg/day	3.0E-03	mg/kg/day	5.E-06
				Lead	0.013	mg/l	4.4E-10	mg/kg/day	--			7.6E-09	mg/kg/day			
				Manganese	0.42	mg/l	NC		NC			2.5E-07	mg/kg/day	2.4E-02	mg/kg/day	1.E-05
				Mercury	0 00000319	mg/l	NC		NC			1.9E-12	mg/kg/day	3.0E-04	mg/kg/day	6.E-09
				Thallium	0.0032	mg/l	NC		NC			1.9E-09	mg/kg/day	8.0E-05	mg/kg/day	2.E-05
				Nitrate	0.76	mg/l	NC		NC			4.5E-07	mg/kg/day	1 6E+00	mg/kg/day	3.E-07
				Nitrite-N	0.12	mg/l	NC		NC			7.0E-08	mg/kg/day	1.0E-01	mg/kg/day	7.E-07
				Toxicity Equivalency (Dioxins/Furans)	0.000000385	mg/l	1.3E-14	mg/kg/day	1.5E+05	mg/kg/day	2.E-09	2.3E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-09					6.E-05
			DERMAL	Tetrachloroethene	0.00055	mg/l	5.9E-09	mg/kg/day	5.4E-01	mg/kg/day	3.E-09	1.0E-07	mg/kg/day	1.0E-02	mg/kg/day	1.E-05
				bis(2-Ethylhexyl)phthalate	0.001	mg/l	2.8E-08	mg/kg/day	1.4E-02	mg/kg/day	4.E-10	5.0E-07	mg/kg/day	2.0E-02	mg/kg/day	2 E-05
				Aldrin	0.000011	mg/l	1.8E-11	mg/kg/day	1.7E+01	mg/kg/day	3.E-10	3.2E-10	mg/kg/day	3.0E-05	mg/kg/day	1.E-05
				alpha-Chlordane	0.00000069	mg/l	2.6E-11	mg/kg/day	3 5E-01	mg/kg/day	9 E-12	4.6E-10	mg/kg/day	5.0E-04	mg/kg/day	9.E-07
				delta-BHC	0.0000096	mg/l	NC		NC			1.2E-09	mg/kg/day	3.0E-04	mg/kg/day	4.E-06
				Endosulfan Sulfate	0.0000026	mg/l	NC		NC			--		6.0E-03	mg/kg/day	

TABLE 7.13.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		R/D/R/C (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Endrin Aldehyde	0.0000028	mg/l	NC		NC			6.3E-10	mg/kg/day	3.0E-04	mg/kg/day	2.E-06
				gamma-Chlordane	0.00000075	mg/l	2.9E-11	mg/kg/day	3.5E-01	mg/kg/day	1.E-11	5.0E-10	mg/kg/day	5.0E-04	mg/kg/day	1.E-06
				Arsenic	0.0075	mg/l	8.8E-10	mg/kg/day	1.5E+00	mg/kg/day	1.E-09	1.5E-08	mg/kg/day	3.0E-04	mg/kg/day	5.E-05
				Barium	0.045	mg/l	NC		NC			9.2E-08	mg/kg/day	4.9E-03	mg/kg/day	2.E-05
				Chromium	0.027	mg/l	NC		NC			1.1E-07	mg/kg/day	7.5E-05	mg/kg/day	1.E-03
				Lead	0.013	mg/l	--		--			--				
				Manganese	0.42	mg/l	NC		NC			8.6E-07	mg/kg/day	9.6E-04	mg/kg/day	9.E-04
				Mercury	0.00000319	mg/l	NC		NC			6.5E-12	mg/kg/day	2.1E-05	mg/kg/day	3.E-07
				Thallium	0.0032	mg/l	NC		NC			6.5E-09	mg/kg/day	8.0E-05	mg/kg/day	8.E-05
				Nitrate	0.76	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.12	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000000385	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-09					3.E-03
		EXPOSURE POINT TOTAL									8.E-09					3.E-03
	EXPOSURE MEDIUM TOTAL										8.E-09					3.E-03
SURFACE WATER TOTAL											8.E-09					3.E-03
BIOTA	COMBINED FISH DIET	ALLENDALE POND	INGESTION	Acenaphthylene	0.002	mg/kg	NC		NC			2.4E-07	mg/kg/day	6.0E-02	mg/kg/day	4.E-06
				Benzo(a)anthracene	0.0014	mg/kg	9.8E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-09	1.7E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Benzo(a)pyrene	0.0015	mg/kg	1.0E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	8.E-08	1.8E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Benzo(b)fluoranthene	0.0016	mg/kg	1.1E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-09	2.0E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Benzo(g,h,i)perylene	0.00065	mg/kg	NC		NC			7.9E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Dibenzo(a,h)anthracene	0.00053	mg/kg	3.7E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-08	6.5E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Indeno(1,2,3-cd)pyrene	0.00073	mg/kg	5.1E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-09	8.9E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Phenanthrene	0.00975	mg/kg	NC		NC			1.2E-06	mg/kg/day	3.0E-02	mg/kg/day	4.E-05
				4,4'-DDD	0.0128	mg/kg	8.9E-08	mg/kg/day	2.4E-01	(mg/kg/day)-1	2.E-08	1.6E-06	mg/kg/day	5.0E-04	mg/kg/day	3.E-03
				4,4'-DDE	0.0249	mg/kg	1.7E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	6.E-08	3.0E-06	mg/kg/day	5.0E-04	mg/kg/day	6.E-03
				4,4'-DDT	0.00789	mg/kg	5.5E-08	mg/kg/day	3.4E-01	(mg/kg/day)-1	2.E-08	9.6E-07	mg/kg/day	5.0E-04	mg/kg/day	2.E-03
				alpha-Chlordane	0.0214	mg/kg	1.5E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	5.E-08	2.6E-06	mg/kg/day	5.0E-04	mg/kg/day	5.E-03
				Aroclor-1254	1.8853	mg/kg	1.3E-05	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-05	2.3E-04	mg/kg/day	2.0E-05	mg/kg/day	1.E+01
				Aroclor-1268	0.02673	mg/kg	1.9E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	4.E-07	3.3E-06	mg/kg/day	2.0E-05	mg/kg/day	2.E-01
				beta-BHC	0.0005	mg/kg	3.5E-09	mg/kg/day	1.8E+00	(mg/kg/day)-1	6.E-09	6.1E-08	mg/kg/day	3.0E-04	mg/kg/day	2.E-04
				Dieldrin	0.00889	mg/kg	6.2E-08	mg/kg/day	1.6E+01	(mg/kg/day)-1	1.E-06	1.1E-06	mg/kg/day	5.0E-05	mg/kg/day	2.E-02
				Endosulfan Sulfate	0.001	mg/kg	NC		NC			1.2E-07	mg/kg/day	6.0E-03	mg/kg/day	2.E-05
				Endrin Aldehyde	0.0005	mg/kg	NC		NC			6.1E-08	mg/kg/day	3.0E-04	mg/kg/day	2.E-04
				gamma-Chlordane	0.008	mg/kg	5.6E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-08	9.8E-07	mg/kg/day	5.0E-04	mg/kg/day	2.E-03
				Heptachlor	0.000507	mg/kg	3.5E-09	mg/kg/day	4.5E+00	(mg/kg/day)-1	2.E-08	6.2E-08	mg/kg/day	5.0E-04	mg/kg/day	1.E-04
				Heptachlor Epoxide	0.0011	mg/kg	7.7E-09	mg/kg/day	9.1E+00	(mg/kg/day)-1	7.E-08	1.3E-07	mg/kg/day	1.3E-05	mg/kg/day	1.E-02
				Technical Chlordane	0.468	mg/kg	3.3E-06	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-06	5.7E-05	mg/kg/day	5.0E-04	mg/kg/day	1.E-01
				Cadmium	0.064	mg/kg	NC		NC			7.8E-06	mg/kg/day	1.0E-03	mg/kg/day	8.E-03
				Chromium	0.103	mg/kg	NC		NC			1.3E-05	mg/kg/day	3.0E-03	mg/kg/day	4.E-03
				Lead	0.37	mg/kg	2.6E-06	mg/kg/day	--			4.5E-05	mg/kg/day			
				Manganese	6.7	mg/kg	NC		NC			8.2E-04	mg/kg/day	1.4E-01	mg/kg/day	6.E-03
				Mercury	0.144	mg/kg	NC		NC			1.8E-05	mg/kg/day	3.0E-04	mg/kg/day	6.E-02
				Mercury (methyl)	0.208	mg/kg	NC		NC			2.5E-05	mg/kg/day	1.0E-04	mg/kg/day	3.E-01
				Toxicity Equivalency (PCB Congeners)	0.0000275	mg/kg	1.9E-10	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-05	3.4E-09	mg/kg/day			
				Toxicity Equivalency (Dioxins/Furans)	0.000301	mg/kg	2.1E-09	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-04	3.7E-08	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-04					1.2.E+01
		EXPOSURE POINT TOTAL									4.E-04					1.2.E+01
	EXPOSURE MEDIUM TOTAL										4.E-04					1.2.E+01
COMBINED FISH DIET TOTAL											4.E-04					1.2.E+01
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	4.E-04	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				1.2.E+01

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TABLE 7.14.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS – CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SOIL	SOIL	ALLENDALE POND	INGESTION	2,3,7,8-TCDD	0.00027	mg/kg	1.1E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-08	2.5E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-08					--
			DERMAL	2,3,7,8-TCDD	0.00027	mg/kg	2.4E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	4.E-09	5.7E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-09					--
		EXPOSURE POINT TOTAL									2.E-08					0.E+00
	EXPOSURE MEDIUM TOTAL										2.E-08					0.E+00
SOIL TOTAL											2.E-08					0.E+00
SEDIMENT	SEDIMENT	ALLENDALE POND	INGESTION	2-Methylnaphthalene	0.13608	mg/kg	NC		NC			1.2E-09	mg/kg/day	2.0E-02	mg/kg/day	6.E-08
				Acenaphthylene	0.97	mg/kg	NC		NC			8.9E-09	mg/kg/day	6.0E-02	mg/kg/day	1.E-07
				Benzo(a)anthracene	3.4	mg/kg	1.3E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-09	3.1E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Benzo(a)pyrene	4	mg/kg	1.6E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-08	3.7E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Benzo(b)fluoranthene	4.4	mg/kg	1.7E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-09	4.0E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Benzo(g,h,i)perylene	2	mg/kg	NC		NC			1.8E-08	mg/kg/day	3.0E-02	mg/kg/day	6.E-07
				Benzo(k)fluoranthene	3.9	mg/kg	1.5E-09	mg/kg/day	7.3E-02	(mg/kg/day)-1	1.E-10	3.6E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				bis(2-Ethylhexyl)phthalate	3.2	mg/kg	1.3E-09	mg/kg/day	1.4E-02	(mg/kg/day)-1	2.E-11	2.9E-08	mg/kg/day	2.0E-02	mg/kg/day	1.E-06
				Dibenzo(a,h)anthracene	2	mg/kg	7.8E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	6.E-09	1.8E-08	mg/kg/day	3.0E-02	mg/kg/day	6.E-07
				Indeno(1,2,3-cd)pyrene	3.2	mg/kg	1.3E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	9.E-10	2.9E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Pentachlorophenol	6.5	mg/kg	2.5E-09	mg/kg/day	1.2E-01	(mg/kg/day)-1	3.E-10	5.9E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Phenanthrene	4.8	mg/kg	NC		NC			4.4E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				alpha-Chlordane	0.0113	mg/kg	4.4E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-12	1.0E-10	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				Aroclor-1254	2.4	mg/kg	9.4E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-09	2.2E-08	mg/kg/day	2.0E-05	mg/kg/day	1.E-03
				Aroclor-1260	0.2	mg/kg	7.8E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-10	1.8E-09	mg/kg/day	2.0E-05	mg/kg/day	9.E-05
				Aroclor-1268	0.079	mg/kg	3.1E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	6.E-11	7.2E-10	mg/kg/day	2.0E-05	mg/kg/day	4.E-05
				delta-BHC	0.0014	mg/kg	NC		NC			1.3E-11	mg/kg/day	3.0E-04	mg/kg/day	4.E-08
				Dieldrin	0.009	mg/kg	3.5E-12	mg/kg/day	1.6E+01	(mg/kg/day)-1	6.E-11	8.2E-11	mg/kg/day	5.0E-05	mg/kg/day	2.E-06
				Endosulfan II	0.037	mg/kg	NC		NC			3.4E-10	mg/kg/day	6.0E-03	mg/kg/day	6.E-08
				Endosulfan sulfate	0.0027	mg/kg	NC		NC			2.5E-11	mg/kg/day	6.0E-03	mg/kg/day	4.E-09
				Endrin aldehyde	0.0029	mg/kg	NC		NC			2.6E-11	mg/kg/day	3.0E-04	mg/kg/day	9.E-08
				Endrin Ketone	0.0038	mg/kg	NC		NC			3.5E-11	mg/kg/day	3.0E-04	mg/kg/day	1.E-07
				gamma-Chlordane	0.017	mg/kg	6.7E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-12	1.6E-10	mg/kg/day	5.0E-04	mg/kg/day	3.E-07
				Technical Chlordane	0.65	mg/kg	2.5E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	9.E-11	5.9E-09	mg/kg/day	5.0E-04	mg/kg/day	1.E-05
				Antimony	4.8	mg/kg	NC		NC			4.4E-08	mg/kg/day	4.0E-04	mg/kg/day	1.E-04
				Arsenic	5.8	mg/kg	2.3E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	3.E-09	5.3E-08	mg/kg/day	3.0E-04	mg/kg/day	2.E-04
				Cadmium	1.2	mg/kg	NC		NC			1.1E-08	mg/kg/day	1.0E-03	mg/kg/day	1.E-05
				Chromium	238	mg/kg	NC		NC			2.2E-06	mg/kg/day	3.0E-03	mg/kg/day	7.E-04
				Lead	488	mg/kg	1.9E-07	mg/kg/day	--			4.5E-06	mg/kg/day			
				Manganese	531	mg/kg	NC		NC			4.8E-06	mg/kg/day	7.1E-02	mg/kg/day	7.E-05
				Mercury	0.97	mg/kg	NC		NC			8.9E-09	mg/kg/day	3.0E-04	mg/kg/day	3.E-05
				Nickel	26.7	mg/kg	NC		NC			2.4E-07	mg/kg/day	2.0E-02	mg/kg/day	1.E-05
				Thallium	6.8	mg/kg	NC		NC			6.2E-08	mg/kg/day	8.0E-05	mg/kg/day	8.E-04
				Vanadium	45.9	mg/kg	NC		NC			4.2E-07	mg/kg/day	7.0E-03	mg/kg/day	6.E-05
				Toxicity Equivalency (Dioxins/Furans)	0.0057	mg/kg	2.2E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-07	5.2E-11	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.000000112	mg/kg	4.4E-17	mg/kg/day	1.5E+05	(mg/kg/day)-1	7.E-12	1.0E-15	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-07					3.E-03
			DERMAL	2-Methylnaphthalene	0.13608	mg/kg	NC		NC			9.2E-10	mg/kg/day	2.0E-02	mg/kg/day	5.E-08
				Acenaphthylene	0.97	mg/kg	NC		NC			6.6E-09	mg/kg/day	6.0E-02	mg/kg/day	1.E-07
				Benzo(a)anthracene	3.4	mg/kg	9.9E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-10	2.3E-08	mg/kg/day	3.0E-02	mg/kg/day	8.E-07
				Benzo(a)pyrene	4	mg/kg	1.2E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	8.E-09	2.7E-08	mg/kg/day	3.0E-02	mg/kg/day	9.E-07
				Benzo(b)fluoranthene	4.4	mg/kg	1.3E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	9.E-10	3.0E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Benzo(g,h,i)perylene	2	mg/kg	NC		NC			1.4E-08	mg/kg/day	3.0E-02	mg/kg/day	5.E-07
				Benzo(k)fluoranthene	3.9	mg/kg	1.1E-09	mg/kg/day	7.3E-02	(mg/kg/day)-1	8.E-11	2.6E-08	mg/kg/day	3.0E-02	mg/kg/day	9.E-07
				bis(2-Ethylhexyl)phthalate	3.2	mg/kg	7.2E-10	mg/kg/day	1.4E-02	(mg/kg/day)-1	1.E-11	1.7E-08	mg/kg/day	2.0E-02	mg/kg/day	8.E-07
				Dibenzo(a,h)anthracene	2	mg/kg	5.8E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-09	1.4E-08	mg/kg/day	3.0E-02	mg/kg/day	5.E-07
				Indeno(1,2,3-cd)pyrene	3.2	mg/kg	9.3E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-10	2.2E-08	mg/kg/day	3.0E-02	mg/kg/day	7.E-07
				Pentachlorophenol	6.5	mg/kg	3.6E-09	mg/kg/day	1.2E-01	(mg/kg/day)-1	4.E-10	8.5E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Phenanthrene	4.8	mg/kg	NC		NC			3.3E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06

TABLE 7.14.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				alpha-Chlordane	0.0113	mg/kg	1.0E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-13	2.4E-11	mg/kg/day	5.0E-04	mg/kg/day	5.E-08
				Aroclor-1254	2.4	mg/kg	7.5E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-09	1.8E-08	mg/kg/day	2.0E-05	mg/kg/day	9.E-04
				Aroclor-1260	0.2	mg/kg	6.3E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-10	1.5E-09	mg/kg/day	2.0E-05	mg/kg/day	7.E-05
				Aroclor-1268	0.079	mg/kg	2.5E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	5.E-11	5.8E-10	mg/kg/day	2.0E-05	mg/kg/day	3.E-05
				delta-BHC	0.0014	mg/kg	NC		NC			7.3E-12	mg/kg/day	3.0E-04	mg/kg/day	2.E-08
				Dieldrin	0.009	mg/kg	2.0E-12	mg/kg/day	1.6E+01	(mg/kg/day)-1	3.E-11	4.7E-11	mg/kg/day	5.0E-05	mg/kg/day	9.E-07
				Endosulfan II	0.037	mg/kg	NC		NC			1.9E-10	mg/kg/day	6.0E-03	mg/kg/day	3.E-08
				Endosulfan sulfate	0.0027	mg/kg	NC		NC			1.4E-11	mg/kg/day	6.0E-03	mg/kg/day	2.E-09
				Endrin aldehyde	0.0029	mg/kg	NC		NC			1.5E-11	mg/kg/day	3.0E-04	mg/kg/day	5.E-08
				Endrin Ketone	0.0038	mg/kg	NC		NC			2.0E-11	mg/kg/day	3.0E-04	mg/kg/day	7.E-08
				gamma-Chlordane	0.017	mg/kg	1.5E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	5.E-13	3.6E-11	mg/kg/day	5.0E-04	mg/kg/day	7.E-08
				Technical Chlordane	0.65	mg/kg	5.8E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-11	1.4E-09	mg/kg/day	5.0E-04	mg/kg/day	3.E-06
				Antimony	4.8	mg/kg	NC		NC					6.0E-05	mg/kg/day	
				Arsenic	5.8	mg/kg	3.9E-10	mg/kg/day	1.5E+00	(mg/kg/day)-1	6.E-10	9.1E-09	mg/kg/day	3.0E-04	mg/kg/day	3.E-05
				Cadmium	1.2	mg/kg	NC		NC			6.3E-11	mg/kg/day	2.5E-05	mg/kg/day	3.E-06
				Chromium	238	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	488	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	531	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Mercury	0.97	mg/kg	NC		NC					2.1E-05	mg/kg/day	
				Nickel	26.7	mg/kg	NC		NC					8.0E-04	mg/kg/day	
				Thallium	6.8	mg/kg	NC		NC					8.0E-05	mg/kg/day	
				Vanadium	45.9	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.0057	mg/kg	3.8E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	6.E-08	8.9E-12	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.000000112	mg/kg	7.5E-18	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-12	1.8E-16	mg/kg/day			
			EXPOSURE ROUTE TOTAL								8.E-08					1.E-03
		EXPOSURE POINT TOTAL									4.E-07					4.E-03
	EXPOSURE MEDIUM TOTAL										4.E-07					4.E-03
SEDIMENT TOTAL											4.E-07					4.E-03
SURFACE WATER	SURFACE WATER	ALLENDALE POND	INGESTION	Tetrachloroethene	0.00055	mg/l	2.2E-11	mg/kg/day	5.4E-01	mg/kg/day	1.E-11	5.0E-10	mg/kg/day	1.0E-02	mg/kg/day	5.E-08
				bis(2-Ethylhexyl)phthalate	0.001	mg/l	3.9E-11	mg/kg/day	1.4E-02	mg/kg/day	5.E-13	9.1E-10	mg/kg/day	2.0E-02	mg/kg/day	5.E-08
				Aldrin	0.000011	mg/l	4.3E-13	mg/kg/day	1.7E+01	mg/kg/day	7.E-12	1.0E-11	mg/kg/day	3.0E-05	mg/kg/day	3.E-07
				alpha-Chlordane	0.00000069	mg/l	2.7E-14	mg/kg/day	3.5E-01	mg/kg/day	9.E-15	6.3E-13	mg/kg/day	5.0E-04	mg/kg/day	1.E-09
				delta-BHC	0.0000096	mg/l	NC		NC			8.8E-12	mg/kg/day	3.0E-04	mg/kg/day	3.E-08
				Endosulfan Sulfate	0.0000026	mg/l	NC		NC			2.4E-12	mg/kg/day	6.0E-03	mg/kg/day	4.E-10
				Endrin Aldehyde	0.0000028	mg/l	NC		NC			2.6E-12	mg/kg/day	3.0E-04	mg/kg/day	9.E-09
				gamma-Chlordane	0.00000075	mg/l	2.9E-14	mg/kg/day	3.5E-01	mg/kg/day	1.E-14	6.8E-13	mg/kg/day	5.0E-04	mg/kg/day	1.E-09
				Arsenic	0.0075	mg/l	2.9E-10	mg/kg/day	1.5E+00	mg/kg/day	4.E-10	6.8E-09	mg/kg/day	3.0E-04	mg/kg/day	2.E-05
				Barium	0.045	mg/l	NC		NC			4.1E-08	mg/kg/day	7.0E-02	mg/kg/day	6.E-07
				Chromium	0.027	mg/l	NC		NC			2.5E-08	mg/kg/day	3.0E-03	mg/kg/day	8.E-06
				Lead	0.013	mg/l	5.1E-10	mg/kg/day	--			1.2E-08	mg/kg/day			
				Manganese	0.42	mg/l	NC		NC			3.8E-07	mg/kg/day	2.4E-02	mg/kg/day	2.E-05
				Mercury	0.00000319	mg/l	NC		NC			2.9E-12	mg/kg/day	3.0E-04	mg/kg/day	1.E-08
				Thallium	0.0032	mg/l	NC		NC			2.9E-09	mg/kg/day	8.0E-05	mg/kg/day	4.E-05
				Nitrate	0.76	mg/l	NC		NC			6.9E-07	mg/kg/day	1.6E+00	mg/kg/day	4.E-07
				Nitrite-N	0.12	mg/l	NC		NC			1.1E-07	mg/kg/day	1.0E-01	mg/kg/day	1.E-06
				Toxicity Equivalency (Dioxins/Furans)	0.000000385	mg/l	1.5E-14	mg/kg/day	1.5E+05	mg/kg/day	2.E-09	3.5E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-09					9.E-05
			DERMAL	Tetrachloroethene	0.00055	mg/l	5.0E-09	mg/kg/day	5.4E-01	mg/kg/day	3.E-09	1.2E-07	mg/kg/day	1.0E-02	mg/kg/day	1.E-05
				bis(2-Ethylhexyl)phthalate	0.001	mg/l	2.4E-08	mg/kg/day	1.4E-02	mg/kg/day	3.E-10	5.5E-07	mg/kg/day	2.0E-02	mg/kg/day	3.E-05
				Aldrin	0.000011	mg/l	1.5E-11	mg/kg/day	1.7E+01	mg/kg/day	3.E-10	3.5E-10	mg/kg/day	3.0E-05	mg/kg/day	1.E-05
				alpha-Chlordane	0.00000069	mg/l	2.2E-11	mg/kg/day	3.5E-01	mg/kg/day	8.E-12	5.2E-10	mg/kg/day	5.0E-04	mg/kg/day	1.E-06
				delta-BHC	0.0000096	mg/l	NC		NC			1.3E-09	mg/kg/day	3.0E-04	mg/kg/day	4.E-06
				Endosulfan Sulfate	0.0000026	mg/l	NC		NC			--		6.0E-03	mg/kg/day	

TABLE 7.14.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		R/D/R/C (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Endrin Aldehyde	0.0000028	mg/l	NC		NC			7.1E-10	mg/kg/day	3.0E-04	mg/kg/day	2.E-06
				gamma-Chlordane	0.00000075	mg/l	2.4E-11	mg/kg/day	3.5E-01	mg/kg/day	8.E-12	5.6E-10	mg/kg/day	5.0E-04	mg/kg/day	1.E-06
				Arsenic	0.0075	mg/l	7.4E-10	mg/kg/day	1.5E+00	mg/kg/day	1.E-09	1.7E-08	mg/kg/day	3.0E-04	mg/kg/day	6.E-05
				Barium	0.045	mg/l	NC		NC			1.0E-07	mg/kg/day	4.9E-03	mg/kg/day	2.E-05
				Chromium	0.027	mg/l	NC		NC			1.2E-07	mg/kg/day	7.5E-05	mg/kg/day	2.E-03
				Lead	0.013	mg/l	--		--			--				
				Manganese	0.42	mg/l	NC		NC			9.6E-07	mg/kg/day	9.6E-04	mg/kg/day	1.E-03
				Mercury	0.00000319	mg/l	NC		NC			7.3E-12	mg/kg/day	2.1E-05	mg/kg/day	3.E-07
				Thallium	0.0032	mg/l	NC		NC			7.3E-09	mg/kg/day	8.0E-05	mg/kg/day	9.E-05
				Nitrate	0.76	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.12	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000000385	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-09					3.E-03
		EXPOSURE POINT TOTAL									7.E-09					3.E-03
	EXPOSURE MEDIUM TOTAL										7.E-09					3.E-03
SURFACE WATER TOTAL											7.E-09					3.E-03
BIOTA	COMBINED FISH DIET	ALLENDALE POND	INGESTION	Acenaphthylene	0.002	mg/kg	NC		NC			2.5E-07	mg/kg/day	6.0E-02	mg/kg/day	4.E-06
				Benzo(a)anthracene	0.0014	mg/kg	7.5E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-09	1.8E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Benzo(a)pyrene	0.0015	mg/kg	8.1E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	6.E-08	1.9E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Benzo(b)fluoranthene	0.0016	mg/kg	8.6E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-09	2.0E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Benzo(g,h,i)perylene	0.00065	mg/kg	NC		NC			8.2E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Dibenzo(a,h)anthracene	0.00053	mg/kg	2.9E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-08	6.7E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Indeno(1,2,3-cd)pyrene	0.00073	mg/kg	3.9E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-09	9.2E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Phenanthrene	0.00975	mg/kg	NC		NC			1.2E-06	mg/kg/day	3.0E-02	mg/kg/day	4.E-05
				4,4'-DDD	0.0128	mg/kg	6.9E-08	mg/kg/day	2.4E-01	(mg/kg/day)-1	2.E-08	1.6E-06	mg/kg/day	5.0E-04	mg/kg/day	3.E-03
				4,4'-DDE	0.0249	mg/kg	1.3E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	5.E-08	3.1E-06	mg/kg/day	5.0E-04	mg/kg/day	6.E-03
				4,4'-DDT	0.00789	mg/kg	4.3E-08	mg/kg/day	3.4E-01	(mg/kg/day)-1	1.E-08	9.9E-07	mg/kg/day	5.0E-04	mg/kg/day	2.E-03
				alpha-Chlordane	0.0214	mg/kg	1.2E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-08	2.7E-06	mg/kg/day	5.0E-04	mg/kg/day	5.E-03
				Aroclor-1254	1.8853	mg/kg	1.0E-05	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-05	2.4E-04	mg/kg/day	2.0E-05	mg/kg/day	1.E+01
				Aroclor-1268	0.02673	mg/kg	1.4E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-07	3.4E-06	mg/kg/day	2.0E-05	mg/kg/day	2.E-01
				beta-BHC	0.0005	mg/kg	2.7E-09	mg/kg/day	1.8E+00	(mg/kg/day)-1	5.E-09	6.3E-08	mg/kg/day	3.0E-04	mg/kg/day	2.E-04
				Dieldrin	0.00889	mg/kg	4.8E-08	mg/kg/day	1.6E+01	(mg/kg/day)-1	8.E-07	1.1E-06	mg/kg/day	5.0E-05	mg/kg/day	2.E-02
				Endosulfan Sulfate	0.001	mg/kg	NC		NC			1.3E-07	mg/kg/day	6.0E-03	mg/kg/day	2.E-05
				Endrin Aldehyde	0.0005	mg/kg	NC		NC			6.3E-08	mg/kg/day	3.0E-04	mg/kg/day	2.E-04
				gamma-Chlordane	0.008	mg/kg	4.3E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-08	1.0E-06	mg/kg/day	5.0E-04	mg/kg/day	2.E-03
				Heptachlor	0.000507	mg/kg	2.7E-09	mg/kg/day	4.5E+00	(mg/kg/day)-1	1.E-08	6.4E-08	mg/kg/day	5.0E-04	mg/kg/day	1.E-04
				Heptachlor Epoxide	0.0011	mg/kg	5.9E-09	mg/kg/day	9.1E+00	(mg/kg/day)-1	5.E-08	1.4E-07	mg/kg/day	1.3E-05	mg/kg/day	1.E-02
				Technical Chlordane	0.468	mg/kg	2.5E-06	mg/kg/day	3.5E-01	(mg/kg/day)-1	9.E-07	5.9E-05	mg/kg/day	5.0E-04	mg/kg/day	1.E-01
				Cadmium	0.064	mg/kg	NC		NC			8.0E-06	mg/kg/day	1.0E-03	mg/kg/day	8.E-03
				Chromium	0.103	mg/kg	NC		NC			1.3E-05	mg/kg/day	3.0E-03	mg/kg/day	4.E-03
				Lead	0.37	mg/kg	2.0E-06	mg/kg/day	--			4.7E-05	mg/kg/day			
				Manganese	6.7	mg/kg	NC		NC			8.4E-04	mg/kg/day	1.4E-01	mg/kg/day	6.E-03
				Mercury	0.144	mg/kg	NC		NC			1.8E-05	mg/kg/day	3.0E-04	mg/kg/day	6.E-02
				Mercury (methyl)	0.208	mg/kg	NC		NC			2.6E-05	mg/kg/day	1.0E-04	mg/kg/day	3.E-01
				Toxicity Equivalency (PCB Congeners)	0.0000275	mg/kg	1.5E-10	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-05	3.5E-09	mg/kg/day			
				Toxicity Equivalency (Dioxins/Furans)	0.000301	mg/kg	1.6E-09	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-04	3.8E-08	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-04					1.3.E+01
		EXPOSURE POINT TOTAL									3.E-04					1.3.E+01
	EXPOSURE MEDIUM TOTAL										3.E-04					1.3.E+01
COMBINED FISH DIET TOTAL											3.E-04					1.3.E+01
									TOTAL RECEPTOR RISK ACROSS ALL MEDIA		3.E-04	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				1.3.E+01

NOTES
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TABLE 7.16.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS – CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SOIL	SOIL	ALLENDALE POND	INGESTION	2,3,7,8-TCDD	0.00027	mg/kg	1.2E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	2 E-07	2.1E-11	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2 E-07					--
			DERMAL	2,3,7,8-TCDD	0.00027	mg/kg	4.0E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	6.E-09	7.0E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								6.E-09					--
		EXPOSURE POINT TOTAL									2.E-07					0.E+00
	EXPOSURE MEDIUM TOTAL										2.E-07					0.E+00
SOIL TOTAL											2.E-07					0.E+00
SEDIMENT	SEDIMENT	ALLENDALE POND	INGESTION	2-Methylnaphthalene	0.13608	mg/kg	NC		NC			3.5E-09	mg/kg/day	2.0E-02	mg/kg/day	2.E-07
				Acenaphthylene	0.97	mg/kg	NC		NC			2.5E-08	mg/kg/day	6.0E-02	mg/kg/day	4.E-07
				Benzo(a)anthracene	3.4	mg/kg	4.9E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-09	8.6E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(a)pyrene	4	mg/kg	5.8E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-08	1.0E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(b)fluoranthene	4.4	mg/kg	6.4E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	5.E-09	1.1E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Benzo(g,h,i)perylene	2	mg/kg	NC		NC			5.1E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(k)fluoranthene	3.9	mg/kg	5.7E-09	mg/kg/day	7.3E-02	(mg/kg/day)-1	4.E-10	9.9E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				bis(2-Ethylhexyl)phthalate	3.2	mg/kg	4.7E-09	mg/kg/day	1.4E-02	(mg/kg/day)-1	7.E-11	8.1E-08	mg/kg/day	2.0E-02	mg/kg/day	4.E-06
				Dibenzo(a,h)anthracene	2	mg/kg	2.9E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-08	5.1E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Indeno(1,2,3-cd)pyrene	3.2	mg/kg	4.7E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-09	8.1E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Pentachlorophenol	6.5	mg/kg	9.4E-09	mg/kg/day	1.2E-01	(mg/kg/day)-1	1.E-09	1.7E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Phenanthrene	4.8	mg/kg	NC		NC			1.2E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				alpha-Chlordane	0.0113	mg/kg	1.6E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	6.E-12	2.9E-10	mg/kg/day	5.0E-04	mg/kg/day	6.E-07
				Aroclor-1254	2.4	mg/kg	3.5E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	7.E-09	6.1E-08	mg/kg/day	2.0E-05	mg/kg/day	3.E-03
				Aroclor-1260	0.2	mg/kg	2.9E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	6.E-10	5.1E-09	mg/kg/day	2.0E-05	mg/kg/day	3.E-04
				Aroclor-1268	0.079	mg/kg	1.1E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-10	2.0E-09	mg/kg/day	2.0E-05	mg/kg/day	1.E-04
				delta-BHC	0.0014	mg/kg	NC		NC			3.6E-11	mg/kg/day	3.0E-04	mg/kg/day	1.E-07
				Dieldrin	0.009	mg/kg	1.3E-11	mg/kg/day	1.6E+01	(mg/kg/day)-1	2.E-10	2.3E-10	mg/kg/day	5.0E-05	mg/kg/day	5.E-06
				Endosulfan II	0.037	mg/kg	NC		NC			9.4E-10	mg/kg/day	6.0E-03	mg/kg/day	2.E-07
				Endosulfan sulfate	0.0027	mg/kg	NC		NC			6.9E-11	mg/kg/day	6.0E-03	mg/kg/day	1.E-08
				Endrin aldehyde	0.0029	mg/kg	NC		NC			7.4E-11	mg/kg/day	3.0E-04	mg/kg/day	2.E-07
				Endrin Ketone	0.0038	mg/kg	NC		NC			9.7E-11	mg/kg/day	3.0E-04	mg/kg/day	3.E-07
				gamma-Chlordane	0.017	mg/kg	2.5E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	9.E-12	4.3E-10	mg/kg/day	5.0E-04	mg/kg/day	9.E-07
				Technical Chlordane	0.65	mg/kg	9.4E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-10	1.7E-08	mg/kg/day	5.0E-04	mg/kg/day	3.E-05
				Antimony	4.8	mg/kg	NC		NC			1.2E-07	mg/kg/day	4.0E-04	mg/kg/day	3.E-04
				Arsenic	5.8	mg/kg	8.4E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-08	1.5E-07	mg/kg/day	3.0E-04	mg/kg/day	5.E-04
				Cadmium	1.2	mg/kg	NC		NC			3.1E-08	mg/kg/day	1.0E-03	mg/kg/day	3.E-05
				Chromium	238	mg/kg	NC		NC			6.1E-06	mg/kg/day	3.0E-03	mg/kg/day	2.E-03
				Lead	488	mg/kg	7.1E-07	mg/kg/day	--			1.2E-05	mg/kg/day			
				Manganese	531	mg/kg	NC		NC			1.4E-05	mg/kg/day	7.1E-02	mg/kg/day	2.E-04
				Mercury	0.97	mg/kg	NC		NC			2.5E-08	mg/kg/day	3.0E-04	mg/kg/day	8.E-05
				Nickel	26.7	mg/kg	NC		NC			6.8E-07	mg/kg/day	2.0E-02	mg/kg/day	3.E-05
				Thallium	6.8	mg/kg	NC		NC			1.7E-07	mg/kg/day	8.0E-05	mg/kg/day	2.E-03
				Vanadium	45.9	mg/kg	NC		NC			1.2E-06	mg/kg/day	7.0E-03	mg/kg/day	2.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.0057	mg/kg	8.3E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-06	1.5E-10	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.000000112	mg/kg	1.6E-16	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-11	2.8E-15	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-06					9.E-03
			DERMAL	2-Methylnaphthalene	0.13608	mg/kg	NC		NC			4.4E-10	mg/kg/day	2.0E-02	mg/kg/day	2.E-08
				Acenaphthylene	0.97	mg/kg	NC		NC			3.1E-09	mg/kg/day	6.0E-02	mg/kg/day	5.E-08
				Benzo(a)anthracene	3.4	mg/kg	6.2E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	5.E-10	1.1E-08	mg/kg/day	3.0E-02	mg/kg/day	4.E-07
				Benzo(a)pyrene	4	mg/kg	7.3E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	5.E-09	1.3E-08	mg/kg/day	3.0E-02	mg/kg/day	4.E-07
				Benzo(b)fluoranthene	4.4	mg/kg	8.1E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-10	1.4E-08	mg/kg/day	3.0E-02	mg/kg/day	5.E-07
				Benzo(g,h,i)perylene	2	mg/kg	NC		NC			6.4E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Benzo(k)fluoranthene	3.9	mg/kg	7.2E-10	mg/kg/day	7.3E-02	(mg/kg/day)-1	5.E-11	1.3E-08	mg/kg/day	3.0E-02	mg/kg/day	4.E-07
				bis(2-Ethylhexyl)phthalate	3.2	mg/kg	4.5E-10	mg/kg/day	1.4E-02	(mg/kg/day)-1	6.E-12	7.9E-09	mg/kg/day	2.0E-02	mg/kg/day	4.E-07
				Dibenzo(a,h)anthracene	2	mg/kg	3.7E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-09	6.4E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Indeno(1,2,3-cd)pyrene	3.2	mg/kg	5.9E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-10	1.0E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				Pentachlorophenol	6.5	mg/kg	2.3E-09	mg/kg/day	1.2E-01	(mg/kg/day)-1	3.E-10	4.0E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Phenanthrene	4.8	mg/kg	NC		NC			1.5E-08	mg/kg/day	3.0E-02	mg/kg/day	5.E-07

TABLE 7.16.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS – CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				alpha-Chlordane	0.0113	mg/kg	6.4E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-13	1.1E-11	mg/kg/day	5.0E-04	mg/kg/day	2.E-08
				Aroclor-1254	2.4	mg/kg	4.7E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	9.E-10	8.3E-09	mg/kg/day	2.0E-05	mg/kg/day	4.E-04
				Aroclor-1260	0.2	mg/kg	4.0E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	8.E-11	6.9E-10	mg/kg/day	2.0E-05	mg/kg/day	3.E-05
				Aroclor-1268	0.079	mg/kg	1.6E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-11	2.7E-10	mg/kg/day	2.0E-05	mg/kg/day	1.E-05
				delta-BHC	0.0014	mg/kg	NC		NC			3.5E-12	mg/kg/day	3.0E-04	mg/kg/day	1.E-08
				Dieldrin	0.009	mg/kg	1.3E-12	mg/kg/day	1.6E+01	(mg/kg/day)-1	2.E-11	2.2E-11	mg/kg/day	5.0E-05	mg/kg/day	4.E-07
				Endosulfan II	0.037	mg/kg	NC		NC			9.1E-11	mg/kg/day	6.0E-03	mg/kg/day	2.E-08
				Endosulfan sulfate	0.0027	mg/kg	NC		NC			6.7E-12	mg/kg/day	6.0E-03	mg/kg/day	1.E-09
				Endrin aldehyde	0.0029	mg/kg	NC		NC			7.2E-12	mg/kg/day	3.0E-04	mg/kg/day	2.E-08
				Endrin Ketone	0.0038	mg/kg	NC		NC			9.4E-12	mg/kg/day	3.0E-04	mg/kg/day	3.E-08
				gamma-Chlordane	0.017	mg/kg	9.6E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-13	1.7E-11	mg/kg/day	5.0E-04	mg/kg/day	3.E-08
				Technical Chlordane	0.65	mg/kg	3.7E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-11	6.4E-10	mg/kg/day	5.0E-04	mg/kg/day	1.E-06
				Antimony	4.8	mg/kg	NC		NC					6.0E-05	mg/kg/day	
				Arsenic	5.8	mg/kg	2.5E-10	mg/kg/day	1.5E+00	(mg/kg/day)-1	4.E-10	4.3E-09	mg/kg/day	3.0E-04	mg/kg/day	1.E-05
				Cadmium	1.2	mg/kg	NC		NC			3.0E-11	mg/kg/day	2.5E-05	mg/kg/day	1.E-06
				Chromium	238	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	488	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	531	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Mercury	0.97	mg/kg	NC		NC					2.1E-05	mg/kg/day	
				Nickel	26.7	mg/kg	NC		NC					8.0E-04	mg/kg/day	
				Thallium	6.8	mg/kg	NC		NC					8.0E-05	mg/kg/day	
				Vanadium	45.9	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.0057	mg/kg	2.4E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	4.E-08	4.2E-12	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.000000112	mg/kg	4.7E-18	mg/kg/day	1.5E+05	(mg/kg/day)-1	7.E-13	8.3E-17	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-08					5.E-04
		EXPOSURE POINT TOTAL									1.E-06					9.E-03
	EXPOSURE MEDIUM TOTAL										1.E-06					9.E-03
SEDIMENT TOTAL											1.E-06					9.E-03
SURFACE WATER	SURFACE WATER	ALLENDALE POND	INGESTION	Tetrachloroethene	0.00055	mg/l	8.0E-10	mg/kg/day	5.4E-01	mg/kg/day	4.E-10	1.4E-08	mg/kg/day	1.0E-02	mg/kg/day	1.E-06
				bis(2-Ethylhexyl)phthalate	0.001	mg/l	1.5E-09	mg/kg/day	1.4E-02	mg/kg/day	2.E-11	2.5E-08	mg/kg/day	2.0E-02	mg/kg/day	1.E-06
				Aldrin	0.000011	mg/l	1.6E-11	mg/kg/day	1.7E+01	mg/kg/day	3.E-10	2.8E-10	mg/kg/day	3.0E-05	mg/kg/day	9.E-06
				alpha-Chlordane	0.00000069	mg/l	1.0E-12	mg/kg/day	3.5E-01	mg/kg/day	4.E-13	1.8E-11	mg/kg/day	5.0E-04	mg/kg/day	4.E-08
				delta-BHC	0.0000096	mg/l	NC		NC			2.4E-10	mg/kg/day	3.0E-04	mg/kg/day	8.E-07
				Endosulfan Sulfate	0.0000026	mg/l	NC		NC			6.6E-11	mg/kg/day	6.0E-03	mg/kg/day	1.E-08
				Endrin Aldehyde	0.0000028	mg/l	NC		NC			7.1E-11	mg/kg/day	3.0E-04	mg/kg/day	2.E-07
				gamma-Chlordane	0.00000075	mg/l	1.1E-12	mg/kg/day	3.5E-01	mg/kg/day	4.E-13	1.9E-11	mg/kg/day	5.0E-04	mg/kg/day	4.E-08
				Arsenic	0.0075	mg/l	1.1E-08	mg/kg/day	1.5E+00	mg/kg/day	2.E-08	1.9E-07	mg/kg/day	3.0E-04	mg/kg/day	6.E-04
				Barium	0.045	mg/l	NC		NC			1.1E-06	mg/kg/day	7.0E-02	mg/kg/day	2.E-05
				Chromium	0.027	mg/l	NC		NC			6.9E-07	mg/kg/day	3.0E-03	mg/kg/day	2.E-04
				Lead	0.013	mg/l	1.9E-08	mg/kg/day	--			3.3E-07	mg/kg/day			
				Manganese	0.42	mg/l	NC		NC			1.1E-05	mg/kg/day	2.4E-02	mg/kg/day	4.E-04
				Mercury	0.00000319	mg/l	NC		NC			8.1E-11	mg/kg/day	3.0E-04	mg/kg/day	3.E-07
				Thallium	0.0032	mg/l	NC		NC			8.1E-08	mg/kg/day	8.0E-05	mg/kg/day	1.E-03
				Nitrate	0.76	mg/l	NC		NC			1.9E-05	mg/kg/day	1.6E+00	mg/kg/day	1.E-05
				Nitrite-N	0.12	mg/l	NC		NC			3.1E-06	mg/kg/day	1.0E-01	mg/kg/day	3.E-05
				Toxicity Equivalency (Dioxins/Furans)	0.000000385	mg/l	5.6E-13	mg/kg/day	1.5E+05	mg/kg/day	8.E-08	9.8E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-07					2.E-03
			DERMAL	Tetrachloroethene	0.00055	mg/l	3.4E-08	mg/kg/day	5.4E-01	mg/kg/day	2.E-08	5.9E-07	mg/kg/day	1.0E-02	mg/kg/day	6.E-05
				bis(2-Ethylhexyl)phthalate	0.001	mg/l	1.6E-07	mg/kg/day	1.4E-02	mg/kg/day	2.E-09	2.8E-06	mg/kg/day	2.0E-02	mg/kg/day	1.E-04
				Aldrin	0.000011	mg/l	1.0E-10	mg/kg/day	1.7E+01	mg/kg/day	2.E-09	1.8E-09	mg/kg/day	3.0E-05	mg/kg/day	6.E-05
				alpha-Chlordane	0.00000069	mg/l	1.5E-10	mg/kg/day	3.5E-01	mg/kg/day	5.E-11	2.6E-09	mg/kg/day	5.0E-04	mg/kg/day	5.E-06
				delta-BHC	0.0000096	mg/l	NC		NC			6.8E-09	mg/kg/day	3.0E-04	mg/kg/day	2.E-05
				Endosulfan Sulfate	0.0000026	mg/l	NC		NC			--		6.0E-03	mg/kg/day	
				Endrin Aldehyde	0.0000028	mg/l	NC		NC			3.6E-09	mg/kg/day	3.0E-04	mg/kg/day	1.E-05
				gamma-Chlordane	0.00000075	mg/l	1.6E-10	mg/kg/day	3.5E-01	mg/kg/day	6.E-11	2.9E-09	mg/kg/day	5.0E-04	mg/kg/day	6.E-06
				Arsenic	0.0075	mg/l	5.0E-09	mg/kg/day	1.5E+00	mg/kg/day	7.E-09	8.7E-08	mg/kg/day	3.0E-04	mg/kg/day	3.E-04
				Barium	0.045	mg/l	NC		NC			5.2E-07	mg/kg/day	4.9E-03	mg/kg/day	1.E-04

TABLE 7.16.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS – CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Chromium	0.027	mg/l	NC		NC			6.3E-07	mg/kg/day	7.5E-05	mg/kg/day	8 E-03
				Lead	0.013	mg/l	--		--			--				
				Manganese	0.42	mg/l	NC		NC			4 9E-06	mg/kg/day	9 6E-04	mg/kg/day	5 E-03
				Mercury	0.00000319	mg/l	NC		NC			3.7E-11	mg/kg/day	2 1E-05	mg/kg/day	2.E-06
				Thallium	0.0032	mg/l	NC		NC			3.7E-08	mg/kg/day	8 0E-05	mg/kg/day	5 E-04
				Nitrate	3.76	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.12	mg/l	NC		NC			--		1 0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000000385	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0 0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-08					1.E-02
		EXPOSURE POINT TOTAL									1.E-07					2.E-02
	EXPOSURE MEDIUM TOTAL										1 E-07					2 E-02
SURFACE WATER TOTAL											1.E-07					2.E-02
BIOTA	COMBINED FISH DIET	ALLENDALE POND	INGESTION	Acenaphthylene	0.002	mg/kg	NC		NC			2.4E-07	mg/kg/day	6.0E-02	mg/kg/day	4.E-06
				Benzo(a)anthracene	0.0014	mg/kg	9.8E-09	mg/kg/day	7 3E-01	(mg/kg/day)-1	7 E-09	1.7E-07	mg/kg/day	3.0E-02	mg/kg/day	6 E-06
				Benzo(a)pyrene	0.0015	mg/kg	1.0E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	8.E-08	1.8E-07	mg/kg/day	3 0E-02	mg/kg/day	6.E-06
				Benzo(b)fluoranthene	0.0016	mg/kg	1 1E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-09	2.0E-07	mg/kg/day	3 0E-02	mg/kg/day	7.E-06
				Benzo(g,h,i)perylene	0.00065	mg/kg	NC		NC			7 9E-08	mg/kg/day	3 0E-02	mg/kg/day	3.E-06
				Dibenzo(a,h)anthracene	0.00053	mg/kg	3.7E-09	mg/kg/day	7 3E+00	(mg/kg/day)-1	3.E-08	6.5E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Indeno(1,2,3-cd)pyrene	0.00073	mg/kg	5.1E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-09	8.9E-08	mg/kg/day	3 0E-02	mg/kg/day	3 E-06
				Phenanthrene	0.00975	mg/kg	NC		NC			1.2E-06	mg/kg/day	3 0E-02	mg/kg/day	4 E-05
				4,4'-DDD	0.0128	mg/kg	8 9E-08	mg/kg/day	2.4E-01	(mg/kg/day)-1	2.E-08	1.6E-06	mg/kg/day	5 0E-04	mg/kg/day	3.E-03
				4,4'-DDE	0.0249	mg/kg	1.7E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	6.E-08	3.0E-06	mg/kg/day	5.0E-04	mg/kg/day	6.E-03
				4,4'-DDT	0.00789	mg/kg	5 5E-08	mg/kg/day	3 4E-01	(mg/kg/day)-1	2 E-08	9.6E-07	mg/kg/day	5 0E-04	mg/kg/day	2 E-03
				alpha-Chlordane	0.0214	mg/kg	1 5E-07	mg/kg/day	3 5E-01	(mg/kg/day)-1	3.E-08	2.6E-06	mg/kg/day	5.0E-04	mg/kg/day	5 E-03
				Aroclor-1254	1.8853	mg/kg	1 3E-05	mg/kg/day	2.0E+00	(mg/kg/day)-1	3 E-05	2 3E-04	mg/kg/day	2.0E-05	mg/kg/day	1 E+01
				Aroclor-1268	0.02673	mg/kg	1 9E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	4 E-07	3.3E-06	mg/kg/day	2.0E-05	mg/kg/day	2 E-01
				beta-BHC	0.0005	mg/kg	3 5E-09	mg/kg/day	1 8E+00	(mg/kg/day)-1	6.E-09	6.1E-08	mg/kg/day	3.0E-04	mg/kg/day	2 E-04
				Dieldrin	0.00889	mg/kg	6 2E-08	mg/kg/day	1 6E+01	(mg/kg/day)-1	1.E-06	1.1E-06	mg/kg/day	5.0E-05	mg/kg/day	2.E-02
				Endosulfan Sulfate	0.001	mg/kg	NC		NC			1.2E-07	mg/kg/day	6.0E-03	mg/kg/day	2.E-05
				Endrin Aldehyde	0.0005	mg/kg	NC		NC			6 1E-08	mg/kg/day	3.0E-04	mg/kg/day	2 E-04
				gamma-Chlordane	0.008	mg/kg	5.6E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-08	9.8E-07	mg/kg/day	5.0E-04	mg/kg/day	2 E-03
				Heptachlor	0.000507	mg/kg	3.5E-09	mg/kg/day	4 5E+00	(mg/kg/day)-1	2.E-08	6.2E-08	mg/kg/day	5.0E-04	mg/kg/day	1.E-04
				Heptachlor Epoxide	0.0011	mg/kg	7.7E-09	mg/kg/day	9 1E+00	(mg/kg/day)-1	7 E-08	1.3E-07	mg/kg/day	1.3E-05	mg/kg/day	1 E-02
				Technical Chlordane	0.468	mg/kg	3 3E-06	mg/kg/day	3 5E-01	(mg/kg/day)-1	1.E-06	5.7E-05	mg/kg/day	5.0E-04	mg/kg/day	1.E-01
				Cadmium	0 064	mg/kg	NC		NC			7.8E-06	mg/kg/day	1.0E-03	mg/kg/day	8.E-03
				Chromium	0 103	mg/kg	NC		NC			1.3E-05	mg/kg/day	3.0E-03	mg/kg/day	4 E-03
				Lead	0 37	mg/kg	2.6E-06	mg/kg/day	--			4.5E-05	mg/kg/day			
				Manganese	6 7	mg/kg	NC		NC			8 2E-04	mg/kg/day	1 4E-01	mg/kg/day	6.E-03
				Mercury	0.144	mg/kg	NC		NC			1 8E-05	mg/kg/day	3.0E-04	mg/kg/day	6.E-02
				Mercury (methyl)	0.208	mg/kg	NC		NC			2.5E-05	mg/kg/day	1 0E-04	mg/kg/day	3.E-01
				Toxicity Equivalency (PCB Congeners)	0.0000275	mg/kg	1.9E-10	mg/kg/day	1 5E+05	(mg/kg/day)-1	3.E-05	3 4E-09	mg/kg/day			
				Toxicity Equivalency (Dioxins/Furans)	0.000301	mg/kg	2 1E-09	mg/kg/day	1 5E+05	(mg/kg/day)-1	3 E-04	3.7E-08	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4 E-04					1 2 E+01
		EXPOSURE POINT TOTAL									4 E-04					1 2 E+01
	EXPOSURE MEDIUM TOTAL										4 E-04					1 2 E+01
COMBINED FISH DIET TOTAL											4.E-04					1.2.E+01
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	4.E-04	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				1.2.E+01

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment
NC - Not carcinogenic by this exposure route
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TABLE 7.17.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS – CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SOIL	SOIL	ALLENDALE POND	INGESTION	2,3,7,8-TCDD	0.00027	mg/kg	1.4E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-07	3.2E-11	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-07					--
			DERMAL	2,3,7,8-TCDD	0.00027	mg/kg	1.6E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-08	3.7E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-08					--
		EXPOSURE POINT TOTAL									2.E-07					0.E+00
	EXPOSURE MEDIUM TOTAL										2.E-07					0.E+00
SOIL TOTAL											2.E-07					0.E+00
SEDIMENT	SEDIMENT	ALLENDALE POND	INGESTION	2-Methylnaphthalene	0.13608	mg/kg	NC		NC			5.4E-09	mg/kg/day	2.0E-02	mg/kg/day	3.E-07
				Acenaphthylene	0.97	mg/kg	NC		NC			3.8E-08	mg/kg/day	6.0E-02	mg/kg/day	6.E-07
				Benzo(a)anthracene	3.4	mg/kg	5.8E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-09	1.3E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Benzo(a)pyrene	4	mg/kg	6.8E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	5.E-08	1.6E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Benzo(b)fluoranthene	4.4	mg/kg	7.5E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	5.E-09	1.7E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Benzo(g,h,i)perylene	2	mg/kg	NC		NC			7.9E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(k)fluoranthene	3.9	mg/kg	6.6E-09	mg/kg/day	7.3E-02	(mg/kg/day)-1	5.E-10	1.5E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				bis(2-Ethylhexyl)phthalate	3.2	mg/kg	5.4E-09	mg/kg/day	1.4E-02	(mg/kg/day)-1	8.E-11	1.3E-07	mg/kg/day	2.0E-02	mg/kg/day	6.E-06
				Dibenzo(a,h)anthracene	2	mg/kg	3.4E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-08	7.9E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Indeno(1,2,3-cd)pyrene	3.2	mg/kg	5.4E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-09	1.3E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Pentachlorophenol	6.5	mg/kg	1.1E-08	mg/kg/day	1.2E-01	(mg/kg/day)-1	1.E-09	2.6E-07	mg/kg/day	3.0E-02	mg/kg/day	9.E-06
				Phenanthrene	4.8	mg/kg	NC		NC			1.9E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				alpha-Chlordane	0.0113	mg/kg	1.9E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	7.E-12	4.5E-10	mg/kg/day	5.0E-04	mg/kg/day	9.E-07
				Aroclor-1254	2.4	mg/kg	4.1E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	8.E-09	9.5E-08	mg/kg/day	2.0E-05	mg/kg/day	5.E-03
				Aroclor-1260	0.2	mg/kg	3.4E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	7.E-10	7.9E-09	mg/kg/day	2.0E-05	mg/kg/day	4.E-04
				Aroclor-1268	0.079	mg/kg	1.3E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-10	3.1E-09	mg/kg/day	2.0E-05	mg/kg/day	2.E-04
				delta-BHC	0.0014	mg/kg	NC		NC			5.5E-11	mg/kg/day	3.0E-04	mg/kg/day	2.E-07
				Dieldrin	0.009	mg/kg	1.5E-11	mg/kg/day	1.6E+01	(mg/kg/day)-1	2.E-10	3.6E-10	mg/kg/day	5.0E-05	mg/kg/day	7.E-06
				Endosulfan II	0.037	mg/kg	NC		NC			1.5E-09	mg/kg/day	6.0E-03	mg/kg/day	2.E-07
				Endosulfan sulfate	0.0027	mg/kg	NC		NC			1.1E-10	mg/kg/day	6.0E-03	mg/kg/day	2.E-08
				Endrin aldehyde	0.0029	mg/kg	NC		NC			1.1E-10	mg/kg/day	3.0E-04	mg/kg/day	4.E-07
				Endrin Ketone	0.0038	mg/kg	NC		NC			1.5E-10	mg/kg/day	3.0E-04	mg/kg/day	5.E-07
				gamma-Chlordane	0.017	mg/kg	2.9E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-11	6.7E-10	mg/kg/day	5.0E-04	mg/kg/day	1.E-06
				Technical Chlordane	0.65	mg/kg	1.1E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-10	2.6E-08	mg/kg/day	5.0E-04	mg/kg/day	5.E-05
				Antimony	4.8	mg/kg	NC		NC			1.9E-07	mg/kg/day	4.0E-04	mg/kg/day	5.E-04
				Arsenic	5.8	mg/kg	9.8E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-08	2.3E-07	mg/kg/day	3.0E-04	mg/kg/day	8.E-04
				Cadmium	1.2	mg/kg	NC		NC			4.7E-08	mg/kg/day	1.0E-03	mg/kg/day	5.E-05
				Chromium	238	mg/kg	NC		NC			9.4E-06	mg/kg/day	3.0E-03	mg/kg/day	3.E-03
				Lead	488	mg/kg	8.3E-07	mg/kg/day	--			1.9E-05	mg/kg/day			
				Manganese	531	mg/kg	NC		NC			2.1E-05	mg/kg/day	7.1E-02	mg/kg/day	3.E-04
				Mercury	0.97	mg/kg	NC		NC			3.8E-08	mg/kg/day	3.0E-04	mg/kg/day	1.E-04
				Nickel	26.7	mg/kg	NC		NC			1.1E-06	mg/kg/day	2.0E-02	mg/kg/day	5.E-05
				Thallium	6.8	mg/kg	NC		NC			2.7E-07	mg/kg/day	8.0E-05	mg/kg/day	3.E-03
				Vanadium	45.9	mg/kg	NC		NC			1.8E-06	mg/kg/day	7.0E-03	mg/kg/day	3.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.0057	mg/kg	9.7E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-06	2.3E-10	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.000000112	mg/kg	1.9E-16	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-11	4.4E-15	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-06					1.E-02
			DERMAL	2-Methylnaphthalene	0.13608	mg/kg	NC		NC			2.0E-09	mg/kg/day	2.0E-02	mg/kg/day	1.E-07
				Acenaphthylene	0.97	mg/kg	NC		NC			1.4E-08	mg/kg/day	6.0E-02	mg/kg/day	2.E-07
				Benzo(a)anthracene	3.4	mg/kg	2.1E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-09	5.0E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(a)pyrene	4	mg/kg	2.5E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-08	5.9E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(b)fluoranthene	4.4	mg/kg	2.8E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-09	6.5E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(g,h,i)perylene	2	mg/kg	NC		NC			2.9E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Benzo(k)fluoranthene	3.9	mg/kg	2.5E-09	mg/kg/day	7.3E-02	(mg/kg/day)-1	2.E-10	5.7E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				bis(2-Ethylhexyl)phthalate	3.2	mg/kg	1.6E-09	mg/kg/day	1.4E-02	(mg/kg/day)-1	2.E-11	3.6E-08	mg/kg/day	2.0E-02	mg/kg/day	2.E-06
				Dibenzo(a,h)anthracene	2	mg/kg	1.3E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	9.E-09	2.9E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Indeno(1,2,3-cd)pyrene	3.2	mg/kg	2.0E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-09	4.7E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Pentachlorophenol	6.5	mg/kg	7.9E-09	mg/kg/day	1.2E-01	(mg/kg/day)-1	9.E-10	1.8E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Phenanthrene	4.8	mg/kg	NC		NC			7.1E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06

TABLE 7.17.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				alpha-Chlordane	0.0113	mg/kg	2.2E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	8.E-13	5.1E-11	mg/kg/day	5.0E-04	mg/kg/day	1 E-07
				Aroclor-1254	2.4	mg/kg	1.6E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-09	3.8E-08	mg/kg/day	2.0E-05	mg/kg/day	2 E-03
				Aroclor-1260	0.2	mg/kg	1.4E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-10	3.2E-09	mg/kg/day	2 0E-05	mg/kg/day	2.E-04
				Aroclor-1268	0.079	mg/kg	5 4E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-10	1.3E-09	mg/kg/day	2.0E-05	mg/kg/day	6.E-05
				delta-BHC	0.0014	mg/kg	NC		NC			1.6E-11	mg/kg/day	3.0E-04	mg/kg/day	5.E-08
				Dieldrin	0 009	mg/kg	4 4E-12	mg/kg/day	1 6E+01	(mg/kg/day)-1	7.E-11	1.0E-10	mg/kg/day	5.0E-05	mg/kg/day	2.E-06
				Endosulfan II	0.037	mg/kg	NC		NC			4.2E-10	mg/kg/day	6.0E-03	mg/kg/day	7.E-08
				Endosulfan sulfate	0 0027	mg/kg	NC		NC			3.1E-11	mg/kg/day	6.0E-03	mg/kg/day	5 E-09
				Endrin aldehyde	0.0029	mg/kg	NC		NC			3.3E-11	mg/kg/day	3.0E-04	mg/kg/day	1.E-07
				Endrin Ketone	0.0038	mg/kg	NC		NC			4.3E-11	mg/kg/day	3.0E-04	mg/kg/day	1.E-07
				gamma-Chlordane	0.017	mg/kg	3.3E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-12	7.7E-11	mg/kg/day	5 0E-04	mg/kg/day	2 E-07
				Technical Chlordane	0.65	mg/kg	1.3E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-11	2.9E-09	mg/kg/day	5.0E-04	mg/kg/day	6.E-06
				Antimony	4.8	mg/kg	NC		NC					6.0E-05	mg/kg/day	
				Arsenic	5.8	mg/kg	8.4E-10	mg/kg/day	1.5E+00	(mg/kg/day)-1	1 E-09	2.0E-08	mg/kg/day	3.0E-04	mg/kg/day	7.E-05
				Cadmium	1.2	mg/kg	NC		NC			1.4E-10	mg/kg/day	2.5E-05	mg/kg/day	5 E-06
				Chromium	238	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	488	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	531	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Mercury	0.97	mg/kg	NC		NC					2.1E-05	mg/kg/day	
				Nickel	26.7	mg/kg	NC		NC					8.0E-04	mg/kg/day	
				Thallium	6.8	mg/kg	NC		NC					8.0E-05	mg/kg/day	
				Vanadium	45.9	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.0057	mg/kg	8.3E-13	mg/kg/day	1 5E+05	(mg/kg/day)-1	1.E-07	1.9E-11	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0 000000112	mg/kg	1.6E-17	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-12	3 8E-16	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2 E-07					2.E-03
		EXPOSURE POINT TOTAL									2 E-06					2.E-02
	EXPOSURE MEDIUM TOTAL										2 E-06					2.E-02
SEDIMENT TOTAL											2.E-06					2.E-02
SURFACE WATER	SURFACE WATER	ALLENDALE POND	INGESTION	Tetrachloroethene	0.00055	mg/l	9 3E-10	mg/kg/day	5.4E-01	mg/kg/day	5.E-10	2.2E-08	mg/kg/day	1.0E-02	mg/kg/day	2.E-06
				bis(2-Ethylhexyl)phthalate	0.001	mg/l	1 7E-09	mg/kg/day	1.4E-02	mg/kg/day	2.E-11	4.0E-08	mg/kg/day	2 0E-02	mg/kg/day	2.E-06
				Aldrin	0 000011	mg/l	1.9E-11	mg/kg/day	1 7E+01	mg/kg/day	3.E-10	4.4E-10	mg/kg/day	3.0E-05	mg/kg/day	1.E-05
				alpha-Chlordane	0 00000069	mg/l	1.2E-12	mg/kg/day	3.5E-01	mg/kg/day	4.E-13	2.7E-11	mg/kg/day	5 0E-04	mg/kg/day	5.E-08
				delta-BHC	0.0000096	mg/l	NC		NC			3.8E-10	mg/kg/day	3.0E-04	mg/kg/day	1.E-06
				Endosulfan Sulfate	0.0000026	mg/l	NC		NC			1 0E-10	mg/kg/day	6.0E-03	mg/kg/day	2.E-08
				Endrin Aldehyde	0.0000028	mg/l	NC		NC			1 1E-10	mg/kg/day	3.0E-04	mg/kg/day	4 E-07
				gamma-Chlordane	0.00000075	mg/l	1.3E-12	mg/kg/day	3.5E-01	mg/kg/day	4.E-13	3.0E-11	mg/kg/day	5.0E-04	mg/kg/day	6 E-08
				Arsenic	0.0075	mg/l	1 3E-08	mg/kg/day	1.5E+00	mg/kg/day	2 E-08	3.0E-07	mg/kg/day	3.0E-04	mg/kg/day	1 E-03
				Barium	0.045	mg/l	NC		NC			1.8E-06	mg/kg/day	7.0E-02	mg/kg/day	3.E-05
				Chromium	0.027	mg/l	NC		NC			1.1E-06	mg/kg/day	3 0E-03	mg/kg/day	4.E-04
				Lead	0.013	mg/l	2.2E-08	mg/kg/day	--			5.1E-07	mg/kg/day			
				Manganese	0.42	mg/l	NC		NC			1 7E-05	mg/kg/day	2.4E-02	mg/kg/day	7.E-04
				Mercury	0.00000319	mg/l	NC		NC			1.3E-10	mg/kg/day	3 0E-04	mg/kg/day	4.E-07
				Thallium	0.0032	mg/l	NC		NC			1.3E-07	mg/kg/day	8.0E-05	mg/kg/day	2.E-03
				Nitrate	0 76	mg/l	NC		NC			3.0E-05	mg/kg/day	1.6E+00	mg/kg/day	2.E-05
				Nitrite-N	0.12	mg/l	NC		NC			4.7E-06	mg/kg/day	1.0E-01	mg/kg/day	5.E-05
				Toxicity Equivalency (Dioxins/Furans)	0 000000385	mg/l	6.5E-13	mg/kg/day	1.5E+05	mg/kg/day	1.E-07	1.5E-11	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1 E-07					4.E-03
			DERMAL	Tetrachloroethene	0.00055	mg/l	3.1E-08	mg/kg/day	5.4E-01	mg/kg/day	2.E-08	7.2E-07	mg/kg/day	1.0E-02	mg/kg/day	7.E-05
				bis(2-Ethylhexyl)phthalate	0 001	mg/l	1.5E-07	mg/kg/day	1.4E-02	mg/kg/day	2.E-09	3.4E-06	mg/kg/day	2.0E-02	mg/kg/day	2.E-04
				Aldrin	0.000011	mg/l	9.3E-11	mg/kg/day	1.7E+01	mg/kg/day	2.E-09	2.2E-09	mg/kg/day	3.0E-05	mg/kg/day	7.E-05
				alpha-Chlordane	0.00000069	mg/l	1.4E-10	mg/kg/day	3.5E-01	mg/kg/day	5.E-11	3.2E-09	mg/kg/day	5.0E-04	mg/kg/day	6.E-06
				delta-BHC	0.0000096	mg/l	NC		NC			8.2E-09	mg/kg/day	3.0E-04	mg/kg/day	3.E-05
				Endosulfan Sulfate	0 0000026	mg/l	NC		NC			--		6.0E-03	mg/kg/day	

TABLE 7.17.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Endrin Aldehyde	0.0000028	mg/l	NC		NC			4.4E-09	mg/kg/day	3.0E-04	mg/kg/day	1.E-05
				gamma-Chlordane	0.00000075	mg/l	1.5E-10	mg/kg/day	3.5E-01	mg/kg/day	5.E-11	3.4E-09	mg/kg/day	5.0E-04	mg/kg/day	7.E-06
				Arsenic	0.0075	mg/l	4.5E-09	mg/kg/day	1.5E+00	mg/kg/day	7.E-09	1.1E-07	mg/kg/day	3.0E-04	mg/kg/day	4.E-04
				Barium	0.045	mg/l	NC		NC			6.3E-07	mg/kg/day	4.9E-03	mg/kg/day	1.E-04
				Chromium	0.027	mg/l	NC		NC			7.6E-07	mg/kg/day	7.5E-05	mg/kg/day	1.E-02
				Lead	0.013	mg/l	--		--			--				
				Manganese	0.42	mg/l	NC		NC			5.9E-06	mg/kg/day	9.6E-04	mg/kg/day	6.E-03
				Mercury	0.00000319	mg/l	NC		NC			4.5E-11	mg/kg/day	2.1E-05	mg/kg/day	2.E-06
				Thallium	0.0032	mg/l	NC		NC			4.5E-08	mg/kg/day	8.0E-05	mg/kg/day	6.E-04
				Nitrate	0.76	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.12	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000000385	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-08					2.E-02
		EXPOSURE POINT TOTAL									1.E-07					2.E-02
	EXPOSURE MEDIUM TOTAL										1.E-07					2.E-02
SURFACE WATER TOTAL											1.E-07					2.E-02
BIOTA	COMBINED FISH DIET	ALLENDALE POND	INGESTION	Acenaphthylene	0.002	mg/kg	NC		NC			2.5E-07	mg/kg/day	6.0E-02	mg/kg/day	4.E-06
				Benzo(a)anthracene	0.0014	mg/kg	7.5E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-09	1.8E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Benzo(a)pyrene	0.0015	mg/kg	8.1E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	6.E-08	1.9E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Benzo(b)fluoranthene	0.0016	mg/kg	8.6E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-09	2.0E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Benzo(g,h,i)perylene	0.00065	mg/kg	NC		NC			8.2E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Dibenzo(a,h)anthracene	0.00053	mg/kg	2.9E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-08	6.7E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Indeno(1,2,3-cd)pyrene	0.00073	mg/kg	3.9E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-09	9.2E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Phenanthrene	0.00975	mg/kg	NC		NC			1.2E-06	mg/kg/day	3.0E-02	mg/kg/day	4.E-05
				4,4'-DDD	0.0128	mg/kg	6.9E-08	mg/kg/day	2.4E-01	(mg/kg/day)-1	2.E-08	1.6E-06	mg/kg/day	5.0E-04	mg/kg/day	3.E-03
				4,4'-DDE	0.0249	mg/kg	1.3E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	5.E-08	3.1E-06	mg/kg/day	5.0E-04	mg/kg/day	6.E-03
				4,4'-DDT	0.00789	mg/kg	4.3E-08	mg/kg/day	3.4E-01	(mg/kg/day)-1	1.E-08	9.9E-07	mg/kg/day	5.0E-04	mg/kg/day	2.E-03
				alpha-Chlordane	0.0214	mg/kg	1.2E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-08	2.7E-06	mg/kg/day	5.0E-04	mg/kg/day	5.E-03
				Aroclor-1254	1.8853	mg/kg	1.0E-05	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-05	2.4E-04	mg/kg/day	2.0E-05	mg/kg/day	1.E+01
				Aroclor-1268	0.02673	mg/kg	1.4E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-07	3.4E-06	mg/kg/day	2.0E-05	mg/kg/day	2.E-01
				beta-BHC	0.0005	mg/kg	2.7E-09	mg/kg/day	1.8E+00	(mg/kg/day)-1	5.E-09	6.3E-08	mg/kg/day	3.0E-04	mg/kg/day	2.E-04
				Dieldrin	0.00889	mg/kg	4.8E-08	mg/kg/day	1.6E+01	(mg/kg/day)-1	8.E-07	1.1E-06	mg/kg/day	5.0E-05	mg/kg/day	2.E-02
				Endosulfan Sulfate	0.001	mg/kg	NC		NC			1.3E-07	mg/kg/day	6.0E-03	mg/kg/day	2.E-05
				Endrin Aldehyde	0.0005	mg/kg	NC		NC			6.3E-08	mg/kg/day	3.0E-04	mg/kg/day	2.E-04
				gamma-Chlordane	0.008	mg/kg	4.3E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-08	1.0E-06	mg/kg/day	5.0E-04	mg/kg/day	2.E-03
				Heptachlor	0.000507	mg/kg	2.7E-09	mg/kg/day	4.5E+00	(mg/kg/day)-1	1.E-08	6.4E-08	mg/kg/day	5.0E-04	mg/kg/day	1.E-04
				Heptachlor Epoxide	0.0011	mg/kg	5.9E-09	mg/kg/day	9.1E+00	(mg/kg/day)-1	5.E-08	1.4E-07	mg/kg/day	1.3E-05	mg/kg/day	1.E-02
				Technical Chlordane	0.468	mg/kg	2.5E-06	mg/kg/day	3.5E-01	(mg/kg/day)-1	9.E-07	5.9E-05	mg/kg/day	5.0E-04	mg/kg/day	1.E-01
				Cadmium	0.064	mg/kg	NC		NC			8.0E-06	mg/kg/day	1.0E-03	mg/kg/day	8.E-03
				Chromium	0.103	mg/kg	NC		NC			1.3E-05	mg/kg/day	3.0E-03	mg/kg/day	4.E-03
				Lead	0.37	mg/kg	2.0E-06	mg/kg/day	--			4.7E-05	mg/kg/day			
				Manganese	6.7	mg/kg	NC		NC			8.4E-04	mg/kg/day	1.4E-01	mg/kg/day	6.E-03
				Mercury	0.144	mg/kg	NC		NC			1.8E-05	mg/kg/day	3.0E-04	mg/kg/day	6.E-02
				Mercury (methyl)	0.208	mg/kg	NC		NC			2.6E-05	mg/kg/day	1.0E-04	mg/kg/day	3.E-01
				Toxicity Equivalency (PCB Congeners)	0.0000275	mg/kg	1.5E-10	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-05	3.5E-09	mg/kg/day			
				Toxicity Equivalency (Dioxins/Furans)	0.000301	mg/kg	1.6E-09	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-04	3.8E-08	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-04					1.3.E+01
		EXPOSURE POINT TOTAL									3.E-04					1.3.E+01
	EXPOSURE MEDIUM TOTAL										3.E-04					1.3.E+01
COMBINED FISH DIET TOTAL											3.E-04					1.3.E+01
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	3.E-04				TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA	1.3.E+01

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TABLE 7.18.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SOIL	SOIL	ALLENDALE POND	INGESTION	2,3,7,8-TCDD	0.00027	mg/kg	5.5E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	8.E-07	1.9E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								8.E-07					–
			DERMAL	2,3,7,8-TCDD	0.00027	mg/kg	1.8E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-08	6.5E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-08					–
		EXPOSURE POINT TOTAL									9.E-07					0.E+00
	EXPOSURE MEDIUM TOTAL										9.E-07					0.E+00
SOIL TOTAL											9.E-07					0.E+00
SEDIMENT	SEDIMENT	ALLENDALE POND	INGESTION	2-Methylnaphthalene	0.13608	mg/kg	NC		NC			6.5E-08	mg/kg/day	2.0E-02	mg/kg/day	3.E-06
				Acenaphthylene	0.97	mg/kg	NC		NC			4.6E-07	mg/kg/day	6.0E-02	mg/kg/day	8.E-06
				Benzo(a)anthracene	3.4	mg/kg	4.6E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-08	1.6E-06	mg/kg/day	3.0E-02	mg/kg/day	5.E-05
				Benzo(a)pyrene	4	mg/kg	5.4E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-07	1.9E-06	mg/kg/day	3.0E-02	mg/kg/day	6.E-05
				Benzo(b)fluoranthene	4.4	mg/kg	6.0E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-08	2.1E-06	mg/kg/day	3.0E-02	mg/kg/day	7.E-05
				Benzo(g,h,i)perylene	2	mg/kg	NC		NC			9.5E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Benzo(k)fluoranthene	3.9	mg/kg	5.3E-08	mg/kg/day	7.3E-02	(mg/kg/day)-1	4.E-09	1.9E-06	mg/kg/day	3.0E-02	mg/kg/day	6.E-05
				bis(2-Ethylhexyl)phthalate	3.2	mg/kg	4.3E-08	mg/kg/day	1.4E-02	(mg/kg/day)-1	6.E-10	1.5E-06	mg/kg/day	2.0E-02	mg/kg/day	8.E-05
				Dibenzo(a,h)anthracene	2	mg/kg	2.7E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-07	9.5E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Indeno(1,2,3-cd)pyrene	3.2	mg/kg	4.3E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-08	1.5E-06	mg/kg/day	3.0E-02	mg/kg/day	5.E-05
				Pentachlorophenol	6.5	mg/kg	8.8E-08	mg/kg/day	1.2E-01	(mg/kg/day)-1	1.E-08	3.1E-06	mg/kg/day	3.0E-02	mg/kg/day	1.E-04
				Phenanthrene	4.8	mg/kg	NC		NC			2.3E-06	mg/kg/day	3.0E-02	mg/kg/day	8.E-05
				alpha-Chlordane	0.0113	mg/kg	1.5E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	5.E-11	5.4E-09	mg/kg/day	5.0E-04	mg/kg/day	1.E-05
				Aroclor-1254	2.4	mg/kg	3.3E-08	mg/kg/day	2.0E+00	(mg/kg/day)-1	7.E-08	1.1E-06	mg/kg/day	2.0E-05	mg/kg/day	6.E-02
				Aroclor-1260	0.2	mg/kg	2.7E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	5.E-09	9.5E-08	mg/kg/day	2.0E-05	mg/kg/day	5.E-03
				Aroclor-1268	0.079	mg/kg	1.1E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-09	3.8E-08	mg/kg/day	2.0E-05	mg/kg/day	2.E-03
				delta-BHC	0.0014	mg/kg	NC		NC			6.6E-10	mg/kg/day	3.0E-04	mg/kg/day	2.E-06
				Dieldrin	0.009	mg/kg	1.2E-10	mg/kg/day	1.6E+01	(mg/kg/day)-1	2.E-09	4.3E-09	mg/kg/day	5.0E-05	mg/kg/day	9.E-05
				Endosulfan II	0.037	mg/kg	NC		NC			1.8E-08	mg/kg/day	6.0E-03	mg/kg/day	3.E-06
				Endosulfan sulfate	0.0027	mg/kg	NC		NC			1.3E-09	mg/kg/day	6.0E-03	mg/kg/day	2.E-07
				Endrin aldehyde	0.0029	mg/kg	NC		NC			1.4E-09	mg/kg/day	3.0E-04	mg/kg/day	5.E-06
				Endrin Ketone	0.0038	mg/kg	NC		NC			1.8E-09	mg/kg/day	3.0E-04	mg/kg/day	6.E-06
				gamma-Chlordane	0.017	mg/kg	2.3E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	8.E-11	8.1E-09	mg/kg/day	5.0E-04	mg/kg/day	2.E-05
				Technical Chlordane	0.65	mg/kg	8.8E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-09	3.1E-07	mg/kg/day	5.0E-04	mg/kg/day	6.E-04
				Antimony	4.8	mg/kg	NC		NC			2.3E-06	mg/kg/day	4.0E-04	mg/kg/day	6.E-03
				Arsenic	5.8	mg/kg	7.9E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-07	2.8E-06	mg/kg/day	3.0E-04	mg/kg/day	9.E-03
				Cadmium	1.2	mg/kg	NC		NC			5.7E-07	mg/kg/day	1.0E-03	mg/kg/day	6.E-04
				Chromium	238	mg/kg	NC		NC			1.1E-04	mg/kg/day	3.0E-03	mg/kg/day	4.E-02
				Lead	488	mg/kg	6.6E-06	mg/kg/day	–			2.3E-04	mg/kg/day			
				Manganese	531	mg/kg	NC		NC			2.5E-04	mg/kg/day	7.1E-02	mg/kg/day	4.E-03
				Mercury	0.97	mg/kg	NC		NC			4.6E-07	mg/kg/day	3.0E-04	mg/kg/day	2.E-03
				Nickel	26.7	mg/kg	NC		NC			1.3E-05	mg/kg/day	2.0E-02	mg/kg/day	6.E-04
				Thallium	6.8	mg/kg	NC		NC			3.2E-06	mg/kg/day	8.0E-05	mg/kg/day	4.E-02
				Vanadium	45.9	mg/kg	NC		NC			2.2E-05	mg/kg/day	7.0E-03	mg/kg/day	3.E-03
				Toxicity Equivalency (Dioxins/Furans)	0.0057	mg/kg	7.7E-11	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-05	2.7E-09	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.000000112	mg/kg	1.5E-15	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-10	5.3E-14	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-05					2.E-01
			DERMAL	2-Methylnaphthalene	0.13608	mg/kg	NC		NC			9.4E-09	mg/kg/day	2.0E-02	mg/kg/day	5.E-07
				Acenaphthylene	0.97	mg/kg	NC		NC			6.7E-08	mg/kg/day	6.0E-02	mg/kg/day	1.E-06
				Benzo(a)anthracene	3.4	mg/kg	6.7E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	5.E-09	2.4E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				Benzo(a)pyrene	4	mg/kg	7.9E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	6.E-08	2.8E-07	mg/kg/day	3.0E-02	mg/kg/day	9.E-06
				Benzo(b)fluoranthene	4.4	mg/kg	8.7E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-09	3.0E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(g,h,i)perylene	2	mg/kg	NC		NC			1.4E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Benzo(k)fluoranthene	3.9	mg/kg	7.7E-09	mg/kg/day	7.3E-02	(mg/kg/day)-1	6.E-10	2.7E-07	mg/kg/day	3.0E-02	mg/kg/day	9.E-06
				bis(2-Ethylhexyl)phthalate	3.2	mg/kg	4.9E-09	mg/kg/day	1.4E-02	(mg/kg/day)-1	7.E-11	1.7E-07	mg/kg/day	2.0E-02	mg/kg/day	9.E-06
				Dibenzo(a,h)anthracene	2	mg/kg	4.0E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-08	1.4E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Indeno(1,2,3-cd)pyrene	3.2	mg/kg	6.3E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	5.E-09	2.2E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Pentachlorophenol	6.5	mg/kg	2.5E-08	mg/kg/day	1.2E-01	(mg/kg/day)-1	3.E-09	8.6E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Phenanthrene	4.8	mg/kg	NC		NC			3.3E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05

TABLE 7.18.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				alpha-Chlordane	0.0113	mg/kg	6.9E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-12	2.4E-10	mg/kg/day	5.0E-04	mg/kg/day	5.E-07
				Aroclor-1254	2.4	mg/kg	5.1E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-08	1.8E-07	mg/kg/day	2.0E-05	mg/kg/day	9.E-03
				Aroclor-1260	0.2	mg/kg	4.3E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	9.E-10	1.5E-08	mg/kg/day	2.0E-05	mg/kg/day	7.E-04
				Aroclor-1268	0.079	mg/kg	1.7E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-10	5.9E-09	mg/kg/day	2.0E-05	mg/kg/day	3.E-04
				delta-BHC	0.0014	mg/kg	NC		NC			7.4E-11	mg/kg/day	3.0E-04	mg/kg/day	2.E-07
				Dieldrin	0.009	mg/kg	1.4E-11	mg/kg/day	1.6E+01	(mg/kg/day)-1	2.E-10	4.8E-10	mg/kg/day	5.0E-05	mg/kg/day	1.E-05
				Endosulfan II	0.037	mg/kg	NC		NC			2.0E-09	mg/kg/day	6.0E-03	mg/kg/day	3.E-07
				Endosulfan sulfate	0.0027	mg/kg	NC		NC			1.4E-10	mg/kg/day	6.0E-03	mg/kg/day	2.E-08
				Endrin aldehyde	0.0029	mg/kg	NC		NC			1.5E-10	mg/kg/day	3.0E-04	mg/kg/day	5.E-07
				Endrin Ketone	0.0038	mg/kg	NC		NC			2.0E-10	mg/kg/day	3.0E-04	mg/kg/day	7.E-07
				gamma-Chlordane	0.017	mg/kg	1.0E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-12	3.6E-10	mg/kg/day	5.0E-04	mg/kg/day	7.E-07
				Technical Chlordane	0.65	mg/kg	4.0E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-10	1.4E-08	mg/kg/day	5.0E-04	mg/kg/day	3.E-05
				Antimony	4.8	mg/kg	NC		NC					6.0E-05	mg/kg/day	
				Arsenic	5.8	mg/kg	2.6E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	4.E-09	9.3E-08	mg/kg/day	3.0E-04	mg/kg/day	3.E-04
				Cadmium	1.2	mg/kg	NC		NC			6.4E-10	mg/kg/day	2.5E-05	mg/kg/day	3.E-05
				Chromium	238	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	488	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	531	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Mercury	0.97	mg/kg	NC		NC					2.1E-05	mg/kg/day	
				Nickel	26.7	mg/kg	NC		NC					8.0E-04	mg/kg/day	
				Thallium	6.8	mg/kg	NC		NC					8.0E-05	mg/kg/day	
				Vanadium	45.9	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.0057	mg/kg	2.6E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	4.E-07	9.1E-11	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.000000112	mg/kg	5.1E-17	mg/kg/day	1.5E+05	(mg/kg/day)-1	8.E-12	1.8E-15	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-07					1.E-02
		EXPOSURE POINT TOTAL									1.E-05					2.E-01
	EXPOSURE MEDIUM TOTAL										1.E-05					2.E-01
SEDIMENT TOTAL											1.E-05					2.E-01
SURFACE WATER	SURFACE WATER	ALLENDALE POND	INGESTION	Tetrachloroethene	0.00055	mg/l	1.9E-09	mg/kg/day	5.4E-01	mg/kg/day	1.E-09	6.5E-08	mg/kg/day	1.0E-02	mg/kg/day	7.E-06
				bis(2-Ethylhexyl)phthalate	0.001	mg/l	3.4E-09	mg/kg/day	1.4E-02	mg/kg/day	5.E-11	1.2E-07	mg/kg/day	2.0E-02	mg/kg/day	6.E-06
				Aldrin	0.000011	mg/l	3.7E-11	mg/kg/day	1.7E+01	mg/kg/day	6.E-10	1.3E-09	mg/kg/day	3.0E-05	mg/kg/day	4.E-05
				alpha-Chlordane	0.00000069	mg/l	2.3E-12	mg/kg/day	3.5E-01	mg/kg/day	8.E-13	8.2E-11	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				delta-BHC	0.0000096	mg/l	NC		NC			1.1E-09	mg/kg/day	3.0E-04	mg/kg/day	4.E-06
				Endosulfan Sulfate	0.0000026	mg/l	NC		NC			3.1E-10	mg/kg/day	6.0E-03	mg/kg/day	5.E-08
				Endrin Aldehyde	0.0000028	mg/l	NC		NC			3.3E-10	mg/kg/day	3.0E-04	mg/kg/day	1.E-06
				gamma-Chlordane	0.00000075	mg/l	2.5E-12	mg/kg/day	3.5E-01	mg/kg/day	9.E-13	8.9E-11	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				Arsenic	0.0075	mg/l	2.5E-08	mg/kg/day	1.5E+00	mg/kg/day	4.E-08	8.9E-07	mg/kg/day	3.0E-04	mg/kg/day	3.E-03
				Barium	0.045	mg/l	NC		NC			5.3E-06	mg/kg/day	7.0E-02	mg/kg/day	8.E-05
				Chromium	0.027	mg/l	NC		NC			3.2E-06	mg/kg/day	3.0E-03	mg/kg/day	1.E-03
				Lead	0.013	mg/l	4.4E-08	mg/kg/day	--			1.5E-06	mg/kg/day			
				Manganese	0.42	mg/l	NC		NC			5.0E-05	mg/kg/day	2.4E-02	mg/kg/day	2.E-03
				Mercury	0.00000319	mg/l	NC		NC			3.8E-10	mg/kg/day	3.0E-04	mg/kg/day	1.E-06
				Thallium	0.0032	mg/l	NC		NC			3.8E-07	mg/kg/day	8.0E-05	mg/kg/day	5.E-03
				Nitrate	0.76	mg/l	NC		NC			9.0E-05	mg/kg/day	1.6E+00	mg/kg/day	6.E-05
				Nitrite-N	0.12	mg/l	NC		NC			1.4E-05	mg/kg/day	1.0E-01	mg/kg/day	1.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.000000385	mg/l	1.3E-12	mg/kg/day	1.5E+05	mg/kg/day	2.E-07	4.6E-11	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-07					1.E-02
			DERMAL	Tetrachloroethene	0.00055	mg/l	1.8E-08	mg/kg/day	5.4E-01	mg/kg/day	1.E-08	6.5E-07	mg/kg/day	1.0E-02	mg/kg/day	6.E-05
				bis(2-Ethylhexyl)phthalate	0.001	mg/l	8.8E-08	mg/kg/day	1.4E-02	mg/kg/day	1.E-09	3.1E-06	mg/kg/day	2.0E-02	mg/kg/day	2.E-04
				Aldrin	0.000011	mg/l	5.6E-11	mg/kg/day	1.7E+01	mg/kg/day	1.E-09	2.0E-09	mg/kg/day	3.0E-05	mg/kg/day	7.E-05
				alpha-Chlordane	0.00000069	mg/l	8.2E-11	mg/kg/day	3.5E-01	mg/kg/day	3.E-11	2.9E-09	mg/kg/day	5.0E-04	mg/kg/day	6.E-06
				delta-BHC	0.0000096	mg/l	NC		NC			7.4E-09	mg/kg/day	3.0E-04	mg/kg/day	2.E-05
				Endosulfan Sulfate	0.0000026	mg/l	NC		NC			--		6.0E-03	mg/kg/day	
				Endrin Aldehyde	0.0000028	mg/l	NC		NC			3.9E-09	mg/kg/day	3.0E-04	mg/kg/day	1.E-05
				gamma-Chlordane	0.00000075	mg/l	8.9E-11	mg/kg/day	3.5E-01	mg/kg/day	3.E-11	3.1E-09	mg/kg/day	5.0E-04	mg/kg/day	6.E-06
				Arsenic	0.0075	mg/l	2.7E-09	mg/kg/day	1.5E+00	mg/kg/day	4.E-09	9.5E-08	mg/kg/day	3.0E-04	mg/kg/day	3.E-04
				Barium	0.045	mg/l	NC		NC			5.7E-07	mg/kg/day	4.9E-03	mg/kg/day	1.E-04

TABLE 7.18.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Chromium	0.027	mg/l	NC		NC			6.9E-07	mg/kg/day	7.5E-05	mg/kg/day	9.E-03
				Lead	0.013	mg/l	--		--			--				
				Manganese	0.42	mg/l	NC		NC			5.3E-06	mg/kg/day	9.6E-04	mg/kg/day	6 E-03
				Mercury	0.00000319	mg/l	NC		NC			4.1E-11	mg/kg/day	2.1E-05	mg/kg/day	2 E-06
				Thallium	0.0032	mg/l	NC		NC			4.1E-08	mg/kg/day	8.0E-05	mg/kg/day	5 E-04
				Nitrate	0.76	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.12	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.000000385	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2 E-08					2.E-02
		EXPOSURE POINT TOTAL									3 E-07					3.E-02
	EXPOSURE MEDIUM TOTAL										3 E-07					3 E-02
SURFACE WATER TOTAL											3.E-07					3.E-02
BIOTA	COMBINED FISH DIET	ALLENDALE POND	INGESTION	Acenaphthylene	0.002	mg/kg	NC		NC			3.8E-07	mg/kg/day	6.0E-02	mg/kg/day	6 E-06
				Benzo(a)anthracene	0.0014	mg/kg	7 7E-09	mg/kg/day	7 3E-01	(mg/kg/day)-1	6.E-09	2.7E-07	mg/kg/day	3.0E-02	mg/kg/day	9.E-06
				Benzo(a)pyrene	0.0015	mg/kg	8 2E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	6.E-08	2.9E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(b)fluoranthene	0.0016	mg/kg	8.8E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-09	3.1E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(g,h,i)perylene	0.00065	mg/kg	NC		NC			1.2E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Dibenzo(a,h)anthracene	0.00053	mg/kg	2.9E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-08	1.0E-07	mg/kg/day	3 0E-02	mg/kg/day	3.E-06
				Indeno(1,2,3-cd)pyrene	0.00073	mg/kg	4.0E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-09	1.4E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Phenanthrene	0.00975	mg/kg	NC		NC			1 9E-06	mg/kg/day	3 0E-02	mg/kg/day	6.E-05
				4,4'-DDD	0.0128	mg/kg	7.0E-08	mg/kg/day	2 4E-01	(mg/kg/day)-1	2.E-08	2.5E-06	mg/kg/day	5.0E-04	mg/kg/day	5 E-03
				4,4'-DDE	0.0249	mg/kg	1.4E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	5.E-08	4.8E-06	mg/kg/day	5.0E-04	mg/kg/day	1.E-02
				4,4'-DDT	0.00789	mg/kg	4.3E-08	mg/kg/day	3.4E-01	(mg/kg/day)-1	1.E-08	1.5E-06	mg/kg/day	5.0E-04	mg/kg/day	3.E-03
				alpha-Chlordane	0.0214	mg/kg	1.2E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-08	4.1E-06	mg/kg/day	5.0E-04	mg/kg/day	8.E-03
				Aroclor-1254	1 8853	mg/kg	1 0E-05	mg/kg/day	2 0E+00	(mg/kg/day)-1	2.E-05	3.6E-04	mg/kg/day	2.0E-05	mg/kg/day	2.E+01
				Aroclor-1268	0 02673	mg/kg	1.5E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-07	5.1E-06	mg/kg/day	2.0E-05	mg/kg/day	3.E-01
				beta-BHC	0.0005	mg/kg	2.7E-09	mg/kg/day	1.8E+00	(mg/kg/day)-1	5.E-09	9.6E-08	mg/kg/day	3.0E-04	mg/kg/day	3.E-04
				Dieldrin	0 00889	mg/kg	4.9E-08	mg/kg/day	1 6E+01	(mg/kg/day)-1	8.E-07	1.7E-06	mg/kg/day	5.0E-05	mg/kg/day	3.E-02
				Endosulfan Sulfate	0.001	mg/kg	NC		NC			1.9E-07	mg/kg/day	6.0E-03	mg/kg/day	3.E-05
				Endrin Aldehyde	0 0005	mg/kg	NC		NC			9.6E-08	mg/kg/day	3 0E-04	mg/kg/day	3 E-04
				gamma-Chlordane	0 008	mg/kg	4.4E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	2 E-08	1.5E-06	mg/kg/day	5 0E-04	mg/kg/day	3.E-03
				Heptachlor	0 000507	mg/kg	2 8E-09	mg/kg/day	4.5E+00	(mg/kg/day)-1	1 E-08	9.7E-08	mg/kg/day	5.0E-04	mg/kg/day	2.E-04
				Heptachlor Epoxide	0.0011	mg/kg	6.0E-09	mg/kg/day	9 1E+00	(mg/kg/day)-1	5 E-08	2 1E-07	mg/kg/day	1.3E-05	mg/kg/day	2.E-02
				Technical Chlordane	0 468	mg/kg	2 6E-06	mg/kg/day	3 5E-01	(mg/kg/day)-1	9 E-07	9 0E-05	mg/kg/day	5.0E-04	mg/kg/day	2.E-01
				Cadmium	0 064	mg/kg	NC		NC			1 2E-03	mg/kg/day	1 0E-03	mg/kg/day	1.E-02
				Chromium	0.103	mg/kg	NC		NC			2 0E-05	mg/kg/day	3.0E-03	mg/kg/day	7.E-03
				Lead	0 37	mg/kg	2 0E-06	mg/kg/day	--			7.1E-05	mg/kg/day			
				Manganese	6 7	mg/kg	NC		NC			1 3E-03	mg/kg/day	1 4E-01	mg/kg/day	9.E-03
				Mercury	0 144	mg/kg	NC		NC			2.8E-05	mg/kg/day	3.0E-04	mg/kg/day	9.E-02
				Mercury (methyl)	0.208	mg/kg	NC		NC			4 0E-05	mg/kg/day	1.0E-04	mg/kg/day	4.E-01
				Toxicity Equivalency (PCB Congeners)	0.0000275	mg/kg	1 5E-10	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-05	5.3E-09	mg/kg/day			
				Toxicity Equivalency (Dioxins/Furans)	0 000301	mg/kg	1 6E-09	mg/kg/day	1.5E+05	(mg/kg/day)-1	2 E-04	5 8E-08	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-04					1 9 E+01
		EXPOSURE POINT TOTAL									3.E-04					1.9 E+01
	EXPOSURE MEDIUM TOTAL										3.E-04					1.9.E+01
COMBINED FISH DIET TOTAL											3.E-04					1.9.E+01
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	3.E-04	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				1.9.E+01

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TABLE 7.19.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	LYMAN MILL POND	INGESTION	2-Methylnaphthalene	0.1	mg/kg	NC		NC			5.9E-10	mg/kg/day	2.0E-02	mg/kg/day	3.E-08
				4-Chloro-3-methylphenol	1.4	mg/kg	NC		NC			8.2E-09	mg/kg/day	5.0E-03	mg/kg/day	2.E-06
				4-Nitrophenol	2.2	mg/kg	NC		NC			1.3E-08	mg/kg/day			
				Acenaphthylene	0.42856	mg/kg	NC		NC			2.5E-09	mg/kg/day	6.0E-02	mg/kg/day	4.E-08
				Benzo(a)anthracene	2.8	mg/kg	9.4E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-10	1.6E-08	mg/kg/day	3.0E-02	mg/kg/day	5.E-07
				Benzo(a)pyrene	2.9	mg/kg	9.7E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	7.E-09	1.7E-08	mg/kg/day	3.0E-02	mg/kg/day	6.E-07
				Benzo(b)fluoranthene	4.5	mg/kg	1.5E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-09	2.6E-08	mg/kg/day	3.0E-02	mg/kg/day	9.E-07
				Benzo(g,h,i)perylene	3	mg/kg	NC		NC			1.8E-08	mg/kg/day	3.0E-02	mg/kg/day	6.E-07
				Benzo(k)fluoranthene	2.1	mg/kg	7.0E-10	mg/kg/day	7.3E-02	(mg/kg/day)-1	5.E-11	1.2E-08	mg/kg/day	3.0E-02	mg/kg/day	4.E-07
				bis(2-Ethylhexyl)phthalate	5.2	mg/kg	1.7E-09	mg/kg/day	1.4E-02	(mg/kg/day)-1	2.E-11	3.1E-08	mg/kg/day	2.0E-02	mg/kg/day	2.E-06
				Dibenzo(a,h)anthracene	0.77	mg/kg	2.6E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-09	4.5E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Indeno(1,2,3-cd)pyrene	2.7	mg/kg	9.1E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-10	1.6E-08	mg/kg/day	3.0E-02	mg/kg/day	5.E-07
				N-Nitroso-di-n-propylamine	1.3	mg/kg	4.4E-10	mg/kg/day	7.0E+00	(mg/kg/day)-1	3.E-09	7.6E-09	mg/kg/day			
				Pentachlorophenol	1.4	mg/kg	4.7E-10	mg/kg/day	1.2E-01	(mg/kg/day)-1	6.E-11	8.2E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				Phenanthrene	2.8	mg/kg	NC		NC			1.6E-08	mg/kg/day	3.0E-02	mg/kg/day	5.E-07
				alpha-Chlordane	0.032	mg/kg	1.1E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-12	1.9E-10	mg/kg/day	5.0E-04	mg/kg/day	4.E-07
				Aroclor-1254	0.49	mg/kg	1.6E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-10	2.9E-09	mg/kg/day	2.0E-05	mg/kg/day	1.E-04
				Aroclor-1260	0.027	mg/kg	9.1E-12	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-11	1.6E-10	mg/kg/day	2.0E-05	mg/kg/day	8.E-06
				Aroclor-1268	0.12	mg/kg	4.0E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	8.E-11	7.0E-10	mg/kg/day	2.0E-05	mg/kg/day	4.E-05
				Dieldrin	0.0044	mg/kg	1.5E-12	mg/kg/day	1.6E+01	(mg/kg/day)-1	2.E-11	2.6E-11	mg/kg/day	5.0E-05	mg/kg/day	5.E-07
				Endosulfan II	0.005	mg/kg	NC		NC			2.9E-11	mg/kg/day	6.0E-03	mg/kg/day	5.E-09
				Endosulfan sulfate	0.0029	mg/kg	NC		NC			1.7E-11	mg/kg/day	6.0E-03	mg/kg/day	3.E-09
				gamma-Chlordane	0.015	mg/kg	5.0E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-12	8.8E-11	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				Technical Chlordane	1.29	mg/kg	4.3E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-10	7.6E-09	mg/kg/day	5.0E-04	mg/kg/day	2.E-05
				Antimony	3.1	mg/kg	NC		NC			1.8E-08	mg/kg/day	4.0E-04	mg/kg/day	5.E-05
				Arsenic	6.4	mg/kg	2.1E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	3.E-09	3.8E-08	mg/kg/day	3.0E-04	mg/kg/day	1.E-04
				Cadmium	2.1	mg/kg	NC		NC			1.2E-08	mg/kg/day	1.0E-03	mg/kg/day	1.E-05
				Chromium	200	mg/kg	NC		NC			1.2E-06	mg/kg/day	3.0E-03	mg/kg/day	4.E-04
				Lead	375	mg/kg	1.3E-07	mg/kg/day	--			2.2E-06	mg/kg/day			
				Manganese	843	mg/kg	NC		NC			4.9E-06	mg/kg/day	7.1E-02	mg/kg/day	7.E-05
				Mercury	0.62	mg/kg	NC		NC			3.6E-09	mg/kg/day	3.0E-04	mg/kg/day	1.E-05
				Nickel	69.2	mg/kg	NC		NC			4.1E-07	mg/kg/day	2.0E-02	mg/kg/day	2.E-05
				Thallium	0.58	mg/kg	NC		NC			3.4E-09	mg/kg/day	8.0E-05	mg/kg/day	4.E-05
				Vanadium	42.4	mg/kg	NC		NC			2.5E-07	mg/kg/day	7.0E-03	mg/kg/day	4.E-05
				Toxicity Equivalency (Dioxins/Furans)	0.00179	mg/kg	6.0E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	9.E-08	1.1E-11	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.000033	mg/kg	1.1E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-09	1.9E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-07					1.E-03
			DERMAL	2-Methylnaphthalene	0.1	mg/kg	NC		NC			1.5E-10	mg/kg/day	2.0E-02	mg/kg/day	7.E-09
				4-Chloro-3-methylphenol	1.4	mg/kg	NC		NC			1.6E-09	mg/kg/day	5.0E-03	mg/kg/day	3.E-07
				4-Nitrophenol	2.2	mg/kg	NC		NC			2.5E-09	mg/kg/day			
				Acenaphthylene	0.42856	mg/kg	NC		NC			6.4E-10	mg/kg/day	6.0E-02	mg/kg/day	1.E-08
				Benzo(a)anthracene	2.8	mg/kg	2.4E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-10	4.2E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				Benzo(a)pyrene	2.9	mg/kg	2.5E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-09	4.3E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				Benzo(b)fluoranthene	4.5	mg/kg	3.8E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-10	6.7E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Benzo(g,h,i)perylene	3	mg/kg	NC		NC			4.5E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				Benzo(k)fluoranthene	2.1	mg/kg	1.8E-10	mg/kg/day	7.3E-02	(mg/kg/day)-1	1.E-11	3.1E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				bis(2-Ethylhexyl)phthalate	5.2	mg/kg	3.4E-10	mg/kg/day	1.4E-02	(mg/kg/day)-1	5.E-12	5.9E-09	mg/kg/day	2.0E-02	mg/kg/day	3.E-07
				Dibenzo(a,h)anthracene	0.77	mg/kg	6.5E-11	mg/kg/day	7.3E+00	(mg/kg/day)-1	5.E-10	1.1E-09	mg/kg/day	3.0E-02	mg/kg/day	4.E-08
				Indeno(1,2,3-cd)pyrene	2.7	mg/kg	2.3E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-10	4.0E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				N-Nitroso-di-n-propylamine	1.3	mg/kg	8.5E-11	mg/kg/day	7.0E+00	(mg/kg/day)-1	6.E-10	1.5E-09	mg/kg/day			
				Pentachlorophenol	1.4	mg/kg	2.3E-10	mg/kg/day	1.2E-01	(mg/kg/day)-1	3.E-11	4.0E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				Phenanthrene	2.8	mg/kg	NC		NC			4.2E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				alpha-Chlordane	0.032	mg/kg	8.3E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-13	1.5E-11	mg/kg/day	5.0E-04	mg/kg/day	3.E-08
				Aroclor-1254	0.49	mg/kg	4.5E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	9.E-11	7.8E-10	mg/kg/day	2.0E-05	mg/kg/day	4.E-05
				Aroclor-1260	0.027	mg/kg	2.5E-12	mg/kg/day	2.0E+00	(mg/kg/day)-1	5.E-12	4.3E-11	mg/kg/day	2.0E-05	mg/kg/day	2.E-06
				Aroclor-1268	0.12	mg/kg	1.1E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-11	1.9E-10	mg/kg/day	2.0E-05	mg/kg/day	1.E-05
				Dieldrin	0.0044	mg/kg	2.9E-13	mg/kg/day	1.6E+01	(mg/kg/day)-1	5.E-12	5.0E-12	mg/kg/day	5.0E-05	mg/kg/day	1.E-07
				Endosulfan II	0.005	mg/kg	NC		NC			5.7E-12	mg/kg/day	6.0E-03	mg/kg/day	1.E-09
				Endosulfan sulfate	0.0029	mg/kg	NC		NC			3.3E-12	mg/kg/day	6.0E-03	mg/kg/day	6.E-10
				gamma-Chlordane	0.015	mg/kg	3.9E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-13	6.8E-12	mg/kg/day	5.0E-04	mg/kg/day	1.E-08
				Technical Chlordane	1.29	mg/kg	3.4E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-11	5.9E-10	mg/kg/day	5.0E-04	mg/kg/day	1.E-06
				Antimony	3.1	mg/kg	NC		NC					6.0E-05	mg/kg/day	

TABLE 7.19.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Arsenic	6.4	mg/kg	1.3E-10	mg/kg/day	1.5E+00	(mg/kg/day)-1	2 E-10	2 2E-09	mg/kg/day	3.0E-04	mg/kg/day	7.E-06
				Cadmium	2.1	mg/kg	NC		NC			2 4E-11	mg/kg/day	2 5E-05	mg/kg/day	1.E-06
				Chromium	200	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	375	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	843	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Mercury	0.62	mg/kg	NC		NC					2.1E-05	mg/kg/day	
				Nickel	69 2	mg/kg	NC		NC					8.0E-04	mg/kg/day	
				Thallium	0.58	mg/kg	NC		NC					8.0E-05	mg/kg/day	
				Vanadium	42.4	mg/kg	NC		NC					1 8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0 00179	mg/kg	3 5E-14	mg/kg/day	1 5E+05	(mg/kg/day)-1	5 E-09	6.1E-13	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0 000033	mg/kg	6 5E-16	mg/kg/day	1 5E+05	(mg/kg/day)-1	1.E-10	1.1E-14	mg/kg/day			
			EXPOSURE ROUTE TOTAL								9 E-09					6.E-05
		EXPOSURE POINT TOTAL									1 E-07					1.E-03
	EXPOSURE MEDIUM TOTAL										1.E-07					1 E-03
SEDIMENT TOTAL											1.E-07					1.E-03
SURFACE WATER	SURFACE WATER	LYMAN MILL POND	INGESTION	Acenaphthylene	0.00000132	mg/l	NC		NC			7.7E-13	mg/kg/day	6.0E-02	mg/kg/day	1.E-11
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	5.7E-10	mg/kg/day	1.4E-02	mg/kg/day	8.E-12	1.0E-08	mg/kg/day	2.0E-02	mg/kg/day	5 E-07
				Aldrin	0.000023	mg/l	7.7E-13	mg/kg/day	1.7E+01	mg/kg/day	1.E-11	1.4E-11	mg/kg/day	3.0E-05	mg/kg/day	5 E-07
				alpha-Chlordane	0 000019	mg/l	6.4E-13	mg/kg/day	3.5E-01	mg/kg/day	2.E-13	1 1E-11	mg/kg/day	5 0E-04	mg/kg/day	2 E-08
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			1.9E-12	mg/kg/day	6 0E-03	mg/kg/day	3 E-10
				Endrin Aldehyde	0.000005	mg/l	NC		NC			2.9E-12	mg/kg/day	3.0E-04	mg/kg/day	1 E-08
				gamma-Chlordane	0.000021	mg/l	7.0E-13	mg/kg/day	3.5E-01	mg/kg/day	2.E-13	1.2E-11	mg/kg/day	5.0E-04	mg/kg/day	2.E-08
				Arsenic	0.0046	mg/l	1.5E-10	mg/kg/day	1.5E+00	mg/kg/day	2.E-10	2.7E-09	mg/kg/day	3.0E-04	mg/kg/day	9 E-06
				Barium	0.021	mg/l	NC		NC			1.2E-08	mg/kg/day	7.0E-02	mg/kg/day	2 E-07
				Chromium	0.0023	mg/l	NC		NC			1.4E-09	mg/kg/day	3 0E-03	mg/kg/day	5 E-07
				Lead	0.0044	mg/l	1.5E-10	mg/kg/day	--			2.6E-09	mg/kg/day			
				Manganese	0.13	mg/l	NC		NC			7.6E-08	mg/kg/day	2.4E-02	mg/kg/day	3.E-06
				Mercury	0 00000394	mg/l	NC		NC			2.3E-12	mg/kg/day	3.0E-04	mg/kg/day	8 E-09
				Thallium	0.0022	mg/l	NC		NC			1.3E-09	mg/kg/day	8.0E-05	mg/kg/day	2 E-05
				Nitrate	0.76	mg/l	NC		NC			4.5E-07	mg/kg/day	1 6E+00	mg/kg/day	3 E-07
				Nitrite-N	0.084	mg/l	NC		NC			4.9E-08	mg/kg/day	1 0E-01	mg/kg/day	5.E-07
				Toxicity Equivalency (Dioxins/Furans)	0.00000012	mg/l	4.0E-15	mg/kg/day	1.5E+05	mg/kg/day	6.E-10	7.0E-14	mg/kg/day			
			EXPOSURE ROUTE TOTAL								9.E-10					3 E-05
			DERMAL	Acenaphthylene	0 00000132	mg/l	NC		NC			--		6 0E-02	mg/kg/day	
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	4.8E-07	mg/kg/day	1.4E-02	mg/kg/day	7.E-09	8.4E-06	mg/kg/day	2.0E-02	mg/kg/day	4.E-04
				Aldrin	0.000023	mg/l	3.8E-11	mg/kg/day	1.7E+01	mg/kg/day	6.E-10	6.6E-10	mg/kg/day	3.0E-05	mg/kg/day	2 E-05
				alpha-Chlordane	0.000019	mg/l	7 3E-10	mg/kg/day	3.5E-01	mg/kg/day	3.E-10	1 3E-08	mg/kg/day	5.0E-04	mg/kg/day	3 E-05
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			--		6.0E-03	mg/kg/day	
				Endrin Aldehyde	0 000005	mg/l	NC		NC			1.1E-09	mg/kg/day	3 0E-04	mg/kg/day	4 E-06
				gamma-Chlordane	0.000021	mg/l	8.0E-10	mg/kg/day	3.5E-01	mg/kg/day	3.E-10	1 4E-08	mg/kg/day	5.0E-04	mg/kg/day	3.E-05
				Arsenic	0.0046	mg/l	5.4E-10	mg/kg/day	1.5E+00	mg/kg/day	8.E-10	9.4E-09	mg/kg/day	3.0E-04	mg/kg/day	3.E-05
				Barium	0.021	mg/l	NC		NC			4.3E-08	mg/kg/day	4.9E-03	mg/kg/day	9.E-06
				Chromium	0.0023	mg/l	NC		NC			9.4E-09	mg/kg/day	7.5E-05	mg/kg/day	1 E-04
				Lead	0.0044	mg/l	--		--			--				
				Manganese	0.13	mg/l	NC		NC			2.7E-07	mg/kg/day	9.6E-04	mg/kg/day	3 E-04
				Mercury	0.00000394	mg/l	NC		NC			8.0E-12	mg/kg/day	2.1E-05	mg/kg/day	4 E-07
				Thallium	0.0022	mg/l	NC		NC			4.5E-09	mg/kg/day	8 0E-05	mg/kg/day	6 E-05
				Nitrate	0.76	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.084	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00000012	mg/l	0.0E+00	mg/kg/day	1 5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								9.E-09					1.E-03
		EXPOSURE POINT TOTAL									1.E-08					1.E-03
	EXPOSURE MEDIUM TOTAL										1.E-08					1.E-03
SURFACE WATER TOTAL											1.E-08					1.E-03

TABLE 7.19.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
BIOTA	COMBINED FISH DIET	LYMAN MILL POND	INGESTION	Acenaphthylene	0.002	mg/kg	NC		NC			2.4E-07	mg/kg/day	6 0E-02	mg/kg/day	4 E-06
				Benzo(a)anthracene	0.00443	mg/kg	3.1E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	5.4E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(a)pyrene	0 0022	mg/kg	1.5E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-07	2.7E-07	mg/kg/day	3.0E-02	mg/kg/day	9 E-06
				Benzo(b)fluoranthene	0 003	mg/kg	2.1E-08	mg/kg/day	7 3E-01	(mg/kg/day)-1	2 E-08	3.7E-07	mg/kg/day	3.0E-02	mg/kg/day	1 E-05
				Benzo(g,h,i)perylene	0.0017	mg/kg	NC		NC			2 1E-07	mg/kg/day	3 0E-02	mg/kg/day	7.E-06
				Dibenzo(a,h)anthracene	0.0012	mg/kg	8 4E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	6 E-08	1.5E-07	mg/kg/day	3.0E-02	mg/kg/day	5 E-06
				Indeno(1,2,3-cd)pyrene	0.0019	mg/kg	1.3E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1 E-08	2.3E-07	mg/kg/day	3.0E-02	mg/kg/day	8 E-06
				Phenanthrene	0.014	mg/kg	NC		NC			1.7E-06	mg/kg/day	3.0E-02	mg/kg/day	6 E-05
				4,4'-DDD	0.027	mg/kg	1 9E-07	mg/kg/day	2 4E-01	(mg/kg/day)-1	5 E-08	3.3E-06	mg/kg/day	5.0E-04	mg/kg/day	7.E-03
				4,4'-DDE	0.08941	mg/kg	6 2E-07	mg/kg/day	3 4E-01	(mg/kg/day)-1	2.E-07	1.1E-05	mg/kg/day	5.0E-04	mg/kg/day	2.E-02
				4,4'-DDT	0 003	mg/kg	2.1E-08	mg/kg/day	3 4E-01	(mg/kg/day)-1	7.E-09	3 7E-07	mg/kg/day	5 0E-04	mg/kg/day	7 E-04
				alpha-Chlordane	0 02	mg/kg	1 4E-07	mg/kg/day	3 5E-01	(mg/kg/day)-1	5.E-08	2.4E-06	mg/kg/day	5 0E-04	mg/kg/day	5 E-03
				Aroclor-1254	2 13	mg/kg	1 5E-05	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-05	2.6E-04	mg/kg/day	2.0E-05	mg/kg/day	1 E+01
				Aroclor-1268	0.0215	mg/kg	1.5E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-07	2.6E-06	mg/kg/day	2.0E-05	mg/kg/day	1 E-01
				beta-BHC	0.0008	mg/kg	5.6E-09	mg/kg/day	1.8E+00	(mg/kg/day)-1	1.E-08	9.8E-08	mg/kg/day	3.0E-04	mg/kg/day	3.E-04
				Dieldrin	0.0057	mg/kg	4.0E-08	mg/kg/day	1 6E+01	(mg/kg/day)-1	6.E-07	6.9E-07	mg/kg/day	5.0E-05	mg/kg/day	1.E-02
				gamma-Chlordane	0.013	mg/kg	9.1E-08	mg/kg/day	3 5E-01	(mg/kg/day)-1	3.E-08	1.6E-06	mg/kg/day	5.0E-04	mg/kg/day	3.E-03
				Heptachlor Epoxide	0.0014	mg/kg	9.8E-09	mg/kg/day	9.1E+00	(mg/kg/day)-1	9.E-08	1 7E-07	mg/kg/day	1.3E-05	mg/kg/day	1.E-02
				Technical Chlordane	1.02	mg/kg	7.1E-06	mg/kg/day	3 5E-01	(mg/kg/day)-1	2.E-06	1.2E-04	mg/kg/day	5.0E-04	mg/kg/day	2.E-01
				Arsenic	0 024	mg/kg	1.7E-07	mg/kg/day	1 5E+00	(mg/kg/day)-1	3.E-07	2.9E-06	mg/kg/day	3.0E-04	mg/kg/day	1.E-02
				Cadmium	0.017	mg/kg	NC		NC			2.1E-06	mg/kg/day	1 0E-03	mg/kg/day	2.E-03
				Chromium	0 197	mg/kg	NC		NC			2.4E-05	mg/kg/day	3.0E-03	mg/kg/day	8 E-03
				Lead	0 33	mg/kg	2.3E-06	mg/kg/day	--			4.0E-05	mg/kg/day			
				Manganese	4 31	mg/kg	NC		NC			5.3E-04	mg/kg/day	1.4E-01	mg/kg/day	4 E-03
				Mercury	0.141	mg/kg	NC		NC			1.7E-05	mg/kg/day	3.0E-04	mg/kg/day	6.E-02
				Mercury (methyl)	0.127	mg/kg	NC		NC			1.5E-05	mg/kg/day	1.0E-04	mg/kg/day	2.E-01
				Toxicity Equivalency (PCB Congeners)	0.0000257	mg/kg	1 8E-10	mg/kg/day	1 5E+05	(mg/kg/day)-1	3 E-05	3 1E-09	mg/kg/day			
				Toxicity Equivalency (Dioxins/Furans)	0 00037	mg/kg	2.6E-09	mg/kg/day	1.5E+05	(mg/kg/day)-1	4.E-04	4.5E-08	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4 E-04					1.4 E+01
		EXPOSURE POINT TOTAL									4.E-04					1.4.E+01
	EXPOSURE MEDIUM TOTAL										4.E-04					1.4 E+01
COMBINED FISH DIET TOTAL											4.E-04					1.4.E+01
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	4.E-04				TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA	1.4.E+01

NOTES.
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TABLE 7.20.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	LYMAN MILL POND	INGESTION	2-Methylnaphthalene	0.1	mg/kg	NC		NC			9.1E-10	mg/kg/day	2.0E-02	mg/kg/day	5.E-08
				4-Chloro-3-methylphenol	1.4	mg/kg	NC		NC			1.3E-08	mg/kg/day	5.0E-03	mg/kg/day	3.E-06
				4-Nitrophenol	2.2	mg/kg	NC		NC			2.0E-08	mg/kg/day			
				Acenaphthylene	0.42856	mg/kg	NC		NC			3.9E-09	mg/kg/day	6.0E-02	mg/kg/day	7.E-08
				Benzo(a)anthracene	2.8	mg/kg	1.1E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-10	2.6E-08	mg/kg/day	3.0E-02	mg/kg/day	9.E-07
				Benzo(a)pyrene	2.9	mg/kg	1.1E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	8.E-09	2.6E-08	mg/kg/day	3.0E-02	mg/kg/day	9.E-07
				Benzo(b)fluoranthene	4.5	mg/kg	1.8E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-09	4.1E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Benzo(g,h,i)perylene	3	mg/kg	NC		NC			2.7E-08	mg/kg/day	3.0E-02	mg/kg/day	9.E-07
				Benzo(k)fluoranthene	2.1	mg/kg	8.2E-10	mg/kg/day	7.3E-02	(mg/kg/day)-1	6.E-11	1.9E-08	mg/kg/day	3.0E-02	mg/kg/day	6.E-07
				bis(2-Ethylhexyl)phthalate	5.2	mg/kg	2.0E-09	mg/kg/day	1.4E-02	(mg/kg/day)-1	3.E-11	4.7E-08	mg/kg/day	2.0E-02	mg/kg/day	2.E-06
				Dibenzo(a,h)anthracene	0.77	mg/kg	3.0E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-09	7.0E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Indeno(1,2,3-cd)pyrene	2.7	mg/kg	1.1E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-10	2.5E-08	mg/kg/day	3.0E-02	mg/kg/day	8.E-07
				N-Nitroso-di-n-propylamine	1.3	mg/kg	5.1E-10	mg/kg/day	7.0E+00	(mg/kg/day)-1	4.E-09	1.2E-08	mg/kg/day			
				Pentachlorophenol	1.4	mg/kg	5.5E-10	mg/kg/day	1.2E-01	(mg/kg/day)-1	7.E-11	1.3E-08	mg/kg/day	3.0E-02	mg/kg/day	4.E-07
				Phenanthrene	2.8	mg/kg	NC		NC			2.6E-08	mg/kg/day	3.0E-02	mg/kg/day	9.E-07
				alpha-Chlordane	0.032	mg/kg	1.3E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-12	2.9E-10	mg/kg/day	5.0E-04	mg/kg/day	6.E-07
				Aroclor-1254	0.49	mg/kg	1.9E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	4.E-10	4.5E-09	mg/kg/day	2.0E-05	mg/kg/day	2.E-04
				Aroclor-1260	0.027	mg/kg	1.1E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-11	2.5E-10	mg/kg/day	2.0E-05	mg/kg/day	1.E-05
				Aroclor-1268	0.12	mg/kg	4.7E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	9.E-11	1.1E-09	mg/kg/day	2.0E-05	mg/kg/day	5.E-05
				Dieldrin	0.0044	mg/kg	1.7E-12	mg/kg/day	1.6E+01	(mg/kg/day)-1	3.E-11	4.0E-11	mg/kg/day	5.0E-05	mg/kg/day	8.E-07
				Endosulfan II	0.005	mg/kg	NC		NC			4.6E-11	mg/kg/day	6.0E-03	mg/kg/day	8.E-09
				Endosulfan sulfate	0.0029	mg/kg	NC		NC			2.6E-11	mg/kg/day	6.0E-03	mg/kg/day	4.E-09
				gamma-Chlordane	0.015	mg/kg	5.9E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-12	1.4E-10	mg/kg/day	5.0E-04	mg/kg/day	3.E-07
				Technical Chlordane	1.29	mg/kg	5.0E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-10	1.2E-08	mg/kg/day	5.0E-04	mg/kg/day	2.E-05
				Antimony	3.1	mg/kg	NC		NC			2.8E-08	mg/kg/day	4.0E-04	mg/kg/day	7.E-05
				Arsenic	6.4	mg/kg	2.5E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	4.E-09	5.8E-08	mg/kg/day	3.0E-04	mg/kg/day	2.E-04
				Cadmium	2.1	mg/kg	NC		NC			1.9E-08	mg/kg/day	1.0E-03	mg/kg/day	2.E-05
				Chromium	200	mg/kg	NC		NC			1.8E-06	mg/kg/day	3.0E-03	mg/kg/day	6.E-04
				Lead	375	mg/kg	1.5E-07	mg/kg/day	--			3.4E-06	mg/kg/day			
				Manganese	843	mg/kg	NC		NC			7.7E-06	mg/kg/day	7.1E-02	mg/kg/day	1.E-04
				Mercury	0.62	mg/kg	NC		NC			5.7E-09	mg/kg/day	3.0E-04	mg/kg/day	2.E-05
				Nickel	69.2	mg/kg	NC		NC			6.3E-07	mg/kg/day	2.0E-02	mg/kg/day	3.E-05
				Thallium	0.58	mg/kg	NC		NC			5.3E-09	mg/kg/day	8.0E-05	mg/kg/day	7.E-05
				Vanadium	42.4	mg/kg	NC		NC			3.9E-07	mg/kg/day	7.0E-03	mg/kg/day	6.E-05
				Toxicity Equivalency (Dioxins/Furans)	0.00179	mg/kg	7.0E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-07	1.6E-11	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.000033	mg/kg	1.3E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-09	3.0E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-07					2.E-03
			DERMAL	2-Methylnaphthalene	0.1	mg/kg	NC		NC			6.8E-10	mg/kg/day	2.0E-02	mg/kg/day	3.E-08
				4-Chloro-3-methylphenol	1.4	mg/kg	NC		NC			7.3E-09	mg/kg/day	5.0E-03	mg/kg/day	1.E-06
				4-Nitrophenol	2.2	mg/kg	NC		NC			1.1E-08	mg/kg/day			
				Acenaphthylene	0.42856	mg/kg	NC		NC			2.9E-09	mg/kg/day	6.0E-02	mg/kg/day	5.E-08
				Benzo(a)anthracene	2.8	mg/kg	8.1E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-10	1.9E-08	mg/kg/day	3.0E-02	mg/kg/day	6.E-07
				Benzo(a)pyrene	2.9	mg/kg	8.4E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	6.E-09	2.0E-08	mg/kg/day	3.0E-02	mg/kg/day	7.E-07
				Benzo(b)fluoranthene	4.5	mg/kg	1.3E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-09	3.1E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Benzo(g,h,i)perylene	3	mg/kg	NC		NC			2.0E-08	mg/kg/day	3.0E-02	mg/kg/day	7.E-07
				Benzo(k)fluoranthene	2.1	mg/kg	6.1E-10	mg/kg/day	7.3E-02	(mg/kg/day)-1	4.E-11	1.4E-08	mg/kg/day	3.0E-02	mg/kg/day	5.E-07
				bis(2-Ethylhexyl)phthalate	5.2	mg/kg	1.2E-09	mg/kg/day	1.4E-02	(mg/kg/day)-1	2.E-11	2.7E-08	mg/kg/day	2.0E-02	mg/kg/day	1.E-06
				Dibenzo(a,h)anthracene	0.77	mg/kg	2.2E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-09	5.2E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Indeno(1,2,3-cd)pyrene	2.7	mg/kg	7.9E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-10	1.8E-08	mg/kg/day	3.0E-02	mg/kg/day	6.E-07
				N-Nitroso-di-n-propylamine	1.3	mg/kg	2.9E-10	mg/kg/day	7.0E+00	(mg/kg/day)-1	2.E-09	6.8E-09	mg/kg/day			
				Pentachlorophenol	1.4	mg/kg	7.8E-10	mg/kg/day	1.2E-01	(mg/kg/day)-1	9.E-11	1.8E-08	mg/kg/day	3.0E-02	mg/kg/day	6.E-07
				Phenanthrene	2.8	mg/kg	NC		NC			1.9E-08	mg/kg/day	3.0E-02	mg/kg/day	6.E-07
				alpha-Chlordane	0.032	mg/kg	2.9E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-12	6.7E-11	mg/kg/day	5.0E-04	mg/kg/day	1.E-07
				Aroclor-1254	0.49	mg/kg	1.5E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-10	3.6E-09	mg/kg/day	2.0E-05	mg/kg/day	2.E-04
				Aroclor-1260	0.027	mg/kg	8.5E-12	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-11	2.0E-10	mg/kg/day	2.0E-05	mg/kg/day	1.E-05
				Aroclor-1268	0.12	mg/kg	3.8E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	8.E-11	8.8E-10	mg/kg/day	2.0E-05	mg/kg/day	4.E-05
				Dieldrin	0.0044	mg/kg	9.8E-13	mg/kg/day	1.6E+01	(mg/kg/day)-1	2.E-11	2.3E-11	mg/kg/day	5.0E-05	mg/kg/day	5.E-07
				Endosulfan II	0.005	mg/kg	NC		NC			2.6E-11	mg/kg/day	6.0E-03	mg/kg/day	4.E-09
				Endosulfan sulfate	0.0029	mg/kg	NC		NC			1.5E-11	mg/kg/day	6.0E-03	mg/kg/day	3.E-09
				gamma-Chlordane	0.015	mg/kg	1.3E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	5.E-13	3.1E-11	mg/kg/day	5.0E-04	mg/kg/day	6.E-08
				Technical Chlordane	1.29	mg/kg	1.2E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-11	2.7E-09	mg/kg/day	5.0E-04	mg/kg/day	5.E-06
				Antimony	3.1	mg/kg	NC		NC					6.0E-05	mg/kg/day	

TABLE 7.20.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Arsenic	6.4	mg/kg	4.3E-10	mg/kg/day	1.5E+00	(mg/kg/day)-1	6.E-10	1.0E-08	mg/kg/day	3.0E-04	mg/kg/day	3.E-05
				Cadmium	2.1	mg/kg	NC		NC			1.1E-10	mg/kg/day	2.5E-05	mg/kg/day	4.E-06
				Chromium	200	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	375	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	843	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Mercury	0.62	mg/kg	NC		NC					2.1E-05	mg/kg/day	
				Nickel	69.2	mg/kg	NC		NC					8.0E-04	mg/kg/day	
				Thallium	0.58	mg/kg	NC		NC					8.0E-05	mg/kg/day	
				Vanadium	42.4	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00179	mg/kg	1.2E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-08	2.8E-12	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.000033	mg/kg	2.2E-15	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-10	5.2E-14	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-08					3.E-04
		EXPOSURE POINT TOTAL									2.E-07					2.E-03
	EXPOSURE MEDIUM TOTAL										2.E-07					2.E-03
SEDIMENT TOTAL											2.E-07					2.E-03
SURFACE WATER	SURFACE WATER	LYMAN MILL POND	INGESTION	Acenaphthylene	0.00000132	mg/l	NC		NC			1.2E-12	mg/kg/day	6.0E-02	mg/kg/day	2.E-11
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	6.7E-10	mg/kg/day	1.4E-02	mg/kg/day	9.E-12	1.6E-08	mg/kg/day	2.0E-02	mg/kg/day	8.E-07
				Aldrin	0.000023	mg/l	9.0E-13	mg/kg/day	1.7E+01	mg/kg/day	2.E-11	2.1E-11	mg/kg/day	3.0E-05	mg/kg/day	7.E-07
				alpha-Chlordane	0.000019	mg/l	7.4E-13	mg/kg/day	3.5E-01	mg/kg/day	3.E-13	1.7E-11	mg/kg/day	5.0E-04	mg/kg/day	3.E-08
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			2.9E-12	mg/kg/day	6.0E-03	mg/kg/day	5.E-10
				Endrin Aldehyde	0.000005	mg/l	NC		NC			4.6E-12	mg/kg/day	3.0E-04	mg/kg/day	2.E-08
				gamma-Chlordane	0.000021	mg/l	8.2E-13	mg/kg/day	3.5E-01	mg/kg/day	3.E-13	1.9E-11	mg/kg/day	5.0E-04	mg/kg/day	4.E-08
				Arsenic	0.0046	mg/l	1.8E-10	mg/kg/day	1.5E+00	mg/kg/day	3.E-10	4.2E-09	mg/kg/day	3.0E-04	mg/kg/day	1.E-05
				Barium	0.021	mg/l	NC		NC			1.9E-08	mg/kg/day	7.0E-02	mg/kg/day	3.E-07
				Chromium	0.0023	mg/l	NC		NC			2.1E-09	mg/kg/day	3.0E-03	mg/kg/day	7.E-07
				Lead	0.0044	mg/l	1.7E-10	mg/kg/day	--			4.0E-09	mg/kg/day			
				Manganese	0.13	mg/l	NC		NC			1.2E-07	mg/kg/day	2.4E-02	mg/kg/day	5.E-06
				Mercury	0.00000394	mg/l	NC		NC			3.6E-12	mg/kg/day	3.0E-04	mg/kg/day	1.E-08
				Thallium	0.0022	mg/l	NC		NC			2.0E-09	mg/kg/day	8.0E-05	mg/kg/day	3.E-05
				Nitrate	0.76	mg/l	NC		NC			6.9E-07	mg/kg/day	1.6E+00	mg/kg/day	4.E-07
				Nitrite-N	0.084	mg/l	NC		NC			7.7E-08	mg/kg/day	1.0E-01	mg/kg/day	8.E-07
				Toxicity Equivalency (Dioxins/Furans)	0.00000012	mg/l	4.7E-15	mg/kg/day	1.5E+05	mg/kg/day	7.E-10	1.1E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-09					5.E-05
			DERMAL	Acenaphthylene	0.00000132	mg/l	NC		NC			--		6.0E-02	mg/kg/day	
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	4.0E-07	mg/kg/day	1.4E-02	mg/kg/day	6.E-09	9.4E-06	mg/kg/day	2.0E-02	mg/kg/day	5.E-04
				Aldrin	0.000023	mg/l	3.2E-11	mg/kg/day	1.7E+01	mg/kg/day	5.E-10	7.4E-10	mg/kg/day	3.0E-05	mg/kg/day	2.E-05
				alpha-Chlordane	0.000019	mg/l	6.1E-10	mg/kg/day	3.5E-01	mg/kg/day	2.E-10	1.4E-08	mg/kg/day	5.0E-04	mg/kg/day	3.E-05
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			--		6.0E-03	mg/kg/day	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			1.3E-09	mg/kg/day	3.0E-04	mg/kg/day	4.E-06
				gamma-Chlordane	0.000021	mg/l	6.7E-10	mg/kg/day	3.5E-01	mg/kg/day	2.E-10	1.6E-08	mg/kg/day	5.0E-04	mg/kg/day	3.E-05
				Arsenic	0.0046	mg/l	4.5E-10	mg/kg/day	1.5E+00	mg/kg/day	7.E-10	1.1E-08	mg/kg/day	3.0E-04	mg/kg/day	4.E-05
				Barium	0.021	mg/l	NC		NC			4.8E-08	mg/kg/day	4.9E-03	mg/kg/day	1.E-05
				Chromium	0.0023	mg/l	NC		NC			1.1E-08	mg/kg/day	7.5E-05	mg/kg/day	1.E-04
				Lead	0.0044	mg/l	--		--			--				
				Manganese	0.13	mg/l	NC		NC			3.0E-07	mg/kg/day	9.6E-04	mg/kg/day	3.E-04
				Mercury	0.00000394	mg/l	NC		NC			9.0E-12	mg/kg/day	2.1E-05	mg/kg/day	4.E-07
				Thallium	0.0022	mg/l	NC		NC			5.0E-09	mg/kg/day	8.0E-05	mg/kg/day	6.E-05
				Nitrate	0.76	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.084	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00000012	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								7.E-09					1.E-03
		EXPOSURE POINT TOTAL									8.E-09					1.E-03
	EXPOSURE MEDIUM TOTAL										8.E-09					1.E-03
SURFACE WATER TOTAL											8.E-09					1.E-03
BIOTA	COMBINED FISH DIET	LYMAN MILL POND	INGESTION	Acenaphthylene	0.002	mg/kg	NC		NC			2.5E-07	mg/kg/day	6.0E-02	mg/kg/day	4.E-06
				Benzo(a)anthracene	0.00443	mg/kg	2.4E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	5.6E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(a)pyrene	0.0022	mg/kg	1.2E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	9.E-08	2.8E-07	mg/kg/day	3.0E-02	mg/kg/day	9.E-06
				Benzo(b)fluoranthene	0.003	mg/kg	1.6E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	3.8E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05

TABLE 7.20.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Benzo(g,h,i)perylene	0.0017	mg/kg	NC		NC			2.1E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Dibenzo(a,h)anthracene	0.0012	mg/kg	6.5E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	5.E-08	1.5E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Indeno(1,2,3-cd)pyrene	0.0019	mg/kg	1.0E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-09	2.4E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				Phenanthrene	0.014	mg/kg	NC		NC			1.8E-06	mg/kg/day	3.0E-02	mg/kg/day	6.E-05
				4,4'-DDD	0.027	mg/kg	1.5E-07	mg/kg/day	2.4E-01	(mg/kg/day)-1	3.E-08	3.4E-06	mg/kg/day	5.0E-04	mg/kg/day	7.E-03
				4,4'-DDE	0.08941	mg/kg	4.8E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	2.E-07	1.1E-05	mg/kg/day	5.0E-04	mg/kg/day	2.E-02
				4,4'-DDT	0.003	mg/kg	1.6E-08	mg/kg/day	3.4E-01	(mg/kg/day)-1	5.E-09	3.8E-07	mg/kg/day	5.0E-04	mg/kg/day	8.E-04
				alpha-Chlordane	0.02	mg/kg	1.1E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-08	2.5E-06	mg/kg/day	5.0E-04	mg/kg/day	5.E-03
				Aroclor-1254	2.13	mg/kg	1.1E-05	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-05	2.7E-04	mg/kg/day	2.0E-05	mg/kg/day	1.E+01
				Aroclor-1268	0.0215	mg/kg	1.2E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-07	2.7E-06	mg/kg/day	2.0E-05	mg/kg/day	1.E-01
				beta-BHC	0.0008	mg/kg	4.3E-09	mg/kg/day	1.8E+00	(mg/kg/day)-1	8.E-09	1.0E-07	mg/kg/day	3.0E-04	mg/kg/day	3.E-04
				Dieldrin	0.0057	mg/kg	3.1E-08	mg/kg/day	1.6E+01	(mg/kg/day)-1	5.E-07	7.2E-07	mg/kg/day	5.0E-05	mg/kg/day	1.E-02
				gamma-Chlordane	0.013	mg/kg	7.0E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-08	1.6E-06	mg/kg/day	5.0E-04	mg/kg/day	3.E-03
				Heptachlor Epoxide	0.0014	mg/kg	7.5E-09	mg/kg/day	9.1E+00	(mg/kg/day)-1	7.E-08	1.8E-07	mg/kg/day	1.3E-05	mg/kg/day	1.E-02
				Technical Chlordane	1.02	mg/kg	5.5E-06	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-06	1.3E-04	mg/kg/day	5.0E-04	mg/kg/day	3.E-01
				Arsenic	0.024	mg/kg	1.3E-07	mg/kg/day	1.5E+00	(mg/kg/day)-1	2.E-07	3.0E-06	mg/kg/day	3.0E-04	mg/kg/day	1.E-02
				Cadmium	0.017	mg/kg	NC		NC			2.1E-06	mg/kg/day	1.0E-03	mg/kg/day	2.E-03
				Chromium	0.197	mg/kg	NC		NC			2.5E-05	mg/kg/day	3.0E-03	mg/kg/day	8.E-03
				Lead	0.33	mg/kg	1.8E-06	mg/kg/day	--			4.1E-05	mg/kg/day			
				Manganese	4.31	mg/kg	NC		NC			5.4E-04	mg/kg/day	1.4E-01	mg/kg/day	4.E-03
				Mercury	0.141	mg/kg	NC		NC			1.8E-05	mg/kg/day	3.0E-04	mg/kg/day	6.E-02
				Mercury (methyl)	0.127	mg/kg	NC		NC			1.6E-05	mg/kg/day	1.0E-04	mg/kg/day	2.E-01
				Toxicity Equivalency (PCB Congeners)	0.0000257	mg/kg	1.4E-10	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-05	3.2E-09	mg/kg/day			
				Toxicity Equivalency (Dioxins/Furans)	0.00037	mg/kg	2.0E-09	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-04	4.7E-08	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-04					1.4.E+01
		EXPOSURE POINT TOTAL									3.E-04					1.4.E+01
	EXPOSURE MEDIUM TOTAL										3.E-04					1.4.E+01
COMBINED FISH DIET TOTAL											3.E-04					1.4.E+01
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	3.E-04				TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA	1.4.E+01

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TABLE 7.22.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	LYMAN MILL POND	INGESTION	2-Methylnaphthalene	0.1	mg/kg	NC		NC			2.5E-09	mg/kg/day	2.0E-02	mg/kg/day	1.E-07
				4-Chloro-3-methylphenol	1.4	mg/kg	NC		NC			3.6E-08	mg/kg/day	5.0E-03	mg/kg/day	7.E-06
				4-Nitrophenol	2.2	mg/kg	NC		NC			5.6E-08	mg/kg/day			
				Acenaphthylene	0.42856	mg/kg	NC		NC			1.1E-08	mg/kg/day	6.0E-02	mg/kg/day	2.E-07
				Benzo(a)anthracene	2.8	mg/kg	4.1E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-09	7.1E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(a)pyrene	2.9	mg/kg	4.2E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-08	7.4E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(b)fluoranthene	4.5	mg/kg	6.5E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	5.E-09	1.1E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Benzo(g,h,i)perylene	3	mg/kg	NC		NC			7.6E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(k)fluoranthene	2.1	mg/kg	3.1E-09	mg/kg/day	7.3E-02	(mg/kg/day)-1	2.E-10	5.3E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				bis(2-Ethylhexyl)phthalate	5.2	mg/kg	7.6E-09	mg/kg/day	1.4E-02	(mg/kg/day)-1	1.E-10	1.3E-07	mg/kg/day	2.0E-02	mg/kg/day	7.E-06
				Dibenzo(a,h)anthracene	0.77	mg/kg	1.1E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	8.E-09	2.0E-08	mg/kg/day	3.0E-02	mg/kg/day	7.E-07
				Indeno(1,2,3-cd)pyrene	2.7	mg/kg	3.9E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-09	6.9E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				N-Nitroso-di-n-propylamine	1.3	mg/kg	1.9E-09	mg/kg/day	7.0E+00	(mg/kg/day)-1	1.E-08	3.3E-08	mg/kg/day			
				Pentachlorophenol	1.4	mg/kg	2.0E-09	mg/kg/day	1.2E-01	(mg/kg/day)-1	2.E-10	3.6E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Phenanthrene	2.8	mg/kg	NC		NC			7.1E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				alpha-Chlordane	0.032	mg/kg	4.7E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-11	8.1E-10	mg/kg/day	5.0E-04	mg/kg/day	2.E-06
				Aroclor-1254	0.49	mg/kg	7.1E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-09	1.2E-08	mg/kg/day	2.0E-05	mg/kg/day	6.E-04
				Aroclor-1260	0.027	mg/kg	3.9E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	8.E-11	6.9E-10	mg/kg/day	2.0E-05	mg/kg/day	3.E-05
				Aroclor-1268	0.12	mg/kg	1.7E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-10	3.1E-09	mg/kg/day	2.0E-05	mg/kg/day	2.E-04
				Dieldrin	0.0044	mg/kg	6.4E-12	mg/kg/day	1.6E+01	(mg/kg/day)-1	1.E-10	1.1E-10	mg/kg/day	5.0E-05	mg/kg/day	2.E-06
				Endosulfan II	0.005	mg/kg	NC		NC			1.3E-10	mg/kg/day	6.0E-03	mg/kg/day	2.E-08
				Endosulfan sulfate	0.0029	mg/kg	NC		NC			7.4E-11	mg/kg/day	6.0E-03	mg/kg/day	1.E-08
				gamma-Chlordane	0.015	mg/kg	2.2E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	8.E-12	3.8E-10	mg/kg/day	5.0E-04	mg/kg/day	8.E-07
				Technical Chlordane	1.29	mg/kg	1.9E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	7.E-10	3.3E-08	mg/kg/day	5.0E-04	mg/kg/day	7.E-05
				Antimony	3.1	mg/kg	NC		NC			7.9E-08	mg/kg/day	4.0E-04	mg/kg/day	2.E-04
				Arsenic	6.4	mg/kg	9.3E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-08	1.6E-07	mg/kg/day	3.0E-04	mg/kg/day	5.E-04
				Cadmium	2.1	mg/kg	NC		NC			5.3E-08	mg/kg/day	1.0E-03	mg/kg/day	5.E-05
				Chromium	200	mg/kg	NC		NC			5.1E-06	mg/kg/day	3.0E-03	mg/kg/day	2.E-03
				Lead	375	mg/kg	5.5E-07	mg/kg/day	--			9.5E-06	mg/kg/day			
				Manganese	843	mg/kg	NC		NC			2.1E-05	mg/kg/day	7.1E-02	mg/kg/day	3.E-04
				Mercury	0.62	mg/kg	NC		NC			1.6E-08	mg/kg/day	3.0E-04	mg/kg/day	5.E-05
				Nickel	69.2	mg/kg	NC		NC			1.8E-06	mg/kg/day	2.0E-02	mg/kg/day	9.E-05
				Thallium	0.58	mg/kg	NC		NC			1.5E-08	mg/kg/day	8.0E-05	mg/kg/day	2.E-04
				Vanadium	42.4	mg/kg	NC		NC			1.1E-06	mg/kg/day	7.0E-03	mg/kg/day	2.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.00179	mg/kg	2.6E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	4.E-07	4.6E-11	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.000033	mg/kg	4.8E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	7.E-09	8.4E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-07					4.E-03
			DERMAL	2-Methylnaphthalene	0.1	mg/kg	NC		NC			3.2E-10	mg/kg/day	2.0E-02	mg/kg/day	2.E-08
				4-Chloro-3-methylphenol	1.4	mg/kg	NC		NC			3.5E-09	mg/kg/day	5.0E-03	mg/kg/day	7.E-07
				4-Nitrophenol	2.2	mg/kg	NC		NC			5.4E-09	mg/kg/day			
				Acenaphthylene	0.42856	mg/kg	NC		NC			1.4E-09	mg/kg/day	6.0E-02	mg/kg/day	2.E-08
				Benzo(a)anthracene	2.8	mg/kg	5.1E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-10	9.0E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				Benzo(a)pyrene	2.9	mg/kg	5.3E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-09	9.3E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				Benzo(b)fluoranthene	4.5	mg/kg	8.3E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-10	1.4E-08	mg/kg/day	3.0E-02	mg/kg/day	5.E-07
				Benzo(g,h,i)perylene	3	mg/kg	NC		NC			9.6E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				Benzo(k)fluoranthene	2.1	mg/kg	3.9E-10	mg/kg/day	7.3E-02	(mg/kg/day)-1	3.E-11	6.8E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				bis(2-Ethylhexyl)phthalate	5.2	mg/kg	7.3E-10	mg/kg/day	1.4E-02	(mg/kg/day)-1	1.E-11	1.3E-08	mg/kg/day	2.0E-02	mg/kg/day	6.E-07
				Dibenzo(a,h)anthracene	0.77	mg/kg	1.4E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-09	2.5E-09	mg/kg/day	3.0E-02	mg/kg/day	8.E-08
				Indeno(1,2,3-cd)pyrene	2.7	mg/kg	5.0E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-10	8.7E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				N-Nitroso-di-n-propylamine	1.3	mg/kg	1.8E-10	mg/kg/day	7.0E+00	(mg/kg/day)-1	1.E-09	3.2E-09	mg/kg/day			
				Pentachlorophenol	1.4	mg/kg	4.9E-10	mg/kg/day	1.2E-01	(mg/kg/day)-1	6.E-11	8.7E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				Phenanthrene	2.8	mg/kg	NC		NC			9.0E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				alpha-Chlordane	0.032	mg/kg	1.8E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	6.E-13	3.2E-11	mg/kg/day	5.0E-04	mg/kg/day	6.E-08
				Aroclor-1254	0.49	mg/kg	9.7E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-10	1.7E-09	mg/kg/day	2.0E-05	mg/kg/day	8.E-05
				Aroclor-1260	0.027	mg/kg	5.3E-12	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-11	9.3E-11	mg/kg/day	2.0E-05	mg/kg/day	5.E-06
				Aroclor-1268	0.12	mg/kg	2.4E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	5.E-11	4.2E-10	mg/kg/day	2.0E-05	mg/kg/day	2.E-05
				Dieldrin	0.0044	mg/kg	6.2E-13	mg/kg/day	1.6E+01	(mg/kg/day)-1	1.E-11	1.1E-11	mg/kg/day	5.0E-05	mg/kg/day	2.E-07
				Endosulfan II	0.005	mg/kg	NC		NC			1.2E-11	mg/kg/day	6.0E-03	mg/kg/day	2.E-09
				Endosulfan sulfate	0.0029	mg/kg	NC		NC			7.2E-12	mg/kg/day	6.0E-03	mg/kg/day	1.E-09
				gamma-Chlordane	0.015	mg/kg	8.5E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-13	1.5E-11	mg/kg/day	5.0E-04	mg/kg/day	3.E-08
				Technical Chlordane	1.29	mg/kg	7.3E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-11	1.3E-09	mg/kg/day	5.0E-04	mg/kg/day	3.E-06

TABLE 7.22.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Antimony	3.1	mg/kg	NC		NC					6.0E-05	mg/kg/day	
				Arsenic	6.4	mg/kg	2.7E-10	mg/kg/day	1.5E+00	(mg/kg/day)-1	4.E-10	4.7E-09	mg/kg/day	3.0E-04	mg/kg/day	2.E-05
				Cadmium	2.1	mg/kg	NC		NC			5.2E-11	mg/kg/day	2.5E-05	mg/kg/day	2.E-06
				Chromium	200	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	375	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	843	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Mercury	0.62	mg/kg	NC		NC					2.1E-05	mg/kg/day	
				Nickel	69.2	mg/kg	NC		NC					8.0E-04	mg/kg/day	
				Thallium	0.58	mg/kg	NC		NC					8.0E-05	mg/kg/day	
				Vanadium	42.4	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00179	mg/kg	7.6E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-08	1.3E-12	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.000033	mg/kg	1.4E-15	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-10	2.4E-14	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-08					1.E-04
		EXPOSURE POINT TOTAL									5.E-07					4.E-03
	EXPOSURE MEDIUM TOTAL										5.E-07					4.E-03
SEDIMENT TOTAL											5.E-07					4.E-03
SURFACE WATER	SURFACE WATER	LYMAN MILL POND	INGESTION	Acenaphthylene	0.00000132	mg/l	NC		NC			3.4E-11	mg/kg/day	6.0E-02	mg/kg/day	6.E-10
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	2.5E-08	mg/kg/day	1.4E-02	mg/kg/day	3.E-10	4.3E-07	mg/kg/day	2.0E-02	mg/kg/day	2.E-05
				Aldrin	0.000023	mg/l	3.3E-11	mg/kg/day	1.7E+01	mg/kg/day	6.E-10	5.9E-10	mg/kg/day	3.0E-05	mg/kg/day	2.E-05
				alpha-Chlordane	0.000019	mg/l	2.8E-11	mg/kg/day	3.5E-01	mg/kg/day	1.E-11	4.8E-10	mg/kg/day	5.0E-04	mg/kg/day	1.E-06
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			8.1E-11	mg/kg/day	6.0E-03	mg/kg/day	1.E-08
				Endrin Aldehyde	0.000005	mg/l	NC		NC			1.3E-10	mg/kg/day	3.0E-04	mg/kg/day	4.E-07
				gamma-Chlordane	0.000021	mg/l	3.1E-11	mg/kg/day	3.5E-01	mg/kg/day	1.E-11	5.3E-10	mg/kg/day	5.0E-04	mg/kg/day	1.E-06
				Arsenic	0.0046	mg/l	6.7E-09	mg/kg/day	1.5E+00	mg/kg/day	1.E-08	1.2E-07	mg/kg/day	3.0E-04	mg/kg/day	4.E-04
				Barium	0.021	mg/l	NC		NC			5.3E-07	mg/kg/day	7.0E-02	mg/kg/day	8.E-06
				Chromium	0.0023	mg/l	NC		NC			5.9E-08	mg/kg/day	3.0E-03	mg/kg/day	2.E-05
				Lead	0.0044	mg/l	6.4E-09	mg/kg/day	--			1.1E-07	mg/kg/day			
				Manganese	0.13	mg/l	NC		NC			3.3E-06	mg/kg/day	2.4E-02	mg/kg/day	1.E-04
				Mercury	0.00000394	mg/l	NC		NC			1.0E-10	mg/kg/day	3.0E-04	mg/kg/day	3.E-07
				Thallium	0.0022	mg/l	NC		NC			5.6E-08	mg/kg/day	8.0E-05	mg/kg/day	7.E-04
				Nitrate	0.76	mg/l	NC		NC			1.9E-05	mg/kg/day	1.6E+00	mg/kg/day	1.E-05
				Nitrite-N	0.084	mg/l	NC		NC			2.1E-06	mg/kg/day	1.0E-01	mg/kg/day	2.E-05
				Toxicity Equivalency (Dioxins/Furans)	0.00000012	mg/l	1.7E-13	mg/kg/day	1.5E+05	mg/kg/day	3.E-08	3.1E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-08					1.E-03
			DERMAL	Acenaphthylene	0.00000132	mg/l	NC		NC			--		6.0E-02	mg/kg/day	
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	2.7E-06	mg/kg/day	1.4E-02	mg/kg/day	4.E-08	4.8E-05	mg/kg/day	2.0E-02	mg/kg/day	2.E-03
				Aldrin	0.000023	mg/l	2.1E-10	mg/kg/day	1.7E+01	mg/kg/day	4.E-09	3.8E-09	mg/kg/day	3.0E-05	mg/kg/day	1.E-04
				alpha-Chlordane	0.000019	mg/l	4.1E-09	mg/kg/day	3.5E-01	mg/kg/day	1.E-09	7.2E-08	mg/kg/day	5.0E-04	mg/kg/day	1.E-04
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			--		6.0E-03	mg/kg/day	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			6.4E-09	mg/kg/day	3.0E-04	mg/kg/day	2.E-05
				gamma-Chlordane	0.000021	mg/l	4.6E-09	mg/kg/day	3.5E-01	mg/kg/day	2.E-09	8.0E-08	mg/kg/day	5.0E-04	mg/kg/day	2.E-04
				Arsenic	0.0046	mg/l	3.1E-09	mg/kg/day	1.5E+00	mg/kg/day	5.E-09	5.4E-08	mg/kg/day	3.0E-04	mg/kg/day	2.E-04
				Barium	0.021	mg/l	NC		NC			2.4E-07	mg/kg/day	4.9E-03	mg/kg/day	5.E-05
				Chromium	0.0023	mg/l	NC		NC			5.4E-08	mg/kg/day	7.5E-05	mg/kg/day	7.E-04
				Lead	0.0044	mg/l	--		--			--				
				Manganese	0.13	mg/l	NC		NC			1.5E-06	mg/kg/day	9.6E-04	mg/kg/day	2.E-03
				Mercury	0.00000394	mg/l	NC		NC			4.6E-11	mg/kg/day	2.1E-05	mg/kg/day	2.E-06
				Thallium	0.0022	mg/l	NC		NC			2.6E-08	mg/kg/day	8.0E-05	mg/kg/day	3.E-04
				Nitrate	0.76	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.084	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00000012	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-08					6.E-03
		EXPOSURE POINT TOTAL									9.E-08					7.E-03
	EXPOSURE MEDIUM TOTAL										9.E-08					7.E-03
SURFACE WATER TOTAL											9.E-08					7.E-03

TABLE 7.22.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
BIOTA	COMBINED FISH DIET	LYMAN MILL POND	INGESTION	Acenaphthylene	0.002	mg/kg	NC		NC			2.4E-07	mg/kg/day	6.0E-02	mg/kg/day	4.E-06
				Benzo(a)anthracene	0.00443	mg/kg	3.1E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	5.4E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(a)pyrene	0.0022	mg/kg	1.5E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-07	2.7E-07	mg/kg/day	3.0E-02	mg/kg/day	9.E-06
				Benzo(b)fluoranthene	0.003	mg/kg	2.1E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	3.7E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(g,h,i)perylene	0.0017	mg/kg	NC		NC			2.1E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Dibenzo(a,h)anthracene	0.0012	mg/kg	8.4E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	6.E-08	1.5E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Indeno(1,2,3-cd)pyrene	0.0019	mg/kg	1.3E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	2.3E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				Phenanthrene	0.014	mg/kg	NC		NC			1.7E-06	mg/kg/day	3.0E-02	mg/kg/day	6.E-05
				4,4'-DDD	0.027	mg/kg	1.9E-07	mg/kg/day	2.4E-01	(mg/kg/day)-1	5.E-08	3.3E-06	mg/kg/day	5.0E-04	mg/kg/day	7.E-03
				4,4'-DDE	0.08941	mg/kg	6.2E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	2.E-07	1.1E-05	mg/kg/day	5.0E-04	mg/kg/day	2.E-02
				4,4'-DDT	0.003	mg/kg	2.1E-08	mg/kg/day	3.4E-01	(mg/kg/day)-1	7.E-09	3.7E-07	mg/kg/day	5.0E-04	mg/kg/day	7.E-04
				alpha-Chlordane	0.02	mg/kg	1.4E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	5.E-08	2.4E-06	mg/kg/day	5.0E-04	mg/kg/day	5.E-03
				Aroclor-1254	2.13	mg/kg	1.5E-05	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-05	2.6E-04	mg/kg/day	2.0E-05	mg/kg/day	1.E+01
				Aroclor-1268	0.0215	mg/kg	1.5E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-07	2.6E-06	mg/kg/day	2.0E-05	mg/kg/day	1.E-01
				beta-BHC	0.0008	mg/kg	5.6E-09	mg/kg/day	1.8E+00	(mg/kg/day)-1	1.E-08	9.8E-08	mg/kg/day	3.0E-04	mg/kg/day	3.E-04
				Dieldrin	0.0057	mg/kg	4.0E-08	mg/kg/day	1.6E+01	(mg/kg/day)-1	6.E-07	6.9E-07	mg/kg/day	5.0E-05	mg/kg/day	1.E-02
				gamma-Chlordane	0.013	mg/kg	9.1E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-08	1.6E-06	mg/kg/day	5.0E-04	mg/kg/day	3.E-03
				Heptachlor Epoxide	0.0014	mg/kg	9.8E-09	mg/kg/day	9.1E+00	(mg/kg/day)-1	9.E-08	1.7E-07	mg/kg/day	1.3E-05	mg/kg/day	1.E-02
				Technical Chlordane	1.02	mg/kg	7.1E-06	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-06	1.2E-04	mg/kg/day	5.0E-04	mg/kg/day	2.E-01
				Arsenic	0.024	mg/kg	1.7E-07	mg/kg/day	1.5E+00	(mg/kg/day)-1	3.E-07	2.9E-06	mg/kg/day	3.0E-04	mg/kg/day	1.E-02
				Cadmium	0.017	mg/kg	NC		NC			2.1E-06	mg/kg/day	1.0E-03	mg/kg/day	2.E-03
				Chromium	0.197	mg/kg	NC		NC			2.4E-05	mg/kg/day	3.0E-03	mg/kg/day	8.E-03
				Lead	0.33	mg/kg	2.3E-06	mg/kg/day	--			4.0E-05	mg/kg/day			
				Manganese	4.31	mg/kg	NC		NC			5.3E-04	mg/kg/day	1.4E-01	mg/kg/day	4.E-03
				Mercury	0.141	mg/kg	NC		NC			1.7E-05	mg/kg/day	3.0E-04	mg/kg/day	6.E-02
				Mercury (methyl)	0.127	mg/kg	NC		NC			1.5E-05	mg/kg/day	1.0E-04	mg/kg/day	2.E-01
				Toxicity Equivalency (PCB Congeners	0.0000257	mg/kg	1.8E-10	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-05	3.1E-09	mg/kg/day			
				Toxicity Equivalency (Dioxins/Furans)	0.00037	mg/kg	2.6E-09	mg/kg/day	1.5E+05	(mg/kg/day)-1	4.E-04	4.5E-08	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-04					1.4.E+01
		EXPOSURE POINT TOTAL									4.E-04					1.4.E+01
	EXPOSURE MEDIUM TOTAL										4.E-04					1.4.E+01
COMBINED FISH DIET TOTAL											4.E-04					1.4.E+01
									TOTAL RECEPTOR RISK ACROSS ALL MEDIA		4.E-04	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				1.4.E+01

NOTES
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAF

TABLE 7.23.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	LYMAN MILL POND	INGESTION	2-Methylnaphthalene	0.1	mg/kg	NC		NC			4.0E-09	mg/kg/day	2.0E-02	mg/kg/day	2 E-07
				4-Chloro-3-methylphenol	1 4	mg/kg	NC		NC			5.5E-08	mg/kg/day	5.0E-03	mg/kg/day	1.E-05
				4-Nitrophenol	2.2	mg/kg	NC		NC			8.7E-08	mg/kg/day			
				Acenaphthylene	0.42856	mg/kg	NC		NC			1 7E-08	mg/kg/day	6.0E-02	mg/kg/day	3 E-07
				Benzo(a)anthracene	2.8	mg/kg	4.7E-09	mg/kg/day	7 3E-01	(mg/kg/day)-1	3 E-09	1.1E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Benzo(a)pyrene	2.9	mg/kg	4.9E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-08	1.1E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Benzo(b)fluoranthene	4.5	mg/kg	7.6E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-09	1.8E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Benzo(g,h,i)perylene	3	mg/kg	NC		NC			1.2E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Benzo(k)fluoranthene	2.1	mg/kg	3.6E-09	mg/kg/day	7.3E-02	(mg/kg/day)-1	3.E-10	8.3E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				bis(2-Ethylhexyl)phthalate	5.2	mg/kg	8.8E-09	mg/kg/day	1.4E-02	(mg/kg/day)-1	1.E-10	2.1E-07	mg/kg/day	2.0E-02	mg/kg/day	1 E-05
				Dibenzo(a,h)anthracene	0 77	mg/kg	1.3E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-08	3.0E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Indeno(1,2,3-cd)pyrene	2.7	mg/kg	4.6E-09	mg/kg/day	7 3E-01	(mg/kg/day)-1	3.E-09	1.1E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				N-Nitroso-di-n-propylamine	1.3	mg/kg	2.2E-09	mg/kg/day	7.0E+00	(mg/kg/day)-1	2.E-08	5.1E-08	mg/kg/day			
				Pentachlorophenol	1.4	mg/kg	2 4E-09	mg/kg/day	1.2E-01	(mg/kg/day)-1	3.E-10	5.5E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Phenanthrene	2.8	mg/kg	NC		NC			1.1E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				alpha-Chlordane	0.032	mg/kg	5 4E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-11	1.3E-09	mg/kg/day	5.0E-04	mg/kg/day	3.E-06
				Aroclor-1254	0.49	mg/kg	8 3E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-09	1.9E-08	mg/kg/day	2.0E-05	mg/kg/day	1.E-03
				Aroclor-1260	0.027	mg/kg	4 6E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	9.E-11	1.1E-09	mg/kg/day	2.0E-05	mg/kg/day	5.E-05
				Aroclor-1268	0.12	mg/kg	2.0E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	4.E-10	4.7E-09	mg/kg/day	2.0E-05	mg/kg/day	2.E-04
				Dieldrin	0.0044	mg/kg	7.5E-12	mg/kg/day	1 6E+01	(mg/kg/day)-1	1 E-10	1.7E-10	mg/kg/day	5.0E-05	mg/kg/day	3.E-06
				Endosulfan II	0.005	mg/kg	NC		NC			2.0E-10	mg/kg/day	6.0E-03	mg/kg/day	3 E-08
				Endosulfan sulfate	0.0029	mg/kg	NC		NC			1.1E-10	mg/kg/day	6.0E-03	mg/kg/day	2.E-08
				gamma-Chlordane	0.015	mg/kg	2 5E-11	mg/kg/day	3 5E-01	(mg/kg/day)-1	9 E-12	5.9E-10	mg/kg/day	5.0E-04	mg/kg/day	1.E-06
				Technical Chlordane	1.29	mg/kg	2.2E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	8.E-10	5.1E-08	mg/kg/day	5 0E-04	mg/kg/day	1.E-04
				Antimony	3.1	mg/kg	NC		NC			1.2E-07	mg/kg/day	4.0E-04	mg/kg/day	3 E-04
				Arsenic	6 4	mg/kg	1 1E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	2 E-08	2.5E-07	mg/kg/day	3.0E-04	mg/kg/day	8.E-04
				Cadmium	2 1	mg/kg	NC		NC			8.3E-08	mg/kg/day	1 0E-03	mg/kg/day	8 E-05
				Chromium	200	mg/kg	NC		NC			7.9E-06	mg/kg/day	3.0E-03	mg/kg/day	3.E-03
				Lead	375	mg/kg	6.4E-07	mg/kg/day	--			1.5E-05	mg/kg/day			
				Manganese	843	mg/kg	NC		NC			3.3E-05	mg/kg/day	7.1E-02	mg/kg/day	5.E-04
				Mercury	0.62	mg/kg	NC		NC			2.5E-08	mg/kg/day	3 0E-04	mg/kg/day	8.E-05
				Nickel	69.2	mg/kg	NC		NC			2 7E-06	mg/kg/day	2.0E-02	mg/kg/day	1.E-04
				Thallium	0.58	mg/kg	NC		NC			2.3E-08	mg/kg/day	8.0E-05	mg/kg/day	3.E-04
				Vanadium	42 4	mg/kg	NC		NC			1.7E-06	mg/kg/day	7.0E-03	mg/kg/day	2.E-04
				Toxicity Equivalency (Dioxins/Furans)	0 00179	mg/kg	3.0E-12	mg/kg/day	1 5E+05	(mg/kg/day)-1	5 E-07	7.1E-11	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0 000033	mg/kg	5 6E-14	mg/kg/day	1 5E+05	(mg/kg/day)-1	8.E-09	1.3E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								6.E-07					7.E-03
			DERMAL	2-Methylnaphthalene	0.1	mg/kg	NC		NC			1.5E-09	mg/kg/day	2 0E-02	mg/kg/day	7.E-08
				4-Chloro-3-methylphenol	1.4	mg/kg	NC		NC			1.6E-08	mg/kg/day	5.0E-03	mg/kg/day	3.E-06
				4-Nitrophenol	2.2	mg/kg	NC		NC			2.5E-08	mg/kg/day			
				Acenaphthylene	0.42856	mg/kg	NC		NC			6.3E-09	mg/kg/day	6 0E-02	mg/kg/day	1.E-07
				Benzo(a)anthracene	2.8	mg/kg	1.8E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-09	4.1E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Benzo(a)pyrene	2.9	mg/kg	1.8E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	1 E-08	4.3E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Benzo(b)fluoranthene	4.5	mg/kg	2.8E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-09	6.6E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(g,h,i)perylene	3	mg/kg	NC		NC			4.4E-08	mg/kg/day	3 0E-02	mg/kg/day	1 E-06
				Benzo(k)fluoranthene	2.1	mg/kg	1.3E-09	mg/kg/day	7.3E-02	(mg/kg/day)-1	1.E-10	3.1E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				bis(2-Ethylhexyl)phthalate	5.2	mg/kg	2.5E-09	mg/kg/day	1.4E-02	(mg/kg/day)-1	4.E-11	5.9E-08	mg/kg/day	2.0E-02	mg/kg/day	3.E-06
				Dibenzo(a,h)anthracene	0.77	mg/kg	4.9E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-09	1.1E-08	mg/kg/day	3.0E-02	mg/kg/day	4.E-07
				Indeno(1,2,3-cd)pyrene	2.7	mg/kg	1.7E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-09	4.0E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				N-Nitroso-di-n-propylamine	1.3	mg/kg	6.3E-10	mg/kg/day	7.0E+00	(mg/kg/day)-1	4.E-09	1.5E-08	mg/kg/day			
				Pentachlorophenol	1.4	mg/kg	1.7E-09	mg/kg/day	1.2E-01	(mg/kg/day)-1	2.E-10	4.0E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Phenanthrene	2.8	mg/kg	NC		NC			4.1E-08	mg/kg/day	3.0E-02	mg/kg/day	1 E-06
				alpha-Chlordane	0.032	mg/kg	6.2E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-12	1.4E-10	mg/kg/day	5.0E-04	mg/kg/day	3.E-07
				Aroclor-1254	0.49	mg/kg	3.3E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	7.E-10	7.8E-09	mg/kg/day	2.0E-05	mg/kg/day	4.E-04
				Aroclor-1260	0.027	mg/kg	1.8E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	4.E-11	4.3E-10	mg/kg/day	2.0E-05	mg/kg/day	2.E-05
				Aroclor-1268	0.12	mg/kg	8 1E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-10	1.9E-09	mg/kg/day	2.0E-05	mg/kg/day	1 E-04
				Dieldrin	0.0044	mg/kg	2.1E-12	mg/kg/day	1.6E+01	(mg/kg/day)-1	3.E-11	5.0E-11	mg/kg/day	5.0E-05	mg/kg/day	1.E-06
				Endosulfan II	0.005	mg/kg	NC		NC			5.7E-11	mg/kg/day	6.0E-03	mg/kg/day	9 E-09
				Endosulfan sulfate	0 0029	mg/kg	NC		NC			3.3E-11	mg/kg/day	6.0E-03	mg/kg/day	5.E-09
				gamma-Chlordane	0.015	mg/kg	2.9E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-12	6.8E-11	mg/kg/day	5.0E-04	mg/kg/day	1.E-07
				Technical Chlordane	1 29	mg/kg	2 5E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	9.E-11	5.8E-09	mg/kg/day	5 0E-04	mg/kg/day	1.E-05
				Antimony	3 1	mg/kg	NC		NC					6.0E-05	mg/kg/day	

TABLE 7.23.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Arsenic	6.4	mg/kg	9.3E-10	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-09	2.2E-08	mg/kg/day	3.0E-04	mg/kg/day	7.E-05
				Cadmium	2.1	mg/kg	NC		NC			2.4E-10	mg/kg/day	2.5E-05	mg/kg/day	1.E-05
				Chromium	200	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	375	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	843	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Mercury	0.62	mg/kg	NC		NC					2.1E-05	mg/kg/day	
				Nickel	69.2	mg/kg	NC		NC					8.0E-04	mg/kg/day	
				Thallium	0.58	mg/kg	NC		NC					8.0E-05	mg/kg/day	
				Vanadium	42.4	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00179	mg/kg	2.6E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	4.E-08	6.1E-12	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.000033	mg/kg	4.8E-15	mg/kg/day	1.5E+05	(mg/kg/day)-1	7.E-10	1.1E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								7.E-08					6.E-04
		EXPOSURE POINT TOTAL									6.E-07					7.E-03
	EXPOSURE MEDIUM TOTAL										6.E-07					7.E-03
SEDIMENT TOTAL											6.E-07					7.E-03
SURFACE WATER	SURFACE WATER	LYMAN MILL POND	INGESTION	Acenaphthylene	0.00000132	mg/l	NC		NC			5.2E-11	mg/kg/day	6.0E-02	mg/kg/day	9.E-10
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	2.9E-08	mg/kg/day	1.4E-02	mg/kg/day	4.E-10	6.7E-07	mg/kg/day	2.0E-02	mg/kg/day	3.E-05
				Aldrin	0.000023	mg/l	3.9E-11	mg/kg/day	1.7E+01	mg/kg/day	7.E-10	9.1E-10	mg/kg/day	3.0E-05	mg/kg/day	3.E-05
				alpha-Chlordane	0.000019	mg/l	3.2E-11	mg/kg/day	3.5E-01	mg/kg/day	1.E-11	7.5E-10	mg/kg/day	5.0E-04	mg/kg/day	2.E-06
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			1.3E-10	mg/kg/day	6.0E-03	mg/kg/day	2.E-08
				Endrin Aldehyde	0.000005	mg/l	NC		NC			2.0E-10	mg/kg/day	3.0E-04	mg/kg/day	7.E-07
				gamma-Chlordane	0.000021	mg/l	3.6E-11	mg/kg/day	3.5E-01	mg/kg/day	1.E-11	8.3E-10	mg/kg/day	5.0E-04	mg/kg/day	2.E-06
				Arsenic	0.0046	mg/l	7.8E-09	mg/kg/day	1.5E+00	mg/kg/day	1.E-08	1.8E-07	mg/kg/day	3.0E-04	mg/kg/day	6.E-04
				Barium	0.021	mg/l	NC		NC			8.3E-07	mg/kg/day	7.0E-02	mg/kg/day	1.E-05
				Chromium	0.0023	mg/l	NC		NC			9.1E-08	mg/kg/day	3.0E-03	mg/kg/day	3.E-05
				Lead	0.0044	mg/l	7.5E-09	mg/kg/day	--			1.7E-07	mg/kg/day			
				Manganese	0.13	mg/l	NC		NC			5.1E-06	mg/kg/day	2.4E-02	mg/kg/day	2.E-04
				Mercury	0.00000394	mg/l	NC		NC			1.6E-10	mg/kg/day	3.0E-04	mg/kg/day	5.E-07
				Thallium	0.0022	mg/l	NC		NC			8.7E-08	mg/kg/day	8.0E-05	mg/kg/day	1.E-03
				Nitrate	0.76	mg/l	NC		NC			3.0E-05	mg/kg/day	1.6E+00	mg/kg/day	2.E-05
				Nitrite-N	0.084	mg/l	NC		NC			3.3E-06	mg/kg/day	1.0E-01	mg/kg/day	3.E-05
				Toxicity Equivalency (Dioxins/Furans)	0.00000012	mg/l	2.0E-13	mg/kg/day	1.5E+05	mg/kg/day	3.E-08	4.7E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-08					2.E-03
			DERMAL	Acenaphthylene	0.00000132	mg/l	NC		NC			--		6.0E-02	mg/kg/day	
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	2.5E-06	mg/kg/day	1.4E-02	mg/kg/day	3.E-08	3.8E-05	mg/kg/day	2.0E-02	mg/kg/day	3.E-03
				Aldrin	0.000023	mg/l	1.9E-10	mg/kg/day	1.7E+01	mg/kg/day	3.E-09	4.5E-09	mg/kg/day	3.0E-05	mg/kg/day	2.E-04
				alpha-Chlordane	0.000019	mg/l	3.7E-09	mg/kg/day	3.5E-01	mg/kg/day	1.E-09	8.7E-08	mg/kg/day	5.0E-04	mg/kg/day	2.E-04
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			--		6.0E-03	mg/kg/day	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			7.8E-09	mg/kg/day	3.0E-04	mg/kg/day	3.E-05
				gamma-Chlordane	0.000021	mg/l	4.1E-09	mg/kg/day	3.5E-01	mg/kg/day	1.E-09	9.7E-08	mg/kg/day	5.0E-04	mg/kg/day	2.E-04
				Arsenic	0.0046	mg/l	2.8E-09	mg/kg/day	1.5E+00	mg/kg/day	4.E-09	6.5E-08	mg/kg/day	3.0E-04	mg/kg/day	2.E-04
				Barium	0.021	mg/l	NC		NC			3.0E-07	mg/kg/day	4.9E-03	mg/kg/day	6.E-05
				Chromium	0.0023	mg/l	NC		NC			6.5E-08	mg/kg/day	7.5E-05	mg/kg/day	9.E-04
				Lead	0.0044	mg/l	--		--			--				
				Manganese	0.13	mg/l	NC		NC			1.8E-06	mg/kg/day	9.6E-04	mg/kg/day	2.E-03
				Mercury	0.00000394	mg/l	NC		NC			5.5E-11	mg/kg/day	2.1E-05	mg/kg/day	3.E-06
				Thallium	0.0022	mg/l	NC		NC			3.1E-08	mg/kg/day	8.0E-05	mg/kg/day	4.E-04
				Nitrate	0.76	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.084	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00000012	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-08					7.E-03
		EXPOSURE POINT TOTAL									9.E-08					9.E-03
	EXPOSURE MEDIUM TOTAL										9.E-08					9.E-03
SURFACE WATER TOTAL											9.E-08					9.E-03

TABLE 7.23.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
BIOTA	COMBINED FISH DIET	LYMAN MILL POND	INGESTION	Acenaphthylene	0.002	mg/kg	NC		NC			2.5E-07	mg/kg/day	6.0E-02	mg/kg/day	4.E-06
				Benzo(a)anthracene	0.00443	mg/kg	2.4E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	5.6E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(a)pyrene	0.0022	mg/kg	1.2E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	9.E-08	2.8E-07	mg/kg/day	3.0E-02	mg/kg/day	9.E-06
				Benzo(b)fluoranthene	0.003	mg/kg	1.6E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	3.8E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(g,h,i)perylene	0.0017	mg/kg	NC		NC			2.1E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Dibenzo(a,h)anthracene	0.0012	mg/kg	6.5E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	5.E-08	1.5E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				Indeno(1,2,3-cd)pyrene	0.0019	mg/kg	1.0E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-09	2.4E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				Phenanthrene	0.014	mg/kg	NC		NC			1.8E-06	mg/kg/day	3.0E-02	mg/kg/day	6.E-05
				4,4'-DDD	0.027	mg/kg	1.5E-07	mg/kg/day	2.4E-01	(mg/kg/day)-1	3.E-08	3.4E-06	mg/kg/day	5.0E-04	mg/kg/day	7.E-03
				4,4'-DDE	0.08941	mg/kg	4.8E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	2.E-07	1.1E-05	mg/kg/day	5.0E-04	mg/kg/day	2.E-02
				4,4'-DDT	0.003	mg/kg	1.6E-08	mg/kg/day	3.4E-01	(mg/kg/day)-1	5.E-09	3.8E-07	mg/kg/day	5.0E-04	mg/kg/day	8.E-04
				alpha-Chlordane	0.02	mg/kg	1.1E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-08	2.5E-06	mg/kg/day	5.0E-04	mg/kg/day	5.E-03
				Aroclor-1254	2.13	mg/kg	1.1E-05	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-05	2.7E-04	mg/kg/day	2.0E-05	mg/kg/day	1.E+01
				Aroclor-1268	0.0215	mg/kg	1.2E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-07	2.7E-06	mg/kg/day	2.0E-05	mg/kg/day	1.E-01
				beta-BHC	0.0008	mg/kg	4.3E-09	mg/kg/day	1.8E+00	(mg/kg/day)-1	8.E-09	1.0E-07	mg/kg/day	3.0E-04	mg/kg/day	3.E-04
				Dieldrin	0.0057	mg/kg	3.1E-08	mg/kg/day	1.6E+01	(mg/kg/day)-1	5.E-07	7.2E-07	mg/kg/day	5.0E-05	mg/kg/day	1.E-02
				gamma-Chlordane	0.013	mg/kg	7.0E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-08	1.6E-06	mg/kg/day	5.0E-04	mg/kg/day	3.E-03
				Heptachlor Epoxide	0.0014	mg/kg	7.5E-09	mg/kg/day	9.1E+00	(mg/kg/day)-1	7.E-08	1.8E-07	mg/kg/day	1.3E-05	mg/kg/day	1.E-02
				Technical Chlordane	1.02	mg/kg	5.5E-06	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-06	1.3E-04	mg/kg/day	5.0E-04	mg/kg/day	3.E-01
				Arsenic	0.024	mg/kg	1.3E-07	mg/kg/day	1.5E+00	(mg/kg/day)-1	2.E-07	3.0E-06	mg/kg/day	3.0E-04	mg/kg/day	1.E-02
				Cadmium	0.017	mg/kg	NC		NC			2.1E-06	mg/kg/day	1.0E-03	mg/kg/day	2.E-03
				Chromium	0.197	mg/kg	NC		NC			2.5E-05	mg/kg/day	3.0E-03	mg/kg/day	8.E-03
				Lead	0.33	mg/kg	1.8E-06	mg/kg/day	--			4.1E-05	mg/kg/day			
				Manganese	4.31	mg/kg	NC		NC			5.4E-04	mg/kg/day	1.4E-01	mg/kg/day	4.E-03
				Mercury	0.141	mg/kg	NC		NC			1.8E-05	mg/kg/day	3.0E-04	mg/kg/day	6.E-02
				Mercury (methyl)	0.127	mg/kg	NC		NC			1.6E-05	mg/kg/day	1.0E-04	mg/kg/day	2.E-01
				Toxicity Equivalency (PCB Congeners)	0.0000257	mg/kg	1.4E-10	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-05	3.2E-09	mg/kg/day			
				Toxicity Equivalency (Dioxins/Furans)	0.00037	mg/kg	2.0E-09	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-04	4.7E-08	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-04					1.4.E+01
		EXPOSURE POINT TOTAL									3.E-04					1.4.E+01
	EXPOSURE MEDIUM TOTAL										3.E-04					1.4.E+01
COMBINED FISH DIET TOTAL											3.E-04					1.4.E+01
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	3.E-04				TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA	1.4.E+01

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TABLE 7.24.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS – CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	LYMAN MILL POND	INGESTION	2-Methylnaphthalene	0.1	mg/kg	NC		NC			4.7E-08	mg/kg/day	2.0E-02	mg/kg/day	2.E-06
				4-Chloro-3-methylphenol	1.4	mg/kg	NC		NC			6.6E-07	mg/kg/day	5.0E-03	mg/kg/day	1.E-04
				4-Nitrophenol	2.2	mg/kg	NC		NC			1.0E-06	mg/kg/day			
				Acenaphthylene	0.42856	mg/kg	NC		NC			2.0E-07	mg/kg/day	6.0E-02	mg/kg/day	3.E-06
				Benzo(a)anthracene	2.8	mg/kg	3.8E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-08	1.3E-06	mg/kg/day	3.0E-02	mg/kg/day	4.E-05
				Benzo(a)pyrene	2.9	mg/kg	3.9E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-07	1.4E-06	mg/kg/day	3.0E-02	mg/kg/day	5.E-05
				Benzo(b)fluoranthene	4.5	mg/kg	6.1E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-08	2.1E-06	mg/kg/day	3.0E-02	mg/kg/day	7.E-05
				Benzo(g,h,i)perylene	3	mg/kg	NC		NC			1.4E-06	mg/kg/day	3.0E-02	mg/kg/day	5.E-05
				Benzo(k)fluoranthene	2.1	mg/kg	2.8E-08	mg/kg/day	7.3E-02	(mg/kg/day)-1	2.E-09	1.0E-06	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				bis(2-Ethylhexyl)phthalate	5.2	mg/kg	7.1E-08	mg/kg/day	1.4E-02	(mg/kg/day)-1	1.E-09	2.5E-06	mg/kg/day	2.0E-02	mg/kg/day	1.E-04
				Dibenzo(a,h)anthracene	0.77	mg/kg	1.0E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	8.E-08	3.7E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Indeno(1,2,3-cd)pyrene	2.7	mg/kg	3.7E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-08	1.3E-06	mg/kg/day	3.0E-02	mg/kg/day	4.E-05
				N-Nitroso-di-n-propylamine	1.3	mg/kg	1.8E-08	mg/kg/day	7.0E+00	(mg/kg/day)-1	1.E-07	6.2E-07	mg/kg/day			
				Pentachlorophenol	1.4	mg/kg	1.9E-08	mg/kg/day	1.2E-01	(mg/kg/day)-1	2.E-09	6.6E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Phenanthrene	2.8	mg/kg	NC		NC			1.3E-06	mg/kg/day	3.0E-02	mg/kg/day	4.E-05
				alpha-Chlordane	0.032	mg/kg	4.3E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-10	1.5E-08	mg/kg/day	5.0E-04	mg/kg/day	3.E-05
				Aroclor-1254	0.49	mg/kg	6.6E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-08	2.3E-07	mg/kg/day	2.0E-05	mg/kg/day	1.E-02
				Aroclor-1260	0.027	mg/kg	3.7E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	7.E-10	1.3E-08	mg/kg/day	2.0E-05	mg/kg/day	6.E-04
				Aroclor-1268	0.12	mg/kg	1.6E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-09	5.7E-08	mg/kg/day	2.0E-05	mg/kg/day	3.E-03
				Dieldrin	0.0044	mg/kg	6.0E-11	mg/kg/day	1.6E+01	(mg/kg/day)-1	1.E-09	2.1E-09	mg/kg/day	5.0E-05	mg/kg/day	4.E-05
				Endosulfan II	0.005	mg/kg	NC		NC			2.4E-09	mg/kg/day	6.0E-03	mg/kg/day	4.E-07
				Endosulfan sulfate	0.0029	mg/kg	NC		NC			1.4E-09	mg/kg/day	6.0E-03	mg/kg/day	2.E-07
				gamma-Chlordane	0.015	mg/kg	2.0E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	7.E-11	7.1E-09	mg/kg/day	5.0E-04	mg/kg/day	1.E-05
				Technical Chlordane	1.29	mg/kg	1.8E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	6.E-09	6.1E-07	mg/kg/day	5.0E-04	mg/kg/day	1.E-03
				Antimony	3.1	mg/kg	NC		NC			1.5E-06	mg/kg/day	4.0E-04	mg/kg/day	4.E-03
				Arsenic	6.4	mg/kg	8.7E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-07	3.0E-06	mg/kg/day	3.0E-04	mg/kg/day	1.E-02
				Cadmium	2.1	mg/kg	NC		NC			1.0E-06	mg/kg/day	1.0E-03	mg/kg/day	1.E-03
				Chromium	200	mg/kg	NC		NC			9.5E-05	mg/kg/day	3.0E-03	mg/kg/day	3.E-02
				Lead	375	mg/kg	5.1E-06	mg/kg/day	--			1.8E-04	mg/kg/day			
				Manganese	843	mg/kg	NC		NC			4.0E-04	mg/kg/day	7.1E-02	mg/kg/day	6.E-03
				Mercury	0.62	mg/kg	NC		NC			2.9E-07	mg/kg/day	3.0E-04	mg/kg/day	1.E-03
				Nickel	69.2	mg/kg	NC		NC			3.3E-05	mg/kg/day	2.0E-02	mg/kg/day	2.E-03
				Thallium	0.58	mg/kg	NC		NC			2.8E-07	mg/kg/day	8.0E-05	mg/kg/day	3.E-03
				Vanadium	42.4	mg/kg	NC		NC			2.0E-05	mg/kg/day	7.0E-03	mg/kg/day	3.E-03
				Toxicity Equivalency (Dioxins/Furans)	0.00179	mg/kg	2.4E-11	mg/kg/day	1.5E+05	(mg/kg/day)-1	4.E-06	8.5E-10	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.000033	mg/kg	4.5E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	7.E-08	1.6E-11	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-06					8.E-02
			DERMAL	2-Methylnaphthalene	0.1	mg/kg	NC		NC			6.9E-09	mg/kg/day	2.0E-02	mg/kg/day	3.E-07
				4-Chloro-3-methylphenol	1.4	mg/kg	NC		NC			7.4E-08	mg/kg/day	5.0E-03	mg/kg/day	1.E-05
				4-Nitrophenol	2.2	mg/kg	NC		NC			1.2E-07	mg/kg/day			
				Acenaphthylene	0.42856	mg/kg	NC		NC			3.0E-08	mg/kg/day	6.0E-02	mg/kg/day	5.E-07
				Benzo(a)anthracene	2.8	mg/kg	5.5E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-09	1.9E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Benzo(a)pyrene	2.9	mg/kg	5.7E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-08	2.0E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Benzo(b)fluoranthene	4.5	mg/kg	8.9E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-09	3.1E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(g,h,i)perylene	3	mg/kg	NC		NC			2.1E-07	mg/kg/day	3.0E-02	mg/kg/day	7.E-06
				Benzo(k)fluoranthene	2.1	mg/kg	4.1E-09	mg/kg/day	7.3E-02	(mg/kg/day)-1	3.E-10	1.5E-07	mg/kg/day	3.0E-02	mg/kg/day	5.E-06
				bis(2-Ethylhexyl)phthalate	5.2	mg/kg	7.9E-09	mg/kg/day	1.4E-02	(mg/kg/day)-1	1.E-10	2.8E-07	mg/kg/day	2.0E-02	mg/kg/day	1.E-05
				Dibenzo(a,h)anthracene	0.77	mg/kg	1.5E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-08	5.5E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Indeno(1,2,3-cd)pyrene	2.7	mg/kg	5.3E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-09	1.9E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				N-Nitroso-di-n-propylamine	1.3	mg/kg	2.0E-09	mg/kg/day	7.0E+00	(mg/kg/day)-1	1.E-08	6.9E-08	mg/kg/day			
				Pentachlorophenol	1.4	mg/kg	5.3E-09	mg/kg/day	1.2E-01	(mg/kg/day)-1	6.E-10	1.9E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Phenanthrene	2.8	mg/kg	NC		NC			1.9E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				alpha-Chlordane	0.032	mg/kg	1.9E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	7.E-12	6.8E-10	mg/kg/day	5.0E-04	mg/kg/day	1.E-06
				Aroclor-1254	0.49	mg/kg	1.0E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-09	3.6E-08	mg/kg/day	2.0E-05	mg/kg/day	2.E-03
				Aroclor-1260	0.027	mg/kg	5.7E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-10	2.0E-09	mg/kg/day	2.0E-05	mg/kg/day	1.E-04
				Aroclor-1268	0.12	mg/kg	2.6E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	5.E-10	8.9E-09	mg/kg/day	2.0E-05	mg/kg/day	4.E-04
				Dieldrin	0.0044	mg/kg	6.7E-12	mg/kg/day	1.6E+01	(mg/kg/day)-1	1.E-10	2.3E-10	mg/kg/day	5.0E-05	mg/kg/day	5.E-06
				Endosulfan II	0.005	mg/kg	NC		NC			2.7E-10	mg/kg/day	6.0E-03	mg/kg/day	4.E-08
				Endosulfan sulfate	0.0029	mg/kg	NC		NC			1.5E-10	mg/kg/day	6.0E-03	mg/kg/day	3.E-08
				gamma-Chlordane	0.015	mg/kg	9.1E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-12	3.2E-10	mg/kg/day	5.0E-04	mg/kg/day	6.E-07
				Technical Chlordane	1.29	mg/kg	7.8E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-10	2.7E-08	mg/kg/day	5.0E-04	mg/kg/day	5.E-05
				Antimony	3.1	mg/kg	NC		NC					6.0E-05	mg/kg/day	

TABLE 7.24.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS – CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Arsenic	6.4	mg/kg	2.9E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	4.E-09	1.0E-07	mg/kg/day	3.0E-04	mg/kg/day	3.E-04
				Cadmium	2.1	mg/kg	NC		NC			1.1E-09	mg/kg/day	2.5E-05	mg/kg/day	4.E-05
				Chromium	200	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	375	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	843	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Mercury	0.62	mg/kg	NC		NC					2.1E-05	mg/kg/day	
				Nickel	69.2	mg/kg	NC		NC					8.0E-04	mg/kg/day	
				Thallium	0.58	mg/kg	NC		NC					8.0E-05	mg/kg/day	
				Vanadium	42.4	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00179	mg/kg	8.2E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-07	2.9E-11	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	0.000033	mg/kg	1.5E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-09	5.3E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-07					3.E-03
		EXPOSURE POINT TOTAL									5.E-06					8.E-02
	EXPOSURE MEDIUM TOTAL										5.E-06					8.E-02
SEDIMENT TOTAL											5.E-06					8.E-02
SURFACE WATER	SURFACE WATER	LYMAN MILL POND	INGESTION	Acenaphthylene	0.00000132	mg/l	NC		NC			1.6E-10	mg/kg/day	6.0E-02	mg/kg/day	3.E-09
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	5.8E-08	mg/kg/day	1.4E-02	mg/kg/day	8.E-10	2.0E-06	mg/kg/day	2.0E-02	mg/kg/day	1.E-04
				Aldrin	0.000023	mg/l	7.8E-11	mg/kg/day	1.7E+01	mg/kg/day	1.E-09	2.7E-09	mg/kg/day	3.0E-05	mg/kg/day	9.E-05
				alpha-Chlordane	0.000019	mg/l	6.4E-11	mg/kg/day	3.5E-01	mg/kg/day	2.E-11	2.3E-09	mg/kg/day	5.0E-04	mg/kg/day	5.E-06
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			3.8E-10	mg/kg/day	6.0E-03	mg/kg/day	6.E-08
				Endrin Aldehyde	0.000005	mg/l	NC		NC			5.9E-10	mg/kg/day	3.0E-04	mg/kg/day	2.E-06
				gamma-Chlordane	0.000021	mg/l	7.1E-11	mg/kg/day	3.5E-01	mg/kg/day	2.E-11	2.5E-09	mg/kg/day	5.0E-04	mg/kg/day	5.E-06
				Arsenic	0.0046	mg/l	1.6E-08	mg/kg/day	1.5E+00	mg/kg/day	2.E-08	5.5E-07	mg/kg/day	3.0E-04	mg/kg/day	2.E-03
				Barium	0.021	mg/l	NC		NC			2.5E-06	mg/kg/day	7.0E-02	mg/kg/day	4.E-05
				Chromium	0.0023	mg/l	NC		NC			2.7E-07	mg/kg/day	3.0E-03	mg/kg/day	9.E-05
				Lead	0.0044	mg/l	1.5E-08	mg/kg/day	--			5.2E-07	mg/kg/day			
				Manganese	0.13	mg/l	NC		NC			1.5E-05	mg/kg/day	2.4E-02	mg/kg/day	6.E-04
				Mercury	0.00000394	mg/l	NC		NC			4.7E-10	mg/kg/day	3.0E-04	mg/kg/day	2.E-06
				Thallium	0.0022	mg/l	NC		NC			2.6E-07	mg/kg/day	8.0E-05	mg/kg/day	3.E-03
				Nitrate	0.76	mg/l	NC		NC			9.0E-05	mg/kg/day	1.6E+00	mg/kg/day	6.E-05
				Nitrite-N	0.084	mg/l	NC		NC			1.0E-05	mg/kg/day	1.0E-01	mg/kg/day	1.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.00000012	mg/l	4.1E-13	mg/kg/day	1.5E+05	mg/kg/day	6.E-08	1.4E-11	mg/kg/day			
			EXPOSURE ROUTE TOTAL								9.E-08					6.E-03
			DERMAL	Acenaphthylene	0.00000132	mg/l	NC		NC			--		6.0E-02	mg/kg/day	
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	1.5E-06	mg/kg/day	1.4E-02	mg/kg/day	2.E-08	5.2E-05	mg/kg/day	2.0E-02	mg/kg/day	3.E-03
				Aldrin	0.000023	mg/l	1.2E-10	mg/kg/day	1.7E+01	mg/kg/day	2.E-09	4.1E-09	mg/kg/day	3.0E-05	mg/kg/day	1.E-04
				alpha-Chlordane	0.000019	mg/l	2.3E-09	mg/kg/day	3.5E-01	mg/kg/day	8.E-10	7.9E-08	mg/kg/day	5.0E-04	mg/kg/day	2.E-04
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			--		6.0E-03	mg/kg/day	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			7.0E-09	mg/kg/day	3.0E-04	mg/kg/day	2.E-05
				gamma-Chlordane	0.000021	mg/l	2.5E-09	mg/kg/day	3.5E-01	mg/kg/day	9.E-10	8.7E-08	mg/kg/day	5.0E-04	mg/kg/day	2.E-04
				Arsenic	0.0046	mg/l	1.7E-09	mg/kg/day	1.5E+00	mg/kg/day	3.E-09	5.9E-08	mg/kg/day	3.0E-04	mg/kg/day	2.E-04
				Barium	0.021	mg/l	NC		NC			2.7E-07	mg/kg/day	4.9E-03	mg/kg/day	5.E-05
				Chromium	0.0023	mg/l	NC		NC			5.9E-08	mg/kg/day	7.5E-05	mg/kg/day	8.E-04
				Lead	0.0044	mg/l	--		--			--				
				Manganese	0.13	mg/l	NC		NC			1.7E-06	mg/kg/day	9.6E-04	mg/kg/day	2.E-03
				Mercury	0.00000394	mg/l	NC		NC			5.0E-11	mg/kg/day	2.1E-05	mg/kg/day	2.E-06
				Thallium	0.0022	mg/l	NC		NC			2.8E-08	mg/kg/day	8.0E-05	mg/kg/day	3.E-04
				Nitrate	0.76	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.084	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00000012	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-08					6.E-03
		EXPOSURE POINT TOTAL									1.E-07					1.E-02
	EXPOSURE MEDIUM TOTAL										1.E-07					1.E-02
SURFACE WATER TOTAL											1.E-07					1.E-02

TABLE 7.24.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS -- CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
BIOTA	COMBINED FISH DIET	LYMAN MILL POND	INGESTION	Acenaphthylene	0.002	mg/kg	NC		NC			3.8E-07	mg/kg/day	6.0E-02	mg/kg/day	6.E-06
				Benzo(a)anthracene	0.00443	mg/kg	2.4E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	8.5E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				Benzo(a)pyrene	0.0022	mg/kg	1.2E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	9.E-08	4.2E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(b)fluoranthene	0.003	mg/kg	1.6E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	5.8E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(g,h,i)perylene	0.0017	mg/kg	NC		NC			3.3E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Dibenzo(a,h)anthracene	0.0012	mg/kg	6.6E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	5.E-08	2.3E-07	mg/kg/day	3.0E-02	mg/kg/day	8.E-06
				Indeno(1,2,3-cd)pyrene	0.0019	mg/kg	1.0E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-09	3.6E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Phenanthrene	0.014	mg/kg	NC		NC			2.7E-06	mg/kg/day	3.0E-02	mg/kg/day	9.E-05
				4,4'-DDD	0.027	mg/kg	1.5E-07	mg/kg/day	2.4E-01	(mg/kg/day)-1	4.E-08	5.2E-06	mg/kg/day	5.0E-04	mg/kg/day	1.E-02
				4,4'-DDE	0.08941	mg/kg	4.9E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	2.E-07	1.7E-05	mg/kg/day	5.0E-04	mg/kg/day	3.E-02
				4,4'-DDT	0.003	mg/kg	1.6E-08	mg/kg/day	3.4E-01	(mg/kg/day)-1	6.E-09	5.8E-07	mg/kg/day	5.0E-04	mg/kg/day	1.E-03
				alpha-Chlordane	0.02	mg/kg	1.1E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-08	3.8E-06	mg/kg/day	5.0E-04	mg/kg/day	8.E-03
				Aroclor-1254	2.13	mg/kg	1.2E-05	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-05	4.1E-04	mg/kg/day	2.0E-05	mg/kg/day	2.E+01
				Aroclor-1268	0.0215	mg/kg	1.2E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-07	4.1E-06	mg/kg/day	2.0E-05	mg/kg/day	2.E-01
				beta-BHC	0.0008	mg/kg	4.4E-09	mg/kg/day	1.8E+00	(mg/kg/day)-1	8.E-09	1.5E-07	mg/kg/day	3.0E-04	mg/kg/day	5.E-04
				Dieldrin	0.0057	mg/kg	3.1E-08	mg/kg/day	1.6E+01	(mg/kg/day)-1	5.E-07	1.1E-06	mg/kg/day	5.0E-05	mg/kg/day	2.E-02
				gamma-Chlordane	0.013	mg/kg	7.1E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-08	2.5E-06	mg/kg/day	5.0E-04	mg/kg/day	5.E-03
				Heptachlor Epoxide	0.0014	mg/kg	7.7E-09	mg/kg/day	9.1E+00	(mg/kg/day)-1	7.E-08	2.7E-07	mg/kg/day	1.3E-05	mg/kg/day	2.E-02
				Technical Chlordane	1.02	mg/kg	5.6E-06	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-06	2.0E-04	mg/kg/day	5.0E-04	mg/kg/day	4.E-01
				Arsenic	0.024	mg/kg	1.3E-07	mg/kg/day	1.5E+00	(mg/kg/day)-1	2.E-07	4.6E-06	mg/kg/day	3.0E-04	mg/kg/day	2.E-02
				Cadmium	0.017	mg/kg	NC		NC			3.3E-06	mg/kg/day	1.0E-03	mg/kg/day	3.E-03
				Chromium	0.197	mg/kg	NC		NC			3.8E-05	mg/kg/day	3.0E-03	mg/kg/day	1.E-02
				Lead	0.33	mg/kg	1.8E-06	mg/kg/day	--			6.3E-05	mg/kg/day			
				Manganese	4.31	mg/kg	NC		NC			8.3E-04	mg/kg/day	1.4E-01	mg/kg/day	6.E-03
				Mercury	0.141	mg/kg	NC		NC			2.7E-05	mg/kg/day	3.0E-04	mg/kg/day	9.E-02
				Mercury (methyl)	0.127	mg/kg	NC		NC			2.4E-05	mg/kg/day	1.0E-04	mg/kg/day	2.E-01
				Toxicity Equivalency (PCB Congeners)	0.0000257	mg/kg	1.4E-10	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-05	4.9E-09	mg/kg/day			
				Toxicity Equivalency (Dioxins/Furans)	0.00037	mg/kg	2.0E-09	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-04	7.1E-08	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-04					2.1.E+01
		EXPOSURE POINT TOTAL									4.E-04					2.1.E+01
	EXPOSURE MEDIUM TOTAL										4.E-04					2.1.E+01
COMBINED FISH DIET TOTAL											4.E-04					2.1.E+01
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	4.E-04				TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA	2.2.E+01

NOTES.
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable. exposure route not applicable for this chemical/exposure medium.
-- - Not calculated: dose-response data and/or dermal absorption values are not available.

Prepared by KJA
Checked by RAR

TABLE 7.25.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	MANTON POND	INGESTION	Benzo(a)anthracene	0.15	mg/kg	5.0E-11	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-11	8.8E-10	mg/kg/day	3.0E-02	mg/kg/day	3.E-08
				Benzo(a)pyrene	0.18	mg/kg	6.0E-11	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-10	1.1E-09	mg/kg/day	3.0E-02	mg/kg/day	4.E-08
				Benzo(b)fluoranthene	0.31	mg/kg	1.0E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	8.E-11	1.8E-09	mg/kg/day	3.0E-02	mg/kg/day	6.E-08
				Benzo(g,h,i)perylene	0.11	mg/kg	NC		NC			6.5E-10	mg/kg/day	3.0E-02	mg/kg/day	2.E-08
				Benzo(k)fluoranthene	0.18	mg/kg	6.0E-11	mg/kg/day	7.3E-02	(mg/kg/day)-1	4.E-12	1.1E-09	mg/kg/day	3.0E-02	mg/kg/day	4.E-08
				bis(2-Ethylhexyl)phthalate	0.31	mg/kg	1.0E-10	mg/kg/day	1.4E-02	(mg/kg/day)-1	1.E-12	1.8E-09	mg/kg/day	2.0E-02	mg/kg/day	9.E-08
				Indeno(1,2,3-cd)pyrene	0.15	mg/kg	5.0E-11	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-11	8.8E-10	mg/kg/day	3.0E-02	mg/kg/day	3.E-08
				Phenanthrene	0.14	mg/kg	NC		NC			8.2E-10	mg/kg/day	3.0E-02	mg/kg/day	3.E-08
				alpha-Chlordane	0.0022	mg/kg	7.4E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-13	1.3E-11	mg/kg/day	5.0E-04	mg/kg/day	3.E-08
				gamma-Chlordane	0.0025	mg/kg	8.4E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-13	1.5E-11	mg/kg/day	5.0E-04	mg/kg/day	3.E-08
				Arsenic	0.77	mg/kg	2.6E-10	mg/kg/day	1.5E+00	(mg/kg/day)-1	4.E-10	4.5E-09	mg/kg/day	3.0E-04	mg/kg/day	2.E-05
				Cadmium	0.68	mg/kg	NC		NC			4.0E-09	mg/kg/day	1.0E-03	mg/kg/day	4.E-06
				Chromium	13.4	mg/kg	NC		NC			7.9E-08	mg/kg/day	3.0E-03	mg/kg/day	3.E-05
				Lead	45.9	mg/kg	1.5E-08	mg/kg/day	--			2.7E-07	mg/kg/day			
				Manganese	128	mg/kg	NC		NC			7.5E-07	mg/kg/day	7.1E-02	mg/kg/day	1.E-05
				Vanadium	5.7	mg/kg	NC		NC			3.3E-08	mg/kg/day	7.0E-03	mg/kg/day	5.E-06
				Toxicity Equivalency (Dioxins/Furans)	0.00043	mg/kg	1.4E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-08	2.5E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-08					6.E-05
			DERMAL	Benzo(a)anthracene	0.15	mg/kg	1.3E-11	mg/kg/day	7.3E-01	(mg/kg/day)-1	9.E-12	2.2E-10	mg/kg/day	3.0E-02	mg/kg/day	7.E-09
				Benzo(a)pyrene	0.18	mg/kg	1.5E-11	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-10	2.7E-10	mg/kg/day	3.0E-02	mg/kg/day	9.E-09
				Benzo(b)fluoranthene	0.31	mg/kg	2.6E-11	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-11	4.6E-10	mg/kg/day	3.0E-02	mg/kg/day	2.E-08
				Benzo(g,h,i)perylene	0.11	mg/kg	NC		NC			1.6E-10	mg/kg/day	3.0E-02	mg/kg/day	5.E-09
				Benzo(k)fluoranthene	0.18	mg/kg	1.5E-11	mg/kg/day	7.3E-02	(mg/kg/day)-1	1.E-12	2.7E-10	mg/kg/day	3.0E-02	mg/kg/day	9.E-09
				bis(2-Ethylhexyl)phthalate	0.31	mg/kg	2.0E-11	mg/kg/day	1.4E-02	(mg/kg/day)-1	3.E-13	3.5E-10	mg/kg/day	2.0E-02	mg/kg/day	2.E-08
				Indeno(1,2,3-cd)pyrene	0.15	mg/kg	1.3E-11	mg/kg/day	7.3E-01	(mg/kg/day)-1	9.E-12	2.2E-10	mg/kg/day	3.0E-02	mg/kg/day	7.E-09
				Phenanthrene	0.14	mg/kg	NC		NC			2.1E-10	mg/kg/day	3.0E-02	mg/kg/day	7.E-09
				alpha-Chlordane	0.0022	mg/kg	5.7E-14	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-14	3.0E-12	mg/kg/day	5.0E-04	mg/kg/day	2.E-09
				gamma-Chlordane	0.0025	mg/kg	6.5E-14	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-14	1.1E-12	mg/kg/day	5.0E-04	mg/kg/day	2.E-09
				Arsenic	0.77	mg/kg	1.5E-11	mg/kg/day	1.5E+00	(mg/kg/day)-1	2.E-11	2.6E-10	mg/kg/day	3.0E-04	mg/kg/day	9.E-07
				Cadmium	0.68	mg/kg	NC		NC			7.8E-12	mg/kg/day	2.5E-05	mg/kg/day	3.E-07
				Chromium	13.4	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	45.9	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	128	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Vanadium	5.7	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00043	mg/kg	8.4E-15	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-09	1.5E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-09					1.E-06
		EXPOSURE POINT TOTAL									2.E-08					6.E-05
	EXPOSURE MEDIUM TOTAL										2.E-08					6.E-05
SEDIMENT TOTAL											2.E-08					6.E-05
SURFACE WATER	SURFACE WATER	MANTON POND	INGESTION	Acenaphthylene	0.00000132	mg/l	NC		NC			7.7E-13	mg/kg/day	6.0E-02	mg/kg/day	1.E-11
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	5.7E-10	mg/kg/day	1.4E-02	mg/kg/day	8.E-12	1.0E-08	mg/kg/day	2.0E-02	mg/kg/day	5.E-07
				Aldrin	0.000023	mg/l	7.7E-13	mg/kg/day	1.7E+01	mg/kg/day	1.E-11	1.4E-11	mg/kg/day	3.0E-05	mg/kg/day	5.E-07
				alpha-Chlordane	0.000019	mg/l	6.4E-13	mg/kg/day	3.5E-01	mg/kg/day	2.E-13	1.1E-11	mg/kg/day	5.0E-04	mg/kg/day	2.E-08
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			1.9E-12	mg/kg/day	6.0E-03	mg/kg/day	3.E-10
				Endrin Aldehyde	0.000005	mg/l	NC		NC			2.9E-12	mg/kg/day	3.0E-04	mg/kg/day	1.E-08
				gamma-Chlordane	0.000021	mg/l	7.0E-13	mg/kg/day	3.5E-01	mg/kg/day	2.E-13	1.2E-11	mg/kg/day	5.0E-04	mg/kg/day	2.E-08
				Arsenic	0.0046	mg/l	1.5E-10	mg/kg/day	1.5E+00	mg/kg/day	2.E-10	2.7E-09	mg/kg/day	3.0E-04	mg/kg/day	9.E-06
				Barium	0.021	mg/l	NC		NC			1.2E-08	mg/kg/day	7.0E-02	mg/kg/day	2.E-07
				Chromium	0.0023	mg/l	NC		NC			1.4E-09	mg/kg/day	3.0E-03	mg/kg/day	5.E-07
				Lead	0.0044	mg/l	1.5E-10	mg/kg/day	--			2.6E-09	mg/kg/day			
				Manganese	0.13	mg/l	NC		NC			7.6E-08	mg/kg/day	2.4E-02	mg/kg/day	3.E-06
				Mercury	0.00000394	mg/l	NC		NC			2.3E-12	mg/kg/day	3.0E-04	mg/kg/day	8.E-09
				Thallium	0.0022	mg/l	NC		NC			1.3E-09	mg/kg/day	8.0E-05	mg/kg/day	2.E-05
				Nitrate	0.76	mg/l	NC		NC			4.5E-07	mg/kg/day	1.6E+00	mg/kg/day	3.E-07
				Nitrite-N	0.084	mg/l	NC		NC			4.9E-08	mg/kg/day	1.0E-01	mg/kg/day	5.E-07

TABLE 7.25.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Toxicity Equivalency (Dioxins/Furans)	0.00000012	mg/l	4.0E-15	mg/kg/day	1.5E+05	mg/kg/day	6.E-10	7.0E-14	mg/kg/day			
			EXPOSURE ROUTE TOTAL								9.E-10					3.E-05
			DERMAL	Acenaphthylene	0.00000132	mg/l	NC		NC			--		6.0E-02	mg/kg/day	
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	4.8E-07	mg/kg/day	1.4E-02	mg/kg/day	7.E-09	8.4E-06	mg/kg/day	2.0E-02	mg/kg/day	4.E-04
				Aldrin	0.000023	mg/l	3.8E-11	mg/kg/day	1.7E+01	mg/kg/day	6.E-10	6.6E-10	mg/kg/day	3.0E-05	mg/kg/day	2.E-05
				alpha-Chlordane	0.000019	mg/l	7.3E-10	mg/kg/day	3.5E-01	mg/kg/day	3.E-10	1.3E-08	mg/kg/day	5.0E-04	mg/kg/day	3.E-05
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			--		6.0E-03	mg/kg/day	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			1.1E-09	mg/kg/day	3.0E-04	mg/kg/day	4.E-06
				gamma-Chlordane	0.000021	mg/l	8.0E-10	mg/kg/day	3.5E-01	mg/kg/day	3.E-10	1.4E-08	mg/kg/day	5.0E-04	mg/kg/day	3.E-05
				Arsenic	0.0046	mg/l	5.4E-10	mg/kg/day	1.5E+00	mg/kg/day	8.E-10	9.4E-09	mg/kg/day	3.0E-04	mg/kg/day	3.E-05
				Barium	0.021	mg/l	NC		NC			4.3E-08	mg/kg/day	4.9E-03	mg/kg/day	9.E-06
				Chromium	0.0023	mg/l	NC		NC			9.4E-09	mg/kg/day	7.5E-05	mg/kg/day	1.E-04
				Lead	0.0044	mg/l	--		--			--				
				Manganese	0.13	mg/l	NC		NC			2.7E-07	mg/kg/day	9.6E-04	mg/kg/day	3.E-04
				Mercury	0.00000394	mg/l	NC		NC			8.0E-12	mg/kg/day	2.1E-05	mg/kg/day	4.E-07
				Thallium	0.0022	mg/l	NC		NC			4.5E-09	mg/kg/day	8.0E-05	mg/kg/day	6.E-05
				Nitrate	0.76	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.084	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00000012	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								9.E-09					1.E-03
		EXPOSURE POINT TOTAL									1.E-08					1.E-03
	EXPOSURE MEDIUM TOTAL										1.E-08					1.E-03
SURFACE WATER TOTAL											1.E-08					1.E-03
BIOTA	COMBINED FISH DIET	MANTON POND	INGESTION	Acenaphthylene	0.0003	mg/kg	NC		NC			3.7E-08	mg/kg/day	6.0E-02	mg/kg/day	6.E-07
				Dibenzo(a,h)anthracene	0.00022	mg/kg	4.6E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-08	2.7E-08	mg/kg/day	3.0E-02	mg/kg/day	9.E-07
				Phenanthrene	0.00293	mg/kg	NC		NC			3.6E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				4,4'-DDE	0.00886	mg/kg	1.9E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	6.E-08	1.1E-06	mg/kg/day	5.0E-04	mg/kg/day	2.E-03
				alpha-Chlordane	0.0014	mg/kg	2.9E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-08	1.7E-07	mg/kg/day	5.0E-04	mg/kg/day	3.E-04
				Aroclor-1254	0.1247	mg/kg	2.6E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	5.E-06	1.5E-05	mg/kg/day	2.0E-05	mg/kg/day	8.E-01
				Aroclor-1268	0.03292	mg/kg	6.9E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-06	4.0E-06	mg/kg/day	2.0E-05	mg/kg/day	2.E-01
				Dieldrin	0.00052	mg/kg	1.1E-08	mg/kg/day	1.6E+01	(mg/kg/day)-1	2.E-07	6.3E-08	mg/kg/day	5.0E-05	mg/kg/day	1.E-03
				Endosulfan Sulfate	0.00096	mg/kg	NC		NC			1.2E-07	mg/kg/day	6.0E-03	mg/kg/day	2.E-05
				gamma-Chlordane	0.00052	mg/kg	1.1E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-09	6.3E-08	mg/kg/day	5.0E-04	mg/kg/day	1.E-04
				Technical Chlordane	0.04062	mg/kg	8.5E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-07	5.0E-06	mg/kg/day	5.0E-04	mg/kg/day	1.E-02
				Lead	0.0113	mg/kg	2.4E-07	mg/kg/day	--			1.4E-06	mg/kg/day			
				Mercury	0.185	mg/kg	NC		NC			2.3E-05	mg/kg/day	3.0E-04	mg/kg/day	8.E-02
				Mercury (methyl)	0.149	mg/kg	NC		NC			1.8E-05	mg/kg/day	1.0E-04	mg/kg/day	2.E-01
				Toxicity Equivalency (Dioxins/Furans)	0.0000186	mg/kg	3.9E-10	mg/kg/day	1.5E+05	(mg/kg/day)-1	6.E-05	2.3E-09	mg/kg/day			
			EXPOSURE ROUTE TOTAL								7.E-05					1.E+00
		EXPOSURE POINT TOTAL									7.E-05					1.E+00
	EXPOSURE MEDIUM TOTAL										7.E-05					1.E+00
COMBINED FISH DIET TOTAL											7.E-05					1.E+00
							TOTAL RECEPTOR RISK ACROSS ALL MEDIA				7.E-05	TOTAL RECEPTOR HAZARD ACROSS ALL MED				1.2.E+00

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TABLE 7.26.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	MANTON POND	INGESTION	Benzo(a)anthracene	0.15	mg/kg	5.9E-11	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-11	1.4E-09	mg/kg/day	3.0E-02	mg/kg/day	5.E-08
				Benzo(a)pyrene	0.18	mg/kg	7.0E-11	mg/kg/day	7.3E+00	(mg/kg/day)-1	5.E-10	1.6E-09	mg/kg/day	3.0E-02	mg/kg/day	5 E-08
				Benzo(b)fluoranthene	0.31	mg/kg	1 2E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	9.E-11	2.8E-09	mg/kg/day	3.0E-02	mg/kg/day	9 E-08
				Benzo(g,h,i)perylene	0.11	mg/kg	NC		NC			1.0E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-08
				Benzo(k)fluoranthene	0.18	mg/kg	7.0E-11	mg/kg/day	7.3E-02	(mg/kg/day)-1	5.E-12	1.6E-09	mg/kg/day	3.0E-02	mg/kg/day	5.E-08
				bis(2-Ethylhexyl)phthalate	0.31	mg/kg	1.2E-10	mg/kg/day	1.4E-02	(mg/kg/day)-1	2.E-12	2.8E-09	mg/kg/day	2.0E-02	mg/kg/day	1 E-07
				Indeno(1,2,3-cd)pyrene	0 15	mg/kg	5.9E-11	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-11	1.4E-09	mg/kg/day	3.0E-02	mg/kg/day	5.E-08
				Phenanthrene	0.14	mg/kg	NC		NC			1.3E-09	mg/kg/day	3.0E-02	mg/kg/day	4 E-08
				alpha-Chlordane	0.0022	mg/kg	8.6E-13	mg/kg/day	3 5E-01	(mg/kg/day)-1	3.E-13	2.0E-11	mg/kg/day	5.0E-04	mg/kg/day	4 E-08
				gamma-Chlordane	0.0025	mg/kg	9.8E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-13	2.3E-11	mg/kg/day	5.0E-04	mg/kg/day	5 E-08
				Arsenic	0.77	mg/kg	3.0E-10	mg/kg/day	1 5E+00	(mg/kg/day)-1	5 E-10	7.0E-09	mg/kg/day	3.0E-04	mg/kg/day	2.E-05
				Cadmium	0.68	mg/kg	NC		NC			6.2E-09	mg/kg/day	1 0E-03	mg/kg/day	6.E-06
				Chromium	13.4	mg/kg	NC		NC			1.2E-07	mg/kg/day	3 0E-03	mg/kg/day	4 E-05
				Lead	45.9	mg/kg	1.8E-08	mg/kg/day	--			4.2E-07	mg/kg/day			
				Manganese	128	mg/kg	NC		NC			1.2E-06	mg/kg/day	7.1E-02	mg/kg/day	2 E-05
				Vanadium	5.7	mg/kg	NC		NC			5.2E-08	mg/kg/day	7.0E-03	mg/kg/day	7.E-06
				Toxicity Equivalency (Dioxins/Furans)	0.00043	mg/kg	1.7E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-08	3 9E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-08					9.E-05
			DERMAL	Benzo(a)anthracene	0 15	mg/kg	4.4E-11	mg/kg/day	7 3E-01	(mg/kg/day)-1	3.E-11	1.0E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-08
				Benzo(a)pyrene	0 18	mg/kg	5.2E-11	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-10	1.2E-09	mg/kg/day	3.0E-02	mg/kg/day	4 E-08
				Benzo(b)fluoranthene	0.31	mg/kg	9.0E-11	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-11	2.1E-09	mg/kg/day	3.0E-02	mg/kg/day	7 E-08
				Benzo(g,h,i)perylene	0.11	mg/kg	NC		NC			7.5E-10	mg/kg/day	3.0E-02	mg/kg/day	2 E-08
				Benzo(k)fluoranthene	0 18	mg/kg	5 2E-11	mg/kg/day	7.3E-02	(mg/kg/day)-1	4 E-12	1 2E-09	mg/kg/day	3.0E-02	mg/kg/day	4 E-08
				bis(2-Ethylhexyl)phthalate	0 31	mg/kg	6.9E-11	mg/kg/day	1.4E-02	(mg/kg/day)-1	1.E-12	1 6E-09	mg/kg/day	2.0E-02	mg/kg/day	8 E-08
				Indeno(1,2,3-cd)pyrene	0 15	mg/kg	4 4E-11	mg/kg/day	7 3E-01	(mg/kg/day)-1	3 E-11	1 0E-09	mg/kg/day	3 0E-02	mg/kg/day	3 E-08
				Phenanthrene	0 14	mg/kg	NC		NC			9.5E-10	mg/kg/day	3 0E-02	mg/kg/day	3 E-08
				alpha-Chlordane	0 0022	mg/kg	2 0E-13	mg/kg/day	3 5E-01	(mg/kg/day)-1	7.E-14	4.6E-12	mg/kg/day	5.0E-04	mg/kg/day	9 E-09
				gamma-Chlordane	0.0025	mg/kg	2.2E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	8 E-14	5.2E-12	mg/kg/day	5.0E-04	mg/kg/day	1 E-08
				Arsenic	0.77	mg/kg	5 2E-11	mg/kg/day	1.5E+00	(mg/kg/day)-1	8.E-11	1 2E-09	mg/kg/day	3.0E-04	mg/kg/day	4 E-06
				Cadmium	0.68	mg/kg	NC		NC			3.6E-11	mg/kg/day	2.5E-05	mg/kg/day	1.E-06
				Chromium	13 4	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	45.9	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	128	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Vanadium	5.7	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0 00043	mg/kg	2.9E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	4.E-09	6.7E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5 E-09					6 E-06
		EXPOSURE POINT TOTAL									3 E-08					1.E-04
	EXPOSURE MEDIUM TOTAL										3.E-08					1 E-04
SEDIMENT TOTAL											3.E-08					1.E-04
SURFACE WATER	SURFACE WATER	MANTON POND	INGESTION	Acenaphthylene	0.00000132	mg/l	NC		NC			1.2E-12	mg/kg/day	6.0E-02	mg/kg/day	2 E-11
				bis(2-Ethylhexyl)phthalate	0 017	mg/l	6.7E-10	mg/kg/day	1.4E-02	mg/kg/day	9.E-12	1.6E-08	mg/kg/day	2.0E-02	mg/kg/day	8.E-07
				Aldrin	0.000023	mg/l	9.0E-13	mg/kg/day	1.7E+01	mg/kg/day	2.E-11	2.1E-11	mg/kg/day	3.0E-05	mg/kg/day	7 E-07
				alpha-Chlordane	0.000019	mg/l	7 4E-13	mg/kg/day	3 5E-01	mg/kg/day	3 E-13	1.7E-11	mg/kg/day	5.0E-04	mg/kg/day	3 E-08
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			2.9E-12	mg/kg/day	6.0E-03	mg/kg/day	5 E-10
				Endrin Aldehyde	0.000005	mg/l	NC		NC			4.6E-12	mg/kg/day	3.0E-04	mg/kg/day	2.E-08
				gamma-Chlordane	0 000021	mg/l	8 2E-13	mg/kg/day	3.5E-01	mg/kg/day	3.E-13	1.9E-11	mg/kg/day	5.0E-04	mg/kg/day	4 E-08
				Arsenic	0.0046	mg/l	1.8E-10	mg/kg/day	1 5E+00	mg/kg/day	3.E-10	4.2E-09	mg/kg/day	3.0E-04	mg/kg/day	1.E-05
				Barium	0.021	mg/l	NC		NC			1.9E-08	mg/kg/day	7 0E-02	mg/kg/day	3.E-07
				Chromium	0.0023	mg/l	NC		NC			2.1E-09	mg/kg/day	3.0E-03	mg/kg/day	7 E-07
				Lead	0.0044	mg/l	1.7E-10	mg/kg/day	--			4.0E-09	mg/kg/day			
				Manganese	0.13	mg/l	NC		NC			1.2E-07	mg/kg/day	2.4E-02	mg/kg/day	5.E-06
				Mercury	0.00000394	mg/l	NC		NC			3.6E-12	mg/kg/day	3.0E-04	mg/kg/day	1.E-08
				Thallium	0.0022	mg/l	NC		NC			2.0E-09	mg/kg/day	8.0E-05	mg/kg/day	3.E-05
				Nitrate	0.76	mg/l	NC		NC			6.9E-07	mg/kg/day	1.6E+00	mg/kg/day	4 E-07
				Nitrite-N	0.084	mg/l	NC		NC			7.7E-08	mg/kg/day	1.0E-01	mg/kg/day	8.E-07
				Toxicity Equivalency (Dioxins/Furans)	0.00000012	mg/l	4.7E-15	mg/kg/day	1.5E+05	mg/kg/day	7 E-10	1.1E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1 E-09					5 E-05

TABLE 7.26.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
			DERMAL	Acenaphthylene	0.00000132	mg/l	NC		NC			--		6.0E-02	mg/kg/day	
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	4.0E-07	mg/kg/day	1.4E-02	mg/kg/day	6 E-09	9 4E-06	mg/kg/day	2.0E-02	mg/kg/day	5.E-04
				Aldrin	0.000023	mg/l	3.2E-11	mg/kg/day	1 7E+01	mg/kg/day	5.E-10	7.4E-10	mg/kg/day	3.0E-05	mg/kg/day	2 E-05
				alpha-Chlordane	0.000019	mg/l	6 1E-10	mg/kg/day	3 5E-01	mg/kg/day	2.E-10	1.4E-08	mg/kg/day	5 0E-04	mg/kg/day	3 E-05
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			--		6 0E-03	mg/kg/day	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			1 3E-09	mg/kg/day	3 0E-04	mg/kg/day	4 E-06
				gamma-Chlordane	0.000021	mg/l	6 7E-10	mg/kg/day	3.5E-01	mg/kg/day	2 E-10	1 6E-08	mg/kg/day	5 0E-04	mg/kg/day	3 E-05
				Arsenic	0.0046	mg/l	4.5E-10	mg/kg/day	1 5E+00	mg/kg/day	7 E-10	1 1E-08	mg/kg/day	3 0E-04	mg/kg/day	4 E-05
				Barium	0 021	mg/l	NC		NC			4 8E-08	mg/kg/day	4 9E-03	mg/kg/day	1 E-05
				Chromium	0 0023	mg/l	NC		NC			1 1E-08	mg/kg/day	7 5E-05	mg/kg/day	1 E-04
				Lead	0 0044	mg/l	--		--			--				
				Manganese	0 13	mg/l	NC		NC			3 0E-07	mg/kg/day	9 6E-04	mg/kg/day	3 E-04
				Mercury	0 00000394	mg/l	NC		NC			9.0E-12	mg/kg/day	2 1E-05	mg/kg/day	4 E-07
				Thallium	0 0022	mg/l	NC		NC			5.0E-09	mg/kg/day	8.0E-05	mg/kg/day	6 E-05
				Nitrate	0.76	mg/l	NC		NC			--		1 6E+00	mg/kg/day	
				Nitrite-N	0.084	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00000012	mg/l	0 0E+00	mg/kg/day	1 5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								7.E-09					1 E-03
		EXPOSURE POINT TOTAL									8.E-09					1 E-03
	EXPOSURE MEDIUM TOTAL										8.E-09					1.E-03
SURFACE WATER TOTAL											8.E-09					1.E-03
BIOTA	COMBINED FISH DIET	MANTON POND	INGESTION	Acenaphthylene	0.0003	mg/kg	NC		NC			3.8E-08	mg/kg/day	6.0E-02	mg/kg/day	6.E-07
				Dibenzo(a,h)anthracene	0.00022	mg/kg	4.7E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-08	2.8E-08	mg/kg/day	3.0E-02	mg/kg/day	9.E-07
				Phenanthrene	0.00293	mg/kg	NC		NC			3.7E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				4,4'-DDE	0.00886	mg/kg	1.9E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	6.E-08	1.1E-06	mg/kg/day	5.0E-04	mg/kg/day	2.E-03
				alpha-Chlordane	0.0014	mg/kg	3.0E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-08	1.8E-07	mg/kg/day	5 0E-04	mg/kg/day	4.E-04
				Aroclor-1254	0.1247	mg/kg	2.7E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	5.E-06	1.6E-05	mg/kg/day	2.0E-05	mg/kg/day	8.E-01
				Aroclor-1268	0 03292	mg/kg	7 1E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-06	4.1E-06	mg/kg/day	2.0E-05	mg/kg/day	2.E-01
				Dieldrin	0 00052	mg/kg	1.1E-08	mg/kg/day	1 6E+01	(mg/kg/day)-1	2.E-07	6.5E-08	mg/kg/day	5.0E-05	mg/kg/day	1.E-03
				Endosulfan Sulfate	0.00096	mg/kg	NC		NC			1.2E-07	mg/kg/day	6.0E-03	mg/kg/day	2.E-05
				gamma-Chlordane	0.00052	mg/kg	1.1E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-09	6.5E-08	mg/kg/day	5.0E-04	mg/kg/day	1 E-04
				Technical Chlordane	0.04062	mg/kg	8.8E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-07	5.1E-06	mg/kg/day	5 0E-04	mg/kg/day	1.E-02
				Lead	0.0113	mg/kg	2.4E-07	mg/kg/day	--			1.4E-06	mg/kg/day			
				Mercury	0.185	mg/kg	NC		NC			2.3E-05	mg/kg/day	3.0E-04	mg/kg/day	8.E-02
				Mercury (methyl)	0.149	mg/kg	NC		NC			1.9E-05	mg/kg/day	1.0E-04	mg/kg/day	2.E-01
				Toxicity Equivalency (Dioxins/Furans)	0.0000186	mg/kg	4.0E-10	mg/kg/day	1.5E+05	(mg/kg/day)-1	6.E-05	2.3E-09	mg/kg/day			
			EXPOSURE ROUTE TOTAL								7.E-05					1 E+00
		EXPOSURE POINT TOTAL									7 E-05					1 E+00
	EXPOSURE MEDIUM TOTAL										7.E-05					1 E+00
COMBINED FISH DIET TOTAL											7.E-05					1.E+00
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	7.E-05	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				1.3.E+00

NOTES
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable: exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TABLE 7.28.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	MANTON POND	INGESTION	Benzo(a)anthracene	0.15	mg/kg	2.2E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-10	3.8E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				Benzo(a)pyrene	0.18	mg/kg	2.6E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-09	4.6E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Benzo(b)fluoranthene	0.31	mg/kg	4.5E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-10	7.9E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				Benzo(g,h,i)perylene	0.11	mg/kg	NC		NC			2.8E-09	mg/kg/day	3.0E-02	mg/kg/day	9.E-08
				Benzo(k)fluoranthene	0.18	mg/kg	2.6E-10	mg/kg/day	7.3E-02	(mg/kg/day)-1	2.E-11	4.6E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				bis(2-Ethylhexyl)phthalate	0.31	mg/kg	4.5E-10	mg/kg/day	1.4E-02	(mg/kg/day)-1	6.E-12	7.9E-09	mg/kg/day	2.0E-02	mg/kg/day	4.E-07
				Indeno(1,2,3-cd)pyrene	0.15	mg/kg	2.2E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-10	3.8E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				Phenanthrene	0.14	mg/kg	NC		NC			3.6E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				alpha-Chlordane	0.0022	mg/kg	3.2E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-12	5.6E-11	mg/kg/day	5.0E-04	mg/kg/day	1.E-07
				gamma-Chlordane	0.0025	mg/kg	3.6E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-12	6.4E-11	mg/kg/day	5.0E-04	mg/kg/day	1.E-07
				Arsenic	0.77	mg/kg	1.1E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	2.E-09	2.0E-08	mg/kg/day	3.0E-04	mg/kg/day	7.E-05
				Cadmium	0.68	mg/kg	NC		NC			1.7E-08	mg/kg/day	1.0E-03	mg/kg/day	2.E-05
				Chromium	13.4	mg/kg	NC		NC			3.4E-07	mg/kg/day	3.0E-03	mg/kg/day	1.E-04
				Lead	45.9	mg/kg	6.7E-08	mg/kg/day	--			1.2E-06	mg/kg/day			
				Manganese	128	mg/kg	NC		NC			3.3E-06	mg/kg/day	7.1E-02	mg/kg/day	5.E-05
				Vanadium	5.7	mg/kg	NC		NC			1.5E-07	mg/kg/day	7.0E-03	mg/kg/day	2.E-05
				Toxicity Equivalency (Dioxins/Furans)	0.00043	mg/kg	6.3E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	9.E-08	1.1E-11	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-07					3.E-04
			DERMAL	Benzo(a)anthracene	0.15	mg/kg	2.8E-11	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-11	4.8E-10	mg/kg/day	3.0E-02	mg/kg/day	2.E-08
				Benzo(a)pyrene	0.18	mg/kg	3.3E-11	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-10	5.8E-10	mg/kg/day	3.0E-02	mg/kg/day	2.E-08
				Benzo(b)fluoranthene	0.31	mg/kg	5.7E-11	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-11	1.0E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-08
				Benzo(g,h,i)perylene	0.11	mg/kg	NC		NC			3.5E-10	mg/kg/day	3.0E-02	mg/kg/day	1.E-08
				Benzo(k)fluoranthene	0.18	mg/kg	3.3E-11	mg/kg/day	7.3E-02	(mg/kg/day)-1	2.E-12	5.8E-10	mg/kg/day	3.0E-02	mg/kg/day	2.E-08
				bis(2-Ethylhexyl)phthalate	0.31	mg/kg	4.4E-11	mg/kg/day	1.4E-02	(mg/kg/day)-1	6.E-13	7.7E-10	mg/kg/day	2.0E-02	mg/kg/day	4.E-08
				Indeno(1,2,3-cd)pyrene	0.15	mg/kg	2.8E-11	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-11	4.8E-10	mg/kg/day	3.0E-02	mg/kg/day	2.E-08
				Phenanthrene	0.14	mg/kg	NC		NC			4.5E-10	mg/kg/day	3.0E-02	mg/kg/day	2.E-08
				alpha-Chlordane	0.0022	mg/kg	1.2E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-14	2.2E-12	mg/kg/day	5.0E-04	mg/kg/day	4.E-09
				gamma-Chlordane	0.0025	mg/kg	1.4E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	5.E-14	2.5E-12	mg/kg/day	5.0E-04	mg/kg/day	5.E-09
				Arsenic	0.77	mg/kg	3.3E-11	mg/kg/day	1.5E+00	(mg/kg/day)-1	5.E-11	5.7E-10	mg/kg/day	3.0E-04	mg/kg/day	2.E-06
				Cadmium	0.68	mg/kg	NC		NC			1.7E-11	mg/kg/day	2.5E-05	mg/kg/day	7.E-07
				Chromium	13.4	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	45.9	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	128	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Vanadium	5.7	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00043	mg/kg	1.8E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-09	3.2E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-09					3.E-06
		EXPOSURE POINT TOTAL									1.E-07					3.E-04
	EXPOSURE MEDIUM TOTAL										1.E-07					3.E-04
SEDIMENT TOTAL											1.E-07					3.E-04
SURFACE WATER	SURFACE WATER	MANTON POND	INGESTION	Acenaphthylene	0.00000132	mg/l	NC		NC			3.4E-11	mg/kg/day	6.0E-02	mg/kg/day	6.E-10
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	2.5E-08	mg/kg/day	1.4E-02	mg/kg/day	3.E-10	4.3E-07	mg/kg/day	2.0E-02	mg/kg/day	2.E-05
				Aldrin	0.000023	mg/l	3.3E-11	mg/kg/day	1.7E+01	mg/kg/day	6.E-10	5.9E-10	mg/kg/day	3.0E-05	mg/kg/day	2.E-05
				alpha-Chlordane	0.000019	mg/l	2.8E-11	mg/kg/day	3.5E-01	mg/kg/day	1.E-11	4.8E-10	mg/kg/day	5.0E-04	mg/kg/day	1.E-06
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			8.1E-11	mg/kg/day	6.0E-03	mg/kg/day	1.E-08
				Endrin Aldehyde	0.000005	mg/l	NC		NC			1.3E-10	mg/kg/day	3.0E-04	mg/kg/day	4.E-07
				gamma-Chlordane	0.000021	mg/l	3.1E-11	mg/kg/day	3.5E-01	mg/kg/day	1.E-11	5.3E-10	mg/kg/day	5.0E-04	mg/kg/day	1.E-06
				Arsenic	0.0046	mg/l	6.7E-09	mg/kg/day	1.5E+00	mg/kg/day	1.E-08	1.2E-07	mg/kg/day	3.0E-04	mg/kg/day	4.E-04
				Barium	0.021	mg/l	NC		NC			5.3E-07	mg/kg/day	7.0E-02	mg/kg/day	8.E-06
				Chromium	0.0023	mg/l	NC		NC			5.9E-08	mg/kg/day	3.0E-03	mg/kg/day	2.E-05
				Lead	0.0044	mg/l	6.4E-09	mg/kg/day	--			1.1E-07	mg/kg/day			
				Manganese	0.13	mg/l	NC		NC			3.3E-06	mg/kg/day	2.4E-02	mg/kg/day	1.E-04
				Mercury	0.00000394	mg/l	NC		NC			1.0E-10	mg/kg/day	3.0E-04	mg/kg/day	3.E-07
				Thallium	0.0022	mg/l	NC		NC			5.6E-08	mg/kg/day	8.0E-05	mg/kg/day	7.E-04
				Nitrate	0.76	mg/l	NC		NC			1.9E-05	mg/kg/day	1.6E+00	mg/kg/day	1.E-05
				Nitrite-N	0.084	mg/l	NC		NC			2.1E-06	mg/kg/day	1.0E-01	mg/kg/day	2.E-05

TABLE 7.28.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Toxicity Equivalency (Dioxins/Furans)	0.00000012	mg/l	1.7E-13	mg/kg/day	1.5E+05	mg/kg/day	3.E-08	3.1E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-08					1.E-03
			DERMAL	Acenaphthylene	0.00000132	mg/l	NC		NC			--		6.0E-02	mg/kg/day	
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	2.7E-06	mg/kg/day	1.4E-02	mg/kg/day	4.E-08	4.8E-05	mg/kg/day	2.0E-02	mg/kg/day	2.E-03
				Aldrin	0.000023	mg/l	2.1E-10	mg/kg/day	1.7E+01	mg/kg/day	4.E-09	3.8E-09	mg/kg/day	3.0E-05	mg/kg/day	1.E-04
				alpha-Chlordane	0.000019	mg/l	4.1E-09	mg/kg/day	3.5E-01	mg/kg/day	1.E-09	7.2E-08	mg/kg/day	5.0E-04	mg/kg/day	1.E-04
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			--		6.0E-03	mg/kg/day	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			6.4E-09	mg/kg/day	3.0E-04	mg/kg/day	2.E-05
				gamma-Chlordane	0.000021	mg/l	4.6E-09	mg/kg/day	3.5E-01	mg/kg/day	2.E-09	8.0E-08	mg/kg/day	5.0E-04	mg/kg/day	2.E-04
				Arsenic	0.0046	mg/l	3.1E-09	mg/kg/day	1.5E+00	mg/kg/day	5.E-09	5.4E-08	mg/kg/day	3.0E-04	mg/kg/day	2.E-04
				Barium	0.021	mg/l	NC		NC			2.4E-07	mg/kg/day	4.9E-03	mg/kg/day	5.E-05
				Chromium	0.0023	mg/l	NC		NC			5.4E-08	mg/kg/day	7.5E-05	mg/kg/day	7.E-04
				Lead	0.0044	mg/l	--		--			--				
				Manganese	0.13	mg/l	NC		NC			1.5E-06	mg/kg/day	9.6E-04	mg/kg/day	2.E-03
				Mercury	0.00000394	mg/l	NC		NC			4.6E-11	mg/kg/day	2.1E-05	mg/kg/day	2.E-06
				Thallium	0.0022	mg/l	NC		NC			2.6E-08	mg/kg/day	8.0E-05	mg/kg/day	3.E-04
				Nitrate	0.76	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.084	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00000012	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-08					6.E-03
		EXPOSURE POINT TOTAL									9.E-08					7.E-03
	EXPOSURE MEDIUM TOTAL										9.E-08					7.E-03
SURFACE WATER TOTAL											9.E-08					7.E-03
BIOTA	COMBINED FISH DIET	MANTON POND	INGESTION	Acenaphthylene	0.0003	mg/kg	NC		NC			3.7E-08	mg/kg/day	6.0E-02	mg/kg/day	6.E-07
				Dibenzo(a,h)anthracene	0.00022	mg/kg	3.4E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-08	2.7E-08	mg/kg/day	3.0E-02	mg/kg/day	9.E-07
				Phenanthrene	0.00293	mg/kg	NC		NC			3.6E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				4,4'-DDE	0.00886	mg/kg	1.4E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	5.E-08	1.1E-06	mg/kg/day	5.0E-04	mg/kg/day	2.E-03
				alpha-Chlordane	0.0014	mg/kg	2.2E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	8.E-09	1.7E-07	mg/kg/day	5.0E-04	mg/kg/day	3.E-04
				Aroclor-1254	0.1247	mg/kg	2.0E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	4.E-06	1.5E-05	mg/kg/day	2.0E-05	mg/kg/day	8.E-01
				Aroclor-1268	0.03292	mg/kg	5.2E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-06	4.0E-06	mg/kg/day	2.0E-05	mg/kg/day	2.E-01
				Dieldrin	0.00052	mg/kg	8.2E-09	mg/kg/day	1.6E+01	(mg/kg/day)-1	1.E-07	6.3E-08	mg/kg/day	5.0E-05	mg/kg/day	1.E-03
				Endosulfan Sulfate	0.00096	mg/kg	NC		NC			1.2E-07	mg/kg/day	6.0E-03	mg/kg/day	2.E-05
				gamma-Chlordane	0.00052	mg/kg	8.2E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-09	6.3E-08	mg/kg/day	5.0E-04	mg/kg/day	1.E-04
				Technical Chlordane	0.04062	mg/kg	6.4E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-07	5.0E-06	mg/kg/day	5.0E-04	mg/kg/day	1.E-02
				Lead	0.0113	mg/kg	1.8E-07	mg/kg/day	--			1.4E-06	mg/kg/day			
				Mercury	0.185	mg/kg	NC		NC			2.3E-05	mg/kg/day	3.0E-04	mg/kg/day	8.E-02
				Mercury (methyl)	0.149	mg/kg	NC		NC			1.8E-05	mg/kg/day	1.0E-04	mg/kg/day	2.E-01
				Toxicity Equivalency (Dioxins/Furans)	0.0000186	mg/kg	2.9E-10	mg/kg/day	1.5E+05	(mg/kg/day)-1	4.E-05	2.3E-09	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-05					1.E+00
		EXPOSURE POINT TOTAL									5.E-05					1.E+00
	EXPOSURE MEDIUM TOTAL										5.E-05					1.E+00
COMBINED FISH DIET TOTAL											5.E-05					1.E+00
							TOTAL RECEPTOR RISK ACROSS ALL MEDIA				5.E-05	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				1.2.E+00

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TABLE 7.29.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	MANTON POND	INGESTION	Benzo(a)anthracene	0.15	mg/kg	2.5E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-10	5.9E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Benzo(a)pyrene	0.18	mg/kg	3.1E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-09	7.1E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Benzo(b)fluoranthene	0.31	mg/kg	5.3E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-10	1.2E-08	mg/kg/day	3.0E-02	mg/kg/day	4.E-07
				Benzo(g,h,i)perylene	0.11	mg/kg	NC		NC			4.4E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				Benzo(k)fluoranthene	0.18	mg/kg	3.1E-10	mg/kg/day	7.3E-02	(mg/kg/day)-1	2.E-11	7.1E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				bis(2-Ethylhexyl)phthalate	0.31	mg/kg	5.3E-10	mg/kg/day	1.4E-02	(mg/kg/day)-1	7.E-12	1.2E-08	mg/kg/day	2.0E-02	mg/kg/day	6.E-07
				Indeno(1,2,3-cd)pyrene	0.15	mg/kg	2.5E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-10	5.9E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Phenanthrene	0.14	mg/kg	NC		NC			5.5E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				alpha-Chlordane	0.0022	mg/kg	3.7E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-12	8.7E-11	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				gamma-Chlordane	0.0025	mg/kg	4.2E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-12	9.9E-11	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				Arsenic	0.77	mg/kg	1.3E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	2.E-09	3.0E-08	mg/kg/day	3.0E-04	mg/kg/day	1.E-04
				Cadmium	0.68	mg/kg	NC		NC			2.7E-08	mg/kg/day	1.0E-03	mg/kg/day	3.E-05
				Chromium	13.4	mg/kg	NC		NC			5.3E-07	mg/kg/day	3.0E-03	mg/kg/day	2.E-04
				Lead	45.9	mg/kg	7.8E-08	mg/kg/day	--			1.8E-06	mg/kg/day			
				Manganese	128	mg/kg	NC		NC			5.1E-06	mg/kg/day	7.1E-02	mg/kg/day	7.E-05
				Vanadium	5.7	mg/kg	NC		NC			2.3E-07	mg/kg/day	7.0E-03	mg/kg/day	3.E-05
				Toxicity Equivalency (Dioxins/Furans)	0.00043	mg/kg	7.3E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-07	1.7E-11	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-07					4.E-04
			DERMAL	Benzo(a)anthracene	0.15	mg/kg	9.5E-11	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-11	2.2E-09	mg/kg/day	3.0E-02	mg/kg/day	7.E-08
				Benzo(a)pyrene	0.18	mg/kg	1.1E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	8.E-10	2.6E-09	mg/kg/day	3.0E-02	mg/kg/day	9.E-08
				Benzo(b)fluoranthene	0.31	mg/kg	2.0E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-10	4.6E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Benzo(g,h,i)perylene	0.11	mg/kg	NC		NC			1.6E-09	mg/kg/day	3.0E-02	mg/kg/day	5.E-08
				Benzo(k)fluoranthene	0.18	mg/kg	1.1E-10	mg/kg/day	7.3E-02	(mg/kg/day)-1	8.E-12	2.6E-09	mg/kg/day	3.0E-02	mg/kg/day	9.E-08
				bis(2-Ethylhexyl)phthalate	0.31	mg/kg	1.5E-10	mg/kg/day	1.4E-02	(mg/kg/day)-1	2.E-12	3.5E-09	mg/kg/day	2.0E-02	mg/kg/day	2.E-07
				Indeno(1,2,3-cd)pyrene	0.15	mg/kg	9.5E-11	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-11	2.2E-09	mg/kg/day	3.0E-02	mg/kg/day	7.E-08
				Phenanthrene	0.14	mg/kg	NC		NC			2.1E-09	mg/kg/day	3.0E-02	mg/kg/day	7.E-08
				alpha-Chlordane	0.0022	mg/kg	4.3E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-13	1.0E-11	mg/kg/day	5.0E-04	mg/kg/day	2.E-08
				gamma-Chlordane	0.0025	mg/kg	4.8E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-13	1.1E-11	mg/kg/day	5.0E-04	mg/kg/day	2.E-08
				Arsenic	0.77	mg/kg	1.1E-10	mg/kg/day	1.5E+00	(mg/kg/day)-1	2.E-10	2.6E-09	mg/kg/day	3.0E-04	mg/kg/day	9.E-06
				Cadmium	0.68	mg/kg	NC		NC			7.7E-11	mg/kg/day	2.5E-05	mg/kg/day	3.E-06
				Chromium	13.4	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	45.9	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	128	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Vanadium	5.7	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00043	mg/kg	6.3E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	9.E-09	1.5E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-08					1.E-05
		EXPOSURE POINT TOTAL									1.E-07					4.E-04
	EXPOSURE MEDIUM TOTAL										1.E-07					4.E-04
SEDIMENT TOTAL											1.E-07					4.E-04
SURFACE WATER	SURFACE WATER	MANTON POND	INGESTION	Acenaphthylene	0.00000132	mg/l	NC		NC			5.2E-11	mg/kg/day	6.0E-02	mg/kg/day	9.E-10
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	2.9E-08	mg/kg/day	1.4E-02	mg/kg/day	4.E-10	6.7E-07	mg/kg/day	2.0E-02	mg/kg/day	3.E-05
				Aldrin	0.000023	mg/l	3.9E-11	mg/kg/day	1.7E+01	mg/kg/day	7.E-10	9.1E-10	mg/kg/day	3.0E-05	mg/kg/day	3.E-05
				alpha-Chlordane	0.000019	mg/l	3.2E-11	mg/kg/day	3.5E-01	mg/kg/day	1.E-11	7.5E-10	mg/kg/day	5.0E-04	mg/kg/day	2.E-06
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			1.3E-10	mg/kg/day	6.0E-03	mg/kg/day	2.E-08
				Endrin Aldehyde	0.000005	mg/l	NC		NC			2.0E-10	mg/kg/day	3.0E-04	mg/kg/day	7.E-07
				gamma-Chlordane	0.000021	mg/l	3.6E-11	mg/kg/day	3.5E-01	mg/kg/day	1.E-11	8.3E-10	mg/kg/day	5.0E-04	mg/kg/day	2.E-06
				Arsenic	0.0046	mg/l	7.8E-09	mg/kg/day	1.5E+00	mg/kg/day	1.E-08	1.8E-07	mg/kg/day	3.0E-04	mg/kg/day	6.E-04
				Barium	0.021	mg/l	NC		NC			8.3E-07	mg/kg/day	7.0E-02	mg/kg/day	1.E-05
				Chromium	0.0023	mg/l	NC		NC			9.1E-08	mg/kg/day	3.0E-03	mg/kg/day	3.E-05
				Lead	0.0044	mg/l	7.5E-09	mg/kg/day	--			1.7E-07	mg/kg/day			
				Manganese	0.13	mg/l	NC		NC			5.1E-06	mg/kg/day	2.4E-02	mg/kg/day	2.E-04
				Mercury	0.00000394	mg/l	NC		NC			1.6E-10	mg/kg/day	3.0E-04	mg/kg/day	5.E-07
				Thallium	0.0022	mg/l	NC		NC			8.7E-08	mg/kg/day	8.0E-05	mg/kg/day	1.E-03
				Nitrate	0.76	mg/l	NC		NC			3.0E-05	mg/kg/day	1.6E+00	mg/kg/day	2.E-05
				Nitrite-N	0.084	mg/l	NC		NC			3.3E-06	mg/kg/day	1.0E-01	mg/kg/day	3.E-05

TABLE 7.29.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Toxicity Equivalency (Dioxins/Furans)	0.00000012	mg/l	2.0E-13	mg/kg/day	1.5E+05	mg/kg/day	3.E-08	4.7E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-08					2.E-03
			DERMAL	Acenaphthylene	0.00000132	mg/l	NC		NC			--		6.0E-02	mg/kg/day	
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	2.5E-06	mg/kg/day	1.4E-02	mg/kg/day	3.E-08	5.8E-05	mg/kg/day	2.0E-02	mg/kg/day	3.E-03
				Aldrin	0.000023	mg/l	1.9E-10	mg/kg/day	1.7E+01	mg/kg/day	3.E-09	4.5E-09	mg/kg/day	3.0E-05	mg/kg/day	2.E-04
				alpha-Chlordane	0.000019	mg/l	3.7E-09	mg/kg/day	3.5E-01	mg/kg/day	1.E-09	8.7E-08	mg/kg/day	5.0E-04	mg/kg/day	2.E-04
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			--		6.0E-03	mg/kg/day	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			7.8E-09	mg/kg/day	3.0E-04	mg/kg/day	3.E-05
				gamma-Chlordane	0.000021	mg/l	4.1E-09	mg/kg/day	3.5E-01	mg/kg/day	1.E-09	9.7E-08	mg/kg/day	5.0E-04	mg/kg/day	2.E-04
				Arsenic	0.0046	mg/l	2.8E-09	mg/kg/day	1.5E+00	mg/kg/day	4.E-09	6.5E-08	mg/kg/day	3.0E-04	mg/kg/day	2.E-04
				Barium	0.021	mg/l	NC		NC			3.0E-07	mg/kg/day	4.9E-03	mg/kg/day	6.E-05
				Chromium	0.0023	mg/l	NC		NC			6.5E-08	mg/kg/day	7.5E-05	mg/kg/day	9.E-04
				Lead	0.0044	mg/l	--		--			--				
				Manganese	0.13	mg/l	NC		NC			1.8E-06	mg/kg/day	9.6E-04	mg/kg/day	2.E-03
				Mercury	0.00000394	mg/l	NC		NC			5.5E-11	mg/kg/day	2.1E-05	mg/kg/day	3.E-06
				Thallium	0.0022	mg/l	NC		NC			3.1E-08	mg/kg/day	8.0E-05	mg/kg/day	4.E-04
				Nitrate	0.76	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.084	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00000012	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-08					7.E-03
		EXPOSURE POINT TOTAL									9.E-08					9.E-03
	EXPOSURE MEDIUM TOTAL										9.E-08					9.E-03
SURFACE WATER TOTAL											9.E-08					9.E-03
BIOTA	COMBINED FISH DIET	MANTON POND	INGESTION	Acenaphthylene	0.0003	mg/kg	NC		NC			3.8E-08	mg/kg/day	6.0E-02	mg/kg/day	6.E-07
				Dibenzo(a,h)anthracene	0.00022	mg/kg	3.6E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-08	2.8E-08	mg/kg/day	3.0E-02	mg/kg/day	9.E-07
				Phenanthrene	0.00293	mg/kg	NC		NC			3.7E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				4,4'-DDE	0.00886	mg/kg	1.4E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	5.E-08	1.1E-06	mg/kg/day	5.0E-04	mg/kg/day	2.E-03
				alpha-Chlordane	0.0014	mg/kg	2.3E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	8.E-09	1.8E-07	mg/kg/day	5.0E-04	mg/kg/day	4.E-04
				Aroclor-1254	0.1247	mg/kg	2.0E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	4.E-06	1.6E-05	mg/kg/day	2.0E-05	mg/kg/day	8.E-01
				Aroclor-1268	0.03292	mg/kg	5.3E-07	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-06	4.1E-06	mg/kg/day	2.0E-05	mg/kg/day	2.E-01
				Dieldrin	0.00052	mg/kg	8.4E-09	mg/kg/day	1.6E+01	(mg/kg/day)-1	1.E-07	6.5E-08	mg/kg/day	5.0E-05	mg/kg/day	1.E-03
				Endosulfan Sulfate	0.00096	mg/kg	NC		NC			1.2E-07	mg/kg/day	6.0E-03	mg/kg/day	2.E-05
				gamma-Chlordane	0.00052	mg/kg	8.4E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-09	6.5E-08	mg/kg/day	5.0E-04	mg/kg/day	1.E-04
				Technical Chlordane	0.04062	mg/kg	6.6E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-07	5.1E-06	mg/kg/day	5.0E-04	mg/kg/day	1.E-02
				Lead	0.0113	mg/kg	1.8E-07	mg/kg/day	--			1.4E-06	mg/kg/day			
				Mercury	0.185	mg/kg	NC		NC			2.3E-05	mg/kg/day	3.0E-04	mg/kg/day	8.E-02
				Mercury (methyl)	0.149	mg/kg	NC		NC			1.9E-05	mg/kg/day	1.0E-04	mg/kg/day	2.E-01
				Toxicity Equivalency (Dioxins/Furans)	0.0000186	mg/kg	3.0E-10	mg/kg/day	1.5E+05	(mg/kg/day)-1	5.E-05	2.3E-09	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-05					1.E+00
		EXPOSURE POINT TOTAL									5.E-05					1.E+00
	EXPOSURE MEDIUM TOTAL										5.E-05					1.E+00
COMBINED FISH DIET TOTAL											5.E-05					1.E+00
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	5.E-05	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				1.3.E+00

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TABLE 7.30.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	MANTON POND	INGESTION	Benzo(a)anthracene	0.15	mg/kg	2.0E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	1 E-09	7.1E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(a)pyrene	0.18	mg/kg	2 4E-09	mg/kg/day	7 3E+00	(mg/kg/day)-1	2.E-08	8.5E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(b)fluoranthene	0 31	mg/kg	4 2E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-09	1.5E-07	mg/kg/day	3 0E-02	mg/kg/day	5.E-06
				Benzo(g,h,i)perylene	0.11	mg/kg	NC		NC			5.2E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(k)fluoranthene	0.18	mg/kg	2.4E-09	mg/kg/day	7 3E-02	(mg/kg/day)-1	2.E-10	8.5E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				bis(2-Ethylhexyl)phthalate	0.31	mg/kg	4 2E-09	mg/kg/day	1 4E-02	(mg/kg/day)-1	6.E-11	1.5E-07	mg/kg/day	2.0E-02	mg/kg/day	7.E-06
				Indeno(1,2,3-cd)pyrene	0.15	mg/kg	2.0E-09	mg/kg/day	7 3E-01	(mg/kg/day)-1	1.E-09	7.1E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Phenanthrene	0 14	mg/kg	NC		NC			6.6E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				alpha-Chlordane	0 0022	mg/kg	3 0E-11	mg/kg/day	3 5E-01	(mg/kg/day)-1	1.E-11	1.0E-09	mg/kg/day	5 0E-04	mg/kg/day	2.E-06
				gamma-Chlordane	0.0025	mg/kg	3 4E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-11	1.2E-09	mg/kg/day	5.0E-04	mg/kg/day	2.E-06
				Arsenic	0 77	mg/kg	1.0E-08	mg/kg/day	1 5E+00	(mg/kg/day)-1	2.E-08	3 7E-07	mg/kg/day	3.0E-04	mg/kg/day	1.E-03
				Cadmium	0 68	mg/kg	NC		NC			3 2E-07	mg/kg/day	1.0E-03	mg/kg/day	3.E-04
				Chromium	13.4	mg/kg	NC		NC			6.4E-06	mg/kg/day	3.0E-03	mg/kg/day	2.E-03
				Lead	45 9	mg/kg	6.2E-07	mg/kg/day	--			2.2E-05	mg/kg/day			
				Manganese	128	mg/kg	NC		NC			6.1E-05	mg/kg/day	7.1E-02	mg/kg/day	9 E-04
				Vanadium	5.7	mg/kg	NC		NC			2.7E-06	mg/kg/day	7 0E-03	mg/kg/day	4.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.00043	mg/kg	5.8E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	9.E-07	2.0E-10	mg/kg/day			
			EXPOSURE ROUTE TOTAL								9 E-07					5 E-03
			DERMAL	Benzo(a)anthracene	0.15	mg/kg	3.0E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-10	1.0E-08	mg/kg/day	3.0E-02	mg/kg/day	3 E-07
				Benzo(a)pyrene	0.18	mg/kg	3.6E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-09	1.2E-08	mg/kg/day	3.0E-02	mg/kg/day	4 E-07
				Benzo(b)fluoranthene	0.31	mg/kg	6.1E-10	mg/kg/day	7 3E-01	(mg/kg/day)-1	4.E-10	2.1E-08	mg/kg/day	3.0E-02	mg/kg/day	7 E-07
				Benzo(g,h,i)perylene	0.11	mg/kg	NC		NC			7.6E-09	mg/kg/day	3 0E-02	mg/kg/day	3.E-07
				Benzo(k)fluoranthene	0 18	mg/kg	3 6E-10	mg/kg/day	7.3E-02	(mg/kg/day)-1	3 E-11	1.2E-08	mg/kg/day	3.0E-02	mg/kg/day	4.E-07
				bis(2-Ethylhexyl)phthalate	0 31	mg/kg	4 7E-10	mg/kg/day	1 4E-02	(mg/kg/day)-1	7.E-12	1 6E-08	mg/kg/day	2.0E-02	mg/kg/day	8 E-07
				Indeno(1,2,3-cd)pyrene	0 15	mg/kg	3 0E-10	mg/kg/day	7 3E-01	(mg/kg/day)-1	2.E-10	1 0E-08	mg/kg/day	3 0E-02	mg/kg/day	3 E-07
				Phenanthrene	0.14	mg/kg	NC		NC			9.7E-09	mg/kg/day	3.0E-02	mg/kg/day	3 E-07
				alpha-Chlordane	0 0022	mg/kg	1.3E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	5 E-13	4.7E-11	mg/kg/day	5.0E-04	mg/kg/day	9.E-08
				gamma-Chlordane	0.0025	mg/kg	1.5E-12	mg/kg/day	3 5E-01	(mg/kg/day)-1	5.E-13	5.3E-11	mg/kg/day	5.0E-04	mg/kg/day	1 E-07
				Arsenic	0 77	mg/kg	3.5E-10	mg/kg/day	1.5E+00	(mg/kg/day)-1	5.E-10	1.2E-08	mg/kg/day	3.0E-04	mg/kg/day	4 E-05
				Cadmium	0.68	mg/kg	NC		NC			3.6E-10	mg/kg/day	2.5E-05	mg/kg/day	1.E-05
				Chromium	13.4	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	45.9	mg/kg	0 0E+00	mg/kg/day	--							
				Manganese	128	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Vanadium	5.7	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00043	mg/kg	2.0E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	3 E-08	6.9E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3.E-08					6 E-05
		EXPOSURE POINT TOTAL									9.E-07					5.E-03
	EXPOSURE MEDIUM TOTAL										9 E-07					5 E-03
SEDIMENT TOTAL											9.E-07					5.E-03
SURFACE WATER	SURFACE WATER	MANTON POND	INGESTION	Acenaphthylene	0.00000132	mg/l	NC		NC			1.6E-10	mg/kg/day	6.0E-02	mg/kg/day	3.E-09
				bis(2-Ethylhexyl)phthalate	0 017	mg/l	5.8E-08	mg/kg/day	1.4E-02	mg/kg/day	8.E-10	2.0E-06	mg/kg/day	2.0E-02	mg/kg/day	1.E-04
				Aldrin	0 000023	mg/l	7.8E-11	mg/kg/day	1.7E+01	mg/kg/day	1 E-09	2.7E-09	mg/kg/day	3.0E-05	mg/kg/day	9.E-05
				alpha-Chlordane	0 000019	mg/l	6.4E-11	mg/kg/day	3.5E-01	mg/kg/day	2.E-11	2.3E-09	mg/kg/day	5.0E-04	mg/kg/day	5 E-06
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			3 8E-10	mg/kg/day	6.0E-03	mg/kg/day	6.E-08
				Endrin Aldehyde	0.000005	mg/l	NC		NC			5.9E-10	mg/kg/day	3.0E-04	mg/kg/day	2.E-06
				gamma-Chlordane	0.000021	mg/l	7.1E-11	mg/kg/day	3.5E-01	mg/kg/day	2.E-11	2.5E-09	mg/kg/day	5.0E-04	mg/kg/day	5.E-06
				Arsenic	0.0046	mg/l	1.6E-08	mg/kg/day	1 5E+00	mg/kg/day	2.E-08	5.5E-07	mg/kg/day	3.0E-04	mg/kg/day	2.E-03
				Barium	0.021	mg/l	NC		NC			2.5E-06	mg/kg/day	7.0E-02	mg/kg/day	4.E-05
				Chromium	0 0023	mg/l	NC		NC			2.7E-07	mg/kg/day	3.0E-03	mg/kg/day	9 E-05
				Lead	0 0044	mg/l	1.5E-08	mg/kg/day	--			5.2E-07	mg/kg/day			
				Manganese	0.13	mg/l	NC		NC			1.5E-05	mg/kg/day	2.4E-02	mg/kg/day	6 E-04
				Mercury	0.00000394	mg/l	NC		NC			4 7E-10	mg/kg/day	3.0E-04	mg/kg/day	2 E-06
				Thallium	0.0022	mg/l	NC		NC			2.6E-07	mg/kg/day	8.0E-05	mg/kg/day	3.E-03
				Nitrate	0.76	mg/l	NC		NC			9.0E-05	mg/kg/day	1.6E+00	mg/kg/day	6 E-05
				Nitrite-N	0.084	mg/l	NC		NC			1 0E-05	mg/kg/day	1.0E-01	mg/kg/day	1 E-04

TABLE 7.30.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Toxicity Equivalency (Dioxins/Furans)	0.00000012	mg/l	4.1E-13	mg/kg/day	1.5E+05	mg/kg/day	6.E-08	1.4E-11	mg/kg/day			
			EXPOSURE ROUTE TOTAL								9 E-08					6 E-03
			DERMAL	Acenaphthylene	0.00000132	mg/l	NC		NC			--		6.0E-02	mg/kg/day	
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	1.5E-06	mg/kg/day	1.4E-02	mg/kg/day	2 E-08	5 2E-05	mg/kg/day	2.0E-02	mg/kg/day	3 E-03
				Aldrin	0 000023	mg/l	1.2E-10	mg/kg/day	1.7E+01	mg/kg/day	2.E-09	4.1E-09	mg/kg/day	3.0E-05	mg/kg/day	1.E-04
				alpha-Chlordane	0 000019	mg/l	2 3E-09	mg/kg/day	3.5E-01	mg/kg/day	8.E-10	7 9E-08	mg/kg/day	5 0E-04	mg/kg/day	2.E-04
				Endosulfan Sulfate	0 0000032	mg/l	NC		NC			--		6 0E-03	mg/kg/day	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			7.0E-09	mg/kg/day	3 0E-04	mg/kg/day	2.E-05
				gamma-Chlordane	0.000021	mg/l	2.5E-09	mg/kg/day	3.5E-01	mg/kg/day	9.E-10	8 7E-08	mg/kg/day	5.0E-04	mg/kg/day	2 E-04
				Arsenic	0.0046	mg/l	1.7E-09	mg/kg/day	1.5E+00	mg/kg/day	3.E-09	5.9E-08	mg/kg/day	3.0E-04	mg/kg/day	2 E-04
				Barium	0.021	mg/l	NC		NC			2.7E-07	mg/kg/day	4.9E-03	mg/kg/day	5 E-05
				Chromium	0.0023	mg/l	NC		NC			5.9E-08	mg/kg/day	7.5E-05	mg/kg/day	8.E-04
				Lead	0.0044	mg/l	--		--			--				
				Manganese	0.13	mg/l	NC		NC			1.7E-06	mg/kg/day	9.6E-04	mg/kg/day	2.E-03
				Mercury	0.00000394	mg/l	NC		NC			5.0E-11	mg/kg/day	2.1E-05	mg/kg/day	2.E-06
				Thallium	0.0022	mg/l	NC		NC			2 8E-08	mg/kg/day	8.0E-05	mg/kg/day	3.E-04
				Nitrate	0.76	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.084	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00000012	mg/l	0.0E+00	mg/kg/day	1 5E+05	mg/kg/day	0 E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3 E-08					6.E-03
		EXPOSURE POINT TOTAL									1.E-07					1.E-02
	EXPOSURE MEDIUM TOTAL										1.E-07					1.E-02
SURFACE WATER TOTAL											1.E-07					1.E-02
BIOTA	COMBINED FISH DIET	MANTON POND	INGESTION	Acenaphthylene	0.0003	mg/kg	NC		NC			1.1E-07	mg/kg/day	6.0E-02	mg/kg/day	2 E-06
				Dibenzo(a,h)anthracene	0.00022	mg/kg	6.8E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	5.E-08	7.9E-08	mg/kg/day	3.0E-02	mg/kg/day	3 E-06
				Phenanthrene	0.00293	mg/kg	NC		NC			1.1E-06	mg/kg/day	3.0E-02	mg/kg/day	4.E-05
				4,4'-DDE	0.00886	mg/kg	2.7E-07	mg/kg/day	3.4E-01	(mg/kg/day)-1	9.E-08	3.2E-06	mg/kg/day	5.0E-04	mg/kg/day	6.E-03
				alpha-Chlordane	0.0014	mg/kg	4.3E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-08	5.0E-07	mg/kg/day	5.0E-04	mg/kg/day	1.E-03
				Aroclor-1254	0.1247	mg/kg	3.8E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	8.E-06	4.5E-05	mg/kg/day	2.0E-05	mg/kg/day	2 E+00
				Aroclor-1268	0.03292	mg/kg	1.0E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-06	1.2E-05	mg/kg/day	2.0E-05	mg/kg/day	6 E-01
				Dieldrin	0.00052	mg/kg	1.6E-08	mg/kg/day	1.6E+01	(mg/kg/day)-1	3.E-07	1.9E-07	mg/kg/day	5.0E-05	mg/kg/day	4.E-03
				Endosulfan Sulfate	0.00096	mg/kg	NC		NC			3.5E-07	mg/kg/day	6.0E-03	mg/kg/day	6 E-05
				gamma-Chlordane	0.00052	mg/kg	1.6E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	6 E-09	1.9E-07	mg/kg/day	5.0E-04	mg/kg/day	4 E-04
				Technical Chlordane	0.04062	mg/kg	1.3E-06	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-07	1.5E-05	mg/kg/day	5.0E-04	mg/kg/day	3.E-02
				Lead	0.0113	mg/kg	3.5E-07	mg/kg/day	--			4.1E-06	mg/kg/day			
				Mercury	0 185	mg/kg	NC		NC			6.7E-05	mg/kg/day	3.0E-04	mg/kg/day	2.E-01
				Mercury (methyl)	0.149	mg/kg	NC		NC			5.4E-05	mg/kg/day	1 0E-04	mg/kg/day	5.E-01
				Toxicity Equivalency (Dioxins/Furans)	0.0000186	mg/kg	5.7E-10	mg/kg/day	1.5E+05	(mg/kg/day)-1	9.E-05	6.7E-09	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1 E-04					4.E+00
		EXPOSURE POINT TOTAL									1 E-04					4.E+00
	EXPOSURE MEDIUM TOTAL										1 E-04					4.E+00
COMBINED FISH DIET TOTAL											1.E-04					4.E+00
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	1.E-04				TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA	3.7.E+00

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TABLE 7.31.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	DYERVILLE POND	INGESTION	2-Methylnaphthalene	0.031	mg/kg	NC		NC			1.8E-10	mg/kg/day	2.0E-02	mg/kg/day	9.E-09
				Acenaphthylene	0.16	mg/kg	NC		NC			9.4E-10	mg/kg/day	6.0E-02	mg/kg/day	2.E-08
				Benzo(a)anthracene	1.4	mg/kg	4.7E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-10	8.2E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				Benzo(a)pyrene	1.4	mg/kg	4.7E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-09	8.2E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				Benzo(b)fluoranthene	2.5	mg/kg	8.4E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-10	1.5E-08	mg/kg/day	3.0E-02	mg/kg/day	5.E-07
				Benzo(g,h,i)perylene	1.1	mg/kg	NC		NC			6.5E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Benzo(k)fluoranthene	0.71	mg/kg	2.4E-10	mg/kg/day	7.3E-02	(mg/kg/day)-1	2.E-11	4.2E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				bis(2-Ethylhexyl)phthalate	1.1	mg/kg	3.7E-10	mg/kg/day	1.4E-02	(mg/kg/day)-1	5.E-12	6.5E-09	mg/kg/day	2.0E-02	mg/kg/day	3.E-07
				Dibenzo(a,h)anthracene	0.2	mg/kg	6.7E-11	mg/kg/day	7.3E+00	(mg/kg/day)-1	5.E-10	1.2E-09	mg/kg/day	3.0E-02	mg/kg/day	4.E-08
				Indeno(1,2,3-cd)pyrene	1.4	mg/kg	4.7E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-10	8.2E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				Phenanthrene	1.4	mg/kg	NC		NC			8.2E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				alpha-Chlordane	0.0043	mg/kg	1.4E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	5.E-13	2.5E-11	mg/kg/day	5.0E-04	mg/kg/day	5.E-08
				Aroclor-1254	0.49	mg/kg	1.6E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-10	2.9E-09	mg/kg/day	2.0E-05	mg/kg/day	1.E-04
				Dieldrin	0.012	mg/kg	4.0E-12	mg/kg/day	1.6E+01	(mg/kg/day)-1	6.E-11	7.0E-11	mg/kg/day	5.0E-05	mg/kg/day	1.E-06
				Endosulfan sulfate	0.0052	mg/kg	NC		NC			3.1E-11	mg/kg/day	6.0E-03	mg/kg/day	5.E-09
				Arsenic	2.1	mg/kg	7.0E-10	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-09	1.2E-08	mg/kg/day	3.0E-04	mg/kg/day	4.E-05
				Cadmium	1.7	mg/kg	NC		NC			1.0E-08	mg/kg/day	1.0E-03	mg/kg/day	1.E-05
				Chromium	156	mg/kg	NC		NC			9.2E-07	mg/kg/day	3.0E-03	mg/kg/day	3.E-04
				Lead	160	mg/kg	5.4E-08	mg/kg/day	–			9.4E-07	mg/kg/day			
				Manganese	332	mg/kg	NC		NC			1.9E-06	mg/kg/day	7.1E-02	mg/kg/day	3.E-05
				Mercury	0.4	mg/kg	NC		NC			2.3E-09	mg/kg/day	3.0E-04	mg/kg/day	8.E-06
				Nickel	19	mg/kg	NC		NC			1.1E-07	mg/kg/day	2.0E-02	mg/kg/day	6.E-06
				Vanadium	16	mg/kg	NC		NC			9.4E-08	mg/kg/day	7.0E-03	mg/kg/day	1.E-05
				Toxicity Equivalency (Dioxins/Furans)	0.00011	mg/kg	3.7E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	6.E-09	6.5E-13	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	*2.53E-08*	*mg/kg*	*8.5E-18*	*mg/kg/day*	*1.5E+05*	*(mg/kg/day)-1*	*1.E-12*	*1.5E-16*	*mg/kg/day*			
			EXPOSURE ROUTE TOTAL								1.E-08					6.E-04
			DERMAL	2-Methylnaphthalene	0.031	mg/kg	NC		NC			4.6E-11	mg/kg/day	2.0E-02	mg/kg/day	2.E-09
				Acenaphthylene	0.16	mg/kg	NC		NC			2.4E-10	mg/kg/day	6.0E-02	mg/kg/day	4.E-09
				Benzo(a)anthracene	1.4	mg/kg	1.2E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	9.E-11	2.1E-09	mg/kg/day	3.0E-02	mg/kg/day	7.E-08
				Benzo(a)pyrene	1.4	mg/kg	1.2E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	9.E-10	2.1E-09	mg/kg/day	3.0E-02	mg/kg/day	7.E-08
				Benzo(b)fluoranthene	2.5	mg/kg	2.1E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-10	3.7E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				Benzo(g,h,i)perylene	1.1	mg/kg	NC		NC			1.6E-09	mg/kg/day	3.0E-02	mg/kg/day	5.E-08
				Benzo(k)fluoranthene	0.71	mg/kg	6.0E-11	mg/kg/day	7.3E-02	(mg/kg/day)-1	4.E-12	1.1E-09	mg/kg/day	3.0E-02	mg/kg/day	4.E-08
				bis(2-Ethylhexyl)phthalate	1.1	mg/kg	7.2E-11	mg/kg/day	1.4E-02	(mg/kg/day)-1	1.E-12	1.3E-09	mg/kg/day	2.0E-02	mg/kg/day	6.E-08
				Dibenzo(a,h)anthracene	0.2	mg/kg	1.7E-11	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-10	3.0E-10	mg/kg/day	3.0E-02	mg/kg/day	1.E-08
				Indeno(1,2,3-cd)pyrene	1.4	mg/kg	1.2E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	9.E-11	2.1E-09	mg/kg/day	3.0E-02	mg/kg/day	7.E-08
				Phenanthrene	1.4	mg/kg	NC		NC			2.1E-09	mg/kg/day	3.0E-02	mg/kg/day	7.E-08
				alpha-Chlordane	0.0043	mg/kg	1.1E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-14	2.0E-12	mg/kg/day	5.0E-04	mg/kg/day	4.E-09
				Aroclor-1254	0.49	mg/kg	4.5E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	9.E-11	7.8E-10	mg/kg/day	2.0E-05	mg/kg/day	4.E-05
				Dieldrin	0.012	mg/kg	7.8E-13	mg/kg/day	1.6E+01	(mg/kg/day)-1	1.E-11	1.4E-11	mg/kg/day	5.0E-05	mg/kg/day	3.E-07
				Endosulfan sulfate	0.0052	mg/kg	NC		NC			5.9E-12	mg/kg/day	6.0E-03	mg/kg/day	1.E-09
				Arsenic	2.1	mg/kg	4.1E-11	mg/kg/day	1.5E+00	(mg/kg/day)-1	6.E-11	7.2E-10	mg/kg/day	3.0E-04	mg/kg/day	2.E-06
				Cadmium	1.7	mg/kg	NC		NC			1.9E-11	mg/kg/day	2.5E-05	mg/kg/day	8.E-07
				Chromium	156	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	160	mg/kg	0.0E+00	mg/kg/day	–							
				Manganese	332	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Mercury	0.4	mg/kg	NC		NC					2.1E-05	mg/kg/day	
				Nickel	19	mg/kg	NC		NC					8.0E-04	mg/kg/day	
				Vanadium	16	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00011	mg/kg	2.2E-15	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-10	3.8E-14	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	2.53E-08	mg/kg	4.9E-19	mg/kg/day	1.5E+05	(mg/kg/day)-1	7.E-14	8.7E-18	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-09					4.E-05
		EXPOSURE POINT TOTAL									1.E-08					6.E-04
	EXPOSURE MEDIUM TOTAL										1.E-08					6.E-04
SEDIMENT TOTAL											1.E-08					6.E-04
SURFACE WATER	SURFACE WATER	DYERVILLE POND	INGESTION	Acenaphthylene	0.00000132	mg/l	NC		NC			7.7E-13	mg/kg/day	6.0E-02	mg/kg/day	1.E-11
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	5.7E-10	mg/kg/day	1.4E-02	mg/kg/day	8.E-12	1.0E-08	mg/kg/day	2.0E-02	mg/kg/day	5.E-07
				Aldrin	0.000023	mg/l	7.7E-13	mg/kg/day	1.7E+01	mg/kg/day	1.E-11	1.4E-11	mg/kg/day	3.0E-05	mg/kg/day	5.E-07
				alpha-Chlordane	0.000019	mg/l	6.4E-13	mg/kg/day	3.5E-01	mg/kg/day	2.E-13	1.1E-11	mg/kg/day	5.0E-04	mg/kg/day	2.E-08
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			1.9E-12	mg/kg/day	6.0E-03	mg/kg/day	3.E-10

TABLE 7.31.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			2.9E-12	mg/kg/day	3.0E-04	mg/kg/day	1 E-08
				gamma-Chlordane	0.000021	mg/l	7.0E-13	mg/kg/day	3.5E-01	mg/kg/day	2.E-13	1.2E-11	mg/kg/day	5.0E-04	mg/kg/day	2 E-08
				Arsenic	0.0046	mg/l	1.5E-10	mg/kg/day	1.5E+00	mg/kg/day	2 E-10	2.7E-09	mg/kg/day	3.0E-04	mg/kg/day	9 E-06
				Barium	0.021	mg/l	NC		NC			1 2E-08	mg/kg/day	7.0E-02	mg/kg/day	2.E-07
				Chromium	0.0023	mg/l	NC		NC			1.4E-09	mg/kg/day	3.0E-03	mg/kg/day	5 E-07
				Lead	0.0044	mg/l	1.5E-10	mg/kg/day	--			2.6E-09	mg/kg/day			
				Manganese	0.13	mg/l	NC		NC			7.6E-08	mg/kg/day	2.4E-02	mg/kg/day	3 E-06
				Mercury	0.00000394	mg/l	NC		NC			2 3E-12	mg/kg/day	3.0E-04	mg/kg/day	8 E-09
				Thallium	0.0022	mg/l	NC		NC			1 3E-09	mg/kg/day	8.0E-05	mg/kg/day	2 E-05
				Nitrate	0.76	mg/l	NC		NC			4 5E-07	mg/kg/day	1 6E+00	mg/kg/day	3 E-07
				Nitrite-N	0.084	mg/l	NC		NC			4 9E-08	mg/kg/day	1 0E-01	mg/kg/day	5 E-07
				Toxicity Equivalency (Dioxins/Furans)	0.00000012	mg/l	4 0E-15	mg/kg/day	1.5E+05	mg/kg/day	6 E-10	7 0E-14	mg/kg/day			
			EXPOSURE ROUTE TOTAL								9.E-10					3 E-05
			DERMAL	Acenaphthylene	0.00000132	mg/l	NC		NC			--		6.0E-02	mg/kg/day	
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	4 8E-07	mg/kg/day	1 4E-02	mg/kg/day	7.E-09	8 4E-06	mg/kg/day	2.0E-02	mg/kg/day	4.E-04
				Aldrin	0 000023	mg/l	3.8E-11	mg/kg/day	1.7E+01	mg/kg/day	6 E-10	6 6E-10	mg/kg/day	3.0E-05	mg/kg/day	2 E-05
				alpha-Chlordane	0 000019	mg/l	7.3E-10	mg/kg/day	3 5E-01	mg/kg/day	3.E-10	1.3E-08	mg/kg/day	5.0E-04	mg/kg/day	3 E-05
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			--		6.0E-03	mg/kg/day	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			1.1E-09	mg/kg/day	3.0E-04	mg/kg/day	4 E-06
				gamma-Chlordane	0.000021	mg/l	8.0E-10	mg/kg/day	3.5E-01	mg/kg/day	3 E-10	1.4E-08	mg/kg/day	5.0E-04	mg/kg/day	3 E-05
				Arsenic	0 0046	mg/l	5.4E-10	mg/kg/day	1.5E+00	mg/kg/day	8.E-10	9.4E-09	mg/kg/day	3.0E-04	mg/kg/day	3 E-05
				Barium	0 021	mg/l	NC		NC			4.3E-08	mg/kg/day	4.9E-03	mg/kg/day	9 E-06
				Chromium	0.0023	mg/l	NC		NC			9.4E-09	mg/kg/day	7.5E-05	mg/kg/day	1 E-04
				Lead	0.0044	mg/l	--		--			--				
				Manganese	0 13	mg/l	NC		NC			2.7E-07	mg/kg/day	9.6E-04	mg/kg/day	3 E-04
				Mercury	0 00000394	mg/l	NC		NC			8.0E-12	mg/kg/day	2 1E-05	mg/kg/day	4 E-07
				Thallium	0.0022	mg/l	NC		NC			4.5E-09	mg/kg/day	8 0E-05	mg/kg/day	6.E-05
				Nitrate	0.76	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.084	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00000012	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								9.E-09					1 E-03
		EXPOSURE POINT TOTAL									1.E-08					1 E-03
	EXPOSURE MEDIUM TOTAL										1.E-08					1 E-03
SURFACE WATER TOTAL											1.E-08					1.E-03
BIOTA	COMBINED FISH DIET	DYERVILLE POND	INGESTION	Acenaphthylene	0.00076	mg/kg	NC		NC			9.3E-08	mg/kg/day	6.0E-02	mg/kg/day	2.E-06
				Dibenzo(a,h)anthracene	0.00017	mg/kg	1.2E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	9 E-09	2.1E-08	mg/kg/day	3.0E-02	mg/kg/day	7.E-07
				Phenanthrene	0.0049	mg/kg	NC		NC			6.0E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				4,4'-DDD	0.03543	mg/kg	2.5E-07	mg/kg/day	2.4E-01	(mg/kg/day)-1	6.E-08	4.3E-06	mg/kg/day	5.0E-04	mg/kg/day	9 E-03
				4,4'-DDE	0.011	mg/kg	7.7E-08	mg/kg/day	3.4E-01	(mg/kg/day)-1	3.E-08	1.3E-06	mg/kg/day	5.0E-04	mg/kg/day	3 E-03
				4,4'-DDT	0 0119	mg/kg	8.3E-08	mg/kg/day	3.4E-01	(mg/kg/day)-1	3.E-08	1.5E-06	mg/kg/day	5.0E-04	mg/kg/day	3 E-03
				alpha-Chlordane	0.0144	mg/kg	1.0E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-08	1.8E-06	mg/kg/day	5.0E-04	mg/kg/day	4 E-03
				Aroclor-1254	0.37026	mg/kg	2.6E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	5.E-06	4.5E-05	mg/kg/day	2.0E-05	mg/kg/day	2.E+00
				Dieldrin	0.00852	mg/kg	5.9E-08	mg/kg/day	1.6E+01	(mg/kg/day)-1	9 E-07	1.0E-06	mg/kg/day	5.0E-05	mg/kg/day	2 E-02
				gamma-Chlordane	0.00574	mg/kg	4.0E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-08	7.0E-07	mg/kg/day	5 0E-04	mg/kg/day	1.E-03
				Heptachlor Epoxide	0.0018	mg/kg	1.3E-08	mg/kg/day	9.1E+00	(mg/kg/day)-1	1.E-07	2.2E-07	mg/kg/day	1.3E-05	mg/kg/day	2.E-02
				Technical Chlordane	0.31006	mg/kg	2.2E-06	mg/kg/day	3.5E-01	(mg/kg/day)-1	8.E-07	3.8E-05	mg/kg/day	5.0E-04	mg/kg/day	8.E-02
				Cadmium	0.157	mg/kg	NC		NC			1.9E-05	mg/kg/day	1.0E-03	mg/kg/day	2.E-02
				Lead	0.341	mg/kg	2.4E-06	mg/kg/day	--			4.2E-05	mg/kg/day			
				Manganese	12.6	mg/kg	NC		NC			1.5E-03	mg/kg/day	1.4E-01	mg/kg/day	1.E-02
				Mercury	0.102	mg/kg	NC		NC			1.2E-05	mg/kg/day	3.0E-04	mg/kg/day	4.E-02
				Mercury (methyl)	0.117	mg/kg	NC		NC			1.4E-05	mg/kg/day	1.0E-04	mg/kg/day	1.E-01
				Toxicity Equivalency (Dioxins/Furans)	0.0000522	mg/kg	3.6E-10	mg/kg/day	1.5E+05	(mg/kg/day)-1	5.E-05	6.4E-09	mg/kg/day			
			EXPOSURE ROUTE TOTAL								6.E-05					2 6.E+00
		EXPOSURE POINT TOTAL									6.E-05					2.6.E+00
	EXPOSURE MEDIUM TOTAL										6 E-05					2 6.E+00
COMBINED FISH DIET TOTAL											6.E-05					2.6.E+00
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	6.E-05				TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA	2.6.E+00

TABLE 7.31.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	

NOTES
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by KJA
Checked by MJM

TABLE 7.32.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	DYERVILLE POND	INGESTION	2-Methylnaphthalene	0.031	mg/kg	NC		NC			2.8E-10	mg/kg/day	2.0E-02	mg/kg/day	1 E-08
				Acenaphthylene	0.16	mg/kg	NC		NC			1.5E-09	mg/kg/day	6 0E-02	mg/kg/day	2 E-08
				Benzo(a)anthracene	1 4	mg/kg	5.5E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-10	1.3E-08	mg/kg/day	3.0E-02	mg/kg/day	4.E-07
				Benzo(a)pyrene	1.4	mg/kg	5.5E-10	mg/kg/day	7 3E+00	(mg/kg/day)-1	4.E-09	1.3E-08	mg/kg/day	3.0E-02	mg/kg/day	4 E-07
				Benzo(b)fluoranthene	2.5	mg/kg	9.8E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	7.E-10	2.3E-08	mg/kg/day	3.0E-02	mg/kg/day	8.E-07
				Benzo(g,h,i)perylene	1.1	mg/kg	NC		NC			1.0E-08	mg/kg/day	3 0E-02	mg/kg/day	3.E-07
				Benzo(k)fluoranthene	0.71	mg/kg	2.8E-10	mg/kg/day	7.3E-02	(mg/kg/day)-1	2 E-11	6 5E-09	mg/kg/day	3.0E-02	mg/kg/day	2 E-07
				bis(2-Ethylhexyl)phthalate	1 1	mg/kg	4.3E-10	mg/kg/day	1 4E-02	(mg/kg/day)-1	6 E-12	1 0E-08	mg/kg/day	2.0E-02	mg/kg/day	5 E-07
				Dibenzo(a,h)anthracene	0 2	mg/kg	7.8E-11	mg/kg/day	7.3E+00	(mg/kg/day)-1	6 E-10	1.8E-09	mg/kg/day	3.0E-02	mg/kg/day	6 E-08
				Indeno(1,2,3-cd)pyrene	1.4	mg/kg	5 5E-10	mg/kg/day	7 3E-01	(mg/kg/day)-1	4 E-10	1 3E-08	mg/kg/day	3.0E-02	mg/kg/day	4 E-07
				Phenanthrene	1.4	mg/kg	NC		NC			1.3E-08	mg/kg/day	3 0E-02	mg/kg/day	4 E-07
				alpha-Chlordane	0 0043	mg/kg	1 7E-12	mg/kg/day	3 5E-01	(mg/kg/day)-1	6 E-13	3 9E-11	mg/kg/day	5.0E-04	mg/kg/day	8 E-08
				Aroclor-1254	0 49	mg/kg	1 9E-10	mg/kg/day	2 0E+00	(mg/kg/day)-1	4.E-10	4.5E-09	mg/kg/day	2 0E-05	mg/kg/day	2 E-04
				Dieldrin	0 012	mg/kg	4 7E-12	mg/kg/day	1 6E+01	(mg/kg/day)-1	8.E-11	1 1E-10	mg/kg/day	5 0E-05	mg/kg/day	2 E-06
				Endosulfan sulfate	0.0052	mg/kg	NC		NC			4.7E-11	mg/kg/day	6 0E-03	mg/kg/day	8 E-09
				Arsenic	2.1	mg/kg	8.2E-10	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-09	1 9E-08	mg/kg/day	3.0E-04	mg/kg/day	6.E-05
				Cadmium	1.7	mg/kg	NC		NC			1.6E-08	mg/kg/day	1.0E-03	mg/kg/day	2.E-05
				Chromium	156	mg/kg	NC		NC			1.4E-06	mg/kg/day	3.0E-03	mg/kg/day	5.E-04
				Lead	160	mg/kg	6.3E-08	mg/kg/day	–			1.5E-06	mg/kg/day			
				Manganese	332	mg/kg	NC		NC			3.0E-06	mg/kg/day	7.1E-02	mg/kg/day	4.E-05
				Mercury	0.4	mg/kg	NC		NC			3.7E-09	mg/kg/day	3.0E-04	mg/kg/day	1 E-05
				Nickel	19	mg/kg	NC		NC			1.7E-07	mg/kg/day	2.0E-02	mg/kg/day	9.E-06
				Vanadium	16	mg/kg	NC		NC			1.5E-07	mg/kg/day	7.0E-03	mg/kg/day	2.E-05
				Toxicity Equivalency (Dioxins/Furans)	0.00011	mg/kg	4 3E-14	mg/kg/day	1 5E+05	(mg/kg/day)-1	6.E-09	1.0E-12	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	2.53E-08	mg/kg	9.9E-18	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-12	2 3E-16	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1 E-08					9 E-04
			DERMAL	2-Methylnaphthalene	0.031	mg/kg	NC		NC			2.1E-10	mg/kg/day	2.0E-02	mg/kg/day	1.E-08
				Acenaphthylene	0.16	mg/kg	NC		NC			1.1E-09	mg/kg/day	6.0E-02	mg/kg/day	2.E-08
				Benzo(a)anthracene	1.4	mg/kg	4.1E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-10	9.5E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				Benzo(a)pyrene	1.4	mg/kg	4.1E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-09	9.5E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				Benzo(b)fluoranthene	2.5	mg/kg	7.3E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	5.E-10	1.7E-08	mg/kg/day	3.0E-02	mg/kg/day	6.E-07
				Benzo(g,h,i)perylene	1.1	mg/kg	NC		NC			7.5E-09	mg/kg/day	3 0E-02	mg/kg/day	2.E-07
				Benzo(k)fluoranthene	0.71	mg/kg	2.1E-10	mg/kg/day	7.3E-02	(mg/kg/day)-1	2.E-11	4.8E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				bis(2-Ethylhexyl)phthalate	1.1	mg/kg	2.5E-10	mg/kg/day	1.4E-02	(mg/kg/day)-1	3.E-12	5.7E-09	mg/kg/day	2.0E-02	mg/kg/day	3.E-07
				Dibenzo(a,h)anthracene	0.2	mg/kg	5.8E-11	mg/kg/day	7.3E+00	(mg/kg/day)-1	4.E-10	1.4E-09	mg/kg/day	3.0E-02	mg/kg/day	5.E-08
				Indeno(1,2,3-cd)pyrene	1.4	mg/kg	4.1E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-10	9.5E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				Phenanthrene	1.4	mg/kg	NC		NC			9.5E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				alpha-Chlordane	0.0043	mg/kg	3.8E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-13	9.0E-12	mg/kg/day	5.0E-04	mg/kg/day	2.E-08
				Aroclor-1254	0.49	mg/kg	1.5E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	3.E-10	3.6E-09	mg/kg/day	2.0E-05	mg/kg/day	2.E-04
				Dieldrin	0.012	mg/kg	2.7E-12	mg/kg/day	1.6E+01	(mg/kg/day)-1	4.E-11	6.3E-11	mg/kg/day	5.0E-05	mg/kg/day	1 E-06
				Endosulfan sulfate	0.0052	mg/kg	NC		NC			2.7E-11	mg/kg/day	6.0E-03	mg/kg/day	5 E-09
				Arsenic	2.1	mg/kg	1.4E-10	mg/kg/day	1.5E+00	(mg/kg/day)-1	2.E-10	3.3E-09	mg/kg/day	3.0E-04	mg/kg/day	1.E-05
				Cadmium	1.7	mg/kg	NC		NC			8.9E-11	mg/kg/day	2.5E-05	mg/kg/day	4.E-06
				Chromium	156	mg/kg	NC		NC					7 5E-05	mg/kg/day	
				Lead	160	mg/kg	0.0E+00	mg/kg/day	–							
				Manganese	332	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Mercury	0.4	mg/kg	NC		NC					2.1E-05	mg/kg/day	
				Nickel	19	mg/kg	NC		NC					8 0E-04	mg/kg/day	
				Vanadium	16	mg/kg	NC		NC					1 8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00011	mg/kg	7.4E-15	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-09	1.7E-13	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	2.53E-08	mg/kg	1 7E-18	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-13	4.0E-17	mg/kg/day			
			EXPOSURE ROUTE TOTAL								6.E-09					2 E-04
		EXPOSURE POINT TOTAL									2 E-08					1 E-03
	EXPOSURE MEDIUM TOTAL										2 E-08					1 E-03
SEDIMENT TOTAL											2.E-08					1.E-03

TABLE 7.32.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SURFACE WATER	SURFACE WATER	DYERVILLE POND	INGESTION	Acenaphthylene	0.00000132	mg/l	NC		NC			1.2E-12	mg/kg/day	6.0E-02	mg/kg/day	2 E-11
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	6.7E-10	mg/kg/day	1.4E-02	mg/kg/day	9.E-12	1.6E-08	mg/kg/day	2.0E-02	mg/kg/day	8 E-07
				Aldrin	0.000023	mg/l	9.0E-13	mg/kg/day	1.7E+01	mg/kg/day	2.E-11	2.1E-11	mg/kg/day	3.0E-05	mg/kg/day	7 E-07
				alpha-Chlordane	0.000019	mg/l	7.4E-13	mg/kg/day	3.5E-01	mg/kg/day	3.E-13	1.7E-11	mg/kg/day	5.0E-04	mg/kg/day	3 E-08
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			2.9E-12	mg/kg/day	6.0E-03	mg/kg/day	5.E-10
				Endrin Aldehyde	0.000005	mg/l	NC		NC			4.6E-12	mg/kg/day	3.0E-04	mg/kg/day	2 E-08
				gamma-Chlordane	0.000021	mg/l	8.2E-13	mg/kg/day	3.5E-01	mg/kg/day	3.E-13	1.9E-11	mg/kg/day	5.0E-04	mg/kg/day	4.E-08
				Arsenic	0.0046	mg/l	1.8E-10	mg/kg/day	1.5E+00	mg/kg/day	3.E-10	4.2E-09	mg/kg/day	3.0E-04	mg/kg/day	1 E-05
				Barium	0.021	mg/l	NC		NC			1.9E-08	mg/kg/day	7.0E-02	mg/kg/day	3 E-07
				Chromium	0.0023	mg/l	NC		NC			2.1E-09	mg/kg/day	3.0E-03	mg/kg/day	7 E-07
				Lead	0.0044	mg/l	1.7E-10	mg/kg/day	--			4.0E-09	mg/kg/day			
				Manganese	0.13	mg/l	NC		NC			1.2E-07	mg/kg/day	2.4E-02	mg/kg/day	5 E-06
				Mercury	0.00000394	mg/l	NC		NC			3.6E-12	mg/kg/day	3.0E-04	mg/kg/day	1 E-08
				Thallium	0.0022	mg/l	NC		NC			2.0E-09	mg/kg/day	8.0E-05	mg/kg/day	3 E-05
				Nitrate	0.76	mg/l	NC		NC			6.9E-07	mg/kg/day	1.6E+00	mg/kg/day	4 E-07
				Nitrite-N	0.084	mg/l	NC		NC			7.7E-08	mg/kg/day	1.0E-01	mg/kg/day	8 E-07
				Toxicity Equivalency (Dioxins/Furans)	0.00000012	mg/l	4.7E-15	mg/kg/day	1.5E+05	mg/kg/day	7.E-10	1.1E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-09					5 E-05
			DERMAL	Acenaphthylene	0.00000132	mg/l	NC		NC			--		6.0E-02	mg/kg/day	
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	4.0E-07	mg/kg/day	1.4E-02	mg/kg/day	6.E-09	9.4E-06	mg/kg/day	2.0E-02	mg/kg/day	5.E-04
				Aldrin	0.000023	mg/l	3.2E-11	mg/kg/day	1.7E+01	mg/kg/day	5.E-10	7.4E-10	mg/kg/day	3.0E-05	mg/kg/day	2 E-05
				alpha-Chlordane	0.000019	mg/l	6.1E-10	mg/kg/day	3.5E-01	mg/kg/day	2.E-10	1.4E-08	mg/kg/day	5.0E-04	mg/kg/day	3 E-05
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			--		6.0E-03	mg/kg/day	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			1.3E-09	mg/kg/day	3.0E-04	mg/kg/day	4 E-06
				gamma-Chlordane	0.000021	mg/l	6.7E-10	mg/kg/day	3.5E-01	mg/kg/day	2.E-10	1.6E-08	mg/kg/day	5.0E-04	mg/kg/day	3 E-05
				Arsenic	0.0046	mg/l	4.5E-10	mg/kg/day	1.5E+00	mg/kg/day	7.E-10	1.1E-08	mg/kg/day	3.0E-04	mg/kg/day	4 E-05
				Barium	0.021	mg/l	NC		NC			4.8E-08	mg/kg/day	4.9E-03	mg/kg/day	1 E-05
				Chromium	0.0023	mg/l	NC		NC			1.1E-08	mg/kg/day	7.5E-05	mg/kg/day	1.E-04
				Lead	0.0044	mg/l	--		--			--				
				Manganese	0.13	mg/l	NC		NC			3.0E-07	mg/kg/day	9.6E-04	mg/kg/day	3 E-04
				Mercury	0.00000394	mg/l	NC		NC			9.0E-12	mg/kg/day	2.1E-05	mg/kg/day	4 E-07
				Thallium	0.0022	mg/l	NC		NC			5.0E-09	mg/kg/day	8.0E-05	mg/kg/day	6 E-05
				Nitrate	0.76	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.084	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00000012	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								7.E-09					1 E-03
		EXPOSURE POINT TOTAL									8.E-09					1 E-03
	EXPOSURE MEDIUM TOTAL										8.E-09					1 E-03
SURFACE WATER TOTAL											8.E-09					1.E-03
BIOTA	COMBINED FISH DIET	DYERVILLE POND	INGESTION	Acenaphthylene	0.00076	mg/kg	NC		NC			9.6E-08	mg/kg/day	6.0E-02	mg/kg/day	2 E-06
				Dibenzo(a,h)anthracene	0.00017	mg/kg	9.2E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	7.E-09	2.1E-08	mg/kg/day	3.0E-02	mg/kg/day	7 E-07
				Phenanthrene	0.0049	mg/kg	NC		NC			6.2E-07	mg/kg/day	3.0E-02	mg/kg/day	2 E-05
				4,4'-DDD	0.03543	mg/kg	1.9E-07	mg/kg/day	2.4E-01	(mg/kg/day)-1	5.E-08	4.5E-06	mg/kg/day	5.0E-04	mg/kg/day	9 E-03
				4,4'-DDE	0.011	mg/kg	5.9E-08	mg/kg/day	3.4E-01	(mg/kg/day)-1	2.E-08	1.4E-06	mg/kg/day	5.0E-04	mg/kg/day	3.E-03
				4,4'-DDT	0.0119	mg/kg	6.4E-08	mg/kg/day	3.4E-01	(mg/kg/day)-1	2.E-08	1.5E-06	mg/kg/day	5.0E-04	mg/kg/day	3 E-03
				alpha-Chlordane	0.0144	mg/kg	7.8E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-08	1.8E-06	mg/kg/day	5.0E-04	mg/kg/day	4 E-03
				Aroclor-1254	0.37026	mg/kg	2.0E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	4.E-06	4.7E-05	mg/kg/day	2.0E-05	mg/kg/day	2.E+00
				Dieldrin	0.00852	mg/kg	4.6E-08	mg/kg/day	1.6E+01	(mg/kg/day)-1	7.E-07	1.1E-06	mg/kg/day	5.0E-05	mg/kg/day	2 E-02
				gamma-Chlordane	0.00574	mg/kg	3.1E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-08	7.2E-07	mg/kg/day	5.0E-04	mg/kg/day	1 E-03
				Heptachlor Epoxide	0.0018	mg/kg	9.7E-09	mg/kg/day	9.1E+00	(mg/kg/day)-1	9.E-08	2.3E-07	mg/kg/day	1.3E-05	mg/kg/day	2.E-02
				Technical Chlordane	0.31006	mg/kg	1.7E-06	mg/kg/day	3.5E-01	(mg/kg/day)-1	6.E-07	3.9E-05	mg/kg/day	5.0E-04	mg/kg/day	8.E-02
				Cadmium	0.157	mg/kg	NC		NC			2.0E-05	mg/kg/day	1.0E-03	mg/kg/day	2.E-02
				Lead	0.341	mg/kg	1.8E-06	mg/kg/day	--			4.3E-05	mg/kg/day			
				Manganese	12.6	mg/kg	NC		NC			1.6E-03	mg/kg/day	1.4E-01	mg/kg/day	1.E-02
				Mercury	0.102	mg/kg	NC		NC			1.3E-05	mg/kg/day	3.0E-04	mg/kg/day	4.E-02
				Mercury (methyl)	0.117	mg/kg	NC		NC			1.5E-05	mg/kg/day	1.0E-04	mg/kg/day	1 E-01

TABLE 7.32.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		R/D/R/C (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Toxicity Equivalency (Dioxins/Furans)	0.0000522	mg/kg	2.8E-10	mg/kg/day	1.5E+05	(mg/kg/day)-1	4.E-05	6.6E-09	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-05					2.7.E+00
		EXPOSURE POINT TOTAL									5.E-05					2.7.E+00
	EXPOSURE MEDIUM TOTAL										5.E-05					2.7.E+00
COMBINED FISH DIET TOTAL											5.E-05					2.7.E+00
TOTAL RECEPTOR RISK ACROSS ALL MEDIA											5.E-05	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				2.7.E+00

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium
-- - Not calculated: dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: MJM

TABLE 7.34.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		R/D/R/C (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	DYERVILLE POND	INGESTION	2-Methylnaphthalene	0.031	mg/kg	NC		NC			7.9E-10	mg/kg/day	2.0E-02	mg/kg/day	4.E-08
				Acenaphthylene	0.16	mg/kg	NC		NC			4.1E-09	mg/kg/day	6.0E-02	mg/kg/day	7.E-08
				Benzo(a)anthracene	1.4	mg/kg	2.0E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-09	3.6E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Benzo(a)pyrene	1.4	mg/kg	2.0E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-08	3.6E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Benzo(b)fluoranthene	2.5	mg/kg	3.6E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-09	6.4E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(g,h,i)perylene	1.1	mg/kg	NC		NC			2.8E-08	mg/kg/day	3.0E-02	mg/kg/day	9.E-07
				Benzo(k)fluoranthene	0.71	mg/kg	1.0E-09	mg/kg/day	7.3E-02	(mg/kg/day)-1	8.E-11	1.8E-08	mg/kg/day	3.0E-02	mg/kg/day	6.E-07
				bis(2-Ethylhexyl)phthalate	1.1	mg/kg	1.6E-09	mg/kg/day	1.4E-02	(mg/kg/day)-1	2.E-11	2.8E-08	mg/kg/day	2.0E-02	mg/kg/day	1.E-06
				Dibenzo(a,h)anthracene	0.2	mg/kg	2.9E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-09	5.1E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Indeno(1,2,3-cd)pyrene	1.4	mg/kg	2.0E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-09	3.6E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Phenanthrene	1.4	mg/kg	NC		NC			3.6E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				alpha-Chlordane	0.0043	mg/kg	6.3E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-12	1.1E-10	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				Aroclor-1254	0.49	mg/kg	7.1E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-09	1.2E-08	mg/kg/day	2.0E-05	mg/kg/day	6.E-04
				Dieldrin	0.012	mg/kg	1.7E-11	mg/kg/day	1.6E+01	(mg/kg/day)-1	3.E-10	3.1E-10	mg/kg/day	5.0E-05	mg/kg/day	6.E-06
				Endosulfan sulfate	0.0052	mg/kg	NC		NC			1.3E-10	mg/kg/day	6.0E-03	mg/kg/day	2.E-08
				Arsenic	2.1	mg/kg	3.1E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	5.E-09	5.3E-08	mg/kg/day	3.0E-04	mg/kg/day	2.E-04
				Cadmium	1.7	mg/kg	NC		NC			4.3E-08	mg/kg/day	1.0E-03	mg/kg/day	4.E-05
				Chromium	156	mg/kg	NC		NC			4.0E-06	mg/kg/day	3.0E-03	mg/kg/day	1.E-03
				Lead	160	mg/kg	2.3E-07	mg/kg/day	--			4.1E-06	mg/kg/day			
				Manganese	332	mg/kg	NC		NC			8.4E-06	mg/kg/day	7.1E-02	mg/kg/day	1.E-04
				Mercury	0.4	mg/kg	NC		NC			1.0E-08	mg/kg/day	3.0E-04	mg/kg/day	3.E-05
				Nickel	19	mg/kg	NC		NC			4.8E-07	mg/kg/day	2.0E-02	mg/kg/day	2.E-05
				Vanadium	16	mg/kg	NC		NC			4.1E-07	mg/kg/day	7.0E-03	mg/kg/day	6.E-05
				Toxicity Equivalency (Dioxins/Furans)	0.00011	mg/kg	1.6E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-08	2.8E-12	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	2.53E-08	mg/kg	3.7E-17	mg/kg/day	1.5E+05	(mg/kg/day)-1	6.E-12	6.4E-16	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-08					2.E-03
			DERMAL	2-Methylnaphthalene	0.031	mg/kg	NC		NC			1.0E-10	mg/kg/day	2.0E-02	mg/kg/day	5.E-09
				Acenaphthylene	0.16	mg/kg	NC		NC			5.1E-10	mg/kg/day	6.0E-02	mg/kg/day	9.E-09
				Benzo(a)anthracene	1.4	mg/kg	2.6E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-10	4.5E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Benzo(a)pyrene	1.4	mg/kg	2.6E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-09	4.5E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Benzo(b)fluoranthene	2.5	mg/kg	4.6E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-10	8.0E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				Benzo(g,h,i)perylene	1.1	mg/kg	NC		NC			3.5E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				Benzo(k)fluoranthene	0.71	mg/kg	1.3E-10	mg/kg/day	7.3E-02	(mg/kg/day)-1	1.E-11	2.3E-09	mg/kg/day	3.0E-02	mg/kg/day	8.E-08
				bis(2-Ethylhexyl)phthalate	1.1	mg/kg	1.6E-10	mg/kg/day	1.4E-02	(mg/kg/day)-1	2.E-12	2.7E-09	mg/kg/day	2.0E-02	mg/kg/day	1.E-07
				Dibenzo(a,h)anthracene	0.2	mg/kg	3.7E-11	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-10	6.4E-10	mg/kg/day	3.0E-02	mg/kg/day	2.E-08
				Indeno(1,2,3-cd)pyrene	1.4	mg/kg	2.6E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-10	4.5E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				Phenanthrene	1.4	mg/kg	NC		NC			4.5E-09	mg/kg/day	3.0E-02	mg/kg/day	2.E-07
				alpha-Chlordane	0.0043	mg/kg	2.4E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	9.E-14	4.3E-12	mg/kg/day	5.0E-04	mg/kg/day	9.E-09
				Aroclor-1254	0.49	mg/kg	9.7E-11	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-10	1.7E-09	mg/kg/day	2.0E-05	mg/kg/day	8.E-05
				Dieldrin	0.012	mg/kg	1.7E-12	mg/kg/day	1.6E+01	(mg/kg/day)-1	3.E-11	3.0E-11	mg/kg/day	5.0E-05	mg/kg/day	6.E-07
				Endosulfan sulfate	0.0052	mg/kg	NC		NC			1.3E-11	mg/kg/day	6.0E-03	mg/kg/day	2.E-09
				Arsenic	2.1	mg/kg	8.9E-11	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-10	1.6E-09	mg/kg/day	3.0E-04	mg/kg/day	5.E-06
				Cadmium	1.7	mg/kg	NC		NC			4.2E-11	mg/kg/day	2.5E-05	mg/kg/day	2.E-06
				Chromium	156	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	160	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	332	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Mercury	0.4	mg/kg	NC		NC					2.1E-05	mg/kg/day	
				Nickel	19	mg/kg	NC		NC					8.0E-04	mg/kg/day	
				Vanadium	16	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00011	mg/kg	4.7E-15	mg/kg/day	1.5E+05	(mg/kg/day)-1	7.E-10	8.2E-14	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	2.53E-08	mg/kg	1.1E-18	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-13	1.9E-17	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-09					9.E-05
		EXPOSURE POINT TOTAL									6.E-08					3.E-03
	EXPOSURE MEDIUM TOTAL										6.E-08					3.E-03
SEDIMENT TOTAL											6.E-08					3.E-03
SURFACE WATER	SURFACE WATER	DYERVILLE POND	INGESTION	Acenaphthylene	0.00000132	mg/l	NC		NC			3.4E-11	mg/kg/day	6.0E-02	mg/kg/day	6.E-10
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	2.5E-08	mg/kg/day	1.4E-02	mg/kg/day	3.E-10	4.3E-07	mg/kg/day	2.0E-02	mg/kg/day	2.E-05
				Aldrin	0.000023	mg/l	3.3E-11	mg/kg/day	1.7E+01	mg/kg/day	6.E-10	5.9E-10	mg/kg/day	3.0E-05	mg/kg/day	2.E-05
				alpha-Chlordane	0.000019	mg/l	2.8E-11	mg/kg/day	3.5E-01	mg/kg/day	1.E-11	4.8E-10	mg/kg/day	5.0E-04	mg/kg/day	1.E-06
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			8.1E-11	mg/kg/day	6.0E-03	mg/kg/day	1.E-08

TABLE 7.34.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		R/D/R/C (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			1.3E-10	mg/kg/day	3.0E-04	mg/kg/day	4.E-07
				gamma-Chlordane	0.000021	mg/l	3.1E-11	mg/kg/day	3.5E-01	mg/kg/day	1.E-11	5.3E-10	mg/kg/day	5.0E-04	mg/kg/day	1.E-06
				Arsenic	0.0046	mg/l	6.7E-09	mg/kg/day	1.5E+00	mg/kg/day	1.E-08	1.2E-07	mg/kg/day	3.0E-04	mg/kg/day	4.E-04
				Barium	0.021	mg/l	NC		NC			5.3E-07	mg/kg/day	7.0E-02	mg/kg/day	8.E-06
				Chromium	0.0023	mg/l	NC		NC			5.9E-08	mg/kg/day	3.0E-03	mg/kg/day	2.E-05
				Lead	0.0044	mg/l	6.4E-09	mg/kg/day	--			1.1E-07	mg/kg/day			
				Manganese	0.13	mg/l	NC		NC			3.3E-06	mg/kg/day	2.4E-02	mg/kg/day	1.E-04
				Mercury	0.00000394	mg/l	NC		NC			1.0E-10	mg/kg/day	3.0E-04	mg/kg/day	3.E-07
				Thallium	0.0022	mg/l	NC		NC			5.6E-08	mg/kg/day	8.0E-05	mg/kg/day	7.E-04
				Nitrate	0.76	mg/l	NC		NC			1.9E-05	mg/kg/day	1.6E+00	mg/kg/day	1.E-05
				Nitrite-N	0.084	mg/l	NC		NC			2.1E-06	mg/kg/day	1.0E-01	mg/kg/day	2.E-05
				Toxicity Equivalency (Dioxins/Furans)	0.00000012	mg/l	1.7E-13	mg/kg/day	1.5E+05	mg/kg/day	3.E-08	3.1E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-08					1.E-03
			DERMAL	Acenaphthylene	0.00000132	mg/l	NC		NC			--		6.0E-02	mg/kg/day	
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	2.7E-06	mg/kg/day	1.4E-02	mg/kg/day	4.E-08	4.8E-05	mg/kg/day	2.0E-02	mg/kg/day	2.E-03
				Aldrin	0.000023	mg/l	2.1E-10	mg/kg/day	1.7E+01	mg/kg/day	4.E-09	3.8E-09	mg/kg/day	3.0E-05	mg/kg/day	1.E-04
				alpha-Chlordane	0.000019	mg/l	4.1E-09	mg/kg/day	3.5E-01	mg/kg/day	1.E-09	7.2E-08	mg/kg/day	5.0E-04	mg/kg/day	1.E-04
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			--		6.0E-03	mg/kg/day	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			6.4E-09	mg/kg/day	3.0E-04	mg/kg/day	2.E-05
				gamma-Chlordane	0.000021	mg/l	4.6E-09	mg/kg/day	3.5E-01	mg/kg/day	2.E-09	8.0E-08	mg/kg/day	5.0E-04	mg/kg/day	2.E-04
				Arsenic	0.0046	mg/l	3.1E-09	mg/kg/day	1.5E+00	mg/kg/day	5.E-09	5.4E-08	mg/kg/day	3.0E-04	mg/kg/day	2.E-04
				Barium	0.021	mg/l	NC		NC			2.4E-07	mg/kg/day	4.9E-03	mg/kg/day	5.E-05
				Chromium	0.0023	mg/l	NC		NC			5.4E-08	mg/kg/day	7.5E-05	mg/kg/day	7.E-04
				Lead	0.0044	mg/l	--		--			--				
				Manganese	0.13	mg/l	NC		NC			1.5E-06	mg/kg/day	9.6E-04	mg/kg/day	2.E-03
				Mercury	0.00000394	mg/l	NC		NC			4.6E-11	mg/kg/day	2.1E-05	mg/kg/day	2.E-06
				Thallium	0.0022	mg/l	NC		NC			2.6E-08	mg/kg/day	8.0E-05	mg/kg/day	3.E-04
				Nitrate	0.76	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.084	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00000012	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-08					6.E-03
		EXPOSURE POINT TOTAL									9.E-08					7.E-03
	EXPOSURE MEDIUM TOTAL										9.E-08					7.E-03
SURFACE WATER TOTAL											9.E-08					7.E-03
BIOTA	COMBINED FISH DIET	DYERVILLE POND	INGESTION	Acenaphthylene	0.00076	mg/kg	NC		NC			9.3E-08	mg/kg/day	6.0E-02	mg/kg/day	2.E-06
				Dibenzo(a,h)anthracene	0.00017	mg/kg	1.2E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	9.E-09	2.1E-08	mg/kg/day	3.0E-02	mg/kg/day	7.E-07
				Phenanthrene	0.0049	mg/kg	NC		NC			6.0E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				4,4'-DDD	0.03543	mg/kg	2.5E-07	mg/kg/day	2.4E-01	(mg/kg/day)-1	6.E-08	4.3E-06	mg/kg/day	5.0E-04	mg/kg/day	9.E-03
				4,4'-DDE	0.011	mg/kg	7.7E-08	mg/kg/day	3.4E-01	(mg/kg/day)-1	3.E-08	1.3E-06	mg/kg/day	5.0E-04	mg/kg/day	3.E-03
				4,4'-DDT	0.0119	mg/kg	8.3E-08	mg/kg/day	3.4E-01	(mg/kg/day)-1	3.E-08	1.5E-06	mg/kg/day	5.0E-04	mg/kg/day	3.E-03
				alpha-Chlordane	0.0144	mg/kg	1.0E-07	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-08	1.8E-06	mg/kg/day	5.0E-04	mg/kg/day	4.E-03
				Aroclor-1254	0.37026	mg/kg	2.6E-06	mg/kg/day	2.0E+00	(mg/kg/day)-1	5.E-06	4.5E-05	mg/kg/day	2.0E-05	mg/kg/day	2.E+00
				Dieldrin	0.00852	mg/kg	5.9E-08	mg/kg/day	1.6E+01	(mg/kg/day)-1	9.E-07	1.0E-06	mg/kg/day	5.0E-05	mg/kg/day	2.E-02
				gamma-Chlordane	0.00574	mg/kg	4.0E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-08	7.0E-07	mg/kg/day	5.0E-04	mg/kg/day	1.E-03
				Heptachlor Epoxide	0.0018	mg/kg	1.3E-08	mg/kg/day	9.1E+00	(mg/kg/day)-1	1.E-07	2.2E-07	mg/kg/day	1.3E-05	mg/kg/day	2.E-02
				Technical Chlordane	0.31006	mg/kg	2.2E-06	mg/kg/day	3.5E-01	(mg/kg/day)-1	8.E-07	3.8E-05	mg/kg/day	5.0E-04	mg/kg/day	8.E-02
				Cadmium	0.157	mg/kg	NC		NC			1.9E-05	mg/kg/day	1.0E-03	mg/kg/day	2.E-02
				Lead	0.341	mg/kg	2.4E-06	mg/kg/day	--			4.2E-05	mg/kg/day			
				Manganese	12.6	mg/kg	NC		NC			1.5E-03	mg/kg/day	1.4E-01	mg/kg/day	1.E-02
				Mercury	0.102	mg/kg	NC		NC			1.2E-05	mg/kg/day	3.0E-04	mg/kg/day	4.E-02
				Mercury (methyl)	0.117	mg/kg	NC		NC			1.4E-05	mg/kg/day	1.0E-04	mg/kg/day	1.E-01
				Toxicity Equivalency (Dioxins/Furans)	0.0000522	mg/kg	3.6E-10	mg/kg/day	1.5E+05	(mg/kg/day)-1	5.E-05	6.4E-09	mg/kg/day			
			EXPOSURE ROUTE TOTAL								6.E-05					2.6.E+00
		EXPOSURE POINT TOTAL									6.E-05					2.6.E+00
	EXPOSURE MEDIUM TOTAL										6.E-05					2.6.E+00
COMBINED FISH DIET TOTAL											6.E-05					2.6.E+00
									TOTAL RECEPTOR RISK ACROSS ALL MEDIA		6.E-05	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				2.6.E+00

TABLE 7.34.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: MJM

TABLE 7.35.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	DYERVILLE POND	INGESTION	2-Methylnaphthalene	0.031	mg/kg	NC		NC			1.2E-09	mg/kg/day	2.0E-02	mg/kg/day	6.E-08
				Acenaphthylene	0.16	mg/kg	NC		NC			6.3E-09	mg/kg/day	6.0E-02	mg/kg/day	1.E-07
				Benzo(a)anthracene	1.4	mg/kg	2.4E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-09	5.5E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(a)pyrene	1.4	mg/kg	2.4E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-08	5.5E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Benzo(b)fluoranthene	2.5	mg/kg	4.2E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-09	9.9E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(g,h,i)perylene	1.1	mg/kg	NC		NC			4.4E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Benzo(k)fluoranthene	0.71	mg/kg	1.2E-09	mg/kg/day	7.3E-02	(mg/kg/day)-1	9.E-11	2.8E-08	mg/kg/day	3.0E-02	mg/kg/day	9.E-07
				bis(2-Ethylhexyl)phthalate	1.1	mg/kg	1.9E-09	mg/kg/day	1.4E-02	(mg/kg/day)-1	3.E-11	4.4E-08	mg/kg/day	2.0E-02	mg/kg/day	2.E-06
				Dibenzo(a,h)anthracene	0.2	mg/kg	3.4E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-09	7.9E-09	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				Indeno(1,2,3-cd)pyrene	1.4	mg/kg	2.4E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-09	5.5E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Phenanthrene	1.4	mg/kg	NC		NC			5.5E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				alpha-Chlordane	0.0043	mg/kg	7.3E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-12	1.7E-10	mg/kg/day	5.0E-04	mg/kg/day	3.E-07
				Aroclor-1254	0.49	mg/kg	8.3E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-09	1.9E-08	mg/kg/day	2.0E-05	mg/kg/day	1.E-03
				Dieldrin	0.012	mg/kg	2.0E-11	mg/kg/day	1.6E+01	(mg/kg/day)-1	3.E-10	4.7E-10	mg/kg/day	5.0E-05	mg/kg/day	9.E-06
				Endosulfan sulfate	0.0052	mg/kg	NC		NC			2.1E-10	mg/kg/day	6.0E-03	mg/kg/day	3.E-08
				Arsenic	2.1	mg/kg	3.6E-09	mg/kg/day	1.5E+00	(mg/kg/day)-1	5.E-09	8.3E-08	mg/kg/day	3.0E-04	mg/kg/day	3.E-04
				Cadmium	1.7	mg/kg	NC		NC			6.7E-08	mg/kg/day	1.0E-03	mg/kg/day	7.E-05
				Chromium	156	mg/kg	NC		NC			6.2E-06	mg/kg/day	3.0E-03	mg/kg/day	2.E-03
				Lead	160	mg/kg	2.7E-07	mg/kg/day	--			6.3E-06	mg/kg/day			
				Manganese	332	mg/kg	NC		NC			1.3E-05	mg/kg/day	7.1E-02	mg/kg/day	2.E-04
				Mercury	0.4	mg/kg	NC		NC			1.6E-08	mg/kg/day	3.0E-04	mg/kg/day	5.E-05
				Nickel	19	mg/kg	NC		NC			7.5E-07	mg/kg/day	2.0E-02	mg/kg/day	4.E-05
				Vanadium	16	mg/kg	NC		NC			6.3E-07	mg/kg/day	7.0E-03	mg/kg/day	9.E-05
				Toxicity Equivalency (Dioxins/Furans)	0.00011	mg/kg	1.9E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	3.E-08	4.4E-12	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	2.53E-08	mg/kg	4.3E-17	mg/kg/day	1.5E+05	(mg/kg/day)-1	6.E-12	1.0E-15	mg/kg/day			
			EXPOSURE ROUTE TOTAL								6.E-08					4.E-03
			DERMAL	2-Methylnaphthalene	0.031	mg/kg	NC		NC			4.6E-10	mg/kg/day	2.0E-02	mg/kg/day	2.E-08
				Acenaphthylene	0.16	mg/kg	NC		NC			2.4E-09	mg/kg/day	6.0E-02	mg/kg/day	4.E-08
				Benzo(a)anthracene	1.4	mg/kg	8.8E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-10	2.1E-08	mg/kg/day	3.0E-02	mg/kg/day	7.E-07
				Benzo(a)pyrene	1.4	mg/kg	8.8E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	6.E-09	2.1E-08	mg/kg/day	3.0E-02	mg/kg/day	7.E-07
				Benzo(b)fluoranthene	2.5	mg/kg	1.6E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-09	3.7E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Benzo(g,h,i)perylene	1.1	mg/kg	NC		NC			1.6E-08	mg/kg/day	3.0E-02	mg/kg/day	5.E-07
				Benzo(k)fluoranthene	0.71	mg/kg	4.5E-10	mg/kg/day	7.3E-02	(mg/kg/day)-1	3.E-11	1.0E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-07
				bis(2-Ethylhexyl)phthalate	1.1	mg/kg	5.3E-10	mg/kg/day	1.4E-02	(mg/kg/day)-1	7.E-12	1.2E-08	mg/kg/day	2.0E-02	mg/kg/day	6.E-07
				Dibenzo(a,h)anthracene	0.2	mg/kg	1.3E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	9.E-10	2.9E-09	mg/kg/day	3.0E-02	mg/kg/day	1.E-07
				Indeno(1,2,3-cd)pyrene	1.4	mg/kg	8.8E-10	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-10	2.1E-08	mg/kg/day	3.0E-02	mg/kg/day	7.E-07
				Phenanthrene	1.4	mg/kg	NC		NC			2.1E-08	mg/kg/day	3.0E-02	mg/kg/day	7.E-07
				alpha-Chlordane	0.0043	mg/kg	8.3E-13	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-13	1.9E-11	mg/kg/day	5.0E-04	mg/kg/day	4.E-08
				Aroclor-1254	0.49	mg/kg	3.3E-10	mg/kg/day	2.0E+00	(mg/kg/day)-1	7.E-10	7.8E-09	mg/kg/day	2.0E-05	mg/kg/day	4.E-04
				Dieldrin	0.012	mg/kg	5.8E-12	mg/kg/day	1.6E+01	(mg/kg/day)-1	9.E-11	1.4E-10	mg/kg/day	5.0E-05	mg/kg/day	3.E-06
				Endosulfan sulfate	0.0052	mg/kg	NC		NC			5.9E-11	mg/kg/day	6.0E-03	mg/kg/day	1.E-08
				Arsenic	2.1	mg/kg	3.1E-10	mg/kg/day	1.5E+00	(mg/kg/day)-1	5.E-10	7.1E-09	mg/kg/day	3.0E-04	mg/kg/day	2.E-05
				Cadmium	1.7	mg/kg	NC		NC			1.9E-10	mg/kg/day	2.5E-05	mg/kg/day	8.E-06
				Chromium	156	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	160	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	332	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Mercury	0.4	mg/kg	NC		NC					2.1E-05	mg/kg/day	
				Nickel	19	mg/kg	NC		NC					8.0E-04	mg/kg/day	
				Vanadium	16	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00011	mg/kg	1.6E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-09	3.7E-13	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	2.53E-08	mg/kg	3.7E-18	mg/kg/day	1.5E+05	(mg/kg/day)-1	6.E-13	8.6E-17	mg/kg/day			
			EXPOSURE ROUTE TOTAL								1.E-08					4.E-04
		EXPOSURE POINT TOTAL									8.E-08					4.E-03
	EXPOSURE MEDIUM TOTAL										8.E-08					4.E-03
SEDIMENT TOTAL											8.E-08					4.E-03
SURFACE WATER	SURFACE WATER	DYERVILLE POND	INGESTION	Acenaphthylene	0.00000132	mg/l	NC		NC			5.2E-11	mg/kg/day	6.0E-02	mg/kg/day	9.E-10
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	2.9E-08	mg/kg/day	1.4E-02	mg/kg/day	4.E-10	6.7E-07	mg/kg/day	2.0E-02	mg/kg/day	3.E-05
				Aldrin	0.000023	mg/l	3.9E-11	mg/kg/day	1.7E+01	mg/kg/day	7.E-10	9.1E-10	mg/kg/day	3.0E-05	mg/kg/day	3.E-05
				alpha-Chlordane	0.000019	mg/l	3.2E-11	mg/kg/day	3.5E-01	mg/kg/day	1.E-11	7.5E-10	mg/kg/day	5.0E-04	mg/kg/day	2.E-06
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			1.3E-10	mg/kg/day	6.0E-03	mg/kg/day	2.E-08

TABLE 7.35.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			2.0E-10	mg/kg/day	3.0E-04	mg/kg/day	7 E-07
				gamma-Chlordane	0.000021	mg/l	3.6E-11	mg/kg/day	3.5E-01	mg/kg/day	1.E-11	8.3E-10	mg/kg/day	5.0E-04	mg/kg/day	2 E-06
				Arsenic	0.0046	mg/l	7.8E-09	mg/kg/day	1.5E+00	mg/kg/day	1.E-08	1.8E-07	mg/kg/day	3.0E-04	mg/kg/day	6 E-04
				Barium	0.021	mg/l	NC		NC			8.3E-07	mg/kg/day	7.0E-02	mg/kg/day	1 E-05
				Chromium	0.0023	mg/l	NC		NC			9.1E-08	mg/kg/day	3.0E-03	mg/kg/day	3.E-05
				Lead	0.0044	mg/l	7.5E-09	mg/kg/day	--			1.7E-07	mg/kg/day			
				Manganese	0.13	mg/l	NC		NC			5.1E-06	mg/kg/day	2 4E-02	mg/kg/day	2.E-04
				Mercury	0.00000394	mg/l	NC		NC			1.6E-10	mg/kg/day	3.0E-04	mg/kg/day	5.E-07
				Thallium	0 0022	mg/l	NC		NC			8.7E-08	mg/kg/day	8.0E-05	mg/kg/day	1 E-03
				Nitrate	0.76	mg/l	NC		NC			3.0E-05	mg/kg/day	1.6E+00	mg/kg/day	2.E-05
				Nitrite-N	0.084	mg/l	NC		NC			3.3E-06	mg/kg/day	1.0E-01	mg/kg/day	3.E-05
				Toxicity Equivalency (Dioxins/Furans)	0.00000012	mg/l	2.0E-13	mg/kg/day	1 5E+05	mg/kg/day	3.E-08	4.7E-12	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-08					2.E-03
			DERMAL	Acenaphthylene	0.00000132	mg/l	NC		NC			--		6.0E-02	mg/kg/day	
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	2.5E-06	mg/kg/day	1.4E-02	mg/kg/day	3.E-08	5.8E-05	mg/kg/day	2.0E-02	mg/kg/day	3 E-03
				Aldrin	0.000023	mg/l	1.9E-10	mg/kg/day	1.7E+01	mg/kg/day	3.E-09	4.5E-09	mg/kg/day	3.0E-05	mg/kg/day	2.E-04
				alpha-Chlordane	0.000019	mg/l	3.7E-09	mg/kg/day	3.5E-01	mg/kg/day	1 E-09	8.7E-08	mg/kg/day	5 0E-04	mg/kg/day	2 E-04
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			--		6.0E-03	mg/kg/day	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			7.8E-09	mg/kg/day	3.0E-04	mg/kg/day	3.E-05
				gamma-Chlordane	0.000021	mg/l	4.1E-09	mg/kg/day	3.5E-01	mg/kg/day	1.E-09	9.7E-08	mg/kg/day	5.0E-04	mg/kg/day	2.E-04
				Arsenic	0.0046	mg/l	2.8E-09	mg/kg/day	1.5E+00	mg/kg/day	4.E-09	6.5E-08	mg/kg/day	3.0E-04	mg/kg/day	2.E-04
				Barium	0.021	mg/l	NC		NC			3.0E-07	mg/kg/day	4.9E-03	mg/kg/day	6.E-05
				Chromium	0.0023	mg/l	NC		NC			6.5E-08	mg/kg/day	7.5E-05	mg/kg/day	9.E-04
				Lead	0.0044	mg/l	--		--			--				
				Manganese	0.13	mg/l	NC		NC			1.8E-06	mg/kg/day	9.6E-04	mg/kg/day	2.E-03
				Mercury	0.00000394	mg/l	NC		NC			5.5E-11	mg/kg/day	2.1E-05	mg/kg/day	3.E-06
				Thallium	0.0022	mg/l	NC		NC			3.1E-08	mg/kg/day	8.0E-05	mg/kg/day	4.E-04
				Nitrate	0.76	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.084	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00000012	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0.0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-08					7.E-03
		EXPOSURE POINT TOTAL									9 E-08					9 E-03
	EXPOSURE MEDIUM TOTAL										9 E-08					9 E-03
SURFACE WATER TOTAL											9.E-08					9.E-03
BIOTA	COMBINED FISH DIET	DYERVILLE POND	INGESTION	Acenaphthylene	0.00076	mg/kg	NC		NC			9.6E-08	mg/kg/day	6.0E-02	mg/kg/day	2.E-06
				Dibenzo(a,h)anthracene	0.00017	mg/kg	9 2E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	7.E-09	2.1E-08	mg/kg/day	3.0E-02	mg/kg/day	7.E-07
				Phenanthrene	0.0049	mg/kg	NC		NC			6.2E-07	mg/kg/day	3 0E-02	mg/kg/day	2.E-05
				4,4'-DDD	0.03543	mg/kg	1.9E-07	mg/kg/day	2.4E-01	(mg/kg/day)-1	5.E-08	4.5E-06	mg/kg/day	5.0E-04	mg/kg/day	9.E-03
				4,4'-DDE	0 011	mg/kg	5.9E-08	mg/kg/day	3.4E-01	(mg/kg/day)-1	2.E-08	1.4E-06	mg/kg/day	5.0E-04	mg/kg/day	3.E-03
				4,4'-DDT	0.0119	mg/kg	6.4E-08	mg/kg/day	3 4E-01	(mg/kg/day)-1	2.E-08	1.5E-06	mg/kg/day	5 0E-04	mg/kg/day	3.E-03
				alpha-Chlordane	0.0144	mg/kg	7.8E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-08	1.8E-06	mg/kg/day	5 0E-04	mg/kg/day	4.E-03
				Aroclor-1254	0.37026	mg/kg	2.0E-06	mg/kg/day	2 0E+00	(mg/kg/day)-1	4 E-06	4.7E-05	mg/kg/day	2 0E-05	mg/kg/day	2 E+00
				Dieldrin	0.00852	mg/kg	4 6E-08	mg/kg/day	1 6E+01	(mg/kg/day)-1	7 E-07	1.1E-06	mg/kg/day	5.0E-05	mg/kg/day	2.E-02
				gamma-Chlordane	0.00574	mg/kg	3 1E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	1 E-08	7.2E-07	mg/kg/day	5 0E-04	mg/kg/day	1 E-03
				Heptachlor Epoxide	0.0018	mg/kg	9.7E-09	mg/kg/day	9.1E+00	(mg/kg/day)-1	9 E-08	2 3E-07	mg/kg/day	1.3E-05	mg/kg/day	2 E-02
				Technical Chlordane	0.31006	mg/kg	1 7E-06	mg/kg/day	3 5E-01	(mg/kg/day)-1	6 E-07	3 9E-05	mg/kg/day	5.0E-04	mg/kg/day	8 E-02
				Cadmium	0.157	mg/kg	NC		NC			2 0E-05	mg/kg/day	1 0E-03	mg/kg/day	2 E-02
				Lead	0.341	mg/kg	1.8E-06	mg/kg/day	--			4 3E-05	mg/kg/day			
				Manganese	12.6	mg/kg	NC		NC			1.6E-03	mg/kg/day	1.4E-01	mg/kg/day	1 E-02
				Mercury	0 102	mg/kg	NC		NC			1.3E-05	mg/kg/day	3.0E-04	mg/kg/day	4 E-02
				Mercury (methyl)	0.117	mg/kg	NC		NC			1.5E-05	mg/kg/day	1.0E-04	mg/kg/day	1.E-01
				Toxicity Equivalency (Dioxins/Furans)	0.0000522	mg/kg	2.8E-10	mg/kg/day	1.5E+05	(mg/kg/day)-1	4.E-05	6.6E-09	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-05					2 7 E+00
		EXPOSURE POINT TOTAL									5.E-05					2.7.E+00
	EXPOSURE MEDIUM TOTAL										5 E-05					2 7.E+00
COMBINED FISH DIET TOTAL											5.E-05					2.7.E+00
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	5.E-05				TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA	2.7.E+00

TABLE 7.35.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	

NOTES:
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: MJM

TABLE 7.36.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS – CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SEDIMENT	SEDIMENT	DYERVILLE POND	INGESTION	2-Methylnaphthalene	0.031	mg/kg	NC		NC			1.5E-08	mg/kg/day	2.0E-02	mg/kg/day	7.E-07
				Acenaphthylene	0.16	mg/kg	NC		NC			7.6E-08	mg/kg/day	6.0E-02	mg/kg/day	1.E-06
				Benzo(a)anthracene	1.4	mg/kg	1.9E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	6.6E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(a)pyrene	1.4	mg/kg	1.9E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-07	6.6E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(b)fluoranthene	2.5	mg/kg	3.4E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.2E-06	mg/kg/day	3.0E-02	mg/kg/day	4.E-05
				Benzo(g,h,i)perylene	1.1	mg/kg	NC		NC			5.2E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Benzo(k)fluoranthene	0.71	mg/kg	9.6E-09	mg/kg/day	7.3E-02	(mg/kg/day)-1	7.E-10	3.4E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				bis(2-Ethylhexyl)phthalate	1.1	mg/kg	1.5E-08	mg/kg/day	1.4E-02	(mg/kg/day)-1	2.E-10	5.2E-07	mg/kg/day	2.0E-02	mg/kg/day	3.E-05
				Dibenzo(a,h)anthracene	0.2	mg/kg	2.7E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-08	9.5E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Indeno(1,2,3-cd)pyrene	1.4	mg/kg	1.9E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	6.6E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				Phenanthrene	1.4	mg/kg	NC		NC			6.6E-07	mg/kg/day	3.0E-02	mg/kg/day	2.E-05
				alpha-Chlordane	0.0043	mg/kg	5.8E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-11	2.0E-09	mg/kg/day	5.0E-04	mg/kg/day	4.E-06
				Aroclor-1254	0.49	mg/kg	6.6E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	1.E-08	2.3E-07	mg/kg/day	2.0E-05	mg/kg/day	1.E-02
				Dieldrin	0.012	mg/kg	1.6E-10	mg/kg/day	1.6E+01	(mg/kg/day)-1	3.E-09	5.7E-09	mg/kg/day	5.0E-05	mg/kg/day	1.E-04
				Endosulfan sulfate	0.0052	mg/kg	NC		NC			2.5E-09	mg/kg/day	6.0E-03	mg/kg/day	4.E-07
				Arsenic	2.1	mg/kg	2.8E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	4.E-08	1.0E-06	mg/kg/day	3.0E-04	mg/kg/day	3.E-03
				Cadmium	1.7	mg/kg	NC		NC			8.1E-07	mg/kg/day	1.0E-03	mg/kg/day	8.E-04
				Chromium	156	mg/kg	NC		NC			7.4E-05	mg/kg/day	3.0E-03	mg/kg/day	2.E-02
				Lead	160	mg/kg	2.2E-06	mg/kg/day	--			7.6E-05	mg/kg/day			
				Manganese	332	mg/kg	NC		NC			1.6E-04	mg/kg/day	7.1E-02	mg/kg/day	2.E-03
				Mercury	0.4	mg/kg	NC		NC			1.9E-07	mg/kg/day	3.0E-04	mg/kg/day	6.E-04
				Nickel	19	mg/kg	NC		NC			9.0E-06	mg/kg/day	2.0E-02	mg/kg/day	5.E-04
				Vanadium	16	mg/kg	NC		NC			7.6E-06	mg/kg/day	7.0E-03	mg/kg/day	1.E-03
				Toxicity Equivalency (Dioxins/Furans)	0.00011	mg/kg	1.5E-12	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-07	5.2E-11	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	2.53E-08	mg/kg	3.4E-16	mg/kg/day	1.5E+05	(mg/kg/day)-1	5.E-11	1.2E-14	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-07					5.E-02
			DERMAL	2-Methylnaphthalene	0.031	mg/kg	NC		NC			2.1E-09	mg/kg/day	2.0E-02	mg/kg/day	1.E-07
				Acenaphthylene	0.16	mg/kg	NC		NC			1.1E-08	mg/kg/day	6.0E-02	mg/kg/day	2.E-07
				Benzo(a)anthracene	1.4	mg/kg	2.8E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-09	9.7E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(a)pyrene	1.4	mg/kg	2.8E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-08	9.7E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(b)fluoranthene	2.5	mg/kg	4.9E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	4.E-09	1.7E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Benzo(g,h,i)perylene	1.1	mg/kg	NC		NC			7.6E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(k)fluoranthene	0.71	mg/kg	1.4E-09	mg/kg/day	7.3E-02	(mg/kg/day)-1	1.E-10	4.9E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				bis(2-Ethylhexyl)phthalate	1.1	mg/kg	1.7E-09	mg/kg/day	1.4E-02	(mg/kg/day)-1	2.E-11	5.9E-08	mg/kg/day	2.0E-02	mg/kg/day	3.E-06
				Dibenzo(a,h)anthracene	0.2	mg/kg	4.0E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-09	1.4E-08	mg/kg/day	3.0E-02	mg/kg/day	5.E-07
				Indeno(1,2,3-cd)pyrene	1.4	mg/kg	2.8E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-09	9.7E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Phenanthrene	1.4	mg/kg	NC		NC			9.7E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				alpha-Chlordane	0.0043	mg/kg	2.6E-12	mg/kg/day	3.5E-01	(mg/kg/day)-1	9.E-13	9.1E-11	mg/kg/day	5.0E-04	mg/kg/day	2.E-07
				Aroclor-1254	0.49	mg/kg	1.0E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-09	3.6E-08	mg/kg/day	2.0E-05	mg/kg/day	2.E-03
				Dieldrin	0.012	mg/kg	1.8E-11	mg/kg/day	1.6E+01	(mg/kg/day)-1	3.E-10	6.4E-10	mg/kg/day	5.0E-05	mg/kg/day	1.E-05
				Endosulfan sulfate	0.0052	mg/kg	NC		NC			2.8E-10	mg/kg/day	6.0E-03	mg/kg/day	5.E-08
				Arsenic	2.1	mg/kg	9.6E-10	mg/kg/day	1.5E+00	(mg/kg/day)-1	1.E-09	3.4E-08	mg/kg/day	3.0E-04	mg/kg/day	1.E-04
				Cadmium	1.7	mg/kg	NC		NC			9.0E-10	mg/kg/day	2.5E-05	mg/kg/day	4.E-05
				Chromium	156	mg/kg	NC		NC					7.5E-05	mg/kg/day	
				Lead	160	mg/kg	0.0E+00	mg/kg/day	--							
				Manganese	332	mg/kg	NC		NC					2.8E-03	mg/kg/day	
				Mercury	0.4	mg/kg	NC		NC					2.1E-05	mg/kg/day	
				Nickel	19	mg/kg	NC		NC					8.0E-04	mg/kg/day	
				Vanadium	16	mg/kg	NC		NC					1.8E-04	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00011	mg/kg	5.0E-14	mg/kg/day	1.5E+05	(mg/kg/day)-1	8.E-09	1.8E-12	mg/kg/day			
				Toxicity Equivalency (PCB Congeners)	2.53E-08	mg/kg	1.2E-17	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-12	4.0E-16	mg/kg/day			
			EXPOSURE ROUTE TOTAL								4.E-08					2.E-03
		EXPOSURE POINT TOTAL									5.E-07					5.E-02
	EXPOSURE MEDIUM TOTAL										5.E-07					5.E-02
SEDIMENT TOTAL											5.E-07					5.E-02
SURFACE WATER	SURFACE WATER	DYERVILLE POND	INGESTION	Acenaphthylene	0.00000132	mg/l	NC		NC			1.6E-10	mg/kg/day	6.0E-02	mg/kg/day	3.E-09
				bis(2-Ethylhexyl)phthalate	0.017	mg/l	5.8E-08	mg/kg/day	1.4E-02	mg/kg/day	8.E-10	2.0E-06	mg/kg/day	2.0E-02	mg/kg/day	1.E-04
				Aldrin	0.000023	mg/l	7.8E-11	mg/kg/day	1.7E+01	mg/kg/day	1.E-09	2.7E-09	mg/kg/day	3.0E-05	mg/kg/day	9.E-05
				alpha-Chlordane	0.000019	mg/l	6.4E-11	mg/kg/day	3.5E-01	mg/kg/day	2.E-11	2.3E-09	mg/kg/day	5.0E-04	mg/kg/day	5.E-06
				Endosulfan Sulfate	0.0000032	mg/l	NC		NC			3.8E-10	mg/kg/day	6.0E-03	mg/kg/day	6.E-08

TABLE 7.36.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS – CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			5.9E-10	mg/kg/day	3.0E-04	mg/kg/day	2 E-06
				gamma-Chlordane	0.000021	mg/l	7.1E-11	mg/kg/day	3.5E-01	mg/kg/day	2.E-11	2 5E-09	mg/kg/day	5.0E-04	mg/kg/day	5 E-06
				Arsenic	0.0046	mg/l	1.6E-08	mg/kg/day	1 5E+00	mg/kg/day	2.E-08	5 5E-07	mg/kg/day	3 0E-04	mg/kg/day	2 E-03
				Barium	0.021	mg/l	NC		NC			2.5E-06	mg/kg/day	7 0E-02	mg/kg/day	4 E-05
				Chromium	0 0023	mg/l	NC		NC			2.7E-07	mg/kg/day	3 0E-03	mg/kg/day	9 E-05
				Lead	0 0044	mg/l	1.5E-08	mg/kg/day	--			5.2E-07	mg/kg/day			
				Manganese	0.13	mg/l	NC		NC			1.5E-05	mg/kg/day	2.4E-02	mg/kg/day	6 E-04
				Mercury	0.00000394	mg/l	NC		NC			4.7E-10	mg/kg/day	3.0E-04	mg/kg/day	2.E-06
				Thallium	0.0022	mg/l	NC		NC			2 6E-07	mg/kg/day	8 0E-05	mg/kg/day	3 E-03
				Nitrate	0.76	mg/l	NC		NC			9 0E-05	mg/kg/day	1 6E+00	mg/kg/day	6 E-05
				Nitrite-N	0.084	mg/l	NC		NC			1 0E-05	mg/kg/day	1 0E-01	mg/kg/day	1 E-04
				Toxicity Equivalency (Dioxins/Furans)	0.00000012	mg/l	4 1E-13	mg/kg/day	1.5E+05	mg/kg/day	6.E-08	1 4E-11	mg/kg/day			
			EXPOSURE ROUTE TOTAL								9.E-08					6 E-03
			DERMAL	Acenaphthylene	0.00000132	mg/l	NC		NC			--		6.0E-02	mg/kg/day	
				bis(2-Ethylhexyl)phthalate	0 017	mg/l	1.5E-06	mg/kg/day	1.4E-02	mg/kg/day	2.E-08	5 2E-05	mg/kg/day	2.0E-02	mg/kg/day	3.E-03
				Aldrin	0 000023	mg/l	1.2E-10	mg/kg/day	1.7E+01	mg/kg/day	2.E-09	4 1E-09	mg/kg/day	3.0E-05	mg/kg/day	1 E-04
				alpha-Chlordane	0 000019	mg/l	2.3E-09	mg/kg/day	3.5E-01	mg/kg/day	8.E-10	7.9E-08	mg/kg/day	5 0E-04	mg/kg/day	2 E-04
				Endosulfan Sulfate	0 0000032	mg/l	NC		NC			--		6.0E-03	mg/kg/day	
				Endrin Aldehyde	0.000005	mg/l	NC		NC			7.0E-09	mg/kg/day	3.0E-04	mg/kg/day	2.E-05
				gamma-Chlordane	0.000021	mg/l	2 5E-09	mg/kg/day	3.5E-01	mg/kg/day	9.E-10	8.7E-08	mg/kg/day	5.0E-04	mg/kg/day	2.E-04
				Arsenic	0 0046	mg/l	1 7E-09	mg/kg/day	1.5E+00	mg/kg/day	3.E-09	5.9E-08	mg/kg/day	3.0E-04	mg/kg/day	2.E-04
				Barium	0.021	mg/l	NC		NC			2.7E-07	mg/kg/day	4.9E-03	mg/kg/day	5.E-05
				Chromium	0.0023	mg/l	NC		NC			5.9E-08	mg/kg/day	7.5E-05	mg/kg/day	8.E-04
				Lead	0 0044	mg/l	--		--			--				
				Manganese	0.13	mg/l	NC		NC			1 7E-06	mg/kg/day	9 6E-04	mg/kg/day	2.E-03
				Mercury	0.00000394	mg/l	NC		NC			5.0E-11	mg/kg/day	2.1E-05	mg/kg/day	2 E-06
				Thallium	0.0022	mg/l	NC		NC			2.8E-08	mg/kg/day	8.0E-05	mg/kg/day	3.E-04
				Nitrate	0.76	mg/l	NC		NC			--		1.6E+00	mg/kg/day	
				Nitrite-N	0.084	mg/l	NC		NC			--		1.0E-01	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00000012	mg/l	0.0E+00	mg/kg/day	1.5E+05	mg/kg/day	0.E+00	0 0E+00	mg/kg/day			
			EXPOSURE ROUTE TOTAL								3 E-08					6 E-03
		EXPOSURE POINT TOTAL									1.E-07					1 E-02
	EXPOSURE MEDIUM TOTAL										1.E-07					1 E-02
SURFACE WATER TOTAL											1.E-07					1.E-02
BIOTA	COMBINED FISH DIET	DYERVILLE POND	INGESTION	Acenaphthylene	0.00076	mg/kg	NC		NC			1.5E-07	mg/kg/day	6.0E-02	mg/kg/day	2.E-06
				Dibenzo(a,h)anthracene	0 00017	mg/kg	9.3E-10	mg/kg/day	7.3E+00	(mg/kg/day)-1	7.E-09	3.3E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Phenanthrene	0 0049	mg/kg	NC		NC			9.4E-07	mg/kg/day	3.0E-02	mg/kg/day	3.E-05
				4,4'-DDD	0.03543	mg/kg	1 9E-07	mg/kg/day	2.4E-01	(mg/kg/day)-1	5.E-08	6.8E-06	mg/kg/day	5.0E-04	mg/kg/day	1.E-02
				4,4'-DDE	0.011	mg/kg	6 0E-08	mg/kg/day	3.4E-01	(mg/kg/day)-1	2.E-08	2.1E-06	mg/kg/day	5.0E-04	mg/kg/day	4.E-03
				4,4'-DDT	0 0119	mg/kg	6.5E-08	mg/kg/day	3.4E-01	(mg/kg/day)-1	2.E-08	2.3E-06	mg/kg/day	5 0E-04	mg/kg/day	5.E-03
				alpha-Chlordane	0.0144	mg/kg	7.9E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-08	2.8E-06	mg/kg/day	5.0E-04	mg/kg/day	6.E-03
				Aroclor-1254	0.37026	mg/kg	2.0E-06	mg/kg/day	2 0E+00	(mg/kg/day)-1	4.E-06	7.1E-05	mg/kg/day	2.0E-05	mg/kg/day	4 E+00
				Dieldrin	0.00852	mg/kg	4.7E-08	mg/kg/day	1.6E+01	(mg/kg/day)-1	7.E-07	1 6E-06	mg/kg/day	5.0E-05	mg/kg/day	3 E-02
				gamma-Chlordane	0.00574	mg/kg	3.1E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	1.E-08	1.1E-06	mg/kg/day	5.0E-04	mg/kg/day	2 E-03
				Heptachlor Epoxide	0.0018	mg/kg	9.9E-09	mg/kg/day	9 1E+00	(mg/kg/day)-1	9 E-08	3.5E-07	mg/kg/day	1 3E-05	mg/kg/day	3 E-02
				Technical Chlordane	0.31006	mg/kg	1.7E-06	mg/kg/day	3.5E-01	(mg/kg/day)-1	6.E-07	5.9E-05	mg/kg/day	5.0E-04	mg/kg/day	1.E-01
				Cadmium	0.157	mg/kg	NC		NC			3.0E-05	mg/kg/day	1 0E-03	mg/kg/day	3 E-02
				Lead	0.343	mg/kg	1.9E-06	mg/kg/day	--			6.5E-05	mg/kg/day			
				Manganese	12.6	mg/kg	NC		NC			2.4E-03	mg/kg/day	1.4E-01	mg/kg/day	2.E-02
				Mercury	0.102	mg/kg	NC		NC			2.0E-05	mg/kg/day	3.0E-04	mg/kg/day	7.E-02
				Mercury (methyl)	0.117	mg/kg	NC		NC			2.2E-05	mg/kg/day	1.0E-04	mg/kg/day	2 E-01
				Toxicity Equivalency (Dioxins/Furans)	0.0000522	mg/kg	2.9E-10	mg/kg/day	1.5E+05	(mg/kg/day)-1	4.E-05	1.0E-08	mg/kg/day			
			EXPOSURE ROUTE TOTAL								5.E-05					4.1.E+00
		EXPOSURE POINT TOTAL									5.E-05					4.1.E+00
	EXPOSURE MEDIUM TOTAL										5.E-05					4.1.E+00
COMBINED FISH DIET TOTAL											5.E-05					4.1.E+00
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	5.E-05	TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA				4.2.E+00

TABLE 7.36.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS – CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		R/D/R/C (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	

NOTES:
(1) - Blank cells indicate that an R/D or R/C is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available

Prepared by: KJA
Checked by: MJM

TABLE 7.37.CT
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS – CENTRAL TENDENCY- CURRENT/FUTURE- COMMERCIAL / INDUSTRIAL WORKER- ADULT - FOGARTY CENTER
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: COMMERCIAL / INDUSTRIAL WORKER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	EXPOSURE ROUTE	CHEMICAL	EPC		CANCER RISK CALCULATIONS					NON-CANCER HAZARD CALCULATIONS				
					VALUE	UNITS	INTAKE/EXPOSURE CONCENTRATION		CSF/UNIT RISK		CANCER RISK	INTAKE/EXPOSURE CONCENTRATION		RfD/RfC (1)		HAZARD QUOTIENT
							VALUE	UNITS	VALUE	UNITS		VALUE	UNITS	VALUE	UNITS	
SOIL	SOIL	FOGARTY CENTER	INGESTION	2-Methylnaphthalene	0.522	mg/kg	NC		NC			7.7E-08	mg/kg/day	2.0E-02	mg/kg/day	4.E-06
				Acenaphthylene	0.0575	mg/kg	NC		NC			8.4E-09	mg/kg/day	6.0E-02	mg/kg/day	1.E-07
				Benzo(a)anthracene	2.53	mg/kg	4.8E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-08	3.7E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				Benzo(a)pyrene	1.78	mg/kg	3.4E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	2.E-07	2.6E-07	mg/kg/day	3.0E-02	mg/kg/day	9.E-06
				Benzo(b)fluoranthene	1.82	mg/kg	3.4E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	3.E-08	2.7E-07	mg/kg/day	3.0E-02	mg/kg/day	9.E-06
				Benzo(g,h,i)perylene	1.13	mg/kg	NC		NC			1.7E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Dibenzo(a,h)anthracene	0.244	mg/kg	4.6E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	3.E-08	3.6E-08	mg/kg/day	3.0E-02	mg/kg/day	1.E-06
				Indeno(1,2,3-cd)pyrene	1.27	mg/kg	2.4E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	2.E-08	1.9E-07	mg/kg/day	3.0E-02	mg/kg/day	6.E-06
				Phenanthrene	8.29	mg/kg	NC		NC			1.2E-06	mg/kg/day	3.0E-02	mg/kg/day	4.E-05
				alpha-Chlordane	0.0419	mg/kg	7.9E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-10	6.1E-09	mg/kg/day	5.0E-04	mg/kg/day	1.E-05
				Aroclor-1254	0.47	mg/kg	8.9E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	2.E-08	6.9E-08	mg/kg/day	2.0E-05	mg/kg/day	3.E-03
				Endosulfan II	0.012	mg/kg	NC		NC			1.8E-09	mg/kg/day	6.0E-03	mg/kg/day	3.E-07
				Endosulfan Sulfate	0.000393	mg/kg	NC		NC			5.8E-11	mg/kg/day	6.0E-03	mg/kg/day	1.E-08
				gamma-Chlordane	0.0339	mg/kg	6.4E-10	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-10	5.0E-09	mg/kg/day	5.0E-04	mg/kg/day	1.E-05
				Technical Chlordane	0.677	mg/kg	1.3E-08	mg/kg/day	3.5E-01	(mg/kg/day)-1	4.E-09	9.9E-08	mg/kg/day	5.0E-04	mg/kg/day	2.E-04
				Aluminum	20067	mg/kg	NC		NC			2.9E-03	mg/kg/day	1.0E+00	mg/kg/day	3.E-03
				Arsenic	10.4	mg/kg	2.0E-07	mg/kg/day	1.5E+00	(mg/kg/day)-1	3.E-07	1.5E-06	mg/kg/day	3.0E-04	mg/kg/day	5.E-03
				Manganese	443	mg/kg	NC		NC			6.5E-05	mg/kg/day	7.1E-02	mg/kg/day	9.E-04
				Mercury	0.206	mg/kg	NC		NC			3.0E-08	mg/kg/day	3.0E-04	mg/kg/day	1.E-04
				Toxicity Equivalency (Dioxins/Furans)	0.00000557	mg/kg	1.1E-13	mg/kg/day	1.5E+05	(mg/kg/day)-1	2.E-08	8.2E-13	mg/kg/day			
			EXPOSURE ROUTE TOTAL								7.E-07					1.E-02
			DERMAL	2-Methylnaphthalene	0.522	mg/kg	NC		NC			2.6E-08	mg/kg/day	2.0E-02	mg/kg/day	1.E-06
				Acenaphthylene	0.0575	mg/kg	NC		NC			2.9E-09	mg/kg/day	6.0E-02	mg/kg/day	5.E-08
				Benzo(a)anthracene	2.53	mg/kg	1.6E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	1.E-08	1.3E-07	mg/kg/day	3.0E-02	mg/kg/day	4.E-06
				Benzo(a)pyrene	1.78	mg/kg	1.2E-08	mg/kg/day	7.3E+00	(mg/kg/day)-1	8.E-08	9.0E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(b)fluoranthene	1.82	mg/kg	1.2E-08	mg/kg/day	7.3E-01	(mg/kg/day)-1	9.E-09	9.2E-08	mg/kg/day	3.0E-02	mg/kg/day	3.E-06
				Benzo(g,h,i)perylene	1.13	mg/kg	NC		NC			5.7E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Dibenzo(a,h)anthracene	0.244	mg/kg	1.6E-09	mg/kg/day	7.3E+00	(mg/kg/day)-1	1.E-08	1.2E-08	mg/kg/day	3.0E-02	mg/kg/day	4.E-07
				Indeno(1,2,3-cd)pyrene	1.27	mg/kg	8.2E-09	mg/kg/day	7.3E-01	(mg/kg/day)-1	6.E-09	6.4E-08	mg/kg/day	3.0E-02	mg/kg/day	2.E-06
				Phenanthrene	8.29	mg/kg	NC		NC			4.2E-07	mg/kg/day	3.0E-02	mg/kg/day	1.E-05
				alpha-Chlordane	0.0419	mg/kg	8.3E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	3.E-11	6.5E-10	mg/kg/day	5.0E-04	mg/kg/day	1.E-06
				Aroclor-1254	0.47	mg/kg	3.3E-09	mg/kg/day	2.0E+00	(mg/kg/day)-1	7.E-09	2.5E-08	mg/kg/day	2.0E-05	mg/kg/day	1.E-03
				Endosulfan II	0.012	mg/kg	NC		NC			4.6E-10	mg/kg/day	6.0E-03	mg/kg/day	8.E-08
				Endosulfan Sulfate	0.000393	mg/kg	NC		NC			1.5E-11	mg/kg/day	6.0E-03	mg/kg/day	3.E-09
				gamma-Chlordane	0.0339	mg/kg	6.8E-11	mg/kg/day	3.5E-01	(mg/kg/day)-1	2.E-11	5.3E-10	mg/kg/day	5.0E-04	mg/kg/day	1.E-06
				Technical Chlordane	0.677	mg/kg	1.3E-09	mg/kg/day	3.5E-01	(mg/kg/day)-1	5.E-10	1.0E-08	mg/kg/day	5.0E-04	mg/kg/day	2.E-05
				Aluminum	20067	mg/kg	NC		NC			--		1.0E-02	mg/kg/day	
				Arsenic	10.4	mg/kg	1.6E-08	mg/kg/day	1.5E+00	(mg/kg/day)-1	2.E-08	1.2E-07	mg/kg/day	3.0E-04	mg/kg/day	4.E-04
				Manganese	443	mg/kg	NC		NC			--		2.8E-03	mg/kg/day	
				Mercury	0.206	mg/kg	NC		NC			--		2.1E-05	mg/kg/day	
				Toxicity Equivalency (Dioxins/Furans)	0.00000557	mg/kg	8.3E-15	mg/kg/day	1.5E+05	(mg/kg/day)-1	1.E-09	6.5E-14	mg/kg/day			
			EXPOSURE ROUTE TOTAL								2.E-07					2.E-03
		EXPOSURE POINT TOTAL									8.E-07					1.E-02
	EXPOSURE MEDIUM TOTAL										8.E-07					1.E-02
SOIL TOTAL											8.E-07					1.E-02
										TOTAL RECEPTOR RISK ACROSS ALL MEDIA	8.E-07				TOTAL RECEPTOR HAZARD ACROSS ALL MEDIA	1.5.E-02

NOTES
(1) - Blank cells indicate that an RfD or RfC is not avalailable from the sources used to obtain dose-response data for this risk assessment.
NC - Not carcinogenic by this exposure route
NA - Not applicable, exposure route not applicable for this chemical/exposure medium
-- - Not calculated, dose-response data and/or dermal absorption values are not available

Prepared by: RAR
Checked by: KJA

TABLE 9.1.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	ASSAPUMPSET POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	2.4E-08	NA	2.1E-08	4.4E-08
			Acenaphthylene	NC	NA	NC	NA		Liver	2.5E-08	NA	2.2E-08	4.7E-08
			Benzo(a)anthracene	3.2E-09	NA	2.8E-09	NA	6.0E-09	Kidney	8.5E-07	NA	7.5E-07	1.6E-06
			Benzo(a)pyrene	2.7E-08	NA	2.4E-08	NA	5.0E-08	Kidney	7.1E-07	NA	6.3E-07	1.3E-06
			Benzo(b)fluoranthene	4.5E-09	NA	3.9E-09	NA	8.4E-09	Kidney	1.2E-06	NA	1.1E-06	2.2E-06
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	5.0E-07	NA	4.5E-07	9.5E-07
			Dibenzo(a,h)anthracene	5.7E-09	NA	5.0E-09	NA	1.1E-08	Kidney	1.5E-07	NA	1.3E-07	2.9E-07
			Indeno(1,2,3-cd)pyrene	2.1E-09	NA	1.8E-09	NA	3.9E-09	Kidney	5.5E-07	NA	4.9E-07	1.0E-06
			Phenanthrene	NC	NA	NC	NA		Kidney	6.7E-07	NA	6.0E-07	1.3E-06
			alpha-Chlordane	2.0E-12	NA	5.5E-13	NA	2.6E-12	Liver	6.8E-08	NA	1.8E-08	8.6E-08
			Aroclor-1254	5.0E-10	NA	4.8E-10	NA	9.8E-10	Immune system	7.3E-05	NA	7.0E-05	1.4E-04
			Aroclor-1268	3.6E-10	NA	3.5E-10	NA	7.1E-10	Immune system	5.3E-05	NA	5.0E-05	1.0E-04
			gamma-Chlordane	9.9E-13	NA	2.7E-13	NA	1.3E-12	Liver	3.3E-08	NA	9.0E-09	4.2E-08
			Technical Chlordane	2.3E-10	NA	6.3E-11	NA	3.0E-10	Liver	7.8E-06	NA	2.1E-06	9.9E-06
			Aluminum	NC	NA	NC	NA		Developmental toxicity	5.5E-04	NA	--	5.5E-04
			Arsenic	3.4E-08	NA	7.0E-09	NA	4.1E-08	Skin	4.4E-04	NA	9.0E-05	5.3E-04
			Cadmium	NC	NA	NC	NA		Kidney	2.2E-05	NA	5.9E-06	2.8E-05
			Chromium	NC	NA	NC	NA		NOAEL	1.5E-04	NA	--	1.5E-04
			Copper	NC	NA	NC	NA		Kidney	1.6E-05	NA	--	1.6E-05
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	5.7E-04	NA	--	5.7E-04
			Mercury	NC	NA	NC	NA		Immune system	9.7E-06	NA	--	9.7E-06
			Nickel	NC	NA	NC	NA		Developmental toxicity	2.5E-05	NA	--	2.5E-05
			Thallium	NC	NA	NC	NA		NOAEL	1.1E-04	NA	--	1.1E-04
			Vanadium	NC	NA	NC	NA		NOAEL	1.2E-04	NA	--	1.2E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	5.1E-09	NA	1.0E-09	NA	6.1E-09		--	NA	--	
			CHEMICAL TOTAL	8.2E-08	--	4.6E-08	--	1E-07		2.2E-03	0.0E+00	2.2E-04	2E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-07					2E-03
	EXPOSURE MEDIUM TOTAL							1E-07					2E-03
SEDIMENT TOTAL								1E-07					2E-03
SURFACE WATER	SURFACE WATER	ASSAPUMPSET POND	Arsenic	3.2E-10	NA	5.6E-10	NA	8.8E-10	Skin	4.2E-06	NA	7.2E-06	1.1E-05
			Manganese	NC	NA	NC	NA		NOAEL	1.8E-05	NA	7.7E-04	7.8E-04
			Mercury	NC	NA	NC	NA		Immune system	1.8E-08	NA	4.5E-07	4.7E-07
			Nitrite-N	NC	NA	NC	NA		Hematological system	1.3E-07	NA	--	1.3E-07
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.5E-10	NA	0.0E+00	NA	3.5E-10		--	NA	--	
			CHEMICAL TOTAL	6.7E-10	--	5.6E-10	--	1E-09		2.2E-05	0.0E+00	7.7E-04	8E-04
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-09					8E-04
	EXPOSURE MEDIUM TOTAL							1E-09					8E-04
SURFACE WATER TOTAL								1E-09					8E-04
BIOTA	COMBINED FISH DIET	ASSAPUMPSET POND	Acenaphthylene	NC	NA	NA	NA		Liver	3.5E-06	NA	NA	3.5E-06
			Benzo(a)anthracene	7.4E-08	NA	NA	NA	7.4E-08	Kidney	2.0E-05	NA	NA	2.0E-05
			Benzo(a)pyrene	7.9E-07	NA	NA	NA	7.9E-07	Kidney	2.1E-05	NA	NA	2.1E-05
			Benzo(b)fluoranthene	9.6E-08	NA	NA	NA	9.6E-08	Kidney	2.6E-05	NA	NA	2.6E-05
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	1.9E-05	NA	NA	1.9E-05

TABLE 9.1.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Dibenzo(a,h)anthracene	1.7E-07	NA	NA	NA	1.7E-07	Kidney	4.5E-06	NA	NA	4 5E-06
			Indeno(1,2,3-cd)pyrene	6.2E-08	NA	NA	NA	6.2E-08	Kidney	1.7E-05	NA	NA	1 7E-05
			Phenanthrene	NC	NA	NA	NA		Kidney	3.8E-05	NA	NA	3 8E-05
			4,4'-DDD	3 5E-08	NA	NA	NA	3.5E-08	Liver	1.7E-03	NA	NA	1 7E-03
			4,4'-DDE	2.6E-07	NA	NA	NA	2.6E-07	Liver	9.0E-03	NA	NA	9 0E-03
			alpha-Chlordane	3.1E-08	NA	NA	NA	3.1E-08	Liver	1.0E-03	NA	NA	1 0E-03
			Aroclor-1254	2.6E-06	NA	NA	NA	2.6E-06	Immune system	3.8E-01	NA	NA	3 8E-01
			Dieldrin	6.8E-07	NA	NA	NA	6 8E-07	Liver	5 0E-03	NA	NA	5 0E-03
			gamma-Chlordane	1.4E-08	NA	NA	NA	1.4E-08	Liver	4.6E-04	NA	NA	4 6E-04
			Heptachlor Epoxide	2 7E-07	NA	NA	NA	2 7E-07	Liver	1 3E-02	NA	NA	1 3E-02
			Technical Chlordane	1.3E-06	NA	NA	NA	1.3E-06	Liver	4.2E-02	NA	NA	4 2E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Mercury	NC	NA	NA	NA		Immune system	1 3E-01	NA	NA	1 3E-01
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	4.2E-01	NA	NA	4 2E-01
			Zinc	NC	NA	NA	NA		Hematological system	1.0E-02	NA	NA	1 0E-02
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.2E-05	NA	NA	NA	1.2E-05		--	NA	NA	
			CHEMICAL TOTAL	1.8E-05	--	--	--	2E-05		1.0E+00	0.0E+00	--	1.0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-05					1.0E+00
	EXPOSURE MEDIUM TOTAL							2E-05					1.0E+00
COMBINED FISH DIET TOTAL								2E-05					1.0E+00

RECEPTOR TOTAL	2E-05		1.0E+00
TOTAL RISK ACROSS ALL MEDIA	2E-05	TOTAL HAZARD ACROSS ALL MEDIA	1.0E+00

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

	--
TOTAL CARDIOVASCULAR SYSTEM HI =	4.4E-08
TOTAL DEVELOPMENTAL TOXICITY HI =	4.2E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	1.0E-02
TOTAL IMMUNE SYSTEM HI =	5.1E-01
TOTAL KIDNEY HI =	2.0E-04
TOTAL LIVER HI =	7.3E-02
	--
	--
TOTAL NOAEL HI =	1.7E-03
	--
TOTAL SKIN HI =	5.4E-04
	--

Prepared by: KJA
Checked by: MJM

TABLE 9.2.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	ASSAPUMPSET POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	3.7E-08	NA	6.8E-08	1.0E-07
			Acenaphthylene	NC	NA	NC	NA		Liver	3.9E-08	NA	7.2E-08	1.1E-07
			Benzo(a)anthracene	5.0E-09	NA	9.2E-09	NA	1.4E-08	Kidney	1.3E-06	NA	2.5E-06	3.8E-06
			Benzo(a)pyrene	4.2E-08	NA	7.7E-08	NA	1.2E-07	Kidney	1.1E-06	NA	2.1E-06	3.2E-06
			Benzo(b)fluoranthene	6.9E-09	NA	1.3E-08	NA	2.0E-08	Kidney	1.8E-06	NA	3.4E-06	5.3E-06
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	7.8E-07	NA	1.5E-06	2.2E-06
			Dibenzo(a,h)anthracene	8.9E-09	NA	1.6E-08	NA	2.5E-08	Kidney	2.4E-07	NA	4.4E-07	6.7E-07
			Indeno(1,2,3-cd)pyrene	3.2E-09	NA	6.0E-09	NA	9.2E-09	Kidney	8.6E-07	NA	1.6E-06	2.5E-06
			Phenanthrene	NC	NA	NC	NA		Kidney	1.0E-06	NA	1.9E-06	3.0E-06
			alpha-Chlordane	3.2E-12	NA	1.8E-12	NA	5.0E-12	Liver	1.1E-07	NA	6.0E-08	1.7E-07
			Aroclor-1254	7.8E-10	NA	1.6E-09	NA	2.3E-09	Immune system	1.1E-04	NA	2.3E-04	3.4E-04
			Aroclor-1268	5.7E-10	NA	1.1E-09	NA	1.7E-09	Immune system	8.2E-05	NA	1.6E-04	2.5E-04
			gamma-Chlordane	1.5E-12	NA	8.8E-13	NA	2.4E-12	Liver	5.1E-08	NA	2.9E-08	8.1E-08
			Technical Chlordane	3.6E-10	NA	2.1E-10	NA	5.7E-10	Liver	1.2E-05	NA	6.9E-06	1.9E-05
			Aluminum	NC	NA	NC	NA		Developmental toxicity	8.6E-04	NA	--	8.6E-04
			Arsenic	5.3E-08	NA	2.3E-08	NA	7.6E-08	Skin	6.9E-04	NA	2.9E-04	9.8E-04
			Cadmium	NC	NA	NC	NA		Kidney	3.4E-05	NA	1.9E-05	5.3E-05
			Chromium	NC	NA	NC	NA		NOAEL	2.3E-04	NA	--	2.3E-04
			Copper	NC	NA	NC	NA		Kidney	2.4E-05	NA	--	2.4E-05
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	8.9E-04	NA	--	8.9E-04
			Mercury	NC	NA	NC	NA		Immune system	1.5E-05	NA	--	1.5E-05
			Nickel	NC	NA	NC	NA		Developmental toxicity	4.0E-05	NA	--	4.0E-05
			Thallium	NC	NA	NC	NA		NOAEL	1.8E-04	NA	--	1.8E-04
			Vanadium	NC	NA	NC	NA		NOAEL	1.8E-04	NA	--	1.8E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	7.9E-09	NA	3.4E-09	NA	1.1E-08		--	NA	--	
			CHEMICAL TOTAL	1.3E-07	--	1.5E-07	--	3E-07		3.4E-03	0.0E+00	7.3E-04	4E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-07					4E-03
	EXPOSURE MEDIUM TOTAL							3E-07					4E-03
SEDIMENT TOTAL								3E-07					4E-03
SURFACE WATER	SURFACE WATER	ASSAPUMPSET POND	Arsenic	5.0E-10	NA	6.3E-10	NA	1.1E-09	Skin	6.5E-06	NA	8.1E-06	1.5E-05
			Manganese	NC	NA	NC	NA		NOAEL	2.7E-05	NA	8.6E-04	8.8E-04
			Mercury	NC	NA	NC	NA		Immune system	2.8E-08	NA	5.1E-07	5.4E-07
			Nitrite-N	NC	NA	NC	NA		Hematological system	2.0E-07	NA	--	2.0E-07
			Toxicity Equivalency (Dioxins/Furans) - Mam	5.4E-10	NA	0.0E+00	NA	5.4E-10		--	NA	--	
			CHEMICAL TOTAL	1.0E-09	--	6.3E-10	--	2E-09		3.4E-05	0.0E+00	8.7E-04	9E-04
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-09					9E-04
	EXPOSURE MEDIUM TOTAL							2E-09					9E-04
SURFACE WATER TOTAL								2E-09					9E-04

TABLE 9.2.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	ASSAPUMPSET POND	Acenaphthylene	NC	NA	NA	NA		Liver	3.6E-06	NA	NA	3.6E-06
			Benzo(a)anthracene	7.7E-08	NA	NA	NA	7.7E-08	Kidney	2.0E-05	NA	NA	2.0E-05
			Benzo(a)pyrene	8 2E-07	NA	NA	NA	8 2E-07	Kidney	2.2E-05	NA	NA	2.2E-05
			Benzo(b)fluoranthene	9.9E-08	NA	NA	NA	9.9E-08	Kidney	2.6E-05	NA	NA	2 6E-05
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	1.9E-05	NA	NA	1.9E-05
			Dibenzo(a,h)anthracene	1.8E-07	NA	NA	NA	1.8E-07	Kidney	4.7E-06	NA	NA	4.7E-06
			Indeno(1,2,3-cd)pyrene	6.4E-08	NA	NA	NA	6.4E-08	Kidney	1.7E-05	NA	NA	1.7E-05
			Phenanthrene	NC	NA	NA	NA		Kidney	3.9E-05	NA	NA	3 9E-05
			4,4'-DDD	3.6E-08	NA	NA	NA	3.6E-08	Liver	1 8E-03	NA	NA	1.8E-03
			4,4'-DDE	2.7E-07	NA	NA	NA	2.7E-07	Liver	9.3E-03	NA	NA	9 3E-03
			alpha-Chlordane	3.2E-08	NA	NA	NA	3.2E-08	Liver	1.1E-03	NA	NA	1.1E-03
			Aroclor-1254	2.7E-06	NA	NA	NA	2.7E-06	Immune system	3.9E-01	NA	NA	3.9E-01
			Dieldrin	7.1E-07	NA	NA	NA	7.1E-07	Liver	5.2E-03	NA	NA	5.2E-03
			gamma-Chlordane	1.4E-08	NA	NA	NA	1.4E-08	Liver	4.8E-04	NA	NA	4.8E-04
			Heptachlor Epoxide	2.8E-07	NA	NA	NA	2.8E-07	Liver	1.4E-02	NA	NA	1.4E-02
			Technical Chlordane	1 3E-06	NA	NA	NA	1.3E-06	Liver	4.4E-02	NA	NA	4 4E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Mercury	NC	NA	NA	NA		Immune system	1.3E-01	NA	NA	1 3E-01
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	4.4E-01	NA	NA	4 4E-01
			Zinc	NC	NA	NA	NA		Hematological system	1.0E-02	NA	NA	1 0E-02
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.2E-05	NA	NA	NA	1.2E-05		--	NA	NA	
			CHEMICAL TOTAL	1.9E-05	--	--	--	2E-05		1.0E+00	0.0E+00	--	1 0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-05					1.0E+00
	EXPOSURE MEDIUM TOTAL							2E-05					1.0E+00
COMBINED FISH DIET TOTAL								2E-05					1.0E+00

RECEPTOR TOTAL	2E-05		1.1E+00
TOTAL RISK ACROSS ALL MEDIA	2E-05	TOTAL HAZARD ACROSS ALL MEDIA	1.1E+00

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

	--
TOTAL CARDIOVASCULAR SYSTEM HI =	1.0E-07
TOTAL DEVELOPMENTAL TOXICITY HI =	4.4E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	1.0E-02
TOTAL IMMUNE SYSTEM HI =	5.3E-01
TOTAL KIDNEY HI =	2.5E-04
TOTAL LIVER HI =	7.5E-02
	--
	--
TOTAL NOAEL HI =	2.4E-03
	--
TOTAL SKIN HI =	1.0E-03
	--

Prepared by: RAR
Checked by: KJA

TABLE 9.4.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	ASSAPUMPSET POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	1.4E-07	NA	6.3E-08	2.0E-07
			Acenaphthylene	NC	NA	NC	NA		Liver	1.5E-07	NA	6.6E-08	2.2E-07
			Benzo(a)anthracene	1.9E-08	NA	8.4E-09	NA	2.8E-08	Kidney	5.1E-06	NA	2.3E-06	7.3E-06
			Benzo(a)pyrene	1.6E-07	NA	7.1E-08	NA	2.3E-07	Kidney	4.3E-06	NA	1.9E-06	6.2E-06
			Benzo(b)fluoranthene	2.7E-08	NA	1.2E-08	NA	3.9E-08	Kidney	7.1E-06	NA	3.2E-06	1.0E-05
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	3.0E-06	NA	1.3E-06	4.4E-06
			Dibenzo(a,h)anthracene	3.4E-08	NA	1.5E-08	NA	4.9E-08	Kidney	9.1E-07	NA	4.0E-07	1.3E-06
			Indeno(1,2,3-cd)pyrene	1.2E-08	NA	5.5E-09	NA	1.8E-08	Kidney	3.3E-06	NA	1.5E-06	4.8E-06
			Phenanthrene	NC	NA	NC	NA		Kidney	4.0E-06	NA	1.8E-06	5.8E-06
			alpha-Chlordane	1.2E-11	NA	1.7E-12	NA	1.4E-11	Liver	4.1E-07	NA	5.5E-08	4.6E-07
			Aroclor-1254	3.0E-09	NA	1.4E-09	NA	4.4E-09	Immune system	4.4E-04	NA	2.1E-04	6.5E-04
			Aroclor-1268	2.2E-09	NA	1.0E-09	NA	3.2E-09	Immune system	3.2E-04	NA	1.5E-04	4.7E-04
			gamma-Chlordane	6.0E-12	NA	8.1E-13	NA	6.8E-12	Liver	2.0E-07	NA	2.7E-08	2.3E-07
			Technical Chlordane	1.4E-09	NA	1.9E-10	NA	1.6E-09	Liver	4.7E-05	NA	6.3E-06	5.3E-05
			Aluminum	NC	NA	NC	NA		Developmental toxicity	3.3E-03	NA	--	3.3E-03
			Arsenic	2.0E-07	NA	2.1E-08	NA	2.3E-07	Skin	2.7E-03	NA	2.7E-04	2.9E-03
			Cadmium	NC	NA	NC	NA		Kidney	1.3E-04	NA	1.8E-05	1.5E-04
			Chromium	NC	NA	NC	NA		NOAEL	8.9E-04	NA	--	8.9E-04
			Copper	NC	NA	NC	NA		Kidney	9.3E-05	NA	--	9.3E-05
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	3.4E-03	NA	--	3.4E-03
			Mercury	NC	NA	NC	NA		Immune system	5.8E-05	NA	--	5.8E-05
			Nickel	NC	NA	NC	NA		Developmental toxicity	1.5E-04	NA	--	1.5E-04
			Thallium	NC	NA	NC	NA		NOAEL	6.8E-04	NA	--	6.8E-04
			Vanadium	NC	NA	NC	NA		NOAEL	7.0E-04	NA	--	7.0E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.0E-08	NA	3.1E-09	NA	3.3E-08		--	NA	--	
			CHEMICAL TOTAL	4.9E-07	--	1.4E-07	--	6E-07		1.3E-02	0.0E+00	6.7E-04	1E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						6E-07					1E-02
	EXPOSURE MEDIUM TOTAL							6E-07					1E-02
SEDIMENT TOTAL								6E-07					1E-02
SURFACE WATER	SURFACE WATER	ASSAPUMPSET POND	Arsenic	1.3E-08	NA	2.1E-09	NA	1.5E-08	Skin	1.7E-04	NA	2.7E-05	1.9E-04
			Manganese	NC	NA	NC	NA		NOAEL	7.0E-04	NA	2.9E-03	3.6E-03
			Mercury	NC	NA	NC	NA		Immune system	7.3E-07	NA	1.7E-06	2.4E-06
			Nitrite-N	NC	NA	NC	NA		Hematological system	5.2E-06	NA	--	5.2E-06
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.4E-08	NA	0.0E+00	NA	1.4E-08		--	NA	--	
			CHEMICAL TOTAL	2.7E-08	--	2.1E-09	--	3E-08		8.8E-04	0.0E+00	2.9E-03	4E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-08					4E-03
	EXPOSURE MEDIUM TOTAL							3E-08					4E-03
SURFACE WATER TOTAL								3E-08					4E-03
BIOTA	COMBINED FISH DIET	ASSAPUMPSET POND	Acenaphthylene	NC	NA	NA	NA		Liver	3.5E-06	NA	NA	3.5E-06
			Benzo(a)anthracene	7.4E-08	NA	NA	NA	7.4E-08	Kidney	2.0E-05	NA	NA	2.0E-05
			Benzo(a)pyrene	7.9E-07	NA	NA	NA	7.9E-07	Kidney	2.1E-05	NA	NA	2.1E-05
			Benzo(b)fluoranthene	9.6E-08	NA	NA	NA	9.6E-08	Kidney	2.6E-05	NA	NA	2.6E-05
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	1.9E-05	NA	NA	1.9E-05

TABLE 9.4.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Dibenzo(a,h)anthracene	1.7E-07	NA	NA	NA	1.7E-07	Kidney	4.5E-06	NA	NA	4.5E-06
			Indeno(1,2,3-cd)pyrene	6.2E-08	NA	NA	NA	6.2E-08	Kidney	1.7E-05	NA	NA	1.7E-05
			Phenanthrene	NC	NA	NA	NA		Kidney	3.8E-05	NA	NA	3.8E-05
			4,4'-DDD	3.5E-08	NA	NA	NA	3.5E-08	Liver	1.7E-03	NA	NA	1.7E-03
			4,4'-DDE	2.6E-07	NA	NA	NA	2.6E-07	Liver	9.0E-03	NA	NA	9.0E-03
			alpha-Chlordane	3.1E-08	NA	NA	NA	3.1E-08	Liver	1.0E-03	NA	NA	1.0E-03
			Aroclor-1254	2.6E-06	NA	NA	NA	2.6E-06	Immune system	3.8E-01	NA	NA	3.8E-01
			Dieldrin	6.8E-07	NA	NA	NA	6.8E-07	Liver	5.0E-03	NA	NA	5.0E-03
			gamma-Chlordane	1.4E-08	NA	NA	NA	1.4E-08	Liver	4.6E-04	NA	NA	4.6E-04
			Heptachlor Epoxide	2.7E-07	NA	NA	NA	2.7E-07	Liver	1.3E-02	NA	NA	1.3E-02
			Technical Chlordane	1.3E-06	NA	NA	NA	1.3E-06	Liver	4.2E-02	NA	NA	4.2E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Mercury	NC	NA	NA	NA		Immune system	1.3E-01	NA	NA	1.3E-01
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	4.2E-01	NA	NA	4.2E-01
			Zinc	NC	NA	NA	NA		Hematological system	1.0E-02	NA	NA	1.0E-02
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.2E-05	NA	NA	NA	1.2E-05		--	NA	NA	
			CHEMICAL TOTAL	1.8E-05	--	--	--	2E-05		1.0E+00	0.0E+00	--	1.0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-05					1.0E+00
	EXPOSURE MEDIUM TOTAL							2E-05					1.0E+00
COMBINED FISH DIET TOTAL								2E-05					1.0E+00
RECEPTOR TOTAL								2E-05					1.0E+00
							TOTAL RISK ACROSS ALL MEDIA	2E-05	TOTAL HAZARD ACROSS ALL MEDIA				1.0E+00

NOTES:
NC - Not carcinogenic by this exposure route
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

	--
TOTAL CARDIOVASCULAR SYSTEM HI =	2.0E-07
TOTAL DEVELOPMENTAL TOXICITY HI =	4.3E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	1.0E-02
TOTAL IMMUNE SYSTEM HI =	5.1E-01
TOTAL KIDNEY HI =	4.3E-04
TOTAL LIVER HI =	7.3E-02
	--
	--
TOTAL NOAEL HI =	9.3E-03
	--
TOTAL SKIN HI =	3.1E-03
	--

Prepared by: RAR
Checked by: KJA

TABLE 9.5.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	ASSAPUMPSET POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	2.2E-07	NA	2.0E-07	4 2E-07
			Acenaphthylene	NC	NA	NC	NA		Liver	2.3E-07	NA	2.2E-07	4 5E-07
			Benzo(a)anthracene	3 0E-08	NA	2.8E-08	NA	5.7E-08	Kidney	7.9E-06	NA	7.4E-06	1 5E-05
			Benzo(a)pyrene	2 5E-07	NA	2 3E-07	NA	4.8E-07	Kidney	6.6E-06	NA	6.2E-06	1.3E-05
			Benzo(b)fluoranthene	4.2E-08	NA	3 9E-08	NA	8.0E-08	Kidney	1.1E-05	NA	1.0E-05	2.1E-05
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	4.7E-06	NA	4.4E-06	9.1E-06
			Dibenzo(a,h)anthracene	5.3E-08	NA	4.9E-08	NA	1.0E-07	Kidney	1.4E-06	NA	1.3E-06	2.7E-06
			Indeno(1,2,3-cd)pyrene	1.9E-08	NA	1.8E-08	NA	3 7E-08	Kidney	5.1E-06	NA	4.8E-06	9.9E-06
			Phenanthrene	NC	NA	NC	NA		Kidney	6.3E-06	NA	5 8E-06	1.2E-05
			alpha-Chlordane	1.9E-11	NA	5.4E-12	NA	2.4E-11	Liver	6.3E-07	NA	1.8E-07	8 1E-07
			Aroclor-1254	4 7E-09	NA	4.7E-09	NA	9.4E-09	Immune system	6.8E-04	NA	6.8E-04	1.4E-03
			Aroclor-1268	3.4E-09	NA	3.4E-09	NA	6.8E-09	Immune system	4.9E-04	NA	4.9E-04	9 9E-04
			gamma-Chlordane	9.3E-12	NA	2.6E-12	NA	1.2E-11	Liver	3.1E-07	NA	8.8E-08	4.0E-07
			Technical Chlordane	2.2E-09	NA	6.2E-10	NA	2.8E-09	Liver	7.2E-05	NA	2.1E-05	9.3E-05
			Aluminum	NC	NA	NC	NA		Developmental toxicity	5 2E-03	NA	--	5 2E-03
			Arsenic	3.2E-07	NA	6.8E-08	NA	3 9E-07	Skin	4 1E-03	NA	8.8E-04	5 0E-03
			Cadmium	NC	NA	NC	NA		Kidney	2 0E-04	NA	5 8E-05	2 6E-04
			Chromium	NC	NA	NC	NA		NOAEL	1.4E-03	NA	--	1.4E-03
			Copper	NC	NA	NC	NA		Kidney	1.4E-04	NA	--	1.4E-04
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	5.3E-03	NA	--	5.3E-03
			Mercury	NC	NA	NC	NA		Immune system	9.0E-05	NA	--	9.0E-05
			Nickel	NC	NA	NC	NA		Developmental toxicity	2.4E-04	NA	--	2 4E-04
			Thallium	NC	NA	NC	NA		NOAEL	1 1E-03	NA	--	1.1E-03
			Vanadium	NC	NA	NC	NA		NOAEL	1 1E-03	NA	--	1 1E-03
			Toxicity Equivalency (Dioxins/Furans) - Mam	4.7E-08	NA	1 0E-08	NA	5.7E-08		--	NA	--	
			CHEMICAL TOTAL	7.7E-07	--	4.5E-07	--	1E-06		2.0E-02	0.0E+00	2 2E-03	2E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-06					2E-02
	EXPOSURE MEDIUM TOTAL							1E-06					2E-02
SEDIMENT TOTAL								1E-06					2E-02
SURFACE WATER	SURFACE WATER	ASSAPUMPSET POND	Arsenic	2 0E-08	NA	2.5E-09	NA	2.2E-08	Skin	2.6E-04	NA	3.2E-05	2 9E-04
			Manganese	NC	NA	NC	NA		NOAEL	1 1E-03	NA	3.4E-03	4.5E-03
			Mercury	NC	NA	NC	NA		Immune system	1.1E-06	NA	2.0E-06	3 2E-06
			Nitrite-N	NC	NA	NC	NA		Hematological system	8.1E-06	NA	--	8 1E-06
			Toxicity Equivalency (Dioxins/Furans) - Mam	2.2E-08	NA	0.0E+00	NA	2.2E-08		--	NA	--	
			CHEMICAL TOTAL	4.2E-08	--	2.5E-09	--	4E-08		1.4E-03	0.0E+00	3.4E-03	5E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-08					5E-03
	EXPOSURE MEDIUM TOTAL							4E-08					5E-03
SURFACE WATER TOTAL								4E-08					5E-03
BIOTA	COMBINED FISH DIET	ASSAPUMPSET POND	Acenaphthylene	NC	NA	NA	NA		Liver	3.6E-06	NA	NA	3.6E-06
			Benzo(a)anthracene	7.7E-08	NA	NA	NA	7.7E-08	Kidney	2.0E-05	NA	NA	2.0E-05
			Benzo(a)pyrene	8.2E-07	NA	NA	NA	8 2E-07	Kidney	2.2E-05	NA	NA	2.2E-05
			Benzo(b)fluoranthene	9.9E-08	NA	NA	NA	9.9E-08	Kidney	2 6E-05	NA	NA	2.6E-05
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	1.9E-05	NA	NA	1.9E-05
			Dibenzo(a,h)anthracene	1.8E-07	NA	NA	NA	1 8E-07	Kidney	4.7E-06	NA	NA	4.7E-06

TABLE 9.5.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Indeno(1,2,3-cd)pyrene	6.4E-08	NA	NA	NA	6.4E-08	Kidney	1.7E-05	NA	NA	1.7E-05
			Phenanthrene	NC	NA	NA	NA		Kidney	3.9E-05	NA	NA	3.9E-05
			4,4'-DDD	3.6E-08	NA	NA	NA	3.6E-08	Liver	1.8E-03	NA	NA	1.8E-03
			4,4'-DDE	2.7E-07	NA	NA	NA	2.7E-07	Liver	9.3E-03	NA	NA	9.3E-03
			alpha-Chlordane	3.2E-08	NA	NA	NA	3.2E-08	Liver	1.1E-03	NA	NA	1.1E-03
			Aroclor-1254	2.7E-06	NA	NA	NA	2.7E-06	Immune system	3.9E-01	NA	NA	3.9E-01
			Dieldrin	7.1E-07	NA	NA	NA	7.1E-07	Liver	5.2E-03	NA	NA	5.2E-03
			gamma-Chlordane	1.4E-08	NA	NA	NA	1.4E-08	Liver	4.8E-04	NA	NA	4.8E-04
			Heptachlor Epoxide	2.8E-07	NA	NA	NA	2.8E-07	Liver	1.4E-02	NA	NA	1.4E-02
			Technical Chlordane	1.3E-06	NA	NA	NA	1.3E-06	Liver	4.4E-02	NA	NA	4.4E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Mercury	NC	NA	NA	NA		Immune system	1.3E-01	NA	NA	1.3E-01
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	4.4E-01	NA	NA	4.4E-01
			Zinc	NC	NA	NA	NA		Hematological system	1.0E-02	NA	NA	1.0E-02
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.2E-05	NA	NA	NA	1.2E-05		--	NA	NA	
			CHEMICAL TOTAL	1.9E-05	--	--	--	2E-05		1.0E+00	0.0E+00	--	1.0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-05					1.0E+00
	EXPOSURE MEDIUM TOTAL							2E-05					1.0E+00
COMBINED FISH DIET TOTAL								2E-05					1.0E+00
RECEPTOR TOTAL								2E-05					1.1E+00
							TOTAL RISK ACROSS ALL MEDIA	2E-05	TOTAL HAZARD ACROSS ALL MEDIA				1.1E+00

NOTES:
NC - Not carcinogenic by this exposure route
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available

	--
TOTAL CARDIOVASCULAR SYSTEM HI =	4.2E-07
TOTAL DEVELOPMENTAL TOXICITY HI =	4.4E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	1.0E-02
TOTAL IMMUNE SYSTEM HI =	5.3E-01
TOTAL KIDNEY HI =	6.4E-04
TOTAL LIVER HI =	7.5E-02
	--
	--
TOTAL NOAEL HI =	1.3E-02
	--
TOTAL SKIN HI =	5.3E-03
	--

Prepared by: RAR
Checked by: KJA

TABLE 9.6.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	ASSAPUMPSET POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	1.8E-06	NA	6.4E-07	2.4E-06
			Acenaphthylene	NC	NA	NC	NA		Liver	1.9E-06	NA	6.8E-07	2.5E-06
			Benzo(a)anthracene	1.2E-07	NA	4.3E-08	NA	1.6E-07	Kidney	6.3E-05	NA	2.3E-05	8.6E-05
			Benzo(a)pyrene	1.0E-06	NA	3.6E-07	NA	1.4E-06	Kidney	5.3E-05	NA	1.9E-05	7.3E-05
			Benzo(b)fluoranthene	1.7E-07	NA	6.1E-08	NA	2.3E-07	Kidney	8.9E-05	NA	3.2E-05	1.2E-04
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	3.8E-05	NA	1.4E-05	5.1E-05
			Dibenzo(a,h)anthracene	2.1E-07	NA	7.7E-08	NA	2.9E-07	Kidney	1.1E-05	NA	4.1E-06	1.5E-05
			Indeno(1,2,3-cd)pyrene	7.7E-08	NA	2.8E-08	NA	1.1E-07	Kidney	4.1E-05	NA	1.5E-05	5.6E-05
			Phenanthrene	NC	NA	NC	NA		Kidney	5.0E-05	NA	1.8E-05	6.9E-05
			alpha-Chlordane	7.6E-11	NA	8.5E-12	NA	8.4E-11	Liver	5.1E-06	NA	5.7E-07	5.6E-06
			Aroclor-1254	1.9E-08	NA	7.3E-09	NA	2.6E-08	Immune system	5.5E-03	NA	2.1E-03	7.6E-03
			Aroclor-1268	1.4E-08	NA	5.3E-09	NA	1.9E-08	Immune system	4.0E-03	NA	1.6E-03	5.5E-03
			gamma-Chlordane	3.7E-11	NA	4.1E-12	NA	4.1E-11	Liver	2.5E-06	NA	2.8E-07	2.7E-06
			Technical Chlordane	8.7E-09	NA	9.7E-10	NA	9.7E-09	Liver	5.8E-04	NA	6.5E-05	6.4E-04
			Aluminum	NC	NA	NC	NA		Developmental toxicity	4.1E-02	NA	--	4.1E-02
			Arsenic	1.3E-06	NA	1.1E-07	NA	1.4E-06	Skin	3.3E-02	NA	2.8E-03	3.6E-02
			Cadmium	NC	NA	NC	NA		Kidney	1.6E-03	NA	1.8E-04	1.8E-03
			Chromium	NC	NA	NC	NA		NOAEL	1.1E-02	NA	--	1.1E-02
			Copper	NC	NA	NC	NA		Kidney	1.2E-03	NA	--	1.2E-03
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	4.3E-02	NA	--	4.3E-02
			Mercury	NC	NA	NC	NA		Immune system	7.2E-04	NA	--	7.2E-04
			Nickel	NC	NA	NC	NA		Developmental toxicity	1.9E-03	NA	--	1.9E-03
			Thallium	NC	NA	NC	NA		NOAEL	8.4E-03	NA	--	8.4E-03
			Vanadium	NC	NA	NC	NA		NOAEL	8.7E-03	NA	--	8.7E-03
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.9E-07	NA	1.6E-08	NA	2.0E-07		--	NA	--	
			CHEMICAL TOTAL	3.1E-06	--	7.1E-07	--	4E-06		1.6E-01	0.0E+00	6.8E-03	2E-01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-06					2E-01
	EXPOSURE MEDIUM TOTAL							4E-06					2E-01
SEDIMENT TOTAL								4E-06					2E-01
SURFACE WATER	SURFACE WATER	ASSAPUMPSET POND	Arsenic	3.0E-08	NA	1.6E-09	NA	3.2E-08	Skin	7.8E-04	NA	4.2E-05	8.2E-04
			Manganese	NC	NA	NC	NA		NOAEL	3.3E-03	NA	4.4E-03	7.7E-03
			Mercury	NC	NA	NC	NA		Immune system	3.4E-06	NA	2.6E-06	6.0E-06
			Nitrite-N	NC	NA	NC	NA		Hematological system	2.4E-05	NA	--	2.4E-05
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.3E-08	NA	0.0E+00	NA	3.3E-08		--	NA	--	
			CHEMICAL TOTAL	6.3E-08	--	1.6E-09	--	6E-08		4.1E-03	0.0E+00	4.4E-03	9E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						6E-08					9E-03
	EXPOSURE MEDIUM TOTAL							6E-08					9E-03
SURFACE WATER TOTAL								6E-08					9E-03
BIOTA	COMBINED FISH DIET	ASSAPUMPSET POND	Acenaphthylene	NC	NA	NA	NA		Liver	5.5E-06	NA	NA	5.5E-06
			Benzo(a)anthracene	5.8E-08	NA	NA	NA	5.8E-08	Kidney	3.1E-05	NA	NA	3.1E-05
			Benzo(a)pyrene	6.2E-07	NA	NA	NA	6.2E-07	Kidney	3.3E-05	NA	NA	3.3E-05
			Benzo(b)fluoranthene	7.5E-08	NA	NA	NA	7.5E-08	Kidney	4.0E-05	NA	NA	4.0E-05

TABLE 9.6.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	3.0E-05	NA	NA	3.0E-05
			Dibenzo(a,h)anthracene	1.3E-07	NA	NA	NA	1.3E-07	Kidney	7.1E-06	NA	NA	7.1E-06
			Indeno(1,2,3-cd)pyrene	4.9E-08	NA	NA	NA	4.9E-08	Kidney	2.6E-05	NA	NA	2.6E-05
			Phenanthrene	NC	NA	NA	NA		Kidney	5.9E-05	NA	NA	5.9E-05
			4,4'-DDD	2.8E-08	NA	NA	NA	2.8E-08	Liver	2.7E-03	NA	NA	2.7E-03
			4,4'-DDE	2.1E-07	NA	NA	NA	2.1E-07	Liver	1.4E-02	NA	NA	1.4E-02
			alpha-Chlordane	2.4E-08	NA	NA	NA	2.4E-08	Liver	1.6E-03	NA	NA	1.6E-03
			Aroclor-1254	2.0E-06	NA	NA	NA	2.0E-06	Immune system	6.0E-01	NA	NA	6.0E-01
			Dieldrin	5.4E-07	NA	NA	NA	5.4E-07	Liver	7.8E-03	NA	NA	7.8E-03
			gamma-Chlordane	1.1E-08	NA	NA	NA	1.1E-08	Liver	7.2E-04	NA	NA	7.2E-04
			Heptachlor Epoxide	2.1E-07	NA	NA	NA	2.1E-07	Liver	2.1E-02	NA	NA	2.1E-02
			Technical Chlordane	9.9E-07	NA	NA	NA	9.9E-07	Liver	6.6E-02	NA	NA	6.6E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Mercury	NC	NA	NA	NA		Immune system	2.0E-01	NA	NA	2.0E-01
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	6.6E-01	NA	NA	6.6E-01
			Zinc	NC	NA	NA	NA		Hematological system	1.6E-02	NA	NA	1.6E-02
			Toxicity Equivalency (Dioxins/Furans) - Mam	9.2E-06	NA	NA	NA	9.2E-06		--	NA	NA	
			CHEMICAL TOTAL	1.4E-05	--	--	--	1E-05		1.6E+00	0.0E+00	--	1.6E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-05					1.6E+00
	EXPOSURE MEDIUM TOTAL							1E-05					1.6E+00
COMBINED FISH DIET TOTAL								1E-05					1.6E+00
RECEPTOR TOTAL								2E-05					1.8E+00
							TOTAL RISK ACROSS ALL MEDIA	2E-05				TOTAL HAZARD ACROSS ALL MEDIA	1.8E+00

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available

	--
TOTAL CARDIOVASCULAR SYSTEM HI =	2.4E-06
TOTAL DEVELOPMENTAL TOXICITY HI =	7.0E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	1.6E-02
TOTAL IMMUNE SYSTEM HI =	8.1E-01
TOTAL KIDNEY HI =	3.7E-03
TOTAL LIVER HI =	1.1E-01
	--
	--
TOTAL NOAEL HI =	7.8E-02
	--
TOTAL SKIN HI =	3.7E-02
	--

Prepared by RAR
Checked by KJA

TABLE 9.7.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- RECREATIONAL ANGLER- ADULT - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SOIL	SOIL	GREYSTONE MILL POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	2.2E-07	NA	2.2E-07	4.4E-07
			Acenaphthylene	NC	NA	NC	NA		Liver	2.1E-07	NA	2.2E-07	4.3E-07
			Benzo(a)anthracene	1.1E-08	NA	1.1E-08	NA	2.2E-08	Kidney	2.9E-06	NA	3.0E-06	5.9E-06
			Benzo(a)pyrene	1.1E-07	NA	1.1E-07	NA	2.2E-07	Kidney	2.9E-06	NA	3.0E-06	5.9E-06
			Benzo(b)fluoranthene	1.4E-08	NA	1.4E-08	NA	2.8E-08	Kidney	3.6E-06	NA	3.8E-06	7.4E-06
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	2.4E-06	NA	2.5E-06	5.0E-06
			Dibenzo(a,h)anthracene	2.3E-08	NA	2.4E-08	NA	4.7E-08	Kidney	6.2E-07	NA	6.4E-07	1.3E-06
			Indeno(1,2,3-cd)pyrene	9.8E-09	NA	1.0E-08	NA	2.0E-08	Kidney	2.6E-06	NA	2.7E-06	5.3E-06
			Phenanthrene	NC	NA	NC	NA		Kidney	4.5E-06	NA	4.7E-06	9.2E-06
			alpha-Chlordane	5.5E-11	NA	1.8E-11	NA	7.2E-11	Liver	1.8E-06	NA	5.8E-07	2.4E-06
			Aroclor-1254	7.3E-09	NA	8.2E-09	NA	1.5E-08	Immune system	1.1E-03	NA	1.2E-03	2.3E-03
			Aroclor-1268	1.2E-09	NA	1.4E-09	NA	2.6E-09	Immune system	1.8E-04	NA	2.0E-04	3.8E-04
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	5.4E-08	NA	4.3E-08	9.7E-08
			Technical Chlordane	1.1E-09	NA	3.6E-10	NA	1.5E-09	Liver	3.7E-05	NA	1.2E-05	4.9E-05
			Aluminum	NC	NA	NC	NA		Developmental toxicity	5.5E-04	NA	--	5.5E-04
			Arsenic	8.0E-08	NA	1.9E-08	NA	9.9E-08	Skin	1.0E-03	NA	2.5E-04	1.3E-03
			Chromium	NC	NA	NC	NA		NOAEL	2.5E-03	NA	--	2.5E-03
			Copper	NC	NA	NC	NA		Kidney	2.7E-04	NA	--	2.7E-04
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	1.5E-03	NA	--	1.5E-03
			Mercury	NC	NA	NC	NA		Immune system	6.9E-05	NA	--	6.9E-05
			Molybdenum	NC	NA	NC	NA		Kidney	4.5E-04	NA	--	4.5E-04
			Nickel	NC	NA	NC	NA		Developmental toxicity	4.9E-04	NA	--	4.9E-04
			Thallium	NC	NA	NC	NA		NOAEL	1.9E-04	NA	--	1.9E-04
			Vanadium	NC	NA	NC	NA		NOAEL	3.7E-04	NA	--	3.7E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	7.1E-08	NA	1.7E-08	NA	8.8E-08		--	NA	--	
			CHEMICAL TOTAL	3.3E-07	--	2.2E-07	--	5E-07		8.7E-03	0.0E+00	1.7E-03	1E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						5E-07					1E-02
	EXPOSURE MEDIUM TOTAL							5E-07					1E-02
SOIL TOTAL								5E-07					1E-02
SEDIMENT	SEDIMENT	GREYSTONE MILL POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	9.5E-08	NA	8.4E-08	1.8E-07
			Acenaphthylene	NC	NA	NC	NA		Liver	8.2E-08	NA	7.2E-08	1.5E-07
			Benzo(a)anthracene	1.1E-08	NA	9.9E-09	NA	2.1E-08	Kidney	3.0E-06	NA	2.6E-06	5.6E-06
			Benzo(a)pyrene	9.9E-08	NA	8.7E-08	NA	1.9E-07	Kidney	2.6E-06	NA	2.3E-06	5.0E-06
			Benzo(b)fluoranthene	9.9E-09	NA	8.7E-09	NA	1.9E-08	Kidney	2.6E-06	NA	2.3E-06	5.0E-06
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	1.8E-06	NA	1.6E-06	3.3E-06
			Dibenzo(a,h)anthracene	2.5E-08	NA	2.2E-08	NA	4.6E-08	Kidney	6.5E-07	NA	5.8E-07	1.2E-06
			Indeno(1,2,3-cd)pyrene	7.0E-09	NA	6.1E-09	NA	1.3E-08	Kidney	1.9E-06	NA	1.6E-06	3.5E-06
			Phenanthrene	NC	NA	NC	NA		Kidney	4.1E-06	NA	3.6E-06	7.7E-06
			alpha-Chlordane	9.3E-12	NA	2.5E-12	NA	1.2E-11	Liver	3.1E-07	NA	8.4E-08	3.9E-07
			Aroclor-1254	3.3E-09	NA	3.2E-09	NA	6.5E-09	Immune system	4.8E-04	NA	4.6E-04	9.4E-04
			Aroclor-1268	2.2E-09	NA	2.0E-09	NA	4.2E-09	Immune system	3.1E-04	NA	3.0E-04	6.1E-04
			gamma-Chlordane	7.6E-12	NA	2.1E-12	NA	9.7E-12	Liver	2.5E-07	NA	6.9E-08	3.2E-07
			Technical Chlordane	9.6E-10	NA	2.6E-10	NA	1.2E-09	Liver	3.2E-05	NA	8.7E-06	4.1E-05
			Aluminum	NC	NA	NC	NA		Developmental toxicity	4.0E-04	NA	--	4.0E-04
			Antimony	NC	NA	NC	NA		Adverse clinical signs	2.7E-04	NA	--	2.7E-04
			Arsenic	6.3E-08	NA	1.3E-08	NA	7.6E-08	Skin	8.1E-04	NA	1.7E-04	9.8E-04
			Cadmium	NC	NA	NC	NA		Kidney	1.1E-04	NA	3.0E-05	1.4E-04

TABLE 9.7.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- RECREATIONAL ANGLER- ADULT - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Chromium	NC	NA	NC	NA		NOAEL	2.3E-03	NA	--	2.3E-03
			Copper	NC	NA	NC	NA		Kidney	3.7E-04	NA	--	3.7E-04
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	2.1E-04	NA	--	2.1E-04
			Mercury	NC	NA	NC	NA		Immune system	6.4E-05	NA	--	6.4E-05
			Nickel	NC	NA	NC	NA		Developmental toxicity	1.8E-04	NA	--	1.8E-04
			Thallium	NC	NA	NC	NA		NOAEL	1.2E-04	NA	--	1.2E-04
			Vanadium	NC	NA	NC	NA		NOAEL	2.9E-04	NA	--	2.9E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	7.9E-08	NA	1.6E-08	NA	9.5E-08		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	1.6E-08	NA	3.3E-09	NA	2.0E-08		--	NA	--	
			CHEMICAL TOTAL	3.2E-07	--	1.7E-07	--	5E-07		6.0E-03	0.0E+00	9.8E-04	7E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						5E-07					7E-03
	EXPOSURE MEDIUM TOTAL							5E-07					7E-03
SEDIMENT TOTAL								5E-07					7E-03
SURFACE WATER	SURFACE WATER	GREYSTONE MILL POND	Arsenic	3.6E-10	NA	6.3E-10	NA	9.9E-10	Skin	4.7E-06	NA	8.1E-06	1.3E-05
			Manganese	NC	NA	NC	NA		NOAEL	1.5E-05	NA	6.6E-04	6.8E-04
			Mercury	NC	NA	NC	NA		Immune system	1.6E-08	NA	4.1E-07	4.2E-07
			Nitrite-N	NC	NA	NC	NA		Hematological system	3.3E-06	NA	--	3.3E-06
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.7E-10	NA	0.0E+00	NA	3.7E-10		--	NA	--	
			CHEMICAL TOTAL	7.3E-10	--	6.3E-10	--	1E-09		2.3E-05	0.0E+00	6.7E-04	7E-04
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-09					7E-04
	EXPOSURE MEDIUM TOTAL							1E-09					7E-04
SURFACE WATER TOTAL								1E-09					7E-04
BIOTA	COMBINED FISH DIET	GREYSTONE MILL POND	Acenaphthylene	NC	NA	NA	NA		Liver	7.0E-06	NA	NA	7.0E-06
			Benzo(a)pyrene	2.4E-07	NA	NA	NA	2.4E-07	Kidney	6.3E-06	NA	NA	6.3E-06
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	7.7E-06	NA	NA	7.7E-06
			Benzo(b)fluoranthene	2.2E-08	NA	NA	NA	2.2E-08	Kidney	5.9E-06	NA	NA	5.9E-06
			Dibenzo(a,h)anthracene	1.4E-07	NA	NA	NA	1.4E-07	Kidney	3.6E-06	NA	NA	3.6E-06
			Indeno(1,2,3-cd)pyrene	2.2E-08	NA	NA	NA	2.2E-08	Kidney	5.9E-06	NA	NA	5.9E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	5.1E-05	NA	NA	5.1E-05
			4,4'-DDD	1.0E-07	NA	NA	NA	1.0E-07	Liver	5.0E-03	NA	NA	5.0E-03
			4,4'-DDE	3.7E-07	NA	NA	NA	3.7E-07	Liver	1.3E-02	NA	NA	1.3E-02
			4,4'-DDT	3.4E-08	NA	NA	NA	3.4E-08	Liver	1.2E-03	NA	NA	1.2E-03
			alpha-Chlordane	1.6E-07	NA	NA	NA	1.6E-07	Liver	5.4E-03	NA	NA	5.4E-03
			Aroclor-1254	1.2E-05	NA	NA	NA	1.2E-05	Immune system	1.7E+00	NA	NA	1.7E+00
			Aroclor-1268	5.6E-06	NA	NA	NA	5.6E-06	Immune system	8.2E-01	NA	NA	8.2E-01
			Dieldrin	1.4E-06	NA	NA	NA	1.4E-06	Liver	1.0E-02	NA	NA	1.0E-02
			gamma-Chlordane	6.9E-08	NA	NA	NA	6.9E-08	Liver	2.3E-03	NA	NA	2.3E-03
			Heptachlor Epoxide	2.4E-07	NA	NA	NA	2.4E-07	Liver	1.2E-02	NA	NA	1.2E-02
			Technical Chlordane	2.4E-06	NA	NA	NA	2.4E-06	Liver	7.9E-02	NA	NA	7.9E-02
			Lead	--	NA	NA	NA			--	NA	NA	

TABLE 9.7.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- RECREATIONAL ANGLER- ADULT - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Mercury	NC	NA	NA	NA		Immune system	1.4E-01	NA	NA	1.4E-01
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	6.3E-01	NA	NA	6.3E-01
			Zinc	NC	NA	NA	NA		Hematological system	1.4E-02	NA	NA	1.4E-02
			Toxicity Equivalency (Dioxins/Furans) - Mam	6.7E-06	NA	NA	NA	6.7E-06		--	NA	NA	
			CHEMICAL TOTAL	2.9E-05	--	--	--	3E-05		3.4E+00	0.0E+00	--	3.4E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-05					3.4E+00
	EXPOSURE MEDIUM TOTAL							3E-05					3.4E+00
COMBINED FISH DIET TOTAL								3E-05					3.4E+00

RECEPTOR TOTAL	3E-05		3.4E+00
TOTAL RISK ACROSS ALL MEDIA	3E-05	TOTAL HAZARD ACROSS ALL MEDIA	3.4E+00

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

TOTAL ADVERSE CLINICAL SIGNS HI =	2.7E-04
TOTAL CARDIOVASCULAR SYSTEM HI =	6.2E-07
TOTAL DEVELOPMENTAL TOXICITY HI =	6.3E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	1.4E-02
TOTAL IMMUNE SYSTEM HI =	2.7E+00
TOTAL KIDNEY HI =	1.4E-03
TOTAL LIVER HI =	1.3E-01
	--
	--
TOTAL NOAEL HI =	8.1E-03
	--
TOTAL SKIN HI =	2.3E-03
	--

Prepared by: RAR
Checked by: KJA

TABLE 9.8.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- RECREATIONAL ANGLER- OLDER CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SOIL	SOIL	GREYSTONE MILL POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	3.4E-07	NA	8.4E-07	1.2E-06
			Acenaphthylene	NC	NA	NC	NA		Liver	3.3E-07	NA	8.2E-07	1.1E-06
			Benzo(a)anthracene	1.7E-08	NA	4.2E-08	NA	5.9E-08	Kidney	4.5E-06	NA	1.1E-05	1.6E-05
			Benzo(a)pyrene	1.7E-07	NA	4.2E-07	NA	5.9E-07	Kidney	4.5E-06	NA	1.1E-05	1.6E-05
			Benzo(b)fluoranthene	2.1E-08	NA	5.3E-08	NA	7.4E-08	Kidney	5.7E-06	NA	1.4E-05	2.0E-05
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	3.8E-06	NA	9.5E-06	1.3E-05
			Dibenzo(a,h)anthracene	3.6E-08	NA	9.0E-08	NA	1.3E-07	Kidney	9.6E-07	NA	2.4E-06	3.4E-06
			Indeno(1,2,3-cd)pyrene	1.5E-08	NA	3.8E-08	NA	5.4E-08	Kidney	4.1E-06	NA	1.0E-05	1.4E-05
			Phenanthrene	NC	NA	NC	NA		Kidney	7.0E-06	NA	1.7E-05	2.4E-05
			alpha-Chlordane	8.5E-11	NA	6.6E-11	NA	1.5E-10	Liver	2.8E-06	NA	2.2E-06	5.0E-06
			Aroclor-1254	1.1E-08	NA	3.1E-08	NA	4.2E-08	Immune system	1.7E-03	NA	4.5E-03	6.1E-03
			Aroclor-1268	1.9E-09	NA	5.1E-09	NA	7.0E-09	Immune system	2.8E-04	NA	7.4E-04	1.0E-03
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	8.4E-08	NA	1.6E-07	2.4E-07
			Technical Chlordane	1.7E-09	NA	1.3E-09	NA	3.1E-09	Liver	5.8E-05	NA	4.5E-05	1.0E-04
			Aluminum	NC	NA	NC	NA		Developmental toxicity	8.6E-04	NA	--	8.6E-04
			Arsenic	1.2E-07	NA	7.2E-08	NA	2.0E-07	Skin	1.6E-03	NA	9.3E-04	2.5E-03
			Chromium	NC	NA	NC	NA		NOAEL	3.8E-03	NA	--	3.8E-03
			Copper	NC	NA	NC	NA		Kidney	4.3E-04	NA	--	4.3E-04
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	2.3E-03	NA	--	2.3E-03
			Mercury	NC	NA	NC	NA		Immune system	1.1E-04	NA	--	1.1E-04
			Molybdenum	NC	NA	NC	NA		Kidney	6.9E-04	NA	--	6.9E-04
			Nickel	NC	NA	NC	NA		Developmental toxicity	7.7E-04	NA	--	7.7E-04
			Thallium	NC	NA	NC	NA		NOAEL	2.9E-04	NA	--	2.9E-04
			Vanadium	NC	NA	NC	NA		NOAEL	5.8E-04	NA	--	5.8E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.1E-07	NA	6.4E-08	NA	1.7E-07		--	NA	--	
			CHEMICAL TOTAL	5.1E-07	--	8.2E-07	--	1E-06		1.4E-02	0.0E+00	6.3E-03	2E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-06					2E-02
	EXPOSURE MEDIUM TOTAL							1E-06					2E-02
SOIL TOTAL								1E-06					2E-02
SEDIMENT	SEDIMENT	GREYSTONE MILL POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	1.5E-07	NA	2.7E-07	4.2E-07
			Acenaphthylene	NC	NA	NC	NA		Liver	1.3E-07	NA	2.4E-07	3.6E-07
			Benzo(a)anthracene	1.7E-08	NA	3.2E-08	NA	5.0E-08	Kidney	4.6E-06	NA	8.6E-06	1.3E-05
			Benzo(a)pyrene	1.5E-07	NA	2.9E-07	NA	4.4E-07	Kidney	4.1E-06	NA	7.6E-06	1.2E-05
			Benzo(b)fluoranthene	1.5E-08	NA	2.9E-08	NA	4.4E-08	Kidney	4.1E-06	NA	7.6E-06	1.2E-05
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	2.7E-06	NA	5.1E-06	7.8E-06
			Dibenzo(a,h)anthracene	3.8E-08	NA	7.1E-08	NA	1.1E-07	Kidney	1.0E-06	NA	1.9E-06	2.9E-06
			Indeno(1,2,3-cd)pyrene	1.1E-08	NA	2.0E-08	NA	3.1E-08	Kidney	2.9E-06	NA	5.4E-06	8.2E-06
			Phenanthrene	NC	NA	NC	NA		Kidney	6.3E-06	NA	1.2E-05	1.8E-05
			alpha-Chlordane	1.4E-11	NA	8.3E-12	NA	2.3E-11	Liver	4.8E-07	NA	2.8E-07	7.6E-07
			Aroclor-1254	5.2E-09	NA	1.0E-08	NA	1.5E-08	Immune system	7.5E-04	NA	1.5E-03	2.3E-03
			Aroclor-1268	3.3E-09	NA	6.7E-09	NA	1.0E-08	Immune system	4.9E-04	NA	9.8E-04	1.5E-03
			gamma-Chlordane	1.2E-11	NA	6.8E-12	NA	1.9E-11	Liver	4.0E-07	NA	2.3E-07	6.2E-07
			Technical Chlordane	1.5E-09	NA	8.5E-10	NA	2.3E-09	Liver	5.0E-05	NA	2.8E-05	7.8E-05
			Aluminum	NC	NA	NC	NA		Developmental toxicity	6.2E-04	NA	--	6.2E-04
			Antimony	NC	NA	NC	NA		Adverse clinical signs	4.3E-04	NA	--	4.3E-04
			Arsenic	9.8E-08	NA	4.2E-08	NA	1.4E-07	Skin	1.3E-03	NA	5.4E-04	1.8E-03
			Cadmium	NC	NA	NC	NA		Kidney	1.7E-04	NA	9.8E-05	2.7E-04

TABLE 9.8.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- RECREATIONAL ANGLER- OLDER CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Chromium	NC	NA	NC	NA		NOAEL	3.6E-03	NA	--	3.6E-03
			Copper	NC	NA	NC	NA		Kidney	5.8E-04	NA	--	5.8E-04
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	3.3E-04	NA	--	3.3E-04
			Mercury	NC	NA	NC	NA		Immune system	1.0E-04	NA	--	1.0E-04
			Nickel	NC	NA	NC	NA		Developmental toxicity	2.8E-04	NA	--	2.8E-04
			Thallium	NC	NA	NC	NA		NOAEL	1.8E-04	NA	--	1.8E-04
			Vanadium	NC	NA	NC	NA		NOAEL	4.5E-04	NA	--	4.5E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.2E-07	NA	5.2E-08	NA	1.7E-07		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Man	2.5E-08	NA	1.1E-08	NA	3.6E-08		--	NA	--	
			CHEMICAL TOTAL	4.9E-07	--	5.6E-07	--	1E-06		9.3E-03	0.0E+00	3.2E-03	1E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-06					1E-02
	EXPOSURE MEDIUM TOTAL							1E-06					1E-02
SEDIMENT TOTAL								1E-06					1E-02
SURFACE WATER	SURFACE WATER	GREYSTONE MILL POND	Arsenic	5.6E-10	NA	7.0E-10	NA	1.3E-09	Skin	7.3E-06	NA	9.1E-06	1.6E-05
			Manganese	NC	NA	NC	NA		NOAEL	2.4E-05	NA	7.4E-04	7.7E-04
			Mercury	NC	NA	NC	NA		Immune system	2.5E-08	NA	4.6E-07	4.8E-07
			Nitrite-N	NC	NA	NC	NA		Hematological system	5.1E-06	NA	--	5.1E-06
			Toxicity Equivalency (Dioxins/Furans) - Mam	5.7E-10	NA	0.0E+00	NA	5.7E-10		--	NA	--	
			CHEMICAL TOTAL	1.1E-09	--	7.0E-10	--	2E-09		3.6E-05	0.0E+00	7.5E-04	8E-04
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-09					8E-04
	EXPOSURE MEDIUM TOTAL							2E-09					8E-04
SURFACE WATER TOTAL								2E-09					8E-04
BIOTA	COMBINED FISH DIET	GREYSTONE MILL POND	Acenaphthylene	NC	NA	NA	NA		Liver	7.3E-06	NA	NA	7.3E-06
			Benzo(a)pyrene	2.5E-07	NA	NA	NA	2.5E-07	Kidney	6.5E-06	NA	NA	6.5E-06
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	7.9E-06	NA	NA	7.9E-06
			Benzo(b)fluoranthene	2.3E-08	NA	NA	NA	2.3E-08	Kidney	6.1E-06	NA	NA	6.1E-06
			Dibenzo(a,h)anthracene	1.4E-07	NA	NA	NA	1.4E-07	Kidney	3.8E-06	NA	NA	3.8E-06
			Indeno(1,2,3-cd)pyrene	2.3E-08	NA	NA	NA	2.3E-08	Kidney	6.1E-06	NA	NA	6.1E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	5.3E-05	NA	NA	5.3E-05
			4,4'-DDD	1.1E-07	NA	NA	NA	1.1E-07	Liver	5.2E-03	NA	NA	5.2E-03
			4,4'-DDE	3.8E-07	NA	NA	NA	3.8E-07	Liver	1.3E-02	NA	NA	1.3E-02
			4,4'-DDT	3.5E-08	NA	NA	NA	3.5E-08	Liver	1.2E-03	NA	NA	1.2E-03
			alpha-Chlordane	1.7E-07	NA	NA	NA	1.7E-07	Liver	5.5E-03	NA	NA	5.5E-03
			Aroclor-1254	1.2E-05	NA	NA	NA	1.2E-05	Immune system	1.8E+00	NA	NA	1.8E+00
			Aroclor-1268	5.8E-06	NA	NA	NA	5.8E-06	Immune system	8.4E-01	NA	NA	8.4E-01
			Dieldrin	1.5E-06	NA	NA	NA	1.5E-06	Liver	1.1E-02	NA	NA	1.1E-02
			gamma-Chlordane	7.1E-08	NA	NA	NA	7.1E-08	Liver	2.4E-03	NA	NA	2.4E-03
			Heptachlor Epoxide	2.5E-07	NA	NA	NA	2.5E-07	Liver	1.2E-02	NA	NA	1.2E-02
			Technical Chlordane	2.4E-06	NA	NA	NA	2.4E-06	Liver	8.1E-02	NA	NA	8.1E-02
			Lead	--	NA	NA	NA			--	NA	NA	

TABLE 9.8.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- RECREATIONAL ANGLER- OLDER CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Mercury	NC	NA	NA	NA		Immune system	1.5E-01	NA	NA	1.5E-01
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	6.5E-01	NA	NA	6.5E-01
			Zinc	NC	NA	NA	NA		Hematological system	1.5E-02	NA	NA	1.5E-02
			Toxicity Equivalency (Dioxins/Furans) - Mam	6.9E-06	NA	NA	NA	6.9E-06		--	NA	NA	
			CHEMICAL TOTAL	3.0E-05	--	--	--	3E-05		3.5E+00	0.0E+00	--	3.5E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-05					3.5E+00
	EXPOSURE MEDIUM TOTAL							3E-05					3.5E+00
COMBINED FISH DIET TOTAL								3E-05					3.5E+00
RECEPTOR TOTAL								3E-05					3.6E+00
							TOTAL RISK ACROSS ALL MEDIA	3E-05	TOTAL HAZARD ACROSS ALL MEDIA				3.6E+00

NOTES.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

TOTAL ADVERSE CLINICAL SIGNS HI =	4.3E-04
TOTAL CARDIOVASCULAR SYSTEM HI =	1.6E-06
TOTAL DEVELOPMENTAL TOXICITY HI =	6.5E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	1.5E-02
TOTAL IMMUNE SYSTEM HI =	2.8E+00
TOTAL KIDNEY HI =	2.2E-03
TOTAL LIVER HI =	1.3E-01
	--
	--
TOTAL NOAEL HI =	1.2E-02
	--
TOTAL SKIN HI =	4.4E-03
	--

Prepared by: RAR
Checked by: KJA

TABLE 9.10.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- RESIDENT- ADULT - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SOIL	SOIL	GREYSTONE MILL POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	2.6E-06	NA	1.3E-06	3.9E-06
			Acenaphthylene	NC	NA	NC	NA		Liver	2.5E-06	NA	1.3E-06	3.8E-06
			Benzo(a)anthracene	1.3E-07	NA	6.8E-08	NA	2.0E-07	Kidney	3.5E-05	NA	1.8E-05	5.3E-05
			Benzo(a)pyrene	1.3E-06	NA	6.8E-07	NA	2.0E-06	Kidney	3.5E-05	NA	1.8E-05	5.3E-05
			Benzo(b)fluoranthene	1.6E-07	NA	8.5E-08	NA	2.5E-07	Kidney	4.4E-05	NA	2.3E-05	6.6E-05
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	2.9E-05	NA	1.5E-05	4.4E-05
			Dibenzo(a,h)anthracene	2.8E-07	NA	1.4E-07	NA	4.2E-07	Kidney	7.4E-06	NA	3.8E-06	1.1E-05
			Indeno(1,2,3-cd)pyrene	1.2E-07	NA	6.1E-08	NA	1.8E-07	Kidney	3.1E-05	NA	1.6E-05	4.8E-05
			Phenanthrene	NC	NA	NC	NA		Kidney	5.4E-05	NA	2.8E-05	8.2E-05
			alpha-Chlordane	6.6E-10	NA	1.1E-10	NA	7.6E-10	Liver	2.2E-05	NA	3.5E-06	2.5E-05
			Aroclor-1254	8.8E-08	NA	4.9E-08	NA	1.4E-07	Immune system	1.3E-02	NA	7.2E-03	2.0E-02
			Aroclor-1268	1.5E-08	NA	8.2E-09	NA	2.3E-08	Immune system	2.1E-03	NA	1.2E-03	3.3E-03
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	6.5E-07	NA	2.6E-07	9.0E-07
			Technical Chlordane	1.3E-08	NA	2.1E-09	NA	1.6E-08	Liver	4.5E-04	NA	7.2E-05	5.2E-04
			Aluminum	NC	NA	NC	NA		Developmental toxicity	6.7E-03	NA	--	6.7E-03
			Arsenic	9.6E-07	NA	1.1E-07	NA	1.1E-06	Skin	1.2E-02	NA	1.5E-03	1.4E-02
			Chromium	NC	NA	NC	NA		NOAEL	3.0E-02	NA	--	3.0E-02
			Copper	NC	NA	NC	NA		Kidney	3.3E-03	NA	--	3.3E-03
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	1.8E-02	NA	--	1.8E-02
			Mercury	NC	NA	NC	NA		Immune system	8.3E-04	NA	--	8.3E-04
			Molybdenum	NC	NA	NC	NA		Kidney	5.4E-03	NA	--	5.4E-03
			Nickel	NC	NA	NC	NA		Developmental toxicity	5.9E-03	NA	--	5.9E-03
			Thallium	NC	NA	NC	NA		NOAEL	2.2E-03	NA	--	2.2E-03
			Vanadium	NC	NA	NC	NA		NOAEL	4.5E-03	NA	--	4.5E-03
			Toxicity Equivalency (Dioxins/Furans) - Mam	8.6E-07	NA	1.0E-07	NA	9.6E-07		--	NA	--	
			CHEMICAL TOTAL	3.9E-06	--	1.3E-06	--	5E-06		1.0E-01	0.0E+00	1.0E-02	1E-01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						5E-06					1E-01
	EXPOSURE MEDIUM TOTAL							5E-06					1E-01
SOIL TOTAL								5E-06					1E-01
SEDIMENT	SEDIMENT	GREYSTONE MILL POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	5.7E-07	NA	2.5E-07	8.2E-07
			Acenaphthylene	NC	NA	NC	NA		Liver	4.9E-07	NA	2.2E-07	7.1E-07
			Benzo(a)anthracene	6.7E-08	NA	3.0E-08	NA	9.6E-08	Kidney	1.8E-05	NA	7.9E-06	2.6E-05
			Benzo(a)pyrene	5.9E-07	NA	2.6E-07	NA	8.5E-07	Kidney	1.6E-05	NA	7.0E-06	2.3E-05
			Benzo(b)fluoranthene	5.9E-08	NA	2.6E-08	NA	8.5E-08	Kidney	1.6E-05	NA	7.0E-06	2.3E-05
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	1.1E-05	NA	4.7E-06	1.5E-05
			Dibenzo(a,h)anthracene	1.5E-07	NA	6.5E-08	NA	2.1E-07	Kidney	3.9E-06	NA	1.7E-06	5.7E-06
			Indeno(1,2,3-cd)pyrene	4.2E-08	NA	1.8E-08	NA	6.0E-08	Kidney	1.1E-05	NA	4.9E-06	1.6E-05
			Phenanthrene	NC	NA	NC	NA		Kidney	2.4E-05	NA	1.1E-05	3.5E-05
			alpha-Chlordane	5.6E-11	NA	7.6E-12	NA	6.3E-11	Liver	1.9E-06	NA	2.5E-07	2.1E-06
			Aroclor-1254	2.0E-08	NA	9.5E-09	NA	2.9E-08	Immune system	2.9E-03	NA	1.4E-03	4.3E-03
			Aroclor-1268	1.3E-08	NA	6.1E-09	NA	1.9E-08	Immune system	1.9E-03	NA	9.0E-04	2.8E-03
			gamma-Chlordane	4.6E-11	NA	6.2E-12	NA	5.2E-11	Liver	1.5E-06	NA	2.1E-07	1.7E-06
			Technical Chlordane	5.7E-09	NA	7.8E-10	NA	6.5E-09	Liver	1.9E-04	NA	2.6E-05	2.2E-04
			Aluminum	NC	NA	NC	NA		Developmental toxicity	2.4E-03	NA	--	2.4E-03
			Antimony	NC	NA	NC	NA		Adverse clinical signs	1.6E-03	NA	--	1.6E-03
			Arsenic	3.8E-07	NA	3.8E-08	NA	4.2E-07	Skin	4.9E-03	NA	5.0E-04	5.4E-03
			Cadmium	NC	NA	NC	NA		Kidney	6.6E-04	NA	9.0E-05	7.5E-04
			Chromium	NC	NA	NC	NA		NOAEL	1.4E-02	NA	--	1.4E-02
			Copper	NC	NA	NC	NA		Kidney	2.2E-03	NA	--	2.2E-03

TABLE 9.10.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- RESIDENT- ADULT - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	1.3E-03	NA	--	1.3E-03
			Mercury	NC	NA	NC	NA		Immune system	3.9E-04	NA	--	3.9E-04
			Nickel	NC	NA	NC	NA		Developmental toxicity	1.1E-03	NA	--	1.1E-03
			Thallium	NC	NA	NC	NA		NOAEL	7.1E-04	NA	--	7.1E-04
			Vanadium	NC	NA	NC	NA		NOAEL	1.7E-03	NA	--	1.7E-03
			Toxicity Equivalency (Dioxins/Furans) - Mam	4.7E-07	NA	4.8E-08	NA	5.2E-07		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	9.8E-08	NA	1.0E-08	NA	1.1E-07		--	NA	--	
			CHEMICAL TOTAL	1.9E-06	--	5.1E-07	--	2E-06		3.6E-02	0.0E+00	2.9E-03	4E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-06					4E-02
	EXPOSURE MEDIUM TOTAL							2E-06					4E-02
SEDIMENT TOTAL								2E-06					4E-02
SURFACE WATER	SURFACE WATER	GREYSTONE MILL POND	Arsenic	1.4E-08	NA	2.3E-09	NA	1.7E-08	Skin	1.9E-04	NA	3.0E-05	2.2E-04
			Manganese	NC	NA	NC	NA		NOAEL	6.1E-04	NA	2.5E-03	3.1E-03
			Mercury	NC	NA	NC	NA		Immune system	6.5E-07	NA	1.5E-06	2.2E-06
			Nitrite-N	NC	NA	NC	NA		Hematological system	1.3E-04	NA	--	1.3E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.5E-08	NA	0.0E+00	NA	1.5E-08		--	NA	--	
			CHEMICAL TOTAL	2.9E-08	--	2.3E-09	--	3E-08		9.3E-04	0.0E+00	2.5E-03	3E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-08					3E-03
	EXPOSURE MEDIUM TOTAL							3E-08					3E-03
SURFACE WATER TOTAL								3E-08					3E-03
BIOTA	COMBINED FISH DIET	GREYSTONE MILL POND	Acenaphthylene	NC	NA	NA	NA		Liver	7.0E-06	NA	NA	7.0E-06
			Benzo(a)pyrene	2.4E-07	NA	NA	NA	2.4E-07	Kidney	6.3E-06	NA	NA	6.3E-06
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	7.7E-06	NA	NA	7.7E-06
			Benzo(b)fluoranthene	2.2E-08	NA	NA	NA	2.2E-08	Kidney	5.9E-06	NA	NA	5.9E-06
			Dibenzo(a,h)anthracene	1.4E-07	NA	NA	NA	1.4E-07	Kidney	3.6E-06	NA	NA	3.6E-06
			Indeno(1,2,3-cd)pyrene	2.2E-08	NA	NA	NA	2.2E-08	Kidney	5.9E-06	NA	NA	5.9E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	5.1E-05	NA	NA	5.1E-05
			4,4'-DDD	1.0E-07	NA	NA	NA	1.0E-07	Liver	5.0E-03	NA	NA	5.0E-03
			4,4'-DDE	3.7E-07	NA	NA	NA	3.7E-07	Liver	1.3E-02	NA	NA	1.3E-02
			4,4'-DDT	3.4E-08	NA	NA	NA	3.4E-08	Liver	1.2E-03	NA	NA	1.2E-03
			alpha-Chlordane	1.6E-07	NA	NA	NA	1.6E-07	Liver	5.4E-03	NA	NA	5.4E-03
			Aroclor-1254	1.2E-05	NA	NA	NA	1.2E-05	Immune system	1.7E+00	NA	NA	1.7E+00
			Aroclor-1268	5.6E-06	NA	NA	NA	5.6E-06	Immune system	8.2E-01	NA	NA	8.2E-01
			Dieldrin	1.4E-06	NA	NA	NA	1.4E-06	Liver	1.0E-02	NA	NA	1.0E-02
			gamma-Chlordane	6.9E-08	NA	NA	NA	6.9E-08	Liver	2.3E-03	NA	NA	2.3E-03
			Heptachlor Epoxide	2.4E-07	NA	NA	NA	2.4E-07	Liver	1.2E-02	NA	NA	1.2E-02
			Technical Chlordane	2.4E-06	NA	NA	NA	2.4E-06	Liver	7.9E-02	NA	NA	7.9E-02
			Lead	--	NA	NA	NA			--	NA	NA	

TABLE 9.10.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- RESIDENT- ADULT - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Mercury	NC	NA	NA	NA		Immune system	1.4E-01	NA	NA	1.4E-01
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	6.3E-01	NA	NA	6.3E-01
			Zinc	NC	NA	NA	NA		Hematological system	1.4E-02	NA	NA	1.4E-02
			Toxicity Equivalency (Dioxins/Furans) - Mam	6.7E-06	NA	NA	NA	6.7E-06		--	NA	NA	
			CHEMICAL TOTAL	2.9E-05	--	--	--	3E-05		3.4E+00	0.0E+00	--	3.4E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-05					3.4E+00
	EXPOSURE MEDIUM TOTAL							3E-05					3.4E+00
COMBINED FISH DIET TOTAL								3E-05					3.4E+00
RECEPTOR TOTAL								4E-05					3.6E+00
							TOTAL RISK ACROSS ALL MEDIA	4E-05	TOTAL HAZARD ACROSS ALL MEDIA				3.6E+00

NOTES.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

TOTAL ADVERSE CLINICAL SIGNS HI =	1.6E-03
TOTAL CARDIOVASCULAR SYSTEM HI =	4.8E-06
TOTAL DEVELOPMENTAL TOXICITY HI =	6.5E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	1.4E-02
TOTAL IMMUNE SYSTEM HI =	2.7E+00
TOTAL KIDNEY HI =	1.2E-02
TOTAL LIVER HI =	1.3E-01
	--
	--
	--
TOTAL NOAEL HI =	7.5E-02
	--
TOTAL SKIN HI =	2.0E-02
	--

Prepared by: KJA
Checked by MJM

TABLE 9.11.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- RESIDENT- OLDER CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SOIL	SOIL	GREYSTONE MILL POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	4.0E-06	NA	5.0E-06	9.1E-06
			Acenaphthylene	NC	NA	NC	NA		Liver	3.9E-06	NA	4.9E-06	8.9E-06
			Benzo(a)anthracene	2.0E-07	NA	2.5E-07	NA	4.6E-07	Kidney	5.4E-05	NA	6.7E-05	1.2E-04
			Benzo(a)pyrene	2.0E-06	NA	2.5E-06	NA	4.6E-06	Kidney	5.4E-05	NA	6.8E-05	1.2E-04
			Benzo(b)fluoranthene	2.5E-07	NA	3.2E-07	NA	5.7E-07	Kidney	6.8E-05	NA	8.5E-05	1.5E-04
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	4.5E-05	NA	5.7E-05	1.0E-04
			Dibenzo(a,h)anthracene	4.3E-07	NA	5.4E-07	NA	9.7E-07	Kidney	1.2E-05	NA	1.4E-05	2.6E-05
			Indeno(1,2,3-cd)pyrene	1.8E-07	NA	2.3E-07	NA	4.1E-07	Kidney	4.9E-05	NA	6.1E-05	1.1E-04
			Phenanthrene	NC	NA	NC	NA		Kidney	8.4E-05	NA	1.0E-04	1.9E-04
			alpha-Chlordane	1.0E-09	NA	3.9E-10	NA	1.4E-09	Liver	3.4E-05	NA	1.3E-05	4.7E-05
			Aroclor-1254	1.4E-07	NA	1.8E-07	NA	3.2E-07	Immune system	2.0E-02	NA	2.7E-02	4.7E-02
			Aroclor-1268	2.3E-08	NA	3.1E-08	NA	5.3E-08	Immune system	3.3E-03	NA	4.5E-03	7.8E-03
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	1.0E-06	NA	9.6E-07	2.0E-06
			Technical Chlordane	2.1E-08	NA	8.0E-09	NA	2.9E-08	Liver	7.0E-04	NA	2.7E-04	9.7E-04
			Aluminum	NC	NA	NC	NA		Developmental toxicity	1.0E-02	NA	--	1.0E-02
			Arsenic	1.5E-06	NA	4.3E-07	NA	1.9E-06	Skin	1.9E-02	NA	5.6E-03	2.5E-02
			Chromium	NC	NA	NC	NA		NOAEL	4.6E-02	NA	--	4.6E-02
			Copper	NC	NA	NC	NA		Kidney	5.1E-03	NA	--	5.1E-03
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	2.8E-02	NA	--	2.8E-02
			Mercury	NC	NA	NC	NA		Immune system	1.3E-03	NA	--	1.3E-03
			Molybdenum	NC	NA	NC	NA		Kidney	8.3E-03	NA	--	8.3E-03
			Nickel	NC	NA	NC	NA		Developmental toxicity	9.2E-03	NA	--	9.2E-03
			Thallium	NC	NA	NC	NA		NOAEL	3.5E-03	NA	--	3.5E-03
			Vanadium	NC	NA	NC	NA		NOAEL	7.0E-03	NA	--	7.0E-03
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.3E-06	NA	3.8E-07	NA	1.7E-06		--	NA	--	
			CHEMICAL TOTAL	6.1E-06	--	4.9E-06	--	1E-05		1.6E-01	0.0E+00	3.8E-02	2E-01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-05					2E-01
	EXPOSURE MEDIUM TOTAL							1E-05					2E-01
SOIL TOTAL								1E-05					2E-01
SEDIMENT	SEDIMENT	GREYSTONE MILL POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	8.9E-07	NA	8.2E-07	1.7E-06
			Acenaphthylene	NC	NA	NC	NA		Liver	7.6E-07	NA	7.1E-07	1.5E-06
			Benzo(a)anthracene	1.0E-07	NA	9.7E-08	NA	2.0E-07	Kidney	2.8E-05	NA	2.6E-05	5.3E-05
			Benzo(a)pyrene	9.2E-07	NA	8.6E-07	NA	1.8E-06	Kidney	2.5E-05	NA	2.3E-05	4.7E-05
			Benzo(b)fluoranthene	9.2E-08	NA	8.6E-08	NA	1.8E-07	Kidney	2.5E-05	NA	2.3E-05	4.7E-05
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	1.6E-05	NA	1.5E-05	3.2E-05
			Dibenzo(a,h)anthracene	2.3E-07	NA	2.1E-07	NA	4.4E-07	Kidney	6.1E-06	NA	5.7E-06	1.2E-05
			Indeno(1,2,3-cd)pyrene	6.5E-08	NA	6.0E-08	NA	1.3E-07	Kidney	1.7E-05	NA	1.6E-05	3.3E-05
			Phenanthrene	NC	NA	NC	NA		Kidney	3.8E-05	NA	3.5E-05	7.3E-05
			alpha-Chlordane	8.7E-11	NA	2.5E-11	NA	1.1E-10	Liver	2.9E-06	NA	8.3E-07	3.7E-06
			Aroclor-1254	3.1E-08	NA	3.1E-08	NA	6.2E-08	Immune system	4.5E-03	NA	4.5E-03	9.0E-03
			Aroclor-1268	2.0E-08	NA	2.0E-08	NA	4.0E-08	Immune system	2.9E-03	NA	2.9E-03	5.9E-03
			gamma-Chlordane	7.1E-11	NA	2.0E-11	NA	9.2E-11	Liver	2.4E-06	NA	6.8E-07	3.1E-06
			Technical Chlordane	8.9E-09	NA	2.6E-09	NA	1.1E-08	Liver	3.0E-04	NA	8.5E-05	3.8E-04
			Aluminum	NC	NA	NC	NA		Developmental toxicity	3.7E-03	NA	--	3.7E-03
			Antimony	NC	NA	NC	NA		Adverse clinical signs	2.6E-03	NA	--	2.6E-03
			Arsenic	5.9E-07	NA	1.3E-07	NA	7.1E-07	Skin	7.6E-03	NA	1.6E-03	9.2E-03
			Cadmium	NC	NA	NC	NA		Kidney	1.0E-03	NA	3.0E-04	1.3E-03
			Chromium	NC	NA	NC	NA		NOAEL	2.1E-02	NA	--	2.1E-02
			Copper	NC	NA	NC	NA		Kidney	3.5E-03	NA	--	3.5E-03

TABLE 9.11.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- RESIDENT- OLDER CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	2.0E-03	NA	--	2.0E-03
			Mercury	NC	NA	NC	NA		Immune system	6.0E-04	NA	--	6.0E-04
			Nickel	NC	NA	NC	NA		Developmental toxicity	1.7E-03	NA	--	1.7E-03
			Thallium	NC	NA	NC	NA		NOAEL	1.1E-03	NA	--	1.1E-03
			Vanadium	NC	NA	NC	NA		NOAEL	2.7E-03	NA	--	2.7E-03
			Toxicity Equivalency (Dioxins/Furans) - Mam	7.3E-07	NA	1.6E-07	NA	8.9E-07		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	1.5E-07	NA	3.3E-08	NA	1.8E-07		--	NA	--	
			CHEMICAL TOTAL	2.9E-06	--	1.7E-06	--	5E-06		5.6E-02	0.0E+00	9.6E-03	7E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						5E-06					7E-02
	EXPOSURE MEDIUM TOTAL							5E-06					7E-02
SEDIMENT TOTAL								5E-06					7E-02
SURFACE WATER	SURFACE WATER	GREYSTONE MILL POND	Arsenic	2.2E-08	NA	2.8E-09	NA	2.5E-08	Skin	2.9E-04	NA	3.6E-05	3.3E-04
			Manganese	NC	NA	NC	NA		NOAEL	9.5E-04	NA	3.0E-03	3.9E-03
			Mercury	NC	NA	NC	NA		Immune system	1.0E-06	NA	1.8E-06	2.8E-06
			Nitrite-N	NC	NA	NC	NA		Hematological system	2.1E-04	NA	--	2.1E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	2.3E-08	NA	0.0E+00	NA	2.3E-08		--	NA	--	
			CHEMICAL TOTAL	4.5E-08	--	2.8E-09	--	5E-08		1.4E-03	0.0E+00	3.0E-03	4E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						5E-08					4E-03
	EXPOSURE MEDIUM TOTAL							5E-08					4E-03
SURFACE WATER TOTAL								5E-08					4E-03
BIOTA	COMBINED FISH DIET	GREYSTONE MILL POND	Acenaphthylene	NC	NA	NA	NA		Liver	7.3E-06	NA	NA	7.3E-06
			Benzo(a)pyrene	2.5E-07	NA	NA	NA	2.5E-07	Kidney	6.5E-06	NA	NA	6.5E-06
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	7.9E-06	NA	NA	7.9E-06
			Benzo(b)fluoranthene	2.3E-08	NA	NA	NA	2.3E-08	Kidney	6.1E-06	NA	NA	6.1E-06
			Dibenzo(a,h)anthracene	1.4E-07	NA	NA	NA	1.4E-07	Kidney	3.8E-06	NA	NA	3.8E-06
			Indeno(1,2,3-cd)pyrene	2.3E-08	NA	NA	NA	2.3E-08	Kidney	6.1E-06	NA	NA	6.1E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	5.3E-05	NA	NA	5.3E-05
			4,4'-DDD	1.1E-07	NA	NA	NA	1.1E-07	Liver	5.2E-03	NA	NA	5.2E-03
			4,4'-DDE	3.8E-07	NA	NA	NA	3.8E-07	Liver	1.3E-02	NA	NA	1.3E-02
			4,4'-DDT	3.5E-08	NA	NA	NA	3.5E-08	Liver	1.2E-03	NA	NA	1.2E-03
			alpha-Chlordane	1.7E-07	NA	NA	NA	1.7E-07	Liver	5.5E-03	NA	NA	5.5E-03
			Aroclor-1254	1.2E-05	NA	NA	NA	1.2E-05	Immune system	1.8E+00	NA	NA	1.8E+00
			Aroclor-1268	5.8E-06	NA	NA	NA	5.8E-06	Immune system	8.4E-01	NA	NA	8.4E-01
			Dieldrin	1.5E-06	NA	NA	NA	1.5E-06	Liver	1.1E-02	NA	NA	1.1E-02
			gamma-Chlordane	7.1E-08	NA	NA	NA	7.1E-08	Liver	2.4E-03	NA	NA	2.4E-03
			Heptachlor Epoxide	2.5E-07	NA	NA	NA	2.5E-07	Liver	1.2E-02	NA	NA	1.2E-02
			Technical Chlordane	2.4E-06	NA	NA	NA	2.4E-06	Liver	8.1E-02	NA	NA	8.1E-02
			Lead	--	NA	NA	NA			--	NA	NA	

TABLE 9.11.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- RESIDENT- OLDER CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Mercury	NC	NA	NA	NA		*Immune system*	1.5E-01	NA	NA	1.5E-01
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	6.5E-01	NA	NA	6.5E-01
			Zinc	NC	NA	NA	NA		Hematological system	1.5E-02	NA	NA	1.5E-02
			Toxicity Equivalency (Dioxins/Furans) - Mam	6.9E-06	NA	NA	NA	6.9E-06		--	NA	NA	
			CHEMICAL TOTAL	3.0E-05	--	--	--	3E-05		3.5E+00	0.0E+00	--	3.5E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-05					3.5E+00
	EXPOSURE MEDIUM TOTAL							3E-05					3.5E+00
COMBINED FISH DIET TOTAL								3E-05					3.5E+00
RECEPTOR TOTAL								5E-05					3.8E+00
							TOTAL RISK ACROSS ALL MEDIA	5E-05	TOTAL HAZARD ACROSS ALL MEDIA				3.8E+00

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

TOTAL ADVERSE CLINICAL SIGNS HI =	2.6E-03
TOTAL CARDIOVASCULAR SYSTEM HI =	1.1E-05
TOTAL DEVELOPMENTAL TOXICITY HI =	6.7E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	1.5E-02
TOTAL IMMUNE SYSTEM HI =	2.8E+00
TOTAL KIDNEY HI =	1.9E-02
TOTAL LIVER HI =	1.3E-01
	--
	--
TOTAL NOAEL HI =	1.2E-01
	--
TOTAL SKIN HI =	3.4E-02
	--

Prepared by: RAR
Checked by: KJA

TABLE 9.12.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- RESIDENT- CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SOIL	SOIL	GREYSTONE MILL POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	2.4E-05	NA	8.8E-06	3.3E-05
			Acenaphthylene	NC	NA	NC	NA		Liver	2.4E-05	NA	8.6E-06	3.2E-05
			Benzo(a)anthracene	6.1E-07	NA	2.2E-07	NA	8.3E-07	Kidney	3.2E-04	NA	1.2E-04	4 4E-04
			Benzo(a)pyrene	6.1E-06	NA	2.2E-06	NA	8.3E-06	Kidney	3.2E-04	NA	1.2E-04	4.4E-04
			Benzo(b)fluoranthene	7.6E-07	NA	2.8E-07	NA	1.0E-06	Kidney	4.1E-04	NA	1.5E-04	5.6E-04
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	2.7E-04	NA	9.9E-05	3.7E-04
			Dibenzo(a,h)anthracene	1.3E-06	NA	4.7E-07	NA	1 8E-06	Kidney	6.9E-05	NA	2.5E-05	9 4E-05
			Indeno(1,2,3-cd)pyrene	5.5E-07	NA	2.0E-07	NA	7.5E-07	Kidney	2.9E-04	NA	1 1E-04	4.0E-04
			Phenanthrene	NC	NA	NC	NA		Kidney	5.0E-04	NA	1.8E-04	6.9E-04
			alpha-Chlordane	3.1E-09	NA	3.4E-10	NA	3.4E-09	Liver	2.0E-04	NA	2 3E-05	2.3E-04
			Aroclor-1254	4.1E-07	NA	1.6E-07	NA	5.7E-07	Immune system	1.2E-01	NA	4.7E-02	1.7E-01
			Aroclor-1268	6.8E-08	NA	2.7E-08	NA	9.5E-08	Immune system	2.0E-02	NA	7.8E-03	2.8E-02
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	6.0E-06	NA	1.7E-06	7 7E-06
			Technical Chlordane	6.3E-08	NA	7.0E-09	NA	7.0E-08	Liver	4.2E-03	NA	4.7E-04	4 7E-03
			Aluminum	NC	NA	NC	NA		Developmental toxicity	6.2E-02	NA	--	6 2E-02
			Arsenic	4 5E-06	NA	3.8E-07	NA	4.8E-06	Skin	1.2E-01	NA	9.7E-03	1.3E-01
			Chromium	NC	NA	NC	NA		NOAEL	2.8E-01	NA	--	2 8E-01
			Copper	NC	NA	NC	NA		Kidney	3.1E-02	NA	--	3.1E-02
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	1.7E-01	NA	--	1 7E-01
			Mercury	NC	NA	NC	NA		Immune system	7 7E-03	NA	--	7 7E-03
			Molybdenum	NC	NA	NC	NA		Kidney	5 0E-02	NA	--	5 0E-02
			Nickel	NC	NA	NC	NA		Developmental toxicity	5 5E-02	NA	--	5 5E-02
			Thallium	NC	NA	NC	NA		NOAEL	2 1E-02	NA	--	2 1E-02
			Vanadium	NC	NA	NC	NA		NOAEL	4 2E-02	NA	--	4 2E-02
			Toxicity Equivalency (Dioxins/Furans) - Mam	4.0E-06	NA	3.4E-07	NA	4.3E-06		--	NA	--	
			CHEMICAL TOTAL	1.8E-05	--	4.3E-06	--	2E-05		9 7E-01	0 0E+00	6.6E-02	1E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-05					1E+00
	EXPOSURE MEDIUM TOTAL							2E-05					1E+00
SOIL TOTAL								2E-05					1E+00
SEDIMENT	SEDIMENT	GREYSTONE MILL POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	7.1E-06	NA	2.6E-06	9.7E-06
			Acenaphthylene	NC	NA	NC	NA		Liver	6.1E-06	NA	2.2E-06	8.3E-06
			Benzo(a)anthracene	4.2E-07	NA	1.5E-07	NA	5 7E-07	Kidney	2.2E-04	NA	8.1E-05	3 0E-04
			Benzo(a)pyrene	3.7E-06	NA	1.3E-06	NA	5 0E-06	Kidney	2.0E-04	NA	7.1E-05	2.7E-04
			Benzo(b)fluoranthene	3.7E-07	NA	1.3E-07	NA	5 0E-07	Kidney	2.0E-04	NA	7.1E-05	2 7E-04
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	1.3E-04	NA	4 8E-05	1.8E-04
			Dibenzo(a,h)anthracene	9 2E-07	NA	3.3E-07	NA	1 2E-06	Kidney	4.9E-05	NA	1.8E-05	6 7E-05
			Indeno(1,2,3-cd)pyrene	2.6E-07	NA	9.4E-08	NA	3.5E-07	Kidney	1.4E-04	NA	5.0E-05	1 9E-04
			Phenanthrene	NC	NA	NC	NA		Kidney	3.0E-04	NA	1 1E-04	4 1E-04
			alpha-Chlordane	3.5E-10	NA	3.9E-11	NA	3.9E-10	Liver	2.3E-05	NA	2 6E-06	2 6E-05
			Aroclor-1254	1.2E-07	NA	4.9E-08	NA	1.7E-07	Immune system	3.6E-02	NA	1 4E-02	5 0E-02
			Aroclor-1268	8.0E-08	NA	3 1E-08	NA	1.1E-07	Immune system	2.3E-02	NA	9 2E-03	3 3E-02
			gamma-Chlordane	2.8E-10	NA	3.2E-11	NA	3.2E-10	Liver	1.9E-05	NA	2 1E-06	2.1E-05
			Technical Chlordane	3.6E-08	NA	4.0E-09	NA	4.0E-08	Liver	2.4E-03	NA	2.7E-04	2.6E-03
			Aluminum	NC	NA	NC	NA		Developmental toxicity	3.0E-02	NA	--	3.0E-02
			Antimony	NC	NA	NC	NA		Adverse clinical signs	2.0E-02	NA	--	2 0E-02
			Arsenic	2.3E-06	NA	2 0E-07	NA	2.5E-06	Skin	6.1E-02	NA	5.1E-03	6.6E-02
			Cadmium	NC	NA	NC	NA		Kidney	8 3E-03	NA	9.3E-04	9 2E-03

TABLE 9.12.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- RESIDENT- CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Chromium	NC	NA	NC	NA		NOAEL	1.7E-01	NA	--	1 7E-01
			Copper	NC	NA	NC	NA		Kidney	2.8E-02	NA	--	2 8E-02
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	1 6E-02	NA	--	1.6E-02
			Mercury	NC	NA	NC	NA		Immune system	4 8E-03	NA	--	4 8E-03
			Nickel	NC	NA	NC	NA		Developmental toxicity	1 3E-02	NA	--	1.3E-02
			Thallium	NC	NA	NC	NA		NOAEL	8 8E-03	NA	--	8 8E-03
			Vanadium	NC	NA	NC	NA		NOAEL	2 1E-02	NA	--	2 1E-02
			Toxicity Equivalency (Dioxins/Furans) - Mam	2 9E-06	NA	2.5E-07	NA	3 2E-06		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	6.1E-07	NA	5.1E-08	NA	6 6E-07		--	NA	--	
			CHEMICAL TOTAL	1.2E-05	--	2.6E-06	--	1E-05		4.5E-01	0.0E+00	3 0E-02	5E-01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-05					5E-01
	EXPOSURE MEDIUM TOTAL							1E-05					5E-01
SEDIMENT TOTAL								1E-05					5E-01
SURFACE WATER	SURFACE WATER	GREYSTONE MILL POND	Arsenic	3.4E-08	NA	1.8E-09	NA	3 5E-08	Skin	8.7E-04	NA	4.7E-05	9 2E-04
			Manganese	NC	NA	NC	NA		NOAEL	2.8E-03	NA	3.8E-03	6 7E-03
			Mercury	NC	NA	NC	NA		Immune system	3.1E-06	NA	2.3E-06	5 4E-06
			Nitrite-N	NC	NA	NC	NA		Hematological system	6.2E-04	NA	--	6.2E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.4E-08	NA	0.0E+00	NA	3 4E-08		--	NA	--	
			CHEMICAL TOTAL	6 8E-08	--	1 8E-09	--	7E-08		4.3E-03	0 0E+00	3.9E-03	8E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						7E-08					8E-03
	EXPOSURE MEDIUM TOTAL							7E-08					8E-03
SURFACE WATER TOTAL								7E-08					8E-03
BIOTA	COMBINED FISH DIET	GREYSTONE MILL POND	Acenaphthylene	NC	NA	NA	NA		Liver	1.1E-05	NA	NA	1.1E-05
			Benzo(a)pyrene	1.9E-07	NA	NA	NA	1.9E-07	Kidney	9.9E-06	NA	NA	9.9E-06
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	1.2E-05	NA	NA	1 2E-05
			Benzo(b)fluoranthene	1.7E-08	NA	NA	NA	1.7E-08	Kidney	9.2E-06	NA	NA	9.2E-06
			Dibenzo(a,h)anthracene	1.1E-07	NA	NA	NA	1.1E-07	Kidney	5.7E-06	NA	NA	5.7E-06
			Indeno(1,2,3-cd)pyrene	1.7E-08	NA	NA	NA	1.7E-08	Kidney	9.2E-06	NA	NA	9.2E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	8.0E-05	NA	NA	8 0E-05
			4,4'-DDD	8.0E-08	NA	NA	NA	8.0E-08	Liver	7.8E-03	NA	NA	7 8E-03
			4,4'-DDE	2.9E-07	NA	NA	NA	2.9E-07	Liver	2.0E-02	NA	NA	2 0E-02
			4,4'-DDT	2.6E-08	NA	NA	NA	2.6E-08	Liver	1.8E-03	NA	NA	1 8E-03
			alpha-Chlordane	1.3E-07	NA	NA	NA	1.3E-07	Liver	8 4E-03	NA	NA	8 4E-03
			Aroclor-1254	9.1E-06	NA	NA	NA	9.1E-06	Immune system	2.7E+00	NA	NA	2 7E+00
			Aroclor-1268	4.4E-06	NA	NA	NA	4.4E-06	Immune system	1.3E+00	NA	NA	1.3E+00
			Dieldrin	1.1E-06	NA	NA	NA	1.1E-06	Liver	1 6E-02	NA	NA	1.6E-02
			gamma-Chlordane	5.4E-08	NA	NA	NA	5.4E-08	Liver	3.6E-03	NA	NA	3.6E-03
			Heptachlor Epoxide	1.9E-07	NA	NA	NA	1.9E-07	Liver	1.8E-02	NA	NA	1 8E-02
			Technical Chlordane	1.9E-06	NA	NA	NA	1.9E-06	Liver	1.2E-01	NA	NA	1.2E-01
			Lead	--	NA	NA	NA			--	NA	NA	

TABLE 9.12.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- RESIDENT- CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Mercury	NC	NA	NA	NA		Immune system	2.3E-01	NA	NA	2.3E-01
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	9.9E-01	NA	NA	9.9E-01
			Zinc	NC	NA	NA	NA		Hematological system	2.2E-02	NA	NA	2.2E-02
			Toxicity Equivalency (Dioxins/Furans) - Mam	5.3E-06	NA	NA	NA	5.3E-06		--	NA	NA	
			CHEMICAL TOTAL	2.3E-05	--	--	--	2E-05		5.4E+00	0.0E+00	--	5.4E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-05					5.4E+00
	EXPOSURE MEDIUM TOTAL							2E-05					5.4E+00
COMBINED FISH DIET TOTAL								2E-05					5.4E+00
RECEPTOR TOTAL								6E-05					6.9E+00
							TOTAL RISK ACROSS ALL MEDIA	6E-05	TOTAL HAZARD ACROSS ALL MEDIA				6.9E+00

NOTES:
NC - Not carcinogenic by this exposure route.
NA - *Not applicable; exposure route not applicable for this chemical/exposure medium.*
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

TOTAL ADVERSE CLINICAL SIGNS HI =	2.0E-02
TOTAL CARDIOVASCULAR SYSTEM HI =	4.3E-05
TOTAL DEVELOPMENTAL TOXICITY HI =	1.1E+00
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	2.3E-02
TOTAL IMMUNE SYSTEM HI =	4.5E+00
TOTAL KIDNEY HI =	1.2E-01
TOTAL LIVER HI =	2.1E-01
	--
TOTAL NERVOUS SYSTEM HI =	4.5E-04
TOTAL NOAEL HI =	7.4E-01
	--
TOTAL SKIN HI =	1.9E-01
	--

Prepared by: RAR
Checked by: KJA

TABLE 9.13.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SOIL	SOIL	ALLENDALE POND	2,3,7,8-TCDD	1.8E-07	NA	4.2E-08	NA	2.2E-07		--	NA	--	
			CHEMICAL TOTAL	1.8E-07	--	4.2E-08	--	2E-07		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-07					0E+00
	EXPOSURE MEDIUM TOTAL							2E-07					0E+00
SOIL TOTAL								2E-07					0E+00
SEDIMENT	SEDIMENT	ALLENDALE POND	2-Methylnaphthalene	NC	NA	NC	NA		Lung	1.7E-07	NA	1.5E-07	3.3E-07
			Acenaphthylene	NC	NA	NC	NA		Liver	4.1E-07	NA	3.6E-07	7.8E-07
			Benzo(a)anthracene	1.1E-08	NA	9.6E-09	NA	2.0E-08	Kidney	2.9E-06	NA	2.6E-06	5.4E-06
			Benzo(a)pyrene	1.3E-07	NA	1.1E-07	NA	2.4E-07	Kidney	3.4E-06	NA	3.0E-06	6.4E-06
			Benzo(b)fluoranthene	1.4E-08	NA	1.2E-08	NA	2.6E-08	Kidney	3.7E-06	NA	3.3E-06	7.0E-06
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	1.7E-06	NA	1.5E-06	3.2E-06
			Benzo(k)fluoranthene	1.2E-09	NA	1.1E-09	NA	2.3E-09	Kidney	3.3E-06	NA	2.9E-06	6.2E-06
			bis(2-Ethylhexyl)phthalate	2.0E-10	NA	1.3E-10	NA	3.3E-10	Liver	4.1E-06	NA	2.8E-06	6.8E-06
			Dibenzo(a,h)anthracene	6.4E-08	NA	5.6E-08	NA	1.2E-07	Kidney	1.7E-06	NA	1.5E-06	3.2E-06
			Indeno(1,2,3-cd)pyrene	1.0E-08	NA	9.0E-09	NA	1.9E-08	Kidney	2.7E-06	NA	2.4E-06	5.1E-06
			Pentachlorophenol	3.4E-09	NA	5.8E-09	NA	9.2E-09	Liver / Kidney	5.5E-06	NA	9.4E-06	1.5E-05
			Phenanthrene	NC	NA	NC	NA		Kidney	4.1E-06	NA	3.6E-06	7.7E-06
			alpha-Chlordane	1.7E-11	NA	4.7E-12	NA	2.2E-11	Liver	5.7E-07	NA	1.6E-07	7.3E-07
			Aroclor-1254	2.1E-08	NA	2.0E-08	NA	4.1E-08	Immune system	3.1E-03	NA	2.9E-03	6.0E-03
			Aroclor-1260	1.7E-09	NA	1.7E-09	NA	3.4E-09	Immune system	2.5E-04	NA	2.4E-04	5.0E-04
			Aroclor-1268	6.9E-10	NA	6.6E-10	NA	1.3E-09	Immune system	1.0E-04	NA	9.6E-05	2.0E-04
			delta-BHC	NC	NA	NC	NA		Liver / Kidney	1.2E-07	NA	8.1E-08	2.0E-07
			Dieldrin	6.3E-10	NA	4.3E-10	NA	1.1E-09	Liver	4.6E-06	NA	3.1E-06	7.7E-06
			Endosulfan II	NC	NA	NC	NA		Kidney	1.6E-07	NA	1.1E-07	2.6E-07
			Endosulfan sulfate	NC	NA	NC	NA		Kidney	1.1E-08	NA	7.8E-09	1.9E-08
			Endrin aldehyde	NC	NA	NC	NA		Nervous system	2.5E-07	NA	1.7E-07	4.1E-07
			Endrin Ketone	NC	NA	NC	NA		Nervous system	3.2E-07	NA	2.2E-07	5.4E-07
			gamma-Chlordane	2.6E-11	NA	7.1E-12	NA	3.3E-11	Liver	8.6E-07	NA	2.4E-07	1.1E-06
			Technical Chlordane	9.9E-10	NA	2.7E-10	NA	1.3E-09	Liver	3.3E-05	NA	9.0E-06	4.2E-05
			Antimony	NC	NA	NC	NA		Adverse clinical signs	3.1E-04	NA		3.1E-04
			Arsenic	3.8E-08	NA	7.7E-09	NA	4.6E-08	Skin	4.9E-04	NA	1.0E-04	5.9E-04
			Cadmium	NC	NA	NC	NA		Kidney	3.1E-05	NA	8.3E-06	3.9E-05
			Chromium	NC	NA	NC	NA		NOAEL	2.0E-03	NA		2.0E-03
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	1.9E-04	NA		1.9E-04
			Mercury	NC	NA	NC	NA		Immune system	8.2E-05	NA		8.2E-05
			Nickel	NC	NA	NC	NA		Developmental toxicity	3.4E-05	NA		3.4E-05
			Thallium	NC	NA	NC	NA		NOAEL	2.2E-03	NA		2.2E-03
			Vanadium	NC	NA	NC	NA		NOAEL	1.7E-04	NA		1.7E-04

TABLE 9.13.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.7E-06	NA	7.6E-07	NA	4.5E-06		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	7.3E-11	NA	1.5E-11	NA	8.8E-11		--	NA	--	
			CHEMICAL TOTAL	4 0E-06	--	1.0E-06	--	5E-06		9 0E-03	0.0E+00	3.4E-03	1E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						5E-06					1E-02
	EXPOSURE MEDIUM TOTAL							5E-06					1E-02
SEDIMENT TOTAL								5E-06					1E-02
SURFACE WATER	SURFACE WATER	ALLENDALE POND	Tetrachloroethene	1.6E-10	NA	2.7E-08	NA	2.7E-08	Liver	1 8E-07	NA	2.9E-05	2.9E-05
			bis(2-Ethylhexyl)phthalate	6.1E-12	NA	2.6E-09	NA	2.6E-09	Liver	1.3E-07	NA	5.4E-05	5.4E-05
			Aldrin	8 2E-11	NA	2.0E-09	NA	2 1E-09	Liver	9 3E-07	NA	2.3E-05	2.4E-05
			alpha-Chlordane	1.1E-13	NA	6.0E-11	NA	6 0E-11	Liver	3 5E-09	NA	2.0E-06	2.0E-06
			delta-BHC	NC	NA	NC	NA		Liver / Kidney	8.1E-08	NA	8.6E-06	8.7E-06
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	1.1E-09	NA	--	1 1E-09
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	2.4E-08	NA	4 6E-06	4.6E-06
			gamma-Chlordane	1.1E-13	NA	6.5E-11	NA	6.5E-11	Liver	3.8E-09	NA	2.2E-06	2 2E-06
			Arsenic	4.9E-09	NA	8.5E-09	NA	1.3E-08	Skin	6.4E-05	NA	1 1E-04	1 7E-04
			Barium	NC	NA	NC	NA		Cardiovascular system	1.6E-06	NA	4 1E-05	4.2E-05
			Chromium	NC	NA	NC	NA		NOAEL	2.3E-05	NA	3.2E-03	3 2E-03
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	4.5E-05	NA	1.9E-03	2 0E-03
			Mercury	NC	NA	NC	NA		Immune system	2.7E-08	NA	6.7E-07	7 0E-07
			Thallium	NC	NA	NC	NA		NOAEL	4.6E-04	NA	8.0E-04	1 3E-03
			Nitrate	NC	NA	NC	NA		Hematological system	1.2E-06	NA	--	1 2E-06
			Nitrite-N	NC	NA	NC	NA		Hematological system	3.5E-06	NA	--	3 5E-06
			Toxicity Equivalency (Dioxins/Furans) - Mam	2 5E-08	NA	0.0E+00	NA	2.5E-08		--	NA	--	
			CHEMICAL TOTAL	3.0E-08	--	4.0E-08	--	7E-08		6.0E-04	0.0E+00	6 2E-03	7E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						7E-08					7E-03
	EXPOSURE MEDIUM TOTAL							7E-08					7E-03
SURFACE WATER TOTAL								7E-08					7E-03
BIOTA	COMBINED FISH DIET	ALLENDALE POND	Acenaphthylene	NC	NA	NA	NA		Liver	6.4E-06	NA	NA	6 4E-06
			Benzo(a)anthracene	3.4E-08	NA	NA	NA	3.4E-08	Kidney	8.9E-06	NA	NA	8 9E-06
			Benzo(a)pyrene	3 6E-07	NA	NA	NA	3.6E-07	Kidney	9.6E-06	NA	NA	9 6E-06
			Benzo(b)fluoranthene	3.8E-08	NA	NA	NA	3.8E-08	Kidney	1.0E-05	NA	NA	1 0E-05
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	4.2E-06	NA	NA	4 2E-06
			Dibenzo(a,h)anthracene	1 3E-07	NA	NA	NA	1 3E-07	Kidney	3.4E-06	NA	NA	3.4E-06

TABLE 9.13.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Indeno(1,2,3-cd)pyrene	1.8E-08	NA	NA	NA	1.8E-08	Kidney	4.7E-06	NA	NA	4.7E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	6.2E-05	NA	NA	6.2E-05
			4,4'-DDD	1.0E-07	NA	NA	NA	1.0E-07	Liver	4.9E-03	NA	NA	4.9E-03
			4,4'-DDE	2.8E-07	NA	NA	NA	2.8E-07	Liver	9.6E-03	NA	NA	9.6E-03
			4,4'-DDT	8.8E-08	NA	NA	NA	8.8E-08	Liver	3.0E-03	NA	NA	3.0E-03
			alpha-Chlordane	2.5E-07	NA	NA	NA	2.5E-07	Liver	8.2E-03	NA	NA	8.2E-03
			Aroclor-1254	1.2E-04	NA	NA	NA	1.2E-04	Immune system	1.8E+01	NA	NA	1.8E+01
			Aroclor-1268	1.8E-06	NA	NA	NA	1.8E-06	Immune system	2.6E-01	NA	NA	2.6E-01
			beta-BHC	3.0E-08	NA	NA	NA	3.0E-08	Liver / Kidney	3.2E-04	NA	NA	3.2E-04
			Dieldrin	4.7E-06	NA	NA	NA	4.7E-06	Liver	3.4E-02	NA	NA	3.4E-02
			Endosulfan Sulfate	NC	NA	NA	NA		Kidney	3.2E-05	NA	NA	3.2E-05
			Endrin Aldehyde	NC	NA	NA	NA		Nervous system	3.2E-04	NA	NA	3.2E-04
			gamma-Chlordane	9.2E-08	NA	NA	NA	9.2E-08	Liver	3.1E-03	NA	NA	3.1E-03
			Heptachlor	7.4E-08	NA	NA	NA	7.4E-08	Liver	1.9E-04	NA	NA	1.9E-04
			Heptachlor Epoxide	3.3E-07	NA	NA	NA	3.3E-07	Liver	1.6E-02	NA	NA	1.6E-02
			Technical Chlordane	5.4E-06	NA	NA	NA	5.4E-06	Liver	1.8E-01	NA	NA	1.8E-01
			Cadmium	NC	NA	NA	NA		Kidney	1.2E-02	NA	NA	1.2E-02
			Chromium	NC	NA	NA	NA		NOAEL	6.6E-03	NA	NA	6.6E-03
			Lead	--	NA	NA	NA			--	NA	NA	
			Manganese	NC	NA	NA	NA		NOAEL	9.2E-03	NA	NA	9.2E-03
			Mercury	NC	NA	NA	NA		Immune system	9.2E-02	NA	NA	9.2E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	4.0E-01	NA	NA	4.0E-01
			Toxicity Equivalency (PCB Congeners) - Mam	1.6E-04	NA	NA	NA	1.6E-04		--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.5E-03	NA	NA	NA	1.5E-03		--	NA	NA	
			CHEMICAL TOTAL	1.8E-03	--	--	--	2E-03		1.9E+01	0.0E+00	--	1.9E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-03					1.9E+01
	EXPOSURE MEDIUM TOTAL							2E-03					1.9E+01
COMBINED FISH DIET TOTAL								2E-03					1.9E+01
RECEPTOR TOTAL								2E-03					1.9E+01
							TOTAL RISK ACROSS ALL MEDIA	2E-03	TOTAL HAZARD ACROSS ALL MEDIA				1.9E+01

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

TOTAL ADVERSE CLINICAL SIGNS HI =	3.1E-04
TOTAL CARDIOVASCULAR SYSTEM HI =	4.2E-05
TOTAL DEVELOPMENTAL TOXICITY HI =	4.0E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	4.8E-06
TOTAL IMMUNE SYSTEM HI =	1.8E+01
TOTAL KIDNEY HI =	1.3E-02
TOTAL LIVER HI =	2.6E-01
	--
TOTAL NERVOUS SYSTEM HI =	3.3E-04
TOTAL NOAEL HI =	2.7E-02
	--
TOTAL SKIN HI =	7.7E-04
	--

Prepared by: KJA
Checked by: MJM

TABLE 9.14.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SOIL	SOIL	ALLENDALE POND	2,3,7,8-TCDD	2.7E-07	NA	1.6E-07	NA	4.3E-07		--	NA	--	
			CHEMICAL TOTAL	2.7E-07	--	1.6E-07	--	4E-07		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-07					0E+00
	EXPOSURE MEDIUM TOTAL							4E-07					0E+00
SOIL TOTAL								4E-07					0E+00
SEDIMENT	SEDIMENT	ALLENDALE POND	2-Methylnaphthalene	NC	NA	NC	NA		Lung	2.7E-07	NA	5.0E-07	7.7E-07
			Acenaphthylene	NC	NA	NC	NA		Liver	6.4E-07	NA	1.2E-06	1.8E-06
			Benzo(a)anthracene	1.7E-08	NA	3.1E-08	NA	4.8E-08	Kidney	4.5E-06	NA	8.3E-06	1.3E-05
			Benzo(a)pyrene	2.0E-07	NA	3.7E-07	NA	5.7E-07	Kidney	5.3E-06	NA	9.8E-06	1.5E-05
			Benzo(b)fluoranthene	2.2E-08	NA	4.0E-08	NA	6.2E-08	Kidney	5.8E-06	NA	1.1E-05	1.7E-05
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	2.6E-06	NA	4.9E-06	7.5E-06
			Benzo(k)fluoranthene	1.9E-09	NA	3.6E-09	NA	5.5E-09	Kidney	5.1E-06	NA	9.6E-06	1.5E-05
			bis(2-Ethylhexyl)phthalate	3.0E-10	NA	4.3E-10	NA	7.4E-10	Liver	6.3E-06	NA	9.1E-06	1.5E-05
			Dibenzo(a,h)anthracene	9.9E-08	NA	1.8E-07	NA	2.8E-07	Kidney	2.6E-06	NA	4.9E-06	7.5E-06
			Indeno(1,2,3-cd)pyrene	1.6E-08	NA	2.9E-08	NA	4.5E-08	Kidney	4.2E-06	NA	7.8E-06	1.2E-05
			Pentachlorophenol	5.3E-09	NA	1.9E-08	NA	2.4E-08	Liver / Kidney	8.6E-06	NA	3.1E-05	3.9E-05
			Phenanthrene	NC	NA	NC	NA		Kidney	6.3E-06	NA	1.2E-05	1.8E-05
			alpha-Chlordane	2.7E-11	NA	1.5E-11	NA	4.2E-11	Liver	8.9E-07	NA	5.1E-07	1.4E-06
			Aroclor-1254	3.3E-08	NA	6.5E-08	NA	9.8E-08	Immune system	4.7E-03	NA	9.5E-03	1.4E-02
			Aroclor-1260	2.7E-09	NA	5.4E-09	NA	8.1E-09	Immune system	4.0E-04	NA	7.9E-04	1.2E-03
			Aroclor-1268	1.1E-09	NA	2.1E-09	NA	3.2E-09	Immune system	1.6E-04	NA	3.1E-04	4.7E-04
			delta-BHC	NC	NA	NC	NA		Liver / Kidney	1.8E-07	NA	2.6E-07	4.5E-07
			Dieldrin	9.8E-10	NA	1.4E-09	NA	2.4E-09	Liver	7.1E-06	NA	1.0E-05	1.7E-05
			Endosulfan II	NC	NA	NC	NA		Kidney	2.4E-07	NA	3.5E-07	5.9E-07
			Endosulfan sulfate	NC	NA	NC	NA		Kidney	1.8E-08	NA	2.5E-08	4.3E-08
			Endrin aldehyde	NC	NA	NC	NA		Nervous system	3.8E-07	NA	5.5E-07	9.3E-07
			Endrin Ketone	NC	NA	NC	NA		Nervous system	5.0E-07	NA	7.2E-07	1.2E-06
			gamma-Chlordane	4.0E-11	NA	2.3E-11	NA	6.3E-11	Liver	1.3E-06	NA	7.7E-07	2.1E-06
			Technical Chlordane	1.5E-09	NA	8.8E-10	NA	2.4E-09	Liver	5.1E-05	NA	2.9E-05	8.1E-05
			Antimony	NC	NA	NC	NA		Adverse clinical signs	4.7E-04	NA		4.7E-04
			Arsenic	5.9E-08	NA	2.5E-08	NA	8.4E-08	Skin	7.7E-04	NA	3.3E-04	1.1E-03
			Cadmium	NC	NA	NC	NA		Kidney	4.7E-05	NA	2.7E-05	7.5E-05
			Chromium	NC	NA	NC	NA		NOAEL	3.1E-03	NA		3.1E-03
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	3.0E-04	NA		3.0E-04
			Mercury	NC	NA	NC	NA		Immune system	1.3E-04	NA		1.3E-04
			Nickel	NC	NA	NC	NA		Developmental toxicity	5.3E-05	NA		5.3E-05
			Thallium	NC	NA	NC	NA		NOAEL	3.4E-03	NA		3.4E-03
			Vanadium	NC	NA	NC	NA		NOAEL	2.6E-04	NA		2.6E-04

TABLE 9.14.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Toxicity Equivalency (Dioxins/Furans) - Mam	5.8E-06	NA	2.5E-06	NA	8.3E-06		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	1.1E-10	NA	4.9E-11	NA	1.6E-10		--	NA	--	
			CHEMICAL TOTAL	6.3E-06	--	3.3E-06	--	1E-05		1.4E-02	0.0E+00	1.1E-02	3E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-05					3E-02
	EXPOSURE MEDIUM TOTAL							1E-05					3E-02
SEDIMENT TOTAL								1E-05					3E-02
SURFACE WATER	SURFACE WATER	ALLENDALE POND	Tetrachloroethene	2.6E-10	NA	3.0E-08	NA	3.0E-08	Liver	2.8E-07	NA	3.2E-05	3.2E-05
			bis(2-Ethylhexyl)phthalate	9.5E-12	NA	2.9E-09	NA	2.9E-09	Liver	2.0E-07	NA	6.0E-05	6.0E-05
			Aldrin	1.3E-10	NA	2.2E-09	NA	2.4E-09	Liver	1.5E-06	NA	2.5E-05	2.7E-05
			alpha-Chlordane	1.6E-13	NA	6.7E-11	NA	6.7E-11	Liver	5.5E-09	NA	2.2E-06	2.2E-06
			delta-BHC	NC	NA	NC	NA		Liver / Kidney	1.3E-07	NA	9.6E-06	9.8E-06
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	1.7E-09	NA	--	1.7E-09
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	3.7E-08	NA	5.1E-06	5.2E-06
			gamma-Chlordane	1.8E-13	NA	7.3E-11	NA	7.3E-11	Liver	5.9E-09	NA	2.4E-06	2.4E-06
			Arsenic	7.6E-09	NA	9.6E-09	NA	1.7E-08	Skin	9.9E-05	NA	1.2E-04	2.2E-04
			Barium	NC	NA	NC	NA		Cardiovascular system	2.5E-06	NA	4.6E-05	4.8E-05
			Chromium	NC	NA	NC	NA		NOAEL	3.6E-05	NA	3.6E-03	3.6E-03
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	6.9E-05	NA	2.2E-03	2.2E-03
			Mercury	NC	NA	NC	NA		Immune system	4.2E-08	NA	7.5E-07	7.9E-07
			Thallium	NC	NA	NC	NA		NOAEL	7.2E-04	NA	9.0E-04	1.6E-03
			Nitrate	NC	NA	NC	NA		Hematological system	1.9E-06	NA	--	1.9E-06
			Nitrite-N	NC	NA	NC	NA		Hematological system	5.5E-06	NA	--	5.5E-06
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.9E-08	NA	0.0E+00	NA	3.9E-08		--	NA	--	
			CHEMICAL TOTAL	4.7E-08	--	4.5E-08	--	9E-08		9.3E-04	0.0E+00	6.9E-03	8E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						9E-08					8E-03
	EXPOSURE MEDIUM TOTAL							9E-08					8E-03
SURFACE WATER TOTAL								9E-08					8E-03
BIOTA	COMBINED FISH DIET	ALLENDALE POND	Acenaphthylene	NC	NA	NA	NA		Liver	6.6E-06	NA	NA	6.6E-06
			Benzo(a)anthracene	3.5E-08	NA	NA	NA	3.5E-08	Kidney	9.2E-06	NA	NA	9.2E-06
			Benzo(a)pyrene	3.7E-07	NA	NA	NA	3.7E-07	Kidney	9.9E-06	NA	NA	9.9E-06
			Benzo(b)fluoranthene	4.0E-08	NA	NA	NA	4.0E-08	Kidney	1.1E-05	NA	NA	1.1E-05
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	4.3E-06	NA	NA	4.3E-06
			Dibenzo(a,h)anthracene	1.3E-07	NA	NA	NA	1.3E-07	Kidney	3.5E-06	NA	NA	3.5E-06
			Indeno(1,2,3-cd)pyrene	1.8E-08	NA	NA	NA	1.8E-08	Kidney	4.8E-06	NA	NA	4.8E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	6.4E-05	NA	NA	6.4E-05

TABLE 9.14.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			4,4'-DDD	1.0E-07	NA	NA	NA	1.0E-07	Liver	5.1E-03	NA	NA	5.1E-03
			4,4'-DDE	2.9E-07	NA	NA	NA	2.9E-07	Liver	9.9E-03	NA	NA	9.9E-03
			4,4'-DDT	9.1E-08	NA	NA	NA	9.1E-08	Liver	3.1E-03	NA	NA	3.1E-03
			alpha-Chlordane	2.5E-07	NA	NA	NA	2.5E-07	Liver	8.5E-03	NA	NA	8.5E-03
			Aroclor-1254	1.3E-04	NA	NA	NA	1.3E-04	Immune system	1.9E+01	NA	NA	1.9E+01
			Aroclor-1268	1.8E-06	NA	NA	NA	1.8E-06	Immune system	2.6E-01	NA	NA	2.6E-01
			beta-BHC	3.1E-08	NA	NA	NA	3.1E-08	Liver / Kidney	3.3E-04	NA	NA	3.3E-04
			Dieldrin	4.8E-06	NA	NA	NA	4.8E-06	Liver	3.5E-02	NA	NA	3.5E-02
			Endosulfan Sulfate	NC	NA	NA	NA		Kidney	3.3E-05	NA	NA	3.3E-05
			Endrin Aldehyde	NC	NA	NA	NA		Nervous system	3.3E-04	NA	NA	3.3E-04
			gamma-Chlordane	9.5E-08	NA	NA	NA	9.5E-08	Liver	3.2E-03	NA	NA	3.2E-03
			Heptachlor	7.6E-08	NA	NA	NA	7.6E-08	Liver	2.0E-04	NA	NA	2.0E-04
			Heptachlor Epoxide	3.4E-07	NA	NA	NA	3.4E-07	Liver	1.7E-02	NA	NA	1.7E-02
			Technical Chlordane	5.6E-06	NA	NA	NA	5.6E-06	Liver	1.9E-01	NA	NA	1.9E-01
			Cadmium	NC	NA	NA	NA		Kidney	1.3E-02	NA	NA	1.3E-02
			Chromium	NC	NA	NA	NA		NOAEL	6.8E-03	NA	NA	6.8E-03
			Lead	--	NA	NA	NA			--	NA	NA	
			Manganese	NC	NA	NA	NA		NOAEL	9.5E-03	NA	NA	9.5E-03
			Mercury	NC	NA	NA	NA		Immune system	9.5E-02	NA	NA	9.5E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	4.1E-01	NA	NA	4.1E-01
			Toxicity Equivalency (PCB Congeners) - Mam	1.6E-04	NA	NA	NA	1.6E-04		--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.5E-03	NA	NA	NA	1.5E-03		--	NA	NA	
			CHEMICAL TOTAL	1.8E-03	--	--	--	2E-03		2.0E+01	0.0E+00	--	2.0E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-03					2.0E+01
	EXPOSURE MEDIUM TOTAL							2E-03					2.0E+01
COMBINED FISH DIET TOTAL								2E-03					2.0E+01
RECEPTOR TOTAL								2E-03					2.0E+01
							TOTAL RISK ACROSS ALL MEDIA	2E-03	TOTAL HAZARD ACROSS ALL MEDIA				2.0E+01

NOTES:
NC - Not carcinogenic by this exposure route
NA - Not applicable; exposure route not applicable for this chemical/exposure medium
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

TOTAL ADVERSE CLINICAL SIGNS HI =	4.7E-04
TOTAL CARDIOVASCULAR SYSTEM HI =	4.8E-05
TOTAL DEVELOPMENTAL TOXICITY HI =	4.1E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	7.4E-06
TOTAL IMMUNE SYSTEM HI =	1.9E+01
TOTAL KIDNEY HI =	1.3E-02
TOTAL LIVER HI =	2.7E-01
	--
TOTAL NERVOUS SYSTEM HI =	3.4E-04
TOTAL NOAEL HI =	3.1E-02
	--
TOTAL SKIN HI =	1.3E-03
	--

Prepared by: KJA
Checked by: MJM

TABLE 9.16.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK (1)					NON-CARCINOGENIC HAZARD QUOTIENT (1)				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SOIL	SOIL	ALLENDALE POND	2,3,7,8-TCDD	2.1E-06	NA	2.5E-07	NA	2.4E-06		--	NA	--	
			CHEMICAL TOTAL	2.1E-06	--	2.5E-07	--	2E-06		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-06					0E+00
	EXPOSURE MEDIUM TOTAL							2E-06					0E+00
SOIL TOTAL								2E-06					0E+00
SEDIMENT	SEDIMENT	ALLENDALE POND	2-Methylnaphthalene	NC	NA	NC	NA		Lung	1.0E-06	NA	4.6E-07	1.5E-06
			Acenaphthylene	NC	NA	NC	NA		Liver	2.5E-06	NA	1.1E-06	3.6E-06
			Benzo(a)anthracene	6.5E-08	NA	2.9E-08	NA	9.4E-08	Kidney	1.7E-05	NA	7.7E-06	2.5E-05
			Benzo(a)pyrene	7.6E-07	NA	3.4E-07	NA	1.1E-06	Kidney	2.0E-05	NA	9.0E-06	2.9E-05
			Benzo(b)fluoranthene	8.4E-08	NA	3.7E-08	NA	1.2E-07	Kidney	2.2E-05	NA	9.9E-06	3.2E-05
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	1.0E-05	NA	4.5E-06	1.5E-05
			Benzo(k)fluoranthene	7.4E-09	NA	3.3E-09	NA	1.1E-08	Kidney	2.0E-05	NA	8.8E-06	2.9E-05
			bis(2-Ethylhexyl)phthalate	1.2E-09	NA	4.0E-10	NA	1.6E-09	Liver	2.4E-05	NA	8.3E-06	3.3E-05
			Dibenzo(a,h)anthracene	3.8E-07	NA	1.7E-07	NA	5.5E-07	Kidney	1.0E-05	NA	4.5E-06	1.5E-05
			Indeno(1,2,3-cd)pyrene	6.1E-08	NA	2.7E-08	NA	8.8E-08	Kidney	1.6E-05	NA	7.2E-06	2.3E-05
			Pentachlorophenol	2.0E-08	NA	1.7E-08	NA	3.8E-08	Liver / Kidney	3.3E-05	NA	2.8E-05	6.1E-05
			Phenanthrene	NC	NA	NC	NA		Kidney	2.4E-05	NA	1.1E-05	3.5E-05
			alpha-Chlordane	1.0E-10	NA	1.4E-11	NA	1.2E-10	Liver	3.4E-06	NA	4.7E-07	3.9E-06
			Aroclor-1254	1.3E-07	NA	6.0E-08	NA	1.9E-07	Immune system	1.8E-02	NA	8.7E-03	2.7E-02
			Aroclor-1260	1.0E-08	NA	5.0E-09	NA	1.5E-08	Immune system	1.5E-03	NA	7.3E-04	2.3E-03
			Aroclor-1268	4.1E-09	NA	2.0E-09	NA	6.1E-09	Immune system	6.0E-04	NA	2.9E-04	8.9E-04
			delta-BHC	NC	NA	NC	NA		Liver / Kidney	7.1E-07	NA	2.4E-07	9.5E-07
			Dieldrin	3.8E-09	NA	1.3E-09	NA	5.0E-09	Liver	2.7E-05	NA	9.3E-06	3.7E-05
			Endosulfan II	NC	NA	NC	NA		Kidney	9.4E-07	NA	3.2E-07	1.3E-06
			Endosulfan sulfate	NC	NA	NC	NA		Kidney	6.9E-08	NA	2.3E-08	9.2E-08
			Endrin aldehyde	NC	NA	NC	NA		Nervous system	1.5E-06	NA	5.0E-07	2.0E-06
			Endrin Ketone	NC	NA	NC	NA		Nervous system	1.9E-06	NA	6.6E-07	2.6E-06
			gamma-Chlordane	1.6E-10	NA	2.1E-11	NA	1.8E-10	Liver	5.2E-06	NA	7.1E-07	5.9E-06
			Technical Chlordane	6.0E-09	NA	8.1E-10	NA	6.8E-09	Liver	2.0E-04	NA	2.7E-05	2.3E-04
			Antimony	NC	NA	NC	NA		Adverse clinical signs	1.8E-03	NA		1.8E-03
			Arsenic	2.3E-07	NA	2.3E-08	NA	2.5E-07	Skin	3.0E-03	NA	3.0E-04	3.3E-03
			Cadmium	NC	NA	NC	NA		Kidney	1.8E-04	NA	2.5E-05	2.1E-04
			Chromium	NC	NA	NC	NA		NOAEL	1.2E-02	NA		1.2E-02
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	1.1E-03	NA		1.1E-03
			Mercury	NC	NA	NC	NA		Immune system	4.9E-04	NA		4.9E-04
			Nickel	NC	NA	NC	NA		Developmental toxicity	2.0E-04	NA		2.0E-04
			Thallium	NC	NA	NC	NA		NOAEL	1.3E-02	NA		1.3E-02
			Vanadium	NC	NA	NC	NA		NOAEL	1.0E-03	NA		1.0E-03

TABLE 9.16.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK (1)					NON-CARCINOGENIC HAZARD QUOTIENT (1)				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Toxicity Equivalency (Dioxins/Furans) - Mam	2.2E-05	NA	2.3E-06	NA	2.5E-05		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	4.4E-10	NA	4.5E-11	NA	4.8E-10		--	NA	--	
			CHEMICAL TOTAL	2.4E-05	--	3.0E-06	--	3E-05		5.4E-02	0.0E+00	1.0E-02	6E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-05					6E-02
	EXPOSURE MEDIUM TOTAL							3E-05					6E-02
SEDIMENT TOTAL								3E-05					6E-02
SURFACE WATER	SURFACE WATER	ALLENDALE POND	Tetrachloroethene	6.6E-09	NA	9.9E-08	NA	1.1E-07	Liver	7.1E-06	NA	1.1E-04	1.1E-04
			bis(2-Ethylhexyl)phthalate	2.4E-10	NA	9.6E-09	NA	9.9E-09	Liver	5.1E-06	NA	2.0E-04	2.1E-04
			Aldrin	3.3E-09	NA	7.5E-09	NA	1.1E-08	Liver	3.7E-05	NA	8.5E-05	1.2E-04
			alpha-Chlordane	4.2E-12	NA	2.2E-10	NA	2.3E-10	Liver	1.4E-07	NA	7.5E-06	7.6E-06
			delta-BHC	NC	NA	NC	NA		Liver / Kidney	3.3E-06	NA	3.2E-05	3.6E-05
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	4.4E-08	NA	--	4.4E-08
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	9.5E-07	NA	1.7E-05	1.8E-05
			gamma-Chlordane	4.6E-12	NA	2.4E-10	NA	2.5E-10	Liver	1.5E-07	NA	8.1E-06	8.3E-06
			Arsenic	2.0E-07	NA	3.2E-08	NA	2.3E-07	Skin	2.5E-03	NA	4.1E-04	3.0E-03
			Barium	NC	NA	NC	NA		Cardiovascular system	6.5E-05	NA	1.5E-04	2.2E-04
			Chromium	NC	NA	NC	NA		NOAEL	9.2E-04	NA	1.2E-02	1.3E-02
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	1.8E-03	NA	7.3E-03	9.0E-03
			Mercury	NC	NA	NC	NA		Immune system	1.1E-06	NA	2.5E-06	3.6E-06
			Thallium	NC	NA	NC	NA		NOAEL	1.8E-02	NA	3.0E-03	2.1E-02
			Nitrate	NC	NA	NC	NA		Hematological system	4.9E-05	NA	--	4.9E-05
			Nitrite-N	NC	NA	NC	NA		Hematological system	1.4E-04	NA	--	1.4E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.0E-06	NA	0.0E+00	NA	1.0E-06		--	NA	--	
			CHEMICAL TOTAL	1.2E-06	--	1.5E-07	--	1E-06		2.4E-02	0.0E+00	2.3E-02	5E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-06					5E-02
	EXPOSURE MEDIUM TOTAL							1E-06					5E-02
SURFACE WATER TOTAL								1E-06					5E-02
BIOTA	COMBINED FISH DIET	ALLENDALE POND	Acenaphthylene	NC	NA	NA	NA		Liver	6.4E-06	NA	NA	6.4E-06
			Benzo(a)anthracene	3.4E-08	NA	NA	NA	3.4E-08	Kidney	8.9E-06	NA	NA	8.9E-06
			Benzo(a)pyrene	3.6E-07	NA	NA	NA	3.6E-07	Kidney	9.6E-06	NA	NA	9.6E-06
			Benzo(b)fluoranthene	3.8E-08	NA	NA	NA	3.8E-08	Kidney	1.0E-05	NA	NA	1.0E-05
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	4.2E-06	NA	NA	4.2E-06
			Dibenzo(a,h)anthracene	1.3E-07	NA	NA	NA	1.3E-07	Kidney	3.4E-06	NA	NA	3.4E-06
			Indeno(1,2,3-cd)pyrene	1.8E-08	NA	NA	NA	1.8E-08	Kidney	4.7E-06	NA	NA	4.7E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	6.2E-05	NA	NA	6.2E-05
			4,4'-DDD	1.0E-07	NA	NA	NA	1.0E-07	Liver	4.9E-03	NA	NA	4.9E-03
			4,4'-DDE	2.8E-07	NA	NA	NA	2.8E-07	Liver	9.6E-03	NA	NA	9.6E-03
			4,4'-DDT	8.8E-08	NA	NA	NA	8.8E-08	Liver	3.0E-03	NA	NA	3.0E-03
			alpha-Chlordane	2.5E-07	NA	NA	NA	2.5E-07	Liver	8.2E-03	NA	NA	8.2E-03
			Aroclor-1254	1.2E-04	NA	NA	NA	1.2E-04	Immune system	1.8E+01	NA	NA	1.8E+01

TABLE 9.16.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK (1)					NON-CARCINOGENIC HAZARD QUOTIENT (1)				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Aroclor-1268	1.8E-06	NA	NA	NA	1.8E-06	Immune system	2.6E-01	NA	NA	2.6E-01
			beta-BHC	3.0E-08	NA	NA	NA	3.0E-08	Liver / Kidney	3.2E-04	NA	NA	3.2E-04
			Dieldrin	4.7E-06	NA	NA	NA	4.7E-06	Liver	3.4E-02	NA	NA	3.4E-02
			Endosulfan Sulfate	NC	NA	NA	NA		Kidney	3.2E-05	NA	NA	3.2E-05
			Endrin Aldehyde	NC	NA	NA	NA		Nervous system	3.2E-04	NA	NA	3.2E-04
			gamma-Chlordane	9.2E-08	NA	NA	NA	9.2E-08	Liver	3.1E-03	NA	NA	3.1E-03
			Heptachlor	7.4E-08	NA	NA	NA	7.4E-08	Liver	1.9E-04	NA	NA	1.9E-04
			Heptachlor Epoxide	3.3E-07	NA	NA	NA	3.3E-07	Liver	1.6E-02	NA	NA	1.6E-02
			Technical Chlordane	5.4E-06	NA	NA	NA	5.4E-06	Liver	1.8E-01	NA	NA	1.8E-01
			Cadmium	NC	NA	NA	NA		Kidney	1.2E-02	NA	NA	1.2E-02
			Chromium	NC	NA	NA	NA		NOAEL	6.6E-03	NA	NA	6.6E-03
			Lead	--	NA	NA	NA			--	NA	NA	
			Manganese	NC	NA	NA	NA		NOAEL	9.2E-03	NA	NA	9.2E-03
			Mercury	NC	NA	NA	NA		Immune system	9.2E-02	NA	NA	9.2E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	4.0E-01	NA	NA	4.0E-01
			Toxicity Equivalency (PCB Congeners) - Mam	1.6E-04	NA	NA	NA	1.6E-04		--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.5E-03	NA	NA	NA	1.5E-03		--	NA	NA	
			CHEMICAL TOTAL	1.8E-03	--	--	--	2E-03		1.9E+01	0.0E+00	--	1.9E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-03					1.9E+01
	EXPOSURE MEDIUM TOTAL							2E-03					1.9E+01
COMBINED FISH DIET TOTAL								2E-03					1.9E+01

RECEPTOR TOTAL	2E-03		1.9E+01
TOTAL RISK ACROSS ALL MEDIA	2E-03	TOTAL HAZARD ACROSS ALL MEDIA	1.9E+01

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium
-- - *Not calculated; dose-response data and/or dermal absorption values are not available*

TOTAL ADVERSE CLINICAL SIGNS HI =	1.8E-03
TOTAL CARDIOVASCULAR SYSTEM HI =	2.2E-04
TOTAL DEVELOPMENTAL TOXICITY HI =	4.0E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	1.9E-04
TOTAL IMMUNE SYSTEM HI =	1.8E+01
TOTAL KIDNEY HI =	1.3E-02
TOTAL LIVER HI =	2.6E-01
	--
TOTAL NERVOUS SYSTEM HI =	3.4E-04
TOTAL NOAEL HI =	8.6E-02
	--
TOTAL SKIN HI =	6.2E-03
	--

Prepared by: KJA
Checked by MJM

TABLE 9.17.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SOIL	SOIL	ALLENDALE POND	2,3,7,8-TCDD	3.3E-06	NA	9.5E-07	NA	4.2E-06		--	NA	--	
			CHEMICAL TOTAL	3.3E-06	--	9.5E-07	--	4E-06		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-06					0E+00
	EXPOSURE MEDIUM TOTAL							4E-06					0E+00
SOIL TOTAL								4E-06					0E+00
SEDIMENT	SEDIMENT	ALLENDALE POND	2-Methylnaphthalene	NC	NA	NC	NA		Lung	1.6E-06	NA	1.5E-06	3.1E-06
			Acenaphthylene	NC	NA	NC	NA		Liver	3.8E-06	NA	3.6E-06	7.4E-06
			Benzo(a)anthracene	1.0E-07	NA	9.4E-08	NA	1.9E-07	Kidney	2.7E-05	NA	2.5E-05	5.2E-05
			Benzo(a)pyrene	1.2E-06	NA	1.1E-06	NA	2.3E-06	Kidney	3.2E-05	NA	2.9E-05	6.1E-05
			Benzo(b)fluoranthene	1.3E-07	NA	1.2E-07	NA	2.5E-07	Kidney	3.5E-05	NA	3.2E-05	6.7E-05
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	1.6E-05	NA	1.5E-05	3.1E-05
			Benzo(k)fluoranthene	1.2E-08	NA	1.1E-08	NA	2.2E-08	Kidney	3.1E-05	NA	2.9E-05	6.0E-05
			bis(2-Ethylhexyl)phthalate	1.8E-09	NA	1.3E-09	NA	3.1E-09	Liver	3.8E-05	NA	2.7E-05	6.5E-05
			Dibenzo(a,h)anthracene	5.9E-07	NA	5.5E-07	NA	1.1E-06	Kidney	1.6E-05	NA	1.5E-05	3.1E-05
			Indeno(1,2,3-cd)pyrene	9.5E-08	NA	8.8E-08	NA	1.8E-07	Kidney	2.5E-05	NA	2.4E-05	4.9E-05
			Pentachlorophenol	3.2E-08	NA	5.7E-08	NA	8.8E-08	Liver / Kidney	5.1E-05	NA	9.2E-05	1.4E-04
			Phenanthrene	NC	NA	NC	NA		Kidney	3.8E-05	NA	3.5E-05	7.3E-05
			alpha-Chlordane	1.6E-10	NA	4.6E-11	NA	2.1E-10	Liver	5.4E-06	NA	1.5E-06	6.9E-06
			Aroclor-1254	2.0E-07	NA	2.0E-07	NA	3.9E-07	Immune system	2.8E-02	NA	2.9E-02	5.7E-02
			Aroclor-1260	1.6E-08	NA	1.6E-08	NA	3.3E-08	Immune system	2.4E-03	NA	2.4E-03	4.8E-03
			Aroclor-1268	6.4E-09	NA	6.4E-09	NA	1.3E-08	Immune system	9.4E-04	NA	9.4E-04	1.9E-03
			delta-BHC	NC	NA	NC	NA		Liver / Kidney	1.1E-06	NA	7.9E-07	1.9E-06
			Dieldrin	5.9E-09	NA	4.2E-09	NA	1.0E-08	Liver	4.3E-05	NA	3.1E-05	7.3E-05
			Endosulfan II	NC	NA	NC	NA		Kidney	1.5E-06	NA	1.0E-06	2.5E-06
			Endosulfan sulfate	NC	NA	NC	NA		Kidney	1.1E-07	NA	7.6E-08	1.8E-07
			Endrin aldehyde	NC	NA	NC	NA		Nervous system	2.3E-06	NA	1.6E-06	3.9E-06
			Endrin Ketone	NC	NA	NC	NA		Nervous system	3.0E-06	NA	2.1E-06	5.2E-06
			gamma-Chlordane	2.4E-10	NA	6.9E-11	NA	3.1E-10	Liver	8.1E-06	NA	2.3E-06	1.0E-05
			Technical Chlordane	9.3E-09	NA	2.6E-09	NA	1.2E-08	Liver	3.1E-04	NA	8.8E-05	4.0E-04
			Antimony	NC	NA	NC	NA		Adverse clinical signs	2.8E-03	NA		2.8E-03
			Arsenic	3.5E-07	NA	7.6E-08	NA	4.3E-07	Skin	4.6E-03	NA	9.8E-04	5.6E-03
			Cadmium	NC	NA	NC	NA		Kidney	2.8E-04	NA	8.1E-05	3.7E-04
			Chromium	NC	NA	NC	NA		NOAEL	1.9E-02	NA		1.9E-02
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	1.8E-03	NA		1.8E-03
			Mercury	NC	NA	NC	NA		Immune system	7.7E-04	NA		7.7E-04
			Nickel	NC	NA	NC	NA		Developmental toxicity	3.2E-04	NA		3.2E-04
			Thallium	NC	NA	NC	NA		NOAEL	2.0E-02	NA		2.0E-02
			Vanadium	NC	NA	NC	NA		NOAEL	1.6E-03	NA		1.6E-03

TABLE 9.17.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.5E-05	NA	7.5E-06	NA	4.2E-05		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	6.8E-10	NA	1.5E-10	NA	8.3E-10		--	NA	--	
			CHEMICAL TOTAL	3.8E-05	--	9.8E-06	--	5E-05		8.4E-02	0.0E+00	3.3E-02	1E-01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						5E-05					1E-01
	EXPOSURE MEDIUM TOTAL							5E-05					1E-01
SEDIMENT TOTAL								5E-05					1E-01
SURFACE WATER	SURFACE WATER	ALLENDALE POND	Tetrachloroethene	1.0E-08	NA	1.2E-07	NA	1.3E-07	Liver	1.1E-05	NA	1.3E-04	1.4E-04
			bis(2-Ethylhexyl)phthalate	3.8E-10	NA	1.1E-08	NA	1.2E-08	Liver	7.9E-06	NA	2.4E-04	2.5E-04
			Aldrin	5.1E-09	NA	8.9E-09	NA	1.4E-08	Liver	5.8E-05	NA	1.0E-04	1.6E-04
			alpha-Chlordane	6.6E-12	NA	2.7E-10	NA	2.7E-10	Liver	2.2E-07	NA	8.9E-06	9.1E-06
			delta-BHC	NC	NA	NC	NA		Liver / Kidney	5.1E-06	NA	3.8E-05	4.3E-05
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	6.9E-08	NA	--	6.9E-08
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	1.5E-06	NA	2.0E-05	2.2E-05
			gamma-Chlordane	7.1E-12	NA	2.9E-10	NA	3.0E-10	Liver	2.4E-07	NA	9.7E-06	9.9E-06
			Arsenic	3.1E-07	NA	3.8E-08	NA	3.4E-07	Skin	4.0E-03	NA	4.9E-04	4.5E-03
			Barium	NC	NA	NC	NA		Cardiovascular system	1.0E-04	NA	1.8E-04	2.8E-04
			Chromium	NC	NA	NC	NA		NOAEL	1.4E-03	NA	1.4E-02	1.6E-02
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	2.8E-03	NA	8.6E-03	1.1E-02
			Mercury	NC	NA	NC	NA		Immune system	1.7E-06	NA	3.0E-06	4.7E-06
			Thallium	NC	NA	NC	NA		NOAEL	2.9E-02	NA	3.6E-03	3.2E-02
			Nitrate	NC	NA	NC	NA		Hematological system	7.6E-05	NA	--	7.6E-05
			Nitrite-N	NC	NA	NC	NA		Hematological system	2.2E-04	NA	--	2.2E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.6E-06	NA	0.0E+00	NA	1.6E-06		--	NA	--	
			CHEMICAL TOTAL	1.9E-06	--	1.8E-07	--	2E-06		3.7E-02	0.0E+00	2.8E-02	6E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-06					6E-02
	EXPOSURE MEDIUM TOTAL							2E-06					6E-02
SURFACE WATER TOTAL								2E-06					6E-02
BIOTA	COMBINED FISH DIET	ALLENDALE POND	Acenaphthylene	NC	NA	NA	NA		Liver	6.6E-06	NA	NA	6.6E-06
			Benzo(a)anthracene	3.5E-08	NA	NA	NA	3.5E-08	Kidney	9.2E-06	NA	NA	9.2E-06
			Benzo(a)pyrene	3.7E-07	NA	NA	NA	3.7E-07	Kidney	9.9E-06	NA	NA	9.9E-06
			Benzo(b)fluoranthene	4.0E-08	NA	NA	NA	4.0E-08	Kidney	1.1E-05	NA	NA	1.1E-05
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	4.3E-06	NA	NA	4.3E-06
			Dibenzo(a,h)anthracene	1.3E-07	NA	NA	NA	1.3E-07	Kidney	3.5E-06	NA	NA	3.5E-06
			Indeno(1,2,3-cd)pyrene	1.8E-08	NA	NA	NA	1.8E-08	Kidney	4.8E-06	NA	NA	4.8E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	6.4E-05	NA	NA	6.4E-05

TABLE 9.17.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			4,4'-DDD	1.0E-07	NA	NA	NA	1 0E-07	Liver	5.1E-03	NA	NA	5.1E-03
			4,4'-DDE	2.9E-07	NA	NA	NA	2 9E-07	Liver	9.9E-03	NA	NA	9 9E-03
			4,4'-DDT	9.1E-08	NA	NA	NA	9.1E-08	Liver	3.1E-03	NA	NA	3 1E-03
			alpha-Chlordane	2 5E-07	NA	NA	NA	2.5E-07	Liver	8 5E-03	NA	NA	8 5E-03
			Aroclor-1254	1.3E-04	NA	NA	NA	1 3E-04	Immune system	1.9E+01	NA	NA	1 9E+01
			Aroclor-1268	1 8E-06	NA	NA	NA	1 8E-06	Immune system	2.6E-01	NA	NA	2.6E-01
			beta-BHC	3.1E-08	NA	NA	NA	3.1E-08	Liver / Kidney	3 3E-04	NA	NA	3 3E-04
			Dieldrin	4.8E-06	NA	NA	NA	4 8E-06	Liver	3.5E-02	NA	NA	3 5E-02
			Endosulfan Sulfate	NC	NA	NA	NA		Kidney	3.3E-05	NA	NA	3 3E-05
			Endrin Aldehyde	NC	NA	NA	NA		Nervous system	3.3E-04	NA	NA	3 3E-04
			gamma-Chlordane	9.5E-08	NA	NA	NA	9 5E-08	Liver	3.2E-03	NA	NA	3.2E-03
			Heptachlor	7 6E-08	NA	NA	NA	7.6E-08	Liver	2.0E-04	NA	NA	2.0E-04
			Heptachlor Epoxide	3 4E-07	NA	NA	NA	3.4E-07	Liver	1.7E-02	NA	NA	1.7E-02
			Technical Chlordane	5.6E-06	NA	NA	NA	5 6E-06	Liver	1.9E-01	NA	NA	1.9E-01
			Cadmium	NC	NA	NA	NA		Kidney	1.3E-02	NA	NA	1.3E-02
			Chromium	NC	NA	NA	NA		NOAEL	6.8E-03	NA	NA	6 8E-03
			Lead	--	NA	NA	NA			--	NA	NA	
			Manganese	NC	NA	NA	NA		NOAEL	9.5E-03	NA	NA	9 5E-03
			Mercury	NC	NA	NA	NA		Immune system	9.5E-02	NA	NA	9 5E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	4.1E-01	NA	NA	4.1E-01
			Toxicity Equivalency (PCB Congeners) - Mam	1.6E-04	NA	NA	NA	1.6E-04		--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	1 5E-03	NA	NA	NA	1.5E-03		--	NA	NA	
			CHEMICAL TOTAL	1.8E-03	--	--	--	2E-03		2 0E+01	0 0E+00	--	2 0E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-03					2 0E+01
	EXPOSURE MEDIUM TOTAL							2E-03					2.0E+01
COMBINED FISH DIET TOTAL								2E-03					2.0E+01

RECEPTOR TOTAL	2E-03		2.0E+01
TOTAL RISK ACROSS ALL MEDIA	2E-03	TOTAL HAZARD ACROSS ALL MEDIA	2.0E+01

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

TOTAL ADVERSE CLINICAL SIGNS HI =	2.8E-03
TOTAL CARDIOVASCULAR SYSTEM HI =	2.8E-04
TOTAL DEVELOPMENTAL TOXICITY HI =	4.1E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	3.0E-04
TOTAL IMMUNE SYSTEM HI =	1.9E+01
TOTAL KIDNEY HI =	1.4E-02
TOTAL LIVER HI =	2.7E-01
	--
TOTAL NERVOUS SYSTEM HI =	3.6E-04
TOTAL NOAEL HI =	1.2E-01
	--
TOTAL SKIN HI =	1.0E-02
	--

Prepared by: KJA
Checked by: MJM

TABLE 9.18.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SOIL	SOIL	ALLENDALE POND	2,3,7,8-TCDD	9.9E-06	NA	8.3E-07	NA	1.1E-05		--	NA	--	
			CHEMICAL TOTAL	9.9E-06	--	8.3E-07	--	1E-05		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-05					0E+00
	EXPOSURE MEDIUM TOTAL							1E-05					0E+00
SOIL TOTAL								1E-05					0E+00
SEDIMENT	SEDIMENT	ALLENDALE POND	2-Methylnaphthalene	NC	NA	NC	NA		Lung	1.3E-05	NA	4.7E-06	1.8E-05
			Acenaphthylene	NC	NA	NC	NA		Liver	3.1E-05	NA	1.1E-05	4.2E-05
			Benzo(a)anthracene	4.0E-07	NA	1.5E-07	NA	5.5E-07	Kidney	2.2E-04	NA	7.8E-05	2.9E-04
			Benzo(a)pyrene	4.8E-06	NA	1.7E-06	NA	6.5E-06	Kidney	2.5E-04	NA	9.2E-05	3.5E-04
			Benzo(b)fluoranthene	5.2E-07	NA	1.9E-07	NA	7.1E-07	Kidney	2.8E-04	NA	1.0E-04	3.8E-04
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	1.3E-04	NA	4.6E-05	1.7E-04
			Benzo(k)fluoranthene	4.6E-08	NA	1.7E-08	NA	6.3E-08	Kidney	2.5E-04	NA	9.0E-05	3.4E-04
			bis(2-Ethylhexyl)phthalate	7.3E-09	NA	2.0E-09	NA	9.3E-09	Liver	3.0E-04	NA	8.5E-05	3.9E-04
			Dibenzo(a,h)anthracene	2.4E-06	NA	8.7E-07	NA	3.2E-06	Kidney	1.3E-04	NA	4.6E-05	1.7E-04
			Indeno(1,2,3-cd)pyrene	3.8E-07	NA	1.4E-07	NA	5.2E-07	Kidney	2.0E-04	NA	7.4E-05	2.8E-04
			Pentachlorophenol	1.3E-07	NA	8.9E-08	NA	2.2E-07	Liver / Kidney	4.1E-04	NA	2.9E-04	7.0E-04
			Phenanthrene	NC	NA	NC	NA		Kidney	3.0E-04	NA	1.1E-04	4.1E-04
			alpha-Chlordane	6.4E-10	NA	7.2E-11	NA	7.2E-10	Liver	4.3E-05	NA	4.8E-06	4.8E-05
			Aroclor-1254	7.8E-07	NA	3.1E-07	NA	1.1E-06	Immune system	2.3E-01	NA	8.9E-02	3.2E-01
			Aroclor-1260	6.5E-08	NA	2.6E-08	NA	9.1E-08	Immune system	1.9E-02	NA	7.4E-03	2.6E-02
			Aroclor-1268	2.6E-08	NA	1.0E-08	NA	3.6E-08	Immune system	7.5E-03	NA	2.9E-03	1.0E-02
			delta-BHC	NC	NA	NC	NA		Liver / Kidney	8.9E-06	NA	2.5E-06	1.1E-05
			Dieldrin	2.3E-08	NA	6.6E-09	NA	3.0E-08	Liver	3.4E-04	NA	9.6E-05	4.4E-04
			Endosulfan II	NC	NA	NC	NA		Kidney	1.2E-05	NA	3.3E-06	1.5E-05
			Endosulfan sulfate	NC	NA	NC	NA		Kidney	8.5E-07	NA	2.4E-07	1.1E-06
			Endrin aldehyde	NC	NA	NC	NA		Nervous system	1.8E-05	NA	5.1E-06	2.4E-05
			Endrin Ketone	NC	NA	NC	NA		Nervous system	2.4E-05	NA	6.7E-06	3.1E-05
			gamma-Chlordane	9.7E-10	NA	1.1E-10	NA	1.1E-09	Liver	6.5E-05	NA	7.2E-06	7.2E-05
			Technical Chlordane	3.7E-08	NA	4.1E-09	NA	4.1E-08	Liver	2.5E-03	NA	2.8E-04	2.7E-03
			Antimony	NC	NA	NC	NA		Adverse clinical signs	2.3E-02	NA		2.3E-02
			Arsenic	1.4E-06	NA	1.2E-07	NA	1.5E-06	Skin	3.7E-02	NA	3.1E-03	4.0E-02
			Cadmium	NC	NA	NC	NA		Kidney	2.3E-03	NA	2.6E-04	2.5E-03
			Chromium	NC	NA	NC	NA		NOAEL	1.5E-01	NA		1.5E-01
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	1.4E-02	NA		1.4E-02
			Mercury	NC	NA	NC	NA		Immune system	6.1E-03	NA		6.1E-03
			Nickel	NC	NA	NC	NA		Developmental toxicity	2.5E-03	NA		2.5E-03
			Thallium	NC	NA	NC	NA		NOAEL	1.6E-01	NA		1.6E-01
			Vanadium	NC	NA	NC	NA		NOAEL	1.2E-02	NA		1.2E-02

TABLE 9.18.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Toxicity Equivalency (Dioxins/Furans) - Mam	1 4E-04	NA	1 2E-05	NA	1 5E-04		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	2 7E-09	NA	2 3E-10	NA	3 0E-09		--	NA	--	
			CHEMICAL TOTAL	1.5E-04	--	1.5E-05	--	2E-04		6 7E-01	0 0E+00	1 0E-01	8E-01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-04					8E-01
	EXPOSURE MEDIUM TOTAL							2E-04					8E-01
SEDIMENT TOTAL								2E-04					8E-01
SURFACE WATER	SURFACE WATER	ALLENDALE POND	Tetrachloroethene	1.5E-08	NA	7.6E-08	NA	9 2E-08	Liver	3 3E-05	NA	1 6E-04	2 0E-04
			bis(2-Ethylhexyl)phthalate	5 7E-10	NA	7 4E-09	NA	8 0E-09	Liver	2.4E-05	NA	3.1E-04	3.3E-04
			Aldrin	7.6E-09	NA	5 7E-09	NA	1.3E-08	Liver	1.7E-04	NA	1 3E-04	3.0E-04
			alpha-Chlordane	9 8E-12	NA	1 7E-10	NA	1 8E-10	Liver	6.6E-07	NA	1.1E-05	1.2E-05
			delta-BHC	NC	NA	NC	NA		Liver / Kidney	1.5E-05	NA	5.0E-05	6 5E-05
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	2 1E-07	NA	--	2.1E-07
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	4.4E-06	NA	2.6E-05	3 1E-05
			gamma-Chlordane	1.1E-11	NA	1.9E-10	NA	2 0E-10	Liver	7.1E-07	NA	1.2E-05	1.3E-05
			Arsenic	4.6E-07	NA	2.5E-08	NA	4 8E-07	Skin	1.2E-02	NA	6.4E-04	1.3E-02
			Barium	NC	NA	NC	NA		Cardiovascular system	3.1E-04	NA	2.3E-04	5.4E-04
			Chromium	NC	NA	NC	NA		NOAEL	4.3E-03	NA	1.8E-02	2.3E-02
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	8.3E-03	NA	1.1E-02	1 9E-02
			Mercury	NC	NA	NC	NA		Immune system	5.0E-06	NA	3.9E-06	8 9E-06
			Thallium	NC	NA	NC	NA		NOAEL	8.6E-02	NA	4.6E-03	9.1E-02
			Nitrate	NC	NA	NC	NA		Hematological system	2.3E-04	NA	--	2.3E-04
			Nitrite-N	NC	NA	NC	NA		Hematological system	6.6E-04	NA	--	6.6E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	2.4E-06	NA	0.0E+00	NA	2.4E-06		--	NA	--	
			CHEMICAL TOTAL	2.8E-06	--	1.1E-07	--	3E-06		1.1E-01	0.0E+00	3.6E-02	1E-01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-06					1E-01
	EXPOSURE MEDIUM TOTAL							3E-06					1E-01
SURFACE WATER TOTAL								3E-06					1E-01
BIOTA	COMBINED FISH DIET	ALLENDALE POND	Acenaphthylene	NC	NA	NA	NA		Liver	1.0E-05	NA	NA	1.0E-05
			Benzo(a)anthracene	2.6E-08	NA	NA	NA	2.6E-08	Kidney	1 4E-05	NA	NA	1 4E-05
			Benzo(a)pyrene	2.8E-07	NA	NA	NA	2 8E-07	Kidney	1.5E-05	NA	NA	1 5E-05
			Benzo(b)fluoranthene	3.0E-08	NA	NA	NA	3 0E-08	Kidney	1.6E-05	NA	NA	1 6E-05
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	6.5E-06	NA	NA	6 5E-06
			Dibenzo(a,h)anthracene	1.0E-07	NA	NA	NA	1.0E-07	Kidney	5.3E-06	NA	NA	5.3E-06
			Indeno(1,2,3-cd)pyrene	1.4E-08	NA	NA	NA	1.4E-08	Kidney	7.3E-06	NA	NA	7 3E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	9.8E-05	NA	NA	9.8E-05

TABLE 9.18.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			4,4'-DDD	7.9E-08	NA	NA	NA	7.9E-08	Liver	7.7E-03	NA	NA	7.7E-03
			4,4'-DDE	2.2E-07	NA	NA	NA	2.2E-07	Liver	1.5E-02	NA	NA	1.5E-02
			4,4'-DDT	6.9E-08	NA	NA	NA	6.9E-08	Liver	4.7E-03	NA	NA	4.7E-03
			alpha-Chlordane	1.9E-07	NA	NA	NA	1.9E-07	Liver	1.3E-02	NA	NA	1.3E-02
			Aroclor-1254	9.7E-05	NA	NA	NA	9.7E-05	Immune system	2.8E+01	NA	NA	2.8E+01
			Aroclor-1268	1.4E-06	NA	NA	NA	1.4E-06	Immune system	4.0E-01	NA	NA	4.0E-01
			beta-BHC	2.3E-08	NA	NA	NA	2.3E-08	Liver / Kidney	5.0E-04	NA	NA	5.0E-04
			Dieldrin	3.7E-06	NA	NA	NA	3.7E-06	Liver	5.3E-02	NA	NA	5.3E-02
			Endosulfan Sulfate	NC	NA	NA	NA		Kidney	5.0E-05	NA	NA	5.0E-05
			Endrin Aldehyde	NC	NA	NA	NA		Nervous system	5.0E-04	NA	NA	5.0E-04
			gamma-Chlordane	7.2E-08	NA	NA	NA	7.2E-08	Liver	4.8E-03	NA	NA	4.8E-03
			Heptachlor	5.8E-08	NA	NA	NA	5.8E-08	Liver	3.0E-04	NA	NA	3.0E-04
			Heptachlor Epoxide	2.6E-07	NA	NA	NA	2.6E-07	Liver	2.5E-02	NA	NA	2.5E-02
			Technical Chlordane	4.2E-06	NA	NA	NA	4.2E-06	Liver	2.8E-01	NA	NA	2.8E-01
			Cadmium	NC	NA	NA	NA		Kidney	1.9E-02	NA	NA	1.9E-02
			Chromium	NC	NA	NA	NA		NOAEL	1.0E-02	NA	NA	1.0E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Manganese	NC	NA	NA	NA		NOAEL	1.4E-02	NA	NA	1.4E-02
			Mercury	NC	NA	NA	NA		Immune system	1.4E-01	NA	NA	1.4E-01
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	6.2E-01	NA	NA	6.2E-01
			Toxicity Equivalency (PCB Congeners) - Mam	1.2E-04	NA	NA	NA	1.2E-04		--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.2E-03	NA	NA	NA	1.2E-03		--	NA	NA	
			CHEMICAL TOTAL	1.4E-03	--	--	--	1E-03		3.0E+01	0.0E+00	--	3.0E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-03					3.0E+01
	EXPOSURE MEDIUM TOTAL							1E-03					3.0E+01
COMBINED FISH DIET TOTAL								1E-03					3.0E+01
RECEPTOR TOTAL								2E-03					3.1E+01
							TOTAL RISK ACROSS ALL MEDIA	2E-03	TOTAL HAZARD ACROSS ALL MEDIA				3.1E+01

NOTES.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

TOTAL ADVERSE CLINICAL SIGNS HI =	2.3E-02
TOTAL CARDIOVASCULAR SYSTEM HI =	5.4E-04
TOTAL DEVELOPMENTAL TOXICITY HI =	6.3E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	8.9E-04
TOTAL IMMUNE SYSTEM HI =	2.9E+01
TOTAL KIDNEY HI =	2.6E-02
TOTAL LIVER HI =	4.1E-01
	--
TOTAL NERVOUS SYSTEM HI =	5.9E-04
TOTAL NOAEL HI =	5.0E-01
	--
TOTAL SKIN HI =	5.2E-02
	--

Prepared by: KJA
Checked by: MJM

TABLE 9.19.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	LYMAN MILL POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	1.3E-07	NA	1.1E-07	2.4E-07
			4-Chloro-3-methylphenol	NC	NA	NC	NA		Reproductive system	6.6E-06	NA	4.5E-06	1.1E-05
			4-Nitrophenol	NC	NA	NC	NA			--	NA	--	
			Acenaphthylene	NC	NA	NC	NA		Liver	1.8E-07	NA	1.6E-07	3.4E-07
			Benzo(a)anthracene	8.9E-09	NA	7.9E-09	NA	1.7E-08	Kidney	2.4E-06	NA	2.1E-06	4.5E-06
			Benzo(a)pyrene	9.2E-08	NA	8.2E-08	NA	1.7E-07	Kidney	2.5E-06	NA	2.2E-06	4.6E-06
			Benzo(b)fluoranthene	1.4E-08	NA	1.3E-08	NA	2.7E-08	Kidney	3.8E-06	NA	3.4E-06	7.2E-06
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	2.5E-06	NA	2.3E-06	4.8E-06
			Benzo(k)fluoranthene	6.7E-10	NA	5.9E-10	NA	1.3E-09	Kidney	1.8E-06	NA	1.6E-06	3.4E-06
			bis(2-Ethylhexyl)phthalate	3.2E-10	NA	2.2E-10	NA	5.3E-10	Liver	6.6E-06	NA	4.5E-06	1.1E-05
			Dibenzo(a,h)anthracene	3.4E-08	NA	3.0E-08	NA	6.4E-08	Kidney	9.1E-07	NA	8.0E-07	1.7E-06
			Indeno(1,2,3-cd)pyrene	8.6E-09	NA	7.6E-09	NA	1.6E-08	Kidney	2.3E-06	NA	2.0E-06	4.3E-06
			N-Nitroso-di-n-propylamine	4.0E-08	NA	2.7E-08	NA	6.7E-08		--	NA	--	
			Pentachlorophenol	7.3E-10	NA	1.2E-09	NA	2.0E-09	Liver / Kidney	1.2E-06	NA	2.0E-06	3.2E-06
			Phenanthrene	NC	NA	NC	NA		Kidney	2.4E-06	NA	2.1E-06	4.5E-06
			alpha-Chlordane	4.9E-11	NA	1.3E-11	NA	6.2E-11	Liver	1.6E-06	NA	4.4E-07	2.1E-06
			Aroclor-1254	4.3E-09	NA	4.1E-09	NA	8.3E-09	Immune system	6.2E-04	NA	5.9E-04	1.2E-03
			Aroclor-1260	2.4E-10	NA	2.2E-10	NA	4.6E-10	Immune system	3.4E-05	NA	3.3E-05	6.7E-05
			Aroclor-1268	2.7E-09	NA	2.6E-09	NA	5.3E-09	Immune system	4.0E-04	NA	3.8E-04	7.8E-04
			Dieldrin	3.1E-10	NA	2.1E-10	NA	5.2E-10	Liver	2.2E-06	NA	1.5E-06	3.8E-06
			Endosulfan II	NC	NA	NC	NA		Kidney	2.1E-08	NA	1.4E-08	3.6E-08
			Endosulfan sulfate	NC	NA	NC	NA		Kidney	1.2E-08	NA	8.4E-09	2.1E-08
			gamma-Chlordane	2.3E-11	NA	6.2E-12	NA	2.9E-11	Liver	7.6E-07	NA	2.1E-07	9.7E-07
			Technical Chlordane	3.4E-09	NA	9.2E-10	NA	4.3E-09	Liver	1.1E-04	NA	3.1E-05	1.4E-04
			Antimony	NC	NA	NC	NA		Adverse clinical signs	2.0E-04	NA		2.0E-04
			Arsenic	4.2E-08	NA	8.5E-09	NA	5.0E-08	Skin	5.4E-04	NA	1.1E-04	6.5E-04
			Cadmium	NC	NA	NC	NA		Kidney	5.3E-05	NA	1.5E-05	6.8E-05
			Chromium	NC	NA	NC	NA		NOAEL	1.7E-03	NA		1.7E-03
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	3.0E-04	NA		3.0E-04
			Mercury	NC	NA	NC	NA		Immune system	5.3E-05	NA		5.3E-05
			Nickel	NC	NA	NC	NA		Developmental toxicity	8.8E-05	NA		8.8E-05
			Thallium	NC	NA	NC	NA		NOAEL	1.8E-04	NA		1.8E-04
			Vanadium	NC	NA	NC	NA		NOAEL	1.5E-04	NA		1.5E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	5.3E-06	NA	1.1E-06	NA	6.3E-06		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	4.2E-08	NA	8.7E-09	NA	5.1E-08		--	NA	--	
			CHEMICAL TOTAL	5.5E-06	--	1.3E-06	--	7E-06		4.5E-03	0.0E+00	1.2E-03	6E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						7E-06					6E-03
	EXPOSURE MEDIUM TOTAL							7E-06					6E-03
SEDIMENT TOTAL								7E-06					6E-03
SURFACE WATER	SURFACE WATER	LYMAN MILL POND	Acenaphthylene	NC	NA	NC	NA		Liver	5.6E-11	NA	--	5.6E-11
			bis(2-Ethylhexyl)phthalate	1.0E-10	NA	4.4E-08	NA	4.4E-08	Liver	2.2E-06	NA	9.1E-04	9.1E-04
			Aldrin	1.7E-10	NA	4.2E-09	NA	4.3E-09	Liver	2.0E-06	NA	4.8E-05	5.0E-05
			alpha-Chlordane	2.9E-12	NA	1.6E-09	NA	1.7E-09	Liver	9.7E-08	NA	5.5E-05	5.5E-05
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	1.4E-09	NA	--	1.4E-09
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	4.2E-08	NA	8.2E-06	8.2E-06
			gamma-Chlordane	3.2E-12	NA	1.8E-09	NA	1.8E-09	Liver	1.1E-07	NA	6.1E-05	6.1E-05
			Arsenic	3.0E-09	NA	5.2E-09	NA	8.2E-09	Skin	3.9E-05	NA	6.8E-05	1.1E-04
			Barium	NC	NA	NC	NA		Cardiovascular system	7.6E-07	NA	1.9E-05	2.0E-05

TABLE 9.19.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Chromium	NC	NA	NC	NA		NOAEL	2.0E-06	NA	2.7E-04	2.7E-04
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	1.4E-05	NA	6.0E-04	6.1E-04
			Mercury	NC	NA	NC	NA		Immune system	3.3E-08	NA	8.3E-07	8.6E-07
			Thallium	NC	NA	NC	NA		NOAEL	7.0E-05	NA	1.2E-04	1.9E-04
			Nitrate	NC	NA	NC	NA		Hematological system	1.2E-06	NA	--	1.2E-06
			Nitrite-N	NC	NA	NC	NA		Hematological system	2.2E-06	NA	--	2.2E-06
			Toxicity Equivalency (Dioxins/Furans) - Mam	5.6E-08	NA	0.0E+00	NA	5.6E-08		--	NA	--	
			CHEMICAL TOTAL	6.0E-08	--	5.7E-08	--	1E-07		1.3E-04	0.0E+00	2.2E-03	2E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-07					2E-03
	EXPOSURE MEDIUM TOTAL							1E-07					2E-03
SURFACE WATER TOTAL								1E-07					2E-03
BIOTA	COMBINED FISH DIET	LYMAN MILL POND	Acenaphthylene	NC	NA	NA	NA		Liver	6.4E-06	NA	NA	6.4E-06
			Benzo(a)anthracene	1.1E-07	NA	NA	NA	1.1E-07	Kidney	2.8E-05	NA	NA	2.8E-05
			Benzo(a)pyrene	1.3E-06	NA	NA	NA	1.3E-06	Kidney	3.5E-05	NA	NA	3.5E-05
			Benzo(b)fluoranthene	7.2E-08	NA	NA	NA	7.2E-08	Kidney	1.9E-05	NA	NA	1.9E-05
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	2.7E-05	NA	NA	2.7E-05
			Dibenzo(a,h)anthracene	2.9E-07	NA	NA	NA	2.9E-07	Kidney	7.7E-06	NA	NA	7.7E-06
			Indeno(1,2,3-cd)pyrene	1.2E-07	NA	NA	NA	1.2E-07	Kidney	3.2E-05	NA	NA	3.2E-05
			Phenanthrene	NC	NA	NA	NA		Kidney	8.9E-05	NA	NA	8.9E-05
			4,4'-DDD	2.1E-07	NA	NA	NA	2.1E-07	Liver	1.0E-02	NA	NA	1.0E-02
			4,4'-DDE	1.0E-06	NA	NA	NA	1.0E-06	Liver	3.4E-02	NA	NA	3.4E-02
			4,4'-DDT	3.4E-08	NA	NA	NA	3.4E-08	Liver	1.2E-03	NA	NA	1.2E-03
			alpha-Chlordane	2.3E-07	NA	NA	NA	2.3E-07	Liver	7.7E-03	NA	NA	7.7E-03
			Aroclor-1254	1.4E-04	NA	NA	NA	1.4E-04	Immune system	2.0E+01	NA	NA	2.0E+01
			Aroclor-1268	1.4E-06	NA	NA	NA	1.4E-06	Immune system	2.1E-01	NA	NA	2.1E-01
			beta-BHC	4.7E-08	NA	NA	NA	4.7E-08	Liver / Kidney	5.1E-04	NA	NA	5.1E-04
			Dieldrin	3.0E-06	NA	NA	NA	3.0E-06	Liver	2.2E-02	NA	NA	2.2E-02
			gamma-Chlordane	1.5E-07	NA	NA	NA	1.5E-07	Liver	5.0E-03	NA	NA	5.0E-03
			Heptachlor Epoxide	4.2E-07	NA	NA	NA	4.2E-07	Liver	2.1E-02	NA	NA	2.1E-02
			Technical Chlordane	1.2E-05	NA	NA	NA	1.2E-05	Liver	3.9E-01	NA	NA	3.9E-01
			Arsenic	1.2E-06	NA	NA	NA	1.2E-06	Skin	1.5E-02	NA	NA	1.5E-02
			Cadmium	NC	NA	NA	NA		Kidney	3.3E-03	NA	NA	3.3E-03
			Chromium	NC	NA	NA	NA		NOAEL	1.3E-02	NA	NA	1.3E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Manganese	NC	NA	NA	NA		NOAEL	5.9E-03	NA	NA	5.9E-03
			Mercury	NC	NA	NA	NA		Immune system	9.0E-02	NA	NA	9.0E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	2.4E-01	NA	NA	2.4E-01

TABLE 9.19.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Toxicity Equivalency (PCB Congeners) - Mam	2.0E-04	NA	NA	NA	2.0E-04		--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.8E-03	NA	NA	NA	1.8E-03		--	NA	NA	
			CHEMICAL TOTAL	2.2E-03	--	--	--	2E-03		2.1E+01	0.0E+00	--	2.1E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-03					2.1E+01
	EXPOSURE MEDIUM TOTAL							2E-03					2.1E+01
COMBINED FISH DIET TOTAL								2E-03					2.1E+01
RECEPTOR TOTAL								2E-03					2.2E+01
							TOTAL RISK ACROSS ALL MEDIA	2E-03	TOTAL HAZARD ACROSS ALL MEDIA				2.2E+01

NOTES
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

TOTAL ADVERSE CLINICAL SIGNS HI =	2.0E-04
TOTAL CARDIOVASCULAR SYSTEM HI =	2.0E-05
TOTAL DEVELOPMENTAL TOXICITY HI =	2.4E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	3.4E-06
TOTAL IMMUNE SYSTEM HI =	2.1E+01
TOTAL KIDNEY HI =	4.1E-03
TOTAL LIVER HI =	4.9E-01
	--
TOTAL NERVOUS SYSTEM HI =	8.2E-06
TOTAL NOAEL HI =	2.2E-02
TOTAL REPRODUCTIVE SYSTEM HI =	1.1E-05
TOTAL SKIN HI =	1.6E-02
	--

Prepared by: KJA
Checked by: MJM

TABLE 9.20.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	LYMAN MILL POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	2.0E-07	NA	3.7E-07	5 7E-07
			4-Chloro-3-methylphenol	NC	NA	NC	NA		Reproductive system	1.0E-05	NA	1.5E-05	2.5E-05
			4-Nitrophenol	NC	NA	NC	NA			--	NA	--	
			Acenaphthylene	NC	NA	NC	NA		Liver	2.8E-07	NA	5.3E-07	8.1E-07
			Benzo(a)anthracene	1.4E-08	NA	2.6E-08	NA	4.0E-08	Kidney	3.7E-06	NA	6.9E-06	1.1E-05
			Benzo(a)pyrene	1.4E-07	NA	2.7E-07	NA	4.1E-07	Kidney	3.8E-06	NA	7 1E-06	1 1E-05
			Benzo(b)fluoranthene	2.2E-08	NA	4.1E-08	NA	6.4E-08	Kidney	5.9E-06	NA	1 1E-05	1 7E-05
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	4.0E-06	NA	7 4E-06	1.1E-05
			Benzo(k)fluoranthene	1.0E-09	NA	1.9E-09	NA	3.0E-09	Kidney	2.8E-06	NA	5 1E-06	7 9E-06
			bis(2-Ethylhexyl)phthalate	4.9E-10	NA	7.1E-10	NA	1.2E-09	Liver	1.0E-05	NA	1 5E-05	2 5E-05
			Dibenzo(a,h)anthracene	5.3E-08	NA	9.8E-08	NA	1.5E-07	Kidney	1.4E-06	NA	2.6E-06	4.0E-06
			Indeno(1,2,3-cd)pyrene	1.3E-08	NA	2.5E-08	NA	3.8E-08	Kidney	3.6E-06	NA	6.6E-06	1.0E-05
			N-Nitroso-di-n-propylamine	6 2E-08	NA	8.8E-08	NA	1.5E-07		--	NA	--	
			Pentachlorophenol	1.1E-09	NA	4.1E-09	NA	5.2E-09	Liver / Kidney	1.8E-06	NA	6 6E-06	8.4E-06
			Phenanthrene	NC	NA	NC	NA		Kidney	3.7E-06	NA	6 9E-06	1 1E-05
			alpha-Chlordane	7.6E-11	NA	4.3E-11	NA	1.2E-10	Liver	2.5E-06	NA	1 4E-06	4 0E-06
			Aroclor-1254	6 6E-09	NA	1.3E-08	NA	2.0E-08	Immune system	9.7E-04	NA	1.9E-03	2 9E-03
			Aroclor-1260	3.7E-10	NA	7.3E-10	NA	1.1E-09	Immune system	5.3E-05	NA	1.1E-04	1.6E-04
			Aroclor-1268	4.3E-09	NA	8.5E-09	NA	1 3E-08	Immune system	6.2E-04	NA	1 2E-03	1 9E-03
			Dieldrin	4.8E-10	NA	6.8E-10	NA	1 2E-09	Liver	3.5E-06	NA	5.0E-06	8.5E-06
			Endosulfan II	NC	NA	NC	NA		Kidney	3.3E-08	NA	4.7E-08	8.0E-08
			Endosulfan sulfate	NC	NA	NC	NA		Kidney	1.9E-08	NA	2.7E-08	4.6E-08
			gamma-Chlordane	3 6E-11	NA	2.0E-11	NA	5.6E-11	Liver	1.2E-06	NA	6.8E-07	1 9E-06
			Technical Chlordane	5.3E-09	NA	3.0E-09	NA	8 3E-09	Liver	1.8E-04	NA	1.0E-04	2.8E-04
			Antimony	NC	NA	NC	NA		Adverse clinical signs	3 1E-04	NA		3.1E-04
			Arsenic	6 5E-08	NA	2.8E-08	NA	9 3E-08	Skin	8 4E-04	NA	3.6E-04	1.2E-03
			Cadmium	NC	NA	NC	NA		Kidney	8.3E-05	NA	4.8E-05	1 3E-04
			Chromium	NC	NA	NC	NA		NOAEL	2.6E-03	NA		2.6E-03
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	4 7E-04	NA		4.7E-04
			Mercury	NC	NA	NC	NA		Immune system	8.2E-05	NA		8.2E-05
			Nickel	NC	NA	NC	NA		Developmental toxicity	1 4E-04	NA		1.4E-04
			Thallium	NC	NA	NC	NA		NOAEL	2.9E-04	NA		2 9E-04
			Vanadium	NC	NA	NC	NA		NOAEL	2.4E-04	NA		2 4E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	8 2E-06	NA	3 5E-06	NA	1.2E-05		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Man	6 6E-08	NA	2.8E-08	NA	9.4E-08		--	NA	--	
			CHEMICAL TOTAL	8.6E-06	--	4 1E-06	--	1E-05		7.0E-03	0.0E+00	3.9E-03	1E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-05					1E-02
	EXPOSURE MEDIUM TOTAL							1E-05					1E-02
SEDIMENT TOTAL								1E-05					1E-02
SURFACE WATER	SURFACE WATER	LYMAN MILL POND	Acenaphthylene	NC	NA	NC	NA		Liver	8.7E-11	NA	--	8.7E-11
			bis(2-Ethylhexyl)phthalate	1 6E-10	NA	4 9E-08	NA	4.9E-08	Liver	3.4E-06	NA	1 0E-03	1 0E-03
			Aldrin	2.7E-10	NA	4.7E-09	NA	4.9E-09	Liver	3.0E-06	NA	5.3E-05	5 6E-05
			alpha-Chlordane	4.5E-12	NA	1.8E-09	NA	1.9E-09	Liver	1.5E-07	NA	6.2E-05	6 2E-05
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	2.1E-09	NA	--	2.1E-09
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	6 6E-08	NA	9.1E-06	9 2E-06
			gamma-Chlordane	5.0E-12	NA	2.0E-09	NA	2.0E-09	Liver	1 7E-07	NA	6.8E-05	6.8E-05

TABLE 9.20.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Arsenic	4.7E-09	NA	5.9E-09	NA	1.1E-08	Skin	6.1E-05	NA	7.6E-05	1.4E-04
			Barium	NC	NA	NC	NA		Cardiovascular system	1.2E-06	NA	2.1E-05	2.2E-05
			Chromium	NC	NA	NC	NA		NOAEL	3.0E-06	NA	3.0E-04	3.1E-04
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	2.1E-05	NA	6.7E-04	6.9E-04
			Mercury	NC	NA	NC	NA		Immune system	5.2E-08	NA	9.3E-07	9.8E-07
			Thallium	NC	NA	NC	NA		NOAEL	1.1E-04	NA	1.4E-04	2.5E-04
			Nitrate	NC	NA	NC	NA		Hematological system	1.9E-06	NA	--	1.9E-06
			Nitrite-N	NC	NA	NC	NA		Hematological system	3.4E-06	NA	--	3.4E-06
			Toxicity Equivalency (Dioxins/Furans) - Mam	8.8E-08	NA	0.0E+00	NA	8.8E-08		--	NA	--	
			CHEMICAL TOTAL	9.3E-08	--	6.3E-08	--	2E-07		2.1E-04	0.0E+00	2.4E-03	3E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-07					3E-03
	EXPOSURE MEDIUM TOTAL							2E-07					3E-03
SURFACE WATER TOTAL								2E-07					3E-03
BIOTA	COMBINED FISH DIET	LYMAN MILL POND	Acenaphthylene	NC	NA	NA	NA		Liver	6.6E-06	NA	NA	6.6E-06
			Benzo(a)anthracene	1.1E-07	NA	NA	NA	1.1E-07	Kidney	2.9E-05	NA	NA	2.9E-05
			Benzo(a)pyrene	1.4E-06	NA	NA	NA	1.4E-06	Kidney	3.6E-05	NA	NA	3.6E-05
			Benzo(b)fluoranthene	7.4E-08	NA	NA	NA	7.4E-08	Kidney	2.0E-05	NA	NA	2.0E-05
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	2.8E-05	NA	NA	2.8E-05
			Dibenzo(a,h)anthracene	3.0E-07	NA	NA	NA	3.0E-07	Kidney	7.9E-06	NA	NA	7.9E-06
			Indeno(1,2,3-cd)pyrene	1.2E-07	NA	NA	NA	1.2E-07	Kidney	3.3E-05	NA	NA	3.3E-05
			Phenanthrene	NC	NA	NA	NA		Kidney	9.2E-05	NA	NA	9.2E-05
			4,4'-DDD	2.2E-07	NA	NA	NA	2.2E-07	Liver	1.1E-02	NA	NA	1.1E-02
			4,4'-DDE	1.0E-06	NA	NA	NA	1.0E-06	Liver	3.5E-02	NA	NA	3.5E-02
			4,4'-DDT	3.5E-08	NA	NA	NA	3.5E-08	Liver	1.2E-03	NA	NA	1.2E-03
			alpha-Chlordane	2.4E-07	NA	NA	NA	2.4E-07	Liver	7.9E-03	NA	NA	7.9E-03
			Aroclor-1254	1.4E-04	NA	NA	NA	1.4E-04	Immune system	2.1E+01	NA	NA	2.1E+01
			Aroclor-1268	1.5E-06	NA	NA	NA	1.5E-06	Immune system	2.1E-01	NA	NA	2.1E-01
			beta-BHC	4.9E-08	NA	NA	NA	4.9E-08	Liver / Kidney	5.3E-04	NA	NA	5.3E-04
			Dieldrin	3.1E-06	NA	NA	NA	3.1E-06	Liver	2.3E-02	NA	NA	2.3E-02
			gamma-Chlordane	1.5E-07	NA	NA	NA	1.5E-07	Liver	5.2E-03	NA	NA	5.2E-03
			Heptachlor Epoxide	4.3E-07	NA	NA	NA	4.3E-07	Liver	2.1E-02	NA	NA	2.1E-02
			Technical Chlordane	1.2E-05	NA	NA	NA	1.2E-05	Liver	4.0E-01	NA	NA	4.0E-01
			Arsenic	1.2E-06	NA	NA	NA	1.2E-06	Skin	1.6E-02	NA	NA	1.6E-02
			Cadmium	NC	NA	NA	NA		Kidney	3.4E-03	NA	NA	3.4E-03
			Chromium	NC	NA	NA	NA		NOAEL	1.3E-02	NA	NA	1.3E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Manganese	NC	NA	NA	NA		NOAEL	6.1E-03	NA	NA	6.1E-03
			Mercury	NC	NA	NA	NA		Immune system	9.3E-02	NA	NA	9.3E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	2.5E-01	NA	NA	2.5E-01

TABLE 9.20.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Toxicity Equivalency (PCB Congeners) - Mam	2.1E-04	NA	NA	NA	2.1E-04		--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.9E-03	NA	NA	NA	1.9E-03		--	NA	NA	
			CHEMICAL TOTAL	2.3E-03	--	--	--	2E-03		2.2E+01	0.0E+00	--	2.2E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-03					2.2E+01
	EXPOSURE MEDIUM TOTAL							2E-03					2.2E+01
COMBINED FISH DIET TOTAL								2E-03					2.2E+01

RECEPTOR TOTAL	2E-03		2.2E+01
TOTAL RISK ACROSS ALL MEDIA	2E-03	TOTAL HAZARD ACROSS ALL MEDIA	2.2E+01

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

TOTAL ADVERSE CLINICAL SIGNS HI =	3.1E-04
TOTAL CARDIOVASCULAR SYSTEM HI =	2.3E-05
TOTAL DEVELOPMENTAL TOXICITY HI =	2.5E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	5.3E-06
TOTAL IMMUNE SYSTEM HI =	2.1E+01
TOTAL KIDNEY HI =	4.4E-03
TOTAL LIVER HI =	5.1E-01
	--
TOTAL NERVOUS SYSTEM HI =	9.2E-06
TOTAL NOAEL HI =	2.4E-02
TOTAL REPRODUCTIVE SYSTEM HI =	2.5E-05
TOTAL SKIN HI =	1.7E-02
	--

Prepared by: KJA
Checked by: MJM

TABLE 9.22.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	LYMAN MILL POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	7.6E-07	NA	3.4E-07	1.1E-06
			4-Chloro-3-methylphenol	NC	NA	NC	NA		Reproductive system	4.0E-05	NA	1.4E-05	5.3E-05
			4-Nitrophenol	NC	NA	NC	NA			--	NA	--	
			Acenaphthylene	NC	NA	NC	NA		Liver	1.1E-06	NA	4.8E-07	1.6E-06
			Benzo(a)anthracene	5.3E-08	NA	2.4E-08	NA	7.7E-08	Kidney	1.4E-05	NA	6.3E-06	2.1E-05
			Benzo(a)pyrene	5.5E-07	NA	2.4E-07	NA	8.0E-07	Kidney	1.5E-05	NA	6.5E-06	2.1E-05
			Benzo(b)fluoranthene	8.6E-08	NA	3.8E-08	NA	1.2E-07	Kidney	2.3E-05	NA	1.0E-05	3.3E-05
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	1.5E-05	NA	6.8E-06	2.2E-05
			Benzo(k)fluoranthene	4.0E-09	NA	1.8E-09	NA	5.8E-09	Kidney	1.1E-05	NA	4.7E-06	1.5E-05
			bis(2-Ethylhexyl)phthalate	1.9E-09	NA	6.5E-10	NA	2.6E-09	Liver	4.0E-05	NA	1.4E-05	5.3E-05
			Dibenzo(a,h)anthracene	2.0E-07	NA	9.0E-08	NA	2.9E-07	Kidney	5.4E-06	NA	2.4E-06	7.8E-06
			Indeno(1,2,3-cd)pyrene	5.2E-08	NA	2.3E-08	NA	7.4E-08	Kidney	1.4E-05	NA	6.1E-06	2.0E-05
			N-Nitroso-di-n-propylamine	2.4E-07	NA	8.1E-08	NA	3.2E-07		--	NA	--	
			Pentachlorophenol	4.4E-09	NA	3.7E-09	NA	8.1E-09	Liver / Kidney	7.1E-06	NA	6.1E-06	1.3E-05
			Phenanthrene	NC	NA	NC	NA		Kidney	1.4E-05	NA	6.3E-06	2.1E-05
			alpha-Chlordane	2.9E-10	NA	4.0E-11	NA	3.3E-10	Liver	9.8E-06	NA	1.3E-06	1.1E-05
			Aroclor-1254	2.6E-08	NA	1.2E-08	NA	3.8E-08	Immune system	3.7E-03	NA	1.8E-03	5.5E-03
			Aroclor-1260	1.4E-09	NA	6.7E-10	NA	2.1E-09	Immune system	2.1E-04	NA	9.8E-05	3.0E-04
			Aroclor-1268	1.6E-08	NA	7.8E-09	NA	2.4E-08	Immune system	2.4E-03	NA	1.1E-03	3.5E-03
			Dieldrin	1.8E-09	NA	6.3E-10	NA	2.5E-09	Liver	1.3E-05	NA	4.6E-06	1.8E-05
			Endosulfan II	NC	NA	NC	NA		Kidney	1.3E-07	NA	4.3E-08	1.7E-07
			Endosulfan sulfate	NC	NA	NC	NA		Kidney	7.4E-08	NA	2.5E-08	9.9E-08
			gamma-Chlordane	1.4E-10	NA	1.9E-11	NA	1.6E-10	Liver	4.6E-06	NA	6.2E-07	5.2E-06
			Technical Chlordane	2.0E-08	NA	2.8E-09	NA	2.3E-08	Liver	6.8E-04	NA	9.2E-05	7.7E-04
			Antimony	NC	NA	NC	NA		Adverse clinical signs	1.2E-03	NA		1.2E-03
			Arsenic	2.5E-07	NA	2.6E-08	NA	2.8E-07	Skin	3.3E-03	NA	3.3E-04	3.6E-03
			Cadmium	NC	NA	NC	NA		Kidney	3.2E-04	NA	4.4E-05	3.6E-04
			Chromium	NC	NA	NC	NA		NOAEL	1.0E-02	NA		1.0E-02
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	1.8E-03	NA		1.8E-03
			Mercury	NC	NA	NC	NA		Immune system	3.2E-04	NA		3.2E-04
			Nickel	NC	NA	NC	NA		Developmental toxicity	5.3E-04	NA		5.3E-04
			Thallium	NC	NA	NC	NA		NOAEL	1.1E-03	NA		1.1E-03
			Vanadium	NC	NA	NC	NA		NOAEL	9.2E-04	NA		9.2E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.2E-05	NA	3.2E-06	NA	3.5E-05		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	2.5E-07	NA	2.6E-08	NA	2.8E-07		--	NA	--	
			CHEMICAL TOTAL	3.3E-05	--	3.8E-06	--	4E-05		2.7E-02	0.0E+00	3.6E-03	3E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-05					3E-02
	EXPOSURE MEDIUM TOTAL							4E-05					3E-02
SEDIMENT TOTAL								4E-05					3E-02
SURFACE WATER	SURFACE WATER	LYMAN MILL POND	Acenaphthylene	NC	NA	NC	NA		Liver	2.2E-09	NA	--	2.2E-09
			bis(2-Ethylhexyl)phthalate	4.2E-09	NA	1.6E-07	NA	1.7E-07	Liver	8.6E-05	NA	3.4E-03	3.5E-03
			Aldrin	6.8E-09	NA	1.6E-08	NA	2.2E-08	Liver	7.8E-05	NA	1.8E-04	2.6E-04
			alpha-Chlordane	1.2E-10	NA	6.2E-09	NA	6.3E-09	Liver	3.9E-06	NA	2.1E-04	2.1E-04
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	5.4E-08	NA	--	5.4E-08
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	1.7E-06	NA	3.1E-05	3.2E-05
			gamma-Chlordane	1.3E-10	NA	6.8E-09	NA	7.0E-09	Liver	4.3E-06	NA	2.3E-04	2.3E-04
			Arsenic	1.2E-07	NA	2.0E-08	NA	1.4E-07	Skin	1.6E-03	NA	2.5E-04	1.8E-03
			Barium	NC	NA	NC	NA		Cardiovascular system	3.1E-05	NA	7.1E-05	1.0E-04
			Chromium	NC	NA	NC	NA		NOAEL	7.8E-05	NA	1.0E-03	1.1E-03

TABLE 9.22.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	5.5E-04	NA	2.2E-03	2.8E-03
			Mercury	NC	NA	NC	NA		Immune system	1.3E-06	NA	3.1E-06	4.4E-06
			Thallium	NC	NA	NC	NA		NOAEL	2.8E-03	NA	4.6E-04	3.3E-03
			Nitrate	NC	NA	NC	NA		Hematological system	4.9E-05	NA	--	4.9E-05
			Nitrite-N	NC	NA	NC	NA		Hematological system	8.8E-05	NA	--	8.8E-05
			Toxicity Equivalency (Dioxins/Furans) - Mam	2.3E-06	NA	0.0E+00	NA	2.3E-06		--	NA	--	
			CHEMICAL TOTAL	2.4E-06	--	2.1E-07	--	3E-06		5.3E-03	0.0E+00	8.1E-03	1E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-06					1E-02
	EXPOSURE MEDIUM TOTAL							3E-06					1E-02
SURFACE WATER TOTAL								3E-06					1E-02
BIOTA	COMBINED FISH DIET	LYMAN MILL POND	Acenaphthylene	NC	NA	NA	NA		Liver	6.4E-06	NA	NA	6.4E-06
			Benzo(a)anthracene	1.1E-07	NA	NA	NA	1.1E-07	Kidney	2.8E-05	NA	NA	2.8E-05
			Benzo(a)pyrene	1.3E-06	NA	NA	NA	1.3E-06	Kidney	3.5E-05	NA	NA	3.5E-05
			Benzo(b)fluoranthene	7.2E-08	NA	NA	NA	7.2E-08	Kidney	1.9E-05	NA	NA	1.9E-05
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	2.7E-05	NA	NA	2.7E-05
			Dibenzo(a,h)anthracene	2.9E-07	NA	NA	NA	2.9E-07	Kidney	7.7E-06	NA	NA	7.7E-06
			Indeno(1,2,3-cd)pyrene	1.2E-07	NA	NA	NA	1.2E-07	Kidney	3.2E-05	NA	NA	3.2E-05
			Phenanthrene	NC	NA	NA	NA		Kidney	8.9E-05	NA	NA	8.9E-05
			4,4'-DDD	2.1E-07	NA	NA	NA	2.1E-07	Liver	1.0E-02	NA	NA	1.0E-02
			4,4'-DDE	1.0E-06	NA	NA	NA	1.0E-06	Liver	3.4E-02	NA	NA	3.4E-02
			4,4'-DDT	3.4E-08	NA	NA	NA	3.4E-08	Liver	1.2E-03	NA	NA	1.2E-03
			alpha-Chlordane	2.3E-07	NA	NA	NA	2.3E-07	Liver	7.7E-03	NA	NA	7.7E-03
			Aroclor-1254	1.4E-04	NA	NA	NA	1.4E-04	Immune system	2.0E+01	NA	NA	2.0E+01
			Aroclor-1268	1.4E-06	NA	NA	NA	1.4E-06	Immune system	2.1E-01	NA	NA	2.1E-01
			beta-BHC	4.7E-08	NA	NA	NA	4.7E-08	Liver / Kidney	5.1E-04	NA	NA	5.1E-04
			Dieldrin	3.0E-06	NA	NA	NA	3.0E-06	Liver	2.2E-02	NA	NA	2.2E-02
			gamma-Chlordane	1.5E-07	NA	NA	NA	1.5E-07	Liver	5.0E-03	NA	NA	5.0E-03
			Heptachlor Epoxide	4.2E-07	NA	NA	NA	4.2E-07	Liver	2.1E-02	NA	NA	2.1E-02
			Technical Chlordane	1.2E-05	NA	NA	NA	1.2E-05	Liver	3.9E-01	NA	NA	3.9E-01
			Arsenic	1.2E-06	NA	NA	NA	1.2E-06	Skin	1.5E-02	NA	NA	1.5E-02
			Cadmium	NC	NA	NA	NA		Kidney	3.3E-03	NA	NA	3.3E-03
			Chromium	NC	NA	NA	NA		NOAEL	1.3E-02	NA	NA	1.3E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Manganese	NC	NA	NA	NA		NOAEL	5.9E-03	NA	NA	5.9E-03
			Mercury	NC	NA	NA	NA		Immune system	9.0E-02	NA	NA	9.0E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	2.4E-01	NA	NA	2.4E-01

TABLE 9.22.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Toxicity Equivalency (PCB Congeners) - Mam	2.0E-04	NA	NA	NA	2.0E-04		--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.8E-03	NA	NA	NA	1.8E-03		--	NA	NA	
			CHEMICAL TOTAL	2.2E-03	--	--	--	2E-03		2.1E+01	0.0E+00	--	2.1E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-03					2.1E+01
	EXPOSURE MEDIUM TOTAL							2E-03					2.1E+01
COMBINED FISH DIET TOTAL								2E-03					2.1E+01
RECEPTOR TOTAL								2E-03					2.2E+01
							TOTAL RISK ACROSS ALL MEDIA	2E-03				TOTAL HAZARD ACROSS ALL MEDIA	2.2E+01

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

TOTAL ADVERSE CLINICAL SIGNS HI =	1.2E-03
TOTAL CARDIOVASCULAR SYSTEM HI =	1.0E-04
TOTAL DEVELOPMENTAL TOXICITY HI =	2.4E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	1.4E-04
TOTAL IMMUNE SYSTEM HI =	2.1E+01
TOTAL KIDNEY HI =	4.5E-03
TOTAL LIVER HI =	5.0E-01
	--
TOTAL NERVOUS SYSTEM HI =	3.2E-05
TOTAL NOAEL HI =	4.0E-02
TOTAL REPRODUCTIVE SYSTEM HI =	5.3E-05
TOTAL SKIN HI =	2.1E-02
	--

Prepared by: KJA
Checked by: MJM

TABLE 9.23.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	LYMAN MILL POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	1.2E-06	NA	1.1E-06	2.3E-06
			4-Chloro-3-methylphenol	NC	NA	NC	NA		Reproductive system	6.2E-05	NA	4.4E-05	1.1E-04
			4-Nitrophenol	NC	NA	NC	NA			--	NA	--	
			Acenaphthylene	NC	NA	NC	NA		Liver	1.7E-06	NA	1.6E-06	3.3E-06
			Benzo(a)anthracene	8.3E-08	NA	7.7E-08	NA	1.6E-07	Kidney	2.2E-05	NA	2.1E-05	4.3E-05
			Benzo(a)pyrene	8.6E-07	NA	8.0E-07	NA	1.7E-06	Kidney	2.3E-05	NA	2.1E-05	4.4E-05
			Benzo(b)fluoranthene	1.3E-07	NA	1.2E-07	NA	2.6E-07	Kidney	3.6E-05	NA	3.3E-05	6.9E-05
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	2.4E-05	NA	2.2E-05	4.6E-05
			Benzo(k)fluoranthene	6.2E-09	NA	5.8E-09	NA	1.2E-08	Kidney	1.7E-05	NA	1.5E-05	3.2E-05
			bis(2-Ethylhexyl)phthalate	3.0E-09	NA	2.1E-09	NA	5.1E-09	Liver	6.2E-05	NA	4.4E-05	1.1E-04
			Dibenzo(a,h)anthracene	3.2E-07	NA	3.0E-07	NA	6.1E-07	Kidney	8.5E-06	NA	7.9E-06	1.6E-05
			Indeno(1,2,3-cd)pyrene	8.0E-08	NA	7.5E-08	NA	1.5E-07	Kidney	2.1E-05	NA	2.0E-05	4.1E-05
			N-Nitroso-di-n-propylamine	3.7E-07	NA	2.6E-07	NA	6.4E-07		--	NA	--	
			Pentachlorophenol	6.8E-09	NA	1.2E-08	NA	1.9E-08	Liver / Kidney	1.1E-05	NA	2.0E-05	3.1E-05
			Phenanthrene	NC	NA	NC	NA		Kidney	2.2E-05	NA	2.1E-05	4.3E-05
			alpha-Chlordane	4.6E-10	NA	1.3E-10	NA	5.9E-10	Liver	1.5E-05	NA	4.3E-06	2.0E-05
			Aroclor-1254	4.0E-08	NA	4.0E-08	NA	8.0E-08	Immune system	5.8E-03	NA	5.8E-03	1.2E-02
			Aroclor-1260	2.2E-09	NA	2.2E-09	NA	4.4E-09	Immune system	3.2E-04	NA	3.2E-04	6.4E-04
			Aroclor-1268	2.6E-08	NA	2.6E-08	NA	5.1E-08	Immune system	3.7E-03	NA	3.7E-03	7.5E-03
			Dieldrin	2.9E-09	NA	2.0E-09	NA	4.9E-09	Liver	2.1E-05	NA	1.5E-05	3.6E-05
			Endosulfan II	NC	NA	NC	NA		Kidney	2.0E-07	NA	1.4E-07	3.4E-07
			Endosulfan sulfate	NC	NA	NC	NA		Kidney	1.1E-07	NA	8.2E-08	2.0E-07
			gamma-Chlordane	2.1E-10	NA	6.1E-11	NA	2.7E-10	Liver	7.1E-06	NA	2.0E-06	9.2E-06
			Technical Chlordane	3.2E-08	NA	9.0E-09	NA	4.1E-08	Liver	1.1E-03	NA	3.0E-04	1.4E-03
			Antimony	NC	NA	NC	NA		Adverse clinical signs	1.8E-03	NA		1.8E-03
			Arsenic	3.9E-07	NA	8.4E-08	NA	4.7E-07	Skin	5.1E-03	NA	1.1E-03	6.2E-03
			Cadmium	NC	NA	NC	NA		Kidney	5.0E-04	NA	1.4E-04	6.4E-04
			Chromium	NC	NA	NC	NA		NOAEL	1.6E-02	NA		1.6E-02
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	2.8E-03	NA		2.8E-03
			Mercury	NC	NA	NC	NA		Immune system	4.9E-04	NA		4.9E-04
			Nickel	NC	NA	NC	NA		Developmental toxicity	8.2E-04	NA		8.2E-04
			Thallium	NC	NA	NC	NA		NOAEL	1.7E-03	NA		1.7E-03
			Vanadium	NC	NA	NC	NA		NOAEL	1.4E-03	NA		1.4E-03
			Toxicity Equivalency (Dioxins/Furans) - Mam	4.9E-05	NA	1.1E-05	NA	6.0E-05		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	4.0E-07	NA	8.5E-08	NA	4.8E-07		--	NA	--	
			CHEMICAL TOTAL	5.2E-05	--	1.2E-05	--	6E-05		4.2E-02	0.0E+00	1.2E-02	5E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						6E-05					5E-02
	EXPOSURE MEDIUM TOTAL							6E-05					5E-02
SEDIMENT TOTAL								6E-05					5E-02

TABLE 9.23.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SURFACE WATER	SURFACE WATER	LYMAN MILL POND	Acenaphthylene	NC	NA	NC	NA		Liver	3.5E-09	NA	--	3.5E-09
			bis(2-Ethylhexyl)phthalate	6 5E-09	NA	2.0E-07	NA	2.0E-07	Liver	1.3E-04	NA	4 1E-03	4.2E-03
			Aldrin	1 1E-08	NA	1.9E-08	NA	2.9E-08	Liver	1.2E-04	NA	2.1E-04	3 3E-04
			alpha-Chlordane	1.8E-10	NA	7.4E-09	NA	7.5E-09	Liver	6.0E-06	NA	2.5E-04	2.5E-04
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	8.4E-08	NA	--	8.4E-08
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	2 6E-06	NA	3.6E-05	3.9E-05
			gamma-Chlordane	2.0E-10	NA	8.1E-09	NA	8 3E-09	Liver	6 6E-06	NA	2.7E-04	2 8E-04
			Arsenic	1.9E-07	NA	2 3E-08	NA	2 1E-07	Skin	2 4E-03	NA	3.0E-04	2 7E-03
			Barium	NC	NA	NC	NA		Cardiovascular system	4 7E-05	NA	8 5E-05	1.3E-04
			Chromium	NC	NA	NC	NA		NOAEL	1 2E-04	NA	1 2E-03	1 3E-03
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	8 6E-04	NA	2.7E-03	3 5E-03
			Mercury	NC	NA	NC	NA		Immune system	2.1E-06	NA	3 7E-06	5 8E-06
			Thallium	NC	NA	NC	NA		NOAEL	4 4E-03	NA	5 4E-04	4 9E-03
			Nitrate	NC	NA	NC	NA		Hematological system	7 6E-05	NA	--	7 6E-05
			Nitrite-N	NC	NA	NC	NA		Hematological system	1 4E-04	NA	--	1 4E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	3 5E-06	NA	0 0E+00	NA	3 5E-06		--	NA	--	
			CHEMICAL TOTAL	3.7E-06	--	2.5E-07	--	4E-06		8.3E-03	0 0E+00	9.6E-03	2E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-06					2E-02
	EXPOSURE MEDIUM TOTAL							4E-06					2E-02
SURFACE WATER TOTAL								4E-06					2E-02
BIOTA	COMBINED FISH DIET	LYMAN MILL POND	Acenaphthylene	NC	NA	NA	NA		Liver	6 6E-06	NA	NA	6.6E-06
			Benzo(a)anthracene	1.1E-07	NA	NA	NA	1 1E-07	Kidney	2.9E-05	NA	NA	2 9E-05
			Benzo(a)pyrene	1 4E-06	NA	NA	NA	1 4E-06	Kidney	3.6E-05	NA	NA	3.6E-05
			Benzo(b)fluoranthene	7.4E-08	NA	NA	NA	7.4E-08	Kidney	2.0E-05	NA	NA	2.0E-05
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	2.8E-05	NA	NA	2.8E-05
			Dibenzo(a,h)anthracene	3.0E-07	NA	NA	NA	3.0E-07	Kidney	7.9E-06	NA	NA	7 9E-06
			Indeno(1,2,3-cd)pyrene	1.2E-07	NA	NA	NA	1.2E-07	Kidney	3.3E-05	NA	NA	3 3E-05
			Phenanthrene	NC	NA	NA	NA		Kidney	9.2E-05	NA	NA	9.2E-05
			4,4'-DDD	2.2E-07	NA	NA	NA	2.2E-07	Liver	1.1E-02	NA	NA	1 1E-02
			4,4'-DDE	1.0E-06	NA	NA	NA	1.0E-06	Liver	3.5E-02	NA	NA	3.5E-02
			4,4'-DDT	3.5E-08	NA	NA	NA	3.5E-08	Liver	1.2E-03	NA	NA	1 2E-03
			alpha-Chlordane	2.4E-07	NA	NA	NA	2.4E-07	Liver	7.9E-03	NA	NA	7.9E-03
			Aroclor-1254	1.4E-04	NA	NA	NA	1.4E-04	Immune system	2.1E+01	NA	NA	2.1E+01
			Aroclor-1268	1.5E-06	NA	NA	NA	1.5E-06	Immune system	2.1E-01	NA	NA	2.1E-01
			beta-BHC	4.9E-08	NA	NA	NA	4.9E-08	Liver / Kidney	5.3E-04	NA	NA	5.3E-04
			Dieldrin	3.1E-06	NA	NA	NA	3.1E-06	Liver	2.3E-02	NA	NA	2.3E-02
			gamma-Chlordane	1.5E-07	NA	NA	NA	1.5E-07	Liver	5.2E-03	NA	NA	5.2E-03
			Heptachlor Epoxide	4.3E-07	NA	NA	NA	4.3E-07	Liver	2.1E-02	NA	NA	2 1E-02
			Technical Chlordane	1 2E-05	NA	NA	NA	1.2E-05	Liver	4.0E-01	NA	NA	4.0E-01
			Arsenic	1.2E-06	NA	NA	NA	1 2E-06	Skin	1.6E-02	NA	NA	1.6E-02

TABLE 9.23.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Cadmium	NC	NA	NA	NA		Kidney	3.4E-03	NA	NA	3.4E-03
			Chromium	NC	NA	NA	NA		NOAEL	1.3E-02	NA	NA	1.3E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Manganese	NC	NA	NA	NA		NOAEL	6.1E-03	NA	NA	6.1E-03
			Mercury	NC	NA	NA	NA		Immune system	9.3E-02	NA	NA	9.3E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	2.5E-01	NA	NA	2.5E-01
			Toxicity Equivalency (PCB Congeners) - Mam	2.1E-04	NA	NA	NA	2.1E-04		--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.9E-03	NA	NA	NA	1.9E-03		--	NA	NA	
			CHEMICAL TOTAL	2.3E-03	--	--	--	2E-03		2.2E+01	0.0E+00	--	2.2E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-03					2.2E+01
	EXPOSURE MEDIUM TOTAL							2E-03					2.2E+01
COMBINED FISH DIET TOTAL								2E-03					2.2E+01
RECEPTOR TOTAL								2E-03					2.2E+01
							TOTAL RISK ACROSS ALL MEDIA	2E-03				TOTAL HAZARD ACROSS ALL MEDIA	2.2E+01

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

TOTAL ADVERSE CLINICAL SIGNS HI =	1.8E-03
TOTAL CARDIOVASCULAR SYSTEM HI =	1.3E-04
TOTAL DEVELOPMENTAL TOXICITY HI =	2.5E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	2.1E-04
TOTAL IMMUNE SYSTEM HI =	2.1E+01
TOTAL KIDNEY HI =	5.2E-03
TOTAL LIVER HI =	5.2E-01
	--
TOTAL NERVOUS SYSTEM HI =	3.9E-05
TOTAL NOAEL HI =	5.1E-02
TOTAL REPRODUCTIVE SYSTEM HI =	1.1E-04
TOTAL SKIN HI =	2.5E-02
	--

Prepared by: KJA
Checked by: MJM

TABLE 9.24.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	LYMAN MILL POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	9.5E-06	NA	3.5E-06	1.3E-05
			4-Chloro-3-methylphenol	NC	NA	NC	NA		Reproductive system	4.9E-04	NA	1.4E-04	6.3E-04
			4-Nitrophenol	NC	NA	NC	NA			--	NA	--	
			Acenaphthylene	NC	NA	NC	NA		Liver	1.4E-05	NA	4.9E-06	1.9E-05
			Benzo(a)anthracene	3.3E-07	NA	1.2E-07	NA	4.5E-07	Kidney	1.8E-04	NA	6.5E-05	2.4E-04
			Benzo(a)pyrene	3.4E-06	NA	1.3E-06	NA	4.7E-06	Kidney	1.8E-04	NA	6.7E-05	2.5E-04
			Benzo(b)fluoranthene	5.3E-07	NA	1.9E-07	NA	7.3E-07	Kidney	2.8E-04	NA	1.0E-04	3.9E-04
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	1.9E-04	NA	6.9E-05	2.6E-04
			Benzo(k)fluoranthene	2.5E-08	NA	9.1E-09	NA	3.4E-08	Kidney	1.3E-04	NA	4.8E-05	1.8E-04
			bis(2-Ethylhexyl)phthalate	1.2E-08	NA	3.3E-09	NA	1.5E-08	Liver	4.9E-04	NA	1.4E-04	6.3E-04
			Dibenzo(a,h)anthracene	1.3E-06	NA	4.6E-07	NA	1.7E-06	Kidney	6.8E-05	NA	2.5E-05	9.2E-05
			Indeno(1,2,3-cd)pyrene	3.2E-07	NA	1.2E-07	NA	4.4E-07	Kidney	1.7E-04	NA	6.2E-05	2.3E-04
			N-Nitroso-di-n-propylamine	1.5E-06	NA	4.1E-07	NA	1.9E-06		--	NA	--	
			Pentachlorophenol	2.7E-08	NA	1.9E-08	NA	4.7E-08	Liver / Kidney	8.9E-05	NA	6.2E-05	1.5E-04
			Phenanthrene	NC	NA	NC	NA		Kidney	1.8E-04	NA	6.5E-05	2.4E-04
			alpha-Chlordane	1.8E-09	NA	2.0E-10	NA	2.0E-09	Liver	1.2E-04	NA	1.4E-05	1.4E-04
			Aroclor-1254	1.6E-07	NA	6.3E-08	NA	2.2E-07	Immune system	4.7E-02	NA	1.8E-02	6.5E-02
			Aroclor-1260	8.8E-09	NA	3.4E-09	NA	1.2E-08	Immune system	2.6E-03	NA	1.0E-03	3.6E-03
			Aroclor-1268	1.0E-07	NA	4.0E-08	NA	1.4E-07	Immune system	3.0E-02	NA	1.2E-02	4.1E-02
			Dieldrin	1.1E-08	NA	3.2E-09	NA	1.5E-08	Liver	1.7E-04	NA	4.7E-05	2.1E-04
			Endosulfan II	NC	NA	NC	NA		Kidney	1.6E-06	NA	4.4E-07	2.0E-06
			Endosulfan sulfate	NC	NA	NC	NA		Kidney	9.2E-07	NA	2.6E-07	1.2E-06
			gamma-Chlordane	8.5E-10	NA	9.6E-11	NA	9.5E-10	Liver	5.7E-05	NA	6.4E-06	6.3E-05
			Technical Chlordane	1.3E-07	NA	1.4E-08	NA	1.4E-07	Liver	8.4E-03	NA	9.4E-04	9.3E-03
			Antimony	NC	NA	NC	NA		Adverse clinical signs	1.5E-02	NA		1.5E-02
			Arsenic	1.6E-06	NA	1.3E-07	NA	1.7E-06	Skin	4.1E-02	NA	3.4E-03	4.4E-02
			Cadmium	NC	NA	NC	NA		Kidney	4.0E-03	NA	4.5E-04	4.4E-03
			Chromium	NC	NA	NC	NA		NOAEL	1.3E-01	NA		1.3E-01
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	2.3E-02	NA		2.3E-02
			Mercury	NC	NA	NC	NA		Immune system	3.9E-03	NA		3.9E-03
			Nickel	NC	NA	NC	NA		Developmental toxicity	6.6E-03	NA		6.6E-03
			Thallium	NC	NA	NC	NA		NOAEL	1.4E-02	NA		1.4E-02
			Vanadium	NC	NA	NC	NA		NOAEL	1.2E-02	NA		1.2E-02
			Toxicity Equivalency (Dioxins/Furans) - Mam	2.0E-04	NA	1.6E-05	NA	2.1E-04		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	1.6E-06	NA	1.3E-07	NA	1.7E-06		--	NA	--	
			CHEMICAL TOTAL	2.1E-04	--	1.9E-05	--	2E-04		3.3E-01	0.0E+00	3.7E-02	4E-01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-04					4E-01
	EXPOSURE MEDIUM TOTAL							2E-04					4E-01
SEDIMENT TOTAL								2E-04					4E-01
SURFACE WATER	SURFACE WATER	LYMAN MILL POND	Acenaphthylene	NC	NA	NC	NA		Liver	1.0E-08	NA	--	1.0E-08
			bis(2-Ethylhexyl)phthalate	9.7E-09	NA	1.3E-07	NA	1.4E-07	Liver	4.0E-04	NA	5.2E-03	5.6E-03
			Aldrin	1.6E-08	NA	1.2E-08	NA	2.8E-08	Liver	3.6E-04	NA	2.7E-04	6.4E-04
			alpha-Chlordane	2.7E-10	NA	4.7E-09	NA	5.0E-09	Liver	1.8E-05	NA	3.2E-04	3.3E-04
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	2.5E-07	NA	--	2.5E-07
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	7.9E-06	NA	4.7E-05	5.5E-05
			gamma-Chlordane	3.0E-10	NA	5.2E-09	NA	5.5E-09	Liver	2.0E-05	NA	3.5E-04	3.7E-04
			Arsenic	2.8E-07	NA	1.5E-08	NA	3.0E-07	Skin	7.3E-03	NA	3.9E-04	7.7E-03

TABLE 9.24.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Barium	NC	NA	NC	NA		Cardiovascular system	1.4E-04	NA	1.1E-04	2.5E-04
			Chromium	NC	NA	NC	NA		NOAEL	3.6E-04	NA	1.6E-03	1.9E-03
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	2.6E-03	NA	3.4E-03	6.0E-03
			Mercury	NC	NA	NC	NA		Immune system	6.2E-06	NA	4.8E-06	1.1E-05
			Thallium	NC	NA	NC	NA		NOAEL	1.3E-02	NA	7.0E-04	1.4E-02
			Nitrate	NC	NA	NC	NA		Hematological system	2.3E-04	NA	--	2.3E-04
			Nitrite-N	NC	NA	NC	NA		Hematological system	4.1E-04	NA	--	4.1E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	5.3E-06	NA	0.0E+00	NA	5.3E-06		--	NA	--	
			CHEMICAL TOTAL	5.6E-06	--	1.6E-07	--	6E-06		2.5E-02	0.0E+00	1.2E-02	4E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						6E-06					4E-02
	EXPOSURE MEDIUM TOTAL							6E-06					4E-02
SURFACE WATER TOTAL								6E-06					4E-02
BIOTA	COMBINED FISH DIET	LYMAN MILL POND	Acenaphthylene	NC	NA	NA	NA		Liver	1.0E-05	NA	NA	1.0E-05
			Benzo(a)anthracene	8.3E-08	NA	NA	NA	8.3E-08	Kidney	4.4E-05	NA	NA	4.4E-05
			Benzo(a)pyrene	1.0E-06	NA	NA	NA	1.0E-06	Kidney	5.5E-05	NA	NA	5.5E-05
			Benzo(b)fluoranthene	5.6E-08	NA	NA	NA	5.6E-08	Kidney	3.0E-05	NA	NA	3.0E-05
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	4.3E-05	NA	NA	4.3E-05
			Dibenzo(a,h)anthracene	2.3E-07	NA	NA	NA	2.3E-07	Kidney	1.2E-05	NA	NA	1.2E-05
			Indeno(1,2,3-cd)pyrene	9.4E-08	NA	NA	NA	9.4E-08	Kidney	5.0E-05	NA	NA	5.0E-05
			Phenanthrene	NC	NA	NA	NA		Kidney	1.4E-04	NA	NA	1.4E-04
			4,4'-DDD	1.7E-07	NA	NA	NA	1.7E-07	Liver	1.6E-02	NA	NA	1.6E-02
			4,4'-DDE	7.8E-07	NA	NA	NA	7.8E-07	Liver	5.4E-02	NA	NA	5.4E-02
			4,4'-DDT	2.6E-08	NA	NA	NA	2.6E-08	Liver	1.8E-03	NA	NA	1.8E-03
			alpha-Chlordane	1.8E-07	NA	NA	NA	1.8E-07	Liver	1.2E-02	NA	NA	1.2E-02
			Aroclor-1254	1.1E-04	NA	NA	NA	1.1E-04	Immune system	3.2E+01	NA	NA	3.2E+01
			Aroclor-1268	1.1E-06	NA	NA	NA	1.1E-06	Immune system	3.2E-01	NA	NA	3.2E-01
			beta-BHC	3.7E-08	NA	NA	NA	3.7E-08	Liver / Kidney	8.0E-04	NA	NA	8.0E-04
			Dieldrin	2.3E-06	NA	NA	NA	2.3E-06	Liver	3.4E-02	NA	NA	3.4E-02
			gamma-Chlordane	1.2E-07	NA	NA	NA	1.2E-07	Liver	7.8E-03	NA	NA	7.8E-03
			Heptachlor Epoxide	3.3E-07	NA	NA	NA	3.3E-07	Liver	3.2E-02	NA	NA	3.2E-02
			Technical Chlordane	9.2E-06	NA	NA	NA	9.2E-06	Liver	6.1E-01	NA	NA	6.1E-01
			Arsenic	9.3E-07	NA	NA	NA	9.3E-07	Skin	2.4E-02	NA	NA	2.4E-02
			Cadmium	NC	NA	NA	NA		Kidney	5.1E-03	NA	NA	5.1E-03
			Chromium	NC	NA	NA	NA		NOAEL	2.0E-02	NA	NA	2.0E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Manganese	NC	NA	NA	NA		NOAEL	9.2E-03	NA	NA	9.2E-03
			Mercury	NC	NA	NA	NA		Immune system	1.4E-01	NA	NA	1.4E-01
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	3.8E-01	NA	NA	3.8E-01

TABLE 9.24.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Toxicity Equivalency (PCB Congeners) - Mam	1.6E-04	NA	NA	NA	1.6E-04		--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.4E-03	NA	NA	NA	1.4E-03		--	NA	NA	
			CHEMICAL TOTAL	1.7E-03	--	--	--	2E-03		3.4E+01	0.0E+00	--	3.4E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-03					3.4E+01
	EXPOSURE MEDIUM TOTAL							2E-03					3.4E+01
COMBINED FISH DIET TOTAL								2E-03					3.4E+01
RECEPTOR TOTAL								2E-03					3.4E+01
							TOTAL RISK ACROSS ALL MEDIA	2E-03	TOTAL HAZARD ACROSS ALL MEDIA				3.4E+01

NOTES:
NC - Not carcinogenic by this exposure route
NA - Not applicable; exposure route not applicable for this chemical/exposure medium
-- - Not calculated, dose-response data and/or dermal absorption values are not available

TOTAL ADVERSE CLINICAL SIGNS HI =	1.5E-02
TOTAL CARDIOVASCULAR SYSTEM HI =	2.6E-04
TOTAL DEVELOPMENTAL TOXICITY HI =	3.9E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	6.4E-04
TOTAL IMMUNE SYSTEM HI =	3.3E+01
TOTAL KIDNEY HI =	1.3E-02
TOTAL LIVER HI =	7.9E-01
	--
TOTAL NERVOUS SYSTEM HI =	5.5E-05
TOTAL NOAEL HI =	2.3E-01
TOTAL REPRODUCTIVE SYSTEM HI =	6.3E-04
TOTAL SKIN HI =	7.6E-02
	--

Prepared by: KJA
Checked by: MJM

TABLE 9.25.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	MANTON POND	Benzo(a)anthracene	9.6E-10	NA	8.4E-10	NA	1.8E-09	Kidney	2.5E-07	NA	2.3E-07	4.8E-07
			Benzo(a)pyrene	1.2E-08	NA	1.0E-08	NA	2.2E-08	Kidney	3.1E-07	NA	2.8E-07	5.9E-07
			Benzo(b)fluoranthene	2.0E-09	NA	1.8E-09	NA	3.8E-09	Kidney	5.4E-07	NA	4.8E-07	1.0E-06
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	1.9E-07	NA	1.7E-07	3.5E-07
			Benzo(k)fluoranthene	6.4E-11	NA	5.6E-11	NA	1.2E-10	Kidney	1.7E-07	NA	1.5E-07	3.2E-07
			bis(2-Ethylhexyl)phthalate	2.6E-11	NA	1.8E-11	NA	4.4E-11	Liver	5.5E-07	NA	3.7E-07	9.2E-07
			Indeno(1,2,3-cd)pyrene	9.2E-10	NA	8.2E-10	NA	1.7E-09	Kidney	2.5E-07	NA	2.2E-07	4.6E-07
			Phenanthrene	NC	NA	NC	NA		Kidney	2.5E-07	NA	2.3E-07	4.8E-07
			alpha-Chlordane	6.1E-12	NA	1.7E-12	NA	7.8E-12	Liver	2.0E-07	NA	5.5E-08	2.6E-07
			gamma-Chlordane	7.6E-12	NA	2.1E-12	NA	9.7E-12	Liver	2.5E-07	NA	6.9E-08	3.2E-07
			Arsenic	6.3E-09	NA	1.3E-09	NA	7.6E-09	Skin	8.2E-05	NA	1.7E-05	9.9E-05
			Cadmium	NC	NA	NC	NA		Kidney	2.4E-05	NA	6.6E-06	3.1E-05
			Chromium	NC	NA	NC	NA		NOAEL	1.6E-04	NA		1.6E-04
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	7.8E-05	NA		7.8E-05
			Vanadium	NC	NA	NC	NA		NOAEL	2.6E-05	NA		2.6E-05
			Toxicity Equivalency (Dioxins/Furans) - Mam	6.5E-07	NA	1.3E-07	NA	7.9E-07		--	NA	--	
			CHEMICAL TOTAL	6.8E-07	--	1.5E-07	--	8E-07		3.7E-04	0.0E+00	2.6E-05	4E-04
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						8E-07					4E-04
	EXPOSURE MEDIUM TOTAL							8E-07					4E-04
SEDIMENT TOTAL								8E-07					4E-04
SURFACE WATER	SURFACE WATER	MANTON POND	Acenaphthylene	NC	NA	NC	NA		Liver	5.6E-11	NA	--	5.6E-11
			bis(2-Ethylhexyl)phthalate	1.0E-10	NA	4.4E-08	NA	4.4E-08	Liver	2.2E-06	NA	9.1E-04	9.1E-04
			Aldrin	1.7E-10	NA	4.2E-09	NA	4.3E-09	Liver	2.0E-06	NA	4.8E-05	5.0E-05
			alpha-Chlordane	2.9E-12	NA	1.6E-09	NA	1.7E-09	Liver	9.7E-08	NA	5.5E-05	5.5E-05
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	1.4E-09	NA	--	1.4E-09
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	4.2E-08	NA	8.2E-06	8.2E-06
			gamma-Chlordane	3.2E-12	NA	1.8E-09	NA	1.8E-09	Liver	1.1E-07	NA	6.1E-05	6.1E-05
			Arsenic	3.0E-09	NA	5.2E-09	NA	8.2E-09	Skin	3.9E-05	NA	6.8E-05	1.1E-04
			Barium	NC	NA	NC	NA		Cardiovascular system	7.6E-07	NA	1.9E-05	2.0E-05
			Chromium	NC	NA	NC	NA		NOAEL	2.0E-06	NA	2.7E-04	2.7E-04
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	1.4E-05	NA	6.0E-04	6.1E-04
			Mercury	NC	NA	NC	NA		Immune system	3.3E-08	NA	8.3E-07	8.6E-07
			Thallium	NC	NA	NC	NA		NOAEL	7.0E-05	NA	1.2E-04	1.9E-04
			Nitrate	NC	NA	NC	NA		Hematological system	1.2E-06	NA	--	1.2E-06
			Nitrite-N	NC	NA	NC	NA		Hematological system	2.2E-06	NA	--	2.2E-06
			Toxicity Equivalency (Dioxins/Furans) - Mam	5.6E-08	NA	0.0E+00	NA	5.6E-08		--	NA	--	
			CHEMICAL TOTAL	6.0E-08	--	5.7E-08	--	1E-07		1.3E-04	0.0E+00	2.2E-03	2E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-07					2E-03
	EXPOSURE MEDIUM TOTAL							1E-07					2E-03
SURFACE WATER TOTAL								1E-07					2E-03

TABLE 9.25.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	MANTON POND	Acenaphthylene	NC	NA	NA	NA		Liver	1.3E-06	NA	NA	1.3E-06
			Dibenzo(a,h)anthracene	5.4E-08	NA	NA	NA	5.4E-08	Kidney	1.4E-06	NA	NA	1.4E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	3.2E-05	NA	NA	3.2E-05
			4,4'-DDE	1.4E-07	NA	NA	NA	1.4E-07	Liver	4.7E-03	NA	NA	4.7E-03
			alpha-Chlordane	3.0E-08	NA	NA	NA	3.0E-08	Liver	1.0E-03	NA	NA	1.0E-03
			Aroclor-1254	1.4E-05	NA	NA	NA	1.4E-05	Immune system	2.1E+00	NA	NA	2.1E+00
			Aroclor-1268	4.4E-06	NA	NA	NA	4.4E-06	Immune system	6.5E-01	NA	NA	6.5E-01
			Dieldrin	3.0E-07	NA	NA	NA	3.0E-07	Liver	2.2E-03	NA	NA	2.2E-03
			Endosulfan Sulfate	NC	NA	NA	NA		Kidney	6.1E-05	NA	NA	6.1E-05
			gamma-Chlordane	1.1E-08	NA	NA	NA	1.1E-08	Liver	3.7E-04	NA	NA	3.7E-04
			Technical Chlordane	7.5E-07	NA	NA	NA	7.5E-07	Liver	2.5E-02	NA	NA	2.5E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Mercury	NC	NA	NA	NA		Immune system	1.7E-01	NA	NA	1.7E-01
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	5.3E-01	NA	NA	5.3E-01
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.5E-04	NA	NA	NA	1.5E-04		--	NA	NA	
			CHEMICAL TOTAL	1.7E-04	--	--	--	2E-04		3.5E+00	0.0E+00	--	3E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-04					3E+00
	EXPOSURE MEDIUM TOTAL							2E-04					3E+00
COMBINED FISH DIET TOTAL								2E-04					3E+00
RECEPTOR TOTAL								2E-04					3.5E+00
							TOTAL RISK ACROSS ALL MEDIA	2E-04				TOTAL HAZARD ACROSS ALL MEDIA	3.5E+00

NOTES
NC - Not carcinogenic by this exposure route
NA - Not applicable; exposure route not applicable for this chemical/exposure medium
-- - Not calculated; dose-response data and/or dermal absorption values are not available

	--
TOTAL CARDIOVASCULAR SYSTEM HI =	2.0E-05
TOTAL DEVELOPMENTAL TOXICITY HI =	5.3E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	3.4E-06
TOTAL IMMUNE SYSTEM HI =	2.9E+00
TOTAL KIDNEY HI =	1.3E-04
TOTAL LIVER HI =	3.4E-02
	--
TOTAL NERVOUS SYSTEM HI =	8.2E-06
TOTAL NOAEL HI =	1.3E-03
	--
TOTAL SKIN HI =	2.1E-04
	--

Prepared by: KJA
Checked by: RAR

TABLE 9.26.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	MANTON POND	Benzo(a)anthracene	1 5E-09	NA	2.8E-09	NA	4.2E-09	Kidney	4 0E-07	NA	7 4E-07	1 1E-06
			Benzo(a)pyrene	1 8E-08	NA	3.4E-08	NA	5 2E-08	Kidney	4 9E-07	NA	9 1E-07	1 4E-06
			Benzo(b)fluoranthene	3 2E-09	NA	5.9E-09	NA	9.1E-09	Kidney	8 4E-07	NA	1.6E-06	2.4E-06
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	2.9E-07	NA	5.4E-07	8 3E-07
			Benzo(k)fluoranthene	9 9E-11	NA	1.8E-10	NA	2 8E-10	Kidney	2.6E-07	NA	4.9E-07	7 5E-07
			bis(2-Ethylhexyl)phthalate	4.1E-11	NA	5.8E-11	NA	9 9E-11	Liver	8.5E-07	NA	1 2E-06	2.1E-06
			Indeno(1,2,3-cd)pyrene	1.4E-09	NA	2.7E-09	NA	4.1E-09	Kidney	3.8E-07	NA	7.1E-07	1 1E-06
			Phenanthrene	NC	NA	NC	NA		Kidney	4.0E-07	NA	7.4E-07	1 1E-06
			alpha-Chlordane	9.5E-12	NA	5.4E-12	NA	1.5E-11	Liver	3.2E-07	NA	1.8E-07	5 0E-07
			gamma-Chlordane	1.2E-11	NA	6.8E-12	NA	1.9E-11	Liver	4.0E-07	NA	2.3E-07	6 2E-07
			Arsenic	9.9E-09	NA	4.2E-09	NA	1.4E-08	Skin	1.3E-04	NA	5 5E-05	1.8E-04
			Cadmium	NC	NA	NC	NA		Kidney	3.8E-05	NA	2.2E-05	6.0E-05
			Chromium	NC	NA	NC	NA		NOAEL	2.5E-04	NA		2.5E-04
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	1.2E-04	NA		1.2E-04
			Vanadium	NC	NA	NC	NA		NOAEL	4.0E-05	NA		4.0E-05
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.0E-06	NA	4.4E-07	NA	1.5E-06		--	NA	--	
			CHEMICAL TOTAL	1.1E-06	--	4.9E-07	--	2E-06		5 8E-04	0.0E+00	8.4E-05	7E-04
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-06					7E-04
	EXPOSURE MEDIUM TOTAL							2E-06					7E-04
SEDIMENT TOTAL								2E-06					7E-04
SURFACE WATER	SURFACE WATER	MANTON POND	Acenaphthylene	NC	NA	NC	NA		Liver	8.7E-11	NA	--	8 7E-11
			bis(2-Ethylhexyl)phthalate	1.6E-10	NA	4.9E-08	NA	4 9E-08	Liver	3.4E-06	NA	1 0E-03	1.0E-03
			Aldrin	2.7E-10	NA	4.7E-09	NA	4.9E-09	Liver	3.0E-06	NA	5.3E-05	5 6E-05
			alpha-Chlordane	4.5E-12	NA	1.8E-09	NA	1.9E-09	Liver	1.5E-07	NA	6 2E-05	6.2E-05
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	2.1E-09	NA	--	2 1E-09
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	6 6E-08	NA	9.1E-06	9 2E-06
			gamma-Chlordane	5.0E-12	NA	2.0E-09	NA	2 0E-09	Liver	1 7E-07	NA	6 8E-05	6.8E-05
			Arsenic	4 7E-09	NA	5.9E-09	NA	1.1E-08	Skin	6.1E-05	NA	7.6E-05	1.4E-04
			Barium	NC	NA	NC	NA		Cardiovascular system	1.2E-06	NA	2.1E-05	2.2E-05
			Chromium	NC	NA	NC	NA		NOAEL	3.0E-06	NA	3.0E-04	3 1E-04
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	2.1E-05	NA	6.7E-04	6.9E-04
			Mercury	NC	NA	NC	NA		Immune system	5.2E-08	NA	9.3E-07	9.8E-07
			Thallium	NC	NA	NC	NA		NOAEL	1.1E-04	NA	1.4E-04	2.5E-04
			Nitrate	NC	NA	NC	NA		Hematological system	1.9E-06	NA	--	1 9E-06
			Nitrite-N	NC	NA	NC	NA		Hematological system	3.4E-06	NA	--	3 4E-06
			Toxicity Equivalency (Dioxins/Furans) - Mam	8 8E-08	NA	0.0E+00	NA	8.8E-08		--	NA	--	
			CHEMICAL TOTAL	9 3E-08	--	6.3E-08	--	2E-07		2.1E-04	0.0E+00	2.4E-03	3E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-07					3E-03
	EXPOSURE MEDIUM TOTAL							2E-07					3E-03
SURFACE WATER TOTAL								2E-07					3E-03

TABLE 9.26.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	MANTON POND	Acenaphthylene	NC	NA	NA	NA		Liver	1.4E-06	NA	NA	1.4E-06
			Dibenzo(a,h)anthracene	5.6E-08	NA	NA	NA	5.6E-08	Kidney	1.5E-06	NA	NA	1.5E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	3.3E-05	NA	NA	3.3E-05
			4,4'-DDE	1.4E-07	NA	NA	NA	1.4E-07	Liver	4.9E-03	NA	NA	4.9E-03
			alpha-Chlordane	3.1E-08	NA	NA	NA	3.1E-08	Liver	1.0E-03	NA	NA	1.0E-03
			Aroclor-1254	1.5E-05	NA	NA	NA	1.5E-05	Immune system	2.2E+00	NA	NA	2.2E+00
			Aroclor-1268	4.6E-06	NA	NA	NA	4.6E-06	Immune system	6.7E-01	NA	NA	6.7E-01
			Dieldrin	3.1E-07	NA	NA	NA	3.1E-07	Liver	2.3E-03	NA	NA	2.3E-03
			Endosulfan Sulfate	NC	NA	NA	NA		Kidney	6.3E-05	NA	NA	6.3E-05
			gamma-Chlordane	1.1E-08	NA	NA	NA	1.1E-08	Liver	3.8E-04	NA	NA	3.8E-04
			Technical Chlordane	7.7E-07	NA	NA	NA	7.7E-07	Liver	2.6E-02	NA	NA	2.6E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Mercury	NC	NA	NA	NA		Immune system	1.7E-01	NA	NA	1.7E-01
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	5.5E-01	NA	NA	5.5E-01
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.6E-04	NA	NA	NA	1.6E-04		--	NA	NA	
			CHEMICAL TOTAL	1.8E-04	--	--	--	2E-04		3.6E+00	0.0E+00	--	4E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-04					4E+00
	EXPOSURE MEDIUM TOTAL							2E-04					4E+00
COMBINED FISH DIET TOTAL								2E-04					4E+00
RECEPTOR TOTAL								2E-04					3.6E+00
							TOTAL RISK ACROSS ALL MEDIA	2E-04				TOTAL HAZARD ACROSS ALL MEDIA	3.6E+00

NOTES.
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

	--
TOTAL CARDIOVASCULAR SYSTEM HI =	2.2E-05
TOTAL DEVELOPMENTAL TOXICITY HI =	5.5E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	5.3E-06
TOTAL IMMUNE SYSTEM HI =	3.0E+00
TOTAL KIDNEY HI =	1.7E-04
TOTAL LIVER HI =	3.6E-02
	--
TOTAL NERVOUS SYSTEM HI =	9.2E-06
TOTAL NOAEL HI =	1.7E-03
	--
TOTAL SKIN HI =	3.2E-04
	--

Prepared by: KJA
Checked by: RAR

TABLE 9.28.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	MANTON POND	Benzo(a)anthracene	5.7E-09	NA	2.5E-09	NA	8.3E-09	Kidney	1.5E-06	NA	6.8E-07	2.2E-06
			Benzo(a)pyrene	7.1E-08	NA	3.1E-08	NA	1.0E-07	Kidney	1.9E-06	NA	8.3E-07	2.7E-06
			Benzo(b)fluoranthene	1.2E-08	NA	5.4E-09	NA	1.8E-08	Kidney	3.3E-06	NA	1.4E-06	4.7E-06
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	1.1E-06	NA	5.0E-07	1.6E-06
			Benzo(k)fluoranthene	3.8E-10	NA	1.7E-10	NA	5.5E-10	Kidney	1.0E-06	NA	4.5E-07	1.5E-06
			bis(2-Ethylhexyl)phthalate	1.6E-10	NA	5.4E-11	NA	2.1E-10	Liver	3.3E-06	NA	1.1E-06	4.4E-06
			Indeno(1,2,3-cd)pyrene	5.5E-09	NA	2.4E-09	NA	8.0E-09	Kidney	1.5E-06	NA	6.5E-07	2.1E-06
			Phenanthrene	NC	NA	NC	NA		Kidney	1.5E-06	NA	6.8E-07	2.2E-06
			alpha-Chlordane	3.7E-11	NA	5.0E-12	NA	4.2E-11	Liver	1.2E-06	NA	1.7E-07	1.4E-06
			gamma-Chlordane	4.6E-11	NA	6.2E-12	NA	5.2E-11	Liver	1.5E-06	NA	2.1E-07	1.7E-06
			Arsenic	3.8E-08	NA	3.9E-09	NA	4.2E-08	Skin	4.9E-04	NA	5.0E-05	5.4E-04
			Cadmium	NC	NA	NC	NA		Kidney	1.5E-04	NA	2.0E-05	1.7E-04
			Chromium	NC	NA	NC	NA		NOAEL	9.5E-04	NA		9.5E-04
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	4.7E-04	NA		4.7E-04
			Vanadium	NC	NA	NC	NA		NOAEL	1.5E-04	NA		1.5E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.9E-06	NA	4.0E-07	NA	4.3E-06		--	NA	--	
			CHEMICAL TOTAL	4.1E-06	--	4.5E-07	--	4E-06		2.2E-03	0.0E+00	7.7E-05	2E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-06					2E-03
	EXPOSURE MEDIUM TOTAL							4E-06					2E-03
SEDIMENT TOTAL								4E-06					2E-03
SURFACE WATER	SURFACE WATER	MANTON POND	Acenaphthylene	NC	NA	NC	NA		Liver	2.2E-09	NA	--	2.2E-09
			bis(2-Ethylhexyl)phthalate	4.2E-09	NA	1.6E-07	NA	1.7E-07	Liver	8.6E-05	NA	3.4E-03	3.5E-03
			Aldrin	6.8E-09	NA	1.6E-08	NA	2.2E-08	Liver	7.8E-05	NA	1.8E-04	2.6E-04
			alpha-Chlordane	1.2E-10	NA	6.2E-09	NA	6.3E-09	Liver	3.9E-06	NA	2.1E-04	2.1E-04
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	5.4E-08	NA	--	5.4E-08
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	1.7E-06	NA	3.1E-05	3.2E-05
			gamma-Chlordane	1.3E-10	NA	6.8E-09	NA	7.0E-09	Liver	4.3E-06	NA	2.3E-04	2.3E-04
			Arsenic	1.2E-07	NA	2.0E-08	NA	1.4E-07	Skin	1.6E-03	NA	2.5E-04	1.8E-03
			Barium	NC	NA	NC	NA		Cardiovascular system	3.1E-05	NA	7.1E-05	1.0E-04
			Chromium	NC	NA	NC	NA		NOAEL	7.8E-05	NA	1.0E-03	1.1E-03
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	5.5E-04	NA	2.2E-03	2.8E-03
			Mercury	NC	NA	NC	NA		Immune system	1.3E-06	NA	3.1E-06	4.4E-06
			Thallium	NC	NA	NC	NA		NOAEL	2.8E-03	NA	4.6E-04	3.3E-03
			Nitrate	NC	NA	NC	NA		Hematological system	4.9E-05	NA	--	4.9E-05
			Nitrite-N	NC	NA	NC	NA		Hematological system	8.8E-05	NA	--	8.8E-05
			Toxicity Equivalency (Dioxins/Furans) - Mam	2.3E-06	NA	0.0E+00	NA	2.3E-06		--	NA	--	
			CHEMICAL TOTAL	2.4E-06	--	2.1E-07	--	3E-06		5.3E-03	0.0E+00	8.1E-03	1E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-06					1E-02
	EXPOSURE MEDIUM TOTAL							3E-06					1E-02
SURFACE WATER TOTAL								3E-06					1E-02

TABLE 9.28.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	MANTON POND	Acenaphthylene	NC	NA	NA	NA		Liver	1.3E-06	NA	NA	1.3E-06
			Dibenzo(a,h)anthracene	5.4E-08	NA	NA	NA	5.4E-08	Kidney	1.4E-06	NA	NA	1.4E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	3.2E-05	NA	NA	3.2E-05
			4,4'-DDE	1.4E-07	NA	NA	NA	1.4E-07	Liver	4.7E-03	NA	NA	4.7E-03
			alpha-Chlordane	3.0E-08	NA	NA	NA	3.0E-08	Liver	1.0E-03	NA	NA	1.0E-03
			Aroclor-1254	1.4E-05	NA	NA	NA	1.4E-05	Immune system	2.1E+00	NA	NA	2.1E+00
			Aroclor-1268	4.4E-06	NA	NA	NA	4.4E-06	Immune system	6.5E-01	NA	NA	6.5E-01
			Dieldrin	3.0E-07	NA	NA	NA	3.0E-07	Liver	2.2E-03	NA	NA	2.2E-03
			Endosulfan Sulfate	NC	NA	NA	NA		Kidney	6.1E-05	NA	NA	6.1E-05
			gamma-Chlordane	1.1E-08	NA	NA	NA	1.1E-08	Liver	3.7E-04	NA	NA	3.7E-04
			Technical Chlordane	7.5E-07	NA	NA	NA	7.5E-07	Liver	2.5E-02	NA	NA	2.5E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Mercury	NC	NA	NA	NA		Immune system	1.7E-01	NA	NA	1.7E-01
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	5.3E-01	NA	NA	5.3E-01
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.5E-04	NA	NA	NA	1.5E-04		--	NA	NA	
			CHEMICAL TOTAL	1.7E-04	--	--	--	2E-04		3.5E+00	0.0E+00	--	3E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-04					3E+00
	EXPOSURE MEDIUM TOTAL							2E-04					3E+00
COMBINED FISH DIET TOTAL								2E-04					3E+00
RECEPTOR TOTAL								2E-04					3.5E+00
							TOTAL RISK ACROSS ALL MEDIA	2E-04				TOTAL HAZARD ACROSS ALL MEDIA	3.5E+00

NOTES.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

	--
TOTAL CARDIOVASCULAR SYSTEM HI =	1.0E-04
TOTAL DEVELOPMENTAL TOXICITY HI =	5.3E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	1.4E-04
TOTAL IMMUNE SYSTEM HI =	2.9E+00
TOTAL KIDNEY HI =	2.8E-04
TOTAL LIVER HI =	3.7E-02
	--
TOTAL NERVOUS SYSTEM HI =	3.2E-05
TOTAL NOAEL HI =	8.7E-03
	--
TOTAL SKIN HI =	2.4E-03
	--

Prepared by: KJA
Checked by: RAR

TABLE 9.29.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	MANTON POND	Benzo(a)anthracene	8 9E-09	NA	8 3E-09	NA	1.7E-08	Kidney	2.4E-06	NA	2.2E-06	4.6E-06
			Benzo(a)pyrene	1 1E-07	NA	1.0E-07	NA	2.1E-07	Kidney	2 9E-06	NA	2.7E-06	5.6E-06
			Benzo(b)fluoranthene	1 9E-08	NA	1 8E-08	NA	3 7E-08	Kidney	5 1E-06	NA	4.7E-06	9 8E-06
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	1 7E-06	NA	1.6E-06	3 4E-06
			Benzo(k)fluoranthene	5 9E-10	NA	5.5E-10	NA	1.1E-09	Kidney	1 6E-06	NA	1 5E-06	3 1E-06
			bis(2-Ethylhexyl)phthalate	2 5E-10	NA	1.8E-10	NA	4.2E-10	Liver	5.1E-06	NA	3.6E-06	8 8E-06
			Indeno(1,2,3-cd)pyrene	8 6E-09	NA	8 0E-09	NA	1 7E-08	Kidney	2 3E-06	NA	2.1E-06	4 4E-06
			Phenanthrene	NC	NA	NC	NA		Kidney	2 4E-06	NA	2.2E-06	4 6E-06
			alpha-Chlordane	5.7E-11	NA	1.6E-11	NA	7 3E-11	Liver	1.9E-06	NA	5.4E-07	2.4E-06
			gamma-Chlordane	7.1E-11	NA	2.0E-11	NA	9 2E-11	Liver	2.4E-06	NA	6.8E-07	3 1E-06
			Arsenic	5.9E-08	NA	1.3E-08	NA	7.2E-08	Skin	7.7E-04	NA	1.6E-04	9 3E-04
			Cadmium	NC	NA	NC	NA		Kidney	2.3E-04	NA	6.5E-05	2.9E-04
			Chromium	NC	NA	NC	NA		NOAEL	1.5E-03	NA		1.5E-03
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	7.3E-04	NA		7.3E-04
			Vanadium	NC	NA	NC	NA		NOAEL	2.4E-04	NA		2.4E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	6 1E-06	NA	1 3E-06	NA	7.4E-06		--	NA	--	
			CHEMICAL TOTAL	6.3E-06	--	1.5E-06	--	8E-06		3.5E-03	0.0E+00	2 5E-04	4E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						8E-06					4E-03
	EXPOSURE MEDIUM TOTAL							8E-06					4E-03
SEDIMENT TOTAL								8E-06					4E-03
SURFACE WATER	SURFACE WATER	MANTON POND	Acenaphthylene	NC	NA	NC	NA		Liver	3 5E-09	NA	--	3 5E-09
			bis(2-Ethylhexyl)phthalate	6.5E-09	NA	2.0E-07	NA	2 0E-07	Liver	1.3E-04	NA	4.1E-03	4.2E-03
			Aldrin	1.1E-08	NA	1 9E-08	NA	2.9E-08	Liver	1 2E-04	NA	2.1E-04	3.3E-04
			alpha-Chlordane	1.8E-10	NA	7.4E-09	NA	7.5E-09	Liver	6.0E-06	NA	2.5E-04	2 5E-04
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	8.4E-08	NA	--	8 4E-08
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	2.6E-06	NA	3.6E-05	3.9E-05
			gamma-Chlordane	2.0E-10	NA	8.1E-09	NA	8.3E-09	Liver	6.6E-06	NA	2.7E-04	2.8E-04
			Arsenic	1 9E-07	NA	2 3E-08	NA	2.1E-07	Skin	2.4E-03	NA	3.0E-04	2.7E-03
			Barium	NC	NA	NC	NA		Cardiovascular system	4.7E-05	NA	8.5E-05	1 3E-04
			Chromium	NC	NA	NC	NA		NOAEL	1.2E-04	NA	1 2E-03	1.3E-03
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	8 6E-04	NA	2.7E-03	3 5E-03
			Mercury	NC	NA	NC	NA		Immune system	2 1E-06	NA	3 7E-06	5.8E-06
			Thallium	NC	NA	NC	NA		NOAEL	4 4E-03	NA	5 4E-04	4 9E-03
			Nitrate	NC	NA	NC	NA		Hematological system	7 6E-05	NA	--	7.6E-05
			Nitrite-N	NC	NA	NC	NA		Hematological system	1 4E-04	NA	--	1.4E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.5E-06	NA	0.0E+00	NA	3.5E-06		--	NA	--	
			CHEMICAL TOTAL	3.7E-06	--	2.5E-07	--	4E-06		8 3E-03	0.0E+00	9.6E-03	2E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-06					2E-02
	EXPOSURE MEDIUM TOTAL							4E-06					2E-02
SURFACE WATER TOTAL								4E-06					2E-02

TABLE 9.29.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	MANTON POND	Acenaphthylene	NC	NA	NA	NA		Liver	1.4E-06	NA	NA	1.4E-06
			Dibenzo(a,h)anthracene	5.6E-08	NA	NA	NA	5.6E-08	Kidney	1.5E-06	NA	NA	1.5E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	3.3E-05	NA	NA	3.3E-05
			4,4'-DDE	1.4E-07	NA	NA	NA	1.4E-07	Liver	4.9E-03	NA	NA	4.9E-03
			alpha-Chlordane	3.1E-08	NA	NA	NA	3.1E-08	Liver	1.0E-03	NA	NA	1.0E-03
			Aroclor-1254	1.5E-05	NA	NA	NA	1.5E-05	Immune system	2.2E+00	NA	NA	2.2E+00
			Aroclor-1268	4.6E-06	NA	NA	NA	4.6E-06	Immune system	6.7E-01	NA	NA	6.7E-01
			Dieldrin	3.1E-07	NA	NA	NA	3.1E-07	Liver	2.3E-03	NA	NA	2.3E-03
			Endosulfan Sulfate	NC	NA	NA	NA		Kidney	6.3E-05	NA	NA	6.3E-05
			gamma-Chlordane	1.1E-08	NA	NA	NA	1.1E-08	Liver	3.8E-04	NA	NA	3.8E-04
			Technical Chlordane	7.7E-07	NA	NA	NA	7.7E-07	Liver	2.6E-02	NA	NA	2.6E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Mercury	NC	NA	NA	NA		Immune system	1.7E-01	NA	NA	1.7E-01
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	5.5E-01	NA	NA	5.5E-01
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.6E-04	NA	NA	NA	1.6E-04		--	NA	NA	
			CHEMICAL TOTAL	1.8E-04	--	--	--	2E-04		3.6E+00	0.0E+00	--	4E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-04					4E+00
	EXPOSURE MEDIUM TOTAL							2E-04					4E+00
COMBINED FISH DIET TOTAL								2E-04					4E+00

RECEPTOR TOTAL	2E-04		3.6E+00
TOTAL RISK ACROSS ALL MEDIA	2E-04	TOTAL HAZARD ACROSS ALL MEDIA	3.6E+00

NOTES.
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

	--
TOTAL CARDIOVASCULAR SYSTEM HI =	1.3E-04
TOTAL DEVELOPMENTAL TOXICITY HI =	5.5E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	2.1E-04
TOTAL IMMUNE SYSTEM HI =	3.0E+00
TOTAL KIDNEY HI =	4.3E-04
TOTAL LIVER HI =	3.9E-02
	--
TOTAL NERVOUS SYSTEM HI =	3.9E-05
TOTAL NOAEL HI =	1.2E-02
	--
TOTAL SKIN HI =	3.7E-03
	--

Prepared by: KJA
Checked by: RAR

TABLE 9.30.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	MANTON POND	Benzo(a)anthracene	3.6E-08	NA	1.3E-08	NA	4.9E-08	Kidney	1.9E-05	NA	6.9E-06	2.6E-05
			Benzo(a)pyrene	4.4E-07	NA	1.6E-07	NA	6.0E-07	Kidney	2.3E-05	NA	8.5E-06	3.2E-05
			Benzo(b)fluoranthene	7.6E-08	NA	2.8E-08	NA	1.0E-07	Kidney	4.1E-05	NA	1.5E-05	5.5E-05
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	1.4E-05	NA	5.1E-06	1.9E-05
			Benzo(k)fluoranthene	2.4E-09	NA	8.7E-10	NA	3.2E-09	Kidney	1.3E-05	NA	4.6E-06	1.7E-05
			bis(2-Ethylhexyl)phthalate	9.8E-10	NA	2.7E-10	NA	1.3E-09	Liver	4.1E-05	NA	1.1E-05	5.2E-05
			Indeno(1,2,3-cd)pyrene	3.4E-08	NA	1.3E-08	NA	4.7E-08	Kidney	1.8E-05	NA	6.7E-06	2.5E-05
			Phenanthrene	NC	NA	NC	NA		Kidney	1.9E-05	NA	6.9E-06	2.6E-05
			alpha-Chlordane	2.3E-10	NA	2.6E-11	NA	2.5E-10	Liver	1.5E-05	NA	1.7E-06	1.7E-05
			gamma-Chlordane	2.8E-10	NA	3.2E-11	NA	3.2E-10	Liver	1.9E-05	NA	2.1E-06	2.1E-05
			Arsenic	2.4E-07	NA	2.0E-08	NA	2.6E-07	Skin	6.1E-03	NA	5.2E-04	6.7E-03
			Cadmium	NC	NA	NC	NA		Kidney	1.8E-03	NA	2.0E-04	2.0E-03
			Chromium	NC	NA	NC	NA		NOAEL	1.2E-02	NA		1.2E-02
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	5.9E-03	NA		5.9E-03
			Vanadium	NC	NA	NC	NA		NOAEL	1.9E-03	NA		1.9E-03
			Toxicity Equivalency (Dioxins/Furans) - Mam	2.4E-05	NA	2.0E-06	NA	2.6E-05		--	NA	--	
			CHEMICAL TOTAL	2.5E-05	--	2.3E-06	--	3E-05		2.8E-02	0.0E+00	7.9E-04	3E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-05					3E-02
	EXPOSURE MEDIUM TOTAL							3E-05					3E-02
SEDIMENT TOTAL								3E-05					3E-02
SURFACE WATER	SURFACE WATER	MANTON POND	Acenaphthylene	NC	NA	NC	NA		Liver	1.0E-08	NA	--	1.0E-08
			bis(2-Ethylhexyl)phthalate	9.7E-09	NA	1.3E-07	NA	1.4E-07	Liver	4.0E-04	NA	5.2E-03	5.6E-03
			Aldrin	1.6E-08	NA	1.2E-08	NA	2.8E-08	Liver	3.6E-04	NA	2.7E-04	6.4E-04
			alpha-Chlordane	2.7E-10	NA	4.7E-09	NA	5.0E-09	Liver	1.8E-05	NA	3.2E-04	3.3E-04
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	2.5E-07	NA	--	2.5E-07
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	7.9E-06	NA	4.7E-05	5.5E-05
			gamma-Chlordane	3.0E-10	NA	5.2E-09	NA	5.5E-09	Liver	2.0E-05	NA	3.5E-04	3.7E-04
			Arsenic	2.8E-07	NA	1.5E-08	NA	3.0E-07	Skin	7.3E-03	NA	3.9E-04	7.7E-03
			Barium	NC	NA	NC	NA		Cardiovascular system	1.4E-04	NA	1.1E-04	2.5E-04
			Chromium	NC	NA	NC	NA		NOAEL	3.6E-04	NA	1.6E-03	1.9E-03
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	2.6E-03	NA	3.4E-03	6.0E-03
			Mercury	NC	NA	NC	NA		Immune system	6.2E-06	NA	4.8E-06	1.1E-05
			Thallium	NC	NA	NC	NA		NOAEL	1.3E-02	NA	7.0E-04	1.4E-02
			Nitrate	NC	NA	NC	NA		Hematological system	2.3E-04	NA	--	2.3E-04
			Nitrite-N	NC	NA	NC	NA		Hematological system	4.1E-04	NA	--	4.1E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	5.3E-06	NA	0.0E+00	NA	5.3E-06		--	NA	--	
			CHEMICAL TOTAL	5.6E-06	--	1.6E-07	--	6E-06		2.5E-02	0.0E+00	1.2E-02	4E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						6E-06					4E-02
	EXPOSURE MEDIUM TOTAL							6E-06					4E-02
SURFACE WATER TOTAL								6E-06					4E-02

TABLE 9.30.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	MANTON POND	Acenaphthylene	NC	NA	NA	NA		Liver	2.1E-06	NA	NA	2.1E-06
			Dibenzo(a,h)anthracene	4.2E-08	NA	NA	NA	4 2E-08	Kidney	2.3E-06	NA	NA	2.3E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	5.0E-05	NA	NA	5 0E-05
			4,4'-DDE	1.1E-07	NA	NA	NA	1.1E-07	Liver	7.4E-03	NA	NA	7 4E-03
			alpha-Chlordane	2.4E-08	NA	NA	NA	2.4E-08	Liver	1.6E-03	NA	NA	1 6E-03
			Aroclor-1254	1.1E-05	NA	NA	NA	1.1E-05	Immune system	3.3E+00	NA	NA	3 3E+00
			Aroclor-1268	3.5E-06	NA	NA	NA	3.5E-06	Immune system	1.0E+00	NA	NA	1 0E+00
			Dieldrin	2 3E-07	NA	NA	NA	2 3E-07	Liver	3.4E-03	NA	NA	3 4E-03
			Endosulfan Sulfate	NC	NA	NA	NA		Kidney	9.5E-05	NA	NA	9 5E-05
			gamma-Chlordane	8 7E-09	NA	NA	NA	8.7E-09	Liver	5 8E-04	NA	NA	5 8E-04
			Technical Chlordane	5.9E-07	NA	NA	NA	5.9E-07	Liver	3 9E-02	NA	NA	3 9E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Mercury	NC	NA	NA	NA		Immune system	2 6E-01	NA	NA	2.6E-01
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	8.4E-01	NA	NA	8.4E-01
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.2E-04	NA	NA	NA	1.2E-04		--	NA	NA	
			CHEMICAL TOTAL	1.4E-04	--	--	--	1E-04		5.5E+00	0.0E+00	--	5E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-04					5E+00
	EXPOSURE MEDIUM TOTAL							1E-04					5E+00
COMBINED FISH DIET TOTAL								1E-04					5E+00
RECEPTOR TOTAL								2E-04					5.5E+00
							TOTAL RISK ACROSS ALL MEDIA	2E-04				TOTAL HAZARD ACROSS ALL MEDIA	5.5E+00

NOTES.
NC - Not carcinogenic by this exposure route
NA - Not applicable; exposure route not applicable for this chemical/exposure medium
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

	--
TOTAL CARDIOVASCULAR SYSTEM HI =	2.5E-04
TOTAL DEVELOPMENTAL TOXICITY HI =	8.4E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	6.4E-04
TOTAL IMMUNE SYSTEM HI =	4.6E+00
TOTAL KIDNEY HI =	2.4E-03
TOTAL LIVER HI =	5.9E-02
	--
TOTAL NERVOUS SYSTEM HI =	5.5E-05
TOTAL NOAEL HI =	4.1E-02
	--
TOTAL SKIN HI =	1.4E-02
	--

Prepared by KJA
Checked by. RAR

TABLE 9.31.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	DYERVILLE POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	3.9E-08	NA	3.5E-08	7.4E-08
			Acenaphthylene	NC	NA	NC	NA		Liver	1.1E-07	NA	1.0E-07	2.2E-07
			Benzo(a)anthracene	8.3E-09	NA	7.3E-09	NA	1.6E-08	Kidney	2.2E-06	NA	2.0E-06	4.2E-06
			Benzo(a)pyrene	7.0E-08	NA	6.2E-08	NA	1.3E-07	Kidney	1.9E-06	NA	1.7E-06	3.5E-06
			Benzo(b)fluoranthene	1.3E-08	NA	1.1E-08	NA	2.4E-08	Kidney	3.4E-06	NA	3.0E-06	6.4E-06
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	1.4E-06	NA	1.2E-06	2.6E-06
			Benzo(k)fluoranthene	3.5E-10	NA	3.1E-10	NA	6.6E-10	Kidney	9.3E-07	NA	8.3E-07	1.8E-06
			bis(2-Ethylhexyl)phthalate	9.8E-11	NA	6.6E-11	NA	1.6E-10	Liver	2.0E-06	NA	1.4E-06	3.4E-06
			Dibenzo(a,h)anthracene	1.0E-08	NA	9.0E-09	NA	1.9E-08	Kidney	2.7E-07	NA	2.4E-07	5.1E-07
			Indeno(1,2,3-cd)pyrene	6.4E-09	NA	5.6E-09	NA	1.2E-08	Kidney	1.7E-06	NA	1.5E-06	3.2E-06
			Phenanthrene	NC	NA	NC	NA		Kidney	2.5E-06	NA	2.2E-06	4.6E-06
			alpha-Chlordane	1.7E-11	NA	4.6E-12	NA	2.1E-11	Liver	5.6E-07	NA	1.5E-07	7.1E-07
			Aroclor-1254	1.1E-08	NA	1.1E-08	NA	2.2E-08	Immune system	1.7E-03	NA	1.6E-03	3.2E-03
			Dieldrin	2.1E-09	NA	1.4E-09	NA	3.5E-09	Liver	1.5E-05	NA	1.0E-05	2.6E-05
			Endosulfan sulfate	NC	NA	NC	NA		Kidney	4.7E-08	NA	3.2E-08	7.8E-08
			Arsenic	1.4E-08	NA	2.8E-09	NA	1.7E-08	Skin	1.8E-04	NA	3.6E-05	2.1E-04
			Cadmium	NC	NA	NC	NA		Kidney	1.0E-04	NA	2.8E-05	1.3E-04
			Chromium	NC	NA	NC	NA		NOAEL	3.3E-03	NA		3.3E-03
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	2.1E-04	NA		2.1E-04
			Mercury	NC	NA	NC	NA		Immune system	9.0E-05	NA		9.0E-05
			Nickel	NC	NA	NC	NA		Developmental toxicity	4.5E-05	NA		4.5E-05
			Vanadium	NC	NA	NC	NA		NOAEL	1.0E-04	NA		1.0E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	9.9E-08	NA	2.0E-08	NA	1.2E-07		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	1.7E-11	NA	3.4E-12	NA	2.0E-11		--	NA	--	
			CHEMICAL TOTAL	2.3E-07	--	1.3E-07	--	4E-07		5.7E-03	0.0E+00	1.7E-03	7E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-07					7E-03
	EXPOSURE MEDIUM TOTAL							4E-07					7E-03
SEDIMENT TOTAL								4E-07					7E-03
SURFACE WATER	SURFACE WATER	DYERVILLE POND	Acenaphthylene	NC	NA	NC	NA		Liver	5.6E-11	NA	--	5.6E-11
			bis(2-Ethylhexyl)phthalate	1.0E-10	NA	4.4E-08	NA	4.4E-08	Liver	2.2E-06	NA	9.1E-04	9.1E-04
			Aldrin	1.7E-10	NA	4.2E-09	NA	4.3E-09	Liver	2.0E-06	NA	4.8E-05	5.0E-05
			alpha-Chlordane	2.9E-12	NA	1.6E-09	NA	1.7E-09	Liver	9.7E-08	NA	5.5E-05	5.5E-05
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	1.4E-09	NA	--	1.4E-09
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	4.2E-08	NA	8.2E-06	8.2E-06
			gamma-Chlordane	3.2E-12	NA	1.8E-09	NA	1.8E-09	Liver	1.1E-07	NA	6.1E-05	6.1E-05
			Arsenic	3.0E-09	NA	5.2E-09	NA	8.2E-09	Skin	3.9E-05	NA	6.8E-05	1.1E-04
			Barium	NC	NA	NC	NA		Cardiovascular system	7.6E-07	NA	1.9E-05	2.0E-05
			Chromium	NC	NA	NC	NA		NOAEL	2.0E-06	NA	2.7E-04	2.7E-04
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	1.4E-05	NA	6.0E-04	6.1E-04
			Mercury	NC	NA	NC	NA		Immune system	3.3E-08	NA	8.3E-07	8.6E-07
			Thallium	NC	NA	NC	NA		NOAEL	7.0E-05	NA	1.2E-04	1.9E-04
			Nitrate	NC	NA	NC	NA		Hematological system	1.2E-06	NA	--	1.2E-06
			Nitrite-N	NC	NA	NC	NA		Hematological system	2.2E-06	NA	--	2.2E-06

TABLE 9.31.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Toxicity Equivalency (Dioxins/Furans) - Mam	5.6E-08	NA	0.0E+00	NA	5.6E-08		--	NA	--	
			CHEMICAL TOTAL	6.0E-08	--	5.7E-08	--	1E-07		1.3E-04	0.0E+00	2.2E-03	2E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-07					2E-03
	EXPOSURE MEDIUM TOTAL							1E-07					2E-03
SURFACE WATER TOTAL								1E-07					2E-03
BIOTA	COMBINED FISH DIET	DYERVILLE POND	Acenaphthylene	NC	NA	NA	NA		Liver	3.0E-06	NA	NA	3.0E-06
			Dibenzo(a,h)anthracene	4.1E-08	NA	NA	NA	4.1E-08	Kidney	1.1E-06	NA	NA	1.1E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	4.0E-05	NA	NA	4.0E-05
			4,4'-DDD	3.2E-07	NA	NA	NA	3.2E-07	Liver	1.6E-02	NA	NA	1.6E-02
			4,4'-DDE	1.6E-07	NA	NA	NA	1.6E-07	Liver	5.7E-03	NA	NA	5.7E-03
			4,4'-DDT	1.6E-07	NA	NA	NA	1.6E-07	Liver	5.6E-03	NA	NA	5.6E-03
			alpha-Chlordane	2.2E-07	NA	NA	NA	2.2E-07	Liver	7.3E-03	NA	NA	7.3E-03
			Aroclor-1254	3.0E-05	NA	NA	NA	3.0E-05	Immune system	4.3E+00	NA	NA	4.3E+00
			Dieldrin	5.7E-06	NA	NA	NA	5.7E-06	Liver	4.2E-02	NA	NA	4.2E-02
			gamma-Chlordane	7.8E-08	NA	NA	NA	7.8E-08	Liver	2.6E-03	NA	NA	2.6E-03
			Heptachlor Epoxide	6.8E-07	NA	NA	NA	6.8E-07	Liver	3.4E-02	NA	NA	3.4E-02
			Technical Chlordane	4.5E-06	NA	NA	NA	4.5E-06	Liver	1.5E-01	NA	NA	1.5E-01
			Cadmium	NC	NA	NA	NA		Kidney	5.0E-02	NA	NA	5.0E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Manganese	NC	NA	NA	NA		NOAEL	3.2E-02	NA	NA	3.2E-02
			Mercury	NC	NA	NA	NA		Immune system	7.2E-02	NA	NA	7.2E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	2.3E-01	NA	NA	2.3E-01
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.7E-04	NA	NA	NA	3.7E-04		--	NA	NA	
			CHEMICAL TOTAL	4.1E-04	--	--	--	4E-04		5.0E+00	0.0E+00	--	5.0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-04					5.0E+00
	EXPOSURE MEDIUM TOTAL							4E-04					5.0E+00
COMBINED FISH DIET TOTAL								4E-04					5.0E+00
RECEPTOR TOTAL								4E-04					5.0E+00
							TOTAL RISK ACROSS ALL MEDIA	4E-04	TOTAL HAZARD ACROSS ALL MEDIA				5.0E+00

TABLE 9.31.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL

NOTES:
NC - Not carcinogenic by this exposure route
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: AWS

	--
TOTAL CARDIOVASCULAR SYSTEM HI =	2.0E-05
TOTAL DEVELOPMENTAL TOXICITY HI =	2.3E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	3.4E-06
TOTAL IMMUNE SYSTEM HI =	4.4E+00
TOTAL KIDNEY HI =	5.0E-02
TOTAL LIVER HI =	2.6E-01
	--
TOTAL NERVOUS SYSTEM HI =	8.2E-06
TOTAL NOAEL HI =	3.6E-02
	--
TOTAL SKIN HI =	3.2E-04
	--

TABLE 9.32.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	DYERVILLE POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	6.1E-08	NA	1.1E-07	1.8E-07
			Acenaphthylene	NC	NA	NC	NA		Liver	1.8E-07	NA	3.3E-07	5.1E-07
			Benzo(a)anthracene	1.3E-08	NA	2.4E-08	NA	3.7E-08	Kidney	3.4E-06	NA	6.4E-06	9.8E-06
			Benzo(a)pyrene	1.1E-07	NA	2.0E-07	NA	3.1E-07	Kidney	2.9E-06	NA	5.4E-06	8.3E-06
			Benzo(b)fluoranthene	2.0E-08	NA	3.7E-08	NA	5.7E-08	Kidney	5.3E-06	NA	9.8E-06	1.5E-05
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	2.1E-06	NA	3.9E-06	6.0E-06
			Benzo(k)fluoranthene	5.4E-10	NA	1.0E-09	NA	1.6E-09	Kidney	1.5E-06	NA	2.7E-06	4.1E-06
			bis(2-Ethylhexyl)phthalate	1.5E-10	NA	2.2E-10	NA	3.7E-10	Liver	3.2E-06	NA	4.5E-06	7.7E-06
			Dibenzo(a,h)anthracene	1.6E-08	NA	2.9E-08	NA	4.5E-08	Kidney	4.2E-07	NA	7.8E-07	1.2E-06
			Indeno(1,2,3-cd)pyrene	9.9E-09	NA	1.8E-08	NA	2.8E-08	Kidney	2.6E-06	NA	4.9E-06	7.5E-06
			Phenanthrene	NC	NA	NC	NA		Kidney	3.8E-06	NA	7.1E-06	1.1E-05
			alpha-Chlordane	2.6E-11	NA	1.5E-11	NA	4.1E-11	Liver	8.7E-07	NA	5.0E-07	1.4E-06
			Aroclor-1254	1.8E-08	NA	3.5E-08	NA	5.3E-08	Immune system	2.6E-03	NA	5.1E-03	7.7E-03
			Dieldrin	3.3E-09	NA	4.7E-09	NA	7.9E-09	Liver	2.4E-05	NA	3.4E-05	5.8E-05
			Endosulfan sulfate	NC	NA	NC	NA		Kidney	7.3E-08	NA	1.0E-07	1.8E-07
			Arsenic	2.1E-08	NA	9.2E-09	NA	3.1E-08	Skin	2.8E-04	NA	1.2E-04	4.0E-04
			Cadmium	NC	NA	NC	NA		Kidney	1.6E-04	NA	9.1E-05	2.5E-04
			Chromium	NC	NA	NC	NA		NOAEL	5.1E-03	NA		5.1E-03
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	3.3E-04	NA		3.3E-04
			Mercury	NC	NA	NC	NA		Immune system	1.4E-04	NA		1.4E-04
			Nickel	NC	NA	NC	NA		Developmental toxicity	6.9E-05	NA		6.9E-05
			Vanadium	NC	NA	NC	NA		NOAEL	1.6E-04	NA		1.6E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.5E-07	NA	6.6E-08	NA	2.2E-07		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	2.6E-11	NA	1.1E-11	NA	3.7E-11		--	NA	--	
			CHEMICAL TOTAL	3.7E-07	--	4.3E-07	--	8E-07		8.8E-03	0.0E+00	5.4E-03	1E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						8E-07					1E-02
	EXPOSURE MEDIUM TOTAL							8E-07					1E-02
SEDIMENT TOTAL								8E-07					1E-02
SURFACE WATER	SURFACE WATER	DYERVILLE POND	Acenaphthylene	NC	NA	NC	NA		Liver	8.7E-11	NA	--	8.7E-11
			bis(2-Ethylhexyl)phthalate	1.6E-10	NA	4.9E-08	NA	4.9E-08	Liver	3.4E-06	NA	1.0E-03	1.0E-03
			Aldrin	2.7E-10	NA	4.7E-09	NA	4.9E-09	Liver	3.0E-06	NA	5.3E-05	5.6E-05
			alpha-Chlordane	4.5E-12	NA	1.8E-09	NA	1.9E-09	Liver	1.5E-07	NA	6.2E-05	6.2E-05
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	2.1E-09	NA	--	2.1E-09
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	6.6E-08	NA	9.1E-06	9.2E-06
			gamma-Chlordane	5.0E-12	NA	2.0E-09	NA	2.0E-09	Liver	1.7E-07	NA	6.8E-05	6.8E-05
			Arsenic	4.7E-09	NA	5.9E-09	NA	1.1E-08	Skin	6.1E-05	NA	7.6E-05	1.4E-04
			Barium	NC	NA	NC	NA		Cardiovascular system	1.2E-06	NA	2.1E-05	2.2E-05
			Chromium	NC	NA	NC	NA		NOAEL	3.0E-06	NA	3.0E-04	3.1E-04
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	2.1E-05	NA	6.7E-04	6.9E-04
			Mercury	NC	NA	NC	NA		Immune system	5.2E-08	NA	9.3E-07	9.8E-07
			Thallium	NC	NA	NC	NA		NOAEL	1.1E-04	NA	1.4E-04	2.5E-04
			Nitrate	NC	NA	NC	NA		Hematological system	1.9E-06	NA	--	1.9E-06
			Nitrite-N	NC	NA	NC	NA		Hematological system	3.4E-06	NA	--	3.4E-06

TABLE 9.32.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Toxicity Equivalency (Dioxins/Furans) - Mam	8.8E-08	NA	0.0E+00	NA	8.8E-08		--	NA	--	
			CHEMICAL TOTAL	9 3E-08	--	6.3E-08	--	2E-07		2.1E-04	0.0E+00	2.4E-03	3E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-07					3E-03
	EXPOSURE MEDIUM TOTAL							2E-07					3E-03
SURFACE WATER TOTAL								2E-07					3E-03
BIOTA	COMBINED FISH DIET	DYERVILLE POND	Acenaphthylene	NC	NA	NA	NA		Liver	3.1E-06	NA	NA	3.1E-06
			Dibenzo(a,h)anthracene	4 2E-08	NA	NA	NA	4 2E-08	Kidney	1 1E-06	NA	NA	1 1E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	4 2E-05	NA	NA	4.2E-05
			4,4'-DDD	3 3E-07	NA	NA	NA	3.3E-07	Liver	1 6E-02	NA	NA	1 6E-02
			4,4'-DDE	1 7E-07	NA	NA	NA	1.7E-07	Liver	5.8E-03	NA	NA	5 8E-03
			4,4'-DDT	1 7E-07	NA	NA	NA	1.7E-07	Liver	5 8E-03	NA	NA	5 8E-03
			alpha-Chlordane	2 3E-07	NA	NA	NA	2.3E-07	Liver	7.6E-03	NA	NA	7.6E-03
			Aroclor-1254	3.1E-05	NA	NA	NA	3 1E-05	Immune system	4 5E+00	NA	NA	4 5E+00
			Dieldrin	5 9E-06	NA	NA	NA	5 9E-06	Liver	4 3E-02	NA	NA	4.3E-02
			gamma-Chlordane	8.1E-08	NA	NA	NA	8.1E-08	Liver	2 7E-03	NA	NA	2 7E-03
			Heptachlor Epoxide	7.0E-07	NA	NA	NA	7 0E-07	Liver	3.5E-02	NA	NA	3 5E-02
			Technical Chlordane	4.6E-06	NA	NA	NA	4 6E-06	Liver	1 5E-01	NA	NA	1 5E-01
			Cadmium	NC	NA	NA	NA		Kidney	5.2E-02	NA	NA	5 2E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Manganese	NC	NA	NA	NA		NOAEL	3.3E-02	NA	NA	3 3E-02
			Mercury	NC	NA	NA	NA		Immune system	7.5E-02	NA	NA	7 5E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	2.4E-01	NA	NA	2 4E-01
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.9E-04	NA	NA	NA	3.9E-04		--	NA	NA	
			CHEMICAL TOTAL	4 3E-04	--	--	--	4E-04		5.1E+00	0 0E+00	--	5.1E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-04					5 1E+00
	EXPOSURE MEDIUM TOTAL							4E-04					5.1E+00
COMBINED FISH DIET TOTAL								4E-04					5.1E+00
RECEPTOR TOTAL								4E-04					5.1E+00
							TOTAL RISK ACROSS ALL MEDIA	4E-04	TOTAL HAZARD ACROSS ALL MEDIA				5.1E+00

TABLE 9.32.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
													--
									TOTAL CARDIOVASCULAR SYSTEM HI =				2.3E-05
									TOTAL DEVELOPMENTAL TOXICITY HI =				2.4E-01
													--
													--
													--
									TOTAL HEMATOLOGICAL SYSTEM HI =				5.3E-06
									TOTAL IMMUNE SYSTEM HI =				4.5E+00
									TOTAL KIDNEY HI =				5.2E-02
									TOTAL LIVER HI =				2.7E-01
													--
									TOTAL NERVOUS SYSTEM HI =				9.2E-06
									TOTAL NOAEL HI =				3.9E-02
													--
									TOTAL SKIN HI =				5.3E-04
													--

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: AWS

TABLE 9.34.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	DYERVILLE POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	2.4E-07	NA	1.0E-07	3.4E-07
			Acenaphthylene	NC	NA	NC	NA		Liver	6.9E-07	NA	3.0E-07	9.9E-07
			Benzo(a)anthracene	5.0E-08	NA	2.2E-08	NA	7.2E-08	Kidney	1.3E-05	NA	5.9E-06	1.9E-05
			Benzo(a)pyrene	4.2E-07	NA	1.9E-07	NA	6.1E-07	Kidney	1.1E-05	NA	5.0E-06	1.6E-05
			Benzo(b)fluoranthene	7.6E-08	NA	3.4E-08	NA	1.1E-07	Kidney	2.0E-05	NA	9.0E-06	2.9E-05
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	8.1E-06	NA	3.6E-06	1.2E-05
			Benzo(k)fluoranthene	2.1E-09	NA	9.3E-10	NA	3.0E-09	Kidney	5.6E-06	NA	2.5E-06	8.1E-06
			bis(2-Ethylhexyl)phthalate	5.9E-10	NA	2.0E-10	NA	7.9E-10	Liver	1.2E-05	NA	4.2E-06	1.6E-05
			Dibenzo(a,h)anthracene	6.1E-08	NA	2.7E-08	NA	8.8E-08	Kidney	1.6E-06	NA	7.2E-07	2.3E-06
			Indeno(1,2,3-cd)pyrene	3.8E-08	NA	1.7E-08	NA	5.5E-08	Kidney	1.0E-05	NA	4.5E-06	1.5E-05
			Phenanthrene	NC	NA	NC	NA		Kidney	1.5E-05	NA	6.5E-06	2.1E-05
			alpha-Chlordane	1.0E-10	NA	1.4E-11	NA	1.1E-10	Liver	3.4E-06	NA	4.6E-07	3.8E-06
			Aroclor-1254	6.8E-08	NA	3.2E-08	NA	1.0E-07	Immune system	9.9E-03	NA	4.7E-03	1.5E-02
			Dieldrin	1.3E-08	NA	4.3E-09	NA	1.7E-08	Liver	9.2E-05	NA	3.1E-05	1.2E-04
			Endosulfan sulfate	NC	NA	NC	NA		Kidney	2.8E-07	NA	9.5E-08	3.8E-07
			Arsenic	8.2E-08	NA	8.4E-09	NA	9.1E-08	Skin	1.1E-03	NA	1.1E-04	1.2E-03
			Cadmium	NC	NA	NC	NA		Kidney	6.1E-04	NA	8.3E-05	6.9E-04
			Chromium	NC	NA	NC	NA		NOAEL	2.0E-02	NA		2.0E-02
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	1.3E-03	NA		1.3E-03
			Mercury	NC	NA	NC	NA		Immune system	5.4E-04	NA		5.4E-04
			Nickel	NC	NA	NC	NA		Developmental toxicity	2.7E-04	NA		2.7E-04
			Vanadium	NC	NA	NC	NA		NOAEL	6.2E-04	NA		6.2E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	6.0E-07	NA	6.1E-08	NA	6.6E-07		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	9.9E-11	NA	1.0E-11	NA	1.1E-10		--	NA	--	
			CHEMICAL TOTAL	1.4E-06	--	3.9E-07	--	2E-06		3.4E-02	0.0E+00	5.0E-03	4E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-06					4E-02
	EXPOSURE MEDIUM TOTAL							2E-06					4E-02
SEDIMENT TOTAL								2E-06					4E-02
SURFACE WATER	SURFACE WATER	DYERVILLE POND	Acenaphthylene	NC	NA	NC	NA		Liver	2.2E-09	NA	--	2.2E-09
			bis(2-Ethylhexyl)phthalate	4.2E-09	NA	1.6E-07	NA	1.7E-07	Liver	8.6E-05	NA	3.4E-03	3.5E-03
			Aldrin	6.8E-09	NA	1.6E-08	NA	2.2E-08	Liver	7.8E-05	NA	1.8E-04	2.6E-04
			alpha-Chlordane	1.2E-10	NA	6.2E-09	NA	6.3E-09	Liver	3.9E-06	NA	2.1E-04	2.1E-04
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	5.4E-08	NA	--	5.4E-08
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	1.7E-06	NA	3.1E-05	3.2E-05
			gamma-Chlordane	1.3E-10	NA	6.8E-09	NA	7.0E-09	Liver	4.3E-06	NA	2.3E-04	2.3E-04
			Arsenic	1.2E-07	NA	2.0E-08	NA	1.4E-07	Skin	1.6E-03	NA	2.5E-04	1.8E-03
			Barium	NC	NA	NC	NA		Cardiovascular system	3.1E-05	NA	7.1E-05	1.0E-04
			Chromium	NC	NA	NC	NA		NOAEL	7.8E-05	NA	1.0E-03	1.1E-03
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	5.5E-04	NA	2.2E-03	2.8E-03
			Mercury	NC	NA	NC	NA		Immune system	1.3E-06	NA	3.1E-06	4.4E-06
			Thallium	NC	NA	NC	NA		NOAEL	2.8E-03	NA	4.6E-04	3.3E-03
			Nitrate	NC	NA	NC	NA		Hematological system	4.9E-05	NA	--	4.9E-05
			Nitrite-N	NC	NA	NC	NA		Hematological system	8.8E-05	NA	--	8.8E-05

TABLE 9.34.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Toxicity Equivalency (Dioxins/Furans) - Mam	2.3E-06	NA	0.0E+00	NA	2.3E-06		--	NA	--	
			CHEMICAL TOTAL	2.4E-06	--	2.1E-07	--	3E-06		5.3E-03	0.0E+00	8.1E-03	1E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-06					1E-02
	EXPOSURE MEDIUM TOTAL							3E-06					1E-02
SURFACE WATER TOTAL								3E-06					1E-02
BIOTA	COMBINED FISH DIET	DYERVILLE POND	Acenaphthylene	NC	NA	NA	NA		Liver	3.0E-06	NA	NA	3.0E-06
			Dibenzo(a,h)anthracene	4.1E-08	NA	NA	NA	4.1E-08	Kidney	1.1E-06	NA	NA	1.1E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	4.0E-05	NA	NA	4.0E-05
			4,4'-DDD	3.2E-07	NA	NA	NA	3.2E-07	Liver	1.6E-02	NA	NA	1.6E-02
			4,4'-DDE	1.6E-07	NA	NA	NA	1.6E-07	Liver	5.7E-03	NA	NA	5.7E-03
			4,4'-DDT	1.6E-07	NA	NA	NA	1.6E-07	Liver	5.6E-03	NA	NA	5.6E-03
			alpha-Chlordane	2.2E-07	NA	NA	NA	2.2E-07	Liver	7.3E-03	NA	NA	7.3E-03
			Aroclor-1254	3.0E-05	NA	NA	NA	3.0E-05	Immune system	4.3E+00	NA	NA	4.3E+00
			Dieldrin	5.7E-06	NA	NA	NA	5.7E-06	Liver	4.2E-02	NA	NA	4.2E-02
			gamma-Chlordane	7.8E-08	NA	NA	NA	7.8E-08	Liver	2.6E-03	NA	NA	2.6E-03
			Heptachlor Epoxide	6.8E-07	NA	NA	NA	6.8E-07	Liver	3.4E-02	NA	NA	3.4E-02
			Technical Chlordane	4.5E-06	NA	NA	NA	4.5E-06	Liver	1.5E-01	NA	NA	1.5E-01
			Cadmium	NC	NA	NA	NA		Kidney	5.0E-02	NA	NA	5.0E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Manganese	NC	NA	NA	NA		NOAEL	3.2E-02	NA	NA	3.2E-02
			Mercury	NC	NA	NA	NA		Immune system	7.2E-02	NA	NA	7.2E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	2.3E-01	NA	NA	2.3E-01
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.7E-04	NA	NA	NA	3.7E-04		--	NA	NA	
			CHEMICAL TOTAL	4.1E-04	--	--	--	4E-04		5.0E+00	0.0E+00	--	5.0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-04					5.0E+00
	EXPOSURE MEDIUM TOTAL							4E-04					5.0E+00
COMBINED FISH DIET TOTAL								4E-04					5.0E+00
RECEPTOR TOTAL								4E-04					5.0E+00
							TOTAL RISK ACROSS ALL MEDIA	4E-04	TOTAL HAZARD ACROSS ALL MEDIA				5.0E+00

TABLE 9.34.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

Prepared by KJA
Checked by: AWS

	--
TOTAL CARDIOVASCULAR SYSTEM HI =	1.0E-04
TOTAL DEVELOPMENTAL TOXICITY HI =	2.3E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	1.4E-04
TOTAL IMMUNE SYSTEM HI =	4.4E+00
TOTAL KIDNEY HI =	5.1E-02
TOTAL LIVER HI =	2.7E-01
	--
TOTAL NERVOUS SYSTEM HI =	3.2E-05
TOTAL NOAEL HI =	6.0E-02
	--
TOTAL SKIN HI =	3.0E-03
	--

TABLE 9.35.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	DYERVILLE POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	3.7E-07	NA	3 4E-07	7 1E-07
			Acenaphthylene	NC	NA	NC	NA		Liver	1.1E-06	NA	9 9E-07	2.1E-06
			Benzo(a)anthracene	7 7E-08	NA	7.2E-08	NA	1.5E-07	Kidney	2 1E-05	NA	1 9E-05	4 0E-05
			Benzo(a)pyrene	6.5E-07	NA	6.1E-07	NA	1 3E-06	Kidney	1.7E-05	NA	1.6E-05	3 4E-05
			Benzo(b)fluoranthene	1 2E-07	NA	1.1E-07	NA	2.3E-07	Kidney	3.2E-05	NA	2.9E-05	6 1E-05
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	1.3E-05	NA	1 2E-05	2.4E-05
			Benzo(k)fluoranthene	3.3E-09	NA	3.0E-09	NA	6 3E-09	Kidney	8.7E-06	NA	8.1E-06	1.7E-05
			bis(2-Ethylhexyl)phthalate	9.1E-10	NA	6.5E-10	NA	1 6E-09	Liver	1.9E-05	NA	1.4E-05	3 3E-05
			Dibenzo(a,h)anthracene	9.5E-08	NA	8.8E-08	NA	1.8E-07	Kidney	2.5E-06	NA	2.4E-06	4 9E-06
			Indeno(1,2,3-cd)pyrene	5.9E-08	NA	5.5E-08	NA	1.1E-07	Kidney	1.6E-05	NA	1.5E-05	3 1E-05
			Phenanthrene	NC	NA	NC	NA		Kidney	2.3E-05	NA	2.1E-05	4 4E-05
			alpha-Chlordane	1.6E-10	NA	4.5E-11	NA	2.0E-10	Liver	5.2E-06	NA	1 5E-06	6.7E-06
			Aroclor-1254	1 1E-07	NA	1.1E-07	NA	2 1E-07	Immune system	1 5E-02	NA	1.5E-02	3.1E-02
			Dieldrin	2.0E-08	NA	1.4E-08	NA	3.4E-08	Liver	1.4E-04	NA	1.0E-04	2.4E-04
			Endosulfan sulfate	NC	NA	NC	NA		Kidney	4.4E-07	NA	3.1E-07	7 5E-07
			Arsenic	1.3E-07	NA	2.7E-08	NA	1.6E-07	Skin	1.7E-03	NA	3.6E-04	2.0E-03
			Cadmium	NC	NA	NC	NA		Kidney	9.5E-04	NA	2.7E-04	1 2E-03
			Chromium	NC	NA	NC	NA		NOAEL	3 0E-02	NA		3.0E-02
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	2.0E-03	NA		2.0E-03
			Mercury	NC	NA	NC	NA		Immune system	8.4E-04	NA		8 4E-04
			Nickel	NC	NA	NC	NA		Developmental toxicity	4.2E-04	NA		4.2E-04
			Vanadium	NC	NA	NC	NA		NOAEL	9 6E-04	NA		9 6E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	9.3E-07	NA	2.0E-07	NA	1.1E-06		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	1.5E-10	NA	3 3E-11	NA	1.9E-10		--	NA	--	
			CHEMICAL TOTAL	2 2E-06	--	1 3E-06	--	3E-06		5 3E-02	0.0E+00	1.6E-02	7E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-06					7E-02
	EXPOSURE MEDIUM TOTAL							3E-06					7E-02
SEDIMENT TOTAL								3E-06					7E-02
SURFACE WATER	SURFACE WATER	DYERVILLE POND	Acenaphthylene	NC	NA	NC	NA		Liver	3.5E-09	NA	--	3 5E-09
			bis(2-Ethylhexyl)phthalate	6.5E-09	NA	2 0E-07	NA	2 0E-07	Liver	1.3E-04	NA	4.1E-03	4 2E-03
			Aldrin	1 1E-08	NA	1 9E-08	NA	2.9E-08	Liver	1.2E-04	NA	2.1E-04	3 3E-04
			alpha-Chlordane	1.8E-10	NA	7 4E-09	NA	7 5E-09	Liver	6.0E-06	NA	2 5E-04	2 5E-04
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	8.4E-08	NA	--	8.4E-08
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	2.6E-06	NA	3 6E-05	3.9E-05
			gamma-Chlordane	2 0E-10	NA	8.1E-09	NA	8 3E-09	Liver	6 6E-06	NA	2.7E-04	2.8E-04
			Arsenic	1.9E-07	NA	2.3E-08	NA	2.1E-07	Skin	2.4E-03	NA	3.0E-04	2.7E-03
			Barium	NC	NA	NC	NA		Cardiovascular system	4.7E-05	NA	8 5E-05	1 3E-04
			Chromium	NC	NA	NC	NA		NOAEL	1.2E-04	NA	1.2E-03	1.3E-03
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	8.6E-04	NA	2 7E-03	3 5E-03
			Mercury	NC	NA	NC	NA		Immune system	2 1E-06	NA	3.7E-06	5.8E-06
			Thallium	NC	NA	NC	NA		NOAEL	4.4E-03	NA	5.4E-04	4 9E-03
			Nitrate	NC	NA	NC	NA		Hematological system	7.6E-05	NA	--	7 6E-05
			Nitrite-N	NC	NA	NC	NA		Hematological system	1.4E-04	NA	--	1 4E-04

TABLE 9.35.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.5E-06	NA	0.0E+00	NA	3.5E-06		--	NA	--	
			CHEMICAL TOTAL	3.7E-06	--	2.5E-07	--	4E-06		8 3E-03	0.0E+00	9 6E-03	2E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-06					2E-02
	EXPOSURE MEDIUM TOTAL							4E-06					2E-02
SURFACE WATER TOTAL								4E-06					2E-02
BIOTA	COMBINED FISH DIET	DYERVILLE POND	Acenaphthylene	NC	NA	NA	NA		Liver	3.1E-06	NA	NA	3 1E-06
			Dibenzo(a,h)anthracene	4.2E-08	NA	NA	NA	4.2E-08	Kidney	1.1E-06	NA	NA	1.1E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	4.2E-05	NA	NA	4.2E-05
			4,4'-DDD	3 3E-07	NA	NA	NA	3.3E-07	Liver	1 6E-02	NA	NA	1 6E-02
			4,4'-DDE	1.7E-07	NA	NA	NA	1 7E-07	Liver	5 8E-03	NA	NA	5 8E-03
			4,4'-DDT	1 7E-07	NA	NA	NA	1 7E-07	Liver	5 8E-03	NA	NA	5 8E-03
			alpha-Chlordane	2.3E-07	NA	NA	NA	2.3E-07	Liver	7 6E-03	NA	NA	7 6E-03
			Aroclor-1254	3.1E-05	NA	NA	NA	3.1E-05	Immune system	4 5E+00	NA	NA	4 5E+00
			Dieldrin	5 9E-06	NA	NA	NA	5 9E-06	Liver	4.3E-02	NA	NA	4 3E-02
			gamma-Chlordane	8.1E-08	NA	NA	NA	8 1E-08	Liver	2.7E-03	NA	NA	2 7E-03
			Heptachlor Epoxide	7 0E-07	NA	NA	NA	7 0E-07	Liver	3.5E-02	NA	NA	3 5E-02
			Technical Chlordane	4.6E-06	NA	NA	NA	4 6E-06	Liver	1.5E-01	NA	NA	1 5E-01
			Cadmium	NC	NA	NA	NA		Kidney	5.2E-02	NA	NA	5 2E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Manganese	NC	NA	NA	NA		NOAEL	3.3E-02	NA	NA	3.3E-02
			Mercury	NC	NA	NA	NA		Immune system	7.5E-02	NA	NA	7.5E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	2 4E-01	NA	NA	2 4E-01
			Toxicity Equivalency (Dioxins/Furans) - Mam	3 9E-04	NA	NA	NA	3.9E-04		--	NA	NA	
			CHEMICAL TOTAL	4 3E-04	--	--	--	4E-04		5.1E+00	0.0E+00	--	5.1E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-04					5.1E+00
	EXPOSURE MEDIUM TOTAL							4E-04					5.1E+00
COMBINED FISH DIET TOTAL								4E-04					5.1E+00
RECEPTOR TOTAL								4E-04					5.2E+00
							TOTAL RISK ACROSS ALL MEDIA	4E-04	TOTAL HAZARD ACROSS ALL MEDIA				5.2E+00

TABLE 9.35.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL

NOTES
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: AWS

	--
TOTAL CARDIOVASCULAR SYSTEM HI =	1.3E-04
TOTAL DEVELOPMENTAL TOXICITY HI =	2.4E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	2.1E-04
TOTAL IMMUNE SYSTEM HI =	4.6E+00
TOTAL KIDNEY HI =	5.3E-02
TOTAL LIVER HI =	2.7E-01
	--
TOTAL NERVOUS SYSTEM HI =	3.9E-05
TOTAL NOAEL HI =	7.6E-02
	--
TOTAL SKIN HI =	4.7E-03
	--

TABLE 9.36.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	DYERVILLE POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	2.9E-06	NA	1.1E-06	4.0E-06
			Acenaphthylene	NC	NA	NC	NA		Liver	8.5E-06	NA	3.1E-06	1.2E-05
			Benzo(a)anthracene	3.1E-07	NA	1.1E-07	NA	4.2E-07	Kidney	1.6E-04	NA	6.0E-05	2.2E-04
			Benzo(a)pyrene	2.6E-06	NA	9.5E-07	NA	3.6E-06	Kidney	1.4E-04	NA	5.1E-05	1.9E-04
			Benzo(b)fluoranthene	4.8E-07	NA	1.7E-07	NA	6.5E-07	Kidney	2.5E-04	NA	9.2E-05	3.5E-04
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	1.0E-04	NA	3.7E-05	1.4E-04
			Benzo(k)fluoranthene	1.3E-08	NA	4.8E-09	NA	1.8E-08	Kidney	7.0E-05	NA	2.5E-05	9.5E-05
			bis(2-Ethylhexyl)phthalate	3.6E-09	NA	1.0E-09	NA	4.7E-09	Liver	1.5E-04	NA	4.3E-05	1.9E-04
			Dibenzo(a,h)anthracene	3.8E-07	NA	1.4E-07	NA	5.2E-07	Kidney	2.0E-05	NA	7.4E-06	2.8E-05
			Indeno(1,2,3-cd)pyrene	2.4E-07	NA	8.7E-08	NA	3.2E-07	Kidney	1.3E-04	NA	4.6E-05	1.7E-04
			Phenanthrene	NC	NA	NC	NA		Kidney	1.8E-04	NA	6.7E-05	2.5E-04
			alpha-Chlordane	6.3E-10	NA	7.0E-11	NA	7.0E-10	Liver	4.2E-05	NA	4.7E-06	4.6E-05
			Aroclor-1254	4.2E-07	NA	1.7E-07	NA	5.9E-07	Immune system	1.2E-01	NA	4.8E-02	1.7E-01
			Dieldrin	7.8E-08	NA	2.2E-08	NA	1.0E-07	Liver	1.1E-03	NA	3.2E-04	1.5E-03
			Endosulfan sulfate	NC	NA	NC	NA		Kidney	3.5E-06	NA	9.8E-07	4.5E-06
			Arsenic	5.1E-07	NA	4.3E-08	NA	5.6E-07	Skin	1.3E-02	NA	1.1E-03	1.4E-02
			Cadmium	NC	NA	NC	NA		Kidney	7.6E-03	NA	8.5E-04	8.4E-03
			Chromium	NC	NA	NC	NA		NOAEL	2.4E-01	NA		2.4E-01
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	1.6E-02	NA		1.6E-02
			Mercury	NC	NA	NC	NA		Immune system	6.7E-03	NA		6.7E-03
			Nickel	NC	NA	NC	NA		Developmental toxicity	3.3E-03	NA		3.3E-03
			Vanadium	NC	NA	NC	NA		NOAEL	7.7E-03	NA		7.7E-03
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.7E-06	NA	3.1E-07	NA	4.0E-06		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	6.2E-10	NA	5.2E-11	NA	6.7E-10		--	NA	--	
			CHEMICAL TOTAL	8.8E-06	--	2.0E-06	--	1E-05		4.2E-01	0.0E+00	5.1E-02	5E-01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-05					5E-01
	EXPOSURE MEDIUM TOTAL							1E-05					5E-01
SEDIMENT TOTAL								1E-05					5E-01
SURFACE WATER	SURFACE WATER	DYERVILLE POND	Acenaphthylene	NC	NA	NC	NA		Liver	1.0E-08	NA	--	1.0E-08
			bis(2-Ethylhexyl)phthalate	9.7E-09	NA	1.3E-07	NA	1.4E-07	Liver	4.0E-04	NA	5.2E-03	5.6E-03
			Aldrin	1.6E-08	NA	1.2E-08	NA	2.8E-08	Liver	3.6E-04	NA	2.7E-04	6.4E-04
			alpha-Chlordane	2.7E-10	NA	4.7E-09	NA	5.0E-09	Liver	1.8E-05	NA	3.2E-04	3.3E-04
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	2.5E-07	NA	--	2.5E-07
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	7.9E-06	NA	4.7E-05	5.5E-05
			gamma-Chlordane	3.0E-10	NA	5.2E-09	NA	5.5E-09	Liver	2.0E-05	NA	3.5E-04	3.7E-04
			Arsenic	2.8E-07	NA	1.5E-08	NA	3.0E-07	Skin	7.3E-03	NA	3.9E-04	7.7E-03
			Barium	NC	NA	NC	NA		Cardiovascular system	1.4E-04	NA	1.1E-04	2.5E-04
			Chromium	NC	NA	NC	NA		NOAEL	3.6E-04	NA	1.6E-03	1.9E-03
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	2.6E-03	NA	3.4E-03	6.0E-03
			Mercury	NC	NA	NC	NA		Immune system	6.2E-06	NA	4.8E-06	1.1E-05
			Thallium	NC	NA	NC	NA		NOAEL	1.3E-02	NA	7.0E-04	1.4E-02
			Nitrate	NC	NA	NC	NA		Hematological system	2.3E-04	NA	--	2.3E-04
			Nitrite-N	NC	NA	NC	NA		Hematological system	4.1E-04	NA	--	4.1E-04

TABLE 9.36.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Toxicity Equivalency (Dioxins/Furans) - Mam	5.3E-06	NA	0.0E+00	NA	5.3E-06		--	NA	--	
			CHEMICAL TOTAL	5.6E-06	--	1.6E-07	--	6E-06		2.5E-02	0.0E+00	1.2E-02	4E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						6E-06					4E-02
	EXPOSURE MEDIUM TOTAL							6E-06					4E-02
SURFACE WATER TOTAL								6E-06					4E-02
BIOTA	COMBINED FISH DIET	DYERVILLE POND	Acenaphthylene	NC	NA	NA	NA		Liver	4.7E-06	NA	NA	4.7E-06
			Dibenzo(a,h)anthracene	3.2E-08	NA	NA	NA	3.2E-08	Kidney	1.7E-06	NA	NA	1.7E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	6.3E-05	NA	NA	6.3E-05
			4,4'-DDD	2.5E-07	NA	NA	NA	2.5E-07	Liver	2.4E-02	NA	NA	2.4E-02
			4,4'-DDE	1.3E-07	NA	NA	NA	1.3E-07	Liver	8.9E-03	NA	NA	8.9E-03
			4,4'-DDT	1.3E-07	NA	NA	NA	1.3E-07	Liver	8.8E-03	NA	NA	8.8E-03
			alpha-Chlordane	1.7E-07	NA	NA	NA	1.7E-07	Liver	1.2E-02	NA	NA	1.2E-02
			Aroclor-1254	2.3E-05	NA	NA	NA	2.3E-05	Immune system	6.8E+00	NA	NA	6.8E+00
			Dieldrin	4.5E-06	NA	NA	NA	4.5E-06	Liver	6.5E-02	NA	NA	6.5E-02
			gamma-Chlordane	6.1E-08	NA	NA	NA	6.1E-08	Liver	4.1E-03	NA	NA	4.1E-03
			Heptachlor Epoxide	5.3E-07	NA	NA	NA	5.3E-07	Liver	5.3E-02	NA	NA	5.3E-02
			Technical Chlordane	3.5E-06	NA	NA	NA	3.5E-06	Liver	2.3E-01	NA	NA	2.3E-01
			Cadmium	NC	NA	NA	NA		Kidney	7.8E-02	NA	NA	7.8E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Manganese	NC	NA	NA	NA		NOAEL	4.9E-02	NA	NA	4.9E-02
			Mercury	NC	NA	NA	NA		Immune system	1.1E-01	NA	NA	1.1E-01
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	3.7E-01	NA	NA	3.7E-01
			Toxicity Equivalency (Dioxins/Furans) - Mam	2.9E-04	NA	NA	NA	2.9E-04		--	NA	NA	
			CHEMICAL TOTAL	3.2E-04	--	--	--	3E-04		7.8E+00	0.0E+00	--	7.8E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-04					7.8E+00
	EXPOSURE MEDIUM TOTAL							3E-04					7.8E+00
COMBINED FISH DIET TOTAL								3E-04					7.8E+00
RECEPTOR TOTAL								3E-04					8.3E+00
							TOTAL RISK ACROSS ALL MEDIA	3E-04	TOTAL HAZARD ACROSS ALL MEDIA				8.3E+00

TABLE 9.36.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
													--
									TOTAL CARDIOVASCULAR SYSTEM HI =				2.6E-04
									TOTAL DEVELOPMENTAL TOXICITY HI =				3.7E-01
													--
													--
													--
									TOTAL HEMATOLOGICAL SYSTEM HI =				6.4E-04
									TOTAL IMMUNE SYSTEM HI =				7.0E+00
									TOTAL KIDNEY HI =				8.8E-02
									TOTAL LIVER HI =				4.2E-01
													--
									TOTAL NERVOUS SYSTEM HI =				5.5E-05
									TOTAL NOAEL HI =				3.4E-01
													--
									TOTAL SKIN HI =				2.2E-02
													--

NOTES.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by; KJA
Checked by: AWS

TABLE 9.37.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - COMMERCIAL / INDUSTRIAL WORKER - ADULT - FOGARTY CENTER
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: COMMERCIAL / INDUSTRIAL WORKER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SOIL	SOIL	FOGARTY CENTER	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	2.3E-05	NA	3.9E-05	6.2E-05
			Acenaphthylene	NC	NA	NC	NA		Liver	7.4E-07	NA	1.3E-06	2.0E-06
			Benzo(a)anthracene	5.6E-07	NA	9.6E-07	NA	1.5E-06	Kidney	7.1E-05	NA	1.2E-04	1.9E-04
			Benzo(a)pyrene	3.9E-06	NA	6.7E-06	NA	1.1E-05	Kidney	5.0E-05	NA	8.6E-05	1.4E-04
			Benzo(b)fluoranthene	3.9E-07	NA	6.8E-07	NA	1.1E-06	Kidney	5.0E-05	NA	8.6E-05	1.4E-04
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	3.1E-05	NA	5.3E-05	8.4E-05
			Dibenzo(a,h)anthracene	5.1E-07	NA	8.8E-07	NA	1.4E-06	Kidney	6.5E-06	NA	1.1E-05	1.8E-05
			Indeno(1,2,3-cd)pyrene	2.7E-07	NA	4.7E-07	NA	7.4E-07	Kidney	3.5E-05	NA	6.0E-05	9.5E-05
			Phenanthrene	NC	NA	NC	NA		Kidney	2.4E-04	NA	4.1E-04	6.5E-04
			alpha-Chlordane	3.3E-09	NA	1.7E-09	NA	5.0E-09	Liver	5.2E-05	NA	2.8E-05	8.0E-05
			Aroclor-1254	2.0E-07	NA	3.6E-07	NA	5.6E-07	Immune system	1.4E-02	NA	2.5E-02	3.9E-02
			Endosulfan II	NC	NA	NC	NA		Kidney	1.6E-06	NA	2.1E-06	3.6E-06
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	5.3E-08	NA	7.0E-08	1.2E-07
			gamma-Chlordane	2.8E-09	NA	1.5E-09	NA	4.3E-09	Liver	4.5E-05	NA	2.4E-05	6.8E-05
			Technical Chlordane	3.5E-08	NA	1.8E-08	NA	5.3E-08	Liver	5.5E-04	NA	2.9E-04	8.5E-04
			Aluminum	NC	NA	NC	NA		Developmental toxicity	7.3E-03	NA	--	7.3E-03
			Arsenic	1.8E-06	NA	7.2E-07	NA	2.5E-06	Skin	1.1E-02	NA	4.5E-03	1.6E-02
			Manganese	NC	NA	NC	NA		NOAEL	2.0E-03	NA	--	2.0E-03
			Mercury	NC	NA	NC	NA		Immune system	2.5E-04	NA	--	2.5E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.0E-07	NA	4.1E-08	NA	1.5E-07		--	NA	--	
			CHEMICAL TOTAL	7.8E-06	--	1.1E-05	--	2E-05		3.6E-02	0.0E+00	3.1E-02	7E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-05					7E-02
	EXPOSURE MEDIUM TOTAL							2E-05					7E-02
SOIL TOTAL								2E-05					7E-02
RECEPTOR TOTAL								2E-05					6.7E-02
							TOTAL RISK ACROSS ALL MEDIA	2E-05	TOTAL HAZARD ACROSS ALL MEDIA				6.7E-02

NOTES
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

	--
TOTAL CARDIOVASCULAR SYSTEM HI =	6.2E-05
	--
	--
	--
	--
	--
TOTAL IMMUNE SYSTEM HI =	3.9E-02
TOTAL KIDNEY HI =	1.3E-03
TOTAL LIVER HI =	1.0E-03
	--
	--
TOTAL NOAEL HI =	2.0E-03
	--
TOTAL SKIN HI =	1.6E-02
	--

Prepared by RAR
Checked by: KJA

TABLE 9.1.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	ASSAPUMPSET POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	5.4E-09	NA	1.4E-09	6.8E-09
			Acenaphthylene	NC	NA	NC	NA		Liver	5.8E-09	NA	1.5E-09	7.2E-09
			Benzo(a)anthracene	1.3E-10	NA	3.2E-11	NA	1.6E-10	Kidney	1.0E-07	NA	2.6E-08	1.3E-07
			Benzo(a)pyrene	1.3E-09	NA	3.3E-10	NA	1.6E-09	Kidney	1.0E-07	NA	2.6E-08	1.3E-07
			Benzo(b)fluoranthene	1.5E-10	NA	3.9E-11	NA	1.9E-10	Kidney	1.2E-07	NA	3.1E-08	1.5E-07
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	7.8E-08	NA	2.0E-08	9.8E-08
			Dibenzo(a,h)anthracene	3.7E-10	NA	9.3E-11	NA	4.6E-10	Kidney	2.9E-08	NA	7.4E-09	3.7E-08
			Indeno(1,2,3-cd)pyrene	1.1E-10	NA	2.7E-11	NA	1.3E-10	Kidney	8.4E-08	NA	2.1E-08	1.1E-07
			Phenanthrene	NC	NA	NC	NA		Kidney	1.1E-07	NA	2.7E-08	1.3E-07
			alpha-Chlordane	1.6E-13	NA	1.2E-14	NA	1.7E-13	Liver	1.6E-08	NA	1.2E-09	1.7E-08
			Aroclor-1254	2.1E-11	NA	5.8E-12	NA	2.7E-11	Immune system	9.4E-06	NA	2.6E-06	1.2E-05
			Aroclor-1268	1.5E-11	NA	4.2E-12	NA	2.0E-11	Immune system	6.8E-06	NA	1.8E-06	8.6E-06
			gamma-Chlordane	7.6E-14	NA	5.9E-15	NA	8.2E-14	Liver	7.6E-09	NA	5.9E-10	8.2E-09
			Technical Chlordane	1.3E-11	NA	1.0E-12	NA	1.4E-11	Liver	1.3E-06	NA	1.0E-07	1.4E-06
			Aluminum	NC	NA	NC	NA		Developmental toxicity	5.8E-05	NA	--	5.8E-05
			Arsenic	1.4E-09	NA	7.9E-11	NA	1.4E-09	Skin	5.3E-05	NA	3.1E-06	5.6E-05
			Cadmium	NC	NA	NC	NA		Kidney	2.2E-06	NA	1.7E-07	2.3E-06
			Chromium	NC	NA	NC	NA		NOAEL	2.0E-05	NA	--	2.0E-05
			Copper	NC	NA	NC	NA		Kidney	2.3E-06	NA	--	2.3E-06
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	5.9E-05	NA	--	5.9E-05
			Mercury	NC	NA	NC	NA		Immune system	1.0E-06	NA	--	1.0E-06
			Nickel	NC	NA	NC	NA		Developmental toxicity	3.0E-06	NA	--	3.0E-06
			Thallium	NC	NA	NC	NA		NOAEL	2.6E-05	NA	--	2.6E-05
			Vanadium	NC	NA	NC	NA		NOAEL	1.4E-05	NA	--	1.4E-05
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.9E-10	NA	1.1E-11	NA	2.0E-10		--	NA	--	
			CHEMICAL TOTAL	3.7E-09	--	6.2E-10	--	4E-09		2.6E-04	0.0E+00	7.9E-06	3E-04
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-09					3E-04
	EXPOSURE MEDIUM TOTAL							4E-09					3E-04
SEDIMENT TOTAL								4E-09					3E-04
SURFACE WATER	SURFACE WATER	ASSAPUMPSET POND	Arsenic	2.5E-11	NA	8.6E-11	NA	1.1E-10	Skin	9.6E-07	NA	3.3E-06	4.3E-06
			Manganese	NC	NA	NC	NA		NOAEL	3.3E-06	NA	2.9E-04	2.9E-04
			Mercury	NC	NA	NC	NA		Immune system	4.2E-09	NA	2.1E-07	2.1E-07
			Nitrite-N	NC	NA	NC	NA		Hematological system	3.0E-08	NA	--	3.0E-08
			Toxicity Equivalency (Dioxins/Furans) - Mam	2.7E-11	NA	0.0E+00	NA	2.7E-11		--	NA	--	
			CHEMICAL TOTAL	5.2E-11	--	8.6E-11	--	1E-10		4.3E-06	0.0E+00	2.9E-04	3E-04
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-10					3E-04
	EXPOSURE MEDIUM TOTAL							1E-10					3E-04
SURFACE WATER TOTAL								1E-10					3E-04

TABLE 9.1.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	ASSAPUMPSET POND	Acenaphthylene	NC	NA	NA	NA		Liver	1.4E-06	NA	NA	1.4E-06
			Benzo(a)anthracene	8.1E-09	NA	NA	NA	8.1E-09	Kidney	6.5E-06	NA	NA	6.5E-06
			Benzo(a)pyrene	8.1E-08	NA	NA	NA	8.1E-08	Kidney	6.5E-06	NA	NA	6.5E-06
			Benzo(b)fluoranthene	9.7E-09	NA	NA	NA	9.7E-09	Kidney	7.7E-06	NA	NA	7.7E-06
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	8.7E-06	NA	NA	8.7E-06
			Dibenzo(a,h)anthracene	3.3E-08	NA	NA	NA	3.3E-08	Kidney	2.6E-06	NA	NA	2.6E-06
			Indeno(1,2,3-cd)pyrene	7.1E-09	NA	NA	NA	7.1E-09	Kidney	5.7E-06	NA	NA	5.7E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	1.4E-05	NA	NA	1.4E-05
			4,4'-DDD	4.2E-09	NA	NA	NA	4.2E-09	Liver	6.2E-04	NA	NA	6.2E-04
			4,4'-DDE	2.8E-08	NA	NA	NA	2.8E-08	Liver	2.9E-03	NA	NA	2.9E-03
			alpha-Chlordane	3.7E-09	NA	NA	NA	3.7E-09	Liver	3.7E-04	NA	NA	3.7E-04
			Aroclor-1254	2.3E-07	NA	NA	NA	2.3E-07	Immune system	9.9E-02	NA	NA	9.9E-02
			Dieldrin	1.0E-07	NA	NA	NA	1.0E-07	Liver	2.2E-03	NA	NA	2.2E-03
			gamma-Chlordane	2.0E-09	NA	NA	NA	2.0E-09	Liver	2.0E-04	NA	NA	2.0E-04
			Heptachlor Epoxide	4.5E-08	NA	NA	NA	4.5E-08	Liver	6.7E-03	NA	NA	6.7E-03
			Technical Chlordane	2.3E-07	NA	NA	NA	2.3E-07	Liver	2.3E-02	NA	NA	2.3E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Mercury	NC	NA	NA	NA		Immune system	5.7E-02	NA	NA	5.7E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	1.2E-01	NA	NA	1.2E-01
			Zinc	NC	NA	NA	NA		Hematological system	4.5E-03	NA	NA	4.5E-03
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.6E-06	NA	NA	NA	1.6E-06		--	NA	NA	
			CHEMICAL TOTAL	2.4E-06	--	--	--	2E-06		3.2E-01	0.0E+00	--	3.2E-01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-06					3.2E-01
	EXPOSURE MEDIUM TOTAL							2E-06					3.2E-01
COMBINED FISH DIET TOTAL								2E-06					3.2E-01
RECEPTOR TOTAL								2E-06					3.2E-01
							TOTAL RISK ACROSS ALL MEDIA	2E-06	TOTAL HAZARD ACROSS ALL MEDIA				3.2E-01

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

	--
TOTAL CARDIOVASCULAR SYSTEM HI =	6.8E-09
TOTAL DEVELOPMENTAL TOXICITY HI =	1.2E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	4.5E-03
TOTAL IMMUNE SYSTEM HI =	1.6E-01
TOTAL KIDNEY HI =	5.7E-05
TOTAL LIVER HI =	3.6E-02
	--
	--
TOTAL NOAEL HI =	4.1E-04
	--
TOTAL SKIN HI =	6.0E-05
	--

Prepared by: KJA
Checked by: RAR

TABLE 9.2.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	ASSAPUMPSET POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	8.5E-09	NA	6.3E-09	1.5E-08
			Acenaphthylene	NC	NA	NC	NA		Liver	9.0E-09	NA	6.7E-09	1.6E-08
			Benzo(a)anthracene	1.5E-10	NA	1.1E-10	NA	2.6E-10	Kidney	1.6E-07	NA	1.2E-07	2.8E-07
			Benzo(a)pyrene	1.5E-09	NA	1.1E-09	NA	2.6E-09	Kidney	1.6E-07	NA	1.2E-07	2.8E-07
			Benzo(b)fluoranthene	1.8E-10	NA	1.3E-10	NA	3.1E-10	Kidney	1.9E-07	NA	1.4E-07	3.3E-07
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	1.2E-07	NA	9.1E-08	2.1E-07
			Dibenzo(a,h)anthracene	4.3E-10	NA	3.2E-10	NA	7.5E-10	Kidney	4.6E-08	NA	3.4E-08	8.0E-08
			Indeno(1,2,3-cd)pyrene	1.2E-10	NA	9.1E-11	NA	2.1E-10	Kidney	1.3E-07	NA	9.7E-08	2.3E-07
			Phenanthrene	NC	NA	NC	NA		Kidney	1.6E-07	NA	1.2E-07	2.9E-07
			alpha-Chlordane	1.8E-13	NA	4.2E-14	NA	2.2E-13	Liver	2.4E-08	NA	5.6E-09	3.0E-08
			Aroclor-1254	2.5E-11	NA	2.0E-11	NA	4.5E-11	Immune system	1.5E-05	NA	1.2E-05	2.6E-05
			Aroclor-1268	1.8E-11	NA	1.4E-11	NA	3.2E-11	Immune system	1.1E-05	NA	8.4E-06	1.9E-05
			gamma-Chlordane	8.9E-14	NA	2.0E-14	NA	1.1E-13	Liver	1.2E-08	NA	2.7E-09	1.5E-08
			Technical Chlordane	1.5E-11	NA	3.4E-12	NA	1.9E-11	Liver	2.0E-06	NA	4.6E-07	2.5E-06
			Aluminum	NC	NA	NC	NA		Developmental toxicity	9.0E-05	NA	--	9.0E-05
			Arsenic	1.6E-09	NA	2.7E-10	NA	1.9E-09	Skin	8.2E-05	NA	1.4E-05	9.6E-05
			Cadmium	NC	NA	NC	NA		Kidney	3.4E-06	NA	7.7E-07	4.2E-06
			Chromium	NC	NA	NC	NA		NOAEL	3.2E-05	NA	--	3.2E-05
			Copper	NC	NA	NC	NA		Kidney	3.6E-06	NA	--	3.6E-06
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	9.1E-05	NA	--	9.1E-05
			Mercury	NC	NA	NC	NA		Immune system	1.6E-06	NA	--	1.6E-06
			Nickel	NC	NA	NC	NA		Developmental toxicity	4.6E-06	NA	--	4.6E-06
			Thallium	NC	NA	NC	NA		NOAEL	4.0E-05	NA	--	4.0E-05
			Vanadium	NC	NA	NC	NA		NOAEL	2.2E-05	NA	--	2.2E-05
			Toxicity Equivalency (Dioxins/Furans) - Mam	2.2E-10	NA	3.8E-11	NA	2.6E-10		--	NA	--	
			CHEMICAL TOTAL	4.3E-09	--	2.1E-09	--	6E-09		4.0E-04	0.0E+00	3.6E-05	4E-04
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						6E-09					4E-04
	EXPOSURE MEDIUM TOTAL							6E-09					4E-04
SEDIMENT TOTAL								6E-09					4E-04
SURFACE WATER	SURFACE WATER	ASSAPUMPSET POND	Arsenic	2.9E-11	NA	7.2E-11	NA	1.0E-10	Skin	1.5E-06	NA	3.7E-06	5.2E-06
			Manganese	NC	NA	NC	NA		NOAEL	5.1E-06	NA	3.2E-04	3.3E-04
			Mercury	NC	NA	NC	NA		Immune system	6.5E-09	NA	2.3E-07	2.4E-07
			Nitrite-N	NC	NA	NC	NA		Hematological system	4.7E-08	NA	--	4.7E-08
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.1E-11	NA	0.0E+00	NA	3.1E-11		--	NA	--	
			CHEMICAL TOTAL	6.0E-11	--	7.2E-11	--	1E-10		6.7E-06	0.0E+00	3.3E-04	3E-04
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-10					3E-04
	EXPOSURE MEDIUM TOTAL							1E-10					3E-04
SURFACE WATER TOTAL								1E-10					3E-04

TABLE 9.2.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	ASSAPUMPSET POND	Acenaphthylene	NC	NA	NA	NA		Liver	1.5E-06	NA	NA	1.5E-06
			Benzo(a)anthracene	6.3E-09	NA	NA	NA	6.3E-09	Kidney	6.7E-06	NA	NA	6.7E-06
			Benzo(a)pyrene	6.3E-08	NA	NA	NA	6.3E-08	Kidney	6.7E-06	NA	NA	6.7E-06
			Benzo(b)fluoranthene	7.5E-09	NA	NA	NA	7.5E-09	Kidney	8.0E-06	NA	NA	8.0E-06
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	9.0E-06	NA	NA	9.0E-06
			Dibenzo(a,h)anthracene	2.5E-08	NA	NA	NA	2.5E-08	Kidney	2.7E-06	NA	NA	2.7E-06
			Indeno(1,2,3-cd)pyrene	5.5E-09	NA	NA	NA	5.5E-09	Kidney	5.9E-06	NA	NA	5.9E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	1.5E-05	NA	NA	1.5E-05
			4,4'-DDD	3.3E-09	NA	NA	NA	3.3E-09	Liver	6.4E-04	NA	NA	6.4E-04
			4,4'-DDE	2.1E-08	NA	NA	NA	2.1E-08	Liver	2.9E-03	NA	NA	2.9E-03
			alpha-Chlordane	2.8E-09	NA	NA	NA	2.8E-09	Liver	3.8E-04	NA	NA	3.8E-04
			Aroclor-1254	1.7E-07	NA	NA	NA	1.7E-07	Immune system	1.0E-01	NA	NA	1.0E-01
			Dieldrin	7.8E-08	NA	NA	NA	7.8E-08	Liver	2.3E-03	NA	NA	2.3E-03
			gamma-Chlordane	1.5E-09	NA	NA	NA	1.5E-09	Liver	2.0E-04	NA	NA	2.0E-04
			Heptachlor Epoxide	3.5E-08	NA	NA	NA	3.5E-08	Liver	6.9E-03	NA	NA	6.9E-03
			Technical Chlordane	1.8E-07	NA	NA	NA	1.8E-07	Liver	2.4E-02	NA	NA	2.4E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Mercury	NC	NA	NA	NA		Immune system	5.9E-02	NA	NA	5.9E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	1.3E-01	NA	NA	1.3E-01
			Zinc	NC	NA	NA	NA		Hematological system	4.7E-03	NA	NA	4.7E-03
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.2E-06	NA	NA	NA	1.2E-06		--	NA	NA	
			CHEMICAL TOTAL	1.8E-06	--	--	--	2E-06		3.3E-01	0.0E+00	--	3.3E-01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-06					3.3E-01
	EXPOSURE MEDIUM TOTAL							2E-06					3.3E-01
COMBINED FISH DIET TOTAL								2E-06					3.3E-01
RECEPTOR TOTAL								2E-06					3.3E-01
							TOTAL RISK ACROSS ALL MEDIA	2E-06	TOTAL HAZARD ACROSS ALL MEDIA				3.3E-01

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

	--
TOTAL CARDIOVASCULAR SYSTEM HI =	1.5E-08
TOTAL DEVELOPMENTAL TOXICITY HI =	1.3E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	4.7E-03
TOTAL IMMUNE SYSTEM HI =	1.6E-01
TOTAL KIDNEY HI =	6.3E-05
TOTAL LIVER HI =	3.7E-02
	--
	--
TOTAL NOAEL HI =	5.1E-04
	--
TOTAL SKIN HI =	1.0E-04
	--

TABLE 9.4.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- ADULT- COMBINED FISH DIET - ASSAPUPMSETT
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	ASSAPUMPSET POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	2.4E-08	NA	3.0E-09	2.7E-08
			Acenaphthylene	NC	NA	NC	NA		Liver	2.5E-08	NA	3.2E-09	2.8E-08
			Benzo(a)anthracene	5.5E-10	NA	7.0E-11	NA	6.2E-10	Kidney	4.4E-07	NA	5.6E-08	5.0E-07
			Benzo(a)pyrene	5.6E-09	NA	7.1E-10	NA	6.3E-09	Kidney	4.5E-07	NA	5.7E-08	5.1E-07
			Benzo(b)fluoranthene	6.7E-10	NA	8.4E-11	NA	7.5E-10	Kidney	5.3E-07	NA	6.8E-08	6.0E-07
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	3.4E-07	NA	4.3E-08	3.8E-07
			Dibenzo(a,h)anthracene	1.6E-09	NA	2.0E-10	NA	1.8E-09	Kidney	1.3E-07	NA	1.6E-08	1.4E-07
			Indeno(1,2,3-cd)pyrene	4.6E-10	NA	5.8E-11	NA	5.1E-10	Kidney	3.6E-07	NA	4.6E-08	4.1E-07
			Phenanthrene	NC	NA	NC	NA		Kidney	4.6E-07	NA	5.8E-08	5.2E-07
			alpha-Chlordane	6.8E-13	NA	2.6E-14	NA	7.0E-13	Liver	6.8E-08	NA	2.6E-09	7.0E-08
			Aroclor-1254	9.3E-11	NA	1.3E-11	NA	1.1E-10	Immune system	4.1E-05	NA	5.5E-06	4.6E-05
			Aroclor-1268	6.7E-11	NA	9.1E-12	NA	7.6E-11	Immune system	2.9E-05	NA	4.0E-06	3.3E-05
			gamma-Chlordane	3.3E-13	NA	1.3E-14	NA	3.4E-13	Liver	3.3E-08	NA	1.3E-09	3.4E-08
			Technical Chlordane	5.6E-11	NA	2.2E-12	NA	5.8E-11	Liver	5.6E-06	NA	2.2E-07	5.8E-06
			Aluminum	NC	NA	NC	NA		Developmental toxicity	2.5E-04	NA	--	2.5E-04
			Arsenic	5.9E-09	NA	1.7E-10	NA	6.1E-09	Skin	2.3E-04	NA	6.7E-06	2.4E-04
			Cadmium	NC	NA	NC	NA		Kidney	9.4E-06	NA	3.7E-07	9.8E-06
			Chromium	NC	NA	NC	NA		NOAEL	8.8E-05	NA	--	8.8E-05
			Copper	NC	NA	NC	NA		Kidney	1.0E-05	NA	--	1.0E-05
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	2.5E-04	NA	--	2.5E-04
			Mercury	NC	NA	NC	NA		Immune system	4.3E-06	NA	--	4.3E-06
			Nickel	NC	NA	NC	NA		Developmental toxicity	1.3E-05	NA	--	1.3E-05
			Thallium	NC	NA	NC	NA		NOAEL	1.1E-04	NA	--	1.1E-04
			Vanadium	NC	NA	NC	NA		NOAEL	6.2E-05	NA	--	6.2E-05
			Toxicity Equivalency (Dioxins/Furans) - Mam	8.3E-10	NA	2.4E-11	NA	8.5E-10		--	NA	--	
			CHEMICAL TOTAL	1.6E-08	--	1.3E-09	--	2E-08		1.1E-03	0.0E+00	1.7E-05	1E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-08					1E-03
	EXPOSURE MEDIUM TOTAL							2E-08					1E-03
SEDIMENT TOTAL								2E-08					1E-03
SURFACE WATER	SURFACE WATER	ASSAPUMPSET POND	Arsenic	1.1E-09	NA	4.9E-10	NA	1.6E-09	Skin	4.2E-05	NA	1.9E-05	6.1E-05
			Manganese	NC	NA	NC	NA		NOAEL	1.4E-04	NA	1.6E-03	1.8E-03
			Mercury	NC	NA	NC	NA		Immune system	1.8E-07	NA	1.2E-06	1.4E-06
			Nitrite-N	NC	NA	NC	NA		Hematological system	1.3E-06	NA	--	1.3E-06
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.2E-09	NA	0.0E+00	NA	1.2E-09		--	NA	--	
			CHEMICAL TOTAL	2.2E-09	--	4.9E-10	--	3E-09		1.9E-04	0.0E+00	1.7E-03	2E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-09					2E-03
	EXPOSURE MEDIUM TOTAL							3E-09					2E-03
SURFACE WATER TOTAL								3E-09					2E-03

TABLE 9.4.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- ADULT- COMBINED FISH DIET - ASSAPUPMSETT
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	ASSAPUMPSET POND	Acenaphthylene	NC	NA	NA	NA		Liver	1.4E-06	NA	NA	1.4E-06
			Benzo(a)anthracene	8.1E-09	NA	NA	NA	8.1E-09	Kidney	6.5E-06	NA	NA	6.5E-06
			Benzo(a)pyrene	8.1E-08	NA	NA	NA	8.1E-08	Kidney	6.5E-06	NA	NA	6.5E-06
			Benzo(b)fluoranthene	9.7E-09	NA	NA	NA	9.7E-09	Kidney	7.7E-06	NA	NA	7.7E-06
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	8.7E-06	NA	NA	8.7E-06
			Dibenzo(a,h)anthracene	3.3E-08	NA	NA	NA	3.3E-08	Kidney	2.6E-06	NA	NA	2.6E-06
			Indeno(1,2,3-cd)pyrene	7.1E-09	NA	NA	NA	7.1E-09	Kidney	5.7E-06	NA	NA	5.7E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	1.4E-05	NA	NA	1.4E-05
			4,4'-DDD	4.2E-09	NA	NA	NA	4.2E-09	Liver	6.2E-04	NA	NA	6.2E-04
			4,4'-DDE	2.8E-08	NA	NA	NA	2.8E-08	Liver	2.9E-03	NA	NA	2.9E-03
			alpha-Chlordane	3.7E-09	NA	NA	NA	3.7E-09	Liver	3.7E-04	NA	NA	3.7E-04
			Aroclor-1254	2.3E-07	NA	NA	NA	2.3E-07	Immune system	9.9E-02	NA	NA	9.9E-02
			Dieldrin	1.0E-07	NA	NA	NA	1.0E-07	Liver	2.2E-03	NA	NA	2.2E-03
			gamma-Chlordane	2.0E-09	NA	NA	NA	2.0E-09	Liver	2.0E-04	NA	NA	2.0E-04
			Heptachlor Epoxide	4.5E-08	NA	NA	NA	4.5E-08	Liver	6.7E-03	NA	NA	6.7E-03
			Technical Chlordane	2.3E-07	NA	NA	NA	2.3E-07	Liver	2.3E-02	NA	NA	2.3E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Mercury	NC	NA	NA	NA		Immune system	5.7E-02	NA	NA	5.7E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	1.2E-01	NA	NA	1.2E-01
			Zinc	NC	NA	NA	NA		Hematological system	4.5E-03	NA	NA	4.5E-03
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.6E-06	NA	NA	NA	1.6E-06		--	NA	NA	
			CHEMICAL TOTAL	2.4E-06	--	--	--	2E-06		3.2E-01	0.0E+00	--	3.2E-01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-06					3.2E-01
	EXPOSURE MEDIUM TOTAL							2E-06					3.2E-01
COMBINED FISH DIET TOTAL								2E-06					3.2E-01
RECEPTOR TOTAL								2E-06					3.2E-01
							TOTAL RISK ACROSS ALL MEDIA	2E-06	TOTAL HAZARD ACROSS ALL MEDIA				3.2E-01

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

	--
TOTAL CARDIOVASCULAR SYSTEM HI =	2.7E-08
TOTAL DEVELOPMENTAL TOXICITY HI =	1.2E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	4.5E-03
TOTAL IMMUNE SYSTEM HI =	1.6E-01
TOTAL KIDNEY HI =	7.5E-05
TOTAL LIVER HI =	3.6E-02
	--
	--
TOTAL NOAEL HI =	2.3E-03
	--
TOTAL SKIN HI =	3.0E-04
	--

Prepared by: RAR
Checked by: KJA

TABLE 9.5.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- OLDER CHILD- COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	ASSAPUMPSET POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	3.7E-08	NA	1.4E-08	5.0E-08
			Acenaphthylene	NC	NA	NC	NA		Liver	3.9E-08	NA	1.4E-08	5.3E-08
			Benzo(a)anthracene	6.4E-10	NA	2.4E-10	NA	8.8E-10	Kidney	6.9E-07	NA	2.5E-07	9.4E-07
			Benzo(a)pyrene	6.6E-09	NA	2.4E-09	NA	9.0E-09	Kidney	7.0E-07	NA	2.6E-07	9.6E-07
			Benzo(b)fluoranthene	7.8E-10	NA	2.9E-10	NA	1.1E-09	Kidney	8.3E-07	NA	3.1E-07	1.1E-06
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	5.3E-07	NA	2.0E-07	7.2E-07
			Dibenzo(a,h)anthracene	1.9E-09	NA	6.9E-10	NA	2.5E-09	Kidney	2.0E-07	NA	7.4E-08	2.7E-07
			Indeno(1,2,3-cd)pyrene	5.3E-10	NA	2.0E-10	NA	7.3E-10	Kidney	5.7E-07	NA	2.1E-07	7.8E-07
			Phenanthrene	NC	NA	NC	NA		Kidney	7.1E-07	NA	2.6E-07	9.8E-07
			alpha-Chlordane	7.9E-13	NA	9.0E-14	NA	8.8E-13	Liver	1.1E-07	NA	1.2E-08	1.2E-07
			Aroclor-1254	1.1E-10	NA	4.3E-11	NA	1.5E-10	Immune system	6.3E-05	NA	2.5E-05	8.9E-05
			Aroclor-1268	7.8E-11	NA	3.1E-11	NA	1.1E-10	Immune system	4.6E-05	NA	1.8E-05	6.4E-05
			gamma-Chlordane	3.9E-13	NA	4.4E-14	NA	4.3E-13	Liver	5.1E-08	NA	5.9E-09	5.7E-08
			Technical Chlordane	6.5E-11	NA	7.5E-12	NA	7.3E-11	Liver	8.7E-06	NA	1.0E-06	9.7E-06
			Aluminum	NC	NA	NC	NA		Developmental toxicity	3.9E-04	NA	--	3.9E-04
			Arsenic	6.9E-09	NA	5.9E-10	NA	7.5E-09	Skin	3.6E-04	NA	3.1E-05	3.9E-04
			Cadmium	NC	NA	NC	NA		Kidney	1.5E-05	NA	1.7E-06	1.6E-05
			Chromium	NC	NA	NC	NA		NOAEL	1.4E-04	NA	--	1.4E-04
			Copper	NC	NA	NC	NA		Kidney	1.6E-05	NA	--	1.6E-05
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	4.0E-04	NA	--	4.0E-04
			Mercury	NC	NA	NC	NA		Immune system	6.7E-06	NA	--	6.7E-06
			Nickel	NC	NA	NC	NA		Developmental toxicity	2.0E-05	NA	--	2.0E-05
			Thallium	NC	NA	NC	NA		NOAEL	1.8E-04	NA	--	1.8E-04
			Vanadium	NC	NA	NC	NA		NOAEL	9.6E-05	NA	--	9.6E-05
			Toxicity Equivalency (Dioxins/Furans) - Mam	9.6E-10	NA	8.3E-11	NA	1.0E-09		--	NA	--	
			CHEMICAL TOTAL	1.8E-08	--	4.6E-09	--	2E-08		1.7E-03	0.0E+00	7.8E-05	2E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-08					2E-03
	EXPOSURE MEDIUM TOTAL							2E-08					2E-03
SEDIMENT TOTAL								2E-08					2E-03
SURFACE WATER	SURFACE WATER	ASSAPUMPSET POND	Arsenic	1.2E-09	NA	4.4E-10	NA	1.7E-09	Skin	6.5E-05	NA	2.3E-05	8.8E-05
			Manganese	NC	NA	NC	NA		NOAEL	2.2E-04	NA	2.0E-03	2.2E-03
			Mercury	NC	NA	NC	NA		Immune system	2.8E-07	NA	1.4E-06	1.7E-06
			Nitrite-N	NC	NA	NC	NA		Hematological system	2.0E-06	NA	--	2.0E-06
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.4E-09	NA	0.0E+00	NA	1.4E-09		--	NA	--	
			CHEMICAL TOTAL	2.6E-09	--	4.4E-10	--	3E-09		2.9E-04	0.0E+00	2.0E-03	2E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-09					2E-03
	EXPOSURE MEDIUM TOTAL							3E-09					2E-03
SURFACE WATER TOTAL								3E-09					2E-03

TABLE 9.5.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- OLDER CHILD- COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	ASSAPUMPSET POND	Acenaphthylene	NC	NA	NA	NA		Liver	1.5E-06	NA	NA	1.5E-06
			Benzo(a)anthracene	6.3E-09	NA	NA	NA	6.3E-09	Kidney	6.7E-06	NA	NA	6.7E-06
			Benzo(a)pyrene	6.3E-08	NA	NA	NA	6.3E-08	Kidney	6.7E-06	NA	NA	6.7E-06
			Benzo(b)fluoranthene	7.5E-09	NA	NA	NA	7.5E-09	Kidney	8.0E-06	NA	NA	8.0E-06
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	9.0E-06	NA	NA	9.0E-06
			Dibenzo(a,h)anthracene	2.5E-08	NA	NA	NA	2.5E-08	Kidney	2.7E-06	NA	NA	2.7E-06
			Indeno(1,2,3-cd)pyrene	5.5E-09	NA	NA	NA	5.5E-09	Kidney	5.9E-06	NA	NA	5.9E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	1.5E-05	NA	NA	1.5E-05
			4,4'-DDD	3.3E-09	NA	NA	NA	3.3E-09	Liver	6.4E-04	NA	NA	6.4E-04
			4,4'-DDE	2.1E-08	NA	NA	NA	2.1E-08	Liver	2.9E-03	NA	NA	2.9E-03
			alpha-Chlordane	2.8E-09	NA	NA	NA	2.8E-09	Liver	3.8E-04	NA	NA	3.8E-04
			Aroclor-1254	1.7E-07	NA	NA	NA	1.7E-07	Immune system	1.0E-01	NA	NA	1.0E-01
			Dieldrin	7.8E-08	NA	NA	NA	7.8E-08	Liver	2.3E-03	NA	NA	2.3E-03
			gamma-Chlordane	1.5E-09	NA	NA	NA	1.5E-09	Liver	2.0E-04	NA	NA	2.0E-04
			Heptachlor Epoxide	3.5E-08	NA	NA	NA	3.5E-08	Liver	6.9E-03	NA	NA	6.9E-03
			Technical Chlordane	1.8E-07	NA	NA	NA	1.8E-07	Liver	2.4E-02	NA	NA	2.4E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Mercury	NC	NA	NA	NA		Immune system	5.9E-02	NA	NA	5.9E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	1.3E-01	NA	NA	1.3E-01
			Zinc	NC	NA	NA	NA		Hematological system	4.7E-03	NA	NA	4.7E-03
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.2E-06	NA	NA	NA	1.2E-06		--	NA	NA	
			CHEMICAL TOTAL	1.8E-06	--	--	--	2E-06		3.3E-01	0.0E+00	--	3.3E-01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-06					3.3E-01
	EXPOSURE MEDIUM TOTAL							2E-06					3.3E-01
COMBINED FISH DIET TOTAL								2E-06					3.3E-01
RECEPTOR TOTAL								2E-06					3.3E-01
							TOTAL RISK ACROSS ALL MEDIA	2E-06	TOTAL HAZARD ACROSS ALL MEDIA				3.3E-01

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

	--
TOTAL CARDIOVASCULAR SYSTEM HI =	5.0E-08
TOTAL DEVELOPMENTAL TOXICITY HI =	1.3E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	4.7E-03
TOTAL IMMUNE SYSTEM HI =	1.6E-01
TOTAL KIDNEY HI =	9.1E-05
TOTAL LIVER HI =	3.7E-02
	--
	--
TOTAL NOAEL HI =	3.0E-03
	--
TOTAL SKIN HI =	4.7E-04
	--

Prepared by: RAR
Checked by: KJA

TABLE 9.6.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- CHILD - COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	ASSAPUMPSET POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	4.4E-07	NA	6.4E-08	5.0E-07
			Acenaphthylene	NC	NA	NC	NA		Liver	4.7E-07	NA	6.8E-08	5.3E-07
			Benzo(a)anthracene	5.2E-09	NA	7.5E-10	NA	5.9E-09	Kidney	8.2E-06	NA	1.2E-06	9.4E-06
			Benzo(a)pyrene	5.2E-08	NA	7.6E-09	NA	6.0E-08	Kidney	8.4E-06	NA	1.2E-06	9.6E-06
			Benzo(b)fluoranthene	6.2E-09	NA	9.1E-10	NA	7.1E-09	Kidney	1.0E-05	NA	1.5E-06	1.1E-05
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	6.3E-06	NA	9.2E-07	7.3E-06
			Dibenzo(a,h)anthracene	1.5E-08	NA	2.2E-09	NA	1.7E-08	Kidney	2.4E-06	NA	3.5E-07	2.7E-06
			Indeno(1,2,3-cd)pyrene	4.3E-09	NA	6.2E-10	NA	4.9E-09	Kidney	6.8E-06	NA	9.9E-07	7.8E-06
			Phenanthrene	NC	NA	NC	NA		Kidney	8.5E-06	NA	1.2E-06	9.8E-06
			alpha-Chlordane	6.3E-12	NA	2.8E-13	NA	6.6E-12	Liver	1.3E-06	NA	5.7E-08	1.3E-06
			Aroclor-1254	8.7E-10	NA	1.4E-10	NA	1.0E-09	Immune system	7.6E-04	NA	1.2E-04	8.8E-04
			Aroclor-1268	6.2E-10	NA	9.8E-11	NA	7.2E-10	Immune system	5.5E-04	NA	8.6E-05	6.3E-04
			gamma-Chlordane	3.1E-12	NA	1.4E-13	NA	3.2E-12	Liver	6.2E-07	NA	2.8E-08	6.5E-07
			Technical Chlordane	5.2E-10	NA	2.3E-11	NA	5.5E-10	Liver	1.0E-04	NA	4.7E-06	1.1E-04
			Aluminum	NC	NA	NC	NA		Developmental toxicity	4.7E-03	NA	--	4.7E-03
			Arsenic	5.5E-08	NA	1.8E-09	NA	5.7E-08	Skin	4.3E-03	NA	1.4E-04	4.4E-03
			Cadmium	NC	NA	NC	NA		Kidney	1.8E-04	NA	7.9E-06	1.8E-04
			Chromium	NC	NA	NC	NA		NOAEL	1.6E-03	NA	--	1.6E-03
			Copper	NC	NA	NC	NA		Kidney	1.9E-04	NA	--	1.9E-04
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	4.8E-03	NA	--	4.8E-03
			Mercury	NC	NA	NC	NA		Immune system	8.1E-05	NA	--	8.1E-05
			Nickel	NC	NA	NC	NA		Developmental toxicity	2.4E-04	NA	--	2.4E-04
			Thallium	NC	NA	NC	NA		NOAEL	2.1E-03	NA	--	2.1E-03
			Vanadium	NC	NA	NC	NA		NOAEL	1.2E-03	NA	--	1.2E-03
			Toxicity Equivalency (Dioxins/Furans) - Mam	7.7E-09	NA	2.6E-10	NA	8.0E-09		--	NA	--	
			CHEMICAL TOTAL	1.5E-07	--	1.4E-08	--	2E-07		2.1E-02	0.0E+00	3.7E-04	2E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-07					2E-02
	EXPOSURE MEDIUM TOTAL							2E-07					2E-02
SEDIMENT TOTAL								2E-07					2E-02
SURFACE WATER	SURFACE WATER	ASSAPUMPSET POND	Arsenic	2.5E-09	NA	2.7E-10	NA	2.8E-09	Skin	1.9E-04	NA	2.1E-05	2.2E-04
			Manganese	NC	NA	NC	NA		NOAEL	6.7E-04	NA	1.8E-03	2.5E-03
			Mercury	NC	NA	NC	NA		Immune system	8.5E-07	NA	1.3E-06	2.2E-06
			Nitrite-N	NC	NA	NC	NA		Hematological system	6.1E-06	NA	--	6.1E-06
			Toxicity Equivalency (Dioxins/Furans) - Mam	2.7E-09	NA	0.0E+00	NA	2.7E-09		--	NA	--	
			CHEMICAL TOTAL	5.2E-09	--	2.7E-10	--	5E-09		8.7E-04	0.0E+00	1.8E-03	3E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						5E-09					3E-03
	EXPOSURE MEDIUM TOTAL							5E-09					3E-03
SURFACE WATER TOTAL								5E-09					3E-03

TABLE 9.6.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- CHILD - COMBINED FISH DIET - ASSAPUMPSET
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	ASSAPUMPSET POND	Acenaphthylene	NC	NA	NA	NA		Liver	2.3E-06	NA	NA	2.3E-06
			Benzo(a)anthracene	6.4E-09	NA	NA	NA	6.4E-09	Kidney	1.0E-05	NA	NA	1.0E-05
			Benzo(a)pyrene	6.4E-08	NA	NA	NA	6.4E-08	Kidney	1.0E-05	NA	NA	1.0E-05
			Benzo(b)fluoranthene	7.6E-09	NA	NA	NA	7.6E-09	Kidney	1.2E-05	NA	NA	1.2E-05
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	1.4E-05	NA	NA	1.4E-05
			Dibenzo(a,h)anthracene	2.6E-08	NA	NA	NA	2.6E-08	Kidney	4.1E-06	NA	NA	4.1E-06
			Indeno(1,2,3-cd)pyrene	5.6E-09	NA	NA	NA	5.6E-09	Kidney	8.9E-06	NA	NA	8.9E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	2.2E-05	NA	NA	2.2E-05
			4,4'-DDD	3.3E-09	NA	NA	NA	3.3E-09	Liver	9.7E-04	NA	NA	9.7E-04
			4,4'-DDE	2.2E-08	NA	NA	NA	2.2E-08	Liver	4.5E-03	NA	NA	4.5E-03
			alpha-Chlordane	2.9E-09	NA	NA	NA	2.9E-09	Liver	5.8E-04	NA	NA	5.8E-04
			Aroclor-1254	1.8E-07	NA	NA	NA	1.8E-07	Immune system	1.6E-01	NA	NA	1.6E-01
			Dieldrin	7.9E-08	NA	NA	NA	7.9E-08	Liver	3.5E-03	NA	NA	3.5E-03
			gamma-Chlordane	1.5E-09	NA	NA	NA	1.5E-09	Liver	3.1E-04	NA	NA	3.1E-04
			Heptachlor Epoxide	3.5E-08	NA	NA	NA	3.5E-08	Liver	1.0E-02	NA	NA	1.0E-02
			Technical Chlordane	1.8E-07	NA	NA	NA	1.8E-07	Liver	3.6E-02	NA	NA	3.6E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Mercury	NC	NA	NA	NA		Immune system	8.9E-02	NA	NA	8.9E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	1.9E-01	NA	NA	1.9E-01
			Zinc	NC	NA	NA	NA		Hematological system	7.1E-03	NA	NA	7.1E-03
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.2E-06	NA	NA	NA	1.2E-06		--	NA	NA	
			CHEMICAL TOTAL	1.9E-06	--	--	--	2E-06		5.0E-01	0.0E+00	--	5.0E-01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-06					5.0E-01
	EXPOSURE MEDIUM TOTAL							2E-06					5.0E-01
COMBINED FISH DIET TOTAL								2E-06					5.0E-01
RECEPTOR TOTAL								2E-06					5.2E-01
							TOTAL RISK ACROSS ALL MEDIA	2E-06	TOTAL HAZARD ACROSS ALL MEDIA				5.2E-01

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

	--
TOTAL CARDIOVASCULAR SYSTEM HI =	5.0E-07
TOTAL DEVELOPMENTAL TOXICITY HI =	2.0E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	7.1E-03
TOTAL IMMUNE SYSTEM HI =	2.5E-01
TOTAL KIDNEY HI =	5.1E-04
TOTAL LIVER HI =	5.7E-02
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	--
TOTAL NOAEL HI =	1.2E-02
	--
	--
	--

Prepared by: KJA
Checked by: RAR

TABLE 9.7.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- RECREATIONAL ANGLER- ADULT - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SOIL	SOIL	GREYSTONE MILL POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	3.1E-08	NA	9.3E-09	4.1E-08
			Acenaphthylene	NC	NA	NC	NA		Liver	3.1E-08	NA	9.2E-09	4.0E-08
			Benzo(a)anthracene	7.6E-10	NA	2.2E-10	NA	9.8E-10	Kidney	6.1E-07	NA	1.8E-07	7.8E-07
			Benzo(a)pyrene	7.5E-09	NA	2.2E-09	NA	9.8E-09	Kidney	6.0E-07	NA	1.8E-07	7.8E-07
			Benzo(b)fluoranthene	8.5E-10	NA	2.5E-10	NA	1.1E-09	Kidney	6.8E-07	NA	2.0E-07	8.8E-07
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	4.6E-07	NA	1.4E-07	5.9E-07
			Dibenzo(a,h)anthracene	1.5E-09	NA	4.5E-10	NA	2.0E-09	Kidney	1.2E-07	NA	3.6E-08	1.6E-07
			Indeno(1,2,3-cd)pyrene	6.2E-10	NA	1.8E-10	NA	8.0E-10	Kidney	4.9E-07	NA	1.5E-07	6.4E-07
			Phenanthrene	NC	NA	NC	NA		Kidney	7.7E-07	NA	2.3E-07	1.0E-06
			alpha-Chlordane	2.1E-12	NA	1.9E-13	NA	2.3E-12	Liver	2.1E-07	NA	1.9E-08	2.3E-07
			Aroclor-1254	3.5E-10	NA	1.1E-10	NA	4.6E-10	Immune system	1.5E-04	NA	4.9E-05	2.0E-04
			Aroclor-1268	5.6E-11	NA	1.8E-11	NA	7.4E-11	Immune system	2.5E-05	NA	7.9E-06	3.2E-05
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	6.4E-09	NA	1.5E-09	7.8E-09
			Technical Chlordane	5.1E-11	NA	4.6E-12	NA	5.5E-11	Liver	5.1E-06	NA	4.6E-07	5.5E-06
			Aluminum	NC	NA	NC	NA		Developmental toxicity	9.3E-05	NA	--	9.3E-05
			Arsenic	3.9E-09	NA	2.7E-10	NA	4.2E-09	Skin	1.5E-04	NA	1.0E-05	1.6E-04
			Chromium	NC	NA	NC	NA		NOAEL	4.5E-04	NA	--	4.5E-04
			Copper	NC	NA	NC	NA		Kidney	4.0E-05	NA	--	4.0E-05
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	1.5E-04	NA	--	1.5E-04
			Mercury	NC	NA	NC	NA		Immune system	1.1E-05	NA	--	1.1E-05
			Molybdenum	NC	NA	NC	NA		Kidney	6.3E-05	NA	--	6.3E-05
			Nickel	NC	NA	NC	NA		Developmental toxicity	3.5E-05	NA	--	3.5E-05
			Thallium	NC	NA	NC	NA		NOAEL	3.4E-05	NA	--	3.4E-05
			Vanadium	NC	NA	NC	NA		NOAEL	6.9E-05	NA	--	6.9E-05
			Toxicity Equivalency (Dioxins/Furans) - Mam	2.8E-09	NA	1.9E-10	NA	3.0E-09		--	NA	--	
			CHEMICAL TOTAL	1.8E-08	--	3.9E-09	--	2E-08		1.3E-03	0.0E+00	6.9E-05	1E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-08					1E-03
	EXPOSURE MEDIUM TOTAL							2E-08					1E-03
SOIL TOTAL								2E-08					1E-03
SEDIMENT	SEDIMENT	GREYSTONE MILL POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	2.2E-08	NA	5.5E-09	2.7E-08
			Acenaphthylene	NC	NA	NC	NA		Liver	1.9E-08	NA	4.8E-09	2.4E-08
			Benzo(a)anthracene	3.7E-10	NA	9.3E-11	NA	4.6E-10	Kidney	2.9E-07	NA	7.4E-08	3.7E-07
			Benzo(a)pyrene	3.4E-09	NA	8.7E-10	NA	4.3E-09	Kidney	2.7E-07	NA	6.9E-08	3.4E-07
			Benzo(b)fluoranthene	3.7E-10	NA	9.3E-11	NA	4.6E-10	Kidney	2.9E-07	NA	7.4E-08	3.7E-07
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	1.7E-07	NA	4.3E-08	2.1E-07
			Dibenzo(a,h)anthracene	1.9E-09	NA	4.8E-10	NA	2.4E-09	Kidney	1.5E-07	NA	3.8E-08	1.9E-07
			Indeno(1,2,3-cd)pyrene	2.4E-10	NA	6.2E-11	NA	3.1E-10	Kidney	2.0E-07	NA	4.9E-08	2.5E-07
			Phenanthrene	NC	NA	NC	NA		Kidney	4.1E-07	NA	1.0E-07	5.1E-07
			alpha-Chlordane	7.2E-13	NA	5.6E-14	NA	7.7E-13	Liver	7.2E-08	NA	5.6E-09	7.7E-08
			Aroclor-1254	1.0E-10	NA	2.7E-11	NA	1.3E-10	Immune system	4.4E-05	NA	1.2E-05	5.6E-05
			Aroclor-1268	9.4E-11	NA	2.6E-11	NA	1.2E-10	Immune system	4.1E-05	NA	1.1E-05	5.2E-05
			gamma-Chlordane	5.6E-13	NA	4.4E-14	NA	6.1E-13	Liver	5.6E-08	NA	4.4E-09	6.1E-08
			Technical Chlordane	4.7E-11	NA	3.7E-12	NA	5.1E-11	Liver	4.7E-06	NA	3.7E-07	5.1E-06
			Aluminum	NC	NA	NC	NA		Developmental toxicity	9.1E-05	NA	--	9.1E-05
			Antimony	NC	NA	NC	NA		Adverse clinical signs	1.1E-05	NA	--	1.1E-05

TABLE 9.7.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- RECREATIONAL ANGLER- ADULT - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Arsenic	4.8E-09	NA	2.8E-10	NA	5.1E-09	Skin	1.9E-04	NA	1.1E-05	2.0E-04
			Cadmium	NC	NA	NC	NA		Kidney	4.8E-06	NA	3.7E-07	5.1E-06
			Chromium	NC	NA	NC	NA		NOAEL	1.9E-04	NA	--	1.9E-04
			Copper	NC	NA	NC	NA		Kidney	1.4E-05	NA	--	1.4E-05
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	5.0E-05	NA	--	5.0E-05
			Mercury	NC	NA	NC	NA		Immune system	4.1E-06	NA	--	4.1E-06
			Nickel	NC	NA	NC	NA		Developmental toxicity	4.2E-05	NA	--	4.2E-05
			Thallium	NC	NA	NC	NA		NOAEL	2.7E-05	NA	--	2.7E-05
			Vanadium	NC	NA	NC	NA		NOAEL	6.6E-05	NA	--	6.6E-05
			Toxicity Equivalency (Dioxins/Furans) - Mam	6.1E-09	NA	3.6E-10	NA	6.4E-09		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	1.3E-09	NA	7.3E-11	NA	1.3E-09		--	NA	--	
			CHEMICAL TOTAL	1.9E-08	--	2.4E-09	--	2E-08		7.8E-04	0.0E+00	3.5E-05	8E-04
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-08					8E-04
	EXPOSURE MEDIUM TOTAL							2E-08					8E-04
SEDIMENT TOTAL								2E-08					8E-04
SURFACE WATER	SURFACE WATER	GREYSTONE MILL POND	Arsenic	2.8E-11	NA	9.6E-11	NA	1.2E-10	Skin	1.1E-06	NA	3.7E-06	4.8E-06
			Manganese	NC	NA	NC	NA		NOAEL	3.2E-06	NA	2.8E-04	2.8E-04
			Mercury	NC	NA	NC	NA		Immune system	3.8E-09	NA	1.9E-07	1.9E-07
			Nitrite-N	NC	NA	NC	NA		Hematological system	7.5E-07	NA	--	7.5E-07
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.6E-11	NA	0.0E+00	NA	1.6E-11		--	NA	--	
			CHEMICAL TOTAL	4.4E-11	--	9.6E-11	--	1E-10		5.0E-06	0.0E+00	2.8E-04	3E-04
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-10					3E-04
	EXPOSURE MEDIUM TOTAL							1E-10					3E-04
SURFACE WATER TOTAL								1E-10					3E-04
BIOTA	COMBINED FISH DIET	GREYSTONE MILL POND	Acenaphthylene	NC	NA	NA	NA		Liver	4.1E-06	NA	NA	4.1E-06
			Benzo(a)pyrene	5.0E-08	NA	NA	NA	5.0E-08	Kidney	4.0E-06	NA	NA	4.0E-06
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	4.9E-06	NA	NA	4.9E-06
			Benzo(b)fluoranthene	4.7E-09	NA	NA	NA	4.7E-09	Kidney	3.7E-06	NA	NA	3.7E-06
			Dibenzo(a,h)anthracene	2.9E-08	NA	NA	NA	2.9E-08	Kidney	2.3E-06	NA	NA	2.3E-06
			Indeno(1,2,3-cd)pyrene	4.7E-09	NA	NA	NA	4.7E-09	Kidney	3.7E-06	NA	NA	3.7E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	3.3E-05	NA	NA	3.3E-05
			4,4'-DDD	2.2E-08	NA	NA	NA	2.2E-08	Liver	3.2E-03	NA	NA	3.2E-03
			4,4'-DDE	7.8E-08	NA	NA	NA	7.8E-08	Liver	8.0E-03	NA	NA	8.0E-03
			4,4'-DDT	7.1E-09	NA	NA	NA	7.1E-09	Liver	7.3E-04	NA	NA	7.3E-04
			alpha-Chlordane	3.4E-08	NA	NA	NA	3.4E-08	Liver	3.4E-03	NA	NA	3.4E-03
			Aroclor-1254	2.5E-06	NA	NA	NA	2.5E-06	Immune system	1.1E+00	NA	NA	1.1E+00
			Aroclor-1268	1.2E-06	NA	NA	NA	1.2E-06	Immune system	5.2E-01	NA	NA	5.2E-01
			Dieldrin	3.0E-07	NA	NA	NA	3.0E-07	Liver	6.6E-03	NA	NA	6.6E-03
			gamma-Chlordane	1.5E-08	NA	NA	NA	1.5E-08	Liver	1.5E-03	NA	NA	1.5E-03
			Heptachlor Epoxide	5.1E-08	NA	NA	NA	5.1E-08	Liver	7.5E-03	NA	NA	7.5E-03

TABLE 9.7.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- RECREATIONAL ANGLER- ADULT - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Technical Chlordane	5.0E-07	NA	NA	NA	5.0E-07	Liver	5.0E-02	NA	NA	5.0E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Mercury	NC	NA	NA	NA		Immune system	9.2E-02	NA	NA	9.2E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	4.0E-01	NA	NA	4.0E-01
			Zinc	NC	NA	NA	NA		Hematological system	8.9E-03	NA	NA	8.9E-03
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.4E-06	NA	NA	NA	1.4E-06		--	NA	NA	
			CHEMICAL TOTAL	6.2E-06	--	--	--	6E-06		2.2E+00	0.0E+00	--	2.2E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						6E-06					2.2E+00
	EXPOSURE MEDIUM TOTAL							6E-06					2.2E+00
COMBINED FISH DIET TOTAL								6E-06					2.2E+00
RECEPTOR TOTAL								6E-06					2.2E+00
							TOTAL RISK ACROSS ALL MEDIA	6E-06				TOTAL HAZARD ACROSS ALL MEDIA	2.2E+00

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

TOTAL ADVERSE CLINICAL SIGNS HI =	1.1E-05
TOTAL CARDIOVASCULAR SYSTEM HI =	6.8E-08
TOTAL DEVELOPMENTAL TOXICITY HI =	4.0E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	8.9E-03
TOTAL IMMUNE SYSTEM HI =	1.7E+00
TOTAL KIDNEY HI =	1.8E-04
TOTAL LIVER HI =	8.1E-02
	--
	--
TOTAL NOAEL HI =	1.3E-03
	--
TOTAL SKIN HI =	3.7E-04
	--

Prepared by: KJA
Checked by: RAR

TABLE 9.8.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- RECREATIONAL ANGLER- OLDER CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SOIL	SOIL	GREYSTONE MILL POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	4.9E-08	NA	4.9E-08	9.8E-08
			Acenaphthylene	NC	NA	NC	NA		Liver	4.8E-08	NA	4.8E-08	9.7E-08
			Benzo(a)anthracene	8.8E-10	NA	8.8E-10	NA	1.8E-09	Kidney	9.4E-07	NA	9.4E-07	1.9E-06
			Benzo(a)pyrene	8.8E-09	NA	8.8E-09	NA	1.8E-08	Kidney	9.4E-07	NA	9.4E-07	1.9E-06
			Benzo(b)fluoranthene	9.9E-10	NA	9.8E-10	NA	2.0E-09	Kidney	1.1E-06	NA	1.0E-06	2.1E-06
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	7.1E-07	NA	7.1E-07	1.4E-06
			Dibenzo(a,h)anthracene	1.8E-09	NA	1.8E-09	NA	3.5E-09	Kidney	1.9E-07	NA	1.9E-07	3.7E-07
			Indeno(1,2,3-cd)pyrene	7.2E-10	NA	7.2E-10	NA	1.4E-09	Kidney	7.7E-07	NA	7.7E-07	1.5E-06
			Phenanthrene	NC	NA	NC	NA		Kidney	1.2E-06	NA	1.2E-06	2.4E-06
			alpha-Chlordane	2.4E-12	NA	7.5E-13	NA	3.2E-12	Liver	3.3E-07	NA	1.0E-07	4.2E-07
			Aroclor-1254	4.1E-10	NA	4.4E-10	NA	8.4E-10	Immune system	2.4E-04	NA	2.6E-04	4.9E-04
			Aroclor-1268	6.6E-11	NA	7.1E-11	NA	1.4E-10	Immune system	3.8E-05	NA	4.1E-05	7.9E-05
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	9.9E-09	NA	7.6E-09	1.7E-08
			Technical Chlordane	5.9E-11	NA	1.8E-11	NA	7.7E-11	Liver	7.9E-06	NA	2.4E-06	1.0E-05
			Aluminum	NC	NA	NC	NA		Developmental toxicity	1.5E-04	NA	--	1.5E-04
			Arsenic	4.5E-09	NA	1.0E-09	NA	5.6E-09	Skin	2.4E-04	NA	5.4E-05	2.9E-04
			Chromium	NC	NA	NC	NA		NOAEL	7.0E-04	NA	--	7.0E-04
			Copper	NC	NA	NC	NA		Kidney	6.2E-05	NA	--	6.2E-05
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	2.4E-04	NA	--	2.4E-04
			Mercury	NC	NA	NC	NA		Immune system	1.8E-05	NA	--	1.8E-05
			Molybdenum	NC	NA	NC	NA		Kidney	9.9E-05	NA	--	9.9E-05
			Nickel	NC	NA	NC	NA		Developmental toxicity	5.5E-05	NA	--	5.5E-05
			Thallium	NC	NA	NC	NA		NOAEL	5.3E-05	NA	--	5.3E-05
			Vanadium	NC	NA	NC	NA		NOAEL	1.1E-04	NA	--	1.1E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.2E-09	NA	7.4E-10	NA	4.0E-09		--	NA	--	
			CHEMICAL TOTAL	2.1E-08	--	1.5E-08	--	4E-08		2.0E-03	0.0E+00	3.6E-04	2E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-08					2E-03
	EXPOSURE MEDIUM TOTAL							4E-08					2E-03
SOIL TOTAL								4E-08					2E-03
SEDIMENT	SEDIMENT	GREYSTONE MILL POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	3.4E-08	NA	2.5E-08	6.0E-08
			Acenaphthylene	NC	NA	NC	NA		Liver	2.9E-08	NA	2.2E-08	5.1E-08
			Benzo(a)anthracene	4.3E-10	NA	3.2E-10	NA	7.5E-10	Kidney	4.6E-07	NA	3.4E-07	8.0E-07
			Benzo(a)pyrene	4.0E-09	NA	3.0E-09	NA	7.0E-09	Kidney	4.3E-07	NA	3.2E-07	7.4E-07
			Benzo(b)fluoranthene	4.3E-10	NA	3.2E-10	NA	7.5E-10	Kidney	4.6E-07	NA	3.4E-07	8.0E-07
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	2.6E-07	NA	1.9E-07	4.6E-07
			Dibenzo(a,h)anthracene	2.2E-09	NA	1.6E-09	NA	3.8E-09	Kidney	2.3E-07	NA	1.7E-07	4.1E-07
			Indeno(1,2,3-cd)pyrene	2.9E-10	NA	2.1E-10	NA	5.0E-10	Kidney	3.0E-07	NA	2.3E-07	5.3E-07
			Phenanthrene	NC	NA	NC	NA		Kidney	6.4E-07	NA	4.8E-07	1.1E-06
			alpha-Chlordane	8.4E-13	NA	1.9E-13	NA	1.0E-12	Liver	1.1E-07	NA	2.5E-08	1.4E-07
			Aroclor-1254	1.2E-10	NA	9.4E-11	NA	2.1E-10	Immune system	6.8E-05	NA	5.5E-05	1.2E-04
			Aroclor-1268	1.1E-10	NA	8.8E-11	NA	2.0E-10	Immune system	6.4E-05	NA	5.1E-05	1.2E-04
			gamma-Chlordane	6.6E-13	NA	1.5E-13	NA	8.1E-13	Liver	8.8E-08	NA	2.0E-08	1.1E-07
			Technical Chlordane	5.5E-11	NA	1.3E-11	NA	6.7E-11	Liver	7.3E-06	NA	1.7E-06	9.0E-06
			Aluminum	NC	NA	NC	NA		Developmental toxicity	1.4E-04	NA	--	1.4E-04
			Antimony	NC	NA	NC	NA		Adverse clinical signs	1.7E-05	NA	--	1.7E-05

TABLE 9.8.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- RECREATIONAL ANGLER- OLDER CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Arsenic	5.6E-09	NA	9.7E-10	NA	6.6E-09	Skin	2.9E-04	NA	5.0E-05	3.4E-04
			Cadmium	NC	NA	NC	NA		Kidney	7.4E-06	NA	1.7E-06	9.1E-06
			Chromium	NC	NA	NC	NA		NOAEL	3.0E-04	NA	--	3.0E-04
			Copper	NC	NA	NC	NA		Kidney	2.2E-05	NA	--	2.2E-05
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	7.7E-05	NA	--	7.7E-05
			Mercury	NC	NA	NC	NA		Immune system	6.4E-06	NA	--	6.4E-06
			Nickel	NC	NA	NC	NA		Developmental toxicity	6.5E-05	NA	--	6.5E-05
			Thallium	NC	NA	NC	NA		NOAEL	4.2E-05	NA	--	4.2E-05
			Vanadium	NC	NA	NC	NA		NOAEL	1.0E-04	NA	--	1.0E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	7.1E-09	NA	1.2E-09	NA	8.3E-09		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	1.5E-09	NA	2.5E-10	NA	1.7E-09		--	NA	--	
			CHEMICAL TOTAL	2.2E-08	--	8.1E-09	--	3E-08		1.2E-03	0.0E+00	1.6E-04	1E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-08					1E-03
	EXPOSURE MEDIUM TOTAL							3E-08					1E-03
SEDIMENT TOTAL								3E-08					1E-03
SURFACE WATER	SURFACE WATER	GREYSTONE MILL POND	Arsenic	3.2E-11	NA	8.1E-11	NA	1.1E-10	Skin	1.7E-06	NA	4.2E-06	5.9E-06
			Manganese	NC	NA	NC	NA		NOAEL	5.0E-06	NA	3.1E-04	3.2E-04
			Mercury	NC	NA	NC	NA		Immune system	5.9E-09	NA	2.1E-07	2.2E-07
			Nitrite-N	NC	NA	NC	NA		Hematological system	1.2E-06	NA	--	1.2E-06
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.9E-11	NA	0.0E+00	NA	1.9E-11		--	NA	--	
			CHEMICAL TOTAL	5.1E-11	--	8.1E-11	--	1E-10		7.8E-06	0.0E+00	3.2E-04	3E-04
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-10					3E-04
	EXPOSURE MEDIUM TOTAL							1E-10					3E-04
SURFACE WATER TOTAL								1E-10					3E-04
BIOTA	COMBINED FISH DIET	GREYSTONE MILL POND	Acenaphthylene	NC	NA	NA	NA		Liver	4.2E-06	NA	NA	4.2E-06
			Benzo(a)pyrene	3.9E-08	NA	NA	NA	3.9E-08	Kidney	4.1E-06	NA	NA	4.1E-06
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	5.0E-06	NA	NA	5.0E-06
			Benzo(b)fluoranthene	3.6E-09	NA	NA	NA	3.6E-09	Kidney	3.9E-06	NA	NA	3.9E-06
			Dibenzo(a,h)anthracene	2.2E-08	NA	NA	NA	2.2E-08	Kidney	2.4E-06	NA	NA	2.4E-06
			Indeno(1,2,3-cd)pyrene	3.6E-09	NA	NA	NA	3.6E-09	Kidney	3.9E-06	NA	NA	3.9E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	3.4E-05	NA	NA	3.4E-05
			4,4'-DDD	1.7E-08	NA	NA	NA	1.7E-08	Liver	3.3E-03	NA	NA	3.3E-03
			4,4'-DDE	6.0E-08	NA	NA	NA	6.0E-08	Liver	8.3E-03	NA	NA	8.3E-03
			4,4'-DDT	5.5E-09	NA	NA	NA	5.5E-09	Liver	7.5E-04	NA	NA	7.5E-04
			alpha-Chlordane	2.6E-08	NA	NA	NA	2.6E-08	Liver	3.5E-03	NA	NA	3.5E-03
			Aroclor-1254	1.9E-06	NA	NA	NA	1.9E-06	Immune system	1.1E+00	NA	NA	1.1E+00
			Aroclor-1268	9.2E-07	NA	NA	NA	9.2E-07	Immune system	5.3E-01	NA	NA	5.3E-01
			Dieldrin	2.3E-07	NA	NA	NA	2.3E-07	Liver	6.8E-03	NA	NA	6.8E-03
			gamma-Chlordane	1.1E-08	NA	NA	NA	1.1E-08	Liver	1.5E-03	NA	NA	1.5E-03
			Heptachlor Epoxide	3.9E-08	NA	NA	NA	3.9E-08	Liver	7.7E-03	NA	NA	7.7E-03

TABLE 9.8.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- RECREATIONAL ANGLER- OLDER CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Technical Chlordane	3.9E-07	NA	NA	NA	3.9E-07	Liver	5.2E-02	NA	NA	5.2E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Mercury	NC	NA	NA	NA		Immune system	9.5E-02	NA	NA	9.5E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	4.1E-01	NA	NA	4.1E-01
			Zinc	NC	NA	NA	NA		Hematological system	9.2E-03	NA	NA	9.2E-03
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.1E-06	NA	NA	NA	1.1E-06		--	NA	NA	
			CHEMICAL TOTAL	4.8E-06	--	--	--	5E-06		2.2E+00	0.0E+00	--	2.2E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						5E-06					2.2E+00
	EXPOSURE MEDIUM TOTAL							5E-06					2.2E+00
COMBINED FISH DIET TOTAL								5E-06					2.2E+00
RECEPTOR TOTAL								5E-06					2.3E+00
							TOTAL RISK ACROSS ALL MEDIA	5E-06	TOTAL HAZARD ACROSS ALL MEDIA				2.3E+00

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

TOTAL ADVERSE CLINICAL SIGNS HI =	1.7E-05
TOTAL CARDIOVASCULAR SYSTEM HI =	1.6E-07
TOTAL DEVELOPMENTAL TOXICITY HI =	4.1E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	9.2E-03
TOTAL IMMUNE SYSTEM HI =	1.7E+00
TOTAL KIDNEY HI =	2.6E-04
TOTAL LIVER HI =	8.4E-02
	--
	--
TOTAL NOAEL HI =	1.9E-03
	--
TOTAL SKIN HI =	6.4E-04
	--

Prepared by: KJA
Checked by: RAR

TABLE 9.10.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- ADULT - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SOIL	SOIL	GREYSTONE MILL POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	4.1E-07	NA	6.1E-08	4.7E-07
			Acenaphthylene	NC	NA	NC	NA		Liver	4.0E-07	NA	6.0E-08	4.6E-07
			Benzo(a)anthracene	9.8E-09	NA	1.5E-09	NA	1.1E-08	Kidney	7.9E-06	NA	1.2E-06	9.0E-06
			Benzo(a)pyrene	9.8E-08	NA	1.5E-08	NA	1.1E-07	Kidney	7.8E-06	NA	1.2E-06	9.0E-06
			Benzo(b)fluoranthene	1.1E-08	NA	1.6E-09	NA	1.3E-08	Kidney	8.8E-06	NA	1.3E-06	1.0E-05
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	5.9E-06	NA	8.8E-07	6.8E-06
			Dibenzo(a,h)anthracene	2.0E-08	NA	2.9E-09	NA	2.2E-08	Kidney	1.6E-06	NA	2.3E-07	1.8E-06
			Indeno(1,2,3-cd)pyrene	8.0E-09	NA	1.2E-09	NA	9.2E-09	Kidney	6.4E-06	NA	9.5E-07	7.4E-06
			Phenanthrene	NC	NA	NC	NA		Kidney	1.0E-05	NA	1.5E-06	1.2E-05
			alpha-Chlordane	2.7E-11	NA	1.2E-12	NA	2.8E-11	Liver	2.7E-06	NA	1.2E-07	2.8E-06
			Aroclor-1254	4.5E-09	NA	7.2E-10	NA	5.3E-09	Immune system	2.0E-03	NA	3.2E-04	2.3E-03
			Aroclor-1268	7.3E-10	NA	1.2E-10	NA	8.5E-10	Immune system	3.2E-04	NA	5.1E-05	3.7E-04
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	8.3E-08	NA	9.4E-09	9.2E-08
			Technical Chlordane	6.6E-10	NA	3.0E-11	NA	6.9E-10	Liver	6.6E-05	NA	3.0E-06	6.9E-05
			Aluminum	NC	NA	NC	NA		Developmental toxicity	1.2E-03	NA	--	1.2E-03
			Arsenic	5.1E-08	NA	1.7E-09	NA	5.2E-08	Skin	2.0E-03	NA	6.7E-05	2.0E-03
			Chromium	NC	NA	NC	NA		NOAEL	5.9E-03	NA	--	5.9E-03
			Copper	NC	NA	NC	NA		Kidney	5.2E-04	NA	--	5.2E-04
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	2.0E-03	NA	--	2.0E-03
			Mercury	NC	NA	NC	NA		Immune system	1.5E-04	NA	--	1.5E-04
			Molybdenum	NC	NA	NC	NA		Kidney	8.2E-04	NA	--	8.2E-04
			Nickel	NC	NA	NC	NA		Developmental toxicity	4.6E-04	NA	--	4.6E-04
			Thallium	NC	NA	NC	NA		NOAEL	4.4E-04	NA	--	4.4E-04
			Vanadium	NC	NA	NC	NA		NOAEL	9.0E-04	NA	--	9.0E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.6E-08	NA	1.2E-09	NA	3.7E-08		--	NA	--	
			CHEMICAL TOTAL	2.4E-07	--	2.6E-08	--	3E-07		1.7E-02	0.0E+00	4.5E-04	2E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-07					2E-02
	EXPOSURE MEDIUM TOTAL							3E-07					2E-02
SOIL TOTAL								3E-07					2E-02
SEDIMENT	SEDIMENT	GREYSTONE MILL POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	9.5E-08	NA	1.2E-08	1.1E-07
			Acenaphthylene	NC	NA	NC	NA		Liver	8.2E-08	NA	1.0E-08	9.2E-08
			Benzo(a)anthracene	1.6E-09	NA	2.0E-10	NA	1.8E-09	Kidney	1.3E-06	NA	1.6E-07	1.4E-06
			Benzo(a)pyrene	1.5E-08	NA	1.9E-09	NA	1.7E-08	Kidney	1.2E-06	NA	1.5E-07	1.3E-06
			Benzo(b)fluoranthene	1.6E-09	NA	2.0E-10	NA	1.8E-09	Kidney	1.3E-06	NA	1.6E-07	1.4E-06
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	7.3E-07	NA	9.2E-08	8.2E-07
			Dibenzo(a,h)anthracene	8.2E-09	NA	1.0E-09	NA	9.2E-09	Kidney	6.5E-07	NA	8.3E-08	7.4E-07
			Indeno(1,2,3-cd)pyrene	1.1E-09	NA	1.3E-10	NA	1.2E-09	Kidney	8.5E-07	NA	1.1E-07	9.6E-07
			Phenanthrene	NC	NA	NC	NA		Kidney	1.8E-06	NA	2.3E-07	2.0E-06
			alpha-Chlordane	3.1E-12	NA	1.2E-13	NA	3.2E-12	Liver	3.1E-07	NA	1.2E-08	3.2E-07
			Aroclor-1254	4.4E-10	NA	5.9E-11	NA	5.0E-10	Immune system	1.9E-04	NA	2.6E-05	2.2E-04
			Aroclor-1268	4.1E-10	NA	5.5E-11	NA	4.6E-10	Immune system	1.8E-04	NA	2.4E-05	2.0E-04
			gamma-Chlordane	2.4E-12	NA	9.5E-14	NA	2.5E-12	Liver	2.4E-07	NA	9.5E-09	2.5E-07
			Technical Chlordane	2.0E-10	NA	7.9E-12	NA	2.1E-10	Liver	2.0E-05	NA	7.9E-07	2.1E-05
			Aluminum	NC	NA	NC	NA		Developmental toxicity	4.0E-04	NA	--	4.0E-04
			Antimony	NC	NA	NC	NA		Adverse clinical signs	4.6E-05	NA	--	4.6E-05
			Arsenic	2.1E-08	NA	6.1E-10	NA	2.2E-08	Skin	8.1E-04	NA	2.4E-05	8.4E-04
			Cadmium	NC	NA	NC	NA		Kidney	2.1E-05	NA	8.0E-07	2.1E-05
			Chromium	NC	NA	NC	NA		NOAEL	8.4E-04	NA	--	8.4E-04
			Copper	NC	NA	NC	NA		Kidney	6.2E-05	NA	--	6.2E-05

TABLE 9.10.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- ADULT - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	2.1E-04	NA	--	2.1E-04
			Mercury	NC	NA	NC	NA		Immune system	1.8E-05	NA	--	1.8E-05
			Nickel	NC	NA	NC	NA		Developmental toxicity	1.8E-04	NA	--	1.8E-04
			Thallium	NC	NA	NC	NA		NOAEL	1.2E-04	NA	--	1.2E-04
			Vanadium	NC	NA	NC	NA		NOAEL	2.9E-04	NA	--	2.9E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	2.6E-08	NA	7.7E-10	NA	2.7E-08		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	5.4E-09	NA	1.6E-10	NA	5.6E-09		--	NA	--	
			CHEMICAL TOTAL	8.1E-08	--	5.1E-09	--	9E-08		3.4E-03	0.0E+00	7.7E-05	3E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						9E-08					3E-03
	EXPOSURE MEDIUM TOTAL							9E-08					3E-03
SEDIMENT TOTAL								9E-08					3E-03
SURFACE WATER	SURFACE WATER	GREYSTONE MILL POND	Arsenic	1.2E-09	NA	5.5E-10	NA	1.7E-09	Skin	4.7E-05	NA	2.1E-05	6.8E-05
			Manganese	NC	NA	NC	NA		NOAEL	1.4E-04	NA	1.6E-03	1.7E-03
			Mercury	NC	NA	NC	NA		Immune system	1.6E-07	NA	1.1E-06	1.2E-06
			Nitrite-N	NC	NA	NC	NA		Hematological system	3.3E-05	NA	--	3.3E-05
			Toxicity Equivalency (Dioxins/Furans) - Mam	7.1E-10	NA	0.0E+00	NA	7.1E-10		--	NA	--	
			CHEMICAL TOTAL	1.9E-09	--	5.5E-10	--	2E-09		2.2E-04	0.0E+00	1.6E-03	2E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-09					2E-03
	EXPOSURE MEDIUM TOTAL							2E-09					2E-03
SURFACE WATER TOTAL								2E-09					2E-03
BIOTA	COMBINED FISH DIET	GREYSTONE MILL POND	Acenaphthylene	NC	NA	NA	NA		Liver	4.1E-06	NA	NA	4.1E-06
			Benzo(a)pyrene	5.0E-08	NA	NA	NA	5.0E-08	Kidney	4.0E-06	NA	NA	4.0E-06
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	4.9E-06	NA	NA	4.9E-06
			Benzo(b)fluoranthene	4.7E-09	NA	NA	NA	4.7E-09	Kidney	3.7E-06	NA	NA	3.7E-06
			Dibenzo(a,h)anthracene	2.9E-08	NA	NA	NA	2.9E-08	Kidney	2.3E-06	NA	NA	2.3E-06
			Indeno(1,2,3-cd)pyrene	4.7E-09	NA	NA	NA	4.7E-09	Kidney	3.7E-06	NA	NA	3.7E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	3.3E-05	NA	NA	3.3E-05
			4,4'-DDD	2.2E-08	NA	NA	NA	2.2E-08	Liver	3.2E-03	NA	NA	3.2E-03
			4,4'-DDE	7.8E-08	NA	NA	NA	7.8E-08	Liver	8.0E-03	NA	NA	8.0E-03
			4,4'-DDT	7.1E-09	NA	NA	NA	7.1E-09	Liver	7.3E-04	NA	NA	7.3E-04
			alpha-Chlordane	3.4E-08	NA	NA	NA	3.4E-08	Liver	3.4E-03	NA	NA	3.4E-03
			Aroclor-1254	2.5E-06	NA	NA	NA	2.5E-06	Immune system	1.1E+00	NA	NA	1.1E+00
			Aroclor-1268	1.2E-06	NA	NA	NA	1.2E-06	Immune system	5.2E-01	NA	NA	5.2E-01
			Dieldrin	3.0E-07	NA	NA	NA	3.0E-07	Liver	6.6E-03	NA	NA	6.6E-03
			gamma-Chlordane	1.5E-08	NA	NA	NA	1.5E-08	Liver	1.5E-03	NA	NA	1.5E-03
			Heptachlor Epoxide	5.1E-08	NA	NA	NA	5.1E-08	Liver	7.5E-03	NA	NA	7.5E-03
			Technical Chlordane	5.0E-07	NA	NA	NA	5.0E-07	Liver	5.0E-02	NA	NA	5.0E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Mercury	NC	NA	NA	NA		Immune system	9.2E-02	NA	NA	9.2E-02

TABLE 9.10.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- ADULT - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	4.0E-01	NA	NA	4.0E-01
			Zinc	NC	NA	NA	NA		Hematological system	8.9E-03	NA	NA	8.9E-03
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.4E-06	NA	NA	NA	1.4E-06		--	NA	NA	
			CHEMICAL TOTAL	6.2E-06	--	--	--	6E-06		2.2E+00	0.0E+00	--	2.2E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						6E-06					2.2E+00
	EXPOSURE MEDIUM TOTAL							6E-06					2.2E+00
COMBINED FISH DIET TOTAL								6E-06					2.2E+00
RECEPTOR TOTAL								7E-06					2.2E+00
							TOTAL RISK ACROSS ALL MEDIA	7E-06				TOTAL HAZARD ACROSS ALL MEDIA	2.2E+00

NOTES:
NC - Not carcinogenic by this exposure route
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

TOTAL ADVERSE CLINICAL SIGNS HI =	4.6E-05
TOTAL CARDIOVASCULAR SYSTEM HI =	5.8E-07
TOTAL DEVELOPMENTAL TOXICITY HI =	4.0E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	9.0E-03
TOTAL IMMUNE SYSTEM HI =	1.7E+00
TOTAL KIDNEY HI =	1.5E-03
TOTAL LIVER HI =	8.1E-02
	--
	--
TOTAL NOAEL HI =	1.2E-02
	--
TOTAL SKIN HI =	2.9E-03
	--

Prepared by: KJA
Checked by: RAR

TABLE 9.11.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- OLDER CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SOIL	SOIL	GREYSTONE MILL POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	6.4E-07	NA	3.2E-07	9.5E-07
			Acenaphthylene	NC	NA	NC	NA		Liver	6.3E-07	NA	3.1E-07	9.4E-07
			Benzo(a)anthracene	1.1E-08	NA	5.7E-09	NA	1.7E-08	Kidney	1.2E-05	NA	6.1E-06	1.8E-05
			Benzo(a)pyrene	1.1E-07	NA	5.7E-08	NA	1.7E-07	Kidney	1.2E-05	NA	6.1E-06	1.8E-05
			Benzo(b)fluoranthene	1.3E-08	NA	6.4E-09	NA	1.9E-08	Kidney	1.4E-05	NA	6.8E-06	2.0E-05
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	9.2E-06	NA	4.6E-06	1.4E-05
			Dibenzo(a,h)anthracene	2.3E-08	NA	1.1E-08	NA	3.4E-08	Kidney	2.4E-06	NA	1.2E-06	3.6E-06
			Indeno(1,2,3-cd)pyrene	9.4E-09	NA	4.7E-09	NA	1.4E-08	Kidney	1.0E-05	NA	5.0E-06	1.5E-05
			Phenanthrene	NC	NA	NC	NA		Kidney	1.6E-05	NA	7.8E-06	2.3E-05
			alpha-Chlordane	3.2E-11	NA	4.9E-12	NA	3.7E-11	Liver	4.2E-06	NA	6.5E-07	4.9E-06
			Aroclor-1254	5.3E-09	NA	2.8E-09	NA	8.1E-09	Immune system	3.1E-03	NA	1.7E-03	4.7E-03
			Aroclor-1268	8.5E-10	NA	4.6E-10	NA	1.3E-09	Immune system	5.0E-04	NA	2.7E-04	7.7E-04
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	1.3E-07	NA	4.9E-08	1.8E-07
			Technical Chlordane	7.7E-10	NA	1.2E-10	NA	8.8E-10	Liver	1.0E-04	NA	1.6E-05	1.2E-04
			Aluminum	NC	NA	NC	NA		Developmental toxicity	1.9E-03	NA	--	1.9E-03
			Arsenic	5.9E-08	NA	6.8E-09	NA	6.6E-08	Skin	3.1E-03	NA	3.5E-04	3.4E-03
			Chromium	NC	NA	NC	NA		NOAEL	9.1E-03	NA	--	9.1E-03
			Copper	NC	NA	NC	NA		Kidney	8.1E-04	NA	--	8.1E-04
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	3.1E-03	NA	--	3.1E-03
			Mercury	NC	NA	NC	NA		Immune system	2.3E-04	NA	--	2.3E-04
			Molybdenum	NC	NA	NC	NA		Kidney	1.3E-03	NA	--	1.3E-03
			Nickel	NC	NA	NC	NA		Developmental toxicity	7.1E-04	NA	--	7.1E-04
			Thallium	NC	NA	NC	NA		NOAEL	6.8E-04	NA	--	6.8E-04
			Vanadium	NC	NA	NC	NA		NOAEL	1.4E-03	NA	--	1.4E-03
			Toxicity Equivalency (Dioxins/Furans) - Mam	4.2E-08	NA	4.8E-09	NA	4.7E-08		--	NA	--	
			CHEMICAL TOTAL	2.8E-07	--	1.0E-07	--	4E-07		2.6E-02	0.0E+00	2.3E-03	3E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-07					3E-02
	EXPOSURE MEDIUM TOTAL							4E-07					3E-02
SOIL TOTAL								4E-07					3E-02
SEDIMENT	SEDIMENT	GREYSTONE MILL POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	1.5E-07	NA	5.5E-08	2.0E-07
			Acenaphthylene	NC	NA	NC	NA		Liver	1.3E-07	NA	4.7E-08	1.7E-07
			Benzo(a)anthracene	1.9E-09	NA	6.9E-10	NA	2.5E-09	Kidney	2.0E-06	NA	7.4E-07	2.7E-06
			Benzo(a)pyrene	1.7E-08	NA	6.4E-09	NA	2.4E-08	Kidney	1.8E-06	NA	6.9E-07	2.5E-06
			Benzo(b)fluoranthene	1.9E-09	NA	6.9E-10	NA	2.5E-09	Kidney	2.0E-06	NA	7.4E-07	2.7E-06
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	1.1E-06	NA	4.2E-07	1.6E-06
			Dibenzo(a,h)anthracene	9.5E-09	NA	3.5E-09	NA	1.3E-08	Kidney	1.0E-06	NA	3.8E-07	1.4E-06
			Indeno(1,2,3-cd)pyrene	1.2E-09	NA	4.6E-10	NA	1.7E-09	Kidney	1.3E-06	NA	4.9E-07	1.8E-06
			Phenanthrene	NC	NA	NC	NA		Kidney	2.8E-06	NA	1.0E-06	3.8E-06
			alpha-Chlordane	3.6E-12	NA	4.1E-13	NA	4.0E-12	Liver	4.8E-07	NA	5.5E-08	5.4E-07
			Aroclor-1254	5.1E-10	NA	2.0E-10	NA	7.1E-10	Immune system	3.0E-04	NA	1.2E-04	4.2E-04
			Aroclor-1268	4.7E-10	NA	1.9E-10	NA	6.6E-10	Immune system	2.8E-04	NA	1.1E-04	3.9E-04
			gamma-Chlordane	2.8E-12	NA	3.3E-13	NA	3.2E-12	Liver	3.8E-07	NA	4.3E-08	4.2E-07
			Technical Chlordane	2.4E-10	NA	2.7E-11	NA	2.6E-10	Liver	3.2E-05	NA	3.6E-06	3.5E-05
			Aluminum	NC	NA	NC	NA		Developmental toxicity	6.2E-04	NA	--	6.2E-04
			Antimony	NC	NA	NC	NA		Adverse clinical signs	7.2E-05	NA	--	7.2E-05

TABLE 9.11.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- OLDER CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Arsenic	2.4E-08	NA	2.1E-09	NA	2.7E-08	Skin	1.3E-03	NA	1.1E-04	1.4E-03
			Cadmium	NC	NA	NC	NA		Kidney	3.2E-05	NA	3.7E-06	3.6E-05
			Chromium	NC	NA	NC	NA		NOAEL	1.3E-03	NA	--	1.3E-03
			Copper	NC	NA	NC	NA		Kidney	9.6E-05	NA	--	9.6E-05
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	3.3E-04	NA	--	3.3E-04
			Mercury	NC	NA	NC	NA		Immune system	2.8E-05	NA	--	2.8E-05
			Nickel	NC	NA	NC	NA		Developmental toxicity	2.8E-04	NA	--	2.8E-04
			Thallium	NC	NA	NC	NA		NOAEL	1.8E-04	NA	--	1.8E-04
			Vanadium	NC	NA	NC	NA		NOAEL	4.5E-04	NA	--	4.5E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.1E-08	NA	2.6E-09	NA	3.3E-08		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	6.3E-09	NA	5.4E-10	NA	6.9E-09		--	NA	--	
			CHEMICAL TOTAL	9.5E-08	--	1.8E-08	--	1E-07		5.3E-03	0.0E+00	3.5E-04	6E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-07					6E-03
	EXPOSURE MEDIUM TOTAL							1E-07					6E-03
SEDIMENT TOTAL								1E-07					6E-03
SURFACE WATER	SURFACE WATER	GREYSTONE MILL POND	Arsenic	1.4E-09	NA	5.0E-10	NA	1.9E-09	Skin	7.3E-05	NA	2.6E-05	9.8E-05
			Manganese	NC	NA	NC	NA		NOAEL	2.2E-04	NA	1.9E-03	2.1E-03
			Mercury	NC	NA	NC	NA		Immune system	2.5E-07	NA	1.3E-06	1.5E-06
			Nitrite-N	NC	NA	NC	NA		Hematological system	5.1E-05	NA	--	5.1E-05
			Toxicity Equivalency (Dioxins/Furans) - Mam	8.3E-10	NA	0.0E+00	NA	8.3E-10		--	NA	--	
			CHEMICAL TOTAL	2.2E-09	--	5.0E-10	--	3E-09		3.4E-04	0.0E+00	1.9E-03	2E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-09					2E-03
	EXPOSURE MEDIUM TOTAL							3E-09					2E-03
SURFACE WATER TOTAL								3E-09					2E-03
BIOTA	COMBINED FISH DIET	GREYSTONE MILL POND	Acenaphthylene	NC	NA	NA	NA		Liver	4.2E-06	NA	NA	4.2E-06
			Benzo(a)pyrene	3.9E-08	NA	NA	NA	3.9E-08	Kidney	4.1E-06	NA	NA	4.1E-06
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	5.0E-06	NA	NA	5.0E-06
			Benzo(b)fluoranthene	3.6E-09	NA	NA	NA	3.6E-09	Kidney	3.9E-06	NA	NA	3.9E-06
			Dibenzo(a,h)anthracene	2.2E-08	NA	NA	NA	2.2E-08	Kidney	2.4E-06	NA	NA	2.4E-06
			Indeno(1,2,3-cd)pyrene	3.6E-09	NA	NA	NA	3.6E-09	Kidney	3.9E-06	NA	NA	3.9E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	3.4E-05	NA	NA	3.4E-05
			4,4'-DDD	1.7E-08	NA	NA	NA	1.7E-08	Liver	3.3E-03	NA	NA	3.3E-03
			4,4'-DDE	6.0E-08	NA	NA	NA	6.0E-08	Liver	8.3E-03	NA	NA	8.3E-03
			4,4'-DDT	5.5E-09	NA	NA	NA	5.5E-09	Liver	7.5E-04	NA	NA	7.5E-04
			alpha-Chlordane	2.6E-08	NA	NA	NA	2.6E-08	Liver	3.5E-03	NA	NA	3.5E-03
			Aroclor-1254	1.9E-06	NA	NA	NA	1.9E-06	Immune system	1.1E+00	NA	NA	1.1E+00
			Aroclor-1268	9.2E-07	NA	NA	NA	9.2E-07	Immune system	5.3E-01	NA	NA	5.3E-01
			Dieldrin	2.3E-07	NA	NA	NA	2.3E-07	Liver	6.8E-03	NA	NA	6.8E-03
			gamma-Chlordane	1.1E-08	NA	NA	NA	1.1E-08	Liver	1.5E-03	NA	NA	1.5E-03
			Heptachlor Epoxide	3.9E-08	NA	NA	NA	3.9E-08	Liver	7.7E-03	NA	NA	7.7E-03

TABLE 9.11.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- OLDER CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Technical Chlordane	3.9E-07	NA	NA	NA	3.9E-07	Liver	5.2E-02	NA	NA	5.2E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Mercury	NC	NA	NA	NA		Immune system	9.5E-02	NA	NA	9.5E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	4.1E-01	NA	NA	4.1E-01
			Zinc	NC	NA	NA	NA		Hematological system	9.2E-03	NA	NA	9.2E-03
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.1E-06	NA	NA	NA	1.1E-06		--	NA	NA	
			CHEMICAL TOTAL	4.8E-06	--	--	--	5E-06		2.2E+00	0.0E+00	--	2.2E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						5E-06					2.2E+00
	EXPOSURE MEDIUM TOTAL							5E-06					2.2E+00
COMBINED FISH DIET TOTAL								5E-06					2.2E+00
RECEPTOR TOTAL								5E-06					2.3E+00
							TOTAL RISK ACROSS ALL MEDIA	5E-06	TOTAL HAZARD ACROSS ALL MEDIA				2.3E+00

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

TOTAL ADVERSE CLINICAL SIGNS HI =	7.2E-05
TOTAL CARDIOVASCULAR SYSTEM HI =	1.2E-06
TOTAL DEVELOPMENTAL TOXICITY HI =	4.2E-01
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	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	9.3E-03
TOTAL IMMUNE SYSTEM HI =	1.7E+00
TOTAL KIDNEY HI =	2.4E-03
TOTAL LIVER HI =	8.4E-02
	--
	--
TOTAL NOAEL HI =	1.9E-02
	--
TOTAL SKIN HI =	4.9E-03
	--

Prepared by: KJA
Checked by: RAR

TABLE 9.12.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SOIL	SOIL	GREYSTONE MILL POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	3.8E-06	NA	5.6E-07	4.4E-06
			Acenaphthylene	NC	NA	NC	NA		Liver	3.8E-06	NA	5.5E-07	4.3E-06
			Benzo(a)anthracene	4.6E-08	NA	6.7E-09	NA	5.3E-08	Kidney	7.3E-05	NA	1.1E-05	8.4E-05
			Benzo(a)pyrene	4.6E-07	NA	6.7E-08	NA	5.2E-07	Kidney	7.3E-05	NA	1.1E-05	8.4E-05
			Benzo(b)fluoranthene	5.1E-08	NA	7.5E-09	NA	5.9E-08	Kidney	8.2E-05	NA	1.2E-05	9.4E-05
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	5.5E-05	NA	8.1E-06	6.4E-05
			Dibenzo(a,h)anthracene	9.1E-08	NA	1.3E-08	NA	1.0E-07	Kidney	1.5E-05	NA	2.1E-06	1.7E-05
			Indeno(1,2,3-cd)pyrene	3.7E-08	NA	5.4E-09	NA	4.3E-08	Kidney	6.0E-05	NA	8.7E-06	6.9E-05
			Phenanthrene	NC	NA	NC	NA		Kidney	9.4E-05	NA	1.4E-05	1.1E-04
			alpha-Chlordane	1.3E-10	NA	5.7E-12	NA	1.3E-10	Liver	2.5E-05	NA	1.1E-06	2.6E-05
			Aroclor-1254	2.1E-08	NA	3.3E-09	NA	2.4E-08	Immune system	1.9E-02	NA	2.9E-03	2.1E-02
			Aroclor-1268	3.4E-09	NA	5.4E-10	NA	4.0E-09	Immune system	3.0E-03	NA	4.7E-04	3.5E-03
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	7.7E-07	NA	8.6E-08	8.6E-07
			Technical Chlordane	3.1E-09	NA	1.4E-10	NA	3.2E-09	Liver	6.1E-04	NA	2.7E-05	6.4E-04
			Aluminum	NC	NA	NC	NA		Developmental toxicity	1.1E-02	NA	--	1.1E-02
			Arsenic	2.4E-07	NA	7.9E-09	NA	2.4E-07	Skin	1.8E-02	NA	6.2E-04	1.9E-02
			Chromium	NC	NA	NC	NA		NOAEL	5.5E-02	NA	--	5.5E-02
			Copper	NC	NA	NC	NA		Kidney	4.9E-03	NA	--	4.9E-03
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	1.8E-02	NA	--	1.8E-02
			Mercury	NC	NA	NC	NA		Immune system	1.4E-03	NA	--	1.4E-03
			Molybdenum	NC	NA	NC	NA		Kidney	7.7E-03	NA	--	7.7E-03
			Nickel	NC	NA	NC	NA		Developmental toxicity	4.3E-03	NA	--	4.3E-03
			Thallium	NC	NA	NC	NA		NOAEL	4.1E-03	NA	--	4.1E-03
			Vanadium	NC	NA	NC	NA		NOAEL	8.4E-03	NA	--	8.4E-03
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.7E-07	NA	5.6E-09	NA	1.7E-07		--	NA	--	
			CHEMICAL TOTAL	1.1E-06	--	1.2E-07	--	1E-06		1.6E-01	0.0E+00	4.1E-03	2E-01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-06					2E-01
	EXPOSURE MEDIUM TOTAL							1E-06					2E-01
SOIL TOTAL								1E-06					2E-01
SEDIMENT	SEDIMENT	GREYSTONE MILL POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	1.8E-06	NA	2.6E-07	2.0E-06
			Acenaphthylene	NC	NA	NC	NA		Liver	1.5E-06	NA	2.2E-07	1.7E-06
			Benzo(a)anthracene	1.5E-08	NA	2.2E-09	NA	1.7E-08	Kidney	2.4E-05	NA	3.5E-06	2.7E-05
			Benzo(a)pyrene	1.4E-07	NA	2.0E-08	NA	1.6E-07	Kidney	2.2E-05	NA	3.2E-06	2.5E-05
			Benzo(b)fluoranthene	1.5E-08	NA	2.2E-09	NA	1.7E-08	Kidney	2.4E-05	NA	3.5E-06	2.7E-05
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	1.4E-05	NA	2.0E-06	1.6E-05
			Dibenzo(a,h)anthracene	7.6E-08	NA	1.1E-08	NA	8.7E-08	Kidney	1.2E-05	NA	1.8E-06	1.4E-05
			Indeno(1,2,3-cd)pyrene	9.9E-09	NA	1.4E-09	NA	1.1E-08	Kidney	1.6E-05	NA	2.3E-06	1.8E-05
			Phenanthrene	NC	NA	NC	NA		Kidney	3.3E-05	NA	4.8E-06	3.8E-05
			alpha-Chlordane	2.9E-11	NA	1.3E-12	NA	3.0E-11	Liver	5.8E-06	NA	2.6E-07	6.1E-06
			Aroclor-1254	4.1E-09	NA	6.4E-10	NA	4.7E-09	Immune system	3.6E-03	NA	5.6E-04	4.1E-03
			Aroclor-1268	3.8E-09	NA	6.0E-10	NA	4.4E-09	Immune system	3.3E-03	NA	5.2E-04	3.8E-03
			gamma-Chlordane	2.3E-11	NA	1.0E-12	NA	2.4E-11	Liver	4.6E-06	NA	2.0E-07	4.8E-06
			Technical Chlordane	1.9E-09	NA	8.5E-11	NA	2.0E-09	Liver	3.8E-04	NA	1.7E-05	4.0E-04
			Aluminum	NC	NA	NC	NA		Developmental toxicity	7.4E-03	NA	--	7.4E-03
			Antimony	NC	NA	NC	NA		Adverse clinical signs	8.7E-04	NA	--	8.7E-04

TABLE 9.12.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Arsenic	2.0E-07	NA	6.6E-09	NA	2.0E-07	Skin	1.5E-02	NA	5.1E-04	1.6E-02
			Cadmium	NC	NA	NC	NA		Kidney	3.8E-04	NA	1.7E-05	4.0E-04
			Chromium	NC	NA	NC	NA		NOAEL	1.6E-02	NA	--	1.6E-02
			Copper	NC	NA	NC	NA		Kidney	1.2E-03	NA	--	1.2E-03
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	4.0E-03	NA	--	4.0E-03
			Mercury	NC	NA	NC	NA		Immune system	3.3E-04	NA	--	3.3E-04
			Nickel	NC	NA	NC	NA		Developmental toxicity	3.4E-03	NA	--	3.4E-03
			Thallium	NC	NA	NC	NA		NOAEL	2.2E-03	NA	--	2.2E-03
			Vanadium	NC	NA	NC	NA		NOAEL	5.4E-03	NA	--	5.4E-03
			Toxicity Equivalency (Dioxins/Furans) - Mam	2.5E-07	NA	8.3E-09	NA	2.5E-07		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	5.1E-08	NA	1.7E-09	NA	5.2E-08		--	NA	--	
			CHEMICAL TOTAL	7.6E-07	--	5.5E-08	--	8E-07		6.3E-02	0.0E+00	1.6E-03	7E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						8E-07					7E-02
	EXPOSURE MEDIUM TOTAL							8E-07					7E-02
SEDIMENT TOTAL								8E-07					7E-02
SURFACE WATER	SURFACE WATER	GREYSTONE MILL POND	Arsenic	2.8E-09	NA	3.0E-10	NA	3.1E-09	Skin	2.2E-04	NA	2.3E-05	2.4E-04
			Manganese	NC	NA	NC	NA		NOAEL	6.5E-04	NA	1.7E-03	2.4E-03
			Mercury	NC	NA	NC	NA		Immune system	7.6E-07	NA	1.2E-06	1.9E-06
			Nitrite-N	NC	NA	NC	NA		Hematological system	1.5E-04	NA	--	1.5E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.7E-09	NA	0.0E+00	NA	1.7E-09		--	NA	--	
			CHEMICAL TOTAL	4.5E-09	--	3.0E-10	--	5E-09		1.0E-03	0.0E+00	1.8E-03	3E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						5E-09					3E-03
	EXPOSURE MEDIUM TOTAL							5E-09					3E-03
SURFACE WATER TOTAL								5E-09					3E-03
BIOTA	COMBINED FISH DIET	GREYSTONE MILL POND	Acenaphthylene	NC	NA	NA	NA		Liver	6.4E-06	NA	NA	6.4E-06
			Benzo(a)pyrene	4.0E-08	NA	NA	NA	4.0E-08	Kidney	6.3E-06	NA	NA	6.3E-06
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	7.7E-06	NA	NA	7.7E-06
			Benzo(b)fluoranthene	3.7E-09	NA	NA	NA	3.7E-09	Kidney	5.9E-06	NA	NA	5.9E-06
			Dibenzo(a,h)anthracene	2.3E-08	NA	NA	NA	2.3E-08	Kidney	3.6E-06	NA	NA	3.6E-06
			Indeno(1,2,3-cd)pyrene	3.7E-09	NA	NA	NA	3.7E-09	Kidney	5.9E-06	NA	NA	5.9E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	5.1E-05	NA	NA	5.1E-05
			4,4'-DDD	1.7E-08	NA	NA	NA	1.7E-08	Liver	5.0E-03	NA	NA	5.0E-03
			4,4'-DDE	6.1E-08	NA	NA	NA	6.1E-08	Liver	1.3E-02	NA	NA	1.3E-02
			4,4'-DDT	5.6E-09	NA	NA	NA	5.6E-09	Liver	1.2E-03	NA	NA	1.2E-03
			alpha-Chlordane	2.7E-08	NA	NA	NA	2.7E-08	Liver	5.4E-03	NA	NA	5.4E-03
			Aroclor-1254	1.9E-06	NA	NA	NA	1.9E-06	Immune system	1.7E+00	NA	NA	1.7E+00
			Aroclor-1268	9.3E-07	NA	NA	NA	9.3E-07	Immune system	8.2E-01	NA	NA	8.2E-01
			Dieldrin	2.4E-07	NA	NA	NA	2.4E-07	Liver	1.0E-02	NA	NA	1.0E-02
			gamma-Chlordane	1.2E-08	NA	NA	NA	1.2E-08	Liver	2.3E-03	NA	NA	2.3E-03
			Heptachlor Epoxide	4.0E-08	NA	NA	NA	4.0E-08	Liver	1.2E-02	NA	NA	1.2E-02

TABLE 9.12.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- CHILD - COMBINED FISH DIET - GREYSTONE MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Technical Chlordane	3.9E-07	NA	NA	NA	3.9E-07	Liver	7.9E-02	NA	NA	7.9E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Mercury	NC	NA	NA	NA		Immune system	1.4E-01	NA	NA	1.4E-01
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	6.3E-01	NA	NA	6.3E-01
			Zinc	NC	NA	NA	NA		Hematological system	1.4E-02	NA	NA	1.4E-02
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.1E-06	NA	NA	NA	1.1E-06		--	NA	NA	
			CHEMICAL TOTAL	4.9E-06	--	--	--	5E-06		3.4E+00	0.0E+00	--	3.4E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						5E-06					3.4E+00
	EXPOSURE MEDIUM TOTAL							5E-06					3.4E+00
COMBINED FISH DIET TOTAL								5E-06					3.4E+00
RECEPTOR TOTAL								7E-06					3.7E+00
			TOTAL RISK ACROSS ALL MEDIA					7E-06	TOTAL HAZARD ACROSS ALL MEDIA				3.7E+00

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

TOTAL ADVERSE CLINICAL SIGNS HI =	8.7E-04
TOTAL CARDIOVASCULAR SYSTEM HI =	6.4E-06
TOTAL DEVELOPMENTAL TOXICITY HI =	6.6E-01
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	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	1.4E-02
TOTAL IMMUNE SYSTEM HI =	2.7E+00
TOTAL KIDNEY HI =	1.5E-02
TOTAL LIVER HI =	1.3E-01
	--
	--
TOTAL NOAEL HI =	1.2E-01
	--
TOTAL SKIN HI =	3.5E-02
	--

Prepared by: KJA
Checked by: RAR

TABLE 9.13.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SOIL	SOIL	ALLENDALE POND	2,3,7,8-TCDD	1.4E-08	NA	9.3E-10	NA	1.5E-08		--	NA	--	
			CHEMICAL TOTAL	1.4E-08	--	9.3E-10	--	1E-08		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-08					0E+00
	EXPOSURE MEDIUM TOTAL							1E-08					0E+00
SOIL TOTAL								1E-08					0E+00
SEDIMENT	SEDIMENT	ALLENDALE POND	2-Methylnaphthalene	NC	NA	NC	NA		Lung	4.0E-08	NA	1.0E-08	5.0E-08
			Acenaphthylene	NC	NA	NC	NA		Liver	9.5E-08	NA	2.4E-08	1.2E-07
			Benzo(a)anthracene	8.3E-10	NA	2.1E-10	NA	1.0E-09	Kidney	6.7E-07	NA	1.7E-07	8.3E-07
			Benzo(a)pyrene	9.8E-09	NA	2.5E-09	NA	1.2E-08	Kidney	7.8E-07	NA	2.0E-07	9.8E-07
			Benzo(b)fluoranthene	1.1E-09	NA	2.7E-10	NA	1.3E-09	Kidney	8.6E-07	NA	2.2E-07	1.1E-06
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	3.9E-07	NA	9.9E-08	4.9E-07
			Benzo(k)fluoranthene	9.6E-11	NA	2.4E-11	NA	1.2E-10	Kidney	7.6E-07	NA	1.9E-07	9.6E-07
			bis(2-Ethylhexyl)phthalate	1.5E-11	NA	2.9E-12	NA	1.8E-11	Liver	9.4E-07	NA	1.8E-07	1.1E-06
			Dibenzo(a,h)anthracene	4.9E-09	NA	1.2E-09	NA	6.1E-09	Kidney	3.9E-07	NA	9.9E-08	4.9E-07
			Indeno(1,2,3-cd)pyrene	7.8E-10	NA	2.0E-10	NA	9.8E-10	Kidney	6.3E-07	NA	1.6E-07	7.8E-07
			Pentachlorophenol	2.6E-10	NA	1.3E-10	NA	3.9E-10	Liver / Kidney	1.3E-06	NA	6.2E-07	1.9E-06
			Phenanthrene	NC	NA	NC	NA		Kidney	9.4E-07	NA	2.4E-07	1.2E-06
			alpha-Chlordane	1.3E-12	NA	1.0E-13	NA	1.4E-12	Liver	1.3E-07	NA	1.0E-08	1.4E-07
			Aroclor-1254	1.6E-09	NA	4.4E-10	NA	2.0E-09	Immune system	7.0E-04	NA	1.9E-04	9.0E-04
			Aroclor-1260	1.3E-10	NA	3.7E-11	NA	1.7E-10	Immune system	5.9E-05	NA	1.6E-05	7.5E-05
			Aroclor-1268	5.3E-11	NA	1.4E-11	NA	6.7E-11	Immune system	2.3E-05	NA	6.3E-06	3.0E-05
			delta-BHC	NC	NA	NC	NA		Liver / Kidney	2.7E-08	NA	5.3E-09	3.3E-08
			Dieldrin	4.8E-11	NA	9.4E-12	NA	5.8E-11	Liver	1.1E-06	NA	2.1E-07	1.3E-06
			Endosulfan II	NC	NA	NC	NA		Kidney	3.6E-08	NA	7.0E-09	4.3E-08
			Endosulfan sulfate	NC	NA	NC	NA		Kidney	2.6E-09	NA	5.1E-10	3.2E-09
			Endrin aldehyde	NC	NA	NC	NA		Nervous system	5.7E-08	NA	1.1E-08	6.8E-08
			Endrin Ketone	NC	NA	NC	NA		Nervous system	7.4E-08	NA	1.4E-08	8.9E-08
			gamma-Chlordane	2.0E-12	NA	1.6E-13	NA	2.2E-12	Liver	2.0E-07	NA	1.6E-08	2.2E-07
			Technical Chlordane	7.6E-11	NA	5.9E-12	NA	8.2E-11	Liver	7.6E-06	NA	5.9E-07	8.2E-06
			Antimony	NC	NA	NC	NA		Adverse clinical signs	7.0E-05	NA		7.0E-05
			Arsenic	2.9E-09	NA	1.7E-10	NA	3.1E-09	Skin	1.1E-04	NA	6.6E-06	1.2E-04
			Cadmium	NC	NA	NC	NA		Kidney	7.0E-06	NA	5.5E-07	7.6E-06
			Chromium	NC	NA	NC	NA		NOAEL	4.7E-04	NA		4.7E-04
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	4.4E-05	NA		4.4E-05
			Mercury	NC	NA	NC	NA		Immune system	1.9E-05	NA		1.9E-05
			Nickel	NC	NA	NC	NA		Developmental toxicity	7.8E-06	NA		7.8E-06
			Thallium	NC	NA	NC	NA		NOAEL	5.0E-04	NA		5.0E-04
			Vanadium	NC	NA	NC	NA		NOAEL	3.8E-05	NA		3.8E-05

TABLE 9.13.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Toxicity Equivalency (Dioxins/Furans) - Mam	2.9E-07	NA	1.7E-08	NA	3.0E-07		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	5.6E-12	NA	3.3E-13	NA	6.0E-12		--	NA	--	
			CHEMICAL TOTAL	3.1E-07	--	2.2E-08	--	3E-07		2.1E-03	0.0E+00	2.2E-04	2E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-07					2E-03
	EXPOSURE MEDIUM TOTAL							3E-07					2E-03
SEDIMENT TOTAL								3E-07					2E-03
SURFACE WATER	SURFACE WATER	ALLENDALE POND	Tetrachloroethene	1.0E-11	NA	3.2E-09	NA	3.2E-09	Liver	3.2E-08	NA	1.0E-05	1.0E-05
			bis(2-Ethylhexyl)phthalate	4.7E-13	NA	4.0E-10	NA	4.0E-10	Liver	2.9E-08	NA	2.5E-05	2.5E-05
			Aldrin	6.3E-12	NA	3.1E-10	NA	3.1E-10	Liver	2.2E-07	NA	1.1E-05	1.1E-05
			alpha-Chlordane	8.1E-15	NA	9.2E-12	NA	9.2E-12	Liver	8.1E-10	NA	9.2E-07	9.2E-07
			delta-BHC	NC	NA	NC	NA		Liver / Kidney	1.9E-08	NA	4.0E-06	4.0E-06
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	2.5E-10	NA	--	2.5E-10
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	5.5E-09	NA	2.1E-06	2.1E-06
			gamma-Chlordane	8.8E-15	NA	1.0E-11	NA	1.0E-11	Liver	8.8E-10	NA	1.0E-06	1.0E-06
			Arsenic	3.8E-10	NA	1.3E-09	NA	1.7E-09	Skin	1.5E-05	NA	5.1E-05	6.6E-05
			Barium	NC	NA	NC	NA		Cardiovascular system	3.8E-07	NA	1.9E-05	1.9E-05
			Chromium	NC	NA	NC	NA		NOAEL	5.3E-06	NA	1.5E-03	1.5E-03
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	1.0E-05	NA	8.9E-04	9.0E-04
			Mercury	NC	NA	NC	NA		Immune system	6.2E-09	NA	3.1E-07	3.2E-07
			Thallium	NC	NA	NC	NA		NOAEL	2.3E-05	NA	8.2E-05	1.1E-04
			Nitrate	NC	NA	NC	NA		Hematological system	2.8E-07	NA	--	2.8E-07
			Nitrite-N	NC	NA	NC	NA		Hematological system	7.0E-07	NA	--	7.0E-07
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.9E-09	NA	0.0E+00	NA	1.9E-09		--	NA	--	
			CHEMICAL TOTAL	2.3E-09	--	5.2E-09	--	8E-09		5.5E-05	0.0E+00	2.6E-03	3E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						8E-09					3E-03
	EXPOSURE MEDIUM TOTAL							8E-09					3E-03
SURFACE WATER TOTAL								8E-09					3E-03
BIOTA	COMBINED FISH DIET	ALLENDALE POND	Acenaphthylene	NC	NA	NA	NA		Liver	4.1E-06	NA	NA	4.1E-06
			Benzo(a)anthracene	7.1E-09	NA	NA	NA	7.1E-09	Kidney	5.7E-06	NA	NA	5.7E-06
			Benzo(a)pyrene	7.6E-08	NA	NA	NA	7.6E-08	Kidney	6.1E-06	NA	NA	6.1E-06
			Benzo(b)fluoranthene	8.1E-09	NA	NA	NA	8.1E-09	Kidney	6.5E-06	NA	NA	6.5E-06
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	2.6E-06	NA	NA	2.6E-06
			Dibenzo(a,h)anthracene	2.7E-08	NA	NA	NA	2.7E-08	Kidney	2.2E-06	NA	NA	2.2E-06
			Indeno(1,2,3-cd)pyrene	3.7E-09	NA	NA	NA	3.7E-09	Kidney	3.0E-06	NA	NA	3.0E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	4.0E-05	NA	NA	4.0E-05
			4,4'-DDD	2.1E-08	NA	NA	NA	2.1E-08	Liver	3.1E-03	NA	NA	3.1E-03
			4,4'-DDE	5.9E-08	NA	NA	NA	5.9E-08	Liver	6.1E-03	NA	NA	6.1E-03
			4,4'-DDT	1.9E-08	NA	NA	NA	1.9E-08	Liver	1.9E-03	NA	NA	1.9E-03
			alpha-Chlordane	5.2E-08	NA	NA	NA	5.2E-08	Liver	5.2E-03	NA	NA	5.2E-03
			Aroclor-1254	2.6E-05	NA	NA	NA	2.6E-05	Immune system	1.1E+01	NA	NA	1.1E+01
			Aroclor-1268	3.7E-07	NA	NA	NA	3.7E-07	Immune system	1.6E-01	NA	NA	1.6E-01

TABLE 9.13.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			beta-BHC	6.3E-09	NA	NA	NA	6.3E-09	Liver / Kidney	2.0E-04	NA	NA	2.0E-04
			Dieldrin	9.9E-07	NA	NA	NA	9.9E-07	Liver	2.2E-02	NA	NA	2.2E-02
			Endosulfan Sulfate	NC	NA	NA	NA		Kidney	2.0E-05	NA	NA	2.0E-05
			Endrin Aldehyde	NC	NA	NA	NA		Nervous system	2.0E-04	NA	NA	2.0E-04
			gamma-Chlordane	2.0E-08	NA	NA	NA	2.0E-08	Liver	2.0E-03	NA	NA	2.0E-03
			Heptachlor	1.6E-08	NA	NA	NA	1.6E-08	Liver	1.2E-04	NA	NA	1.2E-04
			Heptachlor Epoxide	7.0E-08	NA	NA	NA	7.0E-08	Liver	1.0E-02	NA	NA	1.0E-02
			Technical Chlordane	1.1E-06	NA	NA	NA	1.1E-06	Liver	1.1E-01	NA	NA	1.1E-01
			Cadmium	NC	NA	NA	NA		Kidney	7.8E-03	NA	NA	7.8E-03
			Chromium	NC	NA	NA	NA		NOAEL	4.2E-03	NA	NA	4.2E-03
			Lead	--	NA	NA	NA			--	NA	NA	
			Manganese	NC	NA	NA	NA		NOAEL	5.8E-03	NA	NA	5.8E-03
			Mercury	NC	NA	NA	NA		Immune system	5.9E-02	NA	NA	5.9E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	2.5E-01	NA	NA	2.5E-01
			Toxicity Equivalency (PCB Congeners) - Mam	2.9E-05	NA	NA	NA	2.9E-05		--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.1E-04	NA	NA	NA	3.1E-04		--	NA	NA	
			CHEMICAL TOTAL	3.7E-04	--	--	--	4E-04		1.2E+01	0.0E+00	--	1.2E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-04					1.2E+01
	EXPOSURE MEDIUM TOTAL							4E-04					1.2E+01
COMBINED FISH DIET TOTAL								4E-04					1.2E+01
RECEPTOR TOTAL								4E-04					1.2E+01
							TOTAL RISK ACROSS ALL MEDIA	4E-04	TOTAL HAZARD ACROSS ALL MEDIA				1.2E+01

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

TOTAL ADVERSE CLINICAL SIGNS HI =	7.0E-05
TOTAL CARDIOVASCULAR SYSTEM HI =	1.9E-05
TOTAL DEVELOPMENTAL TOXICITY HI =	2.5E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	9.8E-07
TOTAL IMMUNE SYSTEM HI =	1.2E+01
TOTAL KIDNEY HI =	8.1E-03
TOTAL LIVER HI =	1.6E-01
	--
TOTAL NERVOUS SYSTEM HI =	2.1E-04
TOTAL NOAEL HI =	1.4E-02
	--
TOTAL SKIN HI =	1.9E-04
	--

Prepared by: KJA
Checked by: RAR

TABLE 9.14.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SOIL	SOIL	ALLENDALE POND	2,3,7,8-TCDD	1.6E-08	NA	3.7E-09	NA	2.0E-08		--	NA	--	
			CHEMICAL TOTAL	1.6E-08	--	3.7E-09	--	2E-08		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-08					0E+00
	EXPOSURE MEDIUM TOTAL							2E-08					0E+00
SOIL TOTAL								2E-08					0E+00
SEDIMENT	SEDIMENT	ALLENDALE POND	2-Methylnaphthalene	NC	NA	NC	NA		Lung	6.2E-08	NA	4.6E-08	1.1E-07
			Acenaphthylene	NC	NA	NC	NA		Liver	1.5E-07	NA	1.1E-07	2.6E-07
			Benzo(a)anthracene	9.7E-10	NA	7.2E-10	NA	1.7E-09	Kidney	1.0E-06	NA	7.7E-07	1.8E-06
			Benzo(a)pyrene	1.1E-08	NA	8.5E-09	NA	2.0E-08	Kidney	1.2E-06	NA	9.1E-07	2.1E-06
			Benzo(b)fluoranthene	1.3E-09	NA	9.3E-10	NA	2.2E-09	Kidney	1.3E-06	NA	1.0E-06	2.3E-06
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	6.1E-07	NA	4.5E-07	1.1E-06
			Benzo(k)fluoranthene	1.1E-10	NA	8.3E-11	NA	1.9E-10	Kidney	1.2E-06	NA	8.8E-07	2.1E-06
			bis(2-Ethylhexyl)phthalate	1.8E-11	NA	1.0E-11	NA	2.8E-11	Liver	1.5E-06	NA	8.4E-07	2.3E-06
			Dibenzo(a,h)anthracene	5.7E-09	NA	4.2E-09	NA	1.0E-08	Kidney	6.1E-07	NA	4.5E-07	1.1E-06
			Indeno(1,2,3-cd)pyrene	9.1E-10	NA	6.8E-10	NA	1.6E-09	Kidney	9.7E-07	NA	7.2E-07	1.7E-06
			Pentachlorophenol	3.1E-10	NA	4.4E-10	NA	7.4E-10	Liver / Kidney	2.0E-06	NA	2.8E-06	4.8E-06
			Phenanthrene	NC	NA	NC	NA		Kidney	1.5E-06	NA	1.1E-06	2.5E-06
			alpha-Chlordane	1.5E-12	NA	3.5E-13	NA	1.9E-12	Liver	2.1E-07	NA	4.7E-08	2.5E-07
			Aroclor-1254	1.9E-09	NA	1.5E-09	NA	3.4E-09	Immune system	1.1E-03	NA	8.8E-04	2.0E-03
			Aroclor-1260	1.6E-10	NA	1.3E-10	NA	2.8E-10	Immune system	9.1E-05	NA	7.3E-05	1.6E-04
			Aroclor-1268	6.2E-11	NA	5.0E-11	NA	1.1E-10	Immune system	3.6E-05	NA	2.9E-05	6.5E-05
			delta-BHC	NC	NA	NC	NA		Liver / Kidney	4.3E-08	NA	2.4E-08	6.7E-08
			Dieldrin	5.6E-11	NA	3.2E-11	NA	8.9E-11	Liver	1.6E-06	NA	9.4E-07	2.6E-06
			Endosulfan II	NC	NA	NC	NA		Kidney	5.6E-08	NA	3.2E-08	8.9E-08
			Endosulfan sulfate	NC	NA	NC	NA		Kidney	4.1E-09	NA	2.4E-09	6.5E-09
			Endrin aldehyde	NC	NA	NC	NA		Nervous system	8.8E-08	NA	5.0E-08	1.4E-07
			Endrin Ketone	NC	NA	NC	NA		Nervous system	1.2E-07	NA	6.6E-08	1.8E-07
			gamma-Chlordane	2.3E-12	NA	5.3E-13	NA	2.9E-12	Liver	3.1E-07	NA	7.1E-08	3.8E-07
			Technical Chlordane	8.9E-11	NA	2.0E-11	NA	1.1E-10	Liver	1.2E-05	NA	2.7E-06	1.5E-05
			Antimony	NC	NA	NC	NA		Adverse clinical signs	1.1E-04	NA		1.1E-04
			Arsenic	3.4E-09	NA	5.8E-10	NA	4.0E-09	Skin	1.8E-04	NA	3.0E-05	2.1E-04
			Cadmium	NC	NA	NC	NA		Kidney	1.1E-05	NA	2.5E-06	1.3E-05
			Chromium	NC	NA	NC	NA		NOAEL	7.2E-04	NA		7.2E-04
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	6.8E-05	NA		6.8E-05
			Mercury	NC	NA	NC	NA		Immune system	3.0E-05	NA		3.0E-05
			Nickel	NC	NA	NC	NA		Developmental toxicity	1.2E-05	NA		1.2E-05
			Thallium	NC	NA	NC	NA		NOAEL	7.8E-04	NA		7.8E-04
			Vanadium	NC	NA	NC	NA		NOAEL	6.0E-05	NA		6.0E-05

TABLE 9.14.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.3E-07	NA	5.7E-08	NA	3 9E-07		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	6.6E-12	NA	1.1E-12	NA	7.7E-12		--	NA	--	
			CHEMICAL TOTAL	3.6E-07	--	7.5E-08	--	4E-07		3.2E-03	0 0E+00	1.0E-03	4E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-07					4E-03
	EXPOSURE MEDIUM TOTAL							4E-07					4E-03
SEDIMENT TOTAL								4E-07					4E-03
SURFACE WATER	SURFACE WATER	ALLENDALE POND	Tetrachloroethene	1.2E-11	NA	2.7E-09	NA	2.7E-09	Liver	5 0E-08	NA	1.2E-05	1.2E-05
			bis(2-Ethylhexyl)phthalate	5.5E-13	NA	3.3E-10	NA	3.3E-10	Liver	4 6E-08	NA	2.8E-05	2.8E-05
			Aldrin	7.3E-12	NA	2.6E-10	NA	2.6E-10	Liver	3.3E-07	NA	1.2E-05	1 2E-05
			alpha-Chlordane	9.5E-15	NA	7.7E-12	NA	7.7E-12	Liver	1.3E-09	NA	1.0E-06	1.0E-06
			delta-BHC	NC	NA	NC	NA		Liver / Kidney	2.9E-08	NA	4 5E-06	4 5E-06
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	4.0E-10	NA	--	4 0E-10
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	8 5E-09	NA	2 4E-06	2 4E-06
			gamma-Chlordane	1.0E-14	NA	8 4E-12	NA	8 4E-12	Liver	1 4E-09	NA	1 1E-06	1 1E-06
			Arsenic	4.4E-10	NA	1 1E-09	NA	1 5E-09	Skin	2.3E-05	NA	5.7E-05	8 0E-05
			Barium	NC	NA	NC	NA		Cardiovascular system	5 9E-07	NA	2.1E-05	2.2E-05
			Chromium	NC	NA	NC	NA		NOAEL	8.2E-06	NA	1.6E-03	1.7E-03
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	1.6E-05	NA	1 0E-03	1 0E-03
			Mercury	NC	NA	NC	NA		Immune system	9.7E-09	NA	3.5E-07	3 6E-07
			Thallium	NC	NA	NC	NA		NOAEL	3 7E-05	NA	9 1E-05	1.3E-04
			Nitrate	NC	NA	NC	NA		Hematological system	4 3E-07	NA	--	4 3E-07
			Nitrite-N	NC	NA	NC	NA		Hematological system	1.1E-06	NA	--	1.1E-06
			Toxicity Equivalency (Dioxins/Furans) - Mam	2 3E-09	NA	0.0E+00	NA	2.3E-09		--	NA	--	
			CHEMICAL TOTAL	2.7E-09	--	4.4E-09	--	7E-09		8.6E-05	0.0E+00	2.9E-03	3E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						7E-09					3E-03
	EXPOSURE MEDIUM TOTAL							7E-09					3E-03
SURFACE WATER TOTAL								7E-09					3E-03
BIOTA	COMBINED FISH DIET	ALLENDALE POND	Acenaphthylene	NC	NA	NA	NA		Liver	4.2E-06	NA	NA	4.2E-06
			Benzo(a)anthracene	5.5E-09	NA	NA	NA	5.5E-09	Kidney	5.9E-06	NA	NA	5.9E-06
			Benzo(a)pyrene	5.9E-08	NA	NA	NA	5.9E-08	Kidney	6.3E-06	NA	NA	6.3E-06
			Benzo(b)fluoranthene	6.3E-09	NA	NA	NA	6.3E-09	Kidney	6.7E-06	NA	NA	6.7E-06
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	2.7E-06	NA	NA	2.7E-06
			Dibenzo(a,h)anthracene	2.1E-08	NA	NA	NA	2.1E-08	Kidney	2.2E-06	NA	NA	2.2E-06
			Indeno(1,2,3-cd)pyrene	2.9E-09	NA	NA	NA	2.9E-09	Kidney	3.1E-06	NA	NA	3.1E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	4.1E-05	NA	NA	4.1E-05
			4,4'-DDD	1.7E-08	NA	NA	NA	1.7E-08	Liver	3.2E-03	NA	NA	3.2E-03
			4,4'-DDE	4.6E-08	NA	NA	NA	4.6E-08	Liver	6.3E-03	NA	NA	6 3E-03
			4,4'-DDT	1.4E-08	NA	NA	NA	1.4E-08	Liver	2.0E-03	NA	NA	2.0E-03
			alpha-Chlordane	4 0E-08	NA	NA	NA	4.0E-08	Liver	5.4E-03	NA	NA	5 4E-03
			Aroclor-1254	2.0E-05	NA	NA	NA	2.0E-05	Immune system	1.2E+01	NA	NA	1.2E+01
			Aroclor-1268	2 9E-07	NA	NA	NA	2.9E-07	Immune system	1 7E-01	NA	NA	1 7E-01

TABLE 9.14.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			beta-BHC	4.8E-09	NA	NA	NA	4.8E-09	Liver / Kidney	2.1E-04	NA	NA	2.1E-04
			Dieldrin	7.7E-07	NA	NA	NA	7.7E-07	Liver	2.2E-02	NA	NA	2.2E-02
			Endosulfan Sulfate	NC	NA	NA	NA		Kidney	2.1E-05	NA	NA	2.1E-05
			Endrin Aldehyde	NC	NA	NA	NA		Nervous system	2.1E-04	NA	NA	2.1E-04
			gamma-Chlordane	1.5E-08	NA	NA	NA	1.5E-08	Liver	2.0E-03	NA	NA	2.0E-03
			Heptachlor	1.2E-08	NA	NA	NA	1.2E-08	Liver	1.3E-04	NA	NA	1.3E-04
			Heptachlor Epoxide	5.4E-08	NA	NA	NA	5.4E-08	Liver	1.1E-02	NA	NA	1.1E-02
			Technical Chlordane	8.8E-07	NA	NA	NA	8.8E-07	Liver	1.2E-01	NA	NA	1.2E-01
			Cadmium	NC	NA	NA	NA		Kidney	8.0E-03	NA	NA	8.0E-03
			Chromium	NC	NA	NA	NA		NOAEL	4.3E-03	NA	NA	4.3E-03
			Lead	--	NA	NA	NA			--	NA	NA	
			Manganese	NC	NA	NA	NA		NOAEL	6.0E-03	NA	NA	6.0E-03
			Mercury	NC	NA	NA	NA		Immune system	6.0E-02	NA	NA	6.0E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	2.6E-01	NA	NA	2.6E-01
			Toxicity Equivalency (PCB Congeners) - Mam	2.2E-05	NA	NA	NA	2.2E-05		--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	2.4E-04	NA	NA	NA	2.4E-04		--	NA	NA	
			CHEMICAL TOTAL	2.9E-04	--	--	--	3E-04		1.3E+01	0.0E+00	--	1.3E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-04					1.3E+01
	EXPOSURE MEDIUM TOTAL							3E-04					1.3E+01
COMBINED FISH DIET TOTAL								3E-04					1.3E+01
RECEPTOR TOTAL								3E-04					1.3E+01
							TOTAL RISK ACROSS ALL MEDIA	3E-04	TOTAL HAZARD ACROSS ALL MEDIA				1.3E+01

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

TOTAL ADVERSE CLINICAL SIGNS HI =	1.1E-04
TOTAL CARDIOVASCULAR SYSTEM HI =	2.2E-05
TOTAL DEVELOPMENTAL TOXICITY HI =	2.6E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	1.5E-06
TOTAL IMMUNE SYSTEM HI =	1.2E+01
TOTAL KIDNEY HI =	8.4E-03
TOTAL LIVER HI =	1.7E-01
	--
TOTAL NERVOUS SYSTEM HI =	2.1E-04
TOTAL NOAEL HI =	1.5E-02
	--
TOTAL SKIN HI =	2.9E-04
	--

Prepared by: KJA
Checked by: RAR

TABLE 9.16.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SOIL	SOIL	ALLENDALE POND	2,3,7,8-TCDD	1.8E-07	NA	6.0E-09	NA	1.8E-07		--	NA	--	
			CHEMICAL TOTAL	1.8E-07	--	6.0E-09	--	2E-07		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-07					0E+00
	EXPOSURE MEDIUM TOTAL							2E-07					0E+00
SOIL TOTAL								2E-07					0E+00
SEDIMENT	SEDIMENT	ALLENDALE POND	2-Methylnaphthalene	NC	NA	NC	NA		Lung	1.7E-07	NA	2.2E-08	1.9E-07
			Acenaphthylene	NC	NA	NC	NA		Liver	4.1E-07	NA	5.2E-08	4.6E-07
			Benzo(a)anthracene	3.6E-09	NA	4.6E-10	NA	4.1E-09	Kidney	2.9E-06	NA	3.6E-07	3.2E-06
			Benzo(a)pyrene	4.2E-08	NA	5.4E-09	NA	4.8E-08	Kidney	3.4E-06	NA	4.3E-07	3.8E-06
			Benzo(b)fluoranthene	4.7E-09	NA	5.9E-10	NA	5.3E-09	Kidney	3.7E-06	NA	4.7E-07	4.2E-06
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	1.7E-06	NA	2.1E-07	1.9E-06
			Benzo(k)fluoranthene	4.1E-10	NA	5.2E-11	NA	4.7E-10	Kidney	3.3E-06	NA	4.2E-07	3.7E-06
			bis(2-Ethylhexyl)phthalate	6.5E-11	NA	6.3E-12	NA	7.1E-11	Liver	4.1E-06	NA	4.0E-07	4.5E-06
			Dibenzo(a,h)anthracene	2.1E-08	NA	2.7E-09	NA	2.4E-08	Kidney	1.7E-06	NA	2.1E-07	1.9E-06
			Indeno(1,2,3-cd)pyrene	3.4E-09	NA	4.3E-10	NA	3.8E-09	Kidney	2.7E-06	NA	3.4E-07	3.1E-06
			Pentachlorophenol	1.1E-09	NA	2.8E-10	NA	1.4E-09	Liver / Kidney	5.5E-06	NA	1.3E-06	6.9E-06
			Phenanthrene	NC	NA	NC	NA		Kidney	4.1E-06	NA	5.1E-07	4.6E-06
			alpha-Chlordane	5.7E-12	NA	2.2E-13	NA	6.0E-12	Liver	5.7E-07	NA	2.2E-08	6.0E-07
			Aroclor-1254	7.0E-09	NA	9.5E-10	NA	7.9E-09	Immune system	3.1E-03	NA	4.2E-04	3.5E-03
			Aroclor-1260	5.8E-10	NA	7.9E-11	NA	6.6E-10	Immune system	2.5E-04	NA	3.5E-05	2.9E-04
			Aroclor-1268	2.3E-10	NA	3.1E-11	NA	2.6E-10	Immune system	1.0E-04	NA	1.4E-05	1.1E-04
			delta-BHC	NC	NA	NC	NA		Liver / Kidney	1.2E-07	NA	1.2E-08	1.3E-07
			Dieldrin	2.1E-10	NA	2.0E-11	NA	2.3E-10	Liver	4.6E-06	NA	4.5E-07	5.0E-06
			Endosulfan II	NC	NA	NC	NA		Kidney	1.6E-07	NA	1.5E-08	1.7E-07
			Endosulfan sulfate	NC	NA	NC	NA		Kidney	1.1E-08	NA	1.1E-09	1.3E-08
			Endrin aldehyde	NC	NA	NC	NA		Nervous system	2.5E-07	NA	2.4E-08	2.7E-07
			Endrin Ketone	NC	NA	NC	NA		Nervous system	3.2E-07	NA	3.1E-08	3.5E-07
			gamma-Chlordane	8.6E-12	NA	3.4E-13	NA	9.0E-12	Liver	8.6E-07	NA	3.4E-08	9.0E-07
			Technical Chlordane	3.3E-10	NA	1.3E-11	NA	3.4E-10	Liver	3.3E-05	NA	1.3E-06	3.4E-05
			Antimony	NC	NA	NC	NA		Adverse clinical signs	3.1E-04	NA		3.1E-04
			Arsenic	1.3E-08	NA	3.7E-10	NA	1.3E-08	Skin	4.9E-04	NA	1.4E-05	5.1E-04
			Cadmium	NC	NA	NC	NA		Kidney	3.1E-05	NA	1.2E-06	3.2E-05
			Chromium	NC	NA	NC	NA		NOAEL	2.0E-03	NA		2.0E-03
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	1.9E-04	NA		1.9E-04
			Mercury	NC	NA	NC	NA		Immune system	8.2E-05	NA		8.2E-05
			Nickel	NC	NA	NC	NA		Developmental toxicity	3.4E-05	NA		3.4E-05
			Thallium	NC	NA	NC	NA		NOAEL	2.2E-03	NA		2.2E-03
			Vanadium	NC	NA	NC	NA		NOAEL	1.7E-04	NA		1.7E-04

TABLE 9.16.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.2E-06	NA	3 6E-08	NA	1.3E-06		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	2 4E-11	NA	7.1E-13	NA	2.5E-11		--	NA	--	
			CHEMICAL TOTAL	1 3E-06	--	4.8E-08	--	1E-06		9.0E-03	0.0E+00	4.9E-04	9E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-06					9E-03
	EXPOSURE MEDIUM TOTAL							1E-06					9E-03
SEDIMENT TOTAL								1E-06					9E-03
SURFACE WATER	SURFACE WATER	ALLENDALE POND	Tetrachloroethene	4.3E-10	NA	1.8E-08	NA	1.9E-08	Liver	1.4E-06	NA	5.9E-05	6.1E-05
			bis(2-Ethylhexyl)phthalate	2.0E-11	NA	2.3E-09	NA	2 3E-09	Liver	1.3E-06	NA	1.4E-04	1.4E-04
			Aldrin	2 7E-10	NA	1.7E-09	NA	2.0E-09	Liver	9.3E-06	NA	6.0E-05	6.9E-05
			alpha-Chlordane	3 5E-13	NA	5.2E-11	NA	5.3E-11	Liver	3.5E-08	NA	5.2E-06	5.3E-06
			delta-BHC	NC	NA	NC	NA		Liver / Kidney	8.1E-07	NA	2.3E-05	2 3E-05
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	1.1E-08	NA	--	1 1E-08
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	2.4E-07	NA	1.2E-05	1.2E-05
			gamma-Chlordane	3.8E-13	NA	5 7E-11	NA	5.7E-11	Liver	3.8E-08	NA	5.7E-06	5.7E-06
			Arsenic	1.6E-08	NA	7 5E-09	NA	2.4E-08	Skin	6.4E-04	NA	2.9E-04	9 3E-04
			Barium	NC	NA	NC	NA		Cardiovascular system	1.6E-05	NA	1.1E-04	1.2E-04
			Chromium	NC	NA	NC	NA		NOAEL	2 3E-04	NA	8.4E-03	8 6E-03
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	4 5E-04	NA	5.1E-03	5 5E-03
			Mercury	NC	NA	NC	NA		Immune system	2.7E-07	NA	1.8E-06	2.0E-06
			Thallium	NC	NA	NC	NA		NOAEL	1.0E-03	NA	4.7E-04	1.5E-03
			Nitrate	NC	NA	NC	NA		Hematological system	1.2E-05	NA	--	1 2E-05
			Nitrite-N	NC	NA	NC	NA		Hematological system	3 1E-05	NA	--	3 1E-05
			Toxicity Equivalency (Dioxins/Furans) - Mam	8.4E-08	NA	0 0E+00	NA	8.4E-08		--	NA	--	
			CHEMICAL TOTAL	1.0E-07	--	3.0E-08	--	1E-07		2.4E-03	0.0E+00	1.5E-02	2E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-07					2E-02
	EXPOSURE MEDIUM TOTAL							1E-07					2E-02
SURFACE WATER TOTAL								1E-07					2E-02
BIOTA	COMBINED FISH DIET	ALLENDALE POND	Acenaphthylene	NC	NA	NA	NA		Liver	4.1E-06	NA	NA	4.1E-06
			Benzo(a)anthracene	7.1E-09	NA	NA	NA	7.1E-09	Kidney	5.7E-06	NA	NA	5.7E-06
			Benzo(a)pyrene	7.6E-08	NA	NA	NA	7.6E-08	Kidney	6 1E-06	NA	NA	6 1E-06
			Benzo(b)fluoranthene	8 1E-09	NA	NA	NA	8 1E-09	Kidney	6 5E-06	NA	NA	6.5E-06
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	2.6E-06	NA	NA	2 6E-06
			Dibenzo(a,h)anthracene	2 7E-08	NA	NA	NA	2 7E-08	Kidney	2 2E-06	NA	NA	2.2E-06
			Indeno(1,2,3-cd)pyrene	3.7E-09	NA	NA	NA	3.7E-09	Kidney	3.0E-06	NA	NA	3 0E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	4.0E-05	NA	NA	4.0E-05
			4,4'-DDD	2.1E-08	NA	NA	NA	2.1E-08	Liver	3.1E-03	NA	NA	3 1E-03
			4,4'-DDE	5.9E-08	NA	NA	NA	5 9E-08	Liver	6.1E-03	NA	NA	6 1E-03
			4,4'-DDT	1 9E-08	NA	NA	NA	1.9E-08	Liver	1 9E-03	NA	NA	1 9E-03
			alpha-Chlordane	5 2E-08	NA	NA	NA	5 2E-08	Liver	5.2E-03	NA	NA	5 2E-03

TABLE 9.16.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Aroclor-1254	2.6E-05	NA	NA	NA	2.6E-05	Immune system	1.1E+01	NA	NA	1.1E+01
			Aroclor-1268	3.7E-07	NA	NA	NA	3.7E-07	Immune system	1.6E-01	NA	NA	1.6E-01
			beta-BHC	6.3E-09	NA	NA	NA	6.3E-09	Liver / Kidney	2.0E-04	NA	NA	2.0E-04
			Dieldrin	9.9E-07	NA	NA	NA	9.9E-07	Liver	2.2E-02	NA	NA	2.2E-02
			Endosulfan Sulfate	NC	NA	NA	NA		Kidney	2.0E-05	NA	NA	2.0E-05
			Endrin Aldehyde	NC	NA	NA	NA		Nervous system	2.0E-04	NA	NA	2.0E-04
			gamma-Chlordane	2.0E-08	NA	NA	NA	2.0E-08	Liver	2.0E-03	NA	NA	2.0E-03
			Heptachlor	1.6E-08	NA	NA	NA	1.6E-08	Liver	1.2E-04	NA	NA	1.2E-04
			Heptachlor Epoxide	7.0E-08	NA	NA	NA	7.0E-08	Liver	1.0E-02	NA	NA	1.0E-02
			Technical Chlordane	1.1E-06	NA	NA	NA	1.1E-06	Liver	1.1E-01	NA	NA	1.1E-01
			Cadmium	NC	NA	NA	NA		Kidney	7.8E-03	NA	NA	7.8E-03
			Chromium	NC	NA	NA	NA		NOAEL	4.2E-03	NA	NA	4.2E-03
			Lead	--	NA	NA	NA			--	NA	NA	
			Manganese	NC	NA	NA	NA		NOAEL	5.8E-03	NA	NA	5.8E-03
			Mercury	NC	NA	NA	NA		Immune system	5.9E-02	NA	NA	5.9E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	2.5E-01	NA	NA	2.5E-01
			Toxicity Equivalency (PCB Congeners) - Mam	2.9E-05	NA	NA	NA	2.9E-05		--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.1E-04	NA	NA	NA	3.1E-04		--	NA	NA	
			CHEMICAL TOTAL	3.7E-04	--	--	--	4E-04		1.2E+01	0.0E+00	--	1.2E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-04					1.2E+01
	EXPOSURE MEDIUM TOTAL							4E-04					1.2E+01
COMBINED FISH DIET TOTAL								4E-04					1.2E+01
RECEPTOR TOTAL								4E-04					1.2E+01
							TOTAL RISK ACROSS ALL MEDIA	4E-04	TOTAL HAZARD ACROSS ALL MEDIA				1.2E+01

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

TOTAL ADVERSE CLINICAL SIGNS HI =	3.1E-04
TOTAL CARDIOVASCULAR SYSTEM HI =	1.2E-04
TOTAL DEVELOPMENTAL TOXICITY HI =	2.5E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	4.3E-05
TOTAL IMMUNE SYSTEM HI =	1.2E+01
TOTAL KIDNEY HI =	8.2E-03
TOTAL LIVER HI =	1.7E-01
	--
TOTAL NERVOUS SYSTEM HI =	2.2E-04
TOTAL NOAEL HI =	3.0E-02
	--
TOTAL SKIN HI =	1.4E-03
	--

Prepared by: KJA
Checked by: RAR

TABLE 9.17.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SOIL	SOIL	ALLENDALE POND	2,3,7,8-TCDD	2 1E-07	NA	2.4E-08	NA	2.3E-07		--	NA	--	
			CHEMICAL TOTAL	2 1E-07	--	2.4E-08	--	2E-07		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-07					0E+00
	EXPOSURE MEDIUM TOTAL							2E-07					0E+00
SOIL TOTAL								2E-07					0E+00
SEDIMENT	SEDIMENT	ALLENDALE POND	2-Methylnaphthalene	NC	NA	NC	NA		Lung	2.7E-07	NA	1.0E-07	3 7E-07
			Acenaphthylene	NC	NA	NC	NA		Liver	6.4E-07	NA	2.4E-07	8 8E-07
			Benzo(a)anthracene	4.2E-09	NA	1.6E-09	NA	5.8E-09	Kidney	4.5E-06	NA	1.7E-06	6 2E-06
			Benzo(a)pyrene	5.0E-08	NA	1.8E-08	NA	6.8E-08	Kidney	5.3E-06	NA	2.0E-06	7.2E-06
			Benzo(b)fluoranthene	5.4E-09	NA	2.0E-09	NA	7.5E-09	Kidney	5.8E-06	NA	2.2E-06	8.0E-06
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	2.6E-06	NA	9 8E-07	3 6E-06
			Benzo(k)fluoranthene	4.8E-10	NA	1 8E-10	NA	6.6E-10	Kidney	5.1E-06	NA	1.9E-06	7 1E-06
			bis(2-Ethylhexyl)phthalate	7.6E-11	NA	2.2E-11	NA	9.8E-11	Liver	6.3E-06	NA	1.8E-06	8 1E-06
			Dibenzo(a,h)anthracene	2.5E-08	NA	9.2E-09	NA	3.4E-08	Kidney	2.6E-06	NA	9 8E-07	3 6E-06
			Indeno(1,2,3-cd)pyrene	4.0E-09	NA	1.5E-09	NA	5.4E-09	Kidney	4.2E-06	NA	1 6E-06	5 8E-06
			Pentachlorophenol	1.3E-09	NA	9 5E-10	NA	2 3E-09	Liver / Kidney	8.6E-06	NA	6.1E-06	1 5E-05
			Phenanthrene	NC	NA	NC	NA		Kidney	6.3E-06	NA	2.4E-06	8 7E-06
			alpha-Chlordane	6.7E-12	NA	7.7E-13	NA	7 5E-12	Liver	8.9E-07	NA	1.0E-07	1 0E-06
			Aroclor-1254	8 1E-09	NA	3.3E-09	NA	1.1E-08	Immune system	4 7E-03	NA	1.9E-03	6.6E-03
			Aroclor-1260	6.8E-10	NA	2.7E-10	NA	9.5E-10	Immune system	4.0E-04	NA	1.6E-04	5.5E-04
			Aroclor-1268	2.7E-10	NA	1.1E-10	NA	3 8E-10	Immune system	1.6E-04	NA	6.3E-05	2.2E-04
			delta-BHC	NC	NA	NC	NA		Liver / Kidney	1 8E-07	NA	5.3E-08	2 4E-07
			Dieldrin	2.4E-10	NA	7.0E-11	NA	3.1E-10	Liver	7 1E-06	NA	2 0E-06	9.2E-06
			Endosulfan II	NC	NA	NC	NA		Kidney	2.4E-07	NA	7 0E-08	3.1E-07
			Endosulfan sulfate	NC	NA	NC	NA		Kidney	1.8E-08	NA	5.1E-09	2.3E-08
			Endrin aldehyde	NC	NA	NC	NA		Nervous system	3.8E-07	NA	1.1E-07	4.9E-07
			Endrin Ketone	NC	NA	NC	NA		Nervous system	5.0E-07	NA	1.4E-07	6.4E-07
			gamma-Chlordane	1.0E-11	NA	1.2E-12	NA	1 1E-11	Liver	1.3E-06	NA	1.5E-07	1.5E-06
			Technical Chlordane	3.9E-10	NA	4.4E-11	NA	4 3E-10	Liver	5.1E-05	NA	5.9E-06	5.7E-05
			Antimony	NC	NA	NC	NA		Adverse clinical signs	4.7E-04	NA		4.7E-04
			Arsenic	1.5E-08	NA	1.3E-09	NA	1.6E-08	Skin	7.7E-04	NA	6.6E-05	8.3E-04
			Cadmium	NC	NA	NC	NA		Kidney	4.7E-05	NA	5.4E-06	5.3E-05
			Chromium	NC	NA	NC	NA		NOAEL	3 1E-03	NA		3.1E-03
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	3 0E-04	NA		3 0E-04
			Mercury	NC	NA	NC	NA		Immune system	1 3E-04	NA		1.3E-04
			Nickel	NC	NA	NC	NA		Developmental toxicity	5.3E-05	NA		5.3E-05
			Thallium	NC	NA	NC	NA		NOAEL	3.4E-03	NA		3.4E-03
			Vanadium	NC	NA	NC	NA		NOAEL	2.6E-04	NA		2.6E-04

TABLE 9.17.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.5E-06	NA	1.2E-07	NA	1.6E-06		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	2.8E-11	NA	2.4E-12	NA	3.1E-11		--	NA	--	
			CHEMICAL TOTAL	1.6E-06	--	1.6E-07	--	2E-06		1.4E-02	0.0E+00	2.2E-03	2E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-06					2E-02
	EXPOSURE MEDIUM TOTAL							2E-06					2E-02
SEDIMENT TOTAL								2E-06					2E-02
SURFACE WATER	SURFACE WATER	ALLENDALE POND	Tetrachloroethene	5.0E-10	NA	1.7E-08	NA	1.7E-08	Liver	2.2E-06	NA	7.2E-05	7.4E-05
			bis(2-Ethylhexyl)phthalate	2.4E-11	NA	2.0E-09	NA	2.1E-09	Liver	2.0E-06	NA	1.7E-04	1.7E-04
			Aldrin	3.2E-10	NA	1.6E-09	NA	1.9E-09	Liver	1.5E-05	NA	7.2E-05	8.7E-05
			alpha-Chlordane	4.1E-13	NA	4.8E-11	NA	4.8E-11	Liver	5.5E-08	NA	6.3E-06	6.4E-06
			delta-BHC	NC	NA	NC	NA		Liver / Kidney	1.3E-06	NA	2.7E-05	2.9E-05
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	1.7E-08	NA	--	1.7E-08
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	3.7E-07	NA	1.5E-05	1.5E-05
			gamma-Chlordane	4.5E-13	NA	5.2E-11	NA	5.2E-11	Liver	5.9E-08	NA	6.9E-06	7.0E-06
			Arsenic	1.9E-08	NA	6.8E-09	NA	2.6E-08	Skin	9.9E-04	NA	3.5E-04	1.3E-03
			Barium	NC	NA	NC	NA		Cardiovascular system	2.5E-05	NA	1.3E-04	1.5E-04
			Chromium	NC	NA	NC	NA		NOAEL	3.6E-04	NA	1.0E-02	1.0E-02
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	6.9E-04	NA	6.2E-03	6.8E-03
			Mercury	NC	NA	NC	NA		Immune system	4.2E-07	NA	2.1E-06	2.6E-06
			Thallium	NC	NA	NC	NA		NOAEL	1.6E-03	NA	5.6E-04	2.1E-03
			Nitrate	NC	NA	NC	NA		Hematological system	1.9E-05	NA	--	1.9E-05
			Nitrite-N	NC	NA	NC	NA		Hematological system	4.7E-05	NA	--	4.7E-05
			Toxicity Equivalency (Dioxins/Furans) - Mam	9.8E-08	NA	0.0E+00	NA	9.8E-08		--	NA	--	
			CHEMICAL TOTAL	1.2E-07	--	2.7E-08	--	1E-07		3.7E-03	0.0E+00	1.8E-02	2E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-07					2E-02
	EXPOSURE MEDIUM TOTAL							1E-07					2E-02
SURFACE WATER TOTAL								1E-07					2E-02
BIOTA	COMBINED FISH DIET	ALLENDALE POND	Acenaphthylene	NC	NA	NA	NA		Liver	4.2E-06	NA	NA	4.2E-06
			Benzo(a)anthracene	5.5E-09	NA	NA	NA	5.5E-09	Kidney	5.9E-06	NA	NA	5.9E-06
			Benzo(a)pyrene	5.9E-08	NA	NA	NA	5.9E-08	Kidney	6.3E-06	NA	NA	6.3E-06
			Benzo(b)fluoranthene	6.3E-09	NA	NA	NA	6.3E-09	Kidney	6.7E-06	NA	NA	6.7E-06
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	2.7E-06	NA	NA	2.7E-06
			Dibenzo(a,h)anthracene	2.1E-08	NA	NA	NA	2.1E-08	Kidney	2.2E-06	NA	NA	2.2E-06
			Indeno(1,2,3-cd)pyrene	2.9E-09	NA	NA	NA	2.9E-09	Kidney	3.1E-06	NA	NA	3.1E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	4.1E-05	NA	NA	4.1E-05

TABLE 9.17.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			4,4'-DDD	1.7E-08	NA	NA	NA	1.7E-08	Liver	3.2E-03	NA	NA	3.2E-03
			4,4'-DDE	4.6E-08	NA	NA	NA	4.6E-08	Liver	6.3E-03	NA	NA	6.3E-03
			4,4'-DDT	1.4E-08	NA	NA	NA	1.4E-08	Liver	2.0E-03	NA	NA	2.0E-03
			alpha-Chlordane	4.0E-08	NA	NA	NA	4.0E-08	Liver	5.4E-03	NA	NA	5.4E-03
			Aroclor-1254	2.0E-05	NA	NA	NA	2.0E-05	Immune system	1.2E+01	NA	NA	1.2E+01
			Aroclor-1268	2.9E-07	NA	NA	NA	2.9E-07	Immune system	1.7E-01	NA	NA	1.7E-01
			beta-BHC	4.8E-09	NA	NA	NA	4.8E-09	Liver / Kidney	2.1E-04	NA	NA	2.1E-04
			Dieldrin	7.7E-07	NA	NA	NA	7.7E-07	Liver	2.2E-02	NA	NA	2.2E-02
			Endosulfan Sulfate	NC	NA	NA	NA		Kidney	2.1E-05	NA	NA	2.1E-05
			Endrin Aldehyde	NC	NA	NA	NA		Nervous system	2.1E-04	NA	NA	2.1E-04
			gamma-Chlordane	1.5E-08	NA	NA	NA	1.5E-08	Liver	2.0E-03	NA	NA	2.0E-03
			Heptachlor	1.2E-08	NA	NA	NA	1.2E-08	Liver	1.3E-04	NA	NA	1.3E-04
			Heptachlor Epoxide	5.4E-08	NA	NA	NA	5.4E-08	Liver	1.1E-02	NA	NA	1.1E-02
			Technical Chlordane	8.8E-07	NA	NA	NA	8.8E-07	Liver	1.2E-01	NA	NA	1.2E-01
			Cadmium	NC	NA	NA	NA		Kidney	8.0E-03	NA	NA	8.0E-03
			Chromium	NC	NA	NA	NA		NOAEL	4.3E-03	NA	NA	4.3E-03
			Lead	--	NA	NA	NA			--	NA	NA	
			Manganese	NC	NA	NA	NA		NOAEL	6.0E-03	NA	NA	6.0E-03
			Mercury	NC	NA	NA	NA		Immune system	6.0E-02	NA	NA	6.0E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	2.6E-01	NA	NA	2.6E-01
			Toxicity Equivalency (PCB Congeners) - Mam	2.2E-05	NA	NA	NA	2.2E-05		--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	2.4E-04	NA	NA	NA	2.4E-04		--	NA	NA	
			CHEMICAL TOTAL	2.9E-04	--	--	--	3E-04		1.3E+01	0.0E+00	--	1.3E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-04					1.3E+01
	EXPOSURE MEDIUM TOTAL							3E-04					1.3E+01
COMBINED FISH DIET TOTAL								3E-04					1.3E+01

RECEPTOR TOTAL	3E-04		1.3E+01
	TOTAL RISK ACROSS ALL MEDIA	TOTAL HAZARD ACROSS ALL MEDIA	1.3E+01

NOTES.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

TOTAL ADVERSE CLINICAL SIGNS HI =	4.7E-04
TOTAL CARDIOVASCULAR SYSTEM HI =	1.5E-04
TOTAL DEVELOPMENTAL TOXICITY HI =	2.6E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	6.6E-05
TOTAL IMMUNE SYSTEM HI =	1.2E+01
TOTAL KIDNEY HI =	8.5E-03
TOTAL LIVER HI =	1.7E-01
	--
TOTAL NERVOUS SYSTEM HI =	2.3E-04
TOTAL NOAEL HI =	3.7E-02
	--
TOTAL SKIN HI =	2.2E-03
	--

Prepared by: KJA
Checked by: RAR

TABLE 9.18.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SOIL	SOIL	ALLENDALE POND	2,3,7,8-TCDD	8.2E-07	NA	2.8E-08	NA	8.5E-07		--	NA	--	
			CHEMICAL TOTAL	8.2E-07	--	2.8E-08	--	9E-07		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						9E-07					0E+00
	EXPOSURE MEDIUM TOTAL							9E-07					0E+00
SOIL TOTAL								9E-07					0E+00
SEDIMENT	SEDIMENT	ALLENDALE POND	2-Methylnaphthalene	NC	NA	NC	NA		Lung	3.2E-06	NA	4.7E-07	3.7E-06
			Acenaphthylene	NC	NA	NC	NA		Liver	7.7E-06	NA	1.1E-06	8.8E-06
			Benzo(a)anthracene	3.4E-08	NA	4.9E-09	NA	3.9E-08	Kidney	5.4E-05	NA	7.8E-06	6.2E-05
			Benzo(a)pyrene	4.0E-07	NA	5.8E-08	NA	4.5E-07	Kidney	6.3E-05	NA	9.2E-06	7.3E-05
			Benzo(b)fluoranthene	4.4E-08	NA	6.3E-09	NA	5.0E-08	Kidney	7.0E-05	NA	1.0E-05	8.0E-05
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	3.2E-05	NA	4.6E-06	3.6E-05
			Benzo(k)fluoranthene	3.9E-09	NA	5.6E-10	NA	4.4E-09	Kidney	6.2E-05	NA	9.0E-06	7.1E-05
			bis(2-Ethylhexyl)phthalate	6.1E-10	NA	6.8E-11	NA	6.8E-10	Liver	7.6E-05	NA	8.5E-06	8.4E-05
			Dibenzo(a,h)anthracene	2.0E-07	NA	2.9E-08	NA	2.3E-07	Kidney	3.2E-05	NA	4.6E-06	3.6E-05
			Indeno(1,2,3-cd)pyrene	3.2E-08	NA	4.6E-09	NA	3.6E-08	Kidney	5.1E-05	NA	7.4E-06	5.8E-05
			Pentachlorophenol	1.1E-08	NA	3.0E-09	NA	1.4E-08	Liver / Kidney	1.0E-04	NA	2.9E-05	1.3E-04
			Phenanthrene	NC	NA	NC	NA		Kidney	7.6E-05	NA	1.1E-05	8.7E-05
			alpha-Chlordane	5.4E-11	NA	2.4E-12	NA	5.6E-11	Liver	1.1E-05	NA	4.8E-07	1.1E-05
			Aroclor-1254	6.5E-08	NA	1.0E-08	NA	7.5E-08	Immune system	5.7E-02	NA	8.9E-03	6.6E-02
			Aroclor-1260	5.4E-09	NA	8.5E-10	NA	6.3E-09	Immune system	4.7E-03	NA	7.4E-04	5.5E-03
			Aroclor-1268	2.1E-09	NA	3.4E-10	NA	2.5E-09	Immune system	1.9E-03	NA	2.9E-04	2.2E-03
			delta-BHC	NC	NA	NC	NA		Liver / Kidney	2.2E-06	NA	2.5E-07	2.5E-06
			Dieldrin	2.0E-09	NA	2.2E-10	NA	2.2E-09	Liver	8.5E-05	NA	9.6E-06	9.5E-05
			Endosulfan II	NC	NA	NC	NA		Kidney	2.9E-06	NA	3.3E-07	3.3E-06
			Endosulfan sulfate	NC	NA	NC	NA		Kidney	2.1E-07	NA	2.4E-08	2.4E-07
			Endrin aldehyde	NC	NA	NC	NA		Nervous system	4.6E-06	NA	5.1E-07	5.1E-06
			Endrin Ketone	NC	NA	NC	NA		Nervous system	6.0E-06	NA	6.7E-07	6.7E-06
			gamma-Chlordane	8.1E-11	NA	3.6E-12	NA	8.4E-11	Liver	1.6E-05	NA	7.2E-07	1.7E-05
			Technical Chlordane	3.1E-09	NA	1.4E-10	NA	3.2E-09	Liver	6.2E-04	NA	2.8E-05	6.5E-04
			Antimony	NC	NA	NC	NA		Adverse clinical signs	5.7E-03	NA		5.7E-03
			Arsenic	1.2E-07	NA	4.0E-09	NA	1.2E-07	Skin	9.2E-03	NA	3.1E-04	9.5E-03
			Cadmium	NC	NA	NC	NA		Kidney	5.7E-04	NA	2.6E-05	6.0E-04
			Chromium	NC	NA	NC	NA		NOAEL	3.8E-02	NA		3.8E-02
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	3.6E-03	NA		3.6E-03
			Mercury	NC	NA	NC	NA		Immune system	1.5E-03	NA		1.5E-03
			Nickel	NC	NA	NC	NA		Developmental toxicity	6.3E-04	NA		6.3E-04
			Thallium	NC	NA	NC	NA		NOAEL	4.0E-02	NA		4.0E-02
			Vanadium	NC	NA	NC	NA		NOAEL	3.1E-03	NA		3.1E-03

TABLE 9.18.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.2E-05	NA	3 9E-07	NA	1.2E-05		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	2.3E-10	NA	7.7E-12	NA	2.4E-10		--	NA	--	
			CHEMICAL TOTAL	1 3E-05	--	5.1E-07	--	1E-05		1.7E-01	0.0E+00	1.0E-02	2E-01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-05					2E-01
	EXPOSURE MEDIUM TOTAL							1E-05					2E-01
SEDIMENT TOTAL								1E-05					2E-01
SURFACE WATER	SURFACE WATER	ALLENDALE POND	Tetrachloroethene	1.0E-09	NA	1.0E-08	NA	1.1E-08	Liver	6.5E-06	NA	6.5E-05	7.1E-05
			bis(2-Ethylhexyl)phthalate	4.7E-11	NA	1.2E-09	NA	1.3E-09	Liver	5.9E-06	NA	1.5E-04	1 6E-04
			Aldrin	6.3E-10	NA	9 5E-10	NA	1.6E-09	Liver	4.4E-05	NA	6.5E-05	1 1E-04
			alpha-Chlordane	8.2E-13	NA	2.9E-11	NA	3.0E-11	Liver	1.6E-07	NA	5.7E-06	5.9E-06
			delta-BHC	NC	NA	NC	NA		Liver / Kidney	3.8E-06	NA	2.5E-05	2.9E-05
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	5.1E-08	NA	--	5.1E-08
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	1.1E-06	NA	1.3E-05	1.4E-05
			gamma-Chlordane	8.9E-13	NA	3.1E-11	NA	3.2E-11	Liver	1.8E-07	NA	6.2E-06	6.4E-06
			Arsenic	3.8E-08	NA	4.1E-09	NA	4.2E-08	Skin	3.0E-03	NA	3.2E-04	3 3E-03
			Barium	NC	NA	NC	NA		Cardiovascular system	7.6E-05	NA	1.2E-04	1.9E-04
			Chromium	NC	NA	NC	NA		NOAEL	1.1E-03	NA	9.2E-03	1.0E-02
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	2.1E-03	NA	5.6E-03	7 6E-03
			Mercury	NC	NA	NC	NA		Immune system	1.3E-06	NA	1.9E-06	3.2E-06
			Thallium	NC	NA	NC	NA		NOAEL	4.7E-03	NA	5.1E-04	5 3E-03
			Nitrate	NC	NA	NC	NA		Hematological system	5.6E-05	NA	--	5.6E-05
			Nitrite-N	NC	NA	NC	NA		Hematological system	1.4E-04	NA	--	1 4E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	2.0E-07	NA	0 0E+00	NA	2.0E-07		--	NA	--	
			CHEMICAL TOTAL	2 4E-07	--	1.6E-08	--	3E-07		1.1E-02	0.0E+00	1.6E-02	3E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-07					3E-02
	EXPOSURE MEDIUM TOTAL							3E-07					3E-02
SURFACE WATER TOTAL								3E-07					3E-02
BIOTA	COMBINED FISH DIET	ALLENDALE POND	Acenaphthylene	NC	NA	NA	NA		Liver	6.4E-06	NA	NA	6.4E-06
			Benzo(a)anthracene	5.6E-09	NA	NA	NA	5.6E-09	Kidney	8.9E-06	NA	NA	8.9E-06
			Benzo(a)pyrene	6.0E-08	NA	NA	NA	6.0E-08	Kidney	9.6E-06	NA	NA	9.6E-06
			Benzo(b)fluoranthene	6.4E-09	NA	NA	NA	6.4E-09	Kidney	1.0E-05	NA	NA	1.0E-05
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	4.2E-06	NA	NA	4.2E-06
			Dibenzo(a,h)anthracene	2.1E-08	NA	NA	NA	2.1E-08	Kidney	3.4E-06	NA	NA	3.4E-06
			Indeno(1,2,3-cd)pyrene	2.9E-09	NA	NA	NA	2.9E-09	Kidney	4.7E-06	NA	NA	4.7E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	6.2E-05	NA	NA	6.2E-05

TABLE 9.18.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			4,4'-DDD	1.7E-08	NA	NA	NA	1.7E-08	Liver	4.9E-03	NA	NA	4.9E-03
			4,4'-DDE	4.6E-08	NA	NA	NA	4.6E-08	Liver	9.6E-03	NA	NA	9.6E-03
			4,4'-DDT	1.5E-08	NA	NA	NA	1.5E-08	Liver	3.0E-03	NA	NA	3.0E-03
			alpha-Chlordane	4.1E-08	NA	NA	NA	4.1E-08	Liver	8.2E-03	NA	NA	8.2E-03
			Aroclor-1254	2.1E-05	NA	NA	NA	2.1E-05	Immune system	1.8E+01	NA	NA	1.8E+01
			Aroclor-1268	2.9E-07	NA	NA	NA	2.9E-07	Immune system	2.6E-01	NA	NA	2.6E-01
			beta-BHC	4.9E-09	NA	NA	NA	4.9E-09	Liver / Kidney	3.2E-04	NA	NA	3.2E-04
			Dieldrin	7.8E-07	NA	NA	NA	7.8E-07	Liver	3.4E-02	NA	NA	3.4E-02
			Endosulfan Sulfate	NC	NA	NA	NA		Kidney	3.2E-05	NA	NA	3.2E-05
			Endrin Aldehyde	NC	NA	NA	NA		Nervous system	3.2E-04	NA	NA	3.2E-04
			gamma-Chlordane	1.5E-08	NA	NA	NA	1.5E-08	Liver	3.1E-03	NA	NA	3.1E-03
			Heptachlor	1.3E-08	NA	NA	NA	1.3E-08	Liver	1.9E-04	NA	NA	1.9E-04
			Heptachlor Epoxide	5.5E-08	NA	NA	NA	5.5E-08	Liver	1.6E-02	NA	NA	1.6E-02
			Technical Chlordane	9.0E-07	NA	NA	NA	9.0E-07	Liver	1.8E-01	NA	NA	1.8E-01
			Cadmium	NC	NA	NA	NA		Kidney	1.2E-02	NA	NA	1.2E-02
			Chromium	NC	NA	NA	NA		NOAEL	6.6E-03	NA	NA	6.6E-03
			Lead	--	NA	NA	NA			--	NA	NA	
			Manganese	NC	NA	NA	NA		NOAEL	9.2E-03	NA	NA	9.2E-03
			Mercury	NC	NA	NA	NA		Immune system	9.2E-02	NA	NA	9.2E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	4.0E-01	NA	NA	4.0E-01
			Toxicity Equivalency (PCB Congeners) - Mam	2.3E-05	NA	NA	NA	2.3E-05		--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	2.5E-04	NA	NA	NA	2.5E-04		--	NA	NA	
			CHEMICAL TOTAL	2.9E-04	--	--	--	3E-04		1.9E+01	0.0E+00	--	1.9E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-04					1.9E+01
	EXPOSURE MEDIUM TOTAL							3E-04					1.9E+01
COMBINED FISH DIET TOTAL								3E-04					1.9E+01
RECEPTOR TOTAL								3E-04					1.9E+01
							TOTAL RISK ACROSS ALL MEDIA	3E-04	TOTAL HAZARD ACROSS ALL MEDIA				1.9E+01

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

TOTAL ADVERSE CLINICAL SIGNS HI =	5.7E-03
TOTAL CARDIOVASCULAR SYSTEM HI =	1.9E-04
TOTAL DEVELOPMENTAL TOXICITY HI =	4.0E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	2.0E-04
TOTAL IMMUNE SYSTEM HI =	1.9E+01
TOTAL KIDNEY HI =	1.4E-02
TOTAL LIVER HI =	2.6E-01
	--
TOTAL NERVOUS SYSTEM HI =	3.5E-04
TOTAL NOAEL HI =	1.2E-01
	--
TOTAL SKIN HI =	1.3E-02
	--

Prepared by: KJA
Checked by: RAR

TABLE 9.19.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	LYMAN MILL POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	2.9E-08	NA	7.4E-09	3 7E-08
			4-Chloro-3-methylphenol	NC	NA	NC	NA		Reproductive system	1.6E-06	NA	3 2E-07	2 0E-06
			4-Nitrophenol	NC	NA	NC	NA			--	NA	--	
			Acenaphthylene	NC	NA	NC	NA		Liver	4.2E-08	NA	1.1E-08	5 3E-08
			Benzo(a)anthracene	6.9E-10	NA	1.7E-10	NA	8.6E-10	Kidney	5.5E-07	NA	1.4E-07	6.9E-07
			Benzo(a)pyrene	7.1E-09	NA	1.8E-09	NA	8.9E-09	Kidney	5.7E-07	NA	1.4E-07	7.1E-07
			Benzo(b)fluoranthene	1.1E-09	NA	2.8E-10	NA	1.4E-09	Kidney	8.8E-07	NA	2.2E-07	1.1E-06
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	5.9E-07	NA	1.5E-07	7.4E-07
			Benzo(k)fluoranthene	5.1E-11	NA	1.3E-11	NA	6.4E-11	Kidney	4.1E-07	NA	1.0E-07	5.1E-07
			bis(2-Ethylhexyl)phthalate	2.4E-11	NA	4.7E-12	NA	2.9E-11	Liver	1.5E-06	NA	3.0E-07	1.8E-06
			Dibenzo(a,h)anthracene	1.9E-09	NA	4.8E-10	NA	2.4E-09	Kidney	1.5E-07	NA	3.8E-08	1.9E-07
			Indeno(1,2,3-cd)pyrene	6.6E-10	NA	1.7E-10	NA	8.3E-10	Kidney	5.3E-07	NA	1.3E-07	6.6E-07
			N-Nitroso-di-n-propylamine	3.1E-09	NA	5.9E-10	NA	3.6E-09		--	NA	--	
			Pentachlorophenol	5.6E-11	NA	2.7E-11	NA	8.4E-11	Liver / Kidney	2.7E-07	NA	1.3E-07	4.1E-07
			Phenanthrene	NC	NA	NC	NA		Kidney	5.5E-07	NA	1.4E-07	6.9E-07
			alpha-Chlordane	3.8E-12	NA	2.9E-13	NA	4.0E-12	Liver	3.8E-07	NA	2.9E-08	4.0E-07
			Aroclor-1254	3.3E-10	NA	8.9E-11	NA	4.2E-10	Immune system	1.4E-04	NA	3.9E-05	1.8E-04
			Aroclor-1260	1 8E-11	NA	4 9E-12	NA	2 3E-11	Immune system	7.9E-06	NA	2.2E-06	1 0E-05
			Aroclor-1268	8.1E-11	NA	2.2E-11	NA	1.0E-10	Immune system	3.5E-05	NA	9.6E-06	4.5E-05
			Dieldrin	2.4E-11	NA	4.6E-12	NA	2.8E-11	Liver	5.2E-07	NA	1.0E-07	6.2E-07
			Endosulfan II	NC	NA	NC	NA		Kidney	4.9E-09	NA	9.5E-10	5.8E-09
			Endosulfan sulfate	NC	NA	NC	NA		Kidney	2.8E-09	NA	5.5E-10	3.4E-09
			gamma-Chlordane	1.8E-12	NA	1.4E-13	NA	1.9E-12	Liver	1.8E-07	NA	1.4E-08	1.9E-07
			Technical Chlordane	1.5E-10	NA	1.2E-11	NA	1.6E-10	Liver	1.5E-05	NA	1.2E-06	1.6E-05
			Antimony	NC	NA	NC	NA		Adverse clinical signs	4.5E-05	NA		4.5E-05
			Arsenic	3.2E-09	NA	1.9E-10	NA	3.4E-09	Skin	1.3E-04	NA	7.3E-06	1 3E-04
			Cadmium	NC	NA	NC	NA		Kidney	1.2E-05	NA	9 6E-07	1.3E-05
			Chromium	NC	NA	NC	NA		NOAEL	3.9E-04	NA		3 9E-04
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	7 0E-05	NA		7 0E-05
			Mercury	NC	NA	NC	NA		Immune system	1.2E-05	NA		1.2E-05
			Nickel	NC	NA	NC	NA		Developmental toxicity	2.0E-05	NA		2.0E-05
			Thallium	NC	NA	NC	NA		NOAEL	4.3E-05	NA		4.3E-05
			Vanadium	NC	NA	NC	NA		NOAEL	3.6E-05	NA		3.6E-05
			Toxicity Equivalency (Dioxins/Furans) - Mam	9.0E-08	NA	5.3E-09	NA	9 5E-08		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	1 7E-09	NA	9.7E-11	NA	1.8E-09		--	NA	--	
			CHEMICAL TOTAL	1 1E-07	--	9.2E-09	--	1E-07		9.7E-04	0 0E+00	6.2E-05	1E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-07					1E-03
	EXPOSURE MEDIUM TOTAL							1E-07					1E-03
SEDIMENT TOTAL								1E-07					1E-03
SURFACE WATER	SURFACE WATER	LYMAN MILL POND	Acenaphthylene	NC	NA	NC	NA		Liver	1.3E-11	NA	--	1 3E-11
			bis(2-Ethylhexyl)phthalate	8.0E-12	NA	6.7E-09	NA	6.7E-09	Liver	5.0E-07	NA	4.2E-04	4 2E-04
			Aldrin	1 3E-11	NA	6.4E-10	NA	6.5E-10	Liver	4.5E-07	NA	2.2E-05	2.2E-05
			alpha-Chlordane	2.2E-13	NA	2.5E-10	NA	2.5E-10	Liver	2.2E-08	NA	2.5E-05	2.5E-05
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	3.1E-10	NA	--	3.1E-10
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	9 8E-09	NA	3.8E-06	3.8E-06
			gamma-Chlordane	2.5E-13	NA	2 8E-10	NA	2.8E-10	Liver	2.5E-08	NA	2.8E-05	2 8E-05

TABLE 9.19.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Arsenic	2.3E-10	NA	8.1E-10	NA	1.0E-09	Skin	9.0E-06	NA	3.1E-05	4.0E-05
			Barium	NC	NA	NC	NA		Cardiovascular system	1.8E-07	NA	8.8E-06	8.9E-06
			Chromium	NC	NA	NC	NA		NOAEL	4.5E-07	NA	1.3E-04	1.3E-04
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	3.2E-06	NA	2.8E-04	2.8E-04
			Mercury	NC	NA	NC	NA		Immune system	7.7E-09	NA	3.8E-07	3.9E-07
			Thallium	NC	NA	NC	NA		NOAEL	1.6E-05	NA	5.6E-05	7.2E-05
			Nitrate	NC	NA	NC	NA		Hematological system	2.8E-07	NA	--	2.8E-07
			Nitrite-N	NC	NA	NC	NA		Hematological system	4.9E-07	NA	--	4.9E-07
			Toxicity Equivalency (Dioxins/Furans) - Mam	6.0E-10	NA	0.0E+00	NA	6.0E-10		--	NA	--	
			CHEMICAL TOTAL	8.6E-10	--	8.7E-09	--	1E-08		3.1E-05	0.0E+00	1.0E-03	1E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-08					1E-03
	EXPOSURE MEDIUM TOTAL							1E-08					1E-03
SURFACE WATER TOTAL								1E-08					1E-03
BIOTA	COMBINED FISH DIET	LYMAN MILL POND	Acenaphthylene	NC	NA	NA	NA		Liver	4.1E-06	NA	NA	4.1E-06
			Benzo(a)anthracene	2.3E-08	NA	NA	NA	2.3E-08	Kidney	1.8E-05	NA	NA	1.8E-05
			Benzo(a)pyrene	1.1E-07	NA	NA	NA	1.1E-07	Kidney	8.9E-06	NA	NA	8.9E-06
			Benzo(b)fluoranthene	1.5E-08	NA	NA	NA	1.5E-08	Kidney	1.2E-05	NA	NA	1.2E-05
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	6.9E-06	NA	NA	6.9E-06
			Dibenzo(a,h)anthracene	6.1E-08	NA	NA	NA	6.1E-08	Kidney	4.9E-06	NA	NA	4.9E-06
			Indeno(1,2,3-cd)pyrene	9.7E-09	NA	NA	NA	9.7E-09	Kidney	7.7E-06	NA	NA	7.7E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	5.7E-05	NA	NA	5.7E-05
			4,4'-DDD	4.5E-08	NA	NA	NA	4.5E-08	Liver	6.6E-03	NA	NA	6.6E-03
			4,4'-DDE	2.1E-07	NA	NA	NA	2.1E-07	Liver	2.2E-02	NA	NA	2.2E-02
			4,4'-DDT	7.1E-09	NA	NA	NA	7.1E-09	Liver	7.3E-04	NA	NA	7.3E-04
			alpha-Chlordane	4.9E-08	NA	NA	NA	4.9E-08	Liver	4.9E-03	NA	NA	4.9E-03
			Aroclor-1254	3.0E-05	NA	NA	NA	3.0E-05	Immune system	1.3E+01	NA	NA	1.3E+01
			Aroclor-1268	3.0E-07	NA	NA	NA	3.0E-07	Immune system	1.3E-01	NA	NA	1.3E-01
			beta-BHC	1.0E-08	NA	NA	NA	1.0E-08	Liver / Kidney	3.3E-04	NA	NA	3.3E-04
			Dieldrin	6.4E-07	NA	NA	NA	6.4E-07	Liver	1.4E-02	NA	NA	1.4E-02
			gamma-Chlordane	3.2E-08	NA	NA	NA	3.2E-08	Liver	3.2E-03	NA	NA	3.2E-03
			Heptachlor Epoxide	8.9E-08	NA	NA	NA	8.9E-08	Liver	1.3E-02	NA	NA	1.3E-02
			Technical Chlordane	2.5E-06	NA	NA	NA	2.5E-06	Liver	2.5E-01	NA	NA	2.5E-01
			Arsenic	2.5E-07	NA	NA	NA	2.5E-07	Skin	9.8E-03	NA	NA	9.8E-03
			Cadmium	NC	NA	NA	NA		Kidney	2.1E-03	NA	NA	2.1E-03
			Chromium	NC	NA	NA	NA		NOAEL	8.0E-03	NA	NA	8.0E-03
			Lead	--	NA	NA	NA			--	NA	NA	
			Manganese	NC	NA	NA	NA		NOAEL	3.8E-03	NA	NA	3.8E-03
			Mercury	NC	NA	NA	NA		Immune system	5.7E-02	NA	NA	5.7E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	1.5E-01	NA	NA	1.5E-01

TABLE 9.19.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Toxicity Equivalency (PCB Congeners) - Mam	2.7E-05	NA	NA	NA	2.7E-05		--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.9E-04	NA	NA	NA	3.9E-04		--	NA	NA	
			CHEMICAL TOTAL	4.5E-04	--	--	--	4E-04		1.4E+01	0.0E+00	--	1.4E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-04					1.4E+01
	EXPOSURE MEDIUM TOTAL							4E-04					1.4E+01
COMBINED FISH DIET TOTAL								4E-04					1.4E+01
RECEPTOR TOTAL								4E-04					1.4E+01
							TOTAL RISK ACROSS ALL MEDIA	4E-04	TOTAL HAZARD ACROSS ALL MEDIA				1.4E+01

NOTES:
NC - Not carcinogenic by this exposure route
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

TOTAL ADVERSE CLINICAL SIGNS HI =	4.5E-05
TOTAL CARDIOVASCULAR SYSTEM HI =	9.0E-06
TOTAL DEVELOPMENTAL TOXICITY HI =	1.5E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	7.7E-07
TOTAL IMMUNE SYSTEM HI =	1.3E+01
TOTAL KIDNEY HI =	2.5E-03
TOTAL LIVER HI =	3.1E-01
	--
TOTAL NERVOUS SYSTEM HI =	3.8E-06
TOTAL NOAEL HI =	1.3E-02
TOTAL REPRODUCTIVE SYSTEM HI =	2.0E-06
TOTAL SKIN HI =	9.9E-03
	--

Prepared by: KJA
Checked by: RAR

TABLE 9.20.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	LYMAN MILL POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	4.6E-08	NA	3.4E-08	8.0E-08
			4-Chloro-3-methylphenol	NC	NA	NC	NA		Reproductive system	2.6E-06	NA	1.5E-06	4.0E-06
			4-Nitrophenol	NC	NA	NC	NA			--	NA	--	
			Acenaphthylene	NC	NA	NC	NA		Liver	6.5E-08	NA	4.8E-08	1.1E-07
			Benzo(a)anthracene	8.0E-10	NA	5.9E-10	NA	1.4E-09	Kidney	8.5E-07	NA	6.3E-07	1.5E-06
			Benzo(a)pyrene	8.3E-09	NA	6.2E-09	NA	1.4E-08	Kidney	8.8E-07	NA	6.6E-07	1.5E-06
			Benzo(b)fluoranthene	1.3E-09	NA	9.6E-10	NA	2.2E-09	Kidney	1.4E-06	NA	1.0E-06	2.4E-06
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	9.1E-07	NA	6.8E-07	1.6E-06
			Benzo(k)fluoranthene	6.0E-11	NA	4.5E-11	NA	1.0E-10	Kidney	6.4E-07	NA	4.8E-07	1.1E-06
			bis(2-Ethylhexyl)phthalate	2.8E-11	NA	1.6E-11	NA	4.5E-11	Liver	2.4E-06	NA	1.4E-06	3.7E-06
			Dibenzo(a,h)anthracene	2.2E-09	NA	1.6E-09	NA	3.8E-09	Kidney	2.3E-07	NA	1.7E-07	4.1E-07
			Indeno(1,2,3-cd)pyrene	7.7E-10	NA	5.7E-10	NA	1.3E-09	Kidney	8.2E-07	NA	6.1E-07	1.4E-06
			N-Nitroso-di-n-propylamine	3.6E-09	NA	2.0E-09	NA	5.6E-09		--	NA	--	
			Pentachlorophenol	6.6E-11	NA	9.4E-11	NA	1.6E-10	Liver / Kidney	4.3E-07	NA	6.1E-07	1.0E-06
			Phenanthrene	NC	NA	NC	NA		Kidney	8.5E-07	NA	6.3E-07	1.5E-06
			alpha-Chlordane	4.4E-12	NA	1.0E-12	NA	5.4E-12	Liver	5.8E-07	NA	1.3E-07	7.2E-07
			Aroclor-1254	3.8E-10	NA	3.1E-10	NA	6.9E-10	Immune system	2.2E-04	NA	1.8E-04	4.0E-04
			Aroclor-1260	2.1E-11	NA	1.7E-11	NA	3.8E-11	Immune system	1.2E-05	NA	9.9E-06	2.2E-05
			Aroclor-1268	9.4E-11	NA	7.5E-11	NA	1.7E-10	Immune system	5.5E-05	NA	4.4E-05	9.9E-05
			Dieldrin	2.8E-11	NA	1.6E-11	NA	4.3E-11	Liver	8.0E-07	NA	4.6E-07	1.3E-06
			Endosulfan II	NC	NA	NC	NA		Kidney	7.6E-09	NA	4.4E-09	1.2E-08
			Endosulfan sulfate	NC	NA	NC	NA		Kidney	4.4E-09	NA	2.5E-09	6.9E-09
			gamma-Chlordane	2.1E-12	NA	4.7E-13	NA	2.5E-12	Liver	2.7E-07	NA	6.3E-08	3.4E-07
			Technical Chlordane	1.8E-10	NA	4.0E-11	NA	2.2E-10	Liver	2.4E-05	NA	5.4E-06	2.9E-05
			Antimony	NC	NA	NC	NA		Adverse clinical signs	7.1E-05	NA		7.1E-05
			Arsenic	3.8E-09	NA	6.4E-10	NA	4.4E-09	Skin	1.9E-04	NA	3.3E-05	2.3E-04
			Cadmium	NC	NA	NC	NA		Kidney	1.9E-05	NA	4.4E-06	2.4E-05
			Chromium	NC	NA	NC	NA		NOAEL	6.1E-04	NA		6.1E-04
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	1.1E-04	NA		1.1E-04
			Mercury	NC	NA	NC	NA		Immune system	1.9E-05	NA		1.9E-05
			Nickel	NC	NA	NC	NA		Developmental toxicity	3.2E-05	NA		3.2E-05
			Thallium	NC	NA	NC	NA		NOAEL	6.6E-05	NA		6.6E-05
			Vanadium	NC	NA	NC	NA		NOAEL	5.5E-05	NA		5.5E-05
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.1E-07	NA	1.8E-08	NA	1.2E-07		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	1.9E-09	NA	3.3E-10	NA	2.3E-09		--	NA	--	
			CHEMICAL TOTAL	1.3E-07	--	3.2E-08	--	2E-07		1.5E-03	0.0E+00	2.9E-04	2E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-07					2E-03
	EXPOSURE MEDIUM TOTAL							2E-07					2E-03
SEDIMENT TOTAL								2E-07					2E-03
SURFACE WATER	SURFACE WATER	LYMAN MILL POND	Acenaphthylene	NC	NA	NC	NA		Liver	2.0E-11	NA	--	2.0E-11
			bis(2-Ethylhexyl)phthalate	9.3E-12	NA	5.7E-09	NA	5.7E-09	Liver	7.8E-07	NA	4.7E-04	4.7E-04
			Aldrin	1.5E-11	NA	5.4E-10	NA	5.5E-10	Liver	7.0E-07	NA	2.5E-05	2.5E-05
			alpha-Chlordane	2.6E-13	NA	2.1E-10	NA	2.1E-10	Liver	3.5E-08	NA	2.8E-05	2.8E-05
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	4.9E-10	NA	--	4.9E-10
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	1.5E-08	NA	4.2E-06	4.2E-06
			gamma-Chlordane	2.9E-13	NA	2.4E-10	NA	2.4E-10	Liver	3.8E-08	NA	3.1E-05	3.1E-05

TABLE 9.20.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Arsenic	2.7E-10	NA	6.8E-10	NA	9.5E-10	Skin	1.4E-05	NA	3.5E-05	4.9E-05
			Barium	NC	NA	NC	NA		Cardiovascular system	2.7E-07	NA	9.8E-06	1.0E-05
			Chromium	NC	NA	NC	NA		NOAEL	7.0E-07	NA	1.4E-04	1.4E-04
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	4.9E-06	NA	3.1E-04	3.1E-04
			Mercury	NC	NA	NC	NA		Immune system	1.2E-08	NA	4.3E-07	4.4E-07
			Thallium	NC	NA	NC	NA		NOAEL	2.5E-05	NA	6.3E-05	8.8E-05
			Nitrate	NC	NA	NC	NA		Hematological system	4.3E-07	NA	--	4.3E-07
			Nitrite-N	NC	NA	NC	NA		Hematological system	7.7E-07	NA	--	7.7E-07
			Toxicity Equivalency (Dioxins/Furans) - Mam	7.0E-10	NA	0.0E+00	NA	7.0E-10		--	NA	--	
			CHEMICAL TOTAL	1.0E-09	--	7.3E-09	--	8E-09		4.8E-05	0.0E+00	1.1E-03	1E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						8E-09					1E-03
	EXPOSURE MEDIUM TOTAL							8E-09					1E-03
SURFACE WATER TOTAL								8E-09					1E-03
BIOTA	COMBINED FISH DIET	LYMAN MILL POND	Acenaphthylene	NC	NA	NA	NA		Liver	4.2E-06	NA	NA	4.2E-06
			Benzo(a)anthracene	1.7E-08	NA	NA	NA	1.7E-08	Kidney	1.9E-05	NA	NA	1.9E-05
			Benzo(a)pyrene	8.7E-08	NA	NA	NA	8.7E-08	Kidney	9.2E-06	NA	NA	9.2E-06
			Benzo(b)fluoranthene	1.2E-08	NA	NA	NA	1.2E-08	Kidney	1.3E-05	NA	NA	1.3E-05
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	7.1E-06	NA	NA	7.1E-06
			Dibenzo(a,h)anthracene	4.7E-08	NA	NA	NA	4.7E-08	Kidney	5.0E-06	NA	NA	5.0E-06
			Indeno(1,2,3-cd)pyrene	7.5E-09	NA	NA	NA	7.5E-09	Kidney	8.0E-06	NA	NA	8.0E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	5.9E-05	NA	NA	5.9E-05
			4,4'-DDD	3.5E-08	NA	NA	NA	3.5E-08	Liver	6.8E-03	NA	NA	6.8E-03
			4,4'-DDE	1.6E-07	NA	NA	NA	1.6E-07	Liver	2.2E-02	NA	NA	2.2E-02
			4,4'-DDT	5.5E-09	NA	NA	NA	5.5E-09	Liver	7.5E-04	NA	NA	7.5E-04
			alpha-Chlordane	3.8E-08	NA	NA	NA	3.8E-08	Liver	5.0E-03	NA	NA	5.0E-03
			Aroclor-1254	2.3E-05	NA	NA	NA	2.3E-05	Immune system	1.3E+01	NA	NA	1.3E+01
			Aroclor-1268	2.3E-07	NA	NA	NA	2.3E-07	Immune system	1.4E-01	NA	NA	1.4E-01
			beta-BHC	7.8E-09	NA	NA	NA	7.8E-09	Liver / Kidney	3.4E-04	NA	NA	3.4E-04
			Dieldrin	4.9E-07	NA	NA	NA	4.9E-07	Liver	1.4E-02	NA	NA	1.4E-02
			gamma-Chlordane	2.5E-08	NA	NA	NA	2.5E-08	Liver	3.3E-03	NA	NA	3.3E-03
			Heptachlor Epoxide	6.9E-08	NA	NA	NA	6.9E-08	Liver	1.4E-02	NA	NA	1.4E-02
			Technical Chlordane	1.9E-06	NA	NA	NA	1.9E-06	Liver	2.6E-01	NA	NA	2.6E-01
			Arsenic	1.9E-07	NA	NA	NA	1.9E-07	Skin	1.0E-02	NA	NA	1.0E-02
			Cadmium	NC	NA	NA	NA		Kidney	2.1E-03	NA	NA	2.1E-03
			Chromium	NC	NA	NA	NA		NOAEL	8.3E-03	NA	NA	8.3E-03
			Lead	--	NA	NA	NA			--	NA	NA	
			Manganese	NC	NA	NA	NA		NOAEL	3.9E-03	NA	NA	3.9E-03
			Mercury	NC	NA	NA	NA		Immune system	5.9E-02	NA	NA	5.9E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	1.6E-01	NA	NA	1.6E-01

TABLE 9.20.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Toxicity Equivalency (PCB Congeners) - Mam	2.1E-05	NA	NA	NA	2.1E-05		--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.0E-04	NA	NA	NA	3.0E-04		--	NA	NA	
			CHEMICAL TOTAL	3.5E-04	--	--	--	3E-04		1.4E+01	0.0E+00	--	1.4E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-04					1.4E+01
	EXPOSURE MEDIUM TOTAL							3E-04					1.4E+01
COMBINED FISH DIET TOTAL								3E-04					1.4E+01
RECEPTOR TOTAL								3E-04					1.4E+01
							TOTAL RISK ACROSS ALL MEDIA	3E-04	TOTAL HAZARD ACROSS ALL MEDIA				1.4E+01

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

TOTAL ADVERSE CLINICAL SIGNS HI =	7.1E-05
TOTAL CARDIOVASCULAR SYSTEM HI =	1.0E-05
TOTAL DEVELOPMENTAL TOXICITY HI =	1.6E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	1.2E-06
TOTAL IMMUNE SYSTEM HI =	1.4E+01
TOTAL KIDNEY HI =	2.6E-03
TOTAL LIVER HI =	3.2E-01
	--
TOTAL NERVOUS SYSTEM HI =	4.2E-06
TOTAL NOAEL HI =	1.4E-02
TOTAL REPRODUCTIVE SYSTEM HI =	4.0E-06
TOTAL SKIN HI =	1.0E-02
	--

Prepared by: KJA
Checked by: RAR

TABLE 9.22.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	LYMAN MILL POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	1.3E-07	NA	1.6E-08	1.4E-07
			4-Chloro-3-methylphenol	NC	NA	NC	NA		Reproductive system	7.1E-06	NA	6.9E-07	7.8E-06
			4-Nitrophenol	NC	NA	NC	NA			--	NA	--	
			Acenaphthylene	NC	NA	NC	NA		Liver	1.8E-07	NA	2.3E-08	2.0E-07
			Benzo(a)anthracene	3.0E-09	NA	3.8E-10	NA	3.3E-09	Kidney	2.4E-06	NA	3.0E-07	2.7E-06
			Benzo(a)pyrene	3.1E-08	NA	3.9E-09	NA	3.5E-08	Kidney	2.5E-06	NA	3.1E-07	2.8E-06
			Benzo(b)fluoranthene	4.8E-09	NA	6.0E-10	NA	5.4E-09	Kidney	3.8E-06	NA	4.8E-07	4.3E-06
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	2.5E-06	NA	3.2E-07	2.9E-06
			Benzo(k)fluoranthene	2.2E-10	NA	2.8E-11	NA	2.5E-10	Kidney	1.8E-06	NA	2.3E-07	2.0E-06
			bis(2-Ethylhexyl)phthalate	1.1E-10	NA	1.0E-11	NA	1.2E-10	Liver	6.6E-06	NA	6.4E-07	7.3E-06
			Dibenzo(a,h)anthracene	8.2E-09	NA	1.0E-09	NA	9.2E-09	Kidney	6.5E-07	NA	8.3E-08	7.4E-07
			Indeno(1,2,3-cd)pyrene	2.9E-09	NA	3.6E-10	NA	3.2E-09	Kidney	2.3E-06	NA	2.9E-07	2.6E-06
			N-Nitroso-di-n-propylamine	1.3E-08	NA	1.3E-09	NA	1.5E-08		--	NA	--	
			Pentachlorophenol	2.4E-10	NA	5.9E-11	NA	3.0E-10	Liver / Kidney	1.2E-06	NA	2.9E-07	1.5E-06
			Phenanthrene	NC	NA	NC	NA		Kidney	2.4E-06	NA	3.0E-07	2.7E-06
			alpha-Chlordane	1.6E-11	NA	6.3E-13	NA	1.7E-11	Liver	1.6E-06	NA	6.3E-08	1.7E-06
			Aroclor-1254	1.4E-09	NA	1.9E-10	NA	1.6E-09	Immune system	6.2E-04	NA	8.5E-05	7.1E-04
			Aroclor-1260	7.9E-11	NA	1.1E-11	NA	8.9E-11	Immune system	3.4E-05	NA	4.7E-06	3.9E-05
			Aroclor-1268	3.5E-10	NA	4.7E-11	NA	4.0E-10	Immune system	1.5E-04	NA	2.1E-05	1.7E-04
			Dieldrin	1.0E-10	NA	9.9E-12	NA	1.1E-10	Liver	2.2E-06	NA	2.2E-07	2.5E-06
			Endosulfan II	NC	NA	NC	NA		Kidney	2.1E-08	NA	2.1E-09	2.3E-08
			Endosulfan sulfate	NC	NA	NC	NA		Kidney	1.2E-08	NA	1.2E-09	1.3E-08
			gamma-Chlordane	7.6E-12	NA	3.0E-13	NA	7.9E-12	Liver	7.6E-07	NA	3.0E-08	7.9E-07
			Technical Chlordane	6.6E-10	NA	2.6E-11	NA	6.8E-10	Liver	6.6E-05	NA	2.6E-06	6.8E-05
			Antimony	NC	NA	NC	NA		Adverse clinical signs	2.0E-04	NA		2.0E-04
			Arsenic	1.4E-08	NA	4.1E-10	NA	1.4E-08	Skin	5.4E-04	NA	1.6E-05	5.6E-04
			Cadmium	NC	NA	NC	NA		Kidney	5.3E-05	NA	2.1E-06	5.6E-05
			Chromium	NC	NA	NC	NA		NOAEL	1.7E-03	NA		1.7E-03
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	3.0E-04	NA		3.0E-04
			Mercury	NC	NA	NC	NA		Immune system	5.3E-05	NA		5.3E-05
			Nickel	NC	NA	NC	NA		Developmental toxicity	8.8E-05	NA		8.8E-05
			Thallium	NC	NA	NC	NA		NOAEL	1.8E-04	NA		1.8E-04
			Vanadium	NC	NA	NC	NA		NOAEL	1.5E-04	NA		1.5E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.9E-07	NA	1.1E-08	NA	4.0E-07		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	7.2E-09	NA	2.1E-10	NA	7.4E-09		--	NA	--	
			CHEMICAL TOTAL	4.8E-07	--	2.0E-08	--	5E-07		4.2E-03	0.0E+00	1.4E-04	4E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						5E-07					4E-03
	EXPOSURE MEDIUM TOTAL							5E-07					4E-03
SEDIMENT TOTAL								5E-07					4E-03
SURFACE WATER	SURFACE WATER	LYMAN MILL POND	Acenaphthylene	NC	NA	NC	NA		Liver	5.6E-10	NA	--	5.6E-10
			bis(2-Ethylhexyl)phthalate	3.5E-10	NA	3.8E-08	NA	3.9E-08	Liver	2.2E-05	NA	2.4E-03	2.4E-03
			Aldrin	5.7E-10	NA	3.6E-09	NA	4.2E-09	Liver	2.0E-05	NA	1.3E-04	1.4E-04
			alpha-Chlordane	9.7E-12	NA	1.4E-09	NA	1.5E-09	Liver	9.7E-07	NA	1.4E-04	1.5E-04
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	1.4E-08	NA	--	1.4E-08
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	4.2E-07	NA	2.1E-05	2.2E-05
			gamma-Chlordane	1.1E-11	NA	1.6E-09	NA	1.6E-09	Liver	1.1E-06	NA	1.6E-04	1.6E-04
			Arsenic	1.0E-08	NA	4.6E-09	NA	1.5E-08	Skin	3.9E-04	NA	1.8E-04	5.7E-04
			Barium	NC	NA	NC	NA		Cardiovascular system	7.6E-06	NA	5.0E-05	5.7E-05
			Chromium	NC	NA	NC	NA		NOAEL	2.0E-05	NA	7.1E-04	7.3E-04
			Lead	--	NA	--	NA			--	NA	--	

TABLE 9.22.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Manganese	NC	NA	NC	NA		NOAEL	1.4E-04	NA	1.6E-03	1.7E-03
			Mercury	NC	NA	NC	NA		Immune system	3.3E-07	NA	2.2E-06	2.5E-06
			Thallium	NC	NA	NC	NA		NOAEL	7.0E-04	NA	3 2E-04	1.0E-03
			Nitrate	NC	NA	NC	NA		Hematological system	1.2E-05	NA	--	1.2E-05
			Nitrite-N	NC	NA	NC	NA		Hematological system	2 1E-05	NA	--	2 1E-05
			Toxicity Equivalency (Dioxins/Furans) - Mam	2.6E-08	NA	0.0E+00	NA	2.6E-08		--	NA	--	
			CHEMICAL TOTAL	3.7E-08	--	5.0E-08	--	9E-08		1.3E-03	0.0E+00	5.7E-03	7E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						9E-08					7E-03
	EXPOSURE MEDIUM TOTAL							9E-08					7E-03
SURFACE WATER TOTAL								9E-08					7E-03
BIOTA	COMBINED FISH DIET	LYMAN MILL POND	Acenaphthylene	NC	NA	NA	NA		Liver	4.1E-06	NA	NA	4.1E-06
			Benzo(a)anthracene	2.3E-08	NA	NA	NA	2 3E-08	Kidney	1.8E-05	NA	NA	1.8E-05
			Benzo(a)pyrene	1 1E-07	NA	NA	NA	1.1E-07	Kidney	8 9E-06	NA	NA	8.9E-06
			Benzo(b)fluoranthene	1.5E-08	NA	NA	NA	1.5E-08	Kidney	1 2E-05	NA	NA	1 2E-05
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	6.9E-06	NA	NA	6.9E-06
			Dibenzo(a,h)anthracene	6.1E-08	NA	NA	NA	6 1E-08	Kidney	4.9E-06	NA	NA	4.9E-06
			Indeno(1,2,3-cd)pyrene	9.7E-09	NA	NA	NA	9.7E-09	Kidney	7.7E-06	NA	NA	7.7E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	5 7E-05	NA	NA	5.7E-05
			4,4'-DDD	4 5E-08	NA	NA	NA	4.5E-08	Liver	6 6E-03	NA	NA	6 6E-03
			4,4'-DDE	2.1E-07	NA	NA	NA	2.1E-07	Liver	2.2E-02	NA	NA	2.2E-02
			4,4'-DDT	7 1E-09	NA	NA	NA	7.1E-09	Liver	7.3E-04	NA	NA	7.3E-04
			alpha-Chlordane	4.9E-08	NA	NA	NA	4.9E-08	Liver	4.9E-03	NA	NA	4.9E-03
			Aroclor-1254	3.0E-05	NA	NA	NA	3.0E-05	Immune system	1.3E+01	NA	NA	1 3E+01
			Aroclor-1268	3.0E-07	NA	NA	NA	3.0E-07	Immune system	1.3E-01	NA	NA	1.3E-01
			beta-BHC	1 0E-08	NA	NA	NA	1 0E-08	Liver / Kidney	3.3E-04	NA	NA	3.3E-04
			Dieldrin	6.4E-07	NA	NA	NA	6.4E-07	Liver	1.4E-02	NA	NA	1.4E-02
			gamma-Chlordane	3 2E-08	NA	NA	NA	3 2E-08	Liver	3.2E-03	NA	NA	3.2E-03
			Heptachlor Epoxide	8.9E-08	NA	NA	NA	8.9E-08	Liver	1.3E-02	NA	NA	1.3E-02
			Technical Chlordane	2.5E-06	NA	NA	NA	2.5E-06	Liver	2.5E-01	NA	NA	2.5E-01
			Arsenic	2.5E-07	NA	NA	NA	2.5E-07	Skin	9.8E-03	NA	NA	9.8E-03
			Cadmium	NC	NA	NA	NA		Kidney	2.1E-03	NA	NA	2.1E-03
			Chromium	NC	NA	NA	NA		NOAEL	8.0E-03	NA	NA	8.0E-03
			Lead	--	NA	NA	NA			--	NA	NA	
			Manganese	NC	NA	NA	NA		NOAEL	3.8E-03	NA	NA	3.8E-03
			Mercury	NC	NA	NA	NA		Immune system	5.7E-02	NA	NA	5.7E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	1.5E-01	NA	NA	1.5E-01

TABLE 9.22.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Toxicity Equivalency (PCB Congeners) - Mam	2.7E-05	NA	NA	NA	2.7E-05		--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.9E-04	NA	NA	NA	3.9E-04		--	NA	NA	
			CHEMICAL TOTAL	4.5E-04	--	--	--	4E-04		1.4E+01	0.0E+00	--	1.4E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-04					1.4E+01
	EXPOSURE MEDIUM TOTAL							4E-04					1.4E+01
COMBINED FISH DIET TOTAL								4E-04					1.4E+01
RECEPTOR TOTAL								4E-04					1.4E+01
							TOTAL RISK ACROSS ALL MEDIA	4E-04	TOTAL HAZARD ACROSS ALL MEDIA				1.4E+01

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

TOTAL ADVERSE CLINICAL SIGNS HI =	2.0E-04
TOTAL CARDIOVASCULAR SYSTEM HI =	5.8E-05
TOTAL DEVELOPMENTAL TOXICITY HI =	1.5E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	3.3E-05
TOTAL IMMUNE SYSTEM HI =	1.3E+01
TOTAL KIDNEY HI =	2.6E-03
TOTAL LIVER HI =	3.2E-01
	--
TOTAL NERVOUS SYSTEM HI =	2.2E-05
TOTAL NOAEL HI =	1.8E-02
TOTAL REPRODUCTIVE SYSTEM HI =	7.8E-06
TOTAL SKIN HI =	1.1E-02
	--

Prepared by: KJA
Checked by: RAR

TABLE 9.23.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	LYMAN MILL POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	2.0E-07	NA	7.4E-08	2.7E-07
			4-Chloro-3-methylphenol	NC	NA	NC	NA		Reproductive system	1.1E-05	NA	3.2E-06	1.4E-05
			4-Nitrophenol	NC	NA	NC	NA			--	NA	--	
			Acenaphthylene	NC	NA	NC	NA		Liver	2.8E-07	NA	1.1E-07	3.9E-07
			Benzo(a)anthracene	3.5E-09	NA	1.3E-09	NA	4.8E-09	Kidney	3.7E-06	NA	1.4E-06	5.1E-06
			Benzo(a)pyrene	3.6E-08	NA	1.3E-08	NA	4.9E-08	Kidney	3.8E-06	NA	1.4E-06	5.2E-06
			Benzo(b)fluoranthene	5.6E-09	NA	2.1E-09	NA	7.6E-09	Kidney	5.9E-06	NA	2.2E-06	8.1E-06
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	4.0E-06	NA	1.5E-06	5.4E-06
			Benzo(k)fluoranthene	2.6E-10	NA	9.7E-11	NA	3.6E-10	Kidney	2.8E-06	NA	1.0E-06	3.8E-06
			bis(2-Ethylhexyl)phthalate	1.2E-10	NA	3.5E-11	NA	1.6E-10	Liver	1.0E-05	NA	2.9E-06	1.3E-05
			Dibenzo(a,h)anthracene	9.5E-09	NA	3.5E-09	NA	1.3E-08	Kidney	1.0E-06	NA	3.8E-07	1.4E-06
			Indeno(1,2,3-cd)pyrene	3.3E-09	NA	1.2E-09	NA	4.6E-09	Kidney	3.6E-06	NA	1.3E-06	4.9E-06
			N-Nitroso-di-n-propylamine	1.5E-08	NA	4.4E-09	NA	2.0E-08		--	NA	--	
			Pentachlorophenol	2.8E-10	NA	2.0E-10	NA	4.9E-10	Liver / Kidney	1.8E-06	NA	1.3E-06	3.2E-06
			Phenanthrene	NC	NA	NC	NA		Kidney	3.7E-06	NA	1.4E-06	5.1E-06
			alpha-Chlordane	1.9E-11	NA	2.2E-12	NA	2.1E-11	Liver	2.5E-06	NA	2.9E-07	2.8E-06
			Aroclor-1254	1.7E-09	NA	6.7E-10	NA	2.3E-09	Immune system	9.7E-04	NA	3.9E-04	1.4E-03
			Aroclor-1260	9.2E-11	NA	3.7E-11	NA	1.3E-10	Immune system	5.3E-05	NA	2.1E-05	7.5E-05
			Aroclor-1268	4.1E-10	NA	1.6E-10	NA	5.7E-10	Immune system	2.4E-04	NA	9.5E-05	3.3E-04
			Dieldrin	1.2E-10	NA	3.4E-11	NA	1.5E-10	Liver	3.5E-06	NA	1.0E-06	4.5E-06
			Endosulfan II	NC	NA	NC	NA		Kidney	3.3E-08	NA	9.4E-09	4.2E-08
			Endosulfan sulfate	NC	NA	NC	NA		Kidney	1.9E-08	NA	5.5E-09	2.5E-08
			gamma-Chlordane	8.9E-12	NA	1.0E-12	NA	9.9E-12	Liver	1.2E-06	NA	1.4E-07	1.3E-06
			Technical Chlordane	7.7E-10	NA	8.8E-11	NA	8.5E-10	Liver	1.0E-04	NA	1.2E-05	1.1E-04
			Antimony	NC	NA	NC	NA		Adverse clinical signs	3.1E-04	NA		3.1E-04
			Arsenic	1.6E-08	NA	1.4E-09	NA	1.8E-08	Skin	8.4E-04	NA	7.2E-05	9.2E-04
			Cadmium	NC	NA	NC	NA		Kidney	8.3E-05	NA	9.5E-06	9.3E-05
			Chromium	NC	NA	NC	NA		NOAEL	2.6E-03	NA		2.6E-03
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	4.7E-04	NA		4.7E-04
			Mercury	NC	NA	NC	NA		Immune system	8.2E-05	NA		8.2E-05
			Nickel	NC	NA	NC	NA		Developmental toxicity	1.4E-04	NA		1.4E-04
			Thallium	NC	NA	NC	NA		NOAEL	2.9E-04	NA		2.9E-04
			Vanadium	NC	NA	NC	NA		NOAEL	2.4E-04	NA		2.4E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	4.6E-07	NA	3.9E-08	NA	4.9E-07		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	8.4E-09	NA	7.2E-10	NA	9.1E-09		--	NA	--	
			CHEMICAL TOTAL	5.6E-07	--	6.8E-08	--	6E-07		6.5E-03	0.0E+00	6.2E-04	7E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						6E-07					7E-03
	EXPOSURE MEDIUM TOTAL							6E-07					7E-03
SEDIMENT TOTAL								6E-07					7E-03
SURFACE WATER	SURFACE WATER	LYMAN MILL POND	Acenaphthylene	NC	NA	NC	NA		Liver	8.7E-10	NA	--	8.7E-10
			bis(2-Ethylhexyl)phthalate	4.0E-10	NA	3.5E-08	NA	3.5E-08	Liver	3.4E-05	NA	2.9E-03	2.9E-03
			Aldrin	6.6E-10	NA	3.3E-09	NA	4.0E-09	Liver	3.0E-05	NA	1.5E-04	1.8E-04
			alpha-Chlordane	1.1E-11	NA	1.3E-09	NA	1.3E-09	Liver	1.5E-06	NA	1.7E-04	1.8E-04
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	2.1E-08	NA	--	2.1E-08
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	6.6E-07	NA	2.6E-05	2.7E-05
			gamma-Chlordane	1.2E-11	NA	1.4E-09	NA	1.5E-09	Liver	1.7E-06	NA	1.9E-04	1.9E-04

TABLE 9.23.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Arsenic	1.2E-08	NA	4.2E-09	NA	1.6E-08	Skin	6 1E-04	NA	2.2E-04	8.2E-04
			Barium	NC	NA	NC	NA		Cardiovascular system	1.2E-05	NA	6.0E-05	7 2E-05
			Chromium	NC	NA	NC	NA		NOAEL	3 0E-05	NA	8.6E-04	8.9E-04
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	2.1E-04	NA	1.9E-03	2.1E-03
			Mercury	NC	NA	NC	NA		Immune system	5.2E-07	NA	2.6E-06	3 2E-06
			Thallium	NC	NA	NC	NA		NOAEL	1.1E-03	NA	3.9E-04	1 5E-03
			Nitrate	NC	NA	NC	NA		Hematological system	1 9E-05	NA	--	1 9E-05
			Nitrite-N	NC	NA	NC	NA		Hematological system	3.3E-05	NA	--	3 3E-05
			Toxicity Equivalency (Dioxins/Furans) - Mam	3 1E-08	NA	0.0E+00	NA	3 1E-08		--	NA	--	
			CHEMICAL TOTAL	4.3E-08	--	4 5E-08	--	9E-08		2 1E-03	0.0E+00	6.9E-03	9E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						9E-08					9E-03
	EXPOSURE MEDIUM TOTAL							9E-08					9E-03
SURFACE WATER TOTAL								9E-08					9E-03
BIOTA	COMBINED FISH DIET	LYMAN MILL POND	Acenaphthylene	NC	NA	NA	NA		Liver	4.2E-06	NA	NA	4.2E-06
			Benzo(a)anthracene	1.7E-08	NA	NA	NA	1.7E-08	Kidney	1.9E-05	NA	NA	1.9E-05
			Benzo(a)pyrene	8.7E-08	NA	NA	NA	8.7E-08	Kidney	9.2E-06	NA	NA	9.2E-06
			Benzo(b)fluoranthene	1.2E-08	NA	NA	NA	1.2E-08	Kidney	1.3E-05	NA	NA	1.3E-05
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	7.1E-06	NA	NA	7.1E-06
			Dibenzo(a,h)anthracene	4.7E-08	NA	NA	NA	4.7E-08	Kidney	5.0E-06	NA	NA	5.0E-06
			Indeno(1,2,3-cd)pyrene	7.5E-09	NA	NA	NA	7.5E-09	Kidney	8.0E-06	NA	NA	8.0E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	5.9E-05	NA	NA	5.9E-05
			4,4'-DDD	3.5E-08	NA	NA	NA	3.5E-08	Liver	6.8E-03	NA	NA	6.8E-03
			4,4'-DDE	1.6E-07	NA	NA	NA	1.6E-07	Liver	2.2E-02	NA	NA	2 2E-02
			4,4'-DDT	5.5E-09	NA	NA	NA	5.5E-09	Liver	7.5E-04	NA	NA	7 5E-04
			alpha-Chlordane	3.8E-08	NA	NA	NA	3 8E-08	Liver	5 0E-03	NA	NA	5 0E-03
			Aroclor-1254	2.3E-05	NA	NA	NA	2.3E-05	Immune system	1.3E+01	NA	NA	1 3E+01
			Aroclor-1268	2.3E-07	NA	NA	NA	2 3E-07	Immune system	1.4E-01	NA	NA	1.4E-01
			beta-BHC	7.8E-09	NA	NA	NA	7 8E-09	Liver / Kidney	3.4E-04	NA	NA	3.4E-04
			Dieldrin	4.9E-07	NA	NA	NA	4.9E-07	Liver	1.4E-02	NA	NA	1 4E-02
			gamma-Chlordane	2.5E-08	NA	NA	NA	2.5E-08	Liver	3.3E-03	NA	NA	3.3E-03
			Heptachlor Epoxide	6.9E-08	NA	NA	NA	6.9E-08	Liver	1.4E-02	NA	NA	1.4E-02
			Technical Chlordane	1.9E-06	NA	NA	NA	1.9E-06	Liver	2.6E-01	NA	NA	2.6E-01
			Arsenic	1 9E-07	NA	NA	NA	1.9E-07	Skin	1.0E-02	NA	NA	1.0E-02
			Cadmium	NC	NA	NA	NA		Kidney	2.1E-03	NA	NA	2.1E-03
			Chromium	NC	NA	NA	NA		NOAEL	8.3E-03	NA	NA	8.3E-03
			Lead	--	NA	NA	NA			--	NA	NA	
			Manganese	NC	NA	NA	NA		NOAEL	3.9E-03	NA	NA	3.9E-03
			Mercury	NC	NA	NA	NA		Immune system	5.9E-02	NA	NA	5.9E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	1.6E-01	NA	NA	1.6E-01

TABLE 9.23.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Toxicity Equivalency (PCB Congeners) - Mam	2.1E-05	NA	NA	NA	2.1E-05		--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.0E-04	NA	NA	NA	3.0E-04		--	NA	NA	
			CHEMICAL TOTAL	3.5E-04	--	--	--	3E-04		1.4E+01	0.0E+00	--	1.4E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-04					1.4E+01
	EXPOSURE MEDIUM TOTAL							3E-04					1.4E+01
COMBINED FISH DIET TOTAL								3E-04					1.4E+01
RECEPTOR TOTAL								3E-04					1.4E+01
							TOTAL RISK ACROSS ALL MEDIA	3E-04	TOTAL HAZARD ACROSS ALL MEDIA				1.4E+01

NOTES:
NC - Not carcinogenic by this exposure route
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

TOTAL ADVERSE CLINICAL SIGNS HI =	3.1E-04
TOTAL CARDIOVASCULAR SYSTEM HI =	7.2E-05
TOTAL DEVELOPMENTAL TOXICITY HI =	1.6E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	5.2E-05
TOTAL IMMUNE SYSTEM HI =	1.4E+01
TOTAL KIDNEY HI =	2.7E-03
TOTAL LIVER HI =	3.3E-01
	--
TOTAL NERVOUS SYSTEM HI =	2.7E-05
TOTAL NOAEL HI =	2.0E-02
TOTAL REPRODUCTIVE SYSTEM HI =	1.4E-05
TOTAL SKIN HI =	1.2E-02
	--

Prepared by: KJA
Checked by: RAR

TABLE 9.24.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	LYMAN MILL POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	2.4E-06	NA	3.5E-07	2.7E-06
			4-Chloro-3-methylphenol	NC	NA	NC	NA		Reproductive system	1.3E-04	NA	1.5E-05	1.5E-04
			4-Nitrophenol	NC	NA	NC	NA			--	NA	--	
			Acenaphthylene	NC	NA	NC	NA		Liver	3.4E-06	NA	4.9E-07	3.9E-06
			Benzo(a)anthracene	2.8E-08	NA	4.0E-09	NA	3.2E-08	Kidney	4.4E-05	NA	6.5E-06	5.1E-05
			Benzo(a)pyrene	2.9E-07	NA	4.2E-08	NA	3.3E-07	Kidney	4.6E-05	NA	6.7E-06	5.3E-05
			Benzo(b)fluoranthene	4.5E-08	NA	6.5E-09	NA	5.1E-08	Kidney	7.1E-05	NA	1.0E-05	8.2E-05
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	4.7E-05	NA	6.9E-06	5.4E-05
			Benzo(k)fluoranthene	2.1E-09	NA	3.0E-10	NA	2.4E-09	Kidney	3.3E-05	NA	4.8E-06	3.8E-05
			bis(2-Ethylhexyl)phthalate	9.9E-10	NA	1.1E-10	NA	1.1E-09	Liver	1.2E-04	NA	1.4E-05	1.4E-04
			Dibenzo(a,h)anthracene	7.6E-08	NA	1.1E-08	NA	8.7E-08	Kidney	1.2E-05	NA	1.8E-06	1.4E-05
			Indeno(1,2,3-cd)pyrene	2.7E-08	NA	3.9E-09	NA	3.1E-08	Kidney	4.3E-05	NA	6.2E-06	4.9E-05
			N-Nitroso-di-n-propylamine	1.2E-07	NA	1.4E-08	NA	1.4E-07		--	NA	--	
			Pentachlorophenol	2.3E-09	NA	6.4E-10	NA	2.9E-09	Liver / Kidney	2.2E-05	NA	6.2E-06	2.8E-05
			Phenanthrene	NC	NA	NC	NA		Kidney	4.4E-05	NA	6.5E-06	5.1E-05
			alpha-Chlordane	1.5E-10	NA	6.8E-12	NA	1.6E-10	Liver	3.0E-05	NA	1.4E-06	3.2E-05
			Aroclor-1254	1.3E-08	NA	2.1E-09	NA	1.5E-08	Immune system	1.2E-02	NA	1.8E-03	1.3E-02
			Aroclor-1260	7.3E-10	NA	1.1E-10	NA	8.5E-10	Immune system	6.4E-04	NA	1.0E-04	7.4E-04
			Aroclor-1268	3.3E-09	NA	5.1E-10	NA	3.8E-09	Immune system	2.8E-03	NA	4.5E-04	3.3E-03
			Dieldrin	9.6E-10	NA	1.1E-10	NA	1.1E-09	Liver	4.2E-05	NA	4.7E-06	4.6E-05
			Endosulfan II	NC	NA	NC	NA		Kidney	4.0E-07	NA	4.4E-08	4.4E-07
			Endosulfan sulfate	NC	NA	NC	NA		Kidney	2.3E-07	NA	2.6E-08	2.6E-07
			gamma-Chlordane	7.1E-11	NA	3.2E-12	NA	7.4E-11	Liver	1.4E-05	NA	6.4E-07	1.5E-05
			Technical Chlordane	6.1E-09	NA	2.7E-10	NA	6.4E-09	Liver	1.2E-03	NA	5.5E-05	1.3E-03
			Antimony	NC	NA	NC	NA		Adverse clinical signs	3.7E-03	NA		3.7E-03
			Arsenic	1.3E-07	NA	4.4E-09	NA	1.3E-07	Skin	1.0E-02	NA	3.4E-04	1.0E-02
			Cadmium	NC	NA	NC	NA		Kidney	1.0E-03	NA	4.5E-05	1.0E-03
			Chromium	NC	NA	NC	NA		NOAEL	3.2E-02	NA		3.2E-02
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	5.6E-03	NA		5.6E-03
			Mercury	NC	NA	NC	NA		Immune system	9.8E-04	NA		9.8E-04
			Nickel	NC	NA	NC	NA		Developmental toxicity	1.6E-03	NA		1.6E-03
			Thallium	NC	NA	NC	NA		NOAEL	3.4E-03	NA		3.4E-03
			Vanadium	NC	NA	NC	NA		NOAEL	2.9E-03	NA		2.9E-03
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.6E-06	NA	1.2E-07	NA	3.8E-06		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	6.7E-08	NA	2.3E-09	NA	6.9E-08		--	NA	--	
			CHEMICAL TOTAL	4.5E-06	--	2.1E-07	--	5E-06		7.8E-02	0.0E+00	2.9E-03	8E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						5E-06					8E-02
	EXPOSURE MEDIUM TOTAL							5E-06					8E-02
SEDIMENT TOTAL								5E-06					8E-02
SURFACE WATER	SURFACE WATER	LYMAN MILL POND	Acenaphthylene	NC	NA	NC	NA		Liver	2.6E-09	NA	--	2.6E-09
			bis(2-Ethylhexyl)phthalate	8.1E-10	NA	2.1E-08	NA	2.2E-08	Liver	1.0E-04	NA	2.6E-03	2.7E-03
			Aldrin	1.3E-09	NA	2.0E-09	NA	3.3E-09	Liver	9.1E-05	NA	1.4E-04	2.3E-04
			alpha-Chlordane	2.3E-11	NA	7.9E-10	NA	8.1E-10	Liver	4.5E-06	NA	1.6E-04	1.6E-04
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	6.3E-08	NA	--	6.3E-08
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	2.0E-06	NA	2.3E-05	2.5E-05
			gamma-Chlordane	2.5E-11	NA	8.7E-10	NA	9.0E-10	Liver	5.0E-06	NA	1.7E-04	1.8E-04

TABLE 9.24.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Arsenic	2.3E-08	NA	2.5E-09	NA	2.6E-08	Skin	1.8E-03	NA	2.0E-04	2.0E-03
			Barium	NC	NA	NC	NA		Cardiovascular system	3.6E-05	NA	5.5E-05	9.0E-05
			Chromium	NC	NA	NC	NA		NOAEL	9.1E-05	NA	7.8E-04	8.7E-04
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	6.4E-04	NA	1.7E-03	2.4E-03
			Mercury	NC	NA	NC	NA		Immune system	1.6E-06	NA	2.4E-06	3.9E-06
			Thallium	NC	NA	NC	NA		NOAEL	3.3E-03	NA	3.5E-04	3.6E-03
			Nitrate	NC	NA	NC	NA		Hematological system	5.6E-05	NA	--	5.6E-05
			Nitrite-N	NC	NA	NC	NA		Hematological system	1.0E-04	NA	--	1.0E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	6.1E-08	NA	0.0E+00	NA	6.1E-08		--	NA	--	
			CHEMICAL TOTAL	8.7E-08	--	2.7E-08	--	1E-07		6.2E-03	0.0E+00	6.2E-03	1E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-07					1E-02
	EXPOSURE MEDIUM TOTAL							1E-07					1E-02
SURFACE WATER TOTAL								1E-07					1E-02
BIOTA	COMBINED FISH DIET	LYMAN MILL POND	Acenaphthylene	NC	NA	NA	NA		Liver	6.4E-06	NA	NA	6.4E-06
			Benzo(a)anthracene	1.8E-08	NA	NA	NA	1.8E-08	Kidney	2.8E-05	NA	NA	2.8E-05
			Benzo(a)pyrene	8.8E-08	NA	NA	NA	8.8E-08	Kidney	1.4E-05	NA	NA	1.4E-05
			Benzo(b)fluoranthene	1.2E-08	NA	NA	NA	1.2E-08	Kidney	1.9E-05	NA	NA	1.9E-05
			Benzo(g,h,i)perylene	NC	NA	NA	NA		Kidney	1.1E-05	NA	NA	1.1E-05
			Dibenzo(a,h)anthracene	4.8E-08	NA	NA	NA	4.8E-08	Kidney	7.7E-06	NA	NA	7.7E-06
			Indeno(1,2,3-cd)pyrene	7.6E-09	NA	NA	NA	7.6E-09	Kidney	1.2E-05	NA	NA	1.2E-05
			Phenanthrene	NC	NA	NA	NA		Kidney	8.9E-05	NA	NA	8.9E-05
			4,4'-DDD	3.6E-08	NA	NA	NA	3.6E-08	Liver	1.0E-02	NA	NA	1.0E-02
			4,4'-DDE	1.7E-07	NA	NA	NA	1.7E-07	Liver	3.4E-02	NA	NA	3.4E-02
			4,4'-DDT	5.6E-09	NA	NA	NA	5.6E-09	Liver	1.2E-03	NA	NA	1.2E-03
			alpha-Chlordane	3.8E-08	NA	NA	NA	3.8E-08	Liver	7.7E-03	NA	NA	7.7E-03
			Aroclor-1254	2.3E-05	NA	NA	NA	2.3E-05	Immune system	2.0E+01	NA	NA	2.0E+01
			Aroclor-1268	2.4E-07	NA	NA	NA	2.4E-07	Immune system	2.1E-01	NA	NA	2.1E-01
			beta-BHC	7.9E-09	NA	NA	NA	7.9E-09	Liver / Kidney	5.1E-04	NA	NA	5.1E-04
			Dieldrin	5.0E-07	NA	NA	NA	5.0E-07	Liver	2.2E-02	NA	NA	2.2E-02
			gamma-Chlordane	2.5E-08	NA	NA	NA	2.5E-08	Liver	5.0E-03	NA	NA	5.0E-03
			Heptachlor Epoxide	7.0E-08	NA	NA	NA	7.0E-08	Liver	2.1E-02	NA	NA	2.1E-02
			Technical Chlordane	2.0E-06	NA	NA	NA	2.0E-06	Liver	3.9E-01	NA	NA	3.9E-01
			Arsenic	2.0E-07	NA	NA	NA	2.0E-07	Skin	1.5E-02	NA	NA	1.5E-02
			Cadmium	NC	NA	NA	NA		Kidney	3.3E-03	NA	NA	3.3E-03
			Chromium	NC	NA	NA	NA		NOAEL	1.3E-02	NA	NA	1.3E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Manganese	NC	NA	NA	NA		NOAEL	5.9E-03	NA	NA	5.9E-03
			Mercury	NC	NA	NA	NA		Immune system	9.0E-02	NA	NA	9.0E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	2.4E-01	NA	NA	2.4E-01

TABLE 9.24.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Toxicity Equivalency (PCB Congeners) - Mam	2.1E-05	NA	NA	NA	2.1E-05		--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.0E-04	NA	NA	NA	3.0E-04		--	NA	NA	
			CHEMICAL TOTAL	3.5E-04	--	--	--	4E-04		2.1E+01	0.0E+00	--	2.1E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-04					2.1E+01
	EXPOSURE MEDIUM TOTAL							4E-04					2.1E+01
COMBINED FISH DIET TOTAL								4E-04					2.1E+01
RECEPTOR TOTAL								4E-04					2.2E+01
							TOTAL RISK ACROSS ALL MEDIA	4E-04				TOTAL HAZARD ACROSS ALL MEDIA	2.2E+01

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

TOTAL ADVERSE CLINICAL SIGNS HI =	3.7E-03
TOTAL CARDIOVASCULAR SYSTEM HI =	9.3E-05
TOTAL DEVELOPMENTAL TOXICITY HI =	2.5E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	1.6E-04
TOTAL IMMUNE SYSTEM HI =	2.1E+01
TOTAL KIDNEY HI =	5.4E-03
TOTAL LIVER HI =	5.0E-01
	--
TOTAL NERVOUS SYSTEM HI =	2.5E-05
TOTAL NOAEL HI =	6.9E-02
TOTAL REPRODUCTIVE SYSTEM HI =	1.5E-04
TOTAL SKIN HI =	2.8E-02
	--

Prepared by: KJA
Checked by: RAR

TABLE 9.25.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	MANTON POND	Benzo(a)anthracene	3.7E-11	NA	9.3E-12	NA	4.6E-11	Kidney	2.9E-08	NA	7.4E-09	3.7E-08
			Benzo(a)pyrene	4.4E-10	NA	1.1E-10	NA	5.5E-10	Kidney	3.5E-08	NA	8.9E-09	4.4E-08
			Benzo(b)fluoranthene	7.6E-11	NA	1.9E-11	NA	9.5E-11	Kidney	6.1E-08	NA	1.5E-08	7.6E-08
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	2.2E-08	NA	5.4E-09	2.7E-08
			Benzo(k)fluoranthene	4.4E-12	NA	1.1E-12	NA	5.5E-12	Kidney	3.5E-08	NA	8.9E-09	4.4E-08
			bis(2-Ethylhexyl)phthalate	1.5E-12	NA	2.8E-13	NA	1.7E-12	Liver	9.1E-08	NA	1.8E-08	1.1E-07
			Indeno(1,2,3-cd)pyrene	3.7E-11	NA	9.3E-12	NA	4.6E-11	Kidney	2.9E-08	NA	7.4E-09	3.7E-08
			Phenanthrene	NC	NA	NC	NA		Kidney	2.7E-08	NA	6.9E-09	3.4E-08
			alpha-Chlordane	2.6E-13	NA	2.0E-14	NA	2.8E-13	Liver	2.6E-08	NA	2.0E-09	2.8E-08
			gamma-Chlordane	2.9E-13	NA	2.3E-14	NA	3.2E-13	Liver	2.9E-08	NA	2.3E-09	3.2E-08
			Arsenic	3.9E-10	NA	2.3E-11	NA	4.1E-10	Skin	1.5E-05	NA	8.8E-07	1.6E-05
			Cadmium	NC	NA	NC	NA		Kidney	4.0E-06	NA	3.1E-07	4.3E-06
			Chromium	NC	NA	NC	NA		NOAEL	2.6E-05	NA		2.6E-05
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	1.1E-05	NA		1.1E-05
			Vanadium	NC	NA	NC	NA		NOAEL	4.8E-06	NA		4.8E-06
			Toxicity Equivalency (Dioxins/Furans) - Mam	2.2E-08	NA	1.3E-09	NA	2.3E-08		--	NA	--	
			CHEMICAL TOTAL	2.3E-08	--	1.4E-09	--	2E-08		6.1E-05	0.0E+00	1.3E-06	6E-05
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-08					6E-05
	EXPOSURE MEDIUM TOTAL							2E-08					6E-05
SEDIMENT TOTAL								2E-08					6E-05
SURFACE WATER	SURFACE WATER	MANTON POND	Acenaphthylene	NC	NA	NC	NA		Liver	1.3E-11	NA	--	1.3E-11
			bis(2-Ethylhexyl)phthalate	8.0E-12	NA	6.7E-09	NA	6.7E-09	Liver	5.0E-07	NA	4.2E-04	4.2E-04
			Aldrin	1.3E-11	NA	6.4E-10	NA	6.5E-10	Liver	4.5E-07	NA	2.2E-05	2.2E-05
			alpha-Chlordane	2.2E-13	NA	2.5E-10	NA	2.5E-10	Liver	2.2E-08	NA	2.5E-05	2.5E-05
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	3.1E-10	NA	--	3.1E-10
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	9.8E-09	NA	3.8E-06	3.8E-06
			gamma-Chlordane	2.5E-13	NA	2.8E-10	NA	2.8E-10	Liver	2.5E-08	NA	2.8E-05	2.8E-05
			Arsenic	2.3E-10	NA	8.1E-10	NA	1.0E-09	Skin	9.0E-06	NA	3.1E-05	4.0E-05
			Barium	NC	NA	NC	NA		Cardiovascular system	1.8E-07	NA	8.8E-06	8.9E-06
			Chromium	NC	NA	NC	NA		NOAEL	4.5E-07	NA	1.3E-04	1.3E-04
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	3.2E-06	NA	2.8E-04	2.8E-04
			Mercury	NC	NA	NC	NA		Immune system	7.7E-09	NA	3.8E-07	3.9E-07
			Thallium	NC	NA	NC	NA		NOAEL	1.6E-05	NA	5.6E-05	7.2E-05
			Nitrate	NC	NA	NC	NA		Hematological system	2.8E-07	NA	--	2.8E-07
			Nitrite-N	NC	NA	NC	NA		Hematological system	4.9E-07	NA	--	4.9E-07
			Toxicity Equivalency (Dioxins/Furans) - Mam	6.0E-10	NA	0.0E+00	NA	6.0E-10		--	NA	--	
			CHEMICAL TOTAL	8.6E-10	--	8.7E-09	--	1E-08		3.1E-05	0.0E+00	1.0E-03	1E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-08					1E-03
	EXPOSURE MEDIUM TOTAL							1E-08					1E-03
SURFACE WATER TOTAL								1E-08					1E-03

TABLE 9.25.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	MANTON POND	Acenaphthylene	NC	NA	NA	NA		Liver	6.1E-07	NA	NA	6.1E-07
			Dibenzo(a,h)anthracene	3.4E-08	NA	NA	NA	3.4E-08	Kidney	8.9E-07	NA	NA	8 9E-07
			Phenanthrene	NC	NA	NA	NA		Kidney	1.2E-05	NA	NA	1.2E-05
			4,4'-DDE	6.3E-08	NA	NA	NA	6.3E-08	Liver	2.2E-03	NA	NA	2.2E-03
			alpha-Chlordane	1.0E-08	NA	NA	NA	1.0E-08	Liver	3.4E-04	NA	NA	3 4E-04
			Aroclor-1254	5.2E-06	NA	NA	NA	5 2E-06	Immune system	7.6E-01	NA	NA	7 6E-01
			Aroclor-1268	1 4E-06	NA	NA	NA	1 4E-06	Immune system	2.0E-01	NA	NA	2 0E-01
			Dieldrin	1.7E-07	NA	NA	NA	1 7E-07	Liver	1 3E-03	NA	NA	1 3E-03
			Endosulfan Sulfate	NC	NA	NA	NA		Kidney	2.0E-05	NA	NA	2 0E-05
			gamma-Chlordane	3 8E-09	NA	NA	NA	3.8E-09	Liver	1 3E-04	NA	NA	1 3E-04
			Technical Chlordane	3.0E-07	NA	NA	NA	3.0E-07	Liver	9 9E-03	NA	NA	9 9E-03
			Lead	--	NA	NA	NA			--	NA	NA	
			Mercury	NC	NA	NA	NA		Immune system	7.5E-02	NA	NA	7 5E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	1.8E-01	NA	NA	1.8E-01
			Toxicity Equivalency (Dioxins/Furans) - Mam	5.8E-05	NA	NA	NA	5.8E-05		--	NA	NA	
			CHEMICAL TOTAL	6.5E-05	--	--	--	7E-05		1.2E+00	0.0E+00	--	1E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						7E-05					1E+00
	EXPOSURE MEDIUM TOTAL							7E-05					1E+00
COMBINED FISH DIET TOTAL								7E-05					1E+00
RECEPTOR TOTAL								7E-05					1.2E+00
							TOTAL RISK ACROSS ALL MEDIA	7E-05	TOTAL HAZARD ACROSS ALL MEDIA				1.2E+00

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

	--
TOTAL CARDIOVASCULAR SYSTEM HI =	8.9E-06
TOTAL DEVELOPMENTAL TOXICITY HI =	1.8E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	7.7E-07
TOTAL IMMUNE SYSTEM HI =	1.0E+00
TOTAL KIDNEY HI =	3.7E-05
TOTAL LIVER HI =	1.4E-02
	--
TOTAL NERVOUS SYSTEM HI =	3.8E-06
TOTAL NOAEL HI =	5.2E-04
	--
TOTAL SKIN HI =	5.6E-05
	--

Prepared by: KJA
Checked by: RAR

TABLE 9.26.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	MANTON POND	Benzo(a)anthracene	4.3E-11	NA	3.2E-11	NA	7.5E-11	Kidney	4.6E-08	NA	3.4E-08	8.0E-08
			Benzo(a)pyrene	5.1E-10	NA	3.8E-10	NA	9.0E-10	Kidney	5.5E-08	NA	4.1E-08	9.6E-08
			Benzo(b)fluoranthene	8.9E-11	NA	6.6E-11	NA	1.5E-10	Kidney	9.4E-08	NA	7.0E-08	1.6E-07
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	3.3E-08	NA	2.5E-08	5 8E-08
			Benzo(k)fluoranthene	5.1E-12	NA	3.8E-12	NA	9.0E-12	Kidney	5.5E-08	NA	4.1E-08	9.6E-08
			bis(2-Ethylhexyl)phthalate	1.7E-12	NA	9.7E-13	NA	2.7E-12	Liver	1.4E-07	NA	8.1E-08	2.2E-07
			Indeno(1,2,3-cd)pyrene	4.3E-11	NA	3.2E-11	NA	7.5E-11	Kidney	4.6E-08	NA	3.4E-08	8.0E-08
			Phenanthrene	NC	NA	NC	NA		Kidney	4.3E-08	NA	3.2E-08	7.4E-08
			alpha-Chlordane	3.0E-13	NA	6.9E-14	NA	3.7E-13	Liver	4.0E-08	NA	9.2E-09	4 9E-08
			gamma-Chlordane	3.4E-13	NA	7.8E-14	NA	4.2E-13	Liver	4.6E-08	NA	1 0E-08	5.6E-08
			Arsenic	4.5E-10	NA	7.8E-11	NA	5.3E-10	Skin	2.3E-05	NA	4.0E-06	2 7E-05
			Cadmium	NC	NA	NC	NA		Kidney	6.2E-06	NA	1 4E-06	7.6E-06
			Chromium	NC	NA	NC	NA		NOAEL	4.1E-05	NA		4.1E-05
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	1 6E-05	NA		1.6E-05
			Vanadium	NC	NA	NC	NA		NOAEL	7 4E-06	NA		7.4E-06
			Toxicity Equivalency (Dioxins/Furans) - Mam	2 5E-08	NA	4 3E-09	NA	3.0E-08		--	NA	--	
			CHEMICAL TOTAL	2 6E-08	--	4.9E-09	--	3E-08		9 5E-05	0 0E+00	5.8E-06	1E-04
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-08					1E-04
	EXPOSURE MEDIUM TOTAL							3E-08					1E-04
SEDIMENT TOTAL								3E-08					1E-04
SURFACE WATER	SURFACE WATER	MANTON POND	Acenaphthylene	NC	NA	NC	NA		Liver	2.0E-11	NA	--	2.0E-11
			bis(2-Ethylhexyl)phthalate	9.3E-12	NA	5.7E-09	NA	5.7E-09	Liver	7.8E-07	NA	4.7E-04	4.7E-04
			Aldrin	1.5E-11	NA	5.4E-10	NA	5.5E-10	Liver	7.0E-07	NA	2.5E-05	2.5E-05
			alpha-Chlordane	2.6E-13	NA	2.1E-10	NA	2.1E-10	Liver	3.5E-08	NA	2.8E-05	2.8E-05
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	4.9E-10	NA	--	4.9E-10
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	1.5E-08	NA	4.2E-06	4.2E-06
			gamma-Chlordane	2.9E-13	NA	2.4E-10	NA	2 4E-10	Liver	3.8E-08	NA	3.1E-05	3.1E-05
			Arsenic	2.7E-10	NA	6.8E-10	NA	9 5E-10	Skin	1.4E-05	NA	3.5E-05	4.9E-05
			Barium	NC	NA	NC	NA		Cardiovascular system	2.7E-07	NA	9.8E-06	1.0E-05
			Chromium	NC	NA	NC	NA		NOAEL	7.0E-07	NA	1.4E-04	1.4E-04
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	4.9E-06	NA	3 1E-04	3.1E-04
			Mercury	NC	NA	NC	NA		Immune system	1.2E-08	NA	4 3E-07	4.4E-07
			Thallium	NC	NA	NC	NA		NOAEL	2.5E-05	NA	6.3E-05	8.8E-05
			Nitrate	NC	NA	NC	NA		Hematological system	4.3E-07	NA	--	4.3E-07
			Nitrite-N	NC	NA	NC	NA		Hematological system	7.7E-07	NA	--	7.7E-07
			Toxicity Equivalency (Dioxins/Furans) - Mam	7.0E-10	NA	0.0E+00	NA	7.0E-10		--	NA	--	
			CHEMICAL TOTAL	1.0E-09	--	7.3E-09	--	8E-09		4.8E-05	0.0E+00	1.1E-03	1E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						8E-09					1E-03
	EXPOSURE MEDIUM TOTAL							8E-09					1E-03
SURFACE WATER TOTAL								8E-09					1E-03

TABLE 9.26.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	MANTON POND	Acenaphthylene	NC	NA	NA	NA		Liver	6.3E-07	NA	NA	6.3E-07
			Dibenzo(a,h)anthracene	3 5E-08	NA	NA	NA	3.5E-08	Kidney	9.2E-07	NA	NA	9.2E-07
			Phenanthrene	NC	NA	NA	NA		Kidney	1.2E-05	NA	NA	1.2E-05
			4,4'-DDE	6 5E-08	NA	NA	NA	6 5E-08	Liver	2.2E-03	NA	NA	2 2E-03
			alpha-Chlordane	1 1E-08	NA	NA	NA	1 1E-08	Liver	3 5E-04	NA	NA	3.5E-04
			Aroclor-1254	5 4E-06	NA	NA	NA	5 4E-06	Immune system	7 8E-01	NA	NA	7 8E-01
			Aroclor-1268	1 4E-06	NA	NA	NA	1 4E-06	Immune system	2.1E-01	NA	NA	2 1E-01
			Dieldrin	1.8E-07	NA	NA	NA	1 8E-07	Liver	1 3E-03	NA	NA	1 3E-03
			Endosulfan Sulfate	NC	NA	NA	NA		Kidney	2.0E-05	NA	NA	2 0E-05
			gamma-Chlordane	3 9E-09	NA	NA	NA	3 9E-09	Liver	1.3E-04	NA	NA	1 3E-04
			Technical Chlordane	3 1E-07	NA	NA	NA	3 1E-07	Liver	1.0E-02	NA	NA	1.0E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Mercury	NC	NA	NA	NA		Immune system	7.8E-02	NA	NA	7 8E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	1.9E-01	NA	NA	1.9E-01
			Toxicity Equivalency (Dioxins/Furans) - Mam	6 0E-05	NA	NA	NA	6.0E-05		--	NA	NA	
			CHEMICAL TOTAL	6.8E-05	--	--	--	7E-05		1.3E+00	0.0E+00	--	1E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						7E-05					1E+00
	EXPOSURE MEDIUM TOTAL							7E-05					1E+00
COMBINED FISH DIET TOTAL								7E-05					1E+00

RECEPTOR TOTAL	7E-05		1.3E+00
TOTAL RISK ACROSS ALL MEDIA	7E-05	TOTAL HAZARD ACROSS ALL MEDIA	1.3E+00

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

	--
TOTAL CARDIOVASCULAR SYSTEM HI =	1.0E-05
TOTAL DEVELOPMENTAL TOXICITY HI =	1.9E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	1.2E-06
TOTAL IMMUNE SYSTEM HI =	1.1E+00
TOTAL KIDNEY HI =	4.2E-05
TOTAL LIVER HI =	1.5E-02
	--
TOTAL NERVOUS SYSTEM HI =	4.2E-06
TOTAL NOAEL HI =	6.1E-04
	--
TOTAL SKIN HI =	7.7E-05
	--

Prepared by: KJA
Checked by: RAR

TABLE 9.28.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	MANTON POND	Benzo(a)anthracene	1.6E-10	NA	2.0E-11	NA	1.8E-10	Kidney	1.3E-07	NA	1.6E-08	1.4E-07
			Benzo(a)pyrene	1.9E-09	NA	2.4E-10	NA	2.2E-09	Kidney	1.5E-07	NA	1.9E-08	1.7E-07
			Benzo(b)fluoranthene	3.3E-10	NA	4.2E-11	NA	3.7E-10	Kidney	2.6E-07	NA	3.3E-08	3.0E-07
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	9.3E-08	NA	1.2E-08	1.1E-07
			Benzo(k)fluoranthene	1.9E-11	NA	2.4E-12	NA	2.2E-11	Kidney	1.5E-07	NA	1.9E-08	1.7E-07
			bis(2-Ethylhexyl)phthalate	6.3E-12	NA	6.1E-13	NA	6.9E-12	Liver	3.9E-07	NA	3.8E-08	4.3E-07
			Indeno(1,2,3-cd)pyrene	1.6E-10	NA	2.0E-11	NA	1.8E-10	Kidney	1.3E-07	NA	1.6E-08	1.4E-07
			Phenanthrene	NC	NA	NC	NA		Kidney	1.2E-07	NA	1.5E-08	1.3E-07
			alpha-Chlordane	1.1E-12	NA	4.4E-14	NA	1.2E-12	Liver	1.1E-07	NA	4.4E-09	1.2E-07
			gamma-Chlordane	1.3E-12	NA	4.9E-14	NA	1.3E-12	Liver	1.3E-07	NA	4.9E-09	1.3E-07
			Arsenic	1.7E-09	NA	4.9E-11	NA	1.7E-09	Skin	6.5E-05	NA	1.9E-06	6.7E-05
			Cadmium	NC	NA	NC	NA		Kidney	1.7E-05	NA	6.7E-07	1.8E-05
			Chromium	NC	NA	NC	NA		NOAEL	1.1E-04	NA		1.1E-04
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	4.6E-05	NA		4.6E-05
			Vanadium	NC	NA	NC	NA		NOAEL	2.1E-05	NA		2.1E-05
			Toxicity Equivalency (Dioxins/Furans) - Mam	9.4E-08	NA	2.7E-09	NA	9.6E-08		--	NA	--	
			CHEMICAL TOTAL	9.8E-08	--	3.1E-09	--	1E-07		2.6E-04	0.0E+00	2.8E-06	3E-04
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-07					3E-04
	EXPOSURE MEDIUM TOTAL							1E-07					3E-04
SEDIMENT TOTAL								1E-07					3E-04
SURFACE WATER	SURFACE WATER	MANTON POND	Acenaphthylene	NC	NA	NC	NA		Liver	5.6E-10	NA	--	5.6E-10
			bis(2-Ethylhexyl)phthalate	3.5E-10	NA	3.8E-08	NA	3.9E-08	Liver	2.2E-05	NA	2.4E-03	2.4E-03
			Aldrin	5.7E-10	NA	3.6E-09	NA	4.2E-09	Liver	2.0E-05	NA	1.3E-04	1.4E-04
			alpha-Chlordane	9.7E-12	NA	1.4E-09	NA	1.5E-09	Liver	9.7E-07	NA	1.4E-04	1.5E-04
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	1.4E-08	NA	--	1.4E-08
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	4.2E-07	NA	2.1E-05	2.2E-05
			gamma-Chlordane	1.1E-11	NA	1.6E-09	NA	1.6E-09	Liver	1.1E-06	NA	1.6E-04	1.6E-04
			Arsenic	1.0E-08	NA	4.6E-09	NA	1.5E-08	Skin	3.9E-04	NA	1.8E-04	5.7E-04
			Barium	NC	NA	NC	NA		Cardiovascular system	7.6E-06	NA	5.0E-05	5.7E-05
			Chromium	NC	NA	NC	NA		NOAEL	2.0E-05	NA	7.1E-04	7.3E-04
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	1.4E-04	NA	1.6E-03	1.7E-03
			Mercury	NC	NA	NC	NA		Immune system	3.3E-07	NA	2.2E-06	2.5E-06
			Thallium	NC	NA	NC	NA		NOAEL	7.0E-04	NA	3.2E-04	1.0E-03
			Nitrate	NC	NA	NC	NA		Hematological system	1.2E-05	NA	--	1.2E-05
			Nitrite-N	NC	NA	NC	NA		Hematological system	2.1E-05	NA	--	2.1E-05
			Toxicity Equivalency (Dioxins/Furans) - Mam	2.6E-08	NA	0.0E+00	NA	2.6E-08		--	NA	--	
			CHEMICAL TOTAL	3.7E-08	--	5.0E-08	--	9E-08		1.3E-03	0.0E+00	5.7E-03	7E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						9E-08					7E-03
	EXPOSURE MEDIUM TOTAL							9E-08					7E-03
SURFACE WATER TOTAL								9E-08					7E-03

TABLE 9.28.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	MANTON POND	Acenaphthylene	NC	NA	NA	NA		Liver	6.1E-07	NA	NA	6.1E-07
			Dibenzo(a,h)anthracene	2.5E-08	NA	NA	NA	2.5E-08	Kidney	8.9E-07	NA	NA	8.9E-07
			Phenanthrene	NC	NA	NA	NA		Kidney	1.2E-05	NA	NA	1.2E-05
			4,4'-DDE	4.7E-08	NA	NA	NA	4.7E-08	Liver	2.2E-03	NA	NA	2.2E-03
			alpha-Chlordane	7.7E-09	NA	NA	NA	7.7E-09	Liver	3.4E-04	NA	NA	3.4E-04
			Aroclor-1254	3.9E-06	NA	NA	NA	3.9E-06	Immune system	7.6E-01	NA	NA	7.6E-01
			Aroclor-1268	1.0E-06	NA	NA	NA	1.0E-06	Immune system	2.0E-01	NA	NA	2.0E-01
			Dieldrin	1.3E-07	NA	NA	NA	1.3E-07	Liver	1.3E-03	NA	NA	1.3E-03
			Endosulfan Sulfate	NC	NA	NA	NA		Kidney	2.0E-05	NA	NA	2.0E-05
			gamma-Chlordane	2.9E-09	NA	NA	NA	2.9E-09	Liver	1.3E-04	NA	NA	1.3E-04
			Technical Chlordane	2.2E-07	NA	NA	NA	2.2E-07	Liver	9.9E-03	NA	NA	9.9E-03
			Lead	--	NA	NA	NA			--	NA	NA	
			Mercury	NC	NA	NA	NA		Immune system	7.5E-02	NA	NA	7.5E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	1.8E-01	NA	NA	1.8E-01
			Toxicity Equivalency (Dioxins/Furans) - Mam	4.4E-05	NA	NA	NA	4.4E-05		--	NA	NA	
			CHEMICAL TOTAL	4.9E-05	--	--	--	5E-05		1.2E+00	0.0E+00	--	1E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						5E-05					1E+00
	EXPOSURE MEDIUM TOTAL							5E-05					1E+00
COMBINED FISH DIET TOTAL								5E-05					1E+00
RECEPTOR TOTAL								5E-05					1.2E+00
							TOTAL RISK ACROSS ALL MEDIA	5E-05	TOTAL HAZARD ACROSS ALL MEDIA				1.2E+00

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

	--
TOTAL CARDIOVASCULAR SYSTEM HI =	5.7E-05
TOTAL DEVELOPMENTAL TOXICITY HI =	1.8E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	3.3E-05
TOTAL IMMUNE SYSTEM HI =	1.0E+00
TOTAL KIDNEY HI =	5.1E-05
TOTAL LIVER HI =	1.7E-02
	--
TOTAL NERVOUS SYSTEM HI =	2.2E-05
TOTAL NOAEL HI =	3.6E-03
	--
TOTAL SKIN HI =	6.4E-04
	--

TABLE 9.29.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	MANTON POND	Benzo(a)anthracene	1.9E-10	NA	6.9E-11	NA	2.5E-10	Kidney	2.0E-07	NA	7.4E-08	2.7E-07
			Benzo(a)pyrene	2.2E-09	NA	8.3E-10	NA	3.1E-09	Kidney	2.4E-07	NA	8.8E-08	3.3E-07
			Benzo(b)fluoranthene	3.8E-10	NA	1.4E-10	NA	5.3E-10	Kidney	4.1E-07	NA	1.5E-07	5.6E-07
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	1.5E-07	NA	5.4E-08	2.0E-07
			Benzo(k)fluoranthene	2.2E-11	NA	8.3E-12	NA	3.1E-11	Kidney	2.4E-07	NA	8.8E-08	3.3E-07
			bis(2-Ethylhexyl)phthalate	7.4E-12	NA	2.1E-12	NA	9.5E-12	Liver	6.1E-07	NA	1.8E-07	7.9E-07
			Indeno(1,2,3-cd)pyrene	1.9E-10	NA	6.9E-11	NA	2.5E-10	Kidney	2.0E-07	NA	7.4E-08	2.7E-07
			Phenanthrene	NC	NA	NC	NA		Kidney	1.8E-07	NA	6.9E-08	2.5E-07
			alpha-Chlordane	1.3E-12	NA	1.5E-13	NA	1.5E-12	Liver	1.7E-07	NA	2.0E-08	1.9E-07
			gamma-Chlordane	1.5E-12	NA	1.7E-13	NA	1.7E-12	Liver	2.0E-07	NA	2.3E-08	2.2E-07
			Arsenic	2.0E-09	NA	1.7E-10	NA	2.1E-09	Skin	1.0E-04	NA	8.7E-06	1.1E-04
			Cadmium	NC	NA	NC	NA		Kidney	2.7E-05	NA	3.1E-06	3.0E-05
			Chromium	NC	NA	NC	NA		NOAEL	1.8E-04	NA		1.8E-04
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	7.1E-05	NA		7.1E-05
			Vanadium	NC	NA	NC	NA		NOAEL	3.2E-05	NA		3.2E-05
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.1E-07	NA	9.4E-09	NA	1.2E-07		--	NA	--	
			CHEMICAL TOTAL	1.1E-07	--	1.1E-08	--	1E-07		4.1E-04	0.0E+00	1.3E-05	4E-04
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-07					4E-04
	EXPOSURE MEDIUM TOTAL							1E-07					4E-04
SEDIMENT TOTAL								1E-07					4E-04
SURFACE WATER	SURFACE WATER	MANTON POND	Acenaphthylene	NC	NA	NC	NA		Liver	8.7E-10	NA	--	8.7E-10
			bis(2-Ethylhexyl)phthalate	4.0E-10	NA	3.5E-08	NA	3.5E-08	Liver	3.4E-05	NA	2.9E-03	2.9E-03
			Aldrin	6.6E-10	NA	3.3E-09	NA	4.0E-09	Liver	3.0E-05	NA	1.5E-04	1.8E-04
			alpha-Chlordane	1.1E-11	NA	1.3E-09	NA	1.3E-09	Liver	1.5E-06	NA	1.7E-04	1.8E-04
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	2.1E-08	NA	--	2.1E-08
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	6.6E-07	NA	2.6E-05	2.7E-05
			gamma-Chlordane	1.2E-11	NA	1.4E-09	NA	1.5E-09	Liver	1.7E-06	NA	1.9E-04	1.9E-04
			Arsenic	1.2E-08	NA	4.2E-09	NA	1.6E-08	Skin	6.1E-04	NA	2.2E-04	8.2E-04
			Barium	NC	NA	NC	NA		Cardiovascular system	1.2E-05	NA	6.0E-05	7.2E-05
			Chromium	NC	NA	NC	NA		NOAEL	3.0E-05	NA	8.6E-04	8.9E-04
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	2.1E-04	NA	1.9E-03	2.1E-03
			Mercury	NC	NA	NC	NA		Immune system	5.2E-07	NA	2.6E-06	3.2E-06
			Thallium	NC	NA	NC	NA		NOAEL	1.1E-03	NA	3.9E-04	1.5E-03
			Nitrate	NC	NA	NC	NA		Hematological system	1.9E-05	NA	--	1.9E-05
			Nitrite-N	NC	NA	NC	NA		Hematological system	3.3E-05	NA	--	3.3E-05
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.1E-08	NA	0.0E+00	NA	3.1E-08		--	NA	--	
			CHEMICAL TOTAL	4.3E-08	--	4.5E-08	--	9E-08		2.1E-03	0.0E+00	6.9E-03	9E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						9E-08					9E-03
	EXPOSURE MEDIUM TOTAL							9E-08					9E-03
SURFACE WATER TOTAL								9E-08					9E-03

TABLE 9.29.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	MANTON POND	Acenaphthylene	NC	NA	NA	NA		Liver	6.3E-07	NA	NA	6.3E-07
			Dibenzo(a,h)anthracene	2.6E-08	NA	NA	NA	2.6E-08	Kidney	9.2E-07	NA	NA	9.2E-07
			Phenanthrene	NC	NA	NA	NA		Kidney	1.2E-05	NA	NA	1.2E-05
			4,4'-DDE	4.9E-08	NA	NA	NA	4.9E-08	Liver	2.2E-03	NA	NA	2.2E-03
			alpha-Chlordane	7.9E-09	NA	NA	NA	7.9E-09	Liver	3.5E-04	NA	NA	3.5E-04
			Aroclor-1254	4.0E-06	NA	NA	NA	4.0E-06	Immune system	7.8E-01	NA	NA	7.8E-01
			Aroclor-1268	1.1E-06	NA	NA	NA	1.1E-06	Immune system	2.1E-01	NA	NA	2.1E-01
			Dieldrin	1.3E-07	NA	NA	NA	1.3E-07	Liver	1.3E-03	NA	NA	1.3E-03
			Endosulfan Sulfate	NC	NA	NA	NA		Kidney	2.0E-05	NA	NA	2.0E-05
			gamma-Chlordane	2.9E-09	NA	NA	NA	2.9E-09	Liver	1.3E-04	NA	NA	1.3E-04
			Technical Chlordane	2.3E-07	NA	NA	NA	2.3E-07	Liver	1.0E-02	NA	NA	1.0E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Mercury	NC	NA	NA	NA		Immune system	7.8E-02	NA	NA	7.8E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	1.9E-01	NA	NA	1.9E-01
			Toxicity Equivalency (Dioxins/Furans) - Mam	4.5E-05	NA	NA	NA	4.5E-05		--	NA	NA	
			CHEMICAL TOTAL	5.1E-05	--	--	--	5E-05		1.3E+00	0.0E+00	--	1E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						5E-05					1E+00
	EXPOSURE MEDIUM TOTAL							5E-05					1E+00
COMBINED FISH DIET TOTAL								5E-05					1E+00
RECEPTOR TOTAL								5E-05					1.3E+00
							TOTAL RISK ACROSS ALL MEDIA	5E-05				TOTAL HAZARD ACROSS ALL MEDIA	1.3E+00

NOTES:
NC - Not carcinogenic by this exposure route
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

	--
TOTAL CARDIOVASCULAR SYSTEM HI =	7.2E-05
TOTAL DEVELOPMENTAL TOXICITY HI =	1.9E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	5.2E-05
TOTAL IMMUNE SYSTEM HI =	1.1E+00
TOTAL KIDNEY HI =	6.6E-05
TOTAL LIVER HI =	1.8E-02
	--
TOTAL NERVOUS SYSTEM HI =	2.7E-05
TOTAL NOAEL HI =	4.8E-03
	--
TOTAL SKIN HI =	9.3E-04
	--

TABLE 9.30.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	MANTON POND	Benzo(a)anthracene	1.5E-09	NA	2.2E-10	NA	1.7E-09	Kidney	2.4E-06	NA	3.5E-07	2.7E-06
			Benzo(a)pyrene	1.8E-08	NA	2.6E-09	NA	2.0E-08	Kidney	2.8E-06	NA	4.1E-07	3.3E-06
			Benzo(b)fluoranthene	3.1E-09	NA	4.5E-10	NA	3.5E-09	Kidney	4.9E-06	NA	7.1E-07	5.6E-06
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	1.7E-06	NA	2.5E-07	2.0E-06
			Benzo(k)fluoranthene	1.8E-10	NA	2.6E-11	NA	2.0E-10	Kidney	2.8E-06	NA	4.1E-07	3.3E-06
			bis(2-Ethylhexyl)phthalate	5.9E-11	NA	6.6E-12	NA	6.5E-11	Liver	7.4E-06	NA	8.2E-07	8.2E-06
			Indeno(1,2,3-cd)pyrene	1.5E-09	NA	2.2E-10	NA	1.7E-09	Kidney	2.4E-06	NA	3.5E-07	2.7E-06
			Phenanthrene	NC	NA	NC	NA		Kidney	2.2E-06	NA	3.2E-07	2.5E-06
			alpha-Chlordane	1.0E-11	NA	4.7E-13	NA	1.1E-11	Liver	2.1E-06	NA	9.4E-08	2.2E-06
			gamma-Chlordane	1.2E-11	NA	5.3E-13	NA	1.2E-11	Liver	2.4E-06	NA	1.1E-07	2.5E-06
			Arsenic	1.6E-08	NA	5.3E-10	NA	1.6E-08	Skin	1.2E-03	NA	4.1E-05	1.3E-03
			Cadmium	NC	NA	NC	NA		Kidney	3.2E-04	NA	1.4E-05	3.4E-04
			Chromium	NC	NA	NC	NA		NOAEL	2.1E-03	NA		2.1E-03
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	8.6E-04	NA		8.6E-04
			Vanadium	NC	NA	NC	NA		NOAEL	3.9E-04	NA		3.9E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	8.8E-07	NA	2.9E-08	NA	9.0E-07		--	NA	--	
			CHEMICAL TOTAL	9.1E-07	--	3.3E-08	--	9E-07		4.9E-03	0.0E+00	5.9E-05	5E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						9E-07					5E-03
	EXPOSURE MEDIUM TOTAL							9E-07					5E-03
SEDIMENT TOTAL								9E-07					5E-03
SURFACE WATER	SURFACE WATER	MANTON POND	Acenaphthylene	NC	NA	NC	NA		Liver	2.6E-09	NA	--	2.6E-09
			bis(2-Ethylhexyl)phthalate	8.1E-10	NA	2.1E-08	NA	2.2E-08	Liver	1.0E-04	NA	2.6E-03	2.7E-03
			Aldrin	1.3E-09	NA	2.0E-09	NA	3.3E-09	Liver	9.1E-05	NA	1.4E-04	2.3E-04
			alpha-Chlordane	2.3E-11	NA	7.9E-10	NA	8.1E-10	Liver	4.5E-06	NA	1.6E-04	1.6E-04
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	6.3E-08	NA	--	6.3E-08
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	2.0E-06	NA	2.3E-05	2.5E-05
			gamma-Chlordane	2.5E-11	NA	8.7E-10	NA	9.0E-10	Liver	5.0E-06	NA	1.7E-04	1.8E-04
			Arsenic	2.3E-08	NA	2.5E-09	NA	2.6E-08	Skin	1.8E-03	NA	2.0E-04	2.0E-03
			Barium	NC	NA	NC	NA		Cardiovascular system	3.6E-05	NA	5.5E-05	9.0E-05
			Chromium	NC	NA	NC	NA		NOAEL	9.1E-05	NA	7.8E-04	8.7E-04
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	6.4E-04	NA	1.7E-03	2.4E-03
			Mercury	NC	NA	NC	NA		Immune system	1.6E-06	NA	2.4E-06	3.9E-06
			Thallium	NC	NA	NC	NA		NOAEL	3.3E-03	NA	3.5E-04	3.6E-03
			Nitrate	NC	NA	NC	NA		Hematological system	5.6E-05	NA	--	5.6E-05
			Nitrite-N	NC	NA	NC	NA		Hematological system	1.0E-04	NA	--	1.0E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	6.1E-08	NA	0.0E+00	NA	6.1E-08		--	NA	--	
			CHEMICAL TOTAL	8.7E-08	--	2.7E-08	--	1E-07		6.2E-03	0.0E+00	6.2E-03	1E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-07					1E-02
	EXPOSURE MEDIUM TOTAL							1E-07					1E-02
SURFACE WATER TOTAL								1E-07					1E-02

TABLE 9.30.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	MANTON POND	Acenaphthylene	NC	NA	NA	NA		Liver	1.8E-06	NA	NA	1.8E-06
			Dibenzo(a,h)anthracene	5.0E-08	NA	NA	NA	5.0E-08	Kidney	2.6E-06	NA	NA	2.6E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	3.5E-05	NA	NA	3.5E-05
			4,4'-DDE	9.3E-08	NA	NA	NA	9.3E-08	Liver	6.4E-03	NA	NA	6.4E-03
			alpha-Chlordane	1.5E-08	NA	NA	NA	1.5E-08	Liver	1.0E-03	NA	NA	1.0E-03
			Aroclor-1254	7.7E-06	NA	NA	NA	7.7E-06	Immune system	2.2E+00	NA	NA	2.2E+00
			Aroclor-1268	2.0E-06	NA	NA	NA	2.0E-06	Immune system	5.9E-01	NA	NA	5.9E-01
			Dieldrin	2.6E-07	NA	NA	NA	2.6E-07	Liver	3.7E-03	NA	NA	3.7E-03
			Endosulfan Sulfate	NC	NA	NA	NA		Kidney	5.8E-05	NA	NA	5.8E-05
			gamma-Chlordane	5.6E-09	NA	NA	NA	5.6E-09	Liver	3.7E-04	NA	NA	3.7E-04
			Technical Chlordane	4.4E-07	NA	NA	NA	4.4E-07	Liver	2.9E-02	NA	NA	2.9E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Mercury	NC	NA	NA	NA		Immune system	2.2E-01	NA	NA	2.2E-01
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	5.4E-01	NA	NA	5.4E-01
			Toxicity Equivalency (Dioxins/Furans) - Mam	8.6E-05	NA	NA	NA	8.6E-05		--	NA	NA	
			CHEMICAL TOTAL	9.7E-05	--	--	--	1E-04		3.6E+00	0.0E+00	--	4E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-04					4E+00
	EXPOSURE MEDIUM TOTAL							1E-04					4E+00
COMBINED FISH DIET TOTAL								1E-04					4E+00
RECEPTOR TOTAL								1E-04					3.7E+00
							TOTAL RISK ACROSS ALL MEDIA	1E-04	TOTAL HAZARD ACROSS ALL MEDIA				3.7E+00

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

	--
TOTAL CARDIOVASCULAR SYSTEM HI =	9.0E-05
TOTAL DEVELOPMENTAL TOXICITY HI =	5.4E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	1.6E-04
TOTAL IMMUNE SYSTEM HI =	3.1E+00
TOTAL KIDNEY HI =	4.5E-04
TOTAL LIVER HI =	4.4E-02
	--
TOTAL NERVOUS SYSTEM HI =	2.5E-05
TOTAL NOAEL HI =	1.0E-02
	--
TOTAL SKIN HI =	3.3E-03
	--

Prepared by: KJA
Checked by: RAR

TABLE 9.31.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	DYERVILLE POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	9.1E-09	NA	2.3E-09	1.1E-08
			Acenaphthylene	NC	NA	NC	NA		Liver	1.6E-08	NA	4.0E-09	2.0E-08
			Benzo(a)anthracene	3.4E-10	NA	8.7E-11	NA	4.3E-10	Kidney	2.7E-07	NA	6.9E-08	3.4E-07
			Benzo(a)pyrene	3.4E-09	NA	8.7E-10	NA	4.3E-09	Kidney	2.7E-07	NA	6.9E-08	3.4E-07
			Benzo(b)fluoranthene	6.1E-10	NA	1.5E-10	NA	7.7E-10	Kidney	4.9E-07	NA	1.2E-07	6.1E-07
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	2.2E-07	NA	5.4E-08	2.7E-07
			Benzo(k)fluoranthene	1.7E-11	NA	4.4E-12	NA	2.2E-11	Kidney	1.4E-07	NA	3.5E-08	1.7E-07
			bis(2-Ethylhexyl)phthalate	5.2E-12	NA	1.0E-12	NA	6.2E-12	Liver	3.2E-07	NA	6.3E-08	3.9E-07
			Dibenzo(a,h)anthracene	4.9E-10	NA	1.2E-10	NA	6.1E-10	Kidney	3.9E-08	NA	9.9E-09	4.9E-08
			Indeno(1,2,3-cd)pyrene	3.4E-10	NA	8.7E-11	NA	4.3E-10	Kidney	2.7E-07	NA	6.9E-08	3.4E-07
			Phenanthrene	NC	NA	NC	NA		Kidney	2.7E-07	NA	6.9E-08	3.4E-07
			alpha-Chlordane	5.0E-13	NA	3.9E-14	NA	5.4E-13	Liver	5.0E-08	NA	3.9E-09	5.4E-08
			Aroclor-1254	3.3E-10	NA	8.9E-11	NA	4.2E-10	Immune system	1.4E-04	NA	3.9E-05	1.8E-04
			Dieldrin	6.4E-11	NA	1.3E-11	NA	7.7E-11	Liver	1.4E-06	NA	2.7E-07	1.7E-06
			Endosulfan sulfate	NC	NA	NC	NA		Kidney	5.1E-09	NA	9.9E-10	6.1E-09
			Arsenic	1.1E-09	NA	6.2E-11	NA	1.1E-09	Skin	4.1E-05	NA	2.4E-06	4.3E-05
			Cadmium	NC	NA	NC	NA		Kidney	1.0E-05	NA	7.8E-07	1.1E-05
			Chromium	NC	NA	NC	NA		NOAEL	3.1E-04	NA		3.1E-04
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	2.7E-05	NA		2.7E-05
			Mercury	NC	NA	NC	NA		Immune system	7.8E-06	NA		7.8E-06
			Nickel	NC	NA	NC	NA		Developmental toxicity	5.6E-06	NA		5.6E-06
			Vanadium	NC	NA	NC	NA		NOAEL	1.3E-05	NA		1.3E-05
			Toxicity Equivalency (Dioxins/Furans) - Mam	5.5E-09	NA	3.2E-10	NA	5.9E-09		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	1.3E-12	NA	7.4E-14	NA	1.3E-12		--	NA	--	
			CHEMICAL TOTAL	1.2E-08	--	1.8E-09	--	1E-08		5.6E-04	0.0E+00	4.3E-05	6E-04
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-08					6E-04
	EXPOSURE MEDIUM TOTAL							1E-08					6E-04
SEDIMENT TOTAL								1E-08					6E-04
SURFACE WATER	SURFACE WATER	DYERVILLE POND	Acenaphthylene	NC	NA	NC	NA		Liver	1.3E-11	NA	--	1.3E-11
			bis(2-Ethylhexyl)phthalate	8.0E-12	NA	6.7E-09	NA	6.7E-09	Liver	5.0E-07	NA	4.2E-04	4.2E-04
			Aldrin	1.3E-11	NA	6.4E-10	NA	6.5E-10	Liver	4.5E-07	NA	2.2E-05	2.2E-05
			alpha-Chlordane	2.2E-13	NA	2.5E-10	NA	2.5E-10	Liver	2.2E-08	NA	2.5E-05	2.5E-05
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	3.1E-10	NA	--	3.1E-10
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	9.8E-09	NA	3.8E-06	3.8E-06
			gamma-Chlordane	2.5E-13	NA	2.8E-10	NA	2.8E-10	Liver	2.5E-08	NA	2.8E-05	2.8E-05
			Arsenic	2.3E-10	NA	8.1E-10	NA	1.0E-09	Skin	9.0E-06	NA	3.1E-05	4.0E-05
			Barium	NC	NA	NC	NA		Cardiovascular system	1.8E-07	NA	8.8E-06	8.9E-06
			Chromium	NC	NA	NC	NA		NOAEL	4.5E-07	NA	1.3E-04	1.3E-04
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	3.2E-06	NA	2.8E-04	2.8E-04
			Mercury	NC	NA	NC	NA		Immune system	7.7E-09	NA	3.8E-07	3.9E-07
			Thallium	NC	NA	NC	NA		NOAEL	1.6E-05	NA	5.6E-05	7.2E-05
			Nitrate	NC	NA	NC	NA		Hematological system	2.8E-07	NA	--	2.8E-07

TABLE 9.31.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Nitrite-N	NC	NA	NC	NA		Hematological system	4.9E-07	NA	--	4 9E-07
			Toxicity Equivalency (Dioxins/Furans) - Mam	6.0E-10	NA	0.0E+00	NA	6 0E-10		--	NA	--	
			CHEMICAL TOTAL	8.6E-10	--	8.7E-09	--	1E-08		3 1E-05	0 0E+00	1.0E-03	1E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-08					1E-03
	EXPOSURE MEDIUM TOTAL							1E-08					1E-03
SURFACE WATER TOTAL								1E-08					1E-03
BIOTA	COMBINED FISH DIET	DYERVILLE POND	Acenaphthylene	NC	NA	NA	NA		Liver	1.5E-06	NA	NA	1.5E-06
			Dibenzo(a,h)anthracene	8.6E-09	NA	NA	NA	8.6E-09	Kidney	6.9E-07	NA	NA	6.9E-07
			Phenanthrene	NC	NA	NA	NA		Kidney	2.0E-05	NA	NA	2.0E-05
			4,4'-DDD	5.9E-08	NA	NA	NA	5.9E-08	Liver	8.6E-03	NA	NA	8 6E-03
			4,4'-DDE	2 6E-08	NA	NA	NA	2.6E-08	Liver	2.7E-03	NA	NA	2.7E-03
			4,4'-DDT	2.8E-08	NA	NA	NA	2 8E-08	Liver	2.9E-03	NA	NA	2.9E-03
			alpha-Chlordane	3 5E-08	NA	NA	NA	3.5E-08	Liver	3.5E-03	NA	NA	3.5E-03
			Aroclor-1254	5.2E-06	NA	NA	NA	5.2E-06	Immune system	2.3E+00	NA	NA	2.3E+00
			Dieldrin	9.5E-07	NA	NA	NA	9.5E-07	Liver	2.1E-02	NA	NA	2.1E-02
			gamma-Chlordane	1.4E-08	NA	NA	NA	1.4E-08	Liver	1.4E-03	NA	NA	1 4E-03
			Heptachlor Epoxide	1.1E-07	NA	NA	NA	1.1E-07	Liver	1.7E-02	NA	NA	1.7E-02
			Technical Chlordane	7.6E-07	NA	NA	NA	7 6E-07	Liver	7.6E-02	NA	NA	7.6E-02
			Cadmium	NC	NA	NA	NA		Kidney	1.9E-02	NA	NA	1.9E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Manganese	NC	NA	NA	NA		NOAEL	1.1E-02	NA	NA	1.1E-02
			Mercury	NC	NA	NA	NA		Immune system	4.1E-02	NA	NA	4 1E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	1 4E-01	NA	NA	1 4E-01
			Toxicity Equivalency (Dioxins/Furans) - Mam	5 5E-05	NA	NA	NA	5 5E-05		--	NA	NA	
			CHEMICAL TOTAL	6.2E-05	--	--	--	6E-05		2.6E+00	0.0E+00	--	2.6E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						6E-05					2.6E+00
	EXPOSURE MEDIUM TOTAL							6E-05					2.6E+00
COMBINED FISH DIET TOTAL								6E-05					2.6E+00

TABLE 9.31.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
RECEPTOR TOTAL								6E-05					2.6E+00
							TOTAL RISK ACROSS ALL MEDIA	6E-05				TOTAL HAZARD ACROSS ALL MEDIA	2.6E+00

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

	--
TOTAL CARDIOVASCULAR SYSTEM HI =	8.9E-06
TOTAL DEVELOPMENTAL TOXICITY HI =	1.4E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	7.7E-07
TOTAL IMMUNE SYSTEM HI =	2.3E+00
TOTAL KIDNEY HI =	1.9E-02
TOTAL LIVER HI =	1.3E-01
	--
TOTAL NERVOUS SYSTEM HI =	3.8E-06
TOTAL NOAEL HI =	1.2E-02
	--
TOTAL SKIN HI =	8.4E-05
	--

Prepared by: KJA
Checked by: MJM

TABLE 9.32.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	DYERVILLE POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	1.4E-08	NA	1.1E-08	2.5E-08
			Acenaphthylene	NC	NA	NC	NA		Liver	2.4E-08	NA	1.8E-08	4.2E-08
			Benzo(a)anthracene	4.0E-10	NA	3.0E-10	NA	7.0E-10	Kidney	4.3E-07	NA	3.2E-07	7.4E-07
			Benzo(a)pyrene	4.0E-09	NA	3.0E-09	NA	7.0E-09	Kidney	4.3E-07	NA	3.2E-07	7.4E-07
			Benzo(b)fluoranthene	7.1E-10	NA	5.3E-10	NA	1.2E-09	Kidney	7.6E-07	NA	5.7E-07	1.3E-06
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	3.3E-07	NA	2.5E-07	5.8E-07
			Benzo(k)fluoranthene	2.0E-11	NA	1.5E-11	NA	3.5E-11	Kidney	2.2E-07	NA	1.6E-07	3.8E-07
			bis(2-Ethylhexyl)phthalate	6.0E-12	NA	3.4E-12	NA	9.5E-12	Liver	5.0E-07	NA	2.9E-07	7.9E-07
			Dibenzo(a,h)anthracene	5.7E-10	NA	4.2E-10	NA	1.0E-09	Kidney	6.1E-08	NA	4.5E-08	1.1E-07
			Indeno(1,2,3-cd)pyrene	4.0E-10	NA	3.0E-10	NA	7.0E-10	Kidney	4.3E-07	NA	3.2E-07	7.4E-07
			Phenanthrene	NC	NA	NC	NA		Kidney	4.3E-07	NA	3.2E-07	7.4E-07
			alpha-Chlordane	5.9E-13	NA	1.3E-13	NA	7.2E-13	Liver	7.9E-08	NA	1.8E-08	9.7E-08
			Aroclor-1254	3.8E-10	NA	3.1E-10	NA	6.9E-10	Immune system	2.2E-04	NA	1.8E-04	4.0E-04
			Dieldrin	7.5E-11	NA	4.3E-11	NA	1.2E-10	Liver	2.2E-06	NA	1.3E-06	3.4E-06
			Endosulfan sulfate	NC	NA	NC	NA		Kidney	7.9E-09	NA	4.5E-09	1.2E-08
			Arsenic	1.2E-09	NA	2.1E-10	NA	1.4E-09	Skin	6.4E-05	NA	1.1E-05	7.5E-05
			Cadmium	NC	NA	NC	NA		Kidney	1.6E-05	NA	3.6E-06	1.9E-05
			Chromium	NC	NA	NC	NA		NOAEL	4.7E-04	NA		4.7E-04
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	4.3E-05	NA		4.3E-05
			Mercury	NC	NA	NC	NA		Immune system	1.2E-05	NA		1.2E-05
			Nickel	NC	NA	NC	NA		Developmental toxicity	8.7E-06	NA		8.7E-06
			Vanadium	NC	NA	NC	NA		NOAEL	2.1E-05	NA		2.1E-05
			Toxicity Equivalency (Dioxins/Furans) - Mam	6.5E-09	NA	1.1E-09	NA	7.6E-09		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	1.5E-12	NA	2.5E-13	NA	1.7E-12		--	NA	--	
			CHEMICAL TOTAL	1.4E-08	--	6.2E-09	--	2E-08		8.7E-04	0.0E+00	2.0E-04	1E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-08					1E-03
	EXPOSURE MEDIUM TOTAL							2E-08					1E-03
SEDIMENT TOTAL								2E-08					1E-03
SURFACE WATER	SURFACE WATER	DYERVILLE POND	Acenaphthylene	NC	NA	NC	NA		Liver	2.0E-11	NA	--	2.0E-11
			bis(2-Ethylhexyl)phthalate	9.3E-12	NA	5.7E-09	NA	5.7E-09	Liver	7.8E-07	NA	4.7E-04	4.7E-04
			Aldrin	1.5E-11	NA	5.4E-10	NA	5.5E-10	Liver	7.0E-07	NA	2.5E-05	2.5E-05
			alpha-Chlordane	2.6E-13	NA	2.1E-10	NA	2.1E-10	Liver	3.5E-08	NA	2.8E-05	2.8E-05
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	4.9E-10	NA	--	4.9E-10
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	1.5E-08	NA	4.2E-06	4.2E-06
			gamma-Chlordane	2.9E-13	NA	2.4E-10	NA	2.4E-10	Liver	3.8E-08	NA	3.1E-05	3.1E-05
			Arsenic	2.7E-10	NA	6.8E-10	NA	9.5E-10	Skin	1.4E-05	NA	3.5E-05	4.9E-05
			Barium	NC	NA	NC	NA		Cardiovascular system	2.7E-07	NA	9.8E-06	1.0E-05
			Chromium	NC	NA	NC	NA		NOAEL	7.0E-07	NA	1.4E-04	1.4E-04
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	4.9E-06	NA	3.1E-04	3.1E-04
			Mercury	NC	NA	NC	NA		Immune system	1.2E-08	NA	4.3E-07	4.4E-07
			Thallium	NC	NA	NC	NA		NOAEL	2.5E-05	NA	6.3E-05	8.8E-05
			Nitrate	NC	NA	NC	NA		Hematological system	4.3E-07	NA	--	4.3E-07
			Nitrite-N	NC	NA	NC	NA		Hematological system	7.7E-07	NA	--	7.7E-07

TABLE 9.32.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Toxicity Equivalency (Dioxins/Furans) - Mam	7.0E-10	NA	0.0E+00	NA	7.0E-10		--	NA	--	
			CHEMICAL TOTAL	1.0E-09	--	7.3E-09	--	8E-09		4.8E-05	0.0E+00	1.1E-03	1E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						8E-09					1E-03
	EXPOSURE MEDIUM TOTAL							8E-09					1E-03
SURFACE WATER TOTAL								8E-09					1E-03
BIOTA	COMBINED FISH DIET	DYERVILLE POND	Acenaphthylene	NC	NA	NA	NA		Liver	1.6E-06	NA	NA	1.6E-06
			Dibenzo(a,h)anthracene	6.7E-09	NA	NA	NA	6.7E-09	Kidney	7.1E-07	NA	NA	7.1E-07
			Phenanthrene	NC	NA	NA	NA		Kidney	2.1E-05	NA	NA	2.1E-05
			4,4'-DDD	4.6E-08	NA	NA	NA	4.6E-08	Liver	8.9E-03	NA	NA	8.9E-03
			4,4'-DDE	2.0E-08	NA	NA	NA	2.0E-08	Liver	2.8E-03	NA	NA	2.8E-03
			4,4'-DDT	2.2E-08	NA	NA	NA	2.2E-08	Liver	3.0E-03	NA	NA	3.0E-03
			alpha-Chlordane	2.7E-08	NA	NA	NA	2.7E-08	Liver	3.6E-03	NA	NA	3.6E-03
			Aroclor-1254	4.0E-06	NA	NA	NA	4.0E-06	Immune system	2.3E+00	NA	NA	2.3E+00
			Dieldrin	7.3E-07	NA	NA	NA	7.3E-07	Liver	2.1E-02	NA	NA	2.1E-02
			gamma-Chlordane	1.1E-08	NA	NA	NA	1.1E-08	Liver	1.4E-03	NA	NA	1.4E-03
			Heptachlor Epoxide	8.8E-08	NA	NA	NA	8.8E-08	Liver	1.7E-02	NA	NA	1.7E-02
			Technical Chlordane	5.8E-07	NA	NA	NA	5.8E-07	Liver	7.8E-02	NA	NA	7.8E-02
			Cadmium	NC	NA	NA	NA		Kidney	2.0E-02	NA	NA	2.0E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Manganese	NC	NA	NA	NA		NOAEL	1.1E-02	NA	NA	1.1E-02
			Mercury	NC	NA	NA	NA		Immune system	4.3E-02	NA	NA	4.3E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	1.5E-01	NA	NA	1.5E-01
			Toxicity Equivalency (Dioxins/Furans) - Mam	4.2E-05	NA	NA	NA	4.2E-05		--	NA	NA	
			CHEMICAL TOTAL	4.8E-05	--	--	--	5E-05		2.7E+00	0.0E+00	--	2.7E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						5E-05					2.7E+00
	EXPOSURE MEDIUM TOTAL							5E-05					2.7E+00
COMBINED FISH DIET TOTAL								5E-05					2.7E+00
RECEPTOR TOTAL								5E-05					2.7E+00
							TOTAL RISK ACROSS ALL MEDIA	5E-05				TOTAL HAZARD ACROSS ALL MEDIA	2.7E+00

TABLE 9.32.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
													--
									TOTAL CARDIOVASCULAR SYSTEM HI =				1.0E-05
									TOTAL DEVELOPMENTAL TOXICITY HI =				1.5E-01
													--
													--
													--
									TOTAL HEMATOLOGICAL SYSTEM HI =				1.2E-06
									TOTAL IMMUNE SYSTEM HI =				2.4E+00
									TOTAL KIDNEY HI =				2.0E-02
									TOTAL LIVER HI =				1.4E-01
													--
									TOTAL NERVOUS SYSTEM HI =				4.2E-06
									TOTAL NOAEL HI =				1.2E-02
													--
									TOTAL SKIN HI =				1.2E-04
													--

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: MJM

TABLE 9.34.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	DYERVILLE POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	3.9E-08	NA	5.0E-09	4 4E-08
			Acenaphthylene	NC	NA	NC	NA		Liver	6.8E-08	NA	8 6E-09	7.6E-08
			Benzo(a)anthracene	1.5E-09	NA	1.9E-10	NA	1.7E-09	Kidney	1.2E-06	NA	1 5E-07	1.3E-06
			Benzo(a)pyrene	1.5E-08	NA	1 9E-09	NA	1.7E-08	Kidney	1.2E-06	NA	1.5E-07	1.3E-06
			Benzo(b)fluoranthene	2 7E-09	NA	3.4E-10	NA	3 0E-09	Kidney	2.1E-06	NA	2.7E-07	2 4E-06
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	9.3E-07	NA	1.2E-07	1 1E-06
			Benzo(k)fluoranthene	7.5E-11	NA	9.5E-12	NA	8.5E-11	Kidney	6.0E-07	NA	7.6E-08	6.8E-07
			bis(2-Ethylhexyl)phthalate	2.2E-11	NA	2.2E-12	NA	2.5E-11	Liver	1.4E-06	NA	1.4E-07	1.5E-06
			Dibenzo(a,h)anthracene	2.1E-09	NA	2.7E-10	NA	2.4E-09	Kidney	1.7E-07	NA	2.1E-08	1 9E-07
			Indeno(1,2,3-cd)pyrene	1.5E-09	NA	1.9E-10	NA	1 7E-09	Kidney	1.2E-06	NA	1 5E-07	1.3E-06
			Phenanthrene	NC	NA	NC	NA		Kidney	1 2E-06	NA	1.5E-07	1.3E-06
			alpha-Chlordane	2.2E-12	NA	8.5E-14	NA	2.3E-12	Liver	2.2E-07	NA	8.5E-09	2 3E-07
			Aroclor-1254	1.4E-09	NA	1 9E-10	NA	1.6E-09	Immune system	6.2E-04	NA	8.5E-05	7 1E-04
			Dieldrin	2 8E-10	NA	2.7E-11	NA	3.1E-10	Liver	6.1E-06	NA	5.9E-07	6.7E-06
			Endosulfan sulfate	NC	NA	NC	NA		Kidney	2.2E-08	NA	2.1E-09	2.4E-08
			Arsenic	4.6E-09	NA	1.3E-10	NA	4 7E-09	Skin	1.8E-04	NA	5 2E-06	1.8E-04
			Cadmium	NC	NA	NC	NA		Kidney	4.3E-05	NA	1 7E-06	4 5E-05
			Chromium	NC	NA	NC	NA		NOAEL	1.3E-03	NA		1 3E-03
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	1.2E-04	NA		1.2E-04
			Mercury	NC	NA	NC	NA		Immune system	3.4E-05	NA		3.4E-05
			Nickel	NC	NA	NC	NA		Developmental toxicity	2.4E-05	NA		2 4E-05
			Vanadium	NC	NA	NC	NA		NOAEL	5.8E-05	NA		5.8E-05
			Toxicity Equivalency (Dioxins/Furans) - Mam	2.4E-08	NA	7.0E-10	NA	2.5E-08		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	5.5E-12	NA	1.6E-13	NA	5.7E-12		--	NA	--	
			CHEMICAL TOTAL	5 3E-08	--	3.9E-09	--	6E-08		2.4E-03	0.0E+00	9.4E-05	3E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						6E-08					3E-03
	EXPOSURE MEDIUM TOTAL							6E-08					3E-03
SEDIMENT TOTAL								6E-08					3E-03
SURFACE WATER	SURFACE WATER	DYERVILLE POND	Acenaphthylene	NC	NA	NC	NA		Liver	5.6E-10	NA	--	5 6E-10
			bis(2-Ethylhexyl)phthalate	3 5E-10	NA	3.8E-08	NA	3.9E-08	Liver	2.2E-05	NA	2.4E-03	2.4E-03
			Aldrin	5 7E-10	NA	3.6E-09	NA	4 2E-09	Liver	2.0E-05	NA	1.3E-04	1.4E-04
			alpha-Chlordane	9.7E-12	NA	1.4E-09	NA	1 5E-09	Liver	9.7E-07	NA	1 4E-04	1.5E-04
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	1.4E-08	NA	--	1.4E-08
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	4.2E-07	NA	2.1E-05	2 2E-05
			gamma-Chlordane	1.1E-11	NA	1.6E-09	NA	1.6E-09	Liver	1.1E-06	NA	1.6E-04	1 6E-04
			Arsenic	1 0E-08	NA	4 6E-09	NA	1.5E-08	Skin	3 9E-04	NA	1 8E-04	5 7E-04
			Barium	NC	NA	NC	NA		Cardiovascular system	7 6E-06	NA	5.0E-05	5 7E-05
			Chromium	NC	NA	NC	NA		NOAEL	2.0E-05	NA	7.1E-04	7 3E-04
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	1 4E-04	NA	1 6E-03	1 7E-03
			Mercury	NC	NA	NC	NA		Immune system	3.3E-07	NA	2.2E-06	2 5E-06
			Thallium	NC	NA	NC	NA		NOAEL	7.0E-04	NA	3.2E-04	1.0E-03
			Nitrate	NC	NA	NC	NA		Hematological system	1.2E-05	NA	--	1.2E-05
			Nitrite-N	NC	NA	NC	NA		Hematological system	2.1E-05	NA	--	2 1E-05

TABLE 9.34.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Toxicity Equivalency (Dioxins/Furans) - Mam	2.6E-08	NA	0.0E+00	NA	2.6E-08		--	NA	--	
			CHEMICAL TOTAL	3.7E-08	--	5.0E-08	--	9E-08		1.3E-03	0.0E+00	5.7E-03	7E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						9E-08					7E-03
	EXPOSURE MEDIUM TOTAL							9E-08					7E-03
SURFACE WATER TOTAL								9E-08					7E-03
BIOTA	COMBINED FISH DIET	DYERVILLE POND	Acenaphthylene	NC	NA	NA	NA		Liver	1.5E-06	NA	NA	1.5E-06
			Dibenzo(a,h)anthracene	8.6E-09	NA	NA	NA	8.6E-09	Kidney	6.9E-07	NA	NA	6.9E-07
			Phenanthrene	NC	NA	NA	NA		Kidney	2.0E-05	NA	NA	2.0E-05
			4,4'-DDD	5.9E-08	NA	NA	NA	5.9E-08	Liver	8.6E-03	NA	NA	8.6E-03
			4,4'-DDE	2.6E-08	NA	NA	NA	2.6E-08	Liver	2.7E-03	NA	NA	2.7E-03
			4,4'-DDT	2.8E-08	NA	NA	NA	2.8E-08	Liver	2.9E-03	NA	NA	2.9E-03
			alpha-Chlordane	3.5E-08	NA	NA	NA	3.5E-08	Liver	3.5E-03	NA	NA	3.5E-03
			Aroclor-1254	5.2E-06	NA	NA	NA	5.2E-06	Immune system	2.3E+00	NA	NA	2.3E+00
			Dieldrin	9.5E-07	NA	NA	NA	9.5E-07	Liver	2.1E-02	NA	NA	2.1E-02
			gamma-Chlordane	1.4E-08	NA	NA	NA	1.4E-08	Liver	1.4E-03	NA	NA	1.4E-03
			Heptachlor Epoxide	1.1E-07	NA	NA	NA	1.1E-07	Liver	1.7E-02	NA	NA	1.7E-02
			Technical Chlordane	7.6E-07	NA	NA	NA	7.6E-07	Liver	7.6E-02	NA	NA	7.6E-02
			Cadmium	NC	NA	NA	NA		Kidney	1.9E-02	NA	NA	1.9E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Manganese	NC	NA	NA	NA		NOAEL	1.1E-02	NA	NA	1.1E-02
			Mercury	NC	NA	NA	NA		Immune system	4.1E-02	NA	NA	4.1E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	1.4E-01	NA	NA	1.4E-01
			Toxicity Equivalency (Dioxins/Furans) - Mam	5.5E-05	NA	NA	NA	5.5E-05		--	NA	NA	
			CHEMICAL TOTAL	6.2E-05	--	--	--	6E-05		2.6E+00	0.0E+00	--	2.6E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						6E-05					2.6E+00
	EXPOSURE MEDIUM TOTAL							6E-05					2.6E+00
COMBINED FISH DIET TOTAL								6E-05					2.6E+00
RECEPTOR TOTAL								6E-05					2.6E+00
							TOTAL RISK ACROSS ALL MEDIA	6E-05	TOTAL HAZARD ACROSS ALL MEDIA				2.6E+00

TABLE 9.34.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
													--
									TOTAL CARDIOVASCULAR SYSTEM HI =				5.8E-05
									TOTAL DEVELOPMENTAL TOXICITY HI =				1.4E-01
													--
													--
													--
									TOTAL HEMATOLOGICAL SYSTEM HI =				3.3E-05
									TOTAL IMMUNE SYSTEM HI =				2.3E+00
									TOTAL KIDNEY HI =				1.9E-02
									TOTAL LIVER HI =				1.4E-01
													--
									TOTAL NERVOUS SYSTEM HI =				2.2E-05
									TOTAL NOAEL HI =				1.6E-02
													--
									TOTAL SKIN HI =				7.5E-04
													--

NOTES:
NC - Not carcinogenic by this exposure route
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available

Prepared by: KJA
Checked by: MJM

TABLE 9.35.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	DYERVILLE POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	6 1E-08	NA	2.3E-08	8 4E-08
			Acenaphthylene	NC	NA	NC	NA		Liver	1 1E-07	NA	3.9E-08	1 4E-07
			Benzo(a)anthracene	1.7E-09	NA	6.4E-10	NA	2 4E-09	Kidney	1 8E-06	NA	6.9E-07	2.5E-06
			Benzo(a)pyrene	1 7E-08	NA	6.4E-09	NA	2 4E-08	Kidney	1.8E-06	NA	6.9E-07	2 5E-06
			Benzo(b)fluoranthene	3 1E-09	NA	1 2E-09	NA	4 2E-09	Kidney	3.3E-06	NA	1 2E-06	4.5E-06
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	1.5E-06	NA	5.4E-07	2.0E-06
			Benzo(k)fluoranthene	8 8E-11	NA	3 3E-11	NA	1 2E-10	Kidney	9.4E-07	NA	3.5E-07	1 3E-06
			bis(2-Ethylhexyl)phthalate	2 6E-11	NA	7 5E-12	NA	3.4E-11	Liver	2.2E-06	NA	6.2E-07	2.8E-06
			Dibenzo(a,h)anthracene	2 5E-09	NA	9 2E-10	NA	3 4E-09	Kidney	2.6E-07	NA	9.8E-08	3 6E-07
			Indeno(1,2,3-cd)pyrene	1 7E-09	NA	6 4E-10	NA	2.4E-09	Kidney	1.8E-06	NA	6.9E-07	2.5E-06
			Phenanthrene	NC	NA	NC	NA		Kidney	1.8E-06	NA	6.9E-07	2.5E-06
			alpha-Chlordane	2.6E-12	NA	2.9E-13	NA	2 8E-12	Liver	3.4E-07	NA	3.9E-08	3.8E-07
			Aroclor-1254	1.7E-09	NA	6.7E-10	NA	2.3E-09	Immune system	9.7E-04	NA	3 9E-04	1.4E-03
			Dieldrin	3.3E-10	NA	9.3E-11	NA	4.2E-10	Liver	9.5E-06	NA	2.7E-06	1.2E-05
			Endosulfan sulfate	NC	NA	NC	NA		Kidney	3.4E-08	NA	9.8E-09	4.4E-08
			Arsenic	5.3E-09	NA	4.6E-10	NA	5.8E-09	Skin	2.8E-04	NA	2.4E-05	3.0E-04
			Cadmium	NC	NA	NC	NA		Kidney	6.7E-05	NA	7 7E-06	7.5E-05
			Chromium	NC	NA	NC	NA		NOAEL	2.1E-03	NA		2.1E-03
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	1.9E-04	NA		1 9E-04
			Mercury	NC	NA	NC	NA		Immune system	5.3E-05	NA		5 3E-05
			Nickel	NC	NA	NC	NA		Developmental toxicity	3.8E-05	NA		3.8E-05
			Vanadium	NC	NA	NC	NA		NOAEL	9.0E-05	NA		9 0E-05
			Toxicity Equivalency (Dioxins/Furans) - Mam	2.8E-08	NA	2.4E-09	NA	3.0E-08		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	6.4E-12	NA	5.5E-13	NA	7.0E-12		--	NA	--	
			CHEMICAL TOTAL	6.2E-08	--	1.3E-08	--	8E-08		3.8E-03	0.0E+00	4.3E-04	4E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						8E-08					4E-03
	EXPOSURE MEDIUM TOTAL							8E-08					4E-03
SEDIMENT TOTAL								8E-08					4E-03
SURFACE WATER	SURFACE WATER	DYERVILLE POND	Acenaphthylene	NC	NA	NC	NA		Liver	8.7E-10	NA	--	8.7E-10
			bis(2-Ethylhexyl)phthalate	4.0E-10	NA	3.5E-08	NA	3.5E-08	Liver	3.4E-05	NA	2 9E-03	2.9E-03
			Aldrin	6.6E-10	NA	3.3E-09	NA	4.0E-09	Liver	3.0E-05	NA	1 5E-04	1.8E-04
			alpha-Chlordane	1.1E-11	NA	1 3E-09	NA	1.3E-09	Liver	1.5E-06	NA	1 7E-04	1 8E-04
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	2.1E-08	NA	--	2 1E-08
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	6.6E-07	NA	2 6E-05	2 7E-05
			gamma-Chlordane	1.2E-11	NA	1.4E-09	NA	1.5E-09	Liver	1.7E-06	NA	1 9E-04	1.9E-04
			Arsenic	1.2E-08	NA	4.2E-09	NA	1.6E-08	Skin	6.1E-04	NA	2 2E-04	8.2E-04
			Barium	NC	NA	NC	NA		Cardiovascular system	1.2E-05	NA	6.0E-05	7.2E-05
			Chromium	NC	NA	NC	NA		NOAEL	3.0E-05	NA	8 6E-04	8 9E-04
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	2.1E-04	NA	1 9E-03	2.1E-03
			Mercury	NC	NA	NC	NA		Immune system	5.2E-07	NA	2 6E-06	3.2E-06
			Thallium	NC	NA	NC	NA		NOAEL	1.1E-03	NA	3.9E-04	1 5E-03
			Nitrate	NC	NA	NC	NA		Hematological system	1.9E-05	NA	--	1.9E-05
			Nitrite-N	NC	NA	NC	NA		Hematological system	3.3E-05	NA	--	3 3E-05

TABLE 9.35.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.1E-08	NA	0.0E+00	NA	3.1E-08		--	NA	--	
			CHEMICAL TOTAL	4.3E-08	--	4 5E-08	--	9E-08		2.1E-03	0.0E+00	6.9E-03	9E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						9E-08					9E-03
	EXPOSURE MEDIUM TOTAL							9E-08					9E-03
SURFACE WATER TOTAL								9E-08					9E-03
BIOTA	COMBINED FISH DIET	DYERVILLE POND	Acenaphthylene	NC	NA	NA	NA		Liver	1.6E-06	NA	NA	1.6E-06
			Dibenzo(a,h)anthracene	6.7E-09	NA	NA	NA	6.7E-09	Kidney	7.1E-07	NA	NA	7.1E-07
			Phenanthrene	NC	NA	NA	NA		Kidney	2.1E-05	NA	NA	2 1E-05
			4,4'-DDD	4.6E-08	NA	NA	NA	4.6E-08	Liver	8.9E-03	NA	NA	8.9E-03
			4,4'-DDE	2.0E-08	NA	NA	NA	2.0E-08	Liver	2.8E-03	NA	NA	2.8E-03
			4,4'-DDT	2.2E-08	NA	NA	NA	2.2E-08	Liver	3.0E-03	NA	NA	3.0E-03
			alpha-Chlordane	2 7E-08	NA	NA	NA	2.7E-08	Liver	3.6E-03	NA	NA	3.6E-03
			Aroclor-1254	4.0E-06	NA	NA	NA	4 0E-06	Immune system	2.3E+00	NA	NA	2.3E+00
			Dieldrin	7.3E-07	NA	NA	NA	7.3E-07	Liver	2.1E-02	NA	NA	2.1E-02
			gamma-Chlordane	1 1E-08	NA	NA	NA	1.1E-08	Liver	1.4E-03	NA	NA	1.4E-03
			Heptachlor Epoxide	8 8E-08	NA	NA	NA	8.8E-08	Liver	1.7E-02	NA	NA	1 7E-02
			Technical Chlordane	5.8E-07	NA	NA	NA	5.8E-07	Liver	7.8E-02	NA	NA	7 8E-02
			Cadmium	NC	NA	NA	NA		Kidney	2.0E-02	NA	NA	2.0E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Manganese	NC	NA	NA	NA		NOAEL	1.1E-02	NA	NA	1.1E-02
			Mercury	NC	NA	NA	NA		Immune system	4.3E-02	NA	NA	4.3E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	1.5E-01	NA	NA	1.5E-01
			Toxicity Equivalency (Dioxins/Furans) - Mam	4.2E-05	NA	NA	NA	4.2E-05		--	NA	NA	
			CHEMICAL TOTAL	4.8E-05	--	--	--	5E-05		2 7E+00	0.0E+00	--	2.7E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						5E-05					2 7E+00
	EXPOSURE MEDIUM TOTAL							5E-05					2.7E+00
COMBINED FISH DIET TOTAL								5E-05					2.7E+00

TABLE 9.35.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
RECEPTOR TOTAL								5E-05					2.7E+00
							TOTAL RISK ACROSS ALL MEDIA	5E-05				TOTAL HAZARD ACROSS ALL MEDIA	2.7E+00

NOTES.
NC - Not carcinogenic by this exposure route
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

	--
TOTAL CARDIOVASCULAR SYSTEM HI =	7.2E-05
TOTAL DEVELOPMENTAL TOXICITY HI =	1.5E-01
	--
	--
	--
TOTAL HEMATOLOGICAL SYSTEM HI =	5.2E-05
TOTAL IMMUNE SYSTEM HI =	2.4E+00
TOTAL KIDNEY HI =	2.0E-02
TOTAL LIVER HI =	1.4E-01
	--
TOTAL NERVOUS SYSTEM HI =	2.7E-05
TOTAL NOAEL HI =	1.8E-02
	--
TOTAL SKIN HI =	1.1E-03
	--

Prepared by: KJA
Checked by: MJM

TABLE 9.36.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	DYERVILLE POND	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	7.4E-07	NA	1.1E-07	8.4E-07
			Acenaphthylene	NC	NA	NC	NA		Liver	1 3E-06	NA	1.8E-07	1.5E-06
			Benzo(a)anthracene	1.4E-08	NA	2.0E-09	NA	1.6E-08	Kidney	2.2E-05	NA	3.2E-06	2.5E-05
			Benzo(a)pyrene	1.4E-07	NA	2.0E-08	NA	1.6E-07	Kidney	2.2E-05	NA	3.2E-06	2.5E-05
			Benzo(b)fluoranthene	2.5E-08	NA	3.6E-09	NA	2.8E-08	Kidney	4.0E-05	NA	5.8E-06	4 5E-05
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	1.7E-05	NA	2.5E-06	2.0E-05
			Benzo(k)fluoranthene	7 0E-10	NA	1 0E-10	NA	8.1E-10	Kidney	1.1E-05	NA	1.6E-06	1 3E-05
			bis(2-Ethylhexyl)phthalate	2.1E-10	NA	2.3E-11	NA	2.3E-10	Liver	2.6E-05	NA	2.9E-06	2.9E-05
			Dibenzo(a,h)anthracene	2.0E-08	NA	2.9E-09	NA	2.3E-08	Kidney	3.2E-06	NA	4 6E-07	3.6E-06
			Indeno(1,2,3-cd)pyrene	1.4E-08	NA	2.0E-09	NA	1 6E-08	Kidney	2.2E-05	NA	3 2E-06	2.5E-05
			Phenanthrene	NC	NA	NC	NA		Kidney	2.2E-05	NA	3.2E-06	2.5E-05
			alpha-Chlordane	2.0E-11	NA	9.1E-13	NA	2.1E-11	Liver	4.1E-06	NA	1.8E-07	4.3E-06
			Aroclor-1254	1.3E-08	NA	2.1E-09	NA	1.5E-08	Immune system	1.2E-02	NA	1.8E-03	1.3E-02
			Dieldrin	2.6E-09	NA	2.9E-10	NA	2.9E-09	Liver	1.1E-04	NA	1.3E-05	1 3E-04
			Endosulfan sulfate	NC	NA	NC	NA		Kidney	4.1E-07	NA	4.6E-08	4.6E-07
			Arsenic	4 3E-08	NA	1.4E-09	NA	4.4E-08	Skin	3.3E-03	NA	1.1E-04	3.4E-03
			Cadmium	NC	NA	NC	NA		Kidney	8.1E-04	NA	3.6E-05	8 4E-04
			Chromium	NC	NA	NC	NA		NOAEL	2.5E-02	NA		2 5E-02
			Lead	--	NA	--	NA			--	NA		
			Manganese	NC	NA	NC	NA		NOAEL	2.2E-03	NA		2.2E-03
			Mercury	NC	NA	NC	NA		Immune system	6.3E-04	NA		6.3E-04
			Nickel	NC	NA	NC	NA		Developmental toxicity	4.5E-04	NA		4 5E-04
			Vanadium	NC	NA	NC	NA		NOAEL	1.1E-03	NA		1.1E-03
			Toxicity Equivalency (Dioxins/Furans) - Mam	2.2E-07	NA	7.5E-09	NA	2.3E-07		--	NA	--	
			Toxicity Equivalency (PCB Congeners) - Mam	5 1E-11	NA	1 7E-12	NA	5.3E-11		--	NA	--	
			CHEMICAL TOTAL	4 9E-07	--	4 2E-08	--	5E-07		4.5E-02	0.0E+00	2.0E-03	5E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						5E-07					5E-02
	EXPOSURE MEDIUM TOTAL							5E-07					5E-02
SEDIMENT TOTAL								5E-07					5E-02
SURFACE WATER	SURFACE WATER	DYERVILLE POND	Acenaphthylene	NC	NA	NC	NA		Liver	2.6E-09	NA	--	2.6E-09
			bis(2-Ethylhexyl)phthalate	8.1E-10	NA	2 1E-08	NA	2 2E-08	Liver	1 0E-04	NA	2 6E-03	2.7E-03
			Aldrin	1.3E-09	NA	2.0E-09	NA	3 3E-09	Liver	9.1E-05	NA	1.4E-04	2 3E-04
			alpha-Chlordane	2.3E-11	NA	7.9E-10	NA	8.1E-10	Liver	4.5E-06	NA	1.6E-04	1.6E-04
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	6.3E-08	NA	--	6.3E-08
			Endrin Aldehyde	NC	NA	NC	NA		Nervous system	2.0E-06	NA	2.3E-05	2.5E-05
			gamma-Chlordane	2.5E-11	NA	8.7E-10	NA	9.0E-10	Liver	5.0E-06	NA	1.7E-04	1.8E-04
			Arsenic	2.3E-08	NA	2.5E-09	NA	2.6E-08	Skin	1.8E-03	NA	2.0E-04	2.0E-03
			Barium	NC	NA	NC	NA		Cardiovascular system	3.6E-05	NA	5 5E-05	9.0E-05
			Chromium	NC	NA	NC	NA		NOAEL	9.1E-05	NA	7 8E-04	8 7E-04
			Lead	--	NA	--	NA			--	NA	--	
			Manganese	NC	NA	NC	NA		NOAEL	6.4E-04	NA	1 7E-03	2.4E-03
			Mercury	NC	NA	NC	NA		Immune system	1.6E-06	NA	2 4E-06	3 9E-06
			Thallium	NC	NA	NC	NA		NOAEL	3.3E-03	NA	3.5E-04	3.6E-03
			Nitrate	NC	NA	NC	NA		Hematological system	5.6E-05	NA	--	5.6E-05
			Nitrite-N	NC	NA	NC	NA		Hematological system	1.0E-04	NA	--	1.0E-04

TABLE 9.36.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
			Toxicity Equivalency (Dioxins/Furans) - Mam	6.1E-08	NA	0 0E+00	NA	6.1E-08		--	NA	--	
			CHEMICAL TOTAL	8.7E-08	--	2.7E-08	--	1E-07		6 2E-03	0.0E+00	6 2E-03	1E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-07					1E-02
	EXPOSURE MEDIUM TOTAL							1E-07					1E-02
SURFACE WATER TOTAL								1E-07					1E-02
BIOTA	COMBINED FISH DIET	DYERVILLE POND	Acenaphthylene	NC	NA	NA	NA		Liver	2.4E-06	NA	NA	2.4E-06
			Dibenzo(a,h)anthracene	6 8E-09	NA	NA	NA	6 8E-09	Kidney	1.1E-06	NA	NA	1.1E-06
			Phenanthrene	NC	NA	NA	NA		Kidney	3.1E-05	NA	NA	3.1E-05
			4,4'-DDD	4 7E-08	NA	NA	NA	4.7E-08	Liver	1.4E-02	NA	NA	1.4E-02
			4,4'-DDE	2 0E-08	NA	NA	NA	2 0E-08	Liver	4.2E-03	NA	NA	4.2E-03
			4,4'-DDT	2 2E-08	NA	NA	NA	2.2E-08	Liver	4.6E-03	NA	NA	4 6E-03
			alpha-Chlordane	2 8E-08	NA	NA	NA	2.8E-08	Liver	5.5E-03	NA	NA	5 5E-03
			Aroclor-1254	4.1E-06	NA	NA	NA	4.1E-06	Immune system	3.6E+00	NA	NA	3 6E+00
			Dieldrin	7.5E-07	NA	NA	NA	7.5E-07	Liver	3.3E-02	NA	NA	3.3E-02
			gamma-Chlordane	1.1E-08	NA	NA	NA	1.1E-08	Liver	2.2E-03	NA	NA	2 2E-03
			Heptachlor Epoxide	9 0E-08	NA	NA	NA	9.0E-08	Liver	2.7E-02	NA	NA	2.7E-02
			Technical Chlordane	5.9E-07	NA	NA	NA	5.9E-07	Liver	1.2E-01	NA	NA	1 2E-01
			Cadmium	NC	NA	NA	NA		Kidney	3.0E-02	NA	NA	3.0E-02
			Lead	--	NA	NA	NA			--	NA	NA	
			Manganese	NC	NA	NA	NA		NOAEL	1.7E-02	NA	NA	1 7E-02
			Mercury	NC	NA	NA	NA		Immune system	6.5E-02	NA	NA	6 5E-02
			Mercury (methyl)	NC	NA	NA	NA		Developmental toxicity	2.2E-01	NA	NA	2 2E-01
			Toxicity Equivalency (Dioxins/Furans) - Mam	4.3E-05	NA	NA	NA	4.3E-05		--	NA	NA	
			CHEMICAL TOTAL	4.9E-05	--	--	--	5E-05		4 1E+00	0.0E+00	--	4.1E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						5E-05					4.1E+00
	EXPOSURE MEDIUM TOTAL							5E-05					4.1E+00
COMBINED FISH DIET TOTAL								5E-05					4.1E+00
RECEPTOR TOTAL								5E-05					4.2E+00
							TOTAL RISK ACROSS ALL MEDIA	5E-05	TOTAL HAZARD ACROSS ALL MEDIA				4.2E+00

TABLE 9.36.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
													--
									TOTAL CARDIOVASCULAR SYSTEM HI =				9.1E-05
									TOTAL DEVELOPMENTAL TOXICITY HI =				2.2E-01
													--
													--
													--
									TOTAL HEMATOLOGICAL SYSTEM HI =				1.6E-04
									TOTAL IMMUNE SYSTEM HI =				3.6E+00
									TOTAL KIDNEY HI =				3.1E-02
									TOTAL LIVER HI =				2.1E-01
													--
									TOTAL NERVOUS SYSTEM HI =				2.5E-05
									TOTAL NOAEL HI =				5.2E-02
													--
									TOTAL SKIN HI =				5.5E-03
													--

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: MJM

TABLE 9.37.CT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- COMMERCIAL / INDUSTRIAL WORKER- ADULT - FOGARTY CENTER
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: COMMERCIAL / INDUSTRIAL WORKER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SOIL	SOIL	FOGARTY CENTER	2-Methylnaphthalene	NC	NA	NC	NA		Cardiovascular system	3.8E-06	NA	1.3E-06	5.1E-06
			Acenaphthylene	NC	NA	NC	NA		Liver	1.4E-07	NA	4.8E-08	1.9E-07
			Benzo(a)anthracene	3.5E-08	NA	1.2E-08	NA	4.7E-08	Kidney	1.2E-05	NA	4.2E-06	1.7E-05
			Benzo(a)pyrene	2.5E-07	NA	8.4E-08	NA	3.3E-07	Kidney	8.7E-06	NA	3.0E-06	1.2E-05
			Benzo(b)fluoranthene	2.5E-08	NA	8.6E-09	NA	3.4E-08	Kidney	8.9E-06	NA	3.1E-06	1.2E-05
			Benzo(g,h,i)perylene	NC	NA	NC	NA		Kidney	5.5E-06	NA	1.9E-06	7.4E-06
			Dibenzo(a,h)anthracene	3.4E-08	NA	1.2E-08	NA	4.5E-08	Kidney	1.2E-06	NA	4.1E-07	1.6E-06
			Indeno(1,2,3-cd)pyrene	1.7E-08	NA	6.0E-09	NA	2.3E-08	Kidney	6.2E-06	NA	2.1E-06	8.3E-06
			Phenanthrene	NC	NA	NC	NA		Kidney	4.1E-05	NA	1.4E-05	5.4E-05
			alpha-Chlordane	2.8E-10	NA	2.9E-11	NA	3.1E-10	Liver	1.2E-05	NA	1.3E-06	1.4E-05
			Aroclor-1254	1.8E-08	NA	6.6E-09	NA	2.4E-08	Immune system	3.4E-03	NA	1.3E-03	4.7E-03
			Endosulfan II	NC	NA	NC	NA		Kidney	2.9E-07	NA	7.7E-08	3.7E-07
			Endosulfan Sulfate	NC	NA	NC	NA		Kidney	9.6E-09	NA	2.5E-09	1.2E-08
			gamma-Chlordane	2.2E-10	NA	2.4E-11	NA	2.5E-10	Liver	1.0E-05	NA	1.1E-06	1.1E-05
			Technical Chlordane	4.5E-09	NA	4.7E-10	NA	4.9E-09	Liver	2.0E-04	NA	2.1E-05	2.2E-04
			Aluminum	NC	NA	NC	NA		Developmental toxicity	2.9E-03	NA	--	2.9E-03
			Arsenic	2.9E-07	NA	2.3E-08	NA	3.2E-07	Skin	5.1E-03	NA	4.0E-04	5.5E-03
			Manganese	NC	NA	NC	NA		NOAEL	9.2E-04	NA	--	9.2E-04
			Mercury	NC	NA	NC	NA		Immune system	1.0E-04	NA	--	1.0E-04
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.6E-08	NA	1.2E-09	NA	1.7E-08		--	NA	--	
			CHEMICAL TOTAL	6.9E-07	--	1.5E-07	--	8E-07		1.3E-02	0.0E+00	1.7E-03	1E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						8E-07					1E-02
	EXPOSURE MEDIUM TOTAL							8E-07					1E-02
SOIL TOTAL								8E-07					1E-02
RECEPTOR TOTAL								8E-07					1.5E-02
							TOTAL RISK ACROSS ALL MEDIA	8E-07	TOTAL HAZARD ACROSS ALL MEDIA				1.5E-02

NOTES:
NC - Not carcinogenic by this exposure route
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available

	–
TOTAL CARDIOVASCULAR SYSTEM HI =	5.1E-06
TOTAL DEVELOPMENTAL TOXICITY HI =	2.9E-03
	–
	–
	–
	–
TOTAL IMMUNE SYSTEM HI =	4.8E-03
TOTAL KIDNEY HI =	1.1E-04
TOTAL LIVER HI =	2.4E-04
	–
	–
TOTAL NOAEL HI =	9.2E-04
	–
TOTAL SKIN HI =	5.5E-03
	--

Prepared by: RAR
Checked by: KJA

TABLE 10.13.RME
RISK SUMMARY - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	ALLENDALE POND	Toxicity Equivalency (Dioxins/Furans) - Mam	3.7E-06	NA	--	NA	3.7E-06					
			CHEMICAL TOTAL	3.7E-06	--	--	--	4E-06		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-06					0E+00
	EXPOSURE MEDIUM TOTAL							4E-06					0E+00
SEDIMENT TOTAL								4E-06					0E+00
BIOTA	COMBINED FISH DIET	ALLENDALE POND	Aroclor-1254	1.2E-04	NA	NA	NA	1.2E-04	Immune system	1.8E+01	NA	NA	1.8E+01
			Aroclor-1268	1.8E-06	NA	NA	NA	1.8E-06	Immune system	--	NA	NA	
			Dieldrin	4.7E-06	NA	NA	NA	4.7E-06	Liver	--	NA	NA	
			Technical Chlordane	5.4E-06	NA	NA	NA	5.4E-06	Liver	--	NA	NA	
			Toxicity Equivalency (PCB Congeners) - Mam	1.6E-04	NA	NA	NA	1.6E-04					
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.5E-03	NA	NA	NA	1.5E-03					
			CHEMICAL TOTAL	1.8E-03	--	--	--	2E-03		1.8E+01	0.0E+00	--	1.8E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-03					1.8E+01
	EXPOSURE MEDIUM TOTAL							2E-03					1.8E+01
COMBINED FISH DIET TOTAL								2E-03					1.8E+01
RECEPTOR TOTAL								2E-03					1.8E+01
							TOTAL RISK ACROSS ALL MEDIA	2E-03				TOTAL HAZARD ACROSS ALL MEDIA	1.8E+01

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available

Prepared by: KJA
Checked by: MJM

TOTAL IMMUNE SYSTEM HI = 1.8E+01

TABLE 10.14.RME
RISK SUMMARY - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	ALLENDALE POND	Toxicity Equivalency (Dioxins/Furans) - Mam	5.8E-06	NA	2.5E-06	NA	8.3E-06					
			CHEMICAL TOTAL	5.8E-06	--	2.5E-06	--	8E-06		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						8E-06					0E+00
	EXPOSURE MEDIUM TOTAL							8E-06					0E+00
SEDIMENT TOTAL								8E-06					0E+00
BIOTA	COMBINED FISH DIET	ALLENDALE POND	Aroclor-1254	1.3E-04	NA	NA	NA	1.3E-04	Immune system	1.9E+01	NA	NA	1.9E+01
			Aroclor-1268	1.8E-06	NA	NA	NA	1.8E-06	Immune system	--	NA	NA	
			Dieldrin	4.8E-06	NA	NA	NA	4.8E-06	Liver	--	NA	NA	
			Technical Chlordane	5.6E-06	NA	NA	NA	5.6E-06	Liver	--	NA	NA	
			Toxicity Equivalency (PCB Congeners) - Mam	1.6E-04	NA	NA	NA	1.6E-04					
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.5E-03	NA	NA	NA	1.5E-03					
			CHEMICAL TOTAL	1.8E-03	--	--	--	2E-03		1.9E+01	0.0E+00	--	1.9E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-03					1.9E+01
	EXPOSURE MEDIUM TOTAL							2E-03					1.9E+01
COMBINED FISH DIET TOTAL								2E-03					1.9E+01
RECEPTOR TOTAL								2E-03					1.9E+01
							TOTAL RISK ACROSS ALL MEDIA	2E-03				TOTAL HAZARD ACROSS ALL MEDIA	1.9E+01

NOTES
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: MJM

TOTAL IMMUNE SYSTEM HI = 1.9E+01

TABLE 10.16.RME
RISK SUMMARY - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK (1)					NON-CARCINOGENIC HAZARD QUOTIENT (1)				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SOIL	SOIL	ALLENDALE POND	2,3,7,8-TCDD	2.1E-06	NA	--	NA	2.1E-06					
			CHEMICAL TOTAL	2.1E-06	--	--	--	2E-06		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-06					0E+00
	EXPOSURE MEDIUM TOTAL							2E-06					0E+00
SOIL TOTAL								2E-06					0E+00
SEDIMENT	SEDIMENT	ALLENDALE POND	Toxicity Equivalency (Dioxins/Furans) - Mam	2.2E-05	NA	2.3E-06	NA	2.5E-05					
			CHEMICAL TOTAL	2.2E-05	--	2.3E-06	--	2E-05		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-05					0E+00
	EXPOSURE MEDIUM TOTAL							2E-05					0E+00
SEDIMENT TOTAL								2E-05					0E+00
SURFACE WATER	SURFACE WATER	ALLENDALE POND	Toxicity Equivalency (Dioxins/Furans) - Mam	1.0E-06	NA	--	NA	1.0E-06					
			CHEMICAL TOTAL	1.0E-06	--	--	--	1E-06		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-06					0E+00
	EXPOSURE MEDIUM TOTAL							1E-06					0E+00
SURFACE WATER TOTAL								1E-06					0E+00
BIOTA	COMBINED FISH DIET	ALLENDALE POND	Aroclor-1254	1.2E-04	NA	NA	NA	1.2E-04	Immune system	1.8E+01	NA	NA	1.8E+01
			Aroclor-1268	1.8E-06	NA	NA	NA	1.8E-06	Immune system	--	NA	NA	
			Dieldrin	4.7E-06	NA	NA	NA	4.7E-06	Liver	--	NA	NA	
			Technical Chlordane	5.4E-06	NA	NA	NA	5.4E-06	Liver	--	NA	NA	
			Toxicity Equivalency (PCB Congeners) - Mam	1.6E-04	NA	NA	NA	1.6E-04					
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.5E-03	NA	NA	NA	1.5E-03					
			CHEMICAL TOTAL	1.8E-03	--	--	--	2E-03		1.8E+01	0.0E+00	--	1.8E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-03					1.8E+01
	EXPOSURE MEDIUM TOTAL							2E-03					1.8E+01
COMBINED FISH DIET TOTAL								2E-03					1.8E+01
RECEPTOR TOTAL								2E-03					1.8E+01

TABLE 10.16.RME
RISK SUMMARY - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK (1)					NON-CARCINOGENIC HAZARD QUOTIENT (1)				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
							TOTAL RISK ACROSS ALL MEDIA	2E-03				TOTAL HAZARD ACROSS ALL MEDIA	1.8E+01
													--
													--
													--
													--
													--
													--
													--
												TOTAL IMMUNE SYSTEM HI =	1.8E+01
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NOTES.
NC - Not carcinogenic by this exposure route
NA - Not applicable, exposure route not applicable for this chemical/exposure medium
-- - Not calculated, dose-response data and/or dermal absorption values are not available

Prepared by: KJA
Checked by MJM

TABLE 10.17.RME
RISK SUMMARY - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SOIL	SOIL	ALLENDALE POND	2,3,7,8-TCDD	3.3E-06	NA	--	NA	3.3E-06					
			CHEMICAL TOTAL	3.3E-06	--	--	--	3E-06		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-06					0E+00
	EXPOSURE MEDIUM TOTAL							3E-06					0E+00
SOIL TOTAL								3E-06					0E+00
SEDIMENT	SEDIMENT	ALLENDALE POND	Benzo(a)pyrene	1.2E-06	NA	1.1E-06	NA	2.3E-06	Kidney	--	NA	--	
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.5E-05	NA	7.5E-06	NA	4.2E-05					
			CHEMICAL TOTAL	3.6E-05	--	8.6E-06	--	4E-05		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-05					0E+00
	EXPOSURE MEDIUM TOTAL							4E-05					0E+00
SEDIMENT TOTAL								4E-05					0E+00
SURFACE WATER	SURFACE WATER	ALLENDALE POND	Toxicity Equivalency (Dioxins/Furans) - Mam	1.6E-06	NA	--	NA	1.6E-06					
			CHEMICAL TOTAL	1.6E-06	--	--	--	2E-06		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-06					0E+00
	EXPOSURE MEDIUM TOTAL							2E-06					0E+00
SURFACE WATER TOTAL								2E-06					0E+00
BIOTA	COMBINED FISH DIET	ALLENDALE POND	Aroclor-1254	1.3E-04	NA	NA	NA	1.3E-04	Immune system	1.9E+01	NA	NA	1.9E+01
			Aroclor-1268	1.8E-06	NA	NA	NA	1.8E-06	Immune system	--	NA	NA	
			Dieldrin	4.8E-06	NA	NA	NA	4.8E-06	Liver	--	NA	NA	
			Technical Chlordane	5.6E-06	NA	NA	NA	5.6E-06	Liver	--	NA	NA	
			Toxicity Equivalency (PCB Congeners) - Mam	1.6E-04	NA	NA	NA	1.6E-04					
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.5E-03	NA	NA	NA	1.5E-03					
			CHEMICAL TOTAL	1.8E-03	--	--	--	2E-03		1.9E+01	0.0E+00	--	1.9E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-03					1.9E+01
	EXPOSURE MEDIUM TOTAL							2E-03					1.9E+01
COMBINED FISH DIET TOTAL								2E-03					1.9E+01
RECEPTOR TOTAL								2E-03					1.9E+01

TABLE 10.17.RME
RISK SUMMARY - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
							TOTAL RISK ACROSS ALL MEDIA	2E-03				TOTAL HAZARD ACROSS ALL MEDIA	1.9E+01

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: MJM

TOTAL IMMUNE SYSTEM HI = 1.9E+01

TABLE 10.18.RME
RISK SUMMARY - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SOIL	SOIL	ALLENDALE POND	2,3,7,8-TCDD	9.9E-06	NA	8.3E-07	NA	1.1E-05		--	NA	--	
			CHEMICAL TOTAL	9.9E-06	--	8.3E-07	--	1E-05		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-05					0E+00
	EXPOSURE MEDIUM TOTAL							1E-05					0E+00
SOIL TOTAL								1E-05					0E+00
SEDIMENT	SEDIMENT	ALLENDALE POND	Benzo(a)pyrene	4.8E-06	NA	1.7E-06	NA	6.5E-06	Kidney	--	NA	--	
			Dibenzo(a,h)anthracene	2.4E-06	NA	--	NA	2.4E-06	Kidney	--	NA	--	
			Arsenic	1.4E-06	NA	--	NA	1.4E-06	Skin	--	NA	--	
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.4E-04	NA	1.2E-05	NA	1.5E-04					
			CHEMICAL TOTAL	1.5E-04	--	1.3E-05	--	2E-04		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-04					0E+00
	EXPOSURE MEDIUM TOTAL							2E-04					0E+00
SEDIMENT TOTAL								2E-04					0E+00
SURFACE WATER	SURFACE WATER	ALLENDALE POND	Toxicity Equivalency (Dioxins/Furans) - Mam	2.4E-06	NA	--	NA	2.4E-06					
			CHEMICAL TOTAL	2.4E-06	--	--	--	2E-06		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-06					0E+00
	EXPOSURE MEDIUM TOTAL							2E-06					0E+00
SURFACE WATER TOTAL								2E-06					0E+00
BIOTA	COMBINED FISH DIET	ALLENDALE POND	Aroclor-1254	9.7E-05	NA	NA	NA	9.7E-05	Immune system	2.8E+01	NA	NA	2.8E+01
			Aroclor-1268	1.4E-06	NA	NA	NA	1.4E-06	Immune system	--	NA	NA	
			Dieldrin	3.7E-06	NA	NA	NA	3.7E-06	Liver	--	NA	NA	
			Technical Chlordane	4.2E-06	NA	NA	NA	4.2E-06	Liver	--	NA	NA	
			Toxicity Equivalency (PCB Congeners) - Mam	1.2E-04	NA	NA	NA	1.2E-04					
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.2E-03	NA	NA	NA	1.2E-03					
			CHEMICAL TOTAL	1.4E-03	--	--	--	1E-03		2.8E+01	0.0E+00	--	2.8E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-03					2.8E+01
	EXPOSURE MEDIUM TOTAL							1E-03					2.8E+01
COMBINED FISH DIET TOTAL								1E-03					2.8E+01
RECEPTOR TOTAL								2E-03					2.8E+01

TABLE 10.18.RME
RISK SUMMARY - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
							TOTAL RISK ACROSS ALL MEDIA	2E-03				TOTAL HAZARD ACROSS ALL MEDIA	2.8E+01
													--
													--
													--
													--
													--
													--
													--
												TOTAL IMMUNE SYSTEM HI =	2.8E+01
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NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: MJM

TABLE 10.19.RME

BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	LYMAN MILL POND	Toxicity Equivalency (Dioxins/Furans) - Mam	5.3E-06	NA	1.1E-06	NA	6.3E-06					
			CHEMICAL TOTAL	5.3E-06	--	1.1E-06	--	6E-06		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						6E-06					0E+00
	EXPOSURE MEDIUM TOTAL							6E-06					0E+00
SEDIMENT TOTAL								6E-06					0E+00
BIOTA	COMBINED FISH DIET	LYMAN MILL POND	Benzo(a)pyrene	1.3E-06	NA	NA	NA	1.3E-06	Kidney	--	NA	NA	
			Aroclor-1254	1.4E-04	NA	NA	NA	1.4E-04	Immune system	2.0E+01	NA	NA	2.0E+01
			Aroclor-1268	1.4E-06	NA	NA	NA	1.4E-06	Immune system	--	NA	NA	
			Dieldrin	3.0E-06	NA	NA	NA	3.0E-06	Liver	--	NA	NA	
			Technical Chlordane	1.2E-05	NA	NA	NA	1.2E-05	Liver	--	NA	NA	
			Arsenic	1.2E-06	NA	NA	NA	1.2E-06	Skin	--	NA	NA	
			Toxicity Equivalency (PCB Congeners) - Mam	2.0E-04	NA	NA	NA	2.0E-04					
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.8E-03	NA	NA	NA	1.8E-03					
			CHEMICAL TOTAL	2.2E-03	--	--	--	2E-03		2.0E+01	0.0E+00	--	2.0E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-03					2.0E+01
	EXPOSURE MEDIUM TOTAL							2E-03					2.0E+01
COMBINED FISH DIET TOTAL								2E-03					2.0E+01
RECEPTOR TOTAL								2E-03					2.0E+01
				TOTAL RISK ACROSS ALL MEDIA				2E-03	TOTAL HAZARD ACROSS ALL MEDIA				2.0E+01

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: MJM

TOTAL IMMUNE SYSTEM HI = 2.0E+01

TABLE 10.20.RME
RISK SUMMARY - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	LYMAN MILL POND	Toxicity Equivalency (Dioxins/Furans) - Mam	8.2E-06	NA	3.5E-06	NA	1.2E-05					
			CHEMICAL TOTAL	8.2E-06	--	3.5E-06	--	1E-05		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-05					0E+00
	EXPOSURE MEDIUM TOTAL							1E-05					0E+00
SEDIMENT TOTAL								1E-05					0E+00
BIOTA	COMBINED FISH DIET	LYMAN MILL POND	Benzo(a)pyrene	1.4E-06	NA	NA	NA	1.4E-06	Kidney	--	NA	NA	
			4,4'-DDE	1.0E-06	NA	NA	NA	1.0E-06	Liver	--	NA	NA	
			Aroclor-1254	1.4E-04	NA	NA	NA	1.4E-04	Immune system	2.1E+01	NA	NA	2.1E+01
			Aroclor-1268	1.5E-06	NA	NA	NA	1.5E-06	Immune system	--	NA	NA	
			Dieldrin	3.1E-06	NA	NA	NA	3.1E-06	Liver	--	NA	NA	
			Technical Chlordane	1.2E-05	NA	NA	NA	1.2E-05	Liver	--	NA	NA	
			Arsenic	1.2E-06	NA	NA	NA	1.2E-06	Skin	--	NA	NA	
			Toxicity Equivalency (PCB Congeners) - Mam	2.1E-04	NA	NA	NA	2.1E-04					
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.9E-03	NA	NA	NA	1.9E-03					
			CHEMICAL TOTAL	2.3E-03	--	--	--	2E-03		2.1E+01	0.0E+00	--	2.1E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-03					2.1E+01
	EXPOSURE MEDIUM TOTAL							2E-03					2.1E+01
COMBINED FISH DIET TOTAL								2E-03					2.1E+01
RECEPTOR TOTAL								2E-03					2.1E+01
				TOTAL RISK ACROSS ALL MEDIA				2E-03	TOTAL HAZARD ACROSS ALL MEDIA				2.1E+01

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: MJM

TOTAL IMMUNE SYSTEM HI = 2.1E+01

TABLE 10.22.RME
RISK SUMMARY - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	LYMAN MILL POND	Toxicity Equivalency (Dioxins/Furans) - Mam	3.2E-05	NA	3.2E-06	NA	3.5E-05					
			CHEMICAL TOTAL	3.2E-05	--	3.2E-06	--	3E-05		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-05					0E+00
	EXPOSURE MEDIUM TOTAL							3E-05					0E+00
SEDIMENT TOTAL								3E-05					0E+00
SURFACE WATER	WHOLE BODY	LYMAN MILL POND	Toxicity Equivalency (Dioxins/Furans) - Mam	2.3E-06	NA	--	NA	2.3E-06					
			CHEMICAL TOTAL	2.3E-06	--	--	--	2E-06		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-06					0E+00
	EXPOSURE MEDIUM TOTAL							2E-06					0E+00
SURFACE WATER TOTAL								2E-06					0E+00
BIOTA	COMBINED FISH DIET	LYMAN MILL POND	Benzo(a)pyrene	1.3E-06	NA	NA	NA	1.3E-06	Kidney	--	NA	NA	
			Aroclor-1254	1.4E-04	NA	NA	NA	1.4E-04	Immune system	2.0E+01	NA	NA	2.0E+01
			Aroclor-1268	1.4E-06	NA	NA	NA	1.4E-06	Immune system	--	NA	NA	
			Dieldrin	3.0E-06	NA	NA	NA	3.0E-06	Liver	--	NA	NA	
			Technical Chlordane	1.2E-05	NA	NA	NA	1.2E-05	Liver	--	NA	NA	
			Arsenic	1.2E-06	NA	NA	NA	1.2E-06	Skin	--	NA	NA	
			Toxicity Equivalency (PCB Congeners) - Mam	2.0E-04	NA	NA	NA	2.0E-04					
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.8E-03	NA	NA	NA	1.8E-03					
			CHEMICAL TOTAL	2.2E-03	--	--	--	2E-03		2.0E+01	0.0E+00	--	2.0E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-03					2.0E+01
	EXPOSURE MEDIUM TOTAL							2E-03					2.0E+01
COMBINED FISH DIET TOTAL								2E-03					2.0E+01
RECEPTOR TOTAL								2E-03					2.0E+01

TABLE 10.22.RME
RISK SUMMARY - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
TOTAL RISK ACROSS ALL MEDIA								2E-03	TOTAL HAZARD ACROSS ALL MEDIA				2.0E+01
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									TOTAL IMMUNE SYSTEM HI =				2.0E+01
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NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available

Prepared by: KJA
Checked by: MJM

TABLE 10.23.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	LYMAN MILL POND	Toxicity Equivalency (Dioxins/Furans) - Mam	4.9E-05	NA	1.1E-05	NA	6.0E-05					
			CHEMICAL TOTAL	4.9E-05	--	1.1E-05	--	6E-05		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						6E-05					0E+00
	EXPOSURE MEDIUM TOTAL							6E-05					0E+00
SEDIMENT TOTAL								6E-05					0E+00
SURFACE WATER	SURFACE WATER	LYMAN MILL POND	Toxicity Equivalency (Dioxins/Furans) - Mam	3.5E-06	NA	--	NA	3.5E-06					
			CHEMICAL TOTAL	3.5E-06	--	--	--	4E-06		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-06					0E+00
	EXPOSURE MEDIUM TOTAL							4E-06					0E+00
SURFACE WATER TOTAL								4E-06					0E+00
BIOTA	COMBINED FISH DIET	LYMAN MILL POND	Benzo(a)pyrene	1.4E-06	NA	NA	NA	1.4E-06	Kidney	--	NA	NA	
			4,4'-DDE	1.0E-06	NA	NA	NA	1.0E-06	Liver	--	NA	NA	
			Aroclor-1254	1.4E-04	NA	NA	NA	1.4E-04	Immune system	2.1E+01	NA	NA	2.1E+01
			Aroclor-1268	1.5E-06	NA	NA	NA	1.5E-06	Immune system	--	NA	NA	
			Dieldrin	3.1E-06	NA	NA	NA	3.1E-06	Liver	--	NA	NA	
			Technical Chlordane	1.2E-05	NA	NA	NA	1.2E-05	Liver	--	NA	NA	
			Arsenic	1.2E-06	NA	NA	NA	1.2E-06	Skin	--	NA	NA	
			Toxicity Equivalency (PCB Congeners) - Mam	2.1E-04	NA	NA	NA	2.1E-04					
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.9E-03	NA	NA	NA	1.9E-03					
			CHEMICAL TOTAL	2.3E-03	--	--	--	2E-03		2.1E+01	0.0E+00	--	2.1E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-03					2.1E+01
	EXPOSURE MEDIUM TOTAL							2E-03					2.1E+01
COMBINED FISH DIET TOTAL								2E-03					2.1E+01
RECEPTOR TOTAL								2E-03					2.1E+01

TABLE 10.23.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
TOTAL RISK ACROSS ALL MEDIA								2E-03	TOTAL HAZARD ACROSS ALL MEDIA				2.1E+01

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: MJM

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TOTAL IMMUNE SYSTEM HI =	2.1E+01
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TABLE 10.24.RME
RISK SUMMARY - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	LYMAN MILL POND	Benzo(a)pyrene	3 4E-06	NA	1.3E-06	NA	4.7E-06	Kidney	--	NA	--	
			Dibenzo(a,h)anthracene	1.3E-06	NA	--	NA	1.3E-06	Kidney	--	NA	--	
			N-Nitroso-di-n-propylamine	1.5E-06	NA	--	NA	1.5E-06					
			Arsenic	1.6E-06	NA	--	NA	1.6E-06	Skin	--	NA	--	
			Toxicity Equivalency (Dioxins/Furans) - Mam	2.0E-04	NA	1.6E-05	NA	2.1E-04					
			Toxicity Equivalency (PCB Congeners) - Mam	1.6E-06	NA	--	NA	1.6E-06					
			CHEMICAL TOTAL	2.1E-04	--	1.8E-05	--	2E-04		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-04					0E+00
	EXPOSURE MEDIUM TOTAL							2E-04					0E+00
SEDIMENT TOTAL								2E-04					0E+00
SURFACE WATER	SURFACE WATER	LYMAN MILL POND	Toxicity Equivalency (Dioxins/Furans) - Mam	5.3E-06	NA	--	NA	5.3E-06					
			CHEMICAL TOTAL	5.3E-06	--	--	--	5E-06		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						5E-06					0E+00
	EXPOSURE MEDIUM TOTAL							5E-06					0E+00
SURFACE WATER TOTAL								5E-06					0E+00
BIOTA	COMBINED FISH DIET	LYMAN MILL POND	Benzo(a)pyrene	1.0E-06	NA	NA	NA	1.0E-06	Kidney	--	NA	NA	
			Aroclor-1254	1.1E-04	NA	NA	NA	1.1E-04	Immune system	3.2E+01	NA	NA	3.2E+01
			Aroclor-1268	1.1E-06	NA	NA	NA	1.1E-06	Immune system	--	NA	NA	
			Dieldrin	2.3E-06	NA	NA	NA	2.3E-06	Liver	--	NA	NA	
			Technical Chlordane	9 2E-06	NA	NA	NA	9.2E-06	Liver	--	NA	NA	
			Toxicity Equivalency (PCB Congeners) - Mam	1.6E-04	NA	NA	NA	1 6E-04					
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.4E-03	NA	NA	NA	1 4E-03					
			CHEMICAL TOTAL	1 7E-03	--	--	--	2E-03		3.2E+01	0 0E+00	--	3 2E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-03					3 2E+01
	EXPOSURE MEDIUM TOTAL							2E-03					3.2E+01
COMBINED FISH DIET TOTAL								2E-03					3.2E+01
RECEPTOR TOTAL								2E-03					3.2E+01

TABLE 10.24.RME
RISK SUMMARY - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
TOTAL RISK ACROSS ALL MEDIA								2E-03	TOTAL HAZARD ACROSS ALL MEDIA				3.2E+01

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available

Prepared by: KJA
Checked by: MJM

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TOTAL IMMUNE SYSTEM HI =	3.2E+01
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TABLE 10.25.RME
RISK SUMMARY - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	MANTON POND	Aroclor-1254	1.4E-05	NA	NA	NA	1.4E-05	Immune system	2.1E+00	NA	NA	2.1E+00
			Aroclor-1268	4.4E-06	NA	NA	NA	4.4E-06	Immune system	--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.5E-04	NA	NA	NA	1.5E-04					
			CHEMICAL TOTAL	1.7E-04	--	--	--	2E-04		2.1E+00	0.0E+00	--	2E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-04					2E+00
	EXPOSURE MEDIUM TOTAL							2E-04					2E+00
COMBINED FISH DIET TOTAL								2E-04					2E+00
RECEPTOR TOTAL								2E-04					2.1E+00
				TOTAL RISK ACROSS ALL MEDIA				2E-04	TOTAL HAZARD ACROSS ALL MEDIA				2.1E+00

NOTES
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TOTAL IMMUNE SYSTEM HI = 2.1E+00

TABLE 10.26.RME
RISK SUMMARY - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	MANTON POND	Toxicity Equivalency (Dioxins/Furans) - Mam	1.0E-06	NA	--	NA	1.0E-06					
			CHEMICAL TOTAL	1.0E-06	--	--	--	1E-06		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-06					0E+00
	EXPOSURE MEDIUM TOTAL							1E-06					0E+00
SEDIMENT TOTAL								1E-06					0E+00
BIOTA	COMBINED FISH DIET	MANTON POND	Aroclor-1254	1.5E-05	NA	NA	NA	1.5E-05	Immune system	2.2E+00	NA	NA	2.2E+00
			Aroclor-1268	4.6E-06	NA	NA	NA	4.6E-06	Immune system	--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.6E-04	NA	NA	NA	1.6E-04					
			CHEMICAL TOTAL	1.8E-04	--	--	--	2E-04		2.2E+00	0.0E+00	--	2E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-04					2E+00
	EXPOSURE MEDIUM TOTAL							2E-04					2E+00
COMBINED FISH DIET TOTAL								2E-04					2E+00
RECEPTOR TOTAL								2E-04					2.2E+00
				TOTAL RISK ACROSS ALL MEDIA				2E-04	TOTAL HAZARD ACROSS ALL MEDIA				2.2E+00

NOTES.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

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TOTAL IMMUNE SYSTEM HI =	2.2E+00
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TABLE 10.28.RME
RISK SUMMARY - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	MANTON POND	Toxicity Equivalency (Dioxins/Furans) - Mam	3.9E-06	NA	--	NA	3.9E-06					
			CHEMICAL TOTAL	3 9E-06	--	--	--	4E-06		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-06					0E+00
	EXPOSURE MEDIUM TOTAL							4E-06					0E+00
SEDIMENT TOTAL								4E-06					0E+00
SURFACE WATER	WHOLE BODY	MANTON POND	Toxicity Equivalency (Dioxins/Furans) - Mam	2.3E-06	NA	--	NA	2 3E-06					
			CHEMICAL TOTAL	2.3E-06	--	--	--	2E-06		--	0 0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-06					0E+00
	EXPOSURE MEDIUM TOTAL							2E-06					0E+00
SURFACE WATER TOTAL								2E-06					0E+00
BIOTA	COMBINED FISH DIET	MANTON POND	Aroclor-1254	1.4E-05	NA	NA	NA	1.4E-05	Immune system	2.1E+00	NA	NA	2.1E+00
			Aroclor-1268	4.4E-06	NA	NA	NA	4.4E-06	Immune system	--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.5E-04	NA	NA	NA	1.5E-04					
			CHEMICAL TOTAL	1 7E-04	--	--	--	2E-04		2.1E+00	0.0E+00	--	2E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-04					2E+00
	EXPOSURE MEDIUM TOTAL							2E-04					2E+00
COMBINED FISH DIET TOTAL								2E-04					2E+00
RECEPTOR TOTAL								2E-04					2.1E+00

TABLE 10.28.RME
RISK SUMMARY - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
TOTAL RISK ACROSS ALL MEDIA								2E-04	TOTAL HAZARD ACROSS ALL MEDIA				2.1E+00
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									TOTAL IMMUNE SYSTEM HI =				2.1E+00
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NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TABLE 10.29.RME
RISK SUMMARY - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	MANTON POND	Toxicity Equivalency (Dioxins/Furans) - Mam	6.1E-06	NA	1.3E-06	NA	7.4E-06					
			CHEMICAL TOTAL	6.1E-06	--	1.3E-06	--	7E-06		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						7E-06					0E+00
	EXPOSURE MEDIUM TOTAL							7E-06					0E+00
SEDIMENT TOTAL								7E-06					0E+00
SURFACE WATER	WHOLE BODY	MANTON POND	Toxicity Equivalency (Dioxins/Furans) - Mam	3.5E-06	NA	--	NA	3.5E-06					
			CHEMICAL TOTAL	3.5E-06	--	--	--	4E-06		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-06					0E+00
	EXPOSURE MEDIUM TOTAL							4E-06					0E+00
SURFACE WATER TOTAL								4E-06					0E+00
BIOTA	COMBINED FISH DIET	MANTON POND	Aroclor-1254	1.5E-05	NA	NA	NA	1.5E-05	Immune system	2.185061187	NA	NA	2.2E+00
			Aroclor-1268	4.6E-06	NA	NA	NA	4.6E-06	Immune system	--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.6E-04	NA	NA	NA	1.6E-04					
			CHEMICAL TOTAL	1.8E-04	--	--	--	2E-04		2.2E+00	0.0E+00	--	2E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-04					2E+00
	EXPOSURE MEDIUM TOTAL							2E-04					2E+00
COMBINED FISH DIET TOTAL								2E-04					2E+00
RECEPTOR TOTAL								2E-04					2.2E+00

TABLE 10.29.RME
RISK SUMMARY - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
TOTAL RISK ACROSS ALL MEDIA								2E-04	TOTAL HAZARD ACROSS ALL MEDIA				2.2E+00
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													--
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													--
													--
													--
									TOTAL IMMUNE SYSTEM HI =				2.2E+00
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NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TABLE 10.30.RME
RISK SUMMARY - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	MANTON POND	Toxicity Equivalency (Dioxins/Furans) - Mam	2.4E-05	NA	2.0E-06	NA	2.6E-05					
			CHEMICAL TOTAL	2.4E-05	--	2.0E-06	--	3E-05		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-05					0E+00
	EXPOSURE MEDIUM TOTAL							3E-05					0E+00
SEDIMENT TOTAL								3E-05					0E+00
SURFACE WATER	SURFACE WATER	MANTON POND	Toxicity Equivalency (Dioxins/Furans) - Mam	5.3E-06	NA	--	NA	5.3E-06					
			CHEMICAL TOTAL	5.3E-06	--	--	--	5E-06		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						5E-06					0E+00
	EXPOSURE MEDIUM TOTAL							5E-06					0E+00
SURFACE WATER TOTAL								5E-06					0E+00
BIOTA	COMBINED FISH DIET	MANTON POND	Aroclor-1254	1.1E-05	NA	NA	NA	1.1E-05	Immune system	3.3E+00	NA	NA	3 3E+00
			Aroclor-1268	3.5E-06	NA	NA	NA	3.5E-06	Immune system	1.0E+00	NA	NA	1.0E+00
			Toxicity Equivalency (Dioxins/Furans) - Mam	1.2E-04	NA	NA	NA	1.2E-04					
			CHEMICAL TOTAL	1.3E-04	--	--	--	1E-04		4.3E+00	0.0E+00	--	4E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-04					4E+00
	EXPOSURE MEDIUM TOTAL							1E-04					4E+00
COMBINED FISH DIET TOTAL								1E-04					4E+00
RECEPTOR TOTAL								2E-04					4.3E+00

TABLE 10.30.RME
RISK SUMMARY - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
TOTAL RISK ACROSS ALL MEDIA								2E-04	TOTAL HAZARD ACROSS ALL MEDIA				4.3E+00

NOTES.
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by KJA
Checked by: RAR

TOTAL IMMUNE SYSTEM HI = 4.3E+00

TABLE 10.31.RME
RISK SUMMARY - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	DYERVILLE POND	Aroclor-1254	3.0E-05	NA	NA	NA	3.0E-05	Immune system	4.3E+00	NA	NA	4.3E+00
			Dieldrin	5.7E-06	NA	NA	NA	5.7E-06	Liver	--	NA	NA	
			Technical Chlordane	4.5E-06	NA	NA	NA	4.5E-06	Liver	--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.7E-04	NA	NA	NA	3.7E-04					
			CHEMICAL TOTAL	4.1E-04	--	--	--	4E-04		4.3E+00	0.0E+00	--	4.3E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-04					4.3E+00
	EXPOSURE MEDIUM TOTAL							4E-04					4.3E+00
COMBINED FISH DIET TOTAL								4E-04					4.3E+00
RECEPTOR TOTAL								4E-04					4.3E+00
							TOTAL RISK ACROSS ALL MEDIA	4E-04	TOTAL HAZARD ACROSS ALL MEDIA				4.3E+00

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: AWS

TOTAL IMMUNE SYSTEM HI = 4.3E+00

TABLE 10.32.RME
RISK SUMMARY - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	DYERVILLE POND	Aroclor-1254	3.1E-05	NA	NA	NA	3.1E-05	Immune system	4.5E+00	NA	NA	4.5E+00
			Dieldrin	5.9E-06	NA	NA	NA	5.9E-06	Liver	--	NA	NA	
			Technical Chlordane	4.6E-06	NA	NA	NA	4.6E-06	Liver	--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.9E-04	NA	NA	NA	3.9E-04					
			CHEMICAL TOTAL	4.3E-04	--	--	--	4E-04		4.5E+00	0.0E+00	--	4.5E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-04					4.5E+00
	EXPOSURE MEDIUM TOTAL							4E-04					4.5E+00
COMBINED FISH DIET TOTAL								4E-04					4.5E+00
RECEPTOR TOTAL								4E-04					4.5E+00
							TOTAL RISK ACROSS ALL MEDIA	4E-04	TOTAL HAZARD ACROSS ALL MEDIA				4.5E+00

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: AWS

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TOTAL IMMUNE SYSTEM HI =	4.5E+00
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TABLE 10.34.RME
RISK SUMMARY - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SURFACE WATER	SURFACE WATER	DYERVILLE POND	Toxicity Equivalency (Dioxins/Furans) - Mam	2.3E-06	NA	--	NA	2.3E-06					
			CHEMICAL TOTAL	2.3E-06	--	--	--	2E-06		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-06					0E+00
	EXPOSURE MEDIUM TOTAL							2E-06					0E+00
SURFACE WATER TOTAL								2E-06					0E+00
BIOTA	COMBINED FISH DIET	DYERVILLE POND	Aroclor-1254	3.0E-05	NA	NA	NA	3.0E-05	Immune system	4.3E+00	NA	NA	4.3E+00
			Dieldrin	5.7E-06	NA	NA	NA	5.7E-06	Liver	--	NA	NA	
			Technical Chlordane	4.5E-06	NA	NA	NA	4.5E-06	Liver	--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.7E-04	NA	NA	NA	3.7E-04					
			CHEMICAL TOTAL	4.1E-04	--	--	--	4E-04		4.3E+00	0.0E+00	--	4.3E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-04					4.3E+00
	EXPOSURE MEDIUM TOTAL							4E-04					4.3E+00
COMBINED FISH DIET TOTAL								4E-04					4.3E+00
RECEPTOR TOTAL								4E-04					4.3E+00
							TOTAL RISK ACROSS ALL MEDIA	4E-04				TOTAL HAZARD ACROSS ALL MEDIA	4.3E+00

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

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TOTAL IMMUNE SYSTEM HI =	4.3E+00
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Prepared by: KJA
Checked by: AWS

TABLE 10.35.RME
RISK SUMMARY - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SURFACE WATER	SURFACE WATER	DYERVILLE POND	Toxicity Equivalency (Dioxins/Furans) - Mam	3.5E-06	NA	--	NA	3.5E-06					
			CHEMICAL TOTAL	3.5E-06	--	--	--	4E-06		--	0 0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-06					0E+00
	EXPOSURE MEDIUM TOTAL							4E-06					0E+00
SURFACE WATER TOTAL								4E-06					0E+00
BIOTA	COMBINED FISH DIET	DYERVILLE POND	Aroclor-1254	3.1E-05	NA	NA	NA	3 1E-05	Immune system	4.5E+00	NA	NA	4.5E+00
			Dieldrin	5.9E-06	NA	NA	NA	5.9E-06	Liver	--	NA	NA	
			Technical Chlordane	4.6E-06	NA	NA	NA	4.6E-06	Liver	--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.9E-04	NA	NA	NA	3.9E-04					
			CHEMICAL TOTAL	4.3E-04	--	--	--	4E-04		4.5E+00	0.0E+00	--	4.5E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-04					4.5E+00
	EXPOSURE MEDIUM TOTAL							4E-04					4 5E+00
COMBINED FISH DIET TOTAL								4E-04					4.5E+00
RECEPTOR TOTAL								4E-04					4.5E+00
							TOTAL RISK ACROSS ALL MEDIA	4E-04				TOTAL HAZARD ACROSS ALL MEDIA	4.5E+00

NOTES
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: AWS

TOTAL IMMUNE SYSTEM HI = 4.5E+00

TABLE 10.36.RME
RISK SUMMARY - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	DYERVILLE POND	Benzo(a)pyrene	2.6E-06	NA	--	NA	2.6E-06	Kidney	--	NA	--	
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.7E-06	NA	--	NA	3.7E-06					
			CHEMICAL TOTAL	6 3E-06	--	--	--	6E-06		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						6E-06					0E+00
	EXPOSURE MEDIUM TOTAL							6E-06					0E+00
SEDIMENT TOTAL								6E-06					0E+00
SURFACE WATER	SURFACE WATER	DYERVILLE POND	Toxicity Equivalency (Dioxins/Furans) - Mam	5.3E-06	NA	--	NA	5.3E-06					
			CHEMICAL TOTAL	5.3E-06	--	--	--	5E-06		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						5E-06					0E+00
	EXPOSURE MEDIUM TOTAL							5E-06					0E+00
SURFACE WATER TOTAL								5E-06					0E+00
BIOTA	COMBINED FISH DIET	DYERVILLE POND	Aroclor-1254	2 3E-05	NA	NA	NA	2.3E-05	Immune system	6.8E+00	NA	NA	6 8E+00
			Dieldrin	4.5E-06	NA	NA	NA	4.5E-06	Liver	--	NA	NA	
			Technical Chlordane	3.5E-06	NA	NA	NA	3.5E-06	Liver	--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	2.9E-04	NA	NA	NA	2.9E-04					
			CHEMICAL TOTAL	3.2E-04	--	--	--	3E-04		6.8E+00	0.0E+00	--	6.8E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-04					6.8E+00
	EXPOSURE MEDIUM TOTAL							3E-04					6 8E+00
COMBINED FISH DIET TOTAL								3E-04					6.8E+00
RECEPTOR TOTAL								3E-04					6.8E+00
							TOTAL RISK ACROSS ALL MEDIA	3E-04				TOTAL HAZARD ACROSS ALL MEDIA	6.8E+00

TABLE 10.36.RME
RISK SUMMARY - REASONABLE MAXIMUM EXPOSURE - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
													--
													--
													--
													--
													--
													--
													--
													--
												TOTAL IMMUNE SYSTEM HI =	6.8E+00
													--
													--
													--
													--
													--
													--
													--
													--

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: AWS

TABLE 10.37.RME
RISK SUMMARY - CENTRAL TENDENCY - CURRENT/FUTURE - COMMERCIAL / INDUSTRIAL WORKER - ADULT - FOGARTY CENTER
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: COMMERCIAL / INDUSTRIAL WORKER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SOIL	SOIL	FOGARTY CENTER	Benzo(a)pyrene	3 9E-06	NA	6 7E-06	NA	1 1E-05	Kidney	--	NA	--	
			Arsenic	1 8E-06	NA	--	NA	1 8E-06	Skin	--	NA	--	
			CHEMICAL TOTAL	5.7E-06	--	6 7E-06	--	1E-05		--	0 0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-05					0E+00
	EXPOSURE MEDIUM TOTAL							1E-05					0E+00
SOIL TOTAL								1E-05					0E+00
RECEPTOR TOTAL								1E-05					--
							TOTAL RISK ACROSS ALL MEDIA	1E-05	TOTAL HAZARD ACROSS ALL MEDIA				--

NOTES
NC - Not carcinogenic by this exposure route
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: RAR
Checked by: KJA

TABLE 10.13.CT
RISK SUMMARY - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	ALLENDALE POND	Aroclor-1254	2.6E-05	NA	NA	NA	2.6E-05	Immune system	1.1E+01	NA	NA	1.1E+01
			Technical Chlordane	1.1E-06	NA	NA	NA	1.1E-06	Liver	--	NA	NA	
			Toxicity Equivalency (PCB Congeners) - Mam	2.9E-05	NA	NA	NA	2.9E-05					
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.1E-04	NA	NA	NA	3.1E-04					
			CHEMICAL TOTAL	3.7E-04	--	--	--	4E-04		1.1E+01	0.0E+00	--	1.1E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-04					1.1E+01
	EXPOSURE MEDIUM TOTAL							4E-04					1.1E+01
COMBINED FISH DIET TOTAL								4E-04					1.1E+01
RECEPTOR TOTAL								4E-04					1.1E+01
							TOTAL RISK ACROSS ALL MEDIA	4E-04	TOTAL HAZARD ACROSS ALL MEDIA				1.1E+01

NOTES.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TOTAL IMMUNE SYSTEM HI = 1.1E+01

TABLE 10.14.CT
RISK SUMMARY - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	ALLENDALE POND	Aroclor-1254	2.0E-05	NA	NA	NA	2.0E-05	Immune system	1.2E+01	NA	NA	1.2E+01
			Toxicity Equivalency (PCB Congeners) - Mam	2.2E-05	NA	NA	NA	2.2E-05					
			Toxicity Equivalency (Dioxins/Furans) - Mam	2.4E-04	NA	NA	NA	2.4E-04					
			CHEMICAL TOTAL	2.9E-04	--	--	--	3E-04		1.2E+01	0.0E+00	--	1.2E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-04					1.2E+01
	EXPOSURE MEDIUM TOTAL							3E-04					1.2E+01
COMBINED FISH DIET TOTAL								3E-04					1.2E+01
RECEPTOR TOTAL								3E-04					1.2E+01
							TOTAL RISK ACROSS ALL MEDIA	3E-04	TOTAL HAZARD ACROSS ALL MEDIA				1.2E+01

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TOTAL IMMUNE SYSTEM HI = 1.2E+01

TABLE 10.16.CT
RISK SUMMARY - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	ALLENDALE POND	Toxicity Equivalency (Dioxins/Furans) - Mam	1.2E-06	NA	--	NA	1.2E-06					
			CHEMICAL TOTAL	1.2E-06	--	--	--	1E-06		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-06					0E+00
	EXPOSURE MEDIUM TOTAL							1E-06					0E+00
SEDIMENT TOTAL								1E-06					0E+00
BIOTA	COMBINED FISH DIET	ALLENDALE POND	Aroclor-1254	2.6E-05	NA	NA	NA	2.6E-05	Immune system	1.1E+01	NA	NA	1.1E+01
			Technical Chlordane	1.1E-06	NA	NA	NA	1.1E-06	Liver	--	NA	NA	
			Toxicity Equivalency (PCB Congeners) - Mam	2.9E-05	NA	NA	NA	2.9E-05					
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.1E-04	NA	NA	NA	3.1E-04					
			CHEMICAL TOTAL	3.7E-04	--	--	--	4E-04		1.1E+01	0.0E+00	--	1.1E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-04					1.1E+01
	EXPOSURE MEDIUM TOTAL							4E-04					1.1E+01
COMBINED FISH DIET TOTAL								4E-04					1.1E+01
RECEPTOR TOTAL								4E-04					1.1E+01
				TOTAL RISK ACROSS ALL MEDIA				4E-04	TOTAL HAZARD ACROSS ALL MEDIA				1.1E+01

NOTES:
NC - Not carcinogenic by this exposure route
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TOTAL IMMUNE SYSTEM HI = 1.1E+01

TABLE 10.17.CT
RISK SUMMARY - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	ALLENDALE POND	Toxicity Equivalency (Dioxins/Furans) - Mam	1 5E-06	NA	--	NA	1.5E-06					
			CHEMICAL TOTAL	1 5E-06	--	--	--	1E-06		--	0 0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-06					0E+00
	EXPOSURE MEDIUM TOTAL							1E-06					0E+00
SEDIMENT TOTAL								1E-06					0E+00
BIOTA	COMBINED FISH DIET	ALLENDALE POND	Aroclor-1254	2.0E-05	NA	NA	NA	2 0E-05	Immune system	1.2E+01	NA	NA	1.2E+01
			Toxicity Equivalency (PCB Congeners) - Mam	2 2E-05	NA	NA	NA	2.2E-05					
			Toxicity Equivalency (Dioxins/Furans) - Mam	2 4E-04	NA	NA	NA	2.4E-04					
			CHEMICAL TOTAL	2.9E-04	--	--	--	3E-04		1.2E+01	0.0E+00	--	1.2E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-04					1.2E+01
	EXPOSURE MEDIUM TOTAL							3E-04					1.2E+01
COMBINED FISH DIET TOTAL								3E-04					1.2E+01
RECEPTOR TOTAL								3E-04					1.2E+01
							TOTAL RISK ACROSS ALL MEDIA	3E-04	TOTAL HAZARD ACROSS ALL MEDIA				1.2E+01

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TOTAL IMMUNE SYSTEM HI = 1.2E+01

TABLE 10.18.CT
RISK SUMMARY - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - ALLENDALE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	ALLENDALE POND	Toxicity Equivalency (Dioxins/Furans) - Mam	1.2E-05	NA	--	NA	1.2E-05					
			CHEMICAL TOTAL	1.2E-05	--	--	--	1E-05		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-05					0E+00
	EXPOSURE MEDIUM TOTAL							1E-05					0E+00
SEDIMENT TOTAL								1E-05					0E+00
BIOTA	COMBINED FISH DIET	ALLENDALE POND	Aroclor-1254	2.1E-05	NA	NA	NA	2.1E-05	Immune system	1.8E+01	NA	NA	1.8E+01
			Toxicity Equivalency (PCB Congeners) - Mam	2.3E-05	NA	NA	NA	2.3E-05					
			Toxicity Equivalency (Dioxins/Furans) - Mam	2.5E-04	NA	NA	NA	2.5E-04					
			CHEMICAL TOTAL	2.9E-04	--	--	--	3E-04		1.8E+01	0.0E+00	--	1.8E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-04					1.8E+01
	EXPOSURE MEDIUM TOTAL							3E-04					1.8E+01
COMBINED FISH DIET TOTAL								3E-04					1.8E+01
RECEPTOR TOTAL								3E-04					1.8E+01
							TOTAL RISK ACROSS ALL MEDIA	3E-04				TOTAL HAZARD ACROSS ALL MEDIA	1.8E+01

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TOTAL IMMUNE SYSTEM HI = 1.8E+01

TABLE 10.19.CT
RISK SUMMARY - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	LYMAN MILL POND	Aroclor-1254	3.0E-05	NA	NA	NA	3.0E-05	Immune system	1.3E+01	NA	NA	1.3E+01
			Technical Chlordane	2.5E-06	NA	NA	NA	2.5E-06	Liver	--	NA	NA	
			Toxicity Equivalency (PCB Congeners) - Mam	2.7E-05	NA	NA	NA	2.7E-05					
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.9E-04	NA	NA	NA	3.9E-04					
			CHEMICAL TOTAL	4.5E-04	--	--	--	4E-04		1.3E+01	0.0E+00	--	1.3E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-04					1.3E+01
	EXPOSURE MEDIUM TOTAL							4E-04					1.3E+01
COMBINED FISH DIET TOTAL								4E-04					1.3E+01
RECEPTOR TOTAL								4E-04					1.3E+01
				TOTAL RISK ACROSS ALL MEDIA				4E-04	TOTAL HAZARD ACROSS ALL MEDIA				1.3E+01

NOTES:
NC - Not carcinogenic by this exposure route
NA - Not applicable; exposure route not applicable for this chemical/exposure medium
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TOTAL IMMUNE SYSTEM HI = 1.3E+01

TABLE 10.20.CT
RISK SUMMARY - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	LYMAN MILL POND	Aroclor-1254	2.3E-05	NA	NA	NA	2.3E-05	Immune system	1.3E+01	NA	NA	1.3E+01
			Technical Chlordane	1.9E-06	NA	NA	NA	1.9E-06	Liver	--	NA	NA	
			Toxicity Equivalency (PCB Congeners) - Mam	2.1E-05	NA	NA	NA	2.1E-05					
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.0E-04	NA	NA	NA	3.0E-04					
			CHEMICAL TOTAL	3.4E-04	--	--	--	3E-04		1.3E+01	0.0E+00	--	1.3E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-04					1.3E+01
	EXPOSURE MEDIUM TOTAL							3E-04					1.3E+01
COMBINED FISH DIET TOTAL								3E-04					1.3E+01
RECEPTOR TOTAL								3E-04					1.3E+01
				TOTAL RISK ACROSS ALL MEDIA				3E-04	TOTAL HAZARD ACROSS ALL MEDIA				1.3E+01

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TOTAL IMMUNE SYSTEM HI = 1.3E+01

TABLE 10.22.CT
RISK SUMMARY - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	LYMAN MILL POND	Aroclor-1254	3.0E-05	NA	NA	NA	3.0E-05	Immune system	1.3E+01	NA	NA	1.3E+01
			Technical Chlordane	2.5E-06	NA	NA	NA	2.5E-06	Liver	--	NA	NA	
			Toxicity Equivalency (PCB Congeners) - Mam	2.7E-05	NA	NA	NA	2.7E-05					
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.9E-04	NA	NA	NA	3.9E-04					
			CHEMICAL TOTAL	4.5E-04	--	--	--	4E-04		1.3E+01	0.0E+00	--	1.3E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-04					1.3E+01
	EXPOSURE MEDIUM TOTAL							4E-04					1.3E+01
COMBINED FISH DIET TOTAL								4E-04					1.3E+01
RECEPTOR TOTAL								4E-04					1.3E+01
				TOTAL RISK ACROSS ALL MEDIA				4E-04	TOTAL HAZARD ACROSS ALL MEDIA				1.3E+01

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TOTAL IMMUNE SYSTEM HI = 1.3E+01

TABLE 10.23.CT
RISK SUMMARY - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	LYMAN MILL POND	Aroclor-1254	2.3E-05	NA	NA	NA	2.3E-05	Immune system	1.3E+01	NA	NA	1.3E+01
			Technical Chlordane	1.9E-06	NA	NA	NA	1.9E-06	Liver	--	NA	NA	
			Toxicity Equivalency (PCB Congeners) - Mam	2.1E-05	NA	NA	NA	2.1E-05					
			Toxicity Equivalency (Dioxins/Furans) - Mam	3.0E-04	NA	NA	NA	3.0E-04					
			CHEMICAL TOTAL	3.4E-04	--	--	--	3E-04		1.3E+01	0.0E+00	--	1.3E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-04					1.3E+01
	EXPOSURE MEDIUM TOTAL							3E-04					1.3E+01
COMBINED FISH DIET TOTAL								3E-04					1.3E+01
RECEPTOR TOTAL								3E-04					1.3E+01
				TOTAL RISK ACROSS ALL MEDIA				3E-04	TOTAL HAZARD ACROSS ALL MEDIA				1.3E+01

NOTES.
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium
-- - Not calculated; dose-response data and/or dermal absorption values are not available

Prepared by: KJA
Checked by: RAR

TOTAL IMMUNE SYSTEM HI = 1.3E+01

TABLE 10.24.CT
RISK SUMMARY - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - LYMAN MILL
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	LYMAN MILL POND	Toxicity Equivalency (Dioxins/Furans) - Mam	3 6E-06	NA	--	NA	3 6E-06					
			CHEMICAL TOTAL	3 6E-06	--	--	--	4E-06		--	0 0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-06					0E+00
	EXPOSURE MEDIUM TOTAL							4E-06					0E+00
SEDIMENT TOTAL								4E-06					0E+00
BIOTA	COMBINED FISH DIET	LYMAN MILL POND	Aroclor-1254	2 3E-05	NA	NA	NA	2 3E-05	Immune system	2 0E+01	NA	NA	2 0E+01
			Technical Chlordane	2 0E-06	NA	NA	NA	2.0E-06	Liver	--	NA	NA	
			Toxicity Equivalency (PCB Congeners) - Mam	2 1E-05	NA	NA	NA	2 1E-05					
			Toxicity Equivalency (Dioxins/Furans) - Mam	3 0E-04	NA	NA	NA	3 0E-04					
			CHEMICAL TOTAL	3 5E-04	--	--	--	4E-04		2 0E+01	0 0E+00	--	2.0E+01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-04					2 0E+01
	EXPOSURE MEDIUM TOTAL							4E-04					2.0E+01
COMBINED FISH DIET TOTAL								4E-04					2.0E+01
RECEPTOR TOTAL								4E-04					2.0E+01
				TOTAL RISK ACROSS ALL MEDIA				4E-04	TOTAL HAZARD ACROSS ALL MEDIA				2.0E+01

NOTES
NC - Not carcinogenic by this exposure route
NA - Not applicable, exposure route not applicable for this chemical/exposure medium
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

Prepared by KJA
Checked by RAR

TOTAL IMMUNE SYSTEM HI = 2.0E+01

TABLE 10.25.CT
RISK SUMMARY - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	MANTON POND	Aroclor-1254	5.2E-06	NA	NA	NA	5.2E-06	Immune system	--	NA	NA	
			Aroclor-1268	1.4E-06	NA	NA	NA	1.4E-06	Immune system	--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	5.8E-05	NA	NA	NA	5.8E-05					
			CHEMICAL TOTAL	6.5E-05	--	--	--	6E-05		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						6E-05					0E+00
	EXPOSURE MEDIUM TOTAL							6E-05					0E+00
COMBINED FISH DIET TOTAL								6E-05					0E+00
RECEPTOR TOTAL								6E-05					--
				TOTAL RISK ACROSS ALL MEDIA				6E-05	TOTAL HAZARD ACROSS ALL MEDIA				--

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TABLE 10.26.CT
RISK SUMMARY - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	MANTON POND	Aroclor-1254	5.4E-06	NA	NA	NA	5.4E-06	Immune system	--	NA	NA	
			Aroclor-1268	1.4E-06	NA	NA	NA	1.4E-06	Immune system	--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mamm	6.0E-05	NA	NA	NA	6.0E-05					
			CHEMICAL TOTAL	6 7E-05	--	--	--	7E-05		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						7E-05					0E+00
	EXPOSURE MEDIUM TOTAL							7E-05					0E+00
COMBINED FISH DIET TOTAL								7E-05					0E+00
RECEPTOR TOTAL								7E-05					--
			TOTAL RISK ACROSS ALL MEDIA					7E-05	TOTAL HAZARD ACROSS ALL MEDIA				--

NOTES:
NC - Not carcinogenic by this exposure route
NA - Not applicable; exposure route not applicable for this chemical/exposure medium
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TABLE 10.28.CT
RISK SUMMARY - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	MANTON POND	Aroclor-1254	3.9E-06	NA	NA	NA	3.9E-06	Immune system	--	NA	NA	
			Aroclor-1268	1.0E-06	NA	NA	NA	1.0E-06	Immune system	--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	4.4E-05	NA	NA	NA	4.4E-05					
			CHEMICAL TOTAL	4.9E-05	--	--	--	5E-05		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						5E-05					0E+00
	EXPOSURE MEDIUM TOTAL							5E-05					0E+00
COMBINED FISH DIET TOTAL								5E-05					0E+00
RECEPTOR TOTAL								5E-05					--
				TOTAL RISK ACROSS ALL MEDIA				5E-05	TOTAL HAZARD ACROSS ALL MEDIA				--

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TABLE 10.29.CT
RISK SUMMARY - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	MANTON POND	Aroclor-1254	4.0E-06	NA	NA	NA	4.0E-06	Immune system	--	NA	NA	
			Aroclor-1268	1.1E-06	NA	NA	NA	1.1E-06	Immune system	--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	4.5E-05	NA	NA	NA	4.5E-05					
			CHEMICAL TOTAL	5.0E-05	--	--	--	5E-05		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						5E-05					0E+00
	EXPOSURE MEDIUM TOTAL							5E-05					0E+00
COMBINED FISH DIET TOTAL								5E-05					0E+00
RECEPTOR TOTAL								5E-05					--
							TOTAL RISK ACROSS ALL MEDIA	5E-05	TOTAL HAZARD ACROSS ALL MEDIA				--

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

TABLE 10.30.CT
RISK SUMMARY - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - CHILD - COMBINED FISH DIET - MANTON
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	MANTON POND	Aroclor-1254	7.7E-06	NA	NA	NA	7.7E-06	Immune system	2.2E+00	NA	NA	2.2E+00
			Aroclor-1268	2.0E-06	NA	NA	NA	2.0E-06	Immune system	--	NA	NA	
			Toxicity Equivalency (Dioxins/Furans) - Mam	8.6E-05	NA	NA	NA	8.6E-05					
			CHEMICAL TOTAL	9.6E-05	--	--	--	1E-04		2.2E+00	0.0E+00	--	2E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-04					2E+00
	EXPOSURE MEDIUM TOTAL							1E-04					2E+00
COMBINED FISH DIET TOTAL								1E-04					2E+00
RECEPTOR TOTAL								1E-04					2.2E+00
				TOTAL RISK ACROSS ALL MEDIA				1E-04	TOTAL HAZARD ACROSS ALL MEDIA				2.2E+00

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: RAR

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TOTAL IMMUNE SYSTEM HI =	2.2E+00
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TABLE 10.31.CT
RISK SUMMARY - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - ADULT - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	DYERVILLE POND	Aroclor-1254	5.2E-06	NA	NA	NA	5.2E-06	Immune system	2.3E+00	NA	NA	2.3E+00
			Toxicity Equivalency (Dioxins/Furans) - Mam	5.5E-05	NA	NA	NA	5 5E-05					
			CHEMICAL TOTAL	6 0E-05	--	--	--	6E-05		2.3E+00	0.0E+00	--	2.3E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						6E-05					2 3E+00
	EXPOSURE MEDIUM TOTAL							6E-05					2.3E+00
COMBINED FISH DIET TOTAL								6E-05					2.3E+00
RECEPTOR TOTAL								6E-05					2.3E+00
							TOTAL RISK ACROSS ALL MEDIA	6E-05	TOTAL HAZARD ACROSS ALL MEDIA				2.3E+00

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: MJM

TOTAL IMMUNE SYSTEM HI = 2.3E+00

TABLE 10.32.CT
RISK SUMMARY - CENTRAL TENDENCY - CURRENT/FUTURE - RECREATIONAL ANGLER - OLDER CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RECREATIONAL ANGLER
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	DYERVILLE POND	Aroclor-1254	4 0E-06	NA	NA	NA	4.0E-06	Immune system	2.3E+00	NA	NA	2 3E+00
			Toxicity Equivalency (Dioxins/Furans) - Mam	4 2E-05	NA	NA	NA	4.2E-05					
			CHEMICAL TOTAL	4 6E-05	--	--	--	5E-05		2.3E+00	0.0E+00	--	2 3E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						5E-05					2 3E+00
	EXPOSURE MEDIUM TOTAL							5E-05					2 3E+00
COMBINED FISH DIET TOTAL								5E-05					2.3E+00
RECEPTOR TOTAL								5E-05					2.3E+00
							TOTAL RISK ACROSS ALL MEDIA	5E-05	TOTAL HAZARD ACROSS ALL MEDIA				2.3E+00

NOTES
NC - Not carcinogenic by this exposure route
NA - Not applicable, exposure route not applicable for this chemical exposure medium
-- - Not calculated, dose-response data and/or dermal absorption values are not available

Prepared by KJA
Checked by MJM

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TOTAL IMMUNE SYSTEM HI =	2.3E+00
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TABLE 10.34.CT
RISK SUMMARY - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - ADULT - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	DYERVILLE POND	Aroclor-1254	5 2E-06	NA	NA	NA	5.2E-06	Immune system	2.3E+00	NA	NA	2.3E+00
			Toxicity Equivalency (Dioxins/Furans) - Mam	5.5E-05	NA	NA	NA	5 5E-05					
			CHEMICAL TOTAL	6.0E-05	--	--	--	6E-05		2 3E+00	0 0E+00	--	2 3E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						6E-05					2 3E+00
	EXPOSURE MEDIUM TOTAL							6E-05					2 3E+00
COMBINED FISH DIET TOTAL								6E-05					2.3E+00
RECEPTOR TOTAL								6E-05					2.3E+00
							TOTAL RISK ACROSS ALL MEDIA	6E-05	TOTAL HAZARD ACROSS ALL MEDIA				2.3E+00

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: MJM

TOTAL IMMUNE SYSTEM HI = 2.3E+00

TABLE 10.35.CT
RISK SUMMARY - CENTRAL TENDENCY - CURRENT/FUTURE - RESIDENT - OLDER CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: OLDER CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	DYERVILLE POND	Aroclor-1254	4.0E-06	NA	NA	NA	4.0E-06	Immune system	2.3E+00	NA	NA	2.3E+00
			Toxicity Equivalency (Dioxins/Furans) - Mam	4.2E-05	NA	NA	NA	4.2E-05					
			CHEMICAL TOTAL	4.6E-05	--	--	--	5E-05		2.3E+00	0.0E+00	--	2.3E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						5E-05					2.3E+00
	EXPOSURE MEDIUM TOTAL							5E-05					2.3E+00
COMBINED FISH DIET TOTAL								5E-05					2.3E+00
RECEPTOR TOTAL								5E-05					2.3E+00
							TOTAL RISK ACROSS ALL MEDIA	5E-05	TOTAL HAZARD ACROSS ALL MEDIA				2.3E+00

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: MJM

TOTAL IMMUNE SYSTEM HI = 2.3E+00

TABLE 10.36.CT
RISK SUMMARY - CENTRAL TENDENCY- CURRENT/FUTURE- RESIDENT- CHILD - COMBINED FISH DIET - DYERVILLE
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: RESIDENT
RECEPTOR AGE: CHILD

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
BIOTA	COMBINED FISH DIET	DYERVILLE POND	Aroclor-1254	4.1E-06	NA	NA	NA	4.1E-06	Immune system	3.6E+00	NA	NA	3.6E+00
			Toxicity Equivalency (Dioxins/Furans) - Mam	4.3E-05	NA	NA	NA	4.3E-05					
			CHEMICAL TOTAL	4.7E-05	--	--	--	5E-05		3.6E+00	0.0E+00	--	3.6E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						5E-05					3.6E+00
	EXPOSURE MEDIUM TOTAL							5E-05					3.6E+00
COMBINED FISH DIET TOTAL								5E-05					3.6E+00
RECEPTOR TOTAL								5E-05					3.6E+00
							TOTAL RISK ACROSS ALL MEDIA	5E-05	TOTAL HAZARD ACROSS ALL MEDIA				3.6E+00

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

Prepared by: KJA
Checked by: MJM

TOTAL IMMUNE SYSTEM HI = 3.6E+00

TABLE 10.37.CT
RISK SUMMARY - CENTRAL TENDENCY - CURRENT/FUTURE - COMMERCIAL / INDUSTRIAL WORKER - ADULT - FOGARTY CENTER
BASELINE HUMAN HEALTH RISK ASSESSMENT - INTERIM FINAL
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: COMMERCIAL / INDUSTRIAL WORKER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK					NON-CARCINOGENIC HAZARD QUOTIENT				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SOIL	SOIL	FOGARTY CENTER	2-Methylnaphthalene				NA		Cardiovascular system	--	NA	--	
			Acenaphthylene				NA		Liver	--	NA	--	
			Benzo(a)anthracene	--	NA	--	NA		Kidney	--	NA	--	
			Benzo(a)pyrene	--	NA	--	NA		Kidney	--	NA	--	
			Benzo(b)fluoranthene	--	NA	--	NA		Kidney	--	NA	--	
			Benzo(g,h,i)perylene				NA		Kidney	--	NA	--	
			Dibenzo(a,h)anthracene	--	NA	--	NA		Kidney	--	NA	--	
			Indeno(1,2,3-cd)pyrene	--	NA	--	NA		Kidney	--	NA	--	
			Phenanthrene				NA		Kidney	--	NA	--	
			alpha-Chlordane	--	NA	--	NA		Liver	--	NA	--	
			Aroclor-1254	--	NA	--	NA		Immune system	--	NA	--	
			Endosulfan II				NA		Kidney	--	NA	--	
			Endosulfan Sulfate				NA		Kidney	--	NA	--	
			gamma-Chlordane	--	NA	--	NA		Liver	--	NA	--	
			Technical Chlordane	--	NA	--	NA		Liver	--	NA	--	
			Aluminum				NA		Developmental toxicity	--	NA		
			Arsenic	--	NA	--	NA		Skin	--	NA	--	
			Manganese				NA		NOAEL	--	NA		
			Mercury				NA		Immune system	--	NA		
			Toxicity Equivalency (Dioxins/Furans) - Mam	--	NA	--	NA						
			CHEMICAL TOTAL	--	--	--	--	0E+00		--	0.0E+00	--	0E+00
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						0E+00					0E+00
	EXPOSURE MEDIUM TOTAL							0E+00					0E+00
SOIL TOTAL								0E+00					0E+00
RECEPTOR TOTAL								--					--
							TOTAL RISK ACROSS ALL MEDIA	--	TOTAL HAZARD ACROSS ALL MEDIA				--

NOTES
NC - Not carcinogenic by this exposure route
NA - Not applicable, exposure route not applicable for this chemical/exposure medium.
-- - Not calculated, dose-response data and/or dermal absorption values are not available.

Prepared by: RAR
Checked by: KJA

Table 11.RME
Risk Assessment Summary

Baseline Human Health Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Exposure Scenario	Receptor	Exposure Point	Exposure Route	Excess Lifetime Cancer Risk	Hazard Index
Current/Future - Assapumpset Pond					
Visiting Recreational Angler	Child (ages 1 through 6)				
		Sediment	Incidental ingestion	NA	NA
			Dermal contact	NA	NA
		Surface water	Incidental ingestion	NA	NA
			Dermal contact	NA	NA
		Combined Fish Diet	Ingestion	1E-05	2
			Total Risk:	**1E-05**	**2**
Visiting Recreational Angler	Older Child (ages 7 through 18)				
		Sediment	Incidental ingestion	1E-07	0.003
			Dermal contact	2E-07	0.0007
		Surface water	Incidental ingestion	1E-09	0.00003
			Dermal contact	6E-10	0.0009
		Combined Fish Diet	Ingestion	2E-05	1
			Total Risk:	**2E-05**	**1**
Visiting Recreational Angler	Adult (ages 19 and above)				
		Sediment	Incidental ingestion	8E-08	0.002
			Dermal contact	5E-08	0.0002
		Surface water	Incidental ingestion	7E-10	0.00002
			Dermal contact	6E-10	0.0008
		Combined Fish Diet	Ingestion	2E-05	1
			Total Risk:	**2E-05**	**1**
			Total Receptor Risk:	**5E-05**	**NC**

Table 11.RME
Risk Assessment Summary

Baseline Human Health Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Exposure Scenario	Receptor	Exposure Point	Exposure Route	Excess Lifetime Cancer Risk	Hazard Index
Current/Future - Assapumpset Pond (cont)					
Resident Living Along the River	Child (ages 1 through 6)				
		Sediment	Incidental ingestion	3E-06	0.2
			Dermal contact	7E-07	0.007
		Surface water	Incidental ingestion	6E-08	0.004
			Dermal contact	2E-09	0.004
		Combined Fish Diet	Ingestion	1E-05	2
			Total Risk:	**2E-05**	**2**
Resident Living Along the River	Older Child (ages 7 through 18)				
		Sediment	Incidental ingestion	8E-07	0.02
			Dermal contact	5E-07	0.002
		Surface water	Incidental ingestion	4E-08	0.001
			Dermal contact	2E-09	0.003
		Combined Fish Diet	Ingestion	2E-05	1
			Total Risk:	**2E-05**	**1**
Resident Living Along the River	Adult (ages 19 and above)				
		Sediment	Incidental ingestion	5E-07	0.01
			Dermal contact	1E-07	0.0007
		Surface water	Incidental ingestion	3E-08	0.0009
			Dermal contact	2E-09	0.003
		Combined Fish Diet	Ingestion	2E-05	1
			Total Risk:	**2E-05**	**1**
			Total Receptor Risk:	**6E-05**	**NC**

Table 11.RME
Risk Assessment Summary

Baseline Human Health Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Exposure Scenario	Receptor	Exposure Point	Exposure Route	Excess Lifetime Cancer Risk	Hazard Index
Current/Future - Greystone Mill Pond					
Visiting Recreational Angler	Child (ages 1 through 6)				
		Bank Soil	Incidental ingestion	NA	NA
			Dermal contact	NA	NA
		Sediment	Incidental ingestion	NA	NA
			Dermal contact	NA	NA
		Surface water	Incidental ingestion	NA	NA
			Dermal contact	NA	NA
		Combined Fish Diet	Ingestion	2E-05	5
			Total Risk:	**2E-05**	**5**
Visiting Recreational Angler	Older Child (ages 7 through 18)				
		Bank Soil	Incidental ingestion	5E-07	0.01
			Dermal contact	8E-07	0.006
		Sediment	Incidental ingestion	5E-07	0.009
			Dermal contact	6E-07	0.003
		Surface water	Incidental ingestion	1E-09	0.00004
			Dermal contact	7E-10	0.0008
		Combined Fish Diet	Ingestion	3E-05	4
			Total Risk:	**3E-05**	**4**
Visiting Recreational Angler	Adult (ages 19 and above)				
		Bank Soil	Incidental ingestion	3E-07	0.009
			Dermal contact	2E-07	0.002
		Sediment	Incidental ingestion	3E-07	0.006
			Dermal contact	2E-07	0.001
		Surface water	Incidental ingestion	7E-10	0.00002
			Dermal contact	6E-10	0.0007
		Combined Fish Diet	Ingestion	3E-05	3
			Total Risk:	**3E-05**	**3**
			Total Receptor Risk:	**9E-05**	**NC**

Table 11.RME
Risk Assessment Summary

Baseline Human Health Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Exposure Scenario	Receptor	Exposure Point	Exposure Route	Excess Lifetime Cancer Risk	Hazard Index
Current/Future - Greystone Mill Pond (cont)					
Resident Living Along the River	Child (ages 1 through 6)				
		Bank Soil	Incidental ingestion	2E-05	1
			Dermal contact	4E-06	0.07
		Sediment	Incidental ingestion	1E-05	0.4
			Dermal contact	3E-06	0.03
		Surface water	Incidental ingestion	7E-08	0.004
			Dermal contact	2E-09	0.004
		Combined Fish Diet	Ingestion	2E-05	5
			Total Risk:	**6E-05**	**7**
Resident Living Along the River	Older Child (ages 7 through 18)				
		Bank Soil	Incidental ingestion	6E-06	0.2
			Dermal contact	5E-06	0.04
		Sediment	Incidental ingestion	3E-06	0.06
			Dermal contact	2E-06	0.01
		Surface water	Incidental ingestion	5E-08	0.001
			Dermal contact	3E-09	0.003
		Combined Fish Diet	Ingestion	3E-05	4
			Total Risk:	**5E-05**	**4**
Resident Living Along the River	Adult (ages 19 and above)				
		Bank Soil	Incidental ingestion	4E-06	0.1
			Dermal contact	1E-06	0.01
		Sediment	Incidental ingestion	2E-06	0.04
			Dermal contact	5E-07	0.003
		Surface water	Incidental ingestion	3E-08	0.0009
			Dermal contact	2E-09	0.003
		Combined Fish Diet	Ingestion	3E-05	3
			Total Risk:	**4E-05**	**4**
			Total Receptor Risk:	**1E-04**	**NC**

Table 11.RME
Risk Assessment Summary

Baseline Human Health Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Exposure Scenario	Receptor	Exposure Point	Exposure Route	Excess Lifetime Cancer Risk	Hazard Index
Current/Future - Allendale Pond					
Visiting Recreational Angler	Child (ages 1 through 6)				
		Bank Soil	Incidental ingestion	NA	NA
			Dermal contact	NA	NA
		Sediment	Incidental ingestion	NA	NA
			Dermal contact	NA	NA
		Surface water	Incidental ingestion	NA	NA
			Dermal contact	NA	NA
		Combined Fish Diet	Ingestion	1E-03	30
			Total Risk:	**1E-03**	**30**
Visiting Recreational Angler	Older Child (ages 7 through 18)				
		Bank Soil	Incidental ingestion	3E-07	NA
			Dermal contact	2E-07	NA
		Sediment	Incidental ingestion	6E-06	0.01
			Dermal contact	3E-06	0.01
		Surface water	Incidental ingestion	5E-08	0.0009
			Dermal contact	4E-08	0.007
		Combined Fish Diet	Ingestion	2E-03	20
			Total Risk:	**2E-03**	**20**
Visiting Recreational Angler	Adult (ages 19 and above)				
		Bank Soil	Incidental ingestion	2E-07	NA
			Dermal contact	4E-08	NA
		Sediment	Incidental ingestion	4E-06	0.009
			Dermal contact	1E-06	0.003
		Surface water	Incidental ingestion	3E-08	0.0006
			Dermal contact	4E-08	0.006
		Combined Fish Diet	Ingestion	2E-03	19
			Total Risk:	**2E-03**	**19**
			Total Receptor Risk:	**5E-03**	**NC**

Table 11.RME
Risk Assessment Summary

Baseline Human Health Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Exposure Scenario	Receptor	Exposure Point	Exposure Route	Excess Lifetime Cancer Risk	Hazard Index
Current/Future - Allendale Pond (cont)					
Resident Living Along the River	Child (ages 1 through 6)				
		Bank Soil	Incidental ingestion	1E-05	NA
			Dermal contact	8E-07	NA
		Sediment	Incidental ingestion	2E-04	0.7
			Dermal contact	2E-05	0.1
		Surface water	Incidental ingestion	3E-06	0.1
			Dermal contact	1E-07	0.04
		Combined Fish Diet	Ingestion	1E-03	30
			Total Risk:	**2E-03**	**31**
Resident Living Along the River	Older Child (ages 7 through 18)				
		Bank Soil	Incidental ingestion	3E-06	NA
			Dermal contact	9E-07	NA
		Sediment	Incidental ingestion	4E-05	0.08
			Dermal contact	1E-05	0.03
		Surface water	Incidental ingestion	2E-06	0.04
			Dermal contact	2E-07	0.03
		Combined Fish Diet	Ingestion	2E-03	20
			Total Risk:	**2E-03**	**20**
Resident Living Along the River	Adult (ages 19 and above)				
		Bank Soil	Incidental ingestion	2E-06	NA
			Dermal contact	3E-07	NA
		Sediment	Incidental ingestion	2E-05	0.05
			Dermal contact	3E-06	0.01
		Surface water	Incidental ingestion	1E-06	0.02
			Dermal contact	1E-07	0.02
		Combined Fish Diet	Ingestion	2E-03	19
			Total Risk:	**2E-03**	**19**
			Total Receptor Risk:	**5E-03**	**NC**

Table 11.RME
Risk Assessment Summary

Baseline Human Health Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Exposure Scenario	Receptor	Exposure Point	Exposure Route	Excess Lifetime Cancer Risk	Hazard Index
Current/Future - Lyman Mill Pond					
Visiting Recreational Angler	Child (ages 1 through 6)				
		Sediment	Incidental ingestion	NA	NA
			Dermal contact	NA	NA
		Surface water	Incidental ingestion	NA	NA
			Dermal contact	NA	NA
		Combined Fish Diet	*Ingestion*	2E-03	34
			Total Risk:	**2E-03**	**34**
Visiting Recreational Angler	Older Child (ages 7 through 18)				
		Sediment	Incidental ingestion	9E-06	0.007
			Dermal contact	4E-06	0.004
		Surface water	Incidental ingestion	9E-08	0.0002
			Dermal contact	6E-08	0.002
		Combined Fish Diet	Ingestion	2E-03	22
			Total Risk:	**2E-03**	**22**
Visiting Recreational Angler	Adult (ages 19 and above)				
		Sediment	Incidental ingestion	6E-06	0.004
			Dermal contact	1E-06	0.001
		Surface water	Incidental ingestion	6E-08	0.0001
			Dermal contact	6E-08	0.002
		Combined Fish Diet	Ingestion	2E-03	21
			Total Risk:	**2E-03**	**22**
			Total Receptor Risk:	**6E-03**	**NC**

Table 11.RME
Risk Assessment Summary

Baseline Human Health Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Exposure Scenario	Receptor	Exposure Point	Exposure Route	Excess Lifetime Cancer Risk	Hazard Index
Current/Future - Lyman Mill Pond (cont)					
Resident Living Along the River	Child (ages 1 through 6)				
		Sediment	Incidental ingestion	2E-04	0.3
			Dermal contact	2E-05	0.04
		Surface water	Incidental ingestion	6E-06	0.02
			Dermal contact	2E-07	0.01
		Combined Fish Diet	Ingestion	2E-03	34
			Total Risk:	**2E-03**	**34**
Resident Living Along the River	Older Child (ages 7 through 18)				
		Sediment	Incidental ingestion	5E-05	0.04
			Dermal contact	1E-05	0.01
		Surface water	Incidental ingestion	4E-06	0.008
			Dermal contact	3E-07	0.01
		Combined Fish Diet	Ingestion	2E-03	22
			Total Risk:	**2E-03**	**22**
Resident Living Along the River	Adult (ages 19 and above)				
		Sediment	Incidental ingestion	3E-05	0.03
			Dermal contact	4E-06	0.004
		Surface water	Incidental ingestion	2E-06	0.005
			Dermal contact	2E-07	0.008
		Combined Fish Diet	Ingestion	2E-03	21
			Total Risk:	**2E-03**	**22**
			Total Receptor Risk:	**6E-03**	**NC**

Table 11.RME
Risk Assessment Summary

Baseline Human Health Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Exposure Scenario	Receptor	Exposure Point	Exposure Route	Excess Lifetime Cancer Risk	Hazard Index
Current/Future - Manton Pond					
Visiting Recreational Angler	Child (ages 1 through 6)				
		Sediment	Incidental ingestion	NA	NA
			Dermal contact	NA	NA
		Surface water	Incidental ingestion	NA	NA
			Dermal contact	NA	NA
		Combined Fish Diet	Ingestion	1E-04	5
			Total Risk:	**1E-04**	**5**
Visiting Recreational Angler	Older Child (ages 7 through 18)				
		Sediment	Incidental ingestion	1E-06	0.0006
			Dermal contact	5E-07	0.00008
		Surface water	Incidental ingestion	9E-08	0.0002
			Dermal contact	6E-08	0.002
		Combined Fish Diet	Ingestion	2E-04	4
			Total Risk:	**2E-04**	**4**
Visiting Recreational Angler	Adult (ages 19 and above)				
		Sediment	Incidental ingestion	7E-07	0.0004
			Dermal contact	1E-07	0.00003
		Surface water	Incidental ingestion	6E-08	0.0001
			Dermal contact	6E-08	0.002
		Combined Fish Diet	Ingestion	2E-04	3
			Total Risk:	**2E-04**	**3**
			Total Receptor Risk:	**5E-04**	**NC**

Table 11.RME
Risk Assessment Summary

Baseline Human Health Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Exposure Scenario	Receptor	Exposure Point	Exposure Route	Excess Lifetime Cancer Risk	Hazard Index
Current/Future - Manton Pond (cont)					
Resident Living Along the River	Child (ages 1 through 6)				
		Sediment	Incidental ingestion	3E-05	0.03
			Dermal contact	2E-06	0.0008
		Surface water	Incidental ingestion	6E-06	0.02
			Dermal contact	2E-07	0.01
		Combined Fish Diet	Ingestion	1E-04	5
			Total Risk:	**2E-04**	**6**
Resident Living Along the River	Older Child (ages 7 through 18)				
		Sediment	Incidental ingestion	6E-06	0.003
			Dermal contact	1E-06	0.0003
		Surface water	Incidental ingestion	4E-06	0.008
			Dermal contact	3E-07	0.01
		Combined Fish Diet	Ingestion	2E-04	4
			Total Risk:	**2E-04**	**4**
Resident Living Along the River	Adult (ages 19 and above)				
		Sediment	Incidental ingestion	4E-06	0.002
			Dermal contact	4E-07	0.00008
		Surface water	Incidental ingestion	2E-06	0.005
			Dermal contact	2E-07	0.008
		Combined Fish Diet	Ingestion	2E-04	3
			Total Risk:	**2E-04**	**4**
			Total Receptor Risk:	**5E-04**	**NC**

Table 11.RME
Risk Assessment Summary

Baseline Human Health Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Exposure Scenario	Receptor	Exposure Point	Exposure Route	Excess Lifetime Cancer Risk	Hazard Index
Current/Future - Dyerville Pond					
Visiting Recreational Angler	Child (ages 1 through 6)				
		Sediment	Incidental ingestion	NA	NA
			Dermal contact	NA	NA
		Surface water	Incidental ingestion	NA	NA
			Dermal contact	NA	NA
		Combined Fish Diet	Ingestion	3E-04	8
			Total Risk:	**3E-04**	**8**
Visiting Recreational Angler	Older Child (ages 7 through 18)				
		Sediment	Incidental ingestion	4E-07	0.009
			Dermal contact	4E-07	0.005
		Surface water	Incidental ingestion	9E-08	0.0002
			Dermal contact	6E-08	0.002
		Combined Fish Diet	Ingestion	4E-04	5
			Total Risk:	**4E-04**	**5**
Visiting Recreational Angler	Adult (ages 19 and above)				
		Sediment	Incidental ingestion	2E-07	0.006
			Dermal contact	1E-07	0.002
		Surface water	Incidental ingestion	6E-08	0.0001
			Dermal contact	6E-08	0.002
		Combined Fish Diet	Ingestion	4E-04	5
			Total Risk:	**4E-04**	**5**
			Total Receptor Risk:	**1E-03**	**NC**

Table 11.RME
Risk Assessment Summary

Baseline Human Health Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Exposure Scenario	Receptor	Exposure Point	Exposure Route	Excess Lifetime Cancer Risk	Hazard Index
Current/Future - Dyerville Pond (cont)					
Resident Living Along the River	Child (ages 1 through 6)				
		Sediment	Incidental ingestion	9E-06	0.4
			Dermal contact	2E-06	0.05
		Surface water	Incidental ingestion	6E-06	0.02
			Dermal contact	2E-07	0.01
		Combined Fish Diet	Ingestion	3E-04	8
			Total Risk:	**3E-04**	**8**
Resident Living Along the River	Older Child (ages 7 through 18)				
		Sediment	Incidental ingestion	2E-06	0.05
			Dermal contact	1E-06	0.02
		Surface water	Incidental ingestion	4E-06	0.008
			Dermal contact	3E-07	0.01
		Combined Fish Diet	Ingestion	4E-04	5
			Total Risk:	**4E-04**	**5**
Resident Living Along the River	Adult (ages 19 and above)				
		Sediment	Incidental ingestion	1E-06	0.03
			Dermal contact	4E-07	0.005
		Surface water	Incidental ingestion	2E-06	0.005
			Dermal contact	2E-07	0.008
		Combined Fish Diet	Ingestion	4E-04	5
			Total Risk:	**4E-04**	**5**
			Total Receptor Risk:	**1E-03**	**NC**
Current/Future - Fogarty Center					
Worker	Adult (ages 19 and above)	Surface Soil	Incidental ingestion	8E-06	0.04
			Dermal contact	1E-05	0.03
			Total Risk:	**2E-05**	**0.07**

NA = Not applicable. The "Visiting Recreational Angler Child" is not expected to visit the Site and therefore are not exposed to surface water, sediment, or bank soil at the Site. It is presumed that the Child is exposed only by consuming fish caught by older family members.
NC = Not calculated because Hazard Index is not summed across age groups.

Table 11.CT
Risk Assessment Summary

Baseline Human Health Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Exposure Scenario	Receptor	Exposure Point	Exposure Route	Excess Lifetime Cancer Risk	Hazard Index
Current/Future - Assapumpset Pond					
Visiting Recreational Angler	Child (ages 1 through 6)				
		Sediment	Incidental ingestion	NA	NA
			Dermal contact	NA	NA
		Surface water	Incidental ingestion	NA	NA
			Dermal contact	NA	NA
		Combined Fish Diet	Ingestion	2E-06	0.5
			Total Risk:	**2E-06**	**0.5**
Visiting Recreational Angler	Older Child (ages 7 through 18)				
		Sediment	Incidental ingestion	4E-09	0.0004
			Dermal contact	2E-09	0.00004
		Surface water	Incidental ingestion	6E-11	0.000007
			Dermal contact	7E-11	0.0003
		Combined Fish Diet	Ingestion	2E-06	0.3
			Total Risk:	**2E-06**	**0.3**
Visiting Recreational Angler	Adult (ages 19 and above)				
		Sediment	Incidental ingestion	4E-09	0.0003
			Dermal contact	6E-10	0.000008
		Surface water	Incidental ingestion	5E-11	0.000004
			Dermal contact	9E-11	0.0003
		Combined Fish Diet	Ingestion	2E-06	0.3
			Total Risk:	**2E-06**	**0.3**
			Total Receptor Risk:	**6E-06**	**NC**

Table 11.CT
Risk Assessment Summary

Baseline Human Health Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Exposure Scenario	Receptor	Exposure Point	Exposure Route	Excess Lifetime Cancer Risk	Hazard Index
Current/Future - Assapumpset Pond (cont)					
Resident Living Along the River	Child (ages 1 through 6)				
		Sediment	Incidental ingestion	1E-07	0.02
			Dermal contact	1E-08	0.0004
		Surface water	Incidental ingestion	5E-09	0.0009
			Dermal contact	3E-10	0.002
		Combined Fish Diet	Ingestion	2E-06	0.5
			Total Risk:	**2E-06**	**0.5**
Resident Living Along the River	Older Child (ages 7 through 18)				
		Sediment	Incidental ingestion	2E-08	0.002
			Dermal contact	5E-09	0.00008
		Surface water	Incidental ingestion	3E-09	0.0003
			Dermal contact	4E-10	0.002
		Combined Fish Diet	Ingestion	2E-06	0.3
			Total Risk:	**2E-06**	**0.3**
Resident Living Along the River	Adult (ages 19 and above)				
		Sediment	Incidental ingestion	2E-08	0.001
			Dermal contact	1E-09	0.00002
		Surface water	Incidental ingestion	2E-09	0.0002
			Dermal contact	5E-10	0.002
		Combined Fish Diet	Ingestion	2E-06	0.3
			Total Risk:	**2E-06**	**0.3**
			Total Receptor Risk:	**6E-06**	**NC**

Table 11.CT
Risk Assessment Summary

Baseline Human Health Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Exposure Scenario	Receptor	Exposure Point	Exposure Route	Excess Lifetime Cancer Risk	Hazard Index
Current/Future - Greystone Mill Pond					
Visiting Recreational Angler	Child (ages 1 through 6)				
		Bank Soil	Incidental ingestion	NA	NA
			Dermal contact	NA	NA
		Sediment	Incidental ingestion	NA	NA
			Dermal contact	NA	NA
		Surface water	Incidental ingestion	NA	NA
			Dermal contact	NA	NA
		Combined Fish Diet	Ingestion	5E-06	3
			Total Risk:	**5E-06**	**3**
Visiting Recreational Angler	Older Child (ages 7 through 18)				
		Bank Soil	Incidental ingestion	2E-08	0.002
			Dermal contact	2E-08	0.0004
		Sediment	Incidental ingestion	2E-08	0.001
			Dermal contact	8E-09	0.0002
		Surface water	Incidental ingestion	5E-11	0.000008
			Dermal contact	8E-11	0.0003
		Combined Fish Diet	Ingestion	5E-06	2
			Total Risk:	**5E-06**	**2**
Visiting Recreational Angler	Adult (ages 19 and above)				
		Bank Soil	Incidental ingestion	2E-08	0.001
			Dermal contact	4E-09	0.00007
		Sediment	Incidental ingestion	2E-08	0.0008
			Dermal contact	2E-09	0.00004
		Surface water	Incidental ingestion	4E-11	0.000005
			Dermal contact	1E-10	0.0003
		Combined Fish Diet	Ingestion	6E-06	2
			Total Risk:	**6E-06**	**2**
			Total Receptor Risk:	**2E-05**	**NC**

Table 11.CT
Risk Assessment Summary

Baseline Human Health Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Exposure Scenario	Receptor	Exposure Point	Exposure Route	Excess Lifetime Cancer Risk	Hazard Index
Current/Future - Greystone Mill Pond (cont)					
Resident Living Along the River	Child (ages 1 through 6)				
		Bank Soil	Incidental ingestion	1E-06	0.2
			Dermal contact	1E-07	0.004
		Sediment	Incidental ingestion	8E-07	0.06
			Dermal contact	5E-08	0.002
		Surface water	Incidental ingestion	4E-09	0.001
			Dermal contact	3E-10	0.002
		Combined Fish Diet	Ingestion	5E-06	3
			Total Risk:	**7E-06**	**4**
Resident Living Along the River	Older Child (ages 7 through 18)				
		Bank Soil	Incidental ingestion	3E-07	0.03
			Dermal contact	1E-07	0.002
		Sediment	Incidental ingestion	9E-08	0.005
			Dermal contact	2E-08	0.0004
		Surface water	Incidental ingestion	2E-09	0.0003
			Dermal contact	5E-10	0.002
		Combined Fish Diet	Ingestion	5E-06	2
			Total Risk:	**5E-06**	**2**
Resident Living Along the River	Adult (ages 19 and above)				
		Bank Soil	Incidental ingestion	2E-07	0.02
			Dermal contact	3E-08	0.0004
		Sediment	Incidental ingestion	8E-08	0.003
			Dermal contact	5E-09	0.00008
		Surface water	Incidental ingestion	2E-09	0.0002
			Dermal contact	5E-10	0.002
		Combined Fish Diet	Ingestion	6E-06	2
			Total Risk:	**7E-06**	**2**
			Total Receptor Risk:	**2E-05**	**NC**

Table 11.CT
Risk Assessment Summary

Baseline Human Health Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Exposure Scenario	Receptor	Exposure Point	Exposure Route	Excess Lifetime Cancer Risk	Hazard Index
Current/Future - Allendale Pond					
Visiting Recreational Angler	Child (ages 1 through 6)				
		Bank Soil	Incidental ingestion	NA	NA
			Dermal contact	NA	NA
		Sediment	Incidental ingestion	NA	NA
			Dermal contact	NA	NA
		Surface water	Incidental ingestion	NA	NA
			Dermal contact	NA	NA
		Combined Fish Diet	Ingestion	3E-04	19
			Total Risk:	**3E-04**	**19**
Visiting Recreational Angler	Older Child (ages 7 through 18)				
		Bank Soil	Incidental ingestion	2E-08	NA
			Dermal contact	4E-09	NA
		Sediment	Incidental ingestion	4E-07	0.003
			Dermal contact	8E-08	0.001
		Surface water	Incidental ingestion	3E-09	0.00009
			Dermal contact	4E-09	0.003
		Combined Fish Diet	Ingestion	3E-04	13
			Total Risk:	**3E-04**	**13**
Visiting Recreational Angler	Adult (ages 19 and above)				
		Bank Soil	Incidental ingestion	1E-08	NA
			Dermal contact	9E-10	NA
		Sediment	Incidental ingestion	3E-07	0.002
			Dermal contact	2E-08	0.0002
		Surface water	Incidental ingestion	2E-09	0.00006
			Dermal contact	5E-09	0.003
		Combined Fish Diet	Ingestion	4E-04	12
			Total Risk:	**4E-04**	**12**
			Total Receptor Risk:	**1E-03**	**NC**

Table 11.CT
Risk Assessment Summary

Baseline Human Health Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Exposure Scenario	Receptor	Exposure Point	Exposure Route	Excess Lifetime Cancer Risk	Hazard Index
Current/Future - Allendale Pond (cont)					
Resident Living Along the River	Child (ages 1 through 6)				
		Bank Soil	Incidental ingestion	8E-07	NA
			Dermal contact	3E-08	NA
		Sediment	Incidental ingestion	1E-05	0.2
			Dermal contact	5E-07	0.01
		Surface water	Incidental ingestion	2E-07	0.01
			Dermal contact	2E-08	0.02
		Combined Fish Diet	Ingestion	3E-04	19
			Total Risk:	**3E-04**	**19**
Resident Living Along the River	Older Child (ages 7 through 18)				
		Bank Soil	Incidental ingestion	2E-07	NA
			Dermal contact	2E-08	NA
		Sediment	Incidental ingestion	2E-06	0.01
			Dermal contact	2E-07	0.002
		Surface water	Incidental ingestion	1E-07	0.004
			Dermal contact	3E-08	0.02
		Combined Fish Diet	Ingestion	3E-04	13
			Total Risk:	**3E-04**	**13**
Resident Living Along the River	Adult (ages 19 and above)				
		Bank Soil	Incidental ingestion	2E-07	NA
			Dermal contact	6E-09	NA
		Sediment	Incidental ingestion	1E-06	0.009
			Dermal contact	5E-08	0.0005
		Surface water	Incidental ingestion	1E-07	0.002
			Dermal contact	3E-08	0.01
		Combined Fish Diet	Ingestion	4E-04	12
			Total Risk:	**4E-04**	**12**
			Total Receptor Risk:	**1E-03**	**NC**

Table 11.CT
Risk Assessment Summary

Baseline Human Health Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Exposure Scenario	Receptor	Exposure Point	Exposure Route	Excess Lifetime Cancer Risk	Hazard Index
Current/Future - Lyman Mill Pond					
Visiting Recreational Angler	Child (ages 1 through 6)				
		Sediment	*Incidental ingestion*	NA	NA
			Dermal contact	NA	NA
		Surface water	Incidental ingestion	NA	NA
			Dermal contact	NA	NA
		Combined Fish Diet	Ingestion	4E-04	21
			Total Risk:	**4E-04**	**21**
Visiting Recreational Angler	Older Child (ages 7 through 18)				
		Sediment	Incidental ingestion	1E-07	0.002
			Dermal contact	3E-08	0.0003
		Surface water	Incidental ingestion	1E-09	0.00005
			Dermal contact	7E-09	0.001
		Combined Fish Diet	Ingestion	3E-04	14
			Total Risk:	**3E-04**	**14**
Visiting Recreational Angler	Adult (ages 19 and above)				
		Sediment	Incidental ingestion	1E-07	0.001
			Dermal contact	9E-09	0.00006
		Surface water	Incidental ingestion	9E-10	0.00003
			Dermal contact	9E-09	0.001
		Combined Fish Diet	Ingestion	4E-04	14
			Total Risk:	**4E-04**	**14**
			Total Receptor Risk:	**1E-03**	**NC**

Table 11.CT
Risk Assessment Summary

Baseline Human Health Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Exposure Scenario	Receptor	Exposure Point	Exposure Route	Excess Lifetime Cancer Risk	Hazard Index
Current/Future - Lyman Mill Pond (cont)					
Resident Living Along the River	Child (ages 1 through 6)				
		Sediment	Incidental ingestion	4E-06	0.08
			Dermal contact	2E-07	0.003
		Surface water	Incidental ingestion	9E-08	0.006
			Dermal contact	3E-08	0.006
		Combined Fish Diet	Ingestion	4E-04	21
			Total Risk:	**4E-04**	**22**
Resident Living Along the River	Older Child (ages 7 through 18)				
		Sediment	Incidental ingestion	6E-07	0.007
			Dermal contact	7E-08	0.0006
		Surface water	Incidental ingestion	4E-08	0.002
			Dermal contact	5E-08	0.007
		Combined Fish Diet	Ingestion	3E-04	14
			Total Risk:	**3E-04**	**14**
Resident Living Along the River	Adult (ages 19 and above)				
		Sediment	Incidental ingestion	5E-07	0.004
			Dermal contact	2E-08	0.0001
		Surface water	Incidental ingestion	4E-08	0.001
			Dermal contact	5E-08	0.006
		Combined Fish Diet	Ingestion	4E-04	14
			Total Risk:	**4E-04**	**14**
			Total Receptor Risk:	**1E-03**	**NC**

Table 11.CT
Risk Assessment Summary

Baseline Human Health Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Exposure Scenario	Receptor	Exposure Point	Exposure Route	Excess Lifetime Cancer Risk	Hazard Index
Current/Future - Manton Pond					
Visiting Recreational Angler	Child (ages 1 through 6)				
		Sediment	Incidental ingestion	NA	NA
			Dermal contact	NA	NA
		Surface water	Incidental ingestion	NA	NA
			Dermal contact	NA	NA
		Combined Fish Diet	Ingestion	5E-05	2
			Total Risk:	**5E-05**	**2**
Visiting Recreational Angler	Older Child (ages 7 through 18)				
		Sediment	Incidental ingestion	3E-08	0.00009
			Dermal contact	5E-09	0.000006
		Surface water	Incidental ingestion	1E-09	0.00005
			Dermal contact	7E-09	0.001
		Combined Fish Diet	Ingestion	7E-05	1
			Total Risk:	**7E-05**	**1**
Visiting Recreational Angler	Adult (ages 19 and above)				
		Sediment	Incidental ingestion	2E-08	0.00006
			Dermal contact	1E-09	0.000001
		Surface water	Incidental ingestion	9E-10	0.00003
			Dermal contact	9E-09	0.001
		Combined Fish Diet	Ingestion	7E-05	1
			Total Risk:	**7E-05**	**1**
			Total Receptor Risk:	**2E-04**	**NC**

Table 11.CT
Risk Assessment Summary

Baseline Human Health Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Exposure Scenario	Receptor	Exposure Point	Exposure Route	Excess Lifetime Cancer Risk	Hazard Index
Current/Future - Manton Pond (cont)					
Resident Living Along the River	Child (ages 1 through 6)				
		Sediment	Incidental ingestion	9E-07	0.005
			Dermal contact	3E-08	0.00006
		Surface water	Incidental ingestion	9E-08	0.006
			Dermal contact	3E-08	0.006
		Combined Fish Diet	Ingestion	1E-04	4
			Total Risk:	**1E-04**	**4**
Resident Living Along the River	Older Child (ages 7 through 18)				
		Sediment	Incidental ingestion	1E-07	0.0004
			Dermal contact	1E-08	0.00001
		Surface water	Incidental ingestion	4E-08	0.002
			Dermal contact	5E-08	0.007
		Combined Fish Diet	Ingestion	5E-05	1
			Total Risk:	**5E-05**	**1**
Resident Living Along the River	Adult (ages 19 and above)				
		Sediment	Incidental ingestion	1E-07	0.0003
			Dermal contact	3E-09	0.000003
		Surface water	Incidental ingestion	4E-08	0.001
			Dermal contact	5E-08	0.006
		Combined Fish Diet	Ingestion	5E-05	1
			Total Risk:	**5E-05**	**1**
			Total Receptor Risk:	**2E-04**	**NC**

Table 11.CT
Risk Assessment Summary

Baseline Human Health Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Exposure Scenario	Receptor	Exposure Point	Exposure Route	Excess Lifetime Cancer Risk	Hazard Index
Current/Future - Dyerville Pond					
Visiting Recreational Angler	Child (ages 1 through 6)				
		Sediment	Incidental ingestion	NA	NA
			Dermal contact	NA	NA
		Surface water	Incidental ingestion	NA	NA
			Dermal contact	NA	NA
		Combined Fish Diet	Ingestion	5E-05	4
			Total Risk:	**5E-05**	**4**
Visiting Recreational Angler	Older Child (ages 7 through 18)				
		Sediment	Incidental ingestion	1E-08	0.0009
			Dermal contact	6E-09	0.0002
		Surface water	Incidental ingestion	1E-09	0.00005
			Dermal contact	7E-09	0.001
		Combined Fish Diet	Ingestion	5E-05	3
			Total Risk:	**5E-05**	**3**
Visiting Recreational Angler	Adult (ages 19 and above)				
		Sediment	Incidental ingestion	1E-08	0.0006
			Dermal contact	2E-09	0.00004
		Surface water	Incidental ingestion	9E-10	0.00003
			Dermal contact	9E-09	0.001
		Combined Fish Diet	Ingestion	6E-05	3
			Total Risk:	**6E-05**	**3**
			Total Receptor Risk:	**2E-04**	**NC**

Table 11.CT
Risk Assessment Summary

Baseline Human Health Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Exposure Scenario	Receptor	Exposure Point	Exposure Route	Excess Lifetime Cancer Risk	Hazard Index
Current/Future - Dyerville Pond (cont)					
Resident Living Along the River	Child (ages 1 through 6)				
		Sediment	Incidental ingestion	5E-07	0.05
			Dermal contact	4E-08	0.002
		Surface water	Incidental ingestion	9E-08	0.006
			Dermal contact	3E-08	0.006
		Combined Fish Diet	Ingestion	5E-05	4
			Total Risk:	**5E-05**	**4**
Resident Living Along the River	Older Child (ages 7 through 18)				
		Sediment	Incidental ingestion	6E-08	0.004
			Dermal contact	1E-08	0.0004
		Surface water	Incidental ingestion	4E-08	0.002
			Dermal contact	5E-08	0.007
		Combined Fish Diet	Ingestion	5E-05	3
			Total Risk:	**5E-05**	**3**
Resident Living Along the River	Adult (ages 19 and above)				
		Sediment	Incidental ingestion	5E-08	0.002
			Dermal contact	4E-09	0.00009
		Surface water	Incidental ingestion	4E-08	0.001
			Dermal contact	5E-08	0.006
		Combined Fish Diet	Ingestion	6E-05	3
			Total Risk:	**6E-05**	**3**
			Total Receptor Risk:	**2E-04**	**NC**
Current/Future - Fogarty Center					
Worker	Adult (ages 19 and above)	Surface Soil	Incidental ingestion	7E-07	0.01
			Dermal contact	2E-07	0.002
			Total Risk:	**8E-07**	**0.01**

NA = Not applicable. The "Visiting Recreational Angler Child" is not expected to visit the Site and therefore are not exposed to surface water, sediment, or bank soil at the Site. It is presumed that the Child is exposed only by consuming fish caught by older family members.
NC = Not calculated because Hazard Index is not summed across age groups.

Table
Summary of Non-Cancer Risks

Baseline Human Health Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Non-Carcinogenic Risk			Combined Fish Diet CT	Combined Fish Diet RME	Sediment CT	Sediment RME	Surface Water CT	Surface Water RME	Bank Soil CT	Bank Soil RME	Hazard Index CT	Hazard Index RME	Incremental Hazard Index CT	Incremental Hazard Index RME
Resident Living Along River														
Current & Future	Assapumpset													
		Child	0.5	2	0.02	0.2	0.003	0.009	NA	NA	0.5	2	--	--
		Older Child	0.3	1	0.002	0.02	0.002	0.005	NA	NA	0.3	1	--	--
		Adult	0.3	1	0.001	0.01	0.002	0.004	NA	NA	0.3	1	--	--
	Greystone													
		Child	3	5	0.07	0.5	0.003	0.008	0.2	1	4	7	--	--
		Older Child	2	4	0.006	0.07	0.002	0.004	0.03	0.2	2	4	--	--
		Adult	2	3	0.003	0.04	0.002	0.003	0.02	0.1	2	4	--	--
	Allendale													
		Child	19	30	0.2	0.8	0.03	0.1	NC	NC	19	31	**16**	**24**
		Older Child	13	20	0.02	0.1	0.02	0.06	NC	NC	13	20	**10**	**16**
		Adult	12	19	0.009	0.06	0.02	0.05	NC	NC	12	19	**10**	**16**
	Lyman Mill													
		Child	21	34	0.08	0.4	0.01	0.04	NA	NA	22	34	**18**	**27**
		Older Child	14	22	0.007	0.05	0.01	0.02	NA	NA	14	22	**12**	**18**
		Adult	14	21	0.004	0.03	0.01	0.01	NA	NA	14	22	**11**	**18**
	Manton													
		Child	4	5	0.005	0.03	0.01	0.04	NA	NA	4	6	0	0
		Older Child	1	4	0.0004	0.004	0.01	0.02	NA	NA	1	4	0	0
		Adult	1	3	0.0003	0.002	0.01	0.01	NA	NA	1	4	0	0
	Dyerville													
		Child	4	8	0.05	0.5	0.01	0.04	NA	NA	4	8	0.5	**1**
		Older Child	3	5	0.004	0.07	0.01	0.02	NA	NA	3	5	0.4	**1**
		Adult	3	5	0.003	0.04	0.01	0.01	NA	NA	3	5	0.4	**1**
Visiting Recreational Angler														
Current & Future	Assapumpset													
		Child	0.5	2	NA	NA	NA	NA	NA	NA	0.5	2	--	--
		Older Child	0.3	1	0.0004	0.004	0.0003	0.0009	NA	NA	0.3	1	--	--
		Adult	0.3	1	0.0003	0.002	0.0003	0.0008	NA	NA	0.3	1	--	--
	Greystone													
		Child	3	5	NA	NA	NA	NA	NA	NA	3	5	--	--
		Older Child	2	4	0.001	0.01	0.0003	0.0008	0.002	0.02	2	4	--	--
		Adult	2	3	0.0008	0.007	0.0003	0.0007	0.001	0.01	2	3	--	--
	Allendale													
		Child	19	30	NA	NA	NA	NA	NA	NA	19	30	**16**	**25**
		Older Child	13	20	0.004	0.03	0.003	0.008	NC	NC	13	20	**10**	**16**
		Adult	12	19	0.002	0.01	0.003	0.007	NC	NC	12	19	**10**	**16**
	Lyman Mill													
		Child	21	34	NA	NA	NA	NA	NA	NA	21	34	**18**	**28**
		Older Child	14	22	0.002	0.01	0.001	0.003	NA	NA	14	22	**12**	**19**
		Adult	14	21	0.001	0.006	0.001	0.002	NA	NA	14	22	**11**	**18**
	Manton													
		Child	2	5	NA	NA	NA	NA	NA	NA	2	5	0	0
		Older Child	1	4	0.0001	0.0007	0.001	0.003	NA	NA	1	4	0	0
		Adult	1	3	0.00006	0.0004	0.001	0.002	NA	NA	1	3	0	0
	Dyerville													
		Child	4	8	NA	NA	NA	NA	NA	NA	4	8	0.7	**2**
		Older Child	3	5	0.001	0.01	0.001	0.003	NA	NA	3	5	0.4	**2**
		Adult	3	5	0.0006	0.007	0.001	0.002	NA	NA	3	5	0.4	**2**
Commercial/Industrial Employee														
Current & Future	Fogarty Center [1]		NA	NA	NA	NA	NA	NA	0.01	0.07	0.01	0.07	NB	NB

[1] Surface Soil
CT = Central Tendency
RME = Reasonable Maximum Exposure
NC = Not Calculated - Only dioxin data available for bank soil No Hazard Index calculated
NB = No background information for surface soil Incremental Risk not calculated
NA = Not Applicable - Medium not assessed for this exposure area
Incremental Receptor Risk = Difference in risk between the exposure point and the background exposure point
-- = Incremental risk is not calculated for background or reference areas.
BOLDED incremental risk are above the Superfund Noncancer Hazard Index benchmark of 1

Prepared by: RAR
Checked by: KJA

Table 13
Summary of Cancer Risks

Baseline Human Health Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Carcinogenic Risk		Combined Fish Diet		Sediment		Surface Water		Bank Soil		Receptor Total		Incremental Receptor Risk	
		CT	RME	CT	RME	CT	RME	CT	RME	CT	RME	CT	RME
Resident Living Along River (all age groups)													
Current & Future	Assapumpset	6E-06	5E-05	2E-07	6E-06	1E-08	1E-07	NA	NA	6E-06	6E-05	--	--
	Greystone	2E-05	8E-05	1E-06	2E-05	1E-08	1E-07	2E-06	4E-05	2E-05	1E-04	--	--
	Allendale	1E-03	5E-03	2E-05	2E-04	5E-07	6E-06	1E-06	2E-05	1E-03	5E-03	**1E-03**	**5E-03**
	Lyman Mill	1E-03	6E-03	6E-06	3E-04	3E-07	1E-05	NA	NA	1E-03	6E-03	**1E-03**	**6E-03**
	Manton	2E-04	5E-04	1E-06	4E-05	3E-07	1E-05	NA	NA	2E-04	5E-04	**2E-04**	**4E-04**
	Dyerville	2E-04	1E-03	7E-07	2E-05	3E-07	1E-05	NA	NA	2E-04	1E-03	**1E-04**	**1E-03**
Visiting Recreational Angler (all age groups)													
Current & Future	Assapumpset	6E-06	5E-05	1E-08	4E-07	3E-10	3E-09	NA	NA	6E-06	5E-05	--	--
	Greystone	2E-05	8E-05	5E-08	2E-06	3E-10	3E-09	6E-08	2E-06	2E-05	9E-05	--	--
	Allendale	1E-03	5E-03	8E-07	1E-05	1E-08	2E-07	3E-08	7E-07	1E-03	5E-03	**9E-04**	**5E-03**
	Lyman Mill	1E-03	6E-03	3E-07	2E-05	2E-08	3E-07	NA	NA	1E-03	6E-03	**1E-03**	**6E-03**
	Manton	2E-04	5E-04	6E-08	2E-06	2E-08	3E-07	NA	NA	2E-04	5E-04	**2E-04**	**4E-04**
	Dyerville	2E-04	1E-03	3E-08	1E-06	2E-08	3E-07	NA	NA	2E-04	1E-03	**1E-04**	**1E-03**
Commercial/Industrial Employee													
Current & Future	Fogarty Center [1]	NA	NA	NA	NA	NA	NA	8E-07	2E-05	8E-07	2E-05	NB	NB

[1] Surface Soil
CT = Central Tendency
RME = Reasonable Maximum Exposure
NB = No background Information for surface soil. Incremental Risk not calculated
NA = Not Applicable - Medium not assessed for this exposure area
Incremental Receptor Risk = Difference in risk between the exposure point and the background exposure point
-- = Incremental risk is not calculated for background on reference areas.
BOLDED incremental risk are above the high end of the Superfund Cancer risk Range (1E-04 to 1E-06)

Prepared by KJA
Checked by RAR

TABLE 14. SUMMARY OF UNCERTAINTIES IN THE HUMAN HEALTH RISK ASSESSMENT		
Uncertain Technical Issue or Assumption	**Comment**	**Bias**
No reduction in dioxin concentrations due to cooking loss	Conflicting data concerning reduction of concentrations	No bias
Use of maximum detected concentration as exposure point concentration if fewer than 10 samples or if 95% UCL is greater than maximum assumed		High bias
Frequency of wading by Resident Living Along the River and Visiting Recreational Angles	Current frequency affected by advisories. Future frequency cannot be measured	Unknown
Exposure assessment approach for dermal exposure to dioxin in surface water	Dioxin is likely bound to suspended sediment. Absorption through skin unlikely to be significant.	High bias
Identification and evaluation of visiting Subsistence Angler in an appendix	It is not known if the Site could sustain subsistence angling or whether subsistence anglers fish at the site	Unknown
Assessment of exposure and risk for HCX conducted in an appendix		Low bias
Use of Lyman Mill Pond surface water dioxin concentrations to estimate Manton Pond and Dyerville Pond concentrations	No dioxin surface water data for the downstream areas	High bias
Smaller numbers of sediment and fish tissue samples are the basis of risk estimates for Manton Pond and Dyerville Pond	Concentrations of dioxin and Aroclor – 1254 are lower in these two areas than in Allendale Pond and Lyman Mill Pond	Unknown
Exposure to lead in fish tissue is not evaluated quantitatively		Unknown, slight low bias
Selection of target fish species is based on fish species present and reported commonly consumed fish. No detailed consumer survey conducted		Unknown
Combined fish diet, assumes equal consumption rates for each of the species present at each exposure point	No consumer survey possible at this time	Unknown, possible low or high bias based on consumer preference

APPENDIX A

SAMPLE SELECTION CONSIDERATION FOR THE RISK ASSESSMENT

Table A.1
Samples Used in the Baseline Human Health Risk Assessment

Baseline Human Health Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Media	Area	Sample ID	Date Sampled	Depth
Bank Soil	**Greystone Mill Pond**	RWR-FP-5001-0000-01	7/17/2001	0 - 0.5 ft bgs
		RWR-FP-5002-0000-01	7/16/2001	0 - 0.5 ft bgs
		RWR-FP-5003-0000-01	7/17/2001	0 - 0.5 ft bgs
		RWR-FP-5004-0000-01	7/19/2001	0 - 0.5 ft bgs
	Allendale Pond	3428-CMS-001	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-002	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-003	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-004	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-005	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-006	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-007	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-008	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-009	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-010	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-011	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-012	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-013	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-014	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-015	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-016	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-017	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-018	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-019	2/17/1999	0 - 0.25 ft bgs
		CMS-019-A	7/14/1999	0 - 1 ft bgs
Sediment	**Assapumpset Pond**	RAB-FP-3004-01	11/10/1999	0 - 0.5 ft bgs
		RAB-SD-2069-01	9/18/2000	0 - 0.5 ft bgs
		RAB-SD-2070-01	9/18/2000	0 - 0.5 ft bgs
		RAB-SD-3004-01	11/10/1999	0 - 0.5 ft bgs
		RAB-SD-5004-0000-01	7/12/2001	0 - 0.5 ft bgs
		RAB-SD-5008-0000-01	7/9/2001	0 - 0.5 ft bgs
	Greystone Mill Pond	RCC-BK-3002Z-01	10/22/1999	0 - 0.5 ft bgs
		GMP-SD-5007-0000-01	7/9/2001	0 - 0.5 ft bgs
		RCC-BK-3001X-01	10/22/1999	0 - 0.5 ft bgs
		RCC-BK-3001Y-01	10/22/1999	0 - 0.5 ft bgs
		RCC-BK-3001Z-01	10/22/1999	0 - 0.5 ft bgs
		GMP-SD-5002-0000-01	7/11/2001	0 - 0.5 ft bgs
		RCC-BK-3002Y-01	10/22/1999	0 - 0.5 ft bgs
		RWR-SD-5004-0000-01	7/12/2001	0 - 0.5 ft bgs
		RCC-DU-102299A	10/22/1999	0 - 0.5 ft bgs
		RCC-FP-3001-01	11/10/1999	0 - 0.5 ft bgs
		RCC-FP-3002-01	11/10/1999	0 - 0.5 ft bgs
		RCC-SD-3001-01	11/10/1999	0 - 0.5 ft bgs
		RCC-SD-3002-01	11/10/1999	0 - 0.5 ft bgs
		RCC-SD-DU-111099B	11/10/1999	0 - 0.5 ft bgs
		RWR-SD-5003-0000-01	7/12/2001	0 - 0.5 ft bgs
		RCC-BK-3002X-01	10/22/1999	0 - 0.5 ft bgs

Table A.1
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Media	Area	Sample ID	Date Sampled	Depth
Sediment (cont)	**Allendale Pond**	3428-CMS-020	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-022	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-023	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-024	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-025	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-151	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-174	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-175	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-176	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-177	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-179	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-181	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-183	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-186	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-187	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-188	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-190	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-192	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-194	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-195	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-196	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-197	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-199	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-200	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-201	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-203	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-208	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-209	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-210	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-211	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-212	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-213	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-214	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-215	2/17/1999	0 - 0.25 ft bgs
		3428-CMS-216	2/16/1999	0 - 0.25 ft bgs
		3428-CMS-224	2/16/1999	0 - 0.25 ft bgs
		APB-BK-2003Y-01	10/21/1999	0 - 0.5 ft bgs
		APB-BK-2003Z-01	10/21/1999	0 - 0.5 ft bgs
		APB-FP-2028-000.5-01	10/28/1999	0 - 0.5 ft bgs
		APB-FP-2031-01	10/28/1999	0 - 0.5 ft bgs
		APB-FP-2032-01	10/28/1999	0 - 0.5 ft bgs
		APB-FP-2033-000.5-01	10/28/1999	0 - 0.5 ft bgs
		APB-SD-2030-01	10/22/1999	0 - 0.5 ft bgs
		APB-SD-2034-01	11/3/1999	0 - 0.5 ft bgs
		APB-SD-2037-01	10/22/1999	0 - 0.5 ft bgs
		APB-SD-4008-0000-01	7/9/2001	0 - 0.5 ft bgs
		APB-SD-4009-0000-01	7/9/2001	0 - 0.5 ft bgs

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Media	Area	Sample ID	Date Sampled	Depth
Sediment	**Allendale Pond**	APB-SD-4010-0000-01	7/10/2001	0 - 0.5 ft bgs
(cont)	**(cont)**	APC-SD-2035-000.5-01	11/3/1999	0 - 0.5 ft bgs
		CMS-021-A	7/14/1999	0 - 1 ft bgs
		CMS-022-A	7/14/1999	0 - 1 ft bgs
		CMS-023-A	7/14/1999	0 - 1 ft bgs
		CMS-024-A	7/14/1999	0 - 1 ft bgs
		CMS-025-A	7/14/1999	0 - 1 ft bgs
		CMS-175-A	6/25/1999	0 - 1 ft bgs
		CMS-182-A	7/7/1999	0 - 1 ft bgs
		CMS-186-A	7/6/1999	0 - 1 ft bgs
		CMS-187-A	7/6/1999	0 - 1 ft bgs
		CMS-188-A	7/6/1999	0 - 1 ft bgs
		CMS-192-A	6/30/1999	0 - 1 ft bgs
		CMS-195-A	7/7/1999	0 - 1 ft bgs
		CMS-196-A	7/7/1999	0 - 1 ft bgs
		CMS-200-A	7/7/1999	0 - 1 ft bgs
		CMS-203-A	7/7/1999	0 - 1 ft bgs
		CMS-204-A	7/7/1999	0 - 1 ft bgs
		CMS-208-A	7/8/1999	0 - 1 ft bgs
		CMS-209-A	7/8/1999	0 - 1 ft bgs
		CMS-210-A	7/12/1999	0 - 1 ft bgs
		CMS-212-A	7/12/1999	0 - 1 ft bgs
		CMS-213-A	7/8/1999	0 - 1 ft bgs
		CMS-214-A	7/12/1999	0 - 1 ft bgs
		CMS-465-A	7/27/1999	0 - 1 ft bgs
		CMS-467-A	7/27/1999	0 - 1 ft bgs
		CMS-470-A	7/27/1999	0 - 1 ft bgs
		CMS-471-A	7/27/1999	0 - 1 ft bgs
		CMS-472-A	7/29/1999	0 - 1 ft bgs
		CMS-477-A	7/29/1999	0 - 1 ft bgs
		CMS-484-A	7/30/1999	0 - 1 ft bgs
		CMS-487-A	7/30/1999	0 - 1 ft bgs
		CMS-489-A	7/30/1999	0 - 1 ft bgs
		CMS-490-A	7/30/1999	0 - 1 ft bgs
		CMS-493-A	7/30/1999	0 - 1 ft bgs
		CMS-494-A	8/12/1999	0 - 1 ft bgs
		CMS-495-A	8/12/1999	0 - 1 ft bgs
		CMS-496-A	8/12/1999	0 - 1 ft bgs
		CMS-600-A	9/29/1999	0 - 0.5 ft bgs
		CMS-601-A	9/29/1999	0 - 0.5 ft bgs
		CMS-603-A	9/30/1999	0 - 0.5 ft bgs
		CMS-604-A	10/1/1999	0 - 0.5 ft bgs
		CMS-605-A	9/29/1999	0 - 1 ft bgs
		CMS-606-A	9/29/1999	0 - 0.5 ft bgs
		CMS-608-A	9/29/1999	0 - 0.5 ft bgs
		CMS-609-A	9/29/1999	0 - 0.5 ft bgs
		CMS-610-A	10/1/1999	0 - 0.5 ft bgs

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Media	Area	Sample ID	Date Sampled	Depth
Sediment (cont)	Allendale Pond (cont)	CMS-612-A	9/30/1999	0 - 0.5 ft bgs
		CMS-613-A	9/30/1999	0 - 0.5 ft bgs
		CMS-614-A	9/29/1999	0 - 0.5 ft bgs
		CMS-615-A	9/29/1999	0 - 1 ft bgs
		CMS-616-A	9/29/1999	0 - 0.5 ft bgs
		CMS-618-A	10/1/1999	0 - 0.5 ft bgs
		CMS-619-A	10/1/1999	0 - 0.5 ft bgs
		CMS-620-A	10/1/1999	0 - 0.5 ft bgs
		CMS-622-A	10/5/1999	0 - 0.5 ft bgs
		CMS-623-A	10/5/1999	0 - 0.5 ft bgs
		CMS-625-A	10/1/1999	0 - 0.5 ft bgs
		CMS-626-A	10/1/1999	0 - 0.5 ft bgs
		CMS-627-A	10/5/1999	0 - 0.5 ft bgs
		CMS-628-A	9/29/1999	0 - 1 ft bgs
		CMS-630-A	10/1/1999	0 - 0.5 ft bgs
		CMS-631-A	10/5/1999	0 - 0.5 ft bgs
		CMS-633-A	10/5/1999	0 - 0.5 ft bgs
		CMS-634-A	10/5/1999	0 - 0.5 ft bgs
		CMS-FP-4001-0000-01	7/18/2001	0 - 0.5 ft bgs
		CMS-FP-4002-0000-01	7/18/2001	0 - 0.5 ft bgs
		CMS-FP-4003-0000-01	7/19/2001	0 - 0.5 ft bgs
		CMS-FP-4005-0000-01	7/20/2001	0 - 0.5 ft bgs
		CMS-SD-4003-0000-01	7/12/2001	0 - 0.5 ft bgs
		CMS-SD-4006-0000-01	7/12/2001	0 - 0.5 ft bgs
		CMS-SD-4007-0000-01	7/12/2001	0 - 0.5 ft bgs
		CMW-FP-2027-01	10/28/1999	0 - 0.5 ft bgs
		CMW-SD-2023-01	10/27/1999	0 - 0.5 ft bgs
		CMW-SD-2024-01	10/27/1999	0 - 0.5 ft bgs
		CMW-SD-2025-000.5-01	10/28/1999	0 - 0.5 ft bgs
		DAM002-SD	10/23/1998	0 - 0.33 ft bgs
		RES-SS-12-239-01	11/16/1999	0 - 1 ft bgs
		RES-SS-12-240-02	11/16/1999	0 - 1 ft bgs
		RES-SS-12-550-01	11/16/1999	0 - 1 ft bgs
		RES-SS-12-551-01	11/16/1999	0 - 1 ft bgs
		RES-SS-12-552-01	11/16/1999	0 - 1 ft bgs
		RES-SS-12-554-01	11/16/1999	0 - 1 ft bgs
		RES-SS-14-333-01	11/15/1999	0 - 1 ft bgs
		RES-SS-14-334-01	11/15/1999	0 - 1 ft bgs
		RES-SS-14-365-01	11/15/1999	0 - 1 ft bgs
		RES-SS-14-365-02	11/15/1999	0 - 1 ft bgs
		RES-SS-14-365-03	11/15/1999	0 - 1 ft bgs
		RES-SS-14-366-01	11/15/1999	0 - 1 ft bgs
		RES-SS-14-366-02	11/15/1999	0 - 1 ft bgs
		RES-SS-14-398-01	11/15/1999	0 - 1 ft bgs
		RES-SS-14-399-01	11/15/1999	0 - 1 ft bgs
		RES-SS-14-419-01	11/19/1999	0 - 1 ft bgs

Table A.1
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Media	Area	Sample ID	Date Sampled	Depth
Sediment	**Allendale Pond**	RES-SS-14-420-01	11/19/1999	0 - 1 ft bgs
(cont)	***(cont)***	RES-SS-14-422-01	12/2/1999	0 - 1 ft bgs
		RES-SS-14-424-01	12/2/1999	0 - 1 ft bgs
		RES-SS-14-424-02	12/2/1999	0 - 1 ft bgs
		RES-SS-14-425-01	12/2/1999	0 - 1 ft bgs
		RES-SS-14-448-01	11/15/1999	0 - 1 ft bgs
		RES-SS-14-449-01	12/2/1999	0 - 1 ft bgs
		RES-SS-14-449-02	12/2/1999	0 - 1 ft bgs
		SD-20	9/9/1998	0 - 0.25 ft bgs
		SD-22	9/9/1998	0 - 0.25 ft bgs
		SD-23	9/9/1998	0 - 0.25 ft bgs
		SD-24	9/9/1998	0 - 0.25 ft bgs
		SD-25	9/9/1998	0 - 0.25 ft bgs
		SD-26	9/9/1998	0 - 0.5 ft bgs
		SD-27	9/9/1998	0 - 0.5 ft bgs
		SD-28	9/9/1998	0 - 0.5 ft bgs
		SD-29	9/9/1998	0 - 0.5 ft bgs
		WRC-SD-2009-01	11/1/1999	0 - 0.5 ft bgs
		WRC-SD-2013-000.5-01	11/1/1999	0 - 0.5 ft bgs
		WRC-SD-2014-01	11/1/1999	0 - 0.5 ft bgs
		WRC-SD-2015-01	11/1/1999	0 - 0.5 ft bgs
		WRL-SD-2039-01	10/25/1999	0 - 0.5 ft bgs
		WRL-SD-2044-000.5-01	11/9/1999	0 - 0.5 ft bgs
Sediment	**Lyman Mill Pond**	DAM003-SD	10/23/1998	0 - 0.33 ft bgs
		LPX-BK-2006X-01	10/21/1999	0 - 0.5 ft bgs
		LPX-BK-2006Y-01	10/21/1999	0 - 0.5 ft bgs
		LPX-BK-2006Z-01	10/21/1999	0 - 0.5 ft bgs
		LPX-BK-2008X-01	10/21/1999	0 - 0.5 ft bgs
		LPX-BK-2008Y-01	10/21/1999	0 - 0.5 ft bgs
		LPX-BK-2008Z-01	10/21/1999	0 - 0.5 ft bgs
		LPX-SD-2045-01	11/8/1999	0 - 0.5 ft bgs
		LPX-SD-2045B-02	7/25/2001	0 - 0.3 ft bgs
		LPX-SD-2046-000.5-01	11/8/1999	0 - 0.5 ft bgs
		LPX-SD-2047-01	11/8/1999	0 - 0.5 ft bgs
		LPX-SD-2049-01	11/5/1999	0 - 0.5 ft bgs
		LPX-SD-2050-01	11/5/1999	0 - 0.5 ft bgs
		LPX-SD-2051-01	11/4/1999	0 - 0.5 ft bgs
		LPX-SD-2052-000.5-01	11/4/1999	0 - 0.5 ft bgs
		LPX-SD-2072-01	7/25/2001	0 - 0.5 ft bgs
		LPX-SD-4001-0000-01	7/12/2001	0 - 0.5 ft bgs
		LPX-SD-4002-0000-01	7/12/2001	0 - 0.5 ft bgs
		LPX-SD-4004-0000-01	7/12/2001	0 - 0.5 ft bgs
		LPX-SD-4011-0000-01	7/10/2001	0 - 0.5 ft bgs
		LPX-SD-4012-0000-01	7/10/2001	0 - 0.5 ft bgs
		LPX-SD-4013-0000-01	7/10/2001	0 - 0.5 ft bgs
		SD-10	9/9/1998	0 - 0.5 ft bgs
		SD-11	9/9/1998	0 - 1 ft bgs

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Sediment cont'd	Lyman Mill Pond cont'd	SD-12	9/9/1998	0 - 1 ft bgs
		SD-13	9/9/1998	0 - 1 ft bgs
		SD-14	9/9/1998	0 - 0.5 ft bgs
		SD-15	9/9/1998	0 - 0.5 ft bgs
		SD-16	9/9/1998	0 - 0.5 ft bgs
		SD-17	9/9/1998	0 - 0.5 ft bgs
		SD-18	9/9/1998	0 - 0.25 ft bgs
		SD-19	9/9/1998	0 - 0.25 ft bgs
		WRL-BK-2004X-01	10/21/1999	0 - 0.5 ft bgs
		WRL-BK-2004Y-01	10/21/1999	0 - 0.5 ft bgs
		WRL-BK-2004Z-01	10/21/1999	0 - 0.5 ft bgs
		WRL-BK-2005X-01	10/21/1999	0 - 0.5 ft bgs
		WRL-BK-2005Y-01	10/21/1999	0 - 0.5 ft bgs
		WRL-BK-2005Z-01	10/21/1999	0 - 0.5 ft bgs
		WRL-SD-2041-01	10/25/1999	0 - 0.5 ft bgs
		WRL-SD-2042-01	11/2/1999	0 - 0.5 ft bgs
		WRL-SD-2042-02	7/24/2001	0 - 0.3 ft bgs
		WRL-SD-2043-01	11/8/1999	0 - 0.5 ft bgs
		WRL-SD-2043-02	7/25/2001	0 - 0.2 ft bgs
		WRL-SD-2071-01	7/24/2001	0 - 0.2 ft bgs
		WRL-SD-4005-0000-01	7/12/2001	0 - 0.5 ft bgs
		WRM-SD-2054-01	12/2/1999	0 - 0.5 ft bgs
		WRM-SD-2055-01	9/20/2000	0 - 0.5 ft bgs
		WRM-SD-2057-01	9/20/2000	0 - 0.5 ft bgs
		WRM-SD-2062-01	9/19/2000	0 - 0.5 ft bgs
Sediment	Manton Pond	MAP-SD-2058-01	9/20/2000	0 - 0.5 ft bgs
		MAP-SD-2059-01	9/20/2000	0 - 0.5 ft bgs
		MAP-SD-2060-01	9/20/2000	0 - 0.5 ft bgs
Sediment	Dyerville Pond	DAM005-SD	10/23/1998	0 - 0.33 ft bgs
		DYP-SD-2065-01	9/19/2000	0 - 0.5 ft bgs
		DYP-SD-2066-01	9/19/2000	0 - 0.5 ft bgs
Surface Soil	Fogarty Center	LPX-SS-4112-0005-01	11/22/2002	0 - 0.5 ft bgs
		LPX-SS-4113-0005-01	11/22/2002	0 - 0.5 ft bgs
		LPX-SS-4114-0005-01	11/22/2002	0 - 0.5 ft bgs
Surface Water	Assapumpset Pond	RAB-SW-3004-01	11/10/1999	
		RAB-SW-3004-01F	11/10/1999	
		RAB-SW-5004-01	7/17/2001	
	Greystone Mill Pond	RCC-SW-3001-01	11/10/1999	
		RCC-SW-3001-01F	11/10/1999	
		RCC-SW-3002-01	11/10/1999	
		RCC-SW-3002-01F	11/10/1999	
		RWR-SW-5001-01	7/17/2001	
		RWR-SW-5002-01	7/17/2001	
		RWR-SW-6001-0000-01	12/9/2004	
	Allendale Pond	APB-SW-2029-01	10/29/1999	
		APB-SW-2029-01F	10/29/1999	
		APB-SW-2034-01	11/3/1999	
		APB-SW-2034-01F	11/3/1999	
		APB-SW-6001-0000-01	12/9/2004	
		CMW-SW-2024-01	10/27/1999	
		CMW-SW-2024-01F	10/27/1999	
		CMW-SW-2025-01	10/28/1999	
		CMW-SW-2025-01F	10/28/1999	

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Media	Area	Sample ID	Date Sampled	Depth
Surface Water cont'd	Allendale Pond cont'd	DAM002-SW	10/23/1998	
		WRC-SW-2009-01	11/1/1999	
		WRC-SW-2009-01F	11/1/1999	
		WRC-SW-2010-01	11/2/1999	
		WRC-SW-2010-01F	11/2/1999	
		WRC-SW-2011-01F	11/2/1999	
		WRC-SW-2012-01	11/2/1999	
		WRC-SW-2012-01F	11/2/1999	
		WRC-SW-2013-01	11/1/1999	
		WRC-SW-2013-01F	11/1/1999	
		WRC-SW-2014-01	11/1/1999	
		WRC-SW-2014-01F	11/1/1999	
		WRC-SW-2015-01	11/1/1999	
		WRC-SW-2015-01F	11/1/1999	
		WRC-SW-4001-01	7/16/2001	
		WRC-SW-4002-01	7/16/2001	
		WRC-SW-4003-01	7/16/2001	
		WRC-SW-4004-01	7/16/2001	
		WRL-SW-2039-01	10/25/1999	
		WRL-SW-2039-01F	10/25/1999	
		WRL-SW-2044-01	11/9/1999	
		WRL-SW-2044-01F	11/9/1999	
	Lyman Mill Pond	DAM003-SW	10/23/1998	
		LPX-SW-2045-01F	11/8/1999	
		LPX-SW-2046-01	11/8/1999	
		LPX-SW-2046-01F	11/8/1999	
		LPX-SW-2047-01	11/8/1999	
		LPX-SW-2047-01F	11/8/1999	
		LPX-SW-2048-01	11/9/1999	
		LPX-SW-2048-01F	11/9/1999	
		LPX-SW-2049-01	11/5/1999	
		LPX-SW-2049-01F	11/5/1999	
		LPX-SW-2050-01	11/4/1999	
		LPX-SW-2050-01F	11/4/1999	
		LPX-SW-2051-01A	11/9/1999	
		LPX-SW-2051-01F	11/4/1999	
		LPX-SW-2052-01	11/4/1999	
		LPX-SW-2052-01F	11/4/1999	
		LPX-SW-2053-01	11/4/1999	
		LPX-SW-2053-01F	11/4/1999	
		LPX-SW-6001-0000-03	12/18/2004	
		WRL-SW-2041-01	10/25/1999	
		WRL-SW-2041-01F	10/25/1999	
		WRL-SW-2042-01	11/2/1999	
		WRL-SW-2042-01F	11/2/1999	
		WRL-SW-2043-01	11/8/1999	
		WRL-SW-2043-01F	11/8/1999	
		WRL-SW-4004-01	7/17/2001	
		WRL-SW-4005-01	7/17/2001	

Table A.1
Samples Used in the Baseline Human Health Risk Assessment

Baseline Human Health Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Media	Area	Sample ID	Date Sampled	Depth
American Eel	Assapumpset Pond	RAB-AE-5001-0000-01-W	6/26/2001	
		RAB-AE-5002-0000-01-W	6/26/2001	
		RAB-AE-5003-0000-01-W	6/26/2001	
		RAB-AE-5004-0000-01-W	6/27/2001	
		RAB-AE-5005-0000-01-W	6/27/2001	
		RAB-AE-5006-0000-01-W	7/2/2001	
	Greystone Mill Pond	GMP-AE-5001-0000-01-W	6/22/2001	
		GMP-AE-5002-0000-01-W	6/22/2001	
		GMP-AE-5003-0000-01-W	6/22/2001	
		GMP-AE-5004-0000-01-W	6/22/2001	
		GMP-AE-5005-0000-01-W	6/22/2001	
		GMP-AE-5006-0000-01-W	6/22/2001	
		GMP-AE-5007-0000-01-W	6/22/2001	
		GMP-AE-5008-0000-01-W	6/22/2001	
		GMP-AE-5009-0000-01-W	6/22/2001	
		GMP-AE-5010-0000-01-W	6/25/2001	
	Allendale Pond	APC-AE-4001-0000-01-W	6/20/2001	
		APC-AE-4002-0000-01-W	6/20/2001	
		APC-AE-4003-0000-01-W	6/20/2001	
		APC-AE-4004-0000-01-W	6/20/2001	
		APC-AE-4005-0000-01-W	6/20/2001	
		APC-AE-4006-0000-01-W	6/20/2001	
		APC-AE-4007-0000-01-W	6/20/2001	
		APC-AE-4008-0000-01-W	6/20/2001	
		APC-AE-4009-0000-01-W	6/20/2001	
		APC-AE-4010-0000-01-W	6/20/2001	
	Lyman Mill Pond	LPX-AE-4001-0000-01-W	6/21/2001	
		LPX-AE-4002-0000-01-W	6/21/2001	
		LPX-AE-4003-0000-01-W	6/21/2001	
		LPX-AE-4004-0000-01-W	6/21/2001	
		LPX-AE-4005-0000-01-W	6/21/2001	
		LPX-AE-4006-0000-01-W	6/21/2001	
		LPX-AE-4007-0000-01-W	6/21/2001	
		LPX-AE-4008-0000-01-W	6/21/2001	
		LPX-AE-4009-0000-01-W	6/21/2001	
		LPX-AE-4010-0000-01-W	6/21/2001	
	Dyerville Pond	DYP-AE-5001-0000-01-W	7/2/2001	
		DYP-AE-5002-0000-01-W	7/2/2001	
		DYP-AE-5003-0000-01-W	7/2/2001	
Largemouth Bass Fillet	Assapumpset Pond	RAB-LB-5001-0000-01-F	6/26/2001	
		RAB-LB-5002-0000-01-F	6/26/2001	
		RAB-LB-5003-0000-01-F	6/27/2001	
		RAB-LB-5004-0000-01-F	6/27/2001	
	Greystone Mill Pond	GMP-LB-5001-0000-01-F	6/22/2001	
		GMP-LB-5002-0000-01-F	6/22/2001	
		GMP-LB-5003-0000-01-F	6/25/2001	
		GMP-LB-5004-0000-01-F	6/25/2001	
		GMP-LB-5005-0000-01-F	6/25/2001	
		GMP-LB-5006-0000-01-F	6/25/2001	
		GMP-LB-5007-0000-01-F	6/25/2001	
		GMP-LB-5008-0000-01-F	6/25/2001	
		GMP-LB-5009-0000-01-F	6/25/2001	
		GMP-LB-5010-0000-01-F	6/25/2001	

Table A.1
Samples Used in the Baseline Human Health Risk Assessment

Baseline Human Health Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Media	Area	Sample ID	Date Sampled	Depth
Largemouth Bass Fillet (cont)	**Lyman Mill Pond**	LPX-LB-4001-0000-01-F	6/21/2001	
		LPX-LB-4002-0000-01-F	6/21/2001	
		LPX-LB-4003-0000-01-F	6/21/2001	
		LPX-LB-4004-0000-01-F	6/21/2001	
		LPX-LB-4005-0000-01-F	6/21/2001	
		LPX-LB-4006-0000-01-F	6/21/2001	
		LPX-LB-4007-0000-01-F	6/21/2001	
		LPX-LB-4008-0000-01-F	6/21/2001	
		LPX-LB-4009-0000-01-F	6/26/2001	
		LPX-LB-4010-0000-01-F	6/26/2001	
	Manton Pond	MAP-LB-4001-0000-01-F	6/27/2001	
		MAP-LB-4002-0000-01-F	6/27/2001	
		MAP-LB-4003-0000-01-F	6/27/2001	
Brown Bullhead	**Assapumpset Pond**	RAB-BB-5001-0000-01-W	6/26/2001	
		RAB-BB-5002-0000-01-W	6/26/2001	
		RAB-BB-5003-0000-01-W	7/2/2001	
White Sucker	**Greystone Mill Pond**	GMP-WS-5001-0000-01-W	6/22/2001	
		GMP-WS-5002-0000-01-W	6/22/2001	
		GMP-WS-5003-0000-01-W	6/22/2001	
		GMP-WS-5004-0000-01-W	6/22/2001	
		GMP-WS-5005-0000-01-W	6/22/2001	
		GMP-WS-5006-0000-01-W	6/22/2001	
		GMP-WS-5007-0000-01-W	6/22/2001	
		GMP-WS-5008-0000-01-W	6/22/2001	
		GMP-WS-5009-0000-01-W	6/22/2001	
		GMP-WS-5010-0000-01-W	6/22/2001	
	Allendale Pond	APC-WS-4001-0000-01-W	6/20/2001	
		APC-WS-4002-0000-01-W	6/20/2001	
		APC-WS-4003-0000-01-W	6/20/2001	
		APC-WS-4004-0000-01-W	6/20/2001	
		APC-WS-4005-0000-01-W	6/20/2001	
		APC-WS-4006-0000-01-W	6/20/2001	
		APC-WS-4007-0000-01-W	6/20/2001	
		APC-WS-4008-0000-01-W	6/20/2001	
		APC-WS-4009-0000-01-W	6/20/2001	
		APC-WS-4010-0000-01-W	6/20/2001	
	Lyman Mill Pond	LPX-WS-4001-0000-01-W	6/21/2001	
		LPX-WS-4002-0000-01-W	6/21/2001	
		LPX-WS-4003-0000-01-W	6/21/2001	
		LPX-WS-4004-0000-01-W	6/21/2001	
		LPX-WS-4005-0000-01-W	6/21/2001	
		LPX-WS-4006-0000-01-W	6/21/2001	
		LPX-WS-4007-0000-01-W	6/21/2001	
		LPX-WS-4008-0000-01-W	6/21/2001	
		LPX-WS-4009-0000-01-W	6/21/2001	
		LPX-WS-4010-0000-01-W	6/21/2001	

Table A.2
Sample Locations Excluded from the Human Health Risk Assessment

Baseline Human Health Risk Assessment
Centredale Manor Restoration Site
North Providence, Rhode Island

Original Matrix	BHHRA-Matrix	Boring Location	BHHRA-Exposure Area	Reason for Exclusion
Soil	Sediment	CMS-073	ALLENDALE	2 ft Cap - Sluiceway
Soil	Sediment	CMS-143	ALLENDALE	2 ft Cap - Sluiceway
Soil	Sediment	CMS-159	ALLENDALE	2 ft Cap - Sluiceway
Soil	Sediment	CMS-167	ALLENDALE	2 ft Cap - Sluiceway
Sediment	Sediment	CMW-SD-2016	ALLENDALE	2 ft Cap - Sluiceway
Surface Water	Surface Water	CMW-SD-2016	ALLENDALE	2 ft Cap - Sluiceway
Sediment	Sediment	CMW-SD-2017	ALLENDALE	2 ft Cap - Sluiceway
Sediment	Sediment	CMW-SD-2018	ALLENDALE	2 ft Cap - Sluiceway
Sediment	Sediment	CMW-SD-2019	ALLENDALE	2 ft Cap - Sluiceway
Surface Water	Surface Water	CMW-SD-2019	ALLENDALE	2 ft Cap - Sluiceway
Sediment	Sediment	CMW-SD-2020	ALLENDALE	2 ft Cap - Sluiceway
Surface Water	Surface Water	CMW-SD-2020	ALLENDALE	2 ft Cap - Sluiceway
Sediment	Sediment	CMW-SD-2021	ALLENDALE	2 ft Cap - Sluiceway
Surface Water	Surface Water	CMW-SD-2021	ALLENDALE	2 ft Cap - Sluiceway
Sediment	Sediment	CMW-SD-2022	ALLENDALE	2 ft Cap - Sluiceway
Surface Water	Surface Water	CMW-SD-2022	ALLENDALE	2 ft Cap - Sluiceway
Soil	Sediment	MW02	ALLENDALE	2 ft Cap - Sluiceway
Soil	Sediment	RES-14-303-01	ALLENDALE	2 ft Cap - Sluiceway
Soil	Sediment	RES-14-303-02	ALLENDALE	2 ft Cap - Sluiceway
Sediment	Sediment	SD-30	ALLENDALE	2 ft Cap - Sluiceway
Sediment	Sediment	SD-31	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	CMS-054	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	CMS-059	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	CMS-062	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	CMS-067	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	CMS-068	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	CMS-078	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	CMS-079	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	CMS-084	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	CMS-085	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	CMS-090	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	CMS-091	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	CMS-099	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	CMS-100	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	CMS-107	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	CMS-108	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	CMS-114	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	CMS-115	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	CMS-428	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	CMS-434	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	CMS-435	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	CMS-436	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	CMS-437	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	CMS-438	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	CMS-439	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	CMS-440	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	CMS-441	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	CMS-442	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	CMS-443	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	CMS-444	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	CMS-445	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	CMS-456	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	MW01	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	MW03	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	RES-14-271-01A	ALLENDALE	2 ft Cap - Sluiceway

Table A.2
Sample Locations Excluded from the Human Health Risk Assessment

Baseline Human Health Risk Assessment
Centredale Manor Restoration Site
North Providence, Rhode Island

Original Matrix	BHHRA-Matrix	Boring Location	BHHRA-Exposure Area	Reason for Exclusion
Soil	Soil	RES-14-302-01	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	SS-99-00	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	SS-99-01	ALLENDALE	2 ft Cap - Sluiceway
Soil	Soil	CMS-132	ALLENDALE	Cap #1
Soil	Soil	CMS-133	ALLENDALE	Cap #1
Soil	Soil	CMS-134	ALLENDALE	Cap #1
Soil	Soil	CMS-135	ALLENDALE	Cap #1
Soil	Soil	CMS-140	ALLENDALE	Cap #1
Soil	Soil	CMS-141	ALLENDALE	Cap #1
Soil	Soil	CMS-142	ALLENDALE	Cap #1
Soil	Soil	CMS-147	ALLENDALE	Cap #1
Soil	Soil	CMS-148	ALLENDALE	Cap #1
Soil	Soil	CMS-149	ALLENDALE	Cap #1
Soil	Soil	CMS-150	ALLENDALE	Cap #1
Soil	Soil	CMS-153	ALLENDALE	Cap #1
Soil	Soil	CMS-154	ALLENDALE	Cap #1
Soil	Soil	CMS-155	ALLENDALE	Cap #1
Soil	Soil	CMS-156	ALLENDALE	Cap #1
Soil	Soil	CMS-157	ALLENDALE	Cap #1
Soil	Soil	CMS-158	ALLENDALE	Cap #1
Soil	Soil	CMS-160	ALLENDALE	Cap #1
Soil	Soil	CMS-161	ALLENDALE	Cap #1
Soil	Soil	CMS-162	ALLENDALE	Cap #1
Soil	Soil	CMS-163	ALLENDALE	Cap #1
Soil	Soil	CMS-164	ALLENDALE	Cap #1
Soil	Soil	CMS-165	ALLENDALE	Cap #1
Soil	Soil	CMS-166	ALLENDALE	Cap #1
Soil	Soil	CMS-168	ALLENDALE	Cap #1
Soil	Soil	CMS-169	ALLENDALE	Cap #1
Soil	Soil	CMS-170	ALLENDALE	Cap #1
Soil	Soil	CMS-171	ALLENDALE	Cap #1
Soil	Soil	CMS-172	ALLENDALE	Cap #1
Soil	Soil	CMS-173	ALLENDALE	Cap #1
Soil	Soil	CMS-236	ALLENDALE	Cap #1
Soil	Soil	CMS-237	ALLENDALE	Cap #1
Soil	Soil	CMS-238	ALLENDALE	Cap #1
Soil	Soil	CMS-239	ALLENDALE	Cap #1
Soil	Soil	CMS-240	ALLENDALE	Cap #1
Soil	Soil	CMS-241	ALLENDALE	Cap #1
Soil	Soil	CMS-242	ALLENDALE	Cap #1
Soil	Soil	CMS-410	ALLENDALE	Cap #1
Soil	Soil	SS-99-03	ALLENDALE	Cap #1
Soil	Soil	SS-99-04	ALLENDALE	Cap #1
Soil	Soil	SS-99-05	ALLENDALE	Cap #1
Sediment	Sediment	WRC-SD-2010	ALLENDALE	Cap #2
Sediment	Sediment	WRC-SD-2011	ALLENDALE	Cap #2
Sediment	Sediment	WRC-SD-2012	ALLENDALE	Cap #2
Soil	Soil	CMS-060	ALLENDALE	Cap #2
Soil	Soil	CMS-063	ALLENDALE	Cap #2
Soil	Soil	CMS-065	ALLENDALE	Cap #2
Soil	Soil	CMS-069	ALLENDALE	Cap #2
Soil	Soil	CMS-070	ALLENDALE	Cap #2
Soil	Soil	CMS-071	ALLENDALE	Cap #2
Soil	Soil	CMS-074	ALLENDALE	Cap #2
Soil	Soil	CMS-075	ALLENDALE	Cap #2

Table A.2
Sample Locations Excluded from the Human Health Risk Assessment

Baseline Human Health Risk Assessment
Centredale Manor Restoration Site
North Providence, Rhode Island

Original Matrix	BHHRA-Matrix	Boring Location	BHHRA-Exposure Area	Reason for Exclusion
Soil	Soil	CMS-076	ALLENDALE	Cap #2
Soil	Soil	CMS-080	ALLENDALE	Cap #2
Soil	Soil	CMS-081	ALLENDALE	Cap #2
Soil	Soil	CMS-082	ALLENDALE	Cap #2
Soil	Soil	CMS-086	ALLENDALE	Cap #2
Soil	Soil	CMS-087	ALLENDALE	Cap #2
Soil	Soil	CMS-088	ALLENDALE	Cap #2
Soil	Soil	CMS-092	ALLENDALE	Cap #2
Soil	Soil	CMS-093	ALLENDALE	Cap #2
Soil	Soil	CMS-094	ALLENDALE	Cap #2
Soil	Soil	CMS-101	ALLENDALE	Cap #2
Soil	Soil	CMS-102	ALLENDALE	Cap #2
Soil	Soil	CMS-109	ALLENDALE	Cap #2
Soil	Soil	CMS-110	ALLENDALE	Cap #2
Soil	Soil	CMS-117	ALLENDALE	Cap #2
Soil	Soil	CMS-228	ALLENDALE	Cap #2
Soil	Soil	CMS-229	ALLENDALE	Cap #2
Soil	Soil	CMS-230	ALLENDALE	Cap #2
Soil	Soil	CMS-231	ALLENDALE	Cap #2
Soil	Soil	CMS-232	ALLENDALE	Cap #2
Soil	Soil	CMS-233	ALLENDALE	Cap #2
Soil	Soil	CMS-234	ALLENDALE	Cap #2
Soil	Soil	CMS-235	ALLENDALE	Cap #2
Soil	Soil	CMS-417	ALLENDALE	Cap #2
Soil	Soil	MW04B	ALLENDALE	Cap #2
Soil	Soil	MW06	ALLENDALE	Cap #2
Soil	Soil	MW07	ALLENDALE	Cap #2
Soil	Soil	MW09	ALLENDALE	Cap #2
Soil	Soil	SS-99-02	ALLENDALE	Cap #2
Soil	Soil	CMS-051	ALLENDALE	Rip-Rap
Soil	Soil	CMS-055	ALLENDALE	Rip-Rap
Soil	Soil	CMS-057	ALLENDALE	Rip-Rap
Soil	Soil	CMS-124	ALLENDALE	Rip-Rap
Soil	Soil	CMS-131	ALLENDALE	Rip-Rap
Soil	Soil	CMS-138	ALLENDALE	Rip-Rap
Soil	Soil	CMS-145	ALLENDALE	Rip-Rap
Soil	Soil	CMS-700	ALLENDALE	Rip-Rap
Soil	Soil	CMS-701	ALLENDALE	Rip-Rap
Soil	Soil	CMS-702	ALLENDALE	Rip-Rap
Soil	Soil	CMS-703	ALLENDALE	Rip-Rap
Soil	Soil	CMS-123	Excavated-ALLENDALE	NTCRA
Soil	Sediment	CMS-193	Excavated-ALLENDALE	NTCRA
Soil	Sediment	CMS-205	Excavated-ALLENDALE	NTCRA
Soil	Sediment	CMS-206	Excavated-ALLENDALE	NTCRA
Soil	Soil	CMS-221	Excavated-ALLENDALE	NTCRA
Soil	Soil	CMS-476	Excavated-ALLENDALE	NTCRA
Soil	Soil	CMS-483	Excavated-ALLENDALE	NTCRA
Sediment	Sediment	LPX-BK-2007	Excavated-LYMAN MILL	NTCRA
Soil	Soil	RES-11-396-01	Excavated-LYMAN MILL	NTCRA
Soil	Soil	RES-11-425-01	Excavated-LYMAN MILL	NTCRA
Soil	Soil	All other residential locations	Not evaluated	NTCRA

NTCRA - Non Time Critical Removal Action

APPENDIX B

PHOTOGRAPHS TO SUPPORT EXPOSURE ASSESSMENT

Assapumpset Pond, looking north from southern shore

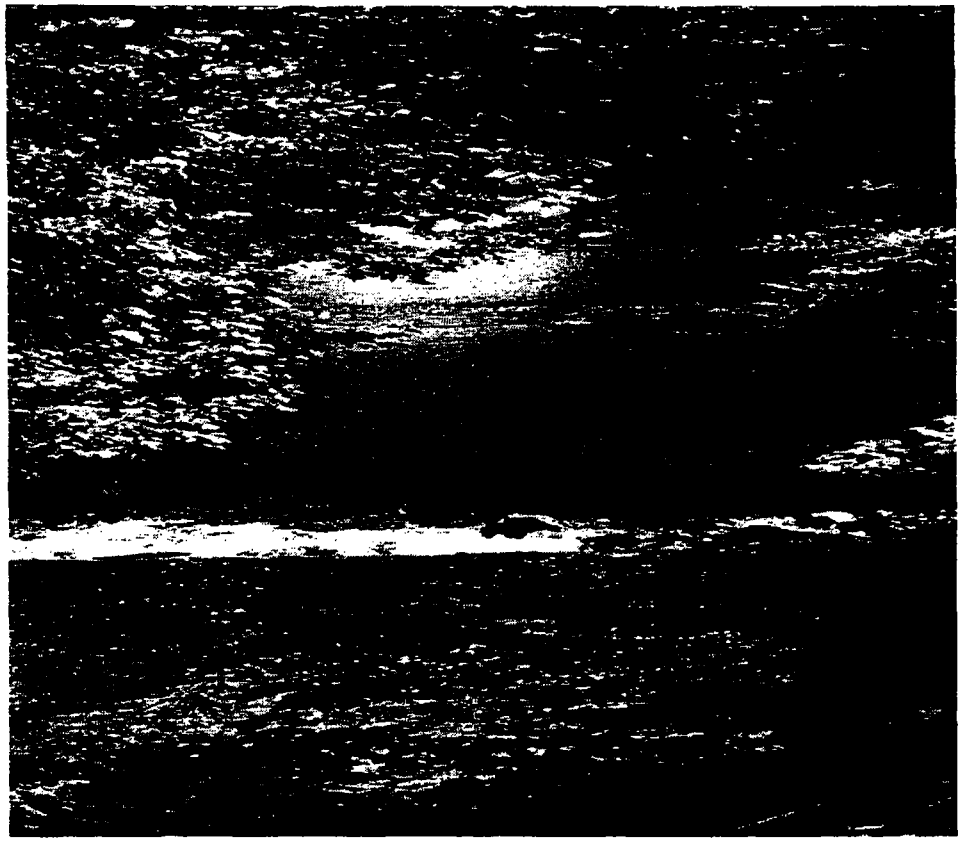
Assapumpset Dam, looking northwest

Assapumpset Brook, south of the Assapumpset Dam

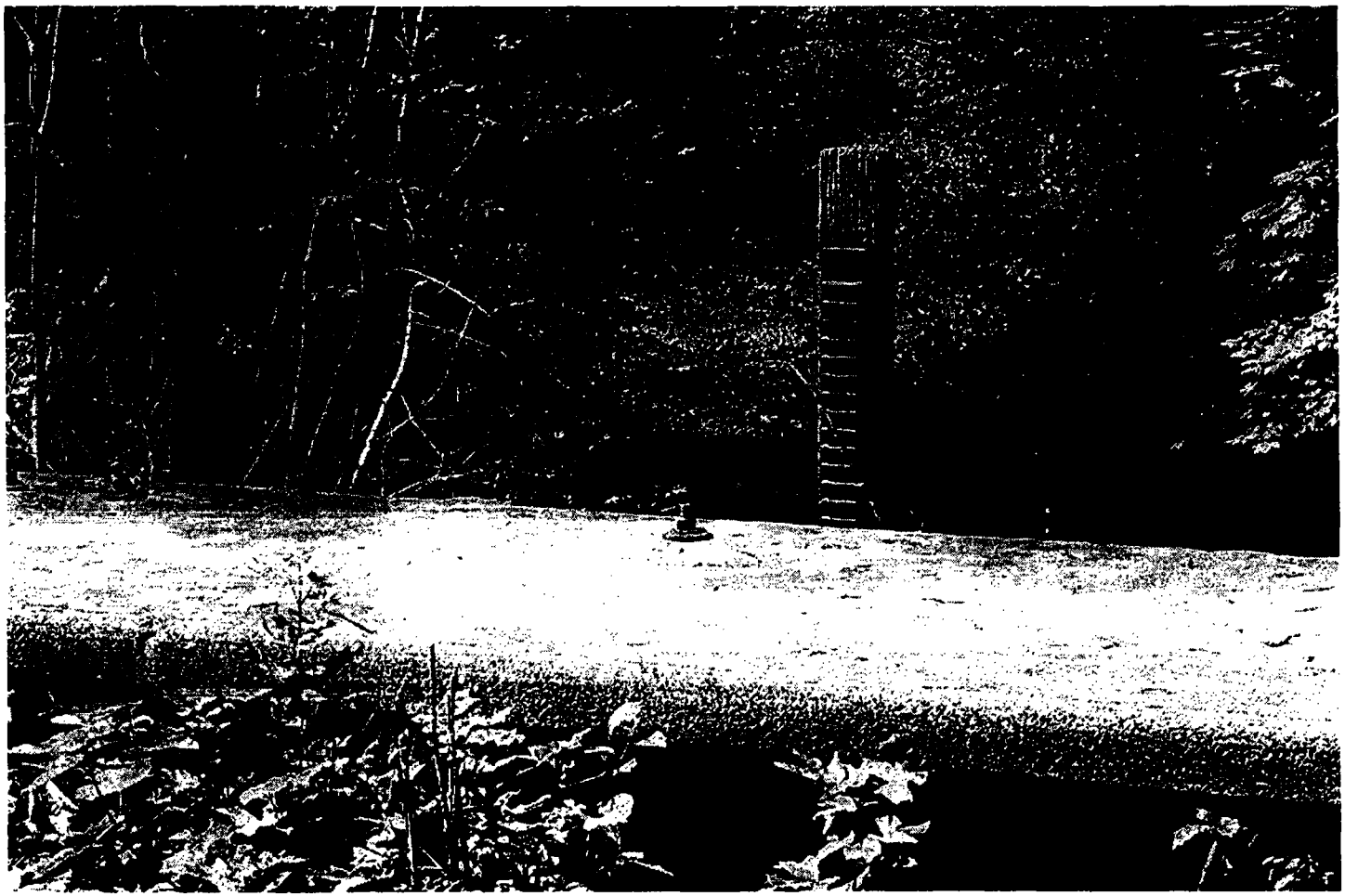
Greystone Pond, looking northeast from dam

Greystone Mill Pond Dam, looking north

Woonasquatucket River looking north from Route 44 (Greystone Mill Pond reference area)



River floodplain just north of Route 44, soil sampling area



Centredale Manor Apartments (right foreground) and Brookside Village Apartments (Center background), looking north from Centredale Manor parking lot.

Area between Brookside Village Apartments and River Looking North

West Branch of Woonasquatucket River (looking south from Cap #1)

Storm water swale (beyond fence) to the east of Centredale Manor, looking east from northeast corner of Centredale Manor Apartments

Cap #2, along eastern bank of river, looking southwest from paved road between Brookside Village Apartments and Centredale Manor Apartments

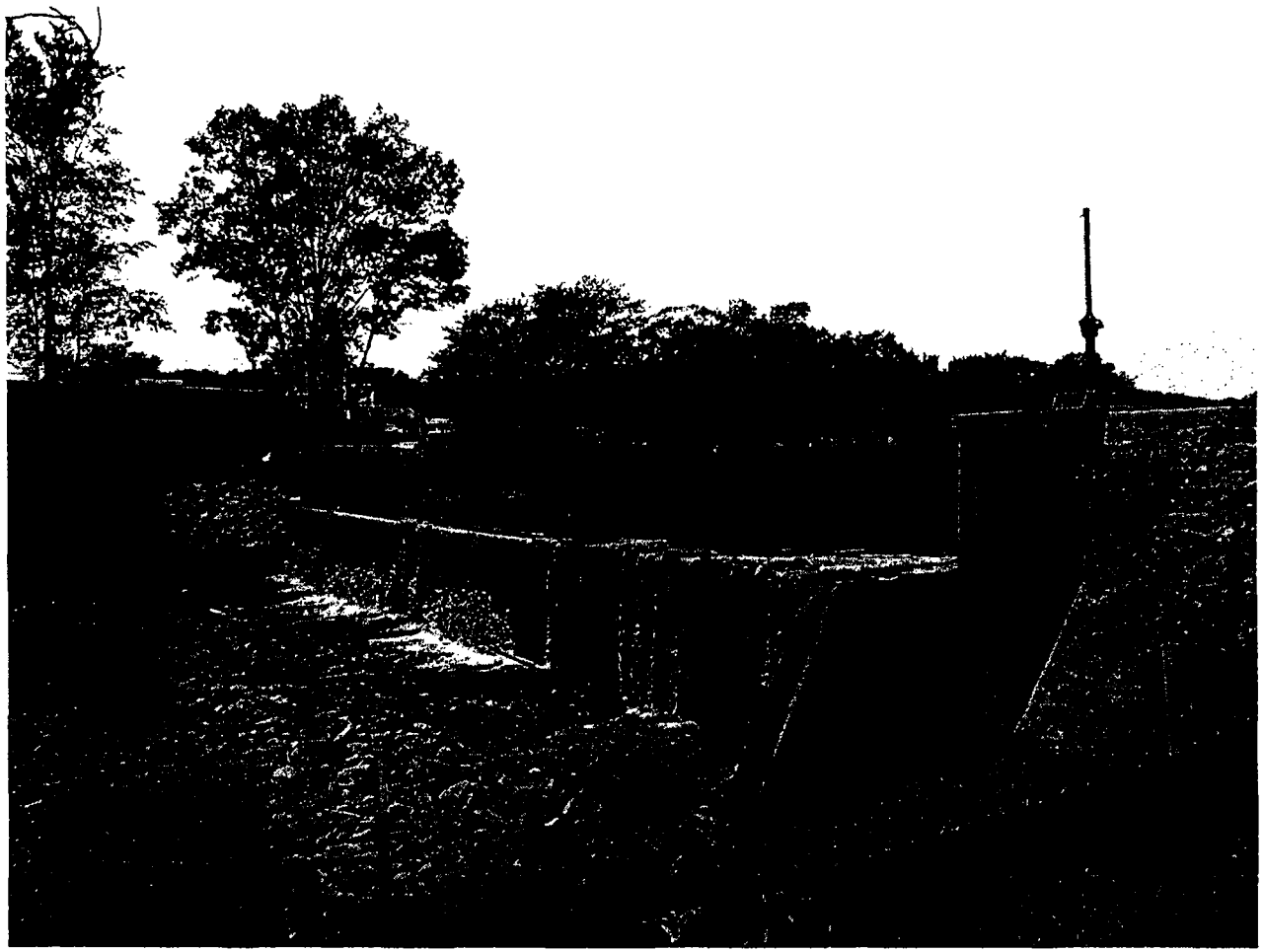
Cap #1(beyond fence) looking southeast from Centredale Manor parking lot

Woonasquatucket River and West Bank across from southern end of Centredale Manor parking lot, looking west

Northern-most portion of Allendale Pond, looking east from Cap #1

Allendale Pond, looking south from the southeast corner of Cap #1

Allendale Dam looking NW

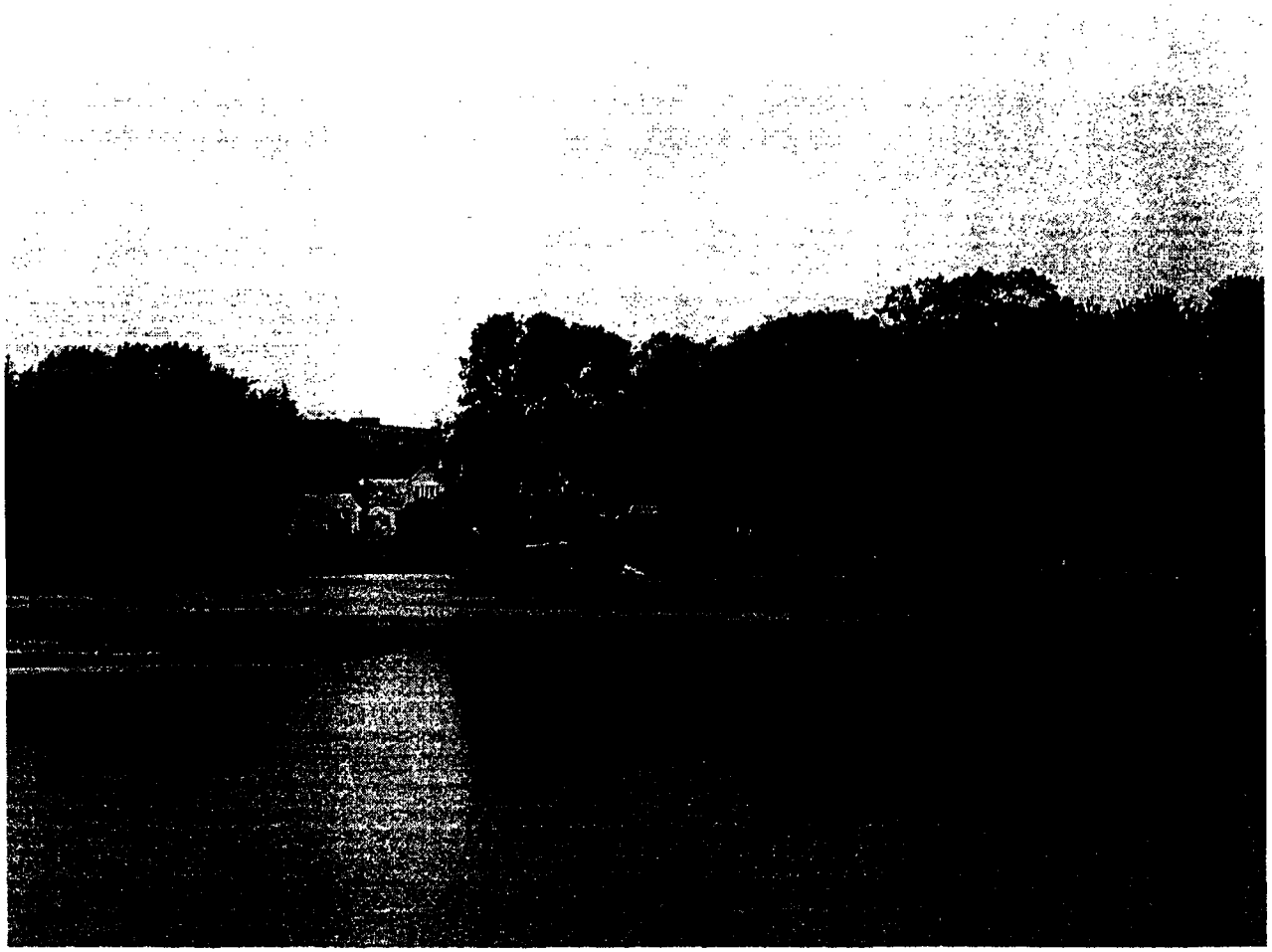


Allendale Dam Looking West

Allendale Pond Looking North from Allendale Dam (after repair)

Allendale Pond Southeast corner (looking northeast from Allendale Dam)

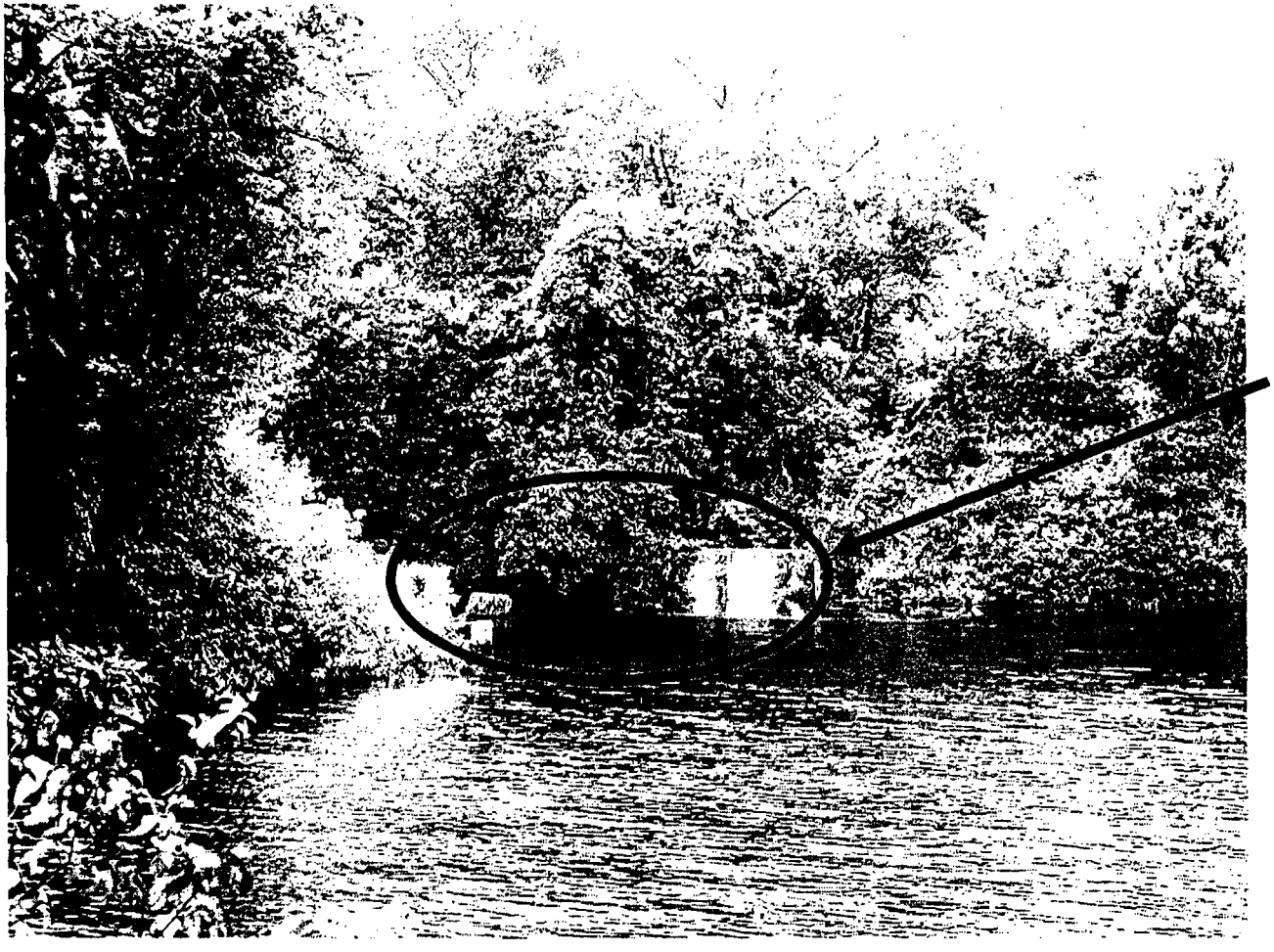
Allendale Pond – central portion of eastern shore (looking from Allendale Dam)



Path to Lyman Mill eastern shore, near LM Dam (looking west from parking lot just south of Fogarty Center)

Southwest corner of Lyman Mill Pond, north of Lyman Mill Dam (looking west from eastern shore near Fogarty Center)

Water Flowing Over Lyman Mill Dam (Looking southwest from eastern shore of Lyman Mill Pond)



Access to eastern shore of Lyman Mill Pond, looking west from industrial property

Access area – eastern shore of Lyman Mill Pond, looking west from parking lot of industrial property

Heavily vegetated, steep bank on western shore of Lyman Mill Pond, looking east from industrial property

Centredale Manor Apartments (right foreground) and Brookside Village Apartments (Center background), looking north from Centredale Manor parking lot.

Manton Pond, looking north

Manton Dam, looking southeast

Dyerville Pond looking north from southwest corner of Dyerville Reach

Former Dyerville Dam, looking south

APPENDIX C

FISH CONSUMPTION RATES

1.0 INTRODUCTION

This appendix presents supporting information for the fish consumption rates that have been utilized in the Baseline Human Health Risk Assessment (BHHRA) for the Centredale Manor Restoration Project Superfund Site (the Site). Because site-specific fish consumption rates are not available, the published literature, state and federal regulatory agencies, and local citizens groups were consulted to identify fish consumption rates that would be appropriate for the potential receptors at the Site. The two receptor groups that have been specifically evaluated in the main body of the BHHRA are the Resident Living Along the River and the Visiting Recreational Angler. For each of those receptor groups, a recreational fish consumption scenario has been evaluated. Recreational fish consumption scenarios assume that receptors are involved in recreational angling at the Site and that some portion of the catch is taken home and consumed. The BHHRA analyzes potential adverse human health effects for both current and future conditions caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these releases (i.e., under an assumption of no action or in the absence of the Rhode Island Department of Health (RI DOH) health advisories on fish consumption for this particular site).

The Site is currently subject to advisories issued by the USEPA and the Rhode Island Department of Health (RIDOH). In October 1996 RIDOH recommended against eating any fish from the lower Woonasquatucket River. This advisory was issued primarily because of dioxin detected in fish but also because polychlorinated biphenyls (PCBs) and mercury were also detected in the fish. In July 1999 the USEPA and RIDOH issued the pamphlet, "DO's and DON'Ts to help you better enjoy the Woonasquatucket River" which advised people not to eat fish, eels, animals, or any plants from the river. In April 2000, RIDOH issued a news release that advised that people should not eat any fish from the Woonasquatucket River below the Smithfield line. In an addendum to the pamphlet "Should I Eat the Fish I Catch?", RIDOH further advised the public not to eat any fish from the Woonasquatucket River below Smithfield due to dioxin, PCB, and mercury contamination. In May 2003 the USEPA issued a press release reminding the public to follow the "DO's and DON'Ts for the Woonasquatucket River". In August 2003, the USEPA issued the "Centredale Manor Restoration Project, Woonasquatucket River, Site Update on Fishing Advisory". This publication also advised people not to eat fish, turtles, eels or plants from the Woonasquatucket River. There are signs, advising people not to eat fish, posted on the shoreline of the Woonasquatucket River in the area of the Centredale Manor Restoration Project Superfund Site.

While recreational angling and associated fish consumption have been evaluated in the main body of the BHHRA, there is considerable uncertainty concerning the potential for subsistence angling at the Site. Subsistence anglers would routinely catch and consume fish as the major component of the diet. The available information for the Site does not indicate that subsistence fishing has occurred in the past nor that it is occurring at the present time. The Woonasquatucket River that flows through the Site is a fresh water body, and it is not clear that the portion of the river within the Site would have sufficient fish resources to be able to sustain a long-term subsistence angling scenario. Also, the Site may be a less desirable location for potential subsistence anglers than the saltwater locations in the general area. Saltwater or marine angling would typically yield higher numbers of fish as well as larger fish than a freshwater river such as the Woonasquatucket River. If subsistence angling were to occur at the Site, there is uncertainty concerning the fish consumption rates that would be appropriate for that scenario. Therefore, the subsistence angler fish consumption scenario has been evaluated in Appendix F of this

report. In addition to the evaluation of recreational angler fish consumption in the main body of the BHHRA, an evaluation of a high-end recreational angler fish consumption scenario is presented in Appendix G. This appendix presents additional perspective for the recreational angler fish consumption scenario. The remainder of this appendix summarizes the information gathering activities that were conducted with respect to the types of biota that were present and might potentially be consumed as well as with respect to potential biota consumption rates and presents the documentation of the recreational angler fish consumption rates that are used in the main body of the BHHRA, the high-end recreational angler fish consumption rates utilized in Appendix G, and the high-end fish consumption rates for the subsistence angler scenario that is presented in Appendix F.

SUMMARY OF INFORMATION GATHERING ACTIVITIES

Attachment A to this appendix contains a detailed summary of the information gathering activities that were conducted to determine what biota potentially could be caught at the Site and consumed and to determine what biota consumption rates might be appropriate for evaluating biota consumption risks. It was hoped that specific information would be obtained that would allow Site-specific or State-specific estimates of biota consumption rates to be used in the BHHRA. However, no Site-specific or State-specific freshwater biota/fish consumption rates that were appropriate for the recreational angler scenario in the main body of the BHHRA were identified. A region-specific study, however, was identified as being appropriate for evaluating the recreational angler scenarios for the Resident living Along the River and for the Visiting Recreational Angler.

The following literature-based sources of information have been reviewed:

1) "Are Turner Reservoir Fish Safe To Eat? A Risk Assessment of Rhode Island Southeast Asian American Fishers (thesis)", Siemay Lee, May 1995.
2) "Quantification of Fish and Seafood Rates for Connecticut", Nancy Balcolm, Constance Capacchione, and Diane Wright Hirsch, January, 1999, University of Connecticut.
3) "Creel Survey for the West Branch of the Penobscot River", Ellen S. Ebert, November 1991.
4) "Subsistence Fishing in Connecticut. The Impact on Southeast Asians", Barry, Capacchione, Hsu, Vu, Yale University School of Medicine; Department of Epidemiology and Public Health, May 1993.
5) "Estimating Consumption of Freshwater Fish Among Maine Anglers", E.S. Ebert, N.W. Harrington, K.J. Boyle, J.W. Knight, and R.E. Keenan, *North American Journal of Fisheries Management* 13:737-745, 1993.
6) "Selection of Fish Consumption Estimates for Use in the Regulatory Process", E.S. Ebert, P.S. Price, R.E. Keenan, *Journal of Exposure Analysis and Environmental Epidemiology*, Vol. 4, no. 3, 1994.
7) "Fish Consumption and Human Health: Developing Partnerships Between Risk Assessors and Resource Managers", American Fisheries Society Symposium 16, 1996.
8) "Sportfish Consumption Patterns of lake Ontario Anglers and the Relationship to Health Advisories", N.A. Connelly, B.A. Knuth, and T.L. Brown, *North American Journal of Fisheries Management*, Vol. 16, 1996.
9) "Estimated Rates of Fish Consumption By Anglers Participating in the Connecticut Housatonic River Creel Survey", E.S. Ebert, S.H. Su, T.J. Barry, M.N. Gray, N.W. Harrington, *North American Journal of Fisheries Management*, Vol. 16, 1996.

Attachment A provides a summary of the information obtained from each of the literature sources identified above. The Balcolm study (item 2 above) was selected as the basis for the high-end subsistence angler fish consumption rates. The Ebert et al. study (item 5 above) was selected as the basis for the recreational angler fish consumption rates that have been evaluated in the main body of the BHHRA.

In addition, the following contacts were made to obtain additional fish consumption information for the Site, Rhode Island, or the New England region. Attachment A provides summaries of the information obtained from those contacts.

1) Nancy Connelly, Professor, Cornell University
2) Caroline Carp, Professor, Brown university
3) Alan Libby, Rhode Island Division of Fish and Wildlife
4) Dan Kosmeckis, U.S. Fish and Wildlife service, NE Regional Office
5) Robert Vanderslice, Rhode Island Department of Health
6) Eugenia Marks, Audubon Society of Rhode Island
7) Alfred Basile, USEPA, Region I
8) Ellen Smith Ebert, AMEC-Ogden Environmental
9) Peter Angelone, Lafayette Fish Hatchery
10) Janice Rowan, U.S. Fish and Wildlife Service, Connecticut River Coordinator
11) Don Henne, U.S. Fish and Wildlife Service, Southern New England/New York Bight
12) Drew Major, U.S. Fish and Wildlife Service, NE Field Office
13) John Warner, U.S. Fish and Wildlife Service, NE Field Office

RECREATIONAL ANGLER FISH CONSUMPTION RATES

As shown in Table 4.1.RME of the main body of the BHHRA, for the Resident Living Along the River and also for the Visiting Recreational Angler, the average daily consumption rate of fish caught at the Site is assumed to be 14 grams/day for the adult, 9.3 grams/day for the older child, and 4.7 gram/day for the young child. As shown in Table 4.1.CT, for the Resident Living Along the River and also for the Visiting Recreational Angler, the average daily consumption rate of fish caught at the Site is assumed to be 8.9 grams/day for the adult, 5.9 grams/day for the older child, and 3.0 gram/day for the young child. These average daily consumption rates do not indicate the amount of fish consumed on days of fish consumption, but rather a daily average fish consumption rate over the course of the year (all seasons included). To provide some context for these rates, the RME adult fish consumption rate of 14 gram/day represents 98 grams/week (or approximately 6 ounces of fish per week) and the CT adult fish consumption rate of 8.9 gram/day represents 62.3 grams/week (or approximately 4 ounces of fish per week). These fish consumption rates include only fish caught from the water bodies at the Site, and do not include fish caught at other locations nor fresh or preserved fish purchased for consumption.

These fish consumption rates have been estimated after review of a considerable body of information from the literature. The consumption rates for adult are primarily based on information provided in the published paper, "Estimating Consumption of Freshwater Fish Among Maine Anglers" (Ebert et al., 1993). The information contained in the Ebert study was selected as the estimate for fish consumption rates for the Site because the study evaluated the consumption of freshwater fish by anglers, the study was conducted in New England (close to the Site), and because fish species identified at the Site (Largemouth

bass, White sucker, and Brown bullhead) were included in the study. The RME fish consumption rate selected for adults represents, from the Ebert study, the 90th percentile fish consumption by household for fish taken from rivers and streams (flowing waters), assuming that the angler consumed all of the harvested fish and did not share that fish with any family members. The CT fish consumption rate selected for adults represents, from the Ebert study, the arithmetic mean (83rd percentile) fish consumption by household for fish taken from rivers and streams (flowing waters), assuming that the angler consumed all of the harvested fish and did not share that fish with any family members.

The Ebert study established estimated amounts of fish harvested per household, but did not determine fish consumption rates for specific family members. Some sharing of the catch likely occurs as a matter of course. However, there would be considerable uncertainty introduced into the fish consumption rates if assumptions were made concerning the number of household members who share the catch and if simplifying assumptions were made concerning the sharing (such as assuming that all household members, including children, share equally). In order to avoid introducing those additional uncertainties, the adult fish consumption rate that has been selected form the Maine angler study is based on the assumption that the angler consumes all the fish brought into the household. This is a conservative estimate of the adult recreational fish consumption rate. Therefore, the selected fish consumption rates for adults are likely overestimates of fish consumption rates by recreational anglers.

The Maine angler study summarized the amount of recreationally caught fish that was brought into the household for human consumption. As reported in that study, fish consumption rates for individuals within the household were not determined by the survey tool utilized in the study. It has been conservatively assumed for the purposes of the BHHRA that all adults have the same fish consumption rate (identified above) and fish consumption rates for children and older children have been estimated by adjusting adult fish consumption rates based on bodyweight differences among the age groups.

The fish consumption rates for the older child and younger child are estimated as portions of the identified adult rates, factoring in differences in bodyweight and food consumption rates of the different age groups. The RME and CT older child fish consumption rates are 2/3 of the corresponding adult fish consumption rates. The RME and CT young child fish consumption rates are 1/3 of the corresponding adult consumption rates. These adjustment factors are consistent with the assumption that dietary intake is related to average bodyweight, and that the average bodyweights of older children and children are approximately 2/3 and 1/3 that of adults. The child and older child RME and CT fish consumption rates are based on the 90th percentile and 83rd percentile household fish consumption rates from the Maine angler survey respectively, as were the adult fish consumption rates.

HIGH END RECREATIONAL ANGLER FISH CONSUMPTION RATES (EVALUATED IN APPENDIX G OF THIS BHHRA)

The receptor exposure scenarios evaluated for ingestion of fish include the resident living along the river (young child, adolescent, and adult), the visiting recreational angler (young child, adolescent, and adult) and the visiting subsistence angler/consumer (young child, adolescent, and adult). The exposure assessment is conducted to characterize high-end exposures for the current/future populations of receptors potentially exposed via consumption of fish from the river. In Appendix G of the Baseline Human Health Risk Assessment, Tables G.1.1.RME through G.4.3.RME and G.4.1.CT through G.4.3.CT provide exposure parameters for potential high-end RME and CT human consumption of fish at the Site. These

tables present fish consumption-related parameters for the two receptor groups and associated age groups. In general, RME parameters represent 95th percentile values and CT parameters represent mean values.

Appendix G, utilizes, for the resident living along the river and the visiting recreational angler, the high-end biota consumption rates summarized below in Table C-1 (and Appendix G Tables G.4.1.RME through G.4.3.RME and G.4.1.CT through G.4.3.CT) have been utilized. These consumption rates were chosen based on fish intake studies discussed in EPA's Exposure Factors Handbook, Volume II (USEPA, 1997).

Table C-1. Summary of High-End Consumption Rates – Resident Living Along River and Visiting Recreational Angler

Scenario/Consumption Rates	Source of the Selected Consumption Rate
Child (1 though 6 years)	
RME: 10.0 to 14.0 g/day	95th percentile for recreational intake (estimated per footnote).
CT: 5.63 g/day	mean recreational fish intake (g/day) for age group 1-5 years in Table 10-61 of USEPA, 1997.
Older Child (7 through 18 years)	
RME: 18.5 to 25.8 g/day	95th percentile for recreational intake (estimated per footnote).
CT: 7.94 g/day	mean recreational fish intake (g/day) for age group 6-10 years in Table 10-61 of USEPA, 1997.
Adult (19 years and above)	
RME: 38.7 g/day	95th percentile for recreational intake as shown in Table 10-63 of USEPA, 1997.
CT: 15.8 g/day	mean recreational fish intake (g/day) for age groups 21 through 80+ years in Table 10-61 of USEPA, 1997.

Notes:

RME for the adult (38.74 g/day) is the 95th percentile for "recreational fish intake (g/day)" as shown in Table 10-63 of USEPA, 1997. The 95th percentile recreational intakes for child and older child age groups are not provided in Table 10-63. Therefore, *ranges of RME recreational fish intakes for the child and older child are estimated as follows:*

1. It is assumed that the proportion of recreational fish consumed versus the total fish consumed from all sources ranges from:
   0.63 (rounded value) (i.e., 38.74 divided by 61.1, which is the 95th percentile recreational intake for adults divided by the maximum 95th percentile for total fish consumed by adults from Table 10-2 in USEPA, 1997), to

   0.89 (rounded value) (i.e., 38.74 divided by 43.7, which is the 95th percentile recreational intake for adults divided by the minimum 95%ile for total fish consumed by adults from Table 10-2 in USEPA, 1997).

2. These proportions are applied to the 95th percentile for total fish consumed by males 0-9 years (15.8 g/day) and males 10-19 years (29.1 g/day) as presented in Table 10-2 of USEPA, 1997 for the child and older child, respectively.

These proposed consumption rates for recreational anglers are based on information provided in Tables 10-2, 10-61, and 10-63 of Exposure Factors Handbook, Volume II (USEPA, 1997). Table 10-2 presents mean and 95th percentile of fish consumption by sex and age. Table 10-61 presents mean fish intake among individuals who eat fish and reside in households with recreational fish consumption. Table 10-63 presents the distribution of usual fish intake among survey respondents (adults) who fished and consumed recreationally-caught fish.

For CT and RME scenarios, it is conservatively assumed that 100% of the total fish consumed is obtained from the Site.

HIGH END SUBSISTENCE ANGLER FISH CONSUMPTION RATES (EVALUATED IN APPENDIX F OF THIS BHHRA)

For visiting subsistence anglers (Appendix F of the BHHRA), the consumption rates summarized in Table C-2 are utilized in Appendix F to evaluate the subsistence angler scenario. These consumption rates were chosen based on recent local consumption rate information.

Table C-2. Summary of High-End Consumption Rates – Visiting Subsistence Angler

Scenario/Consumption Rates	Source of the Selected Consumption Rate
Child (1 though 6 years):	
RME: 53.5 g/day	95th percentile fish consumption (estimated per footnote 2).
CT: 21.1 g/day	mean fish consumption (estimated per footnote 2).
Older Child (7 through 18 years):	
RME: 98.6 g/day	95th percentile fish consumption (estimated per footnote 2).
CT: 29.7 g/day	mean fish consumption (estimated per footnote 2).
Adult (19 years and above):	
RME: 148 g/day	95th percentile fish consumption for Southeast Asian Families (estimated per footnote 1).
CT: 59.2 g/day	mean total fish consumption for Southeast Asian Families per Table 12 presented in Balcolm, 1999.

Notes:

1. The adult RME (148 g/day) is the calculated 95th percentile value for total fish consumption for Southeast Asian Families based on information provided in Table 12 of Balcolm, 1999. It is assumed the data are lognormal distributed.

2. For the child and older child, values for CT and RME were estimated assuming that the ratios between the adult and child, and the adult and older child, under the subsistence scenario are similar to those ratios for recreational anglers shown in the previous table.

For RME and CT scenarios, it is conservatively assumed that 100% of the total fish consumed by subsistence anglers is obtained from the Site.

The adult intake values are based on information provided in Table 12 of the following:

Balcolm, N.C., C.M. Capacchione, D.W. Hirsch, 1999. *Quantification of Fish and Seafood Consumption Rates for Connecticut*. Submitted to CTDEP. January.

The Balcolm, 1999, document is a valuable source of fish ingestion rate information because it is based on a study in the New England. This document provides estimates of daily fish consumption rates for minority populations (e.g., Southeast Asians) that typically subsistence fish.

This risk assessment utilizes consumption rates based on local information rather than use default USEPA exposure parameters. For recreational freshwater anglers, EPA's Exposure Factors Handbook recommends mean and 95th percentile values of 8 g/day and 25 g/day, respectively. For Native American subsistence populations, EPA's Exposure Factors Handbook recommends mean and 95th percentile values of 70 g/day and 170 g/day, respectively. This information is provided on page 10-26 of the Exposure Factors Handbook, Volume II (USEPA, 1997). However, there are no consumption rates recommended for various age groups. The age group-specific consumption rates proposed in this discussion are conservative and are based on fish intake studies discussed in USEPA's Exposure Factors Handbook and the more recent Balcolm study.

Tables C-3 and C-4 provide documentation of the derivation of the bodyweights and fish consumption rates utilized in the main body of the BHHRA, in Appendix F (subsistence angler scenario), and in Appendix G (high-end recreational angler scenario).

ATTACHMENT A

SUMMARY OF INFORMATION GATHERING ACTIVITIES – FISH CONSUMPTION

LITERATURE

(1) Title: **Are Turner Reservoir Fish Safe to Eat? A Risk Assessment of Rhode Island Southeast Asian American Fishers (thesis)**
Author: **Siemay Lee**
Date: **May 1995**

General:

- Purpose: evaluation of risks to subsistence fishing population (Southeast Asian Americans [SEAA]), Turner Reservoir, East Providence, RI.
- History of industrial contamination and evidence of sport and subsistence fishing.
- As the survey showed, saltwater fishing locations prove most popular. No interviewees cited the freshwater Turner Reservoir as an area frequented. However, it is reported that people fished extensively at the Turner Reservoir for four years from 1988 through 1991. There is a possibility they may return considering that RI DEM has plans to make the Turner Reservoir more accessible for public use.
- Therefore, the species caught and associated consumption rates from Turner are unknown based on information from this study.
- The author applied saltwater fish consumption rates to evaluate risks from consumption of freshwater fish.

Population:

- Population assessed: subsistence fishers including Cambodian Americans, Hmong Americans, Laotian Americans were interviewed (20 personal interviews total; English-speaking, predominantly younger males; more sensitive populations not accounted for).
- Based on results of the survey, many subsistence fishers unaware or misunderstand advisories (language and cultural barriers).
- Body weight assumed: 60.1 kg better reflected the study group; exposure over 70-year lifetime.

Potential Species Consumed:

- The survey concluded that scup, blackfish, flounder, bass, bluefish, mackerel, catfish, and strip bass are the most commonly caught species (Note: primarily saltwater species). The survey did not determine which fish are most commonly caught and eaten in Turner Reservoir. The species evaluated in the risk assessment: largemouth bass and white perch (most commonly caught and most likely eaten per Allen Libby, RIDEM Division of Fish and Wildlife). *The survey did not provide this information.*
- The survey concluded that other saltwater aquatic organisms, including clams, shrimp, crabs, squid, quahogs, lobsters, and little necks, are also eaten.
- In this report, no non-fish freshwater species were identified as species that are consumed.
- Target species chosen based on availability and their somewhat dissimilar ecological groups. Largemouth bass are good indicators of persistent pollutants that may be bio-magnified through the food chain.
- Other species in Turner Reservoir: chain pickerel, brown bullhead, pumpkinseed sunfish.
- Series of MADEP studies in Ten-Mile River: using largemouth bass edible fish fillets (*indicating that this species may be a good target*).

Consumption Patterns & Preparation:

- Most sport fishers/recreationists at Turner *do not* consume the fish they catch. Some may eat the larger catches (according to RIDEM Enforcement in 1994).
- The author's research showed that, in general, subsistence fishers *regularly consume* their catches (of any size) and urban minority groups consume greater quantities of fish than the average population.
- Based on the survey, the general population removes skin, fat, organs (from saltwater species, which are the most commonly caught)
  Subsistence fishers may not remove these parts. Also, they often fish w/out licenses, disregard size limits, keep what they catch.
- Based on the survey, consumption rates (of primarily self-caught saltwater fish) varied among groups:
  Cambodian: 2.03 – 340.8 g/day (2nd highest 97.4 g/day believed to be more representative)
  Hmong: 30.3 – 113 g/day
  Laotian: 6.09 – 24.3 g/day
  EPA (general population): 6.5 g/day
  EPA (subsistence fishers): 140 g/day
  All eat flesh, most eat skin, a few eat organs.
  Specifically, all SEAA fishers interviewed eat the flesh of the fish. In addition, 50% of Cambodian, 100% of Hmong, and 60% of Laotian Americans eat the skin, and 20% of Cambodian and Laotian Americans eat the organs, such as the liver.
- Based on the results of the survey, fish **flesh** (fillet) **and skins** were analyzed together (homogenized in a blender) to support the risk assessment. Organs (which tend to accumulate more heavy metals) were disregarded due to lack of info (ambiguous) as to whether organs consumed or not. Fish slime and scales removed.
- The survey concluded that fishers often freeze self-caught fish to eat at a later date.
- The author assumed in the RA that fishers consumed same amount all year-round.
- The survey concluded that fish cooking methods include: boiling (and according to the author, the broth may be used for soup), baking, frying, steaming.
- The author assumed in the RA that cooking does not change the amount of contaminant ingested & absorbed (heavy metals only were evaluated in this study).

(2) **Title:** **Quantification of Fish and Seafood Consumption Rates for Connecticut**
Author: **Nancy Balcolm, Constance Capacchione, Diane Wright Hirsch**
Date: **January 22, 1999**

General:

- Purpose: to provide documentation of fish and seafood consumption practices and patterns for the general population as well as 8 other populations potentially at higher risk of exposure to contaminants in fish/seafood.
- Exposure to seafood includes fish **bought in a store, bought in a restaurant, served in school, and self-caught**.
- The study provides evidence that CT residents consume fish/seafood at rates that greatly exceed a national average of 14.3 g/day (developed in the 1970's). EPA-default rate = 6.5 g/person/day.
- Marine sport fishing was a focus (to quantify consumption from Long Island Sound), however, freshwater activities are also included in results.
- **Overall, good information on <u>consumption patterns</u>, <u>populations</u>, and <u>food preparation</u>. The focus of the document was on saltwater species, but there was some information on what freshwater species are typically caught or eaten. Information on fishing locations would not be applicable.**

Methodology:

- Data collected from the survey included:
  - Fish/seafood type / species selection
  - Frequency of consumption
  - Time of year consumed (season)
  - Portion size
  - Parts consumed (e.g., meat, head, skin, organs)
  - Cooking procedures/meal preparation
  - Where fish/seafood obtained (caught or bought?)
  - If caught, where is the location where you fish
  - In addition, data collected over a 10-day period for each household member re: what days seafood eaten, what type eaten, how obtained, & how much.
  - Household and individual histories
- Cooking conversions were done to account for weight loss due to cooking.
- Conversions for suspected whole fish were provided to account for cleaning. Assumed 40% edible meat

Data Obtained/Results:

<u>Population:</u>

- Nine populations assessed in the study. There were distinct differences in consumption rates and behavior between populations and among populations based on age and gender.
  - General population
  - Sport fishing population
  - Commercial fishing population
  - *Limited income population*

- Minority population
- Southeast Asian Population
- Non-SE Asian minority population
- Women of childbearing age
- Children 15 and younger

- Monthly consumption patterns by species and population (*freshwater and saltwater species*) – Appendix 17.
- For each population, breakdown of *mean meal size* (total g/day) provided (*freshwater and saltwater species*) – Appendix 18.
- Demographics (no. of people per household, race/ethnicity, primary language, education, income, gender, age frequency of eating seafood)

Species:

- 85 different species of fish/seafood were listed in the survey overall.
- Table 8: Commonly caught freshwater species include bass (largemouth & smallmouth), carp, catfish, eel, perch (yellow & white), sunfish, whitefish, eel, trout.
  Patterns show an increase in consumption during summer months.

Consumption Patterns & Preparation (as it pertains to freshwater species caught):

- Survey shows: Mean meal sizes for locally caught fish were in the 4 – 7 ounce range.
- Mean consumption rates were calculated for all fish consumed (caught & bought, saltwater and fresh) for the nine populations based on survey responses.
- Survey shows: Trimming fish prior to cooking to remove skin and fatty tissue is less likely in minority and limited income populations (SEAA). The majority of people consume meat only (Table 16 of study, by species)
  ** Information for freshwater species, including bass (largemouth, smallmouth, unspecified), carp, catfish, perch (white, yellow, unspecified), pickerel, sunfish (unspecified), trout, and whitesucker is provided.**
- Survey shows: fishing activity and consumption rates for locally caught fish is greater for SEAA and non-SEAA minorities (for freshwater and saltwater species).
- Survey shows: The majority of individuals fish between 1 and 12 times per year.
- CTDPH (1986): Max consumption rates 10-105 g/day for sport anglers.
- CT Housatonic River study: 2.6 g/day mean consumption rate; 12 g/day 95%ile for sport anglers.
- Author research shows: cultural preference for freshly caught fish among SEAA and Native Americans.
- Consumption of "**caught**" fish included both *saltwater and freshwater* fish. Meal sizes for the 9 groups (**ounces per meal**):

General population	5.0
Sport fishing population	7.3
Commercial fishing population	5.2
Limited income population	7.1
Minority population	7.1
Southeast Asian Population	7.0
Non-SE Asian minority population	7.1
Women of childbearing age	5.9
Children 15 and younger	3.9

Roughly 1/3 of all fish/seafood meals consumed by each population were "caught". Most large meals of caught fish were bluefish and striped bass (both *saltwater* species).

The average number of meals per year of caught fish ranged from 8-10 meals per year; although average of 5 meals per year for the general population.

- Percent of people for each population who trim fat/skin from fish grouped as such: "Always" trim, "Never" trim, "Certain Fish" trim (see **Table 14**).
- Percent of fish trimmed (*listed by species*) prior to cooking also provided (see **Table 15**). ** Information for freshwater species, including bass (unspecified), bullhead/catfish, carp, eel, trout, and sunfish/bluegill/pumpkinseed, is provided.**

(3) Title: **Creel Survey for the West Branch of the Penobscot River**
Source: **ChemRisk**
Author: **Ellen S. Ebert – Project Manager**
Date: **November 22, 1991**

Introduction:

- The consumption of fish is the primary route of human exposure to TCDD found in aquatic environments. Therefore, estimation of a representative rate of consumption is critical.
- Available fish resident in Maine rivers: bass, perch, pickerel.
- Creel survey conducted on West Branch of the Penobscot River.
- Fish consumption rates estimated for each angler interviewed.

Data Analysis:

- If fish were creeled but given away, they were not included in consumption rate calculations.
- Edible portions were determined relative to whole fish weight:
  - Average edible fraction for salmon: 37%
  - Average edible fraction for smallmouth bass: 29%
  - Average edible fraction white perch: 24%
  - EPA default value used for pickerel and brook trout: 30%
- No distinction made b/w adults and children in calculating consumption rates.
  - Because anglers may freeze, smoke, or can portions of catch for winter consumption, daily fish consumption rate was annualized.
  - 2 reaches (A & B) were evaluated.

Results:

- 78 anglers interviewed.
- Frequency of trips ranged from 0.05 – 6 trips per week.
- No. of people sharing a catch ranged from 1 – 8.
- Of total individuals reported to share a catch, 75% adults and 25% children.
- Fish consumption rates ranged from 0.013 g/day – 98 g/day.
- Mean consumption rate for combined reaches: 5.1 g/person-day (8.1 for "A" reach and 2.3 for "B" reach).
- Median consumption rate for combined reaches: 1.3 g/person-day (2.5 for "A" reach and 0.9 for "B" reach).
- Because consumption rates are positively skewed rather than symmetrically distributed, the *median* is more relevant central tendency measure for a skewed dataset.

Discussion:

- Assumed that success rate is constant for individual anglers.
- Assumed that fishing trips taken before time of interview would continue throughout season.
- Assumptions would likely result in overestimated rates of consumption.
  - Monte Carlo used to incorporate seasonal fluctuation in consumption rates and frequencies of fishing trips.
  - Using Monte Carlo, mean consumption rate for combined reaches: **3.0 g/person-day**. Median consumption rate for combined reaches: **0.49 g/person-day**.

(4) **Title:** **Subsistence Fishing in Connecticut. The Impact on Southeast Asians**
Source: **Yale University School of Medicine; Dept. of Epidemiology & Public Health**
Author: **Barry, Capacchione, Hsu, Vu**
Date: **May 1993**

- Population: SE Asian fishing along the Housatonic River.
- Elevated PCB levels in fish, measured in white perch, yellow perch, sunfish.
  - Objective: characterize SEA fishing behaviors. Anecdotal evidence suggests that SEA fish regularly along PCB-contaminated areas of the Housatonic River.
  - Fish is a main staple of the traditional diets of SEA.
  - In addition to fillets, SEA eat eyes, skin, and organs.

** Little relevant info. An angler questionnaire is proposed, but not administered.**

(5) **Title:** **Estimating Consumption of Freshwater Fish among Maine Anglers**
Source: **North American Journal of Fisheries Management**
Author: **E.S. Ebert, N.W. Harrington, K.J. Boyle, J.W. Knight, R.E. Keenan**
Date: **1993**

Introduction/Methodology:

- Mailed creel survey to 2,500 licensed resident anglers; obtained 1,612 usable surveys back.
- If fish shared among household members, annual average consumption of freshwater river fish eaters in Maine is 3.7 g/day.
- Anglers asked to describe number, species, and average length of each sport-caught fish they had consumed.
- The weight was predicted from reported average lengths and length-weight regression equations.
- Per EPA Exposure Factors Handbook (1989), 30% used to characterize the edible portion of finfish.
- Information collected for 15 species.
- Three scenarios considered:
    - All household fish consumers eat an equal share of consumed fish;
    - Only adults in the household consume fish;
    - The angler alone consumes all the fish reported.

Results:

- Consumption rates vary depending on how fish were shared.
- **All household consumers share**: median of 2.0 g/day consumption and mean of 6.4 g/day consumption for those fishing in "all waters" (standing and flowing); median of 0.99 g/day consumption and mean of 3.7 g/day consumption for those fishing in rivers and streams ("flowing waters").
- **Only adults share**: median of 2.3 g/day consumption and mean of 7.5 g/day consumption for those fishing in "all waters" (standing and flowing); median of 1.2 g/day consumption and mean of 4.5 g/day consumption for those fishing in rivers and streams ("flowing waters").
- **Only anglers consume**: median of 5.0 g/day consumption and mean of 15 g/day consumption for those fishing in "all waters" (standing and flowing); median of 2.5 g/day consumption and mean of 8.9 g/day consumption for those fishing in rivers and streams ("flowing waters").

Other:

- Species indigenous to riverine environments, such as white perch, yellow perch, brown bullhead, creek chub, and white sucker may have "large body burdens of chemical contaminants".

(6) **Title:** **Selection of Fish Consumption Estimates for Use in the Regulatory Process**
Source: **Journal of Exposure Analysis and Environmental Epidemiology, Vol. 4, No. 3**
Author: **Ellen S. Ebert, Paul S. Price, Russell E. Keenan (ChemRisk)**
Date: **1994**

- Variation in fish consumption estimates, different target populations (general population vs. sport-caught vs. subpopulations), different water bodies (freshwater vs. saltwater; single body of water vs. multiple locations).
- For **freshwater single waterbody**:
  - Estimates of waterbody-specific consumption from other similar waterbodies can be substituted and used as a reasonable representative of the waterbody studied.
  - Soldat 1970: Upper Columbia River; reported average angler surveyed took 4.7 trips per year, harvested 0.7 meals per trip, 202 g/meal, 1.8 g/day consumption rate.
  - Honstead et al. 1971: Upper Columbia River; reported average of 14 meals of sport-caught fish per year, 200 g/meal, 7.7 g/day consumption rate.
  - Turcotte 1983: Savannah River; reported 30% harvested fish edible, 19 g/day consumption rate (does not account for sharing), 7.4 g/day consumption rate (if shared among 2.5 individuals).
  - ChemRisk, 1991: West Branch of Penobscot River; 5.1 g/day mean consumption rate. After adjusting trends using monthly adjustment factors, consumption rates were estimated as a mean of 3.0 g/day and median of 0.49 g/day.
- *Conclusions of this paper:*
  - rates of intake generally lower from individual bodies of water than those from multiple bodies of water;
  - rates of intake generally lower from moving waters than for still waters;
  - rates of consumption of sport-caught marine fish generally higher than those of sport-caught freshwater fish (although some studies have indicated they are comparable).
- *Recommendations of this paper:*
  - Estimate of consumption should be based on the most comparable study (waterbody similar in nature to the one of interest);
  - If no commercial fisheries on the waterbody, rates of intake should not include consumption of fish from non-angling sources (restaurants, markets, etc);
  - Important to consider species and size of fish because they vary in their propensity to bioaccumulate persistent compounds.

(7) **Title:** **Fish Consumption and Human Health: Developing Partnerships Between Risk Assessors and Resource Managers**
Source: **American Fisheries Society Symposium 16**
Author: **Ellen S. Ebert (ChemRisk)**
Date: **1996**

General:

- Factors that affect potential health risks associated with fish consumption: species, age, and size of fish; frequency of fish meals; parts of fish consumed; contaminant concentrations; demographics of anglers; also access, productivity, seasonality.
- Use of default assumptions may lead to over- or underestimation of risks.
- Humans typically consume only muscle meat rather than whole fish (assumed to be 30% of total fish mass per USEPA).
- Certain angler subgroups eat higher portions and have higher potential for exposure.
- Most reported fish consumption rates have been annualized – used for evaluating long-term exposures.
- Generally, angler activity and consumption are highly skewed, with most reporting very low levels and a very small percentage reporting high rates of activity and consumption. Therefore, it is important to understand variability in angler behaviors.
- To determine if chemical concentrations a problem, regulatory agencies often focus on whole fish or species (e.g., **carp and suckers**) that are known to accumulate higher levels of certain contaminants.
- Important considerations: preparation methods may affect chemical concentrations. For example, chemical losses of PCBs vary depending on cooking method, ranging from 15% for microwaving to 60% for frying. However, other contaminants, like mercury, seem to be unaffected by cooking. Effect of cooking may vary from species to species as well.
- Contaminants accumulate in species differently, depending on **trophic level**, **lipid content**, and **feeding behavior**.

(8) **Title:** **Sportfish Consumption Patterns of Lake Ontario Anglers and the Relationship to Health Advisories**
Source: **North American Journal of Fisheries Management, Volume 16**
Author: **N.A. Connelly, B.A. Knuth, and T.L. Brown**
Date: **1996**

Objective:

- Provide estimates of fish consumption (overall and spot-caught) among Ontario anglers.
- Results based on a 12-month diary methodology.
- Assess the use of risk-reducing fish preparation methods by anglers preparing sport-caught fish for consumption.

General:

- Human exposure to contaminants can be reduced through use of certain fish-cleaning and cooking methods.

Results:

- The average percent of meals per person that were sport-caught: 26%.
- Overall (fish from all sources) average meal size was 216 g/day; average sport-caught meal size was 232 g/day.
- Average daily fish consumption from sport sources in 1992:

%ile of Lake Ontario Anglers	Grams/Day (Sport-Caught)
25%	0.6
50%	2.2
75%	6.6
90%	13.2
95%	17.9
99%	39.8

- Half the anglers ate 2.2 g/day or less of sport-caught fish.
- Angler consumption from all sources varied monthly, with the highest consumption in the spring and lowest in late fall. Although, results showed that anglers ate sport-caught fish year-round.

(9) **Title:** **Estimated Rates of Fish Consumption By Anglers Participating in the Connecticut Housatonic River Creel Survey**
Source: **North American Journal of Fisheries Management, Volume 16**
Author: **E.S. Ebert, S.H. Su, T.J. Barry, M.N. Gray, N.W. Harrington**
Date: **1996**

Objectives:

- Housatonic River creel survey (for 1984 – 1986 timeframe) performed to determine consumption behavior of anglers and to also determine if any subpopulations of river anglers consumed considerably more fish than others at the time of survey.

Methodology/Assumptions:

- River divided into 6 sections.
- Only anglers living in CT, MA, and NY were included in the population.
- Assumed that fish were harvested for consumption unless the survey indicated otherwise.
- Assumed that the edible mass of fish kept by each interviewed angler represented the typical amount consumed by the angler's household every trip.
- Assumed that 30% of the total mass represents the edible portion of finfish (USEPA, 1989).
- Assumed household size of 2.59 persons (average CT household size reported in 1990 census).

Results:

- Other than trout (primarily occurring in the trout management area), bass were targeted by anglers. Of all harvested fish, the most frequently taken were white and yellow perch. Others commonly kept included redbreast sunfish and smallmouth bass.
- Annualized daily fish consumption rates for all surveyed anglers: 0.17 g/person-day median, 2.6 g/person-day mean, and 12 g/person-day 95th %ile.
- Total edible masses by individuals averaged 120 g/trip.
- There were no significant differences among seasonal consumption rates.
- Frequency of angling: 10 trips/year.
- No evidence that any subpopulation consumed more than 100 g/day of caught fish. Therefore, Housatonic River anglers primarily fish the Housatonic for its recreational and aesthetic values, not for obtaining food.

Telephone Conversations

Contact Name: **Nancy Connelly** ****AUTHOR****
Affiliation: **Cornell University**
Title: **Professor**
Phone Number: **607-255-2830**

Ms. Connelly will forward a number of papers and studies on fish consumption that she has written. She indicated that some of these sources would provide information on consumption rates and consumption behaviors of various populations. However, she stated that her work has been done on licensed anglers, and may not provide information applicable to subsistence fishers. She also indicated that the literature she will send includes some information on food preparation methods for freshwater biota. Additionally, she indicated that her research has shown that anglers report that their source of information on fish consumption advisories is not site posting, but rather information contained in the New York State regulatory guide.

Contact Name: **Caroline Carp**
Affiliation: **Brown University**
Title: **Professor**
Phone Number: **401-863-3874**

Ms. Carp provided answers to several questions. She indicated that Alan Libby at the RIDFW would be a good source of information on which freshwater species might be found in the Woonasquatucket River. She suggested that RIDEM might have preliminary data for mercury levels in the basin, and stated that largemouth bass, yellow perch, and white perch had been used in previous studies of urban Rhode Island rivers. She indicated that she did not have any information on food preparation methods for freshwater biota. She put forth the hypothesis that much of the subsistance fishing which occurs in Rhode Island most likely takes place in the bay, where a greater quantity of edible fish could be gathered with less effort. She suggested that sport fishers might be at greater risk in fresh water, but the primary sport fish would be trout, with only incidental catches of bass and perch. In addition, she suggested that if there is concern about human consumption of fish from contaminated streams, it might be worthwhile to stock the streams with more attractive sport fish, such as trout, since they would have a shorter period for uptake of contaminants, since it is estimated that more than 99 percent of fish stocked are harvested within a year. Ms. Carp suggested as an additional contact her thesis advisee, Ms. Alissa Barron. Ms. Barron may be reached at Alissa_Barron@brown.edu.

Contact: Massachusetts Coastal Zone Management

Two contacts at the MCZM stated that they were unable to provide any information on the subject, and provided contact numbers outside their organization.

Contact Name: **Alan Libby**
Affiliation: **Rhode Island Division of Fish and Wildlife**
Phone Number: **401-789-7481**

Mr. Libby stated that the freshwater species found in the Woonasquatucket include sunfish, yellow perch, white perch, bass, and bullhead catfish. He suggested that although he did not have any hard data on fishing locations along the relevant reach of the Woonasquatucket, bridges and dams would represent the most likely places.

Contact Name: **Dan Kosmeckis**
Affiliation: **US Fish and Wildlife Service – NE Regional Office**
Phone Number: **(413) 253-8200**

He suggested Drew call the Fish Health Biologist at the Lafayette Fish Hatchery in North Kingstown, RI – **Peter Angelone at (401) 294-4662**.

Contact Name: **Robert Vanderslice**
Affiliation: **Rhode Island Department of Health**
Title: **Chief of Environmental Health Risk**
Phone Number: **(401) 222-3424 ext. 2103**
Email: **bobv@doh.state.ri.us**

May 9, 2001. Mr. Vanderslice provided limited information regarding biota that we should target in the Woonasquatucket River. Based on fish collection efforts about five years ago in the Woonasquatucket River and the current fish advisories in Rhode Island, he suggested focusing on **bluegill** and **eel**. They also found trout during this effort. He also suggested targeting a predatory fish like **largemouth bass** and a bottom feeder like **croaker** (which I think is a saltwater species). Anecdotal information indicates people eat **turtles** form the river. As far as consumption patterns, exposed populations, fishing locations, he said he did not know. He suggested that I contact the following:

Eugenia Marks
Director of Research, Advocacy & Publications
Audubon Society of Rhode Island
12 Sanderson Road
Smithfield, RI 02917
(401) 949-5454 (phone)
(401) 949-5788 (fax)

Alfred Basile
USEPA Region I
(617) 918-1599
basile.alfred@epa.gov

Contact Name: **Eugenia Marks**
Affiliation: **Audubon Society of Rhode Island**
Title: **Director of Research, Advocacy & Publications**
Contact Information: **12 Sanderson Road**
Smithfield, RI 02917
(401) 949-5454 (phone)
(401) 949-5788 (fax)

May 10, 2001. Eugenia Marks has been working on Woonasquatucket River projects for 8-10 years (community organizing projects). She has some personal observations in Olneyville (behind Atlantic Mills) – a young boy about 10 years old told her that he caught turtles and his family cooked them for food. Ms. Marks assumes that people catch painted turtles as opposed to snapping turtles because they would be easier to catch. Along the Johnston side of Manton Pond, there is ample evidence of kids fishing. One young man fishing admitted he digs for clams and uses them as bait. But, he said after he catches fish, he releases them. Other young boys she talked with said they try to catch ducks. Ms. Marks has observed painted turtles between Valley Street and Sunrise Dam. She saw a 14-15 inch eel in Assapumpsett Brook along Armento Street. She believes that fish species in the river may include white suckers, bass, perch, sunfish, eel, pickerel. Other species she has observed include: cormorant, hooded merganser, star-nosed mole, mallard, great blue heron, red-tailed hawk.

She suggested that I contact **Harold Pomeroy 401-254-3170**. She believes he has done some fish survey work in Woonasquatucket. I have called him on 5/10/01 and left a message. She also suggested I call **Matt McConeghey (Roger Williams) at 401-456-1766**. I tried calling on 5/10/01, but it was a wrong number.

Contact Name: **Alfred Basile**
Affiliation: **USEPA Region I**
Phone Number: **(617) 918-1599**

May 9, 2001. I have called him and left a message. I have also emailed him information re: what we need and provided him with some questions.

Mr. Basile left me a message referring me to Alan Libby.

May 11, 2001. Mr. Basile called me and thought he may be of some help. A target list of species provided as part of an EPA proposal for Rhode Island lakes/rivers (based on geographic distribution and bioaccumulation potential) included predatory species: largemouth bass (target), smallmouth bass, chain pickerel, and yellow perch. For bottom feeders: brown bullhead (target), white sucker, and common carp. Also he suggested that American eel would be a good species because he thought that people do consume them quite readily (particularly subsistence fishers, he thought).

Mr. Basile will be sending me documentation of these species (in the form of an EPA proposal) via email and will also send me guidance re: fish sampling procedures.

Contact Name: **Ellen Smith Ebert** ****AUTHOR****
Affiliation: **AMEC-Ogden Environmental**
Phone Number: **(207) 879-4222**

May 10, 2001. E.S. Ebert is the author of many articles we have obtained. I called her to see if she had any personal knowledge to share. For species to target, she suggested I use species similar to her Maine Angler paper. Other than that she didn't feel like she could be very helpful.

Contact Name: **Peter Angelone**
Affiliation: **Lafayette Fish Hatchery**
Phone Number: **(401) 294-4662**

May 10, 2001. His group stocks fish (brook trout, rainbow trout, brown trout) in the upper Woonasquatucket (no lower than Smithfield). The water is colder up there and Mr. Angelone thinks the downgradient waters may be too warm for them. But, he is not sure. He thought the most important fish to sample were the bottom feeders and he suggested carp and also brown bullhead and catfish species. Other species to consider would be yellow and white perch and largemouth bass. Although, he indicated that he thought there weren't as many perch as there used to be. He suggested calling **Terry Bradley at URI (401) 874-5404.** I called him and left a message on 5/10/01.

Contact Name: **Janice Rowan**
Affiliation: **U.S. FWS Connecticut River Coordinator**
Phone Number: **(413) 548-9138**
Email: Jan_Rowan@fws.gov

May 11, 2001. She provided me with three contacts that may be helpful: **Christine Lipsky** of FWS in West Kingtown, RI at (401) 789-0281; **Don Henne** at (401) 364-9124; **Susie Van Ottingen** of NE Field Office in Concord, NH at (603) 223-2541.

In the office of **Christine Lipsky**, I was referred back to **Alan Libby** (see notes below). In the office of **Susie Van Ottingen**, I was referred to **Drew Major**. I left a message for Mr. Major on 5/11/01.

Contact Name: **Don Henne**
Affiliation: **USFWS - Southern New England/New York Bight**
Contact Information: **Box 307**
Charlestown, RI 02813
(401) 364-9124 (phone)
(401) 364-0170 (fax)

May 11, 2001. Called and left message. He will not be in until Monday 5/14/01.

May 15, 2001. He called me and referred me to Drew Major of NE Field Office in Concord, NH (below).

Contact Name: **Drew Major**
Affiliation: **USFWS - NE Field Office**
Concord, NH
Contact Information: **(603) 223-2541 (phone)**

May 15, 2001. Mr. Major recommended the following species: white sucker for the bottom dweller. Suckers are the standard and there is a lot of data on suckers. Carp would be a good second choice. One of the bass species (largemouth bass) is the standard predatory species to sample. In addition, he suggested perch - yellow would be best, but white perch instead if the river is tidal.

Contact Name: **Alan Libby**
Affiliation: **USFWS**
Contact Information: **West Kingstown, RI**
(401) 789-0281 (phone)

May 11, 2001. Mr. Libby suggested the following species for predatory/pelagic species: largemouth bass, pickerel, yellow perch, bluegill (including pumpkinseed). For bottom feeders, he suggested brown bullhead, and perhaps yellow bullhead and white catfish. Also, eel should be plentiful. He will be faxing me some documentation of species found in Woonasquatucket River.

Contact Name: **Caleb Slater**
Affiliation: **Massachusetts Division of Fish and Wildlife**
Phone Number: **(508) 792-7270 ext. 133**
Email: Caleb.Slater@state.ma.us

Contact Name: **John Warner**
Affiliation: **U.S. FWS New England Field Office**
Phone Number: **(603) 225-1411**
Email: John_Warner@fws.gov

May 11, 2001. Spoke to Ken Carr and Ken Munney (who has worked with Cornell Rosiu). Recommendations included bullhead and pickerel. Largemouth bass and sunfish may also be good choices. While collecting fish egg data, Ken Munney thought that Cornell found white sucker and fall fish. However, these are probably not species preferably consumed except maybe by the Asian population.

TABLE C-3
CALCULATION OF REPRESENTATIVE BODY WEIGHTS

BASELINE HUMAN HEALTH RISK ASSESSMENT -DRAFT
CENTERDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

from Table 7-6 and 7-7 of Exposure Factors Handbook, Volume I, 1997.

	Bodyweight					
Age	Male	Male	Female	Female	Male and Female	Male and Female
	Mean	5th Percentile	Mean	5th Percentile	Mean	5th Percentile
					CT	RME
1	11.8	9.6	10.8	8.8		
2	13.6	11.1	13	10.8		
3	15.7	12.9	14.9	11.7		
4	17.8	14.1	17	13.7		
5	19.8	16	19.6	15.3		
6	23	18.6	22.1	17		
Child Average	17.0	13.7	16.2	12.9	**16.6**	**13.3**
7	25.1	19.7	24.7	19.2		
8	28.2	20.4	27.9	21.4		
9	31.1	24	31.9	22.9		
10	36.4	27.2	36.1	25.7		
11	40.3	26.8	41.8	29.8		
12	44.2	30.7	46.4	32.3		
13	49.9	35.4	50.9	35.4		
14	57.1	41	54.8	40.3		
15	61	46.2	55.1	44		
16	67.1	51.4	58.1	44.1		
17	66.7	50.7	59.6	44.5		
18	71.1	54.1	59	45.3		
Older Child Average	48.2	35.6	45.5	33.7	**46.9**	**34.7**

TABLE C-4. CALCULATION OF RECREATIONAL FISH CONSUMPTION RATES FOR CHILD AND OLDER CHILD

BASELINE HUMAN HEALTH BIOTA CONSUMPTION RISK ASSESSMENT - DRAFT
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

Ratio (1)	95%ile total fish consumed (2)	Estimated RME intake (3)	Final estimated RME intake (4)
	g/day	g/day	g/day
Child low end of range			
0.634042553	15.8	10.01787234	10.0
Child high end of range			
0.886498856	15.8	14.00668192	14.0
Older child low end of range			
0.634042553	29.1	18.4506383	18.5
Older child high end of range			
0.886498856	29.1	25.7971167	25.8

(1) Ratio represents the portion of total fish consumed that is recreationally caught as described in the footnotes of Table 3.
(2) These values were obtained from Table 10-2 of USEPA's 1997 Exposure Factors Handbook
(3) These values have not been adjusted for significant digits
(4) These values have been rounded to the appropriate number of significant digits

APPENDIX D

TOXICITY ASSESSMENT SUPPORT INFORMATION

Table D-1
WHO TEFs for Human Health Risk Assessment

Baseline Human Health Risk Assessment
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Congener	TEF Value
Dibenzo-p-dioxins	
2,3,7,8-TCDD	1
1,2,3,7,8-PnCDD	1
1,2,3,4,7,8-HxCDD	0.1
1,2,3,6,7,8-HxCDD	0.1
1,2,3,7,8,9-HxCDD	0.1
1,2,3,4,6,7,8-HpCDD	0.01
OCDD	0.0001
Dibenzofurans	
2,3,7,8-TCDF	0.1
1,2,3,7,8-PnCDF	0.05
2,3,4,7,8-PnCDF	0.5
1,2,3,4,7,8-HxCDF	0.1
1,2,3,6,7,8-HxCDF	0.1
1,2,3,7,8,9-HxCDF	0.1
2,3,4,6,7,8-HxCDF	0.1
1,2,3,4,6,7,8-HpCDF	0.01
1,2,3,4,7,8,9-HpCDF	0.01
OCDF	0.0001
Non-ortho PCBs	
PCB 77	0.0001
PCB 81	0.0001
PCB 126	0.1
PCB 169	0.01
Mono-ortho PCBs	
PCB 105	0.0001
PCB 114	0.0005
PCB 118	0.0001
PCB 123	0.0001
PCB 156	0.0005
PCB 157	0.0005
PCB 167	0.00001
PCB 189	0.0001
Hexachloroxanthene (USEPA, 2002)	
HCX	0.0002

Notes:

[1] TEFs are based on the conclusions of the World Health Organization meeting in Stockholm, Sweden, June 15-18 1997 (Van den Berg et al., 1998).

Van den Berg, M., Birnbaum, L., Bosveld, B.T.C., Brunström, B., Cook, P., Feeley, M., Giesy, J.P., Hanberg, A., Hasegawa, R., Kennedy, S.W., Kubiak, T., Larsen, J.C., van Leeuwen, F.X.R., Liem, A.K.D.,Nolt, C., Peterson, R.E., Poellinger, L., Safe, S., Schrenk, D., Tillitt,D., Tysklind, M., Younes, M., Waern, F.,Zacharewski, 1998. T. Toxic Equivalency Factors (TEFs) for PCBs, PCDDs, PCDFs for humans and wildlife. Environmental Health Perspective, 106 (12), 775-792.

USEPA, 2002. Personal communication with Chau Vu, USEPA Region I re: TEF for HCX, May 22.

BRIEF TOXICITY SUMMARIES

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

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1.1 What are CDDs?
1.2 What happens to CDDs when they enter the environment?
1.3 How might I be exposed to CDDs?
1.4 How can CDDs enter and leave my body?
1.5 How can CDDs affect my health?
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RELATED RESOURCES

ToxFAQ™ 110k
ToxFAQ™ en Español 28k
Public Health Statement 128k
Public Health Statement en Español
Toxicological Profile 10.2MB

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ATSDR RESOURCES

ToxFAQs™
ToxFAQs™ en Español
Public Health Statements
Toxicological Profiles
Minimum Risk Levels

December 1998

Public Health Statement for Chlorinated Dibenzo-p-dioxins (CDDs)

(Dibenzo-p-dioxinas policloradas)

This Public Health Statement is the summary chapter from the Toxicological Profile for chlorinated dibenzo-p-dioxins (CDDs). It is one in a series of Public Health Statements about hazardous substances and their health effects. A shorter version, the ToxFAQs™, is also available. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present. For more information, call the ATSDR Information Center at 1-888-422-8737.

This public health statement tells you about chlorinated dibenzo-p-dioxins (CDDs) and the effects of exposure.

The Environmental Protection Agency (EPA) identifies the most serious hazardous waste sites in the nation. These sites make up the National Priorities List (NPL) and are the sites targeted for long-term federal clean-up. CDDs (all types) have been found in at least 126 of the 1,467 current or former NPL sites. However, it's unknown how many NPL sites have been evaluated for these substances. As more sites are evaluated, the number of sites with CDDs may increase. This is important because exposure to these substances may harm you and because these sites may be sources of exposure.

When a substance is released from a large area, such as an industrial plant, or from a container, such as a drum or bottle, it enters the environment. This release does not always lead to exposure. You can be exposed to a substance only when you come in contact with it. You may be exposed by breathing, eating, or drinking the substance or by skin contact.

If you are exposed to CDDs, many factors determine whether you'll be harmed. These factors include the dose (how much), the duration (how long), and how you come in contact with it. You must also consider the other chemicals you're exposed to and your age, sex, diet, family traits, lifestyle, and state of health.

1.1 What are CDDs?

CDDs are a family of 75 different compounds commonly referred to as polychlorinated dioxins. These compounds have varying

MMGs
MHMIs
Interaction Profiles
Priority List of Hazardous Substances
Division of Toxicology

harmful effects. The CDD family is divided into eight groups of chemicals based on the number of chlorine atoms in the compound. The group with one chlorine atom is called the mono-chlorinated dioxin(s). The groups with two through eight chlorine atoms are called di-chlorinated dioxin (DCDD), tri-chlorinated dioxin (TrCDD), tetra-chlorinated dioxin (TCDD), penta-chlorinated dioxin (PeCDD), hexa-chlorinated dioxin (HxCDD), hepta-chlorinated dioxin (HpCDD), and octa-chlorinated dioxin (OCDD). The chlorine atoms can be attached to the dioxin molecule at any one of eight positions. The name of each CDD indicates both the number and the positions of the chlorine atoms. For example, the CDD with four chlorine atoms at positions 2, 3, 7, and 8 on the dioxin molecule is called 2,3,7,8-tetrachlorodibenzo-p-dioxin or 2,3,7,8-TCDD. 2,3,7,8-TCDD is one of the most toxic of the CDDs to mammals and has received the most attention. Thus, 2,3,7,8-TCDD serves as a prototype for the CDDs. CDDs with toxic properties similar to 2,3,7,8-TCDD are called "dioxin-like" compounds.

In the pure form, CDDs are colorless solids or crystals. CDDs enter the environment as mixtures containing a variety of individual components and impurities. In the environment they tend to be associated with ash, soil, or any surface with a high organic content, such as plant leaves. In air and water, a portion of the CDDs may be found in the vapor or dissolved state, depending on the amount of particulate matter, temperature, and other environmental factors. 2,3,7,8-TCDD is odorless. The odors of the other CDDs are not known. CDDs are known to occur naturally, and are also produced by human activities. They are naturally produced from the incomplete combustion of organic material by forest fires or volcanic activity. CDDs are not intentionally manufactured by industry, except in small amounts for research purposes. They are unintentionally produced by industrial, municipal, and domestic incineration and combustion processes. Currently, it is believed that CDD emissions associated with human incineration and combustion activities are the predominant environmental source.

CDDs (mainly 2,3,7,8-TCDD) may be formed during the chlorine bleaching process used by pulp and paper mills. CDDs occur as a contaminant in the manufacturing process of certain chlorinated organic chemicals, such as chlorinated phenols. 2,3,7,8-TCDD is a by-product formed during the manufacture of 2,4,5-trichlorophenol (2,4,5-TCP). 2,4,5-TCP was used to produce hexachlorophene (used to kill bacteria) and the herbicide, 2,4,5-trichlorophenoxyacetic acid (2,4,5-T). Various formulations of 2,4,5-T have been used extensively for weed control on crops and range lands, and along roadways throughout the world. 2,4,5-T was a component of Agent Orange, which was used extensively by the U.S. military in the Vietnam War. In most industrialized countries the use of products contaminated with CDDs has been greatly reduced. Use of hexachlorophene and the herbicide 2,4,5-T is currently restricted in the United States. Other chlorinated chemicals, like pentachlorophenol (PCP), used to preserve wood,

do contain some of the more highly chlorinated CDDs (those with more chlorine atoms), but 2,3,7,8-TCDD is not usually found. The use of PCP has been restricted to certain manufacturing applications.

Currently, CDDs are primarily released to the environment during combustion of fossil fuels (coal, oil, and natural gas) and wood, and during incineration processes (municipal and medical solid waste and hazardous waste incineration). While incineration may be the primary current source of release of CDDs into the environment, the levels of CDDs produced by incineration are extremely low. CDDs are associated with ash generated in combustion and incineration processes. Emissions from incinerator sources vary greatly and depend on management practices and applied technologies. CDDs also have been detected at low concentrations in cigarette smoke, home-heating systems, and exhaust from cars running on leaded gasoline or unleaded gasoline, and diesel fuel. Burning of many materials that may contain chlorine, such as plastics, wood treated with pentachlorophenol (PCP), pesticide-treated wastes, other polychlorinated chemicals (polychlorinated biphenyls or PCBs), and even bleached paper can produce CDDs.

Although this public health statement will focus on CDDs, it is important to note that CDDs are found in the environment together with other structurally related chlorinated chemicals, such as chlorinated dibenzofurans (CDFs) and polychlorinated biphenyls (PCBs). Therefore, people are generally exposed to mixtures of CDDs and other classes of toxicologically and structurally similar compounds. 2,3,7,8-TCDD is one of the most toxic and extensively studied of the CDDs and serves as a prototype for the toxicologically relevant or "dioxin-like CDDs. Based on results from animal studies, scientists have learned that they can express the toxicity of dioxin-like CDDs as a fraction of the toxicity attributed to 2,3,7,8-TCDD. For example, the toxicity of dioxin-like CDDs can be half or one tenth or any fraction of that of 2,3,7,8-TCDD. Scientists call that fraction a Toxic Equivalent Factor (TEF).

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1.2 What happens to CDDs when they enter the environment?

CDDs are released into the air in emissions from municipal solid waste and industrial incinerators. Exhaust from vehicles powered with leaded and unleaded gasoline and diesel fuel also release CDDs to the air. Other sources of CDDs in air include: emissions from oil- or coal-fired power plants, burning of chlorinated compounds such as PCBs, and cigarette smoke. CDDs formed during combustion processes are associated with small particles in the air, such as ash. The larger particles will be deposited close to the emission source, while very small particles may be transported longer distances. Some of the lower chlorinated CDDs (DCDD, TrCDD, and some of the TCDDs) may vaporize from the particles (and soil or water surfaces) and be transported long distances in

the atmosphere, even around the globe. It has been estimated that 20 to 60% of 2,3,7,8-TCDD in the air is in the vapor phase. Sunlight and atmospheric chemicals will break down a very small portion of the CDDs, but most CDDs will be deposited on land or water.

CDDs occur as a contaminant in the manufacture of various chlorinated pesticides and herbicides, and releases to the environment have occurred during the use of these chemicals. Because CDDs remain in the environment for a long time, contamination from past pesticide and herbicide use may still be of concern. In addition, improper storage or disposal of these pesticides and waste generated during their production can lead to CDD contamination of soil and water.

CDDs are released in waste waters from pulp and paper mills that use chlorine or chlorine-containing chemicals in the bleaching process. Some of the CDDs deposited on or near the water surface will be broken down by sunlight. A very small portion of the total CDDs in water will evaporate to air. Because CDDs do not dissolve easily in water, most of the CDDs in water will attach strongly to small particles of soil or organic matter and eventually settle to the bottom. CDDs may also attach to microscopic plants and animals (plankton) which are eaten by larger animals, that are in turn eaten by even larger animals. This is called a food chain. Concentrations of chemicals such as the most toxic, 2,3,7,8-chlorine substituted CDDs, which are difficult for the animals to break down, usually increase at each step in the food chain. This process, called biomagnification, is the reason why undetectable levels of CDDs in water can result in measurable concentrations in aquatic animals. The food chain is the main route by which CDD concentrations build up in larger fish, although some fish may accumulate CDDs by eating particles containing CDDs directly off the bottom.

CDDs deposited on land from combustion sources or from herbicide or pesticide applications bind strongly to the soil, and therefore are not likely to contaminate groundwater by moving deeper into the soil. However, the presence of other chemical pollutants in contaminated soils, such as those found at hazardous waste sites or associated with chemical spills (for example, oil spills), may dissolve CDDs, making it easier for CDDs to move through the soil. The movement of chemical waste containing CDDs through soil has resulted in contamination of groundwater. Soil erosion and surface runoff can also transport CDDs into surface waters. A very small amount of CDDs at the soil surface will evaporate into air. Certain types of soil bacteria and fungus can break CDDs down, but the process is very slow. In fact, CDDs can exist in soil for many years. Plants take up only very small amounts of CDDs by their roots. Most of the CDDs found on the parts of plants above the ground probably come from air and dust and/or previous use of CDD-containing pesticides or herbicides. Animals (such as cattle) feeding on the plants may

accumulate CDDs in their body tissues (meat) and milk.

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1.3 How might I be exposed to CDDs?

CDDs are found at very low levels in the environment. These levels are measured in nanograms and picograms. One nanogram (ng) is one billionth of a gram, and one picogram (pg) is one trillionth of a gram. In some contaminated soils, concentrations of CDDs are reported as parts per billion. One part per billion (ppb) is one part CDD per billion parts of soil. The concentration of CDDs is often reported as parts per trillion, in samples of air, water, or soil. One part per trillion (ppt) is one part CDD per trillion parts of air, water, or soil. In some rural areas where CDD concentrations are very low in air or water, measurements are given in parts per quadrillion (ppq), which means one part CDD per quadrillion parts of air or water.

CDDs are found everywhere in the environment, and most people are exposed to very small background levels of CDDs when they breath air, consume food or milk, or have skin contact with materials contaminated with CDDs. For the general population, more than 90% of the daily intake of CDDs, CDFs, and other dioxin-like compounds comes from food, primarily meat, dairy products, and fish. CDDs may be present at much lower levels in fruits and vegetables. The actual intake of CDDs from food for any one person will depend on the amount and type of food consumed and the level of contamination. Higher levels may be found in foods from areas contaminated with chemicals, such as pesticides or herbicides, containing CDDs as impurities. CDDs have been measured in human milk, cow's milk, and infant formula, so infants are known to be exposed to CDDs.

Most surface water in the United States typically does not contain 2,3,7,8-TCDD and other CDDs at levels that are high enough to be measured (1 ppq or more). Municipal drinking water does not usually contain CDDs because the CDDs do not dissolve in water and primarily stick to particles, which are usually filtered out of treated drinking water. This means that using tap water to wash clothes or to bathe or shower, or swimming in pools or in uncontaminated lakes, rivers, or at ocean beaches will not expose people to significant levels of CDDs. Although CDDs are not usually found in filtered, treated drinking water, they have, on occasion, been detected in unfiltered groundwater from areas with known CDD contamination.

Exposure to CDDs can also occur through skin contact with chlorinated pesticides and herbicides, contaminated soils, or other materials such as PCP-treated wood and PCB transformer fluids. Background levels of CDDs in soil are higher than background levels in both air and water. Background levels of CDDs detected in uncontaminated soils in the United States are generally very low or not detectable. 2,3,7,8-TCDD is not usually found in rural soil, but is typically found in soil in industrialized areas at levels ranging from 0.001 to 0.01 ppb. However, higher levels of

2,3,7,8-TCDD may be found in areas where CDDs have contaminated the soil. For example, contaminated soil at Times Beach, Missouri, had levels of 2,3,7,8-TCDD ranging from 4.4–317 ppb.

If CDDs are present at all in outdoor air in rural areas, they are generally present at very low levels or at concentrations near the detection limits for testing equipment. In winter, because of the burning of wood and other fuels for home heating, CDD levels may be slightly higher than during other seasons. In general, the background air levels of CDDs in urban areas are higher than in rural areas. Typical levels of CDDs in outdoor air in urban areas and industrial areas averaged 2.3 picograms per meter cubed (pg/m^3). 2,3,7,8-TCDD is not usually found in rural or urban air, but it is found in air near urban waste incinerators and high-traffic areas. The air around people who are smoking cigarettes may also have CDDs at levels above background levels. Although breathing contaminated air is a minor route of exposure for most people, exposure may be greater in areas near these CDD sources.

CDDs have been found in all samples of adipose tissue and blood (serum lipids) from individuals with no known previous exposure. This indicates that all people are exposed to small amounts of CDDs. Levels of 2,3,7,8-TCDD in serum from the general population typically range from 3 to 7 ppt (on a lipid basis), and rarely exceed 10 ppt. Typically, lower levels of CDDs are found in less industrialized countries and in younger people.

The production, use, and disposal of pesticides and phenoxy herbicides, disposal of production waste containing 2,3,7,8-TCDD, industrial accidents involving 2,4,5-trichlorophenol (2,3,5-TCP), and the consumption of CDD-contaminated food, have all led to increased potential for excess exposure of some groups of people. 2,3,7,8-TCDD has been detected at 91 of the 126 hazardous waste sites on the NPL that have been reported to contain CDDs. People living around these sites may be exposed to above-background levels of 2,3,7,8-TCDD and other CDDs. Elevated levels of CDDs have been reported in fish, shellfish, birds, and mammals collected in areas surrounding various chemical production facilities, various hazardous waste sites, and pulp and paper mills using the chlorine bleaching process. Sometimes these findings have resulted in closure of these areas for the purpose of fishing. People who eat contaminated food from these contaminated areas are at risk of increased exposure to CDDs.

Occupational exposure to CDDs generally occurs through breathing contaminated air, or through skin contact with materials containing CDDs. Workers with the potential to be exposed to above-average levels of CDDs include those involved in the production or handling of certain chlorinated phenols (such as 2,4,5-TCP, PCP) or chlorinated pesticides or herbicides (such as 2,4,5-T, 2,4-D, hexachlorophene, Silvex®), and those involved in application of chlorinated pesticides containing CDDs as

impurities. Workers whose jobs involve pressure treatment of wood with PCP and the handling of PCP-treated wood products, chlorination processes at pulp and paper mills, or operation of municipal solid waste or hazardous waste incinerators may have increased exposure to CDDs. Finally, workers involved in hazardous waste clean-up or clean-up of PCB transformer and/or capacitor fires including emergency service personnel like fire fighters and police who respond to such fires are also at additional risk of exposure to CDDs. Most of these occupational exposures have been significantly reduced in recent years.

In general, workers involved in the manufacture of 2,4,5-TCP and subsequent products were exposed to far greater levels of 2,3,7,8-TCDD than those involved in the handling and application of chlorinated pesticides containing CDDs. Current serum lipid levels of 2,3,7,8-TCDD in a small number of U.S. Air Force veterans who were directly involved in the aerial spraying of herbicides (Agent Orange contaminated with 2,3,7,8-TCDD) in Vietnam as part of Operation Ranch Hand, are up to 3 times higher than the general population. However, while studies on blood or fatty tissue 2,3,7,8-TCDD levels in U.S. Army ground combat Vietnam veterans also found some individuals with 2,3,7,8-TCDD levels higher than those of the general population, overall, most Vietnam veterans and Vietnamese living in Vietnam studied to dated have blood and fatty tissue 2,3,7,8-TCDD levels comparable to members of the general U.S. population.

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1.4 How can CDDs enter and leave my body?

CDDs can enter your body when you breathe contaminated air, eat contaminated food, or have skin contact with contaminated soil or other materials. The most common way CDDs can enter your body is by eating food contaminated with CDDs.

If you breathe air that contains CDDs, the CDDs can enter your body through your lungs and pass into the blood stream, but we do not know how fast or how much of the CDDs will enter the blood stream. If you swallow food or water containing CDDs, most of the CDDs will enter your body and pass from the intestines to the blood stream. Smaller amounts of highly chlorinated CDDs will enter your body compared to the less chlorinated 2,3,7,8-TCDD. If you swallow soil containing CDDs, a small amount of the CDDs will pass through the intestines into the blood stream. If soil contaminated with CDDs comes into contact with your skin, some of the CDDs will enter the body but we do not know how fast they will enter the blood stream.

Once in your body, CDDs can be found in most tissues with the highest amounts found in the liver and body fat (adipose tissue). Body fat and possibly the liver can store CDDs for many years before eliminating them from the body. CDDs with chlorine atoms in the 2, 3, 7, and 8 positions and highly chlorinated dioxins, such as OCDD, are generally found in higher concentrations in the fat than other CDDs.

Little is known about CDDs breakdown in the human body. Studies in animals show that some of the 2,3,7,8-TCDD from food is slowly broken down. There is evidence from animals suggesting that the break-down products are less harmful than the unchanged 2,3,7,8-TCDD.

For people, the average time it takes to remove one-half of the 2,3,7,8-TCDD from the body is highly variable and may take from 7 to 12 years. There is less information on the other CDDs, but what information exists suggests 5 to 15 years. CDDs are eliminated from the body primarily in the stool, and only a small amount leaves the body in the urine. Some CDDs will leave the body in the breast milk of nursing mothers.

Much less is known about how much other CDD compounds will enter the body, how much will be stored in the body and for how long, and how they are removed from the body.

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1.5 How can CDDs affect my health?

Many studies have looked at how CDDs can affect human health. Most of these studies examined workers exposed during the manufacture of chemicals and pesticides contaminated with 2,3,7,8-TCDD. Other studies have looked at American Vietnam veterans and Vietnamese populations exposed to Agent Orange and populations exposed to 2,3,7,8-TCDD as a result of an accident. The workers and Vietnam veterans were most likely exposed to 2,3,7,8-TCDD mainly through breathing and skin contact. People who were accidentally exposed to 2,3,7,8-TCDD in Seveso, Italy, or Times Beach, Missouri, were probably exposed through eating and drinking contaminated food and milk, breathing contaminated particles and dust, and through skin contact with contaminated soil. Epidemiology is an inexact science and many of the human studies have many shortcomings which make it difficult for scientists to establish an association between 2,3,7,8-TCDD exposure levels and health effects. A common problem with most of the human studies is that the people are exposed to a number of chemicals at the same time. In most human health studies, we do not know how much 2,3,7,8-TCDD people were exposed to or how long the exposure lasted. In other studies, the people were examined many years after they were exposed and some of the effects may have not have been present at the time of examination or the effects observed may not have been caused by 2,3,7,8-TCDD. Some of the more recent studies have measured 2,3,7,8-TCDD levels in the blood or fat tissue of exposed populations. The levels of 2,3,7,8-TCDD in the blood or fat tissue can be used to estimate the extent of past exposures.

A number of effects have been observed in people exposed to 2,3,7,8-TCDD levels which are at least 10 times higher than background levels. The most obvious health effect in people exposed to relatively large amounts of 2,3,7,8-TCDD is

chloracne. Chloracne is a severe skin disease characterized by acne-like lesions. Chloracne generally occurs on the face and upper body, but may occur elsewhere on the body. Unlike common acne, severe chloracne is harder to cure and can be more disfiguring. In milder cases, the lesions heal several months after exposure ends. In more severe cases, the lesions may last for many years after exposure. Most of the chloracne cases have been attributed to accidental exposure to high doses of 2,3,7,8-TCDD. Other effects to the skin, such as erythematous or red skin rashes, discoloration, and excessive body hair, have been reported to occur in people following exposure to high concentrations of 2,3,7,8-TCDD. Changes in blood and urine that may indicate liver damage have been observed in people. Alterations in the ability of the liver to metabolize (or breakdown) hemoglobin, lipids, sugar, and protein have been reported in people exposed to relatively high concentrations of 2,3,7,8-TCDD. Most of the effects are considered mild and were reversible. However, in some people these effects may last for many years. Slight increases in the risk of diabetes and abnormal glucose tolerance have been observed in some studies of people exposed to 2,3,7,8-TCDD. We do not have enough information to know if exposure to 2,3,7,8-TCDD will result in reproductive or developmental effects in people, but animal studies suggest that this is a potential health concern. Several studies of workers exposed to high levels (more than 50 times higher than background levels) of 2,3,7,8-TCDD suggest that exposure to 2,3,7,8-TCDD may increase the risk of cancer in people.

The Department of Health and Human Services (DHHS) has determined that it is reasonable to expect that 2,3,7,8-TCDD may cause cancer. The International Agency for Research on Cancer (IARC) has determined that 2,3,7,8-TCDD can cause cancer in people, but that it is not possible to classify other CDDs as to their carcinogenicity to humans. The EPA has determined that 2,3,7,8-TCDD is a possible human carcinogen when considered alone and a probable human carcinogen when considered in association with phenoxy herbicides and/or chlorophenols. The EPA has determined also that a mixture of CDDs with six chlorine atoms (4 of the 6 chlorine atoms at the 2, 3, 7, and 8 positions) is a probable human carcinogen.

To protect the public from the harmful effects of toxic chemicals and to find ways to treat people who have been harmed, scientists use many tests.

One way to see if a chemical will hurt people is to learn how the chemical is absorbed, used, and released by the body; for some chemicals, animal testing may be necessary. Animal testing may also be used to identify health effects such as cancer or birth defects. Without laboratory animals, scientists would lose a basic method to get information needed to make wise decisions to protect public health. Scientists have the responsibility to treat research animals with care and compassion. Laws today protect

the welfare of research animals, and scientists must comply with strict animal care guidelines.

The health effects of some CDDs have been extensively studied in animals. Some CDDs are much more toxic than others. 2,3,7,8-TCDD and, to a lesser extent, CDDs with five (penta) or six (hexa) chlorine atoms substituted in the 2, 3, 7, and 8 positions, are extremely toxic to animals. Other CDDs, which do not have chlorine atoms substituted in the 2, 3, 7, and 8 positions, are considered relatively less toxic compared to 2,3,7,8-TCDD.

2,3,7,8-TCDD has been the most extensively studied CDD and it has been shown to cause a large number of adverse health effects in animals. There are always going to be some difficulties in using animal data to quantify health risks in people. In general, the doses used in the animal studies result in body burdens that are at least 10 times higher than human background body burdens, often the animal studies use doses that are over 1,000 times higher than human background levels. Some animal species are much more acutely sensitive to 2,3,7,8-TCDD than others. For example, it takes several thousand times more 2,3,7,8-TCDD to kill a hamster than a guinea pig. The reason for the difference in sensitivity among species is currently being investigated. For other effects, such as reproductive toxicity, there is very little difference in sensitivity between hamsters and guinea pigs. Another consideration in using animal data to predict health effects in people exposed to CDDs in the environment is the design of the animal studies. In most of the animal studies, the animals were exposed to only 2,3,7,8-TCDD, the most toxic CDD. 2,3,7,8-TCDD is rarely the main CDD found in the environment and people are typically exposed to a number of CDDs and compounds with similar toxic actions. Until scientists learn more about possible differences between people and animals, levels recommended to be of little or no risk to human health are based on the more sensitive species and the assumption that effects in animals could occur in people. This approach is further justified on the basis that humans are likely to exhibit a wide range of sensitivities to various health effects and the need to protect the most susceptible individuals.

In certain species, 2,3,7,8-TCDD is especially harmful and can cause death after a single exposure to small amounts. Before death, animals may lose as much as 40% or more of their body weight following a single dose of 2,3,7,8-TCDD. Exposure to non-lethal levels in food can cause a variety of adverse effects in animals, such as weight loss, biochemical and degenerative changes in the liver. Some animals that were exposed to CDDs in food had effects to the skin such as hair loss, swelling of the face, and moderate to severe chloracne. In many species of animals, the immune system appears to be extremely sensitive to 2,3,7,8-TCDD. At relatively low levels (approximately 10 times higher than human background body burdens), 2,3,7,8-TCDD weakens the immune system and causes a decrease in the system's ability to

fight foreign substances such as bacteria and viruses.

Exposure to 2,3,7,8-TCDD can cause reproductive damage and birth defects in animals. Decreases in fertility, altered levels of sex hormones, reduced production of sperm, and increased rates of miscarriages were found in animals exposed to 2,3,7,8-TCDD in food. Rats and mice that were exposed to small amounts of 2,3,7,8-TCDD in food for a long time developed cancer of the liver and thyroid, and other types of cancer.

The results of the oral animal studies suggest that the most sensitive effects (effects that will occur at the lowest doses) are immune, endocrine, and developmental effects. It is reasonable to assume that these will also be the most sensitive effects in humans.

We know less about the ability of other CDDs to cause adverse health effects. However, it appears that all CDDs with chlorine in the 2, 3, 7, and 8 positions have similar effects to 2,3,7,8-TCDD but the effects occur at higher doses.

Relatively large amounts of 2,3,7,8-TCDD applied to the skin of some animal species have resulted in deaths. Smaller amounts have resulted in weight loss, acne-like sores on the skin, and biochemical and degenerative changes in the liver. In addition, mice that had 2,3,7,8-TCDD repeatedly applied to their skin developed skin cancer. Although effects in animals following exposure through the skin have not been as extensively studied as effects following exposure in food, they appear to be quite similar. The ability of other CDDs to cause adverse health effects in animals following exposure to the skin has not been well studied.

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1.6 How can CDDs affect children?

This section discusses potential health effects from exposures during the period from conception to maturity at 18 years of age in humans. Potential effects on children resulting from exposures of the parents are also considered.

Very few studies have looked at how CDDs can affect children's health. Chloracne has been observed in children exposed to much higher than current background levels of 2,3,7,8-TCDD. The children appeared to be more sensitive (effects occurred at a lower body burden) than adults. We do not know why children are more sensitive than adults to this effect. It is likely that children exposed to higher than background levels will have similar effects as adults.

We do not know if exposure to CDDs will result in birth defects or other developmental effects in people. Birth defects have been observed in animals exposed to higher than background levels of 2,3,7,8-TCDD. The developing animal is very sensitive to 2,3,7,8-TCDD. In some studies, effects were observed at body burdens 10

times higher than human background levels. Offspring of animals exposed to 2,3,7,8-TCDD in food during pregnancy often had severe birth defects including bleeding, skeletal deformities, kidney defects, weakened immune responses, impaired development of the reproductive system, and learning and behavioral impairments. Exposure to other CDDs, such as 2,7-DCDD, 1,2,3,7,8-PeCDD, OCDD, and HxCDD, can also result in developmental effects in animals.

We have no information to suggest that there are any differences between children and adults in terms of how much CDDs will enter the body, where CDDs can be found in the body, and how fast CDDs will leave the body. CDDs from the mother can enter her unborn baby through the placenta. It can also be transferred from the mother to infant through breast milk. Because CDDs have been measured in human milk, cows milk, and infant formula, nursing infants are also exposed to CDDs. In most cases the beneficial aspects (biological and psychological) of breast-feeding outweigh any risks from exposure to CDDs from mother's milk.

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1.7 How can families reduce the risk of exposure to CDDs?

If your doctor finds that you have been exposed to significant amounts of CDDs, ask your doctor if children may also be exposed. When necessary your doctor may need to ask your state Department of Public Health to investigate.

Structural material used in building homes such as chemically treated lumber for decking and plastic PVC pipes used in water pipes and other conduits can release CDDs if they are burned as refuse during construction or if there is a structural fire in your home. To avoid exposures from some of these sources, construction refuse should not be burned near your home especially when children are out playing.

Children may be exposed to CDDs from ingestion of contaminated soil or by contact of contaminated soil with their skin. However, skin contact with contaminated soil will result in much less CDDs entering the blood stream than if they ingest contaminated soil. Also, the amount of CDDs that will pass to the blood stream after eating contaminated soil will depend on the type of soil and on how tight the CDDs are bound to the soil. Children should be restricted from playing near any known hazardous waste sites. Some children eat a lot of dirt. Discourage your children from eating dirt or from putting their toys or other foreign objects in their mouths that may be contaminated with soil. Make sure that your children wash their hands frequently, especially before eating. Discourage your children from putting their hands in their mouths or other hand-to-mouth activities.

Older children may be exposed to CDDs if they smoke cigarettes.

Younger children and infants may be exposed by inhaling the second-hand smoke from their parents or other adult smokers. Parents should talk to their children about the dangers of smoking cigarettes.

You and your children are likely to be exposed to very low amounts of CDDs in the diet particularly when you consume meat, milk, other dairy products, and fish. This represents the major source of background exposure to CDDs in most people. Children and adults should eat a balanced diet preferably containing low to moderate amounts of animal fats including meat and dairy products, and fish that contain higher amounts of CDDs and eat larger amounts of fruits, vegetables and grains.

You or your children may be exposed to CDDs by eating certain types of fish or wildlife caught in certain locations. A number of states have advisories for CDDs in fish and shellfish species; and one state has a wildlife advisory in effect for wood ducks. Each state, Native American tribe, or U.S. Territory sets its own criteria for issuing fish and wildlife advisories. A fish advisory will specify which waterbodies have restrictions, and a wildlife advisory will specify which hunting areas have restrictions. The advisory will tell you what types and sizes of fish or game are of concern. The advisory may completely ban eating fish or game or recommend that you limit the number of meals you eat of a certain species. For example, an advisory may tell you to eat a certain type of fish no more than once a month. The advisory may also tell you only to eat certain parts of the fish or game animal and how to prepare or cook the fish or game to decrease your exposure to CDDs. Fish and wildlife advisories are often stricter for pregnant women, nursing mothers, and young children. To reduce your children's exposure to CDDs, obey all fish and wildlife advisories. Information on Fish and Wildlife Advisories in your state is available from your state Public Health Department, or state Natural Resources Department and signs may be posted in certain fishing and hunting areas.

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1.8 Is there a medical test to determine whether I have been exposed to CDDs?

Specific tests exist to measure CDD levels in samples of body fat, blood, and breast milk, but these tests are not routinely available. All people now have some levels of CDDs in their body fat and blood. Levels of 2,3,7,8-TCDD on a lipid basis are generally below 10 pg/g of lipid (ppt) in the blood and fatty tissue of the general population of the United States, and usually range from 3 to 7 ppt. Levels higher than these indicate past exposure to above-normal levels of 2,3,7,8-TCDD. Although CDDs stay in the body fat for a long time (see Section 1.4), tests are not used to determine when exposure occurred, but can be used to estimate dose of the exposure if the time of exposure is known.

Although exposure to 2,3,7,8-TCDD has been associated with adverse health effects in people, no one effect is specifically

related to exposure to CDDs. There are laboratory tests which can indicate whether you have been exposed to CDDs, but these are costly and take weeks to perform and they cannot be used to predict whether you will develop harmful health effects.

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1.9 What recommendations has the federal government made to protect human health?

The federal government develops regulations and recommendations to protect public health. Regulations can be enforced by law. Federal agencies that develop regulations for toxic substances include the Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), and the Food and Drug Administration (FDA). Recommendations provide valuable guidelines to protect public health but cannot be enforced by law. Federal organizations that develop recommendations for toxic substances include the Agency for Toxic Substances and Disease Registry (ATSDR) and the National Institute for Occupational Safety and Health (NIOSH).

Regulations and recommendations can be expressed in not-to-exceed levels in air, water, soil, or food that are usually based on levels that affect animals, then they are adjusted to help protect people. Sometimes these not-to-exceed levels differ among federal organizations because of different exposure times (an 8-hour workday or a 24-hour day), the use of different animal studies, or other factors.

Recommendations and regulations are also periodically updated as more information becomes available. For the most current information, check with the federal agency or organization that provides it. Some regulations and recommendations for CDDs include the following:

The government has developed regulations and guidelines for 2,3,7,8-TCDD. These are designed to protect the public from the potential adverse health effects of the chemical. The Food and Drug Administration (FDA) recommends against consuming fish and shellfish with 2,3,7,8-TCDD levels greater than 50 ppt. Such levels have resulted in the closing of several commercial fishing areas. In addition, EPA has issued guidance to states on how to evaluate health risks to recreational and subsistence fishers, and how to issue fish consumption advisories when concentrations of CDDs in fish and shellfish pose a risk to these populations. Currently, 66 health advisories have been issued by 21 states restricting consumption of fish and wildlife contaminated with CDDs. EPA also has recommended limits on how much 2,3,7,8-TCDD can be present in drinking water. EPA advises that children should not have more than 1 nanogram 2,3,7,8-TCDD per liter of water (ng/L) (ppt) in 1 day, or more than 0.01 ng/L per day for long-term exposure. For long-term exposure in adults, EPA recommends that there should not be more than 0.04 ng/L (ppt) in drinking water.

Human milk can contain higher levels of CDDs than cow's milk. Therefore, breast-fed infants can be exposed to higher levels of CDDs on a body weight basis than adults. The World Health Organization (WHO) has concluded that this risk to infants does not outweigh the positive biological and psychological benefits of breast-feeding at general population levels of dioxins. However, the specific concentration at which CDD levels in human milk would lead to harmful health effects in infants has not yet been determined.

Regulation of many of the sources of CDDs appears to have been successful in reducing the amount of CDDs entering the ecosystem and in decreasing the potential for human exposure. EPA considers 2,3,7,8-TCDD to be a hazardous waste. Many regulations govern its destruction and disposal.

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1.10 Where can I get more information?

If you have any more questions or concerns, please contact your community or state health or environmental quality department or:

Agency for Toxic Substances and Disease Registry
Division of Toxicology
1600 Clifton Road NE, Mailstop F-32
Atlanta, GA 30333

Information line and technical assistance:

Phone: 888-422-8737
FAX: (770)-488-4178

ATSDR can also tell you the location of occupational and environmental health clinics. These clinics specialize in recognizing, evaluating, and treating illnesses resulting from exposure to hazardous substances.

To order toxicological profiles, contact:

National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
Phone: 800-553-6847 or 703-605-6000

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References

Agency for Toxic Substances and Disease Registry (ATSDR). 1998. Toxicological profile for chlorinated dibenzo-p-dioxins (CDDs). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

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September 1995

ToxFAQs™ for Chlorodibenzofurans (CDFs)

(Dibenzofuranos Policlorados (DFPCs))

This fact sheet answers the most frequently asked health questions about chlorodibenzofurans (CDFs). For more information, you may call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

SUMMARY: Exposure to chlorodibenzofurans (CDFs) occurs mainly by eating certain contaminated foods. In people, exposure to CDFs is most likely to cause skin and eye irritation, and increased vulnerability to respiratory infection and nervous system effects. This chemical has been found in at least 51 of 1,416 National Priorities List sites identified by the Environmental Protection Agency.

What are chlorodibenzofurans (CDFs)?

Chlorinated dibenzofurans, or CDFs, are a family of chemicals that contain one to eight chlorine atoms attached to the carbon atoms of the parent chemical, dibenzofuran. There are 135 different types of CDFs with varying harmful health and environmental effects. The compounds that contain chlorine atoms at the 2,3,7,8-positions of the dibenzofuran molecule are known to be especially harmful.

Not all of the different types have been found in large enough quantities to study the physical properties. However, of those that have been studied, they do not dissolve in water easily and appear to be in the form of colorless solids.

There is no known use for these chemicals. Other than for research purposes, they are not deliberately produced by industry. Most CDFs are produced in small amounts as undesirable by-products of certain processes, such as manufacturing other chemicals or bleaching at paper and pulp mills. CDFs can also be released from incinerators.

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What happens to CDFs when they enter the

environment?

- CDFs exist in the air as solid particles and sometimes vapors.
- They can enter the environment from car exhausts or from burning coal, wood, or oil for home heating, and the production of electricity.
- Vaporized CDFs are broken down by other chemicals in the atmosphere.
- They can be removed from the air in snow and rain.
- They attach to soil and sediment in lakes and rivers.
- They are not likely to move into groundwater from soil.
- They accumulate in fish to tens of thousands times higher levels than in the water or sediment.
- They also build up in other animals, birds, and people that are exposed to CDFs in their food.

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How might I be exposed to CDFs?

- Eating contaminated foods, such as meat, fish, and milk (90% of daily exposure, which is only a few picograms [pg], results from eating contaminated food).
- Breathing air or drinking water that is contaminated, or coming in contact with contaminated soil.
- Using products such as milk cartons, coffee filters, and tampons could result in very low exposures.
- Breathing contaminated workplace air.

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How can CDFs affect my health?

Very little is known about the health effects in people or animals from breathing or touching CDFs. A study in mice showed that skin exposure to low levels over several weeks produced effects similar to those from ingesting CDFs.

Most of the information on the adverse health effects comes from studies in people who were accidentally exposed to food contaminated with CDFs. The amounts that these people were exposed to were much higher than are likely from environmental exposures or from a normal diet.

CDFs caused skin and eye irritations, including severe acne, darkened skin color, and swollen eyelids with discharge from the eyes. CDF poisoning also caused vomiting and diarrhea, anemia, more frequent lung infections, numbness, effects on the nervous system, and mild changes in the liver. Children born to exposed mothers had skin irritation and more difficulty learning.

Many of the same effects that occurred in people also occurred in laboratory animals that ate CDFs. Animals also had severe weight loss, and their stomachs, livers, kidneys, and immune systems were seriously injured. Some animals had birth defects and testicular damage, and in severe cases, some animals died. These effects in animals were seen when they were fed large amounts of CDFs over a short time, or small amounts over several weeks or

months.

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How likely are CDFs to cause cancer?

The Department of Health and Human Services, the International Agency for Research on Cancer, and the Environmental Protection Agency (EPA) have not classified CDFs for carcinogenicity.

It is not definitely known if CDFs cause cancer in people. There are no cancer studies in animals that ate or breathed CDFs. One study found that when CDFs were applied to the skin of animals, they did not cause cancer, but when they were applied with another compound called MNNG, which is known to initiate tumors, cancer did develop.

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Is there a medical test to show whether I've been exposed to CDFs?

There are tests available to measure CDFs in your blood, body fat, and breast milk. The tests can tell you if you have been exposed, but they can't tell you the exact amount of CDFs or for how long you were exposed. The tests also cannot predict whether you will experience harmful health effects. Nearly everyone in the United States and other industrialized countries has been exposed to low levels of CDFs because they are in the environment.

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Has the federal government made recommendations to protect human health?

There are no federal guidelines or recommendations for protecting human health or the environment from exposure to CDFs.

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Glossary

Anemia: A decreased ability of the blood to transport oxygen.

Carcinogenicity: Ability to cause cancer.

Picogram (pg): One trillionth of a gram.

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References

Agency for Toxic Substances and Disease Registry (ATSDR). 1994. Toxicological Profile for chlorodibenzofurans (CDFs). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

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Where can I get more information?

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

For more information, contact:

Agency for Toxic Substances and Disease Registry
Division of Toxicology
1600 Clifton Road NE, Mailstop F-32
Atlanta, GA 30333
Phone: 1-888-42-ATSDR (1-888-422-8737)
FAX: (770)-488-4178
Email: ATSDRIC@cdc.gov

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November 2000

Public Health Statement for Polychlorinated Biphenyls (PCBs)

This Public Health Statement is the summary chapter from the Toxicological Profile for polychlorinated biphenyls (PCBs). It is one in a series of Public Health Statements about hazardous substances and their health effects. A shorter version, the ToxFAQs™, is also available. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present. For more information, call the ATSDR Information Center at 1-888-422-8737.

This public health statement tells you about polychlorinated biphenyls (PCBs) and the effects of exposure.

The Environmental Protection Agency (EPA) identifies the most serious hazardous waste sites in the nation. These sites make up the National Priorities List (NPL) and are the sites targeted for long-term federal cleanup activities. PCBs have been found in at least 500 of the 1,598 current or former NPL sites. However, the total number of NPL sites evaluated for PCBs is not known. As more sites are evaluated, the sites at which PCBs are found may increase. This information is important because exposure to PCBs may harm you and because these sites may be sources of exposure.

When a substance is released from a large area, such as an industrial plant, or from a container, such as a drum or bottle, it enters the environment. This release does not always lead to exposure. You are exposed to a substance only when you come in contact with it. You may be exposed by breathing, eating, or drinking the substance, or by skin contact.

If you are exposed to PCBs, many factors determine whether you'll be harmed. These factors include the dose (how much), the duration (how long), and how you come in contact with them. You must also consider the other chemicals you're exposed to and your age, sex, diet, family traits, lifestyle, and state of health.

1.1 What are polychlorinated biphenyls (PCBs)?

PCBs are a group of synthetic organic chemicals that can cause a number of different harmful effects. There are no known natural sources of PCBs in the environment. PCBs are either oily liquids or solids and are colorless to light yellow. Some PCBs are volatile

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and may exist as a vapor in air. They have no known smell or taste. PCBs enter the environment as mixtures containing a variety of individual chlorinated biphenyl components, known as congeners, as well as impurities. Because the health effects of environmental mixtures of PCBs are difficult to evaluate, most of the information in this toxicological profile is about seven types of PCB mixtures that were commercially produced. These seven kinds of PCB mixtures include 35% of all the PCBs commercially produced and 98% of PCBs sold in the United States since 1970. Some commercial PCB mixtures are known in the United States by their industrial trade name, Aroclor. For example, the name Aroclor 1254 means that the mixture contains approximately 54% chlorine by weight, as indicated by the second two digits in the name. Because they don't burn easily and are good insulating materials, PCBs were used widely as coolants and lubricants in transformers, capacitors, and other electrical equipment. The manufacture of PCBs stopped in the United States in August 1977 because there was evidence that PCBs build up in the environment and may cause harmful effects. Consumer products that may contain PCBs include old fluorescent lighting fixtures, electrical devices or appliances containing PCB capacitors made before PCB use was stopped, old microscope oil, and old hydraulic oil. You can find further information on the physical properties and uses of PCBs in Chapters 4 and 5 of the toxicological profile.

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1.2 What happens to polychlorinated biphenyls (PCBs) when they enter the environment?

Before 1977, PCBs entered the air, water, and soil during their manufacture and use in the United States. Wastes that contained PCBs were generated at that time, and these wastes were often placed in landfills. PCBs also entered the environment from accidental spills and leaks during the transport of the chemicals, or from leaks or fires in transformers, capacitors, or other products containing PCBs. Today, PCBs can still be released into the environment from poorly maintained hazardous waste sites that contain PCBs; illegal or improper dumping of PCB wastes, such as old transformer fluids; leaks or releases from electrical transformers containing PCBs; and disposal of PCB-containing consumer products into municipal or other landfills not designed to handle hazardous waste. PCBs may be released into the environment by the burning of some wastes in municipal and industrial incinerators.

Once in the environment, PCBs do not readily break down and therefore may remain for very long periods of time. They can easily cycle between air, water, and soil. For example, PCBs can enter the air by evaporation from both soil and water. In air, PCBs can be carried long distances and have been found in snow and sea water in areas far away from where they were released into the environment, such as in the arctic. As a consequence, PCBs are found all over the world. In general, the lighter the type of PCBs, the further they may be transported from the source of

contamination. PCBs are present as solid particles or as a vapor in the atmosphere. They will eventually return to land and water by settling as dust or in rain and snow. In water, PCBs may be transported by currents, attach to bottom sediment or particles in the water, and evaporate into air. Heavy kinds of PCBs are more likely to settle into sediments while lighter PCBs are more likely to evaporate to air. Sediments that contain PCBs can also release the PCBs into the surrounding water. PCBs stick strongly to soil and will not usually be carried deep into the soil with rainwater. They do not readily break down in soil and may stay in the soil for months or years; generally, the more chlorine atoms that the PCBs contain, the more slowly they break down. Evaporation appears to be an important way by which the lighter PCBs leave soil. As a gas, PCBs can accumulate in the leaves and above-ground parts of plants and food crops.

PCBs are taken up into the bodies of small organisms and fish in water. They are also taken up by other animals that eat these aquatic animals as food. PCBs especially accumulate in fish and marine mammals (such as seals and whales) reaching levels that may be many thousands of times higher than in water. PCB levels are highest in animals high up in the food chain. You can find more information about what happens to PCBs in the environment in Chapter 6 of the toxicological profile.

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1.3 How might I be exposed to polychlorinated biphenyls (PCBs)?

Although PCBs are no longer made in the United States, people can still be exposed to them. Many older transformers and capacitors may still contain PCBs, and this equipment can be used for 30 years or more. Old fluorescent lighting fixtures and old electrical devices and appliances, such as television sets and refrigerators, therefore may contain PCBs if they were made before PCB use was stopped. When these electric devices get hot during operation, small amounts of PCBs may get into the air and raise the level of PCBs in indoor air. Because devices that contain PCBs can leak with age, they could also be a source of skin exposure to PCBs.

Small amounts of PCBs can be found in almost all outdoor and indoor air, soil, sediments, surface water, and animals. However, PCB levels have generally decreased since PCB production stopped in 1977. People are exposed to PCBs primarily from contaminated food and breathing contaminated air. The major dietary sources of PCBs are fish (especially sportfish that were caught in contaminated lakes or rivers), meat, and dairy products. Between 1978 and 1991, the estimated daily intake of PCBs in adults from dietary sources declined from about 1.9 nanograms (a nanogram is a billionth part of a gram) to less than 0.7 nanograms. PCB levels in sportfish are still high enough so that eating PCB-contaminated fish may be an important source of exposure for some people. Recent studies on fish indicate maximum concentrations of PCBs are a few parts of PCBs in a million parts

(ppm) of fish, with higher levels found in bottom-feeders such as carp. Meat and dairy products are other important sources of PCBs in food, with PCB levels in meat and dairy products usually ranging from less than 1 part in a billion parts (ppb) of food to a few ppb.

Concentrations of PCBs in subsurface soil at a Superfund site have been as high as 750 ppm. People who live near hazardous waste sites may be exposed to PCBs by consuming PCB-contaminated sportfish and game animals, by breathing PCBs in air, or by drinking PCB-contaminated well water. Adults and children may come into contact with PCBs when swimming in contaminated water and by accidentally swallowing water during swimming. However, both of these exposures are far less serious than exposures from ingesting PCB-contaminated food (particularly sportfish and wildlife) or from breathing PCB-contaminated air.

Workplace exposure to PCBs can occur during repair and maintenance of PCB transformers; accidents, fires, or spills involving PCB transformers and older computers and instruments; and disposal of PCB materials. In addition to older electrical instruments and fluorescent lights that contain PCB-filled capacitors, caulking materials, elastic sealants, and heat insulation have also been known to contain PCBs. Contact with PCBs at hazardous waste sites can happen when workers breathe air and touch soil containing PCBs. Exposure in the contaminated workplace occurs mostly by breathing air containing PCBs and by touching substances that contain PCBs. You can find more information about exposure to PCBs in Chapter 6 of the toxicological profile.

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1.4 How can polychlorinated biphenyls (PCBs) enter and leave my body?

If you breathe air that contains PCBs, they can enter your body through your lungs and pass into the bloodstream. We do not know how fast or how much of the PCBs that are breathed will pass into the blood. A common way for PCBs to enter your body is by eating meat or fish products or other foods that contain PCBs. Exposure from drinking water is less than from food. It is also possible that PCBs can enter your body by breathing indoor air or by skin contact in buildings that have the kinds of old electrical devices that contain and can leak PCBs. For people living near waste sites or processing or storage facilities, and for people who work with or around PCBs, the most likely ways that PCBs will enter their bodies are from skin contact with contaminated soil and from breathing PCB vapors. Once PCBs are in your body, some may be changed by your body into other related chemicals called metabolites. Some metabolites of PCBs may have the potential to be as harmful as some unchanged PCBs. Some of the metabolites may leave your body in the feces in a few days, but others may remain in your body fat for months. Unchanged PCBs may also remain in your body and be stored for years mainly in the fat and liver, but smaller amounts can be found

in other organs as well. PCBs collect in milk fat and can enter the bodies of infants through breast-feeding. For more information on how PCBs can enter and leave your body, see Chapter 3 of the toxicological profile.

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1.5 How can polychlorinated biphenyls (PCBs) affect my health?

Many studies have looked at how PCBs can affect human health. Some of these studies investigated people exposed in the workplace, and others have examined members of the general population. Skin conditions, such as acne and rashes, may occur in people exposed to high levels of PCBs. These effects on the skin are well documented, but are not likely to result from exposures in the general population. Most of the human studies have many shortcomings, which make it difficult for scientists to establish a clear association between PCB exposure levels and health effects. Some studies in workers suggest that exposure to PCBs may also cause irritation of the nose and lungs, gastrointestinal discomfort, changes in the blood and liver, and depression and fatigue. Workplace concentrations of PCBs, such as those in areas where PCB transformers are repaired and maintained, are higher than levels in other places, such as air in buildings that have electrical devices containing PCBs or in outdoor air, including air at hazardous waste sites. Most of the studies of health effects of PCBs in the general population examined children of mothers who were exposed to PCBs. The possible health effects of PCBs in children are discussed in Section 1.6.

To protect the public from the harmful effects of toxic chemicals and to find ways to treat people who have been harmed, scientists use many tests.

One way to see if a chemical will hurt people is to learn how the chemical is absorbed, used, and released by the body; for some chemicals, animal testing may be necessary. Animal testing may also be used to identify health effects such as cancer or birth defects. Without laboratory animals, scientists would lose a basic method to get information needed to make wise decisions to protect public health. Scientists have the responsibility to treat research animals with care and compassion. Laws today protect the welfare of research animals, and scientists must comply with strict animal care guidelines.

Rats that ate food containing large amounts of PCBs for short periods of time had mild liver damage, and some died. Rats, mice, or monkeys that ate smaller amounts of PCBs in food over several weeks or months developed various kinds of health effects, including anemia, acne-like skin conditions, and liver, stomach, and thyroid gland injuries. Other effects caused by PCBs in animals include reductions in the immune system function, behavioral alterations, and impaired reproduction. Some PCBs can mimic or block the action of hormones from the thyroid and other endocrine glands. Because hormones influence the normal

functioning of many organs, some of the effects of PCBs may result from endocrine changes. PCBs are not known to cause birth defects. Only a small amount of information exists on health effects in animals exposed to PCBs by skin contact or breathing. This information indicates that liver, kidney, and skin damage occurred in rabbits following repeated skin exposures, and that a single exposure to a large amount of PCBs on the skin caused death in rabbits and mice. Breathing PCBs over several months also caused liver and kidney damage in rats and other animals, but the levels necessary to produce these effects were very high. For more information on how PCBs can affect your health, see Chapters 2 and 3 of the toxicological profile.

Studies of workers provide evidence that PCBs were associated with certain types of cancer in humans, such as cancer of the liver and biliary tract. Rats that ate commercial PCB mixtures throughout their lives developed liver cancer. Based on the evidence for cancer in animals, the Department of Health and Human Services (DHHS) has stated that PCBs may reasonably be anticipated to be carcinogens. Both EPA and the International Agency for Research on Cancer (IARC) have determined that PCBs are probably carcinogenic to humans.

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1.6 How can polychlorinated biphenyls (PCBs) affect children?

This section discusses potential health effects from exposures during the period from conception to maturity at 18 years of age in humans.

Children are exposed to PCBs in the same way as are adults: by eating contaminated food, breathing indoor air in buildings that have electrical devices containing PCBs, and drinking contaminated water. Because of their smaller weight, children's intake of PCBs per kilogram of body weight may be greater than that of adults. In addition, a child's diet often differs from that of adults. A Food and Drug Administration (FDA) study in 1991 estimated dietary intakes of PCBs for infants (6 months) and toddlers (2 years) of less than 0.001 and 0.002 μg/kg/day. Children who live near hazardous waste sites may accidentally eat some PCBs through hand-to-mouth behavior, such as by putting dirty hands or other soil/dirt covered objects in their mouths, or eating without washing their hands. Some children also eat dirt on purpose; this behavior is called pica. Children could also be exposed by playing with old appliances or electrical devices that contain PCBs.

It is possible that children could be exposed to PCBs following transport of the chemical on clothing from the parent's workplace to the home. House dust in homes of workers exposed to PCBs contained higher than average levels of PCBs. PCBs have also been found on the clothing of firefighters following transformer fires. The most likely way infants will be exposed is from breast milk that contains PCBs. Fetuses in the womb are also exposed

from the exposed mother.

In one study of women exposed to relatively high concentrations of PCBs in the workplace during pregnancy, their babies weighed slightly less at birth than babies born to women exposed to lower concentrations of PCBs. Studies of women who consumed high amounts of fish contaminated with PCBs and other chemicals also had babies that weighed less than babies from women who did not eat fish. Similar observations have been made in some studies of women with no known high exposure to PCBs, but not all studies have confirmed these findings. Babies born to women who ate fish contaminated with PCBs before and during pregnancy showed abnormal responses to tests of infant behavior. Some of these behaviors, such as problems with motor skills and a decrease in short-term memory, persisted for several years. However, in these studies, the women may have been exposed to other chemicals. Other studies suggest that the immune system may be affected in children born to and nursed by mothers exposed to increased levels of PCBs. There are no reports of structural birth defects in humans caused by exposure to PCBs or of health effects of PCBs in older children. It is not known whether PCB exposure can cause in skin acne and rashes in children as occurs in some adults, although it is likely that the same effects would occur at very high PCB exposure levels.

Animal studies have shown harmful effects in the behavior of very young animals when their mothers were exposed to PCBs and they were exposed in the womb or by nursing. In addition, some animal studies suggest that exposure to PCBs causes an increased incidence of prenatal death and changes in the immune system, thyroid, and reproductive organs. Studies in monkeys showed that young animals developed skin effects from nursing after their mothers were exposed to PCBs. Some studies indicate that very high doses of PCBs may cause structural birth defects in animals.

Children can be exposed to PCBs both prenatally and from breast milk. PCBs are stored in the mother's body and can be released during pregnancy, cross the placenta, and enter fetal tissues. Because PCBs dissolve readily in fat, they can accumulate in breast milk fat and be transferred to babies and young children. PCBs have been measured in umbilical cord blood and in breast milk. Some studies have estimated that an infant who is breast fed for 6 months may accumulate in this period 6–12% of the total PCBs that will accumulate during its lifetime. However, in most cases, the benefits of breast-feeding outweigh any risks from exposure to PCBs in mother's milk. You should consult your health care provider if you have any concerns about PCBs and breast feeding. Because the brain, nervous system, immune system, thyroid, and reproductive organs are still developing in the fetus and child, the effects of PCBs on these target systems may be more profound after exposure during the prenatal and neonatal periods, making fetuses and children more susceptible to PCBs than adults.

More information regarding children's health and PCBs can be found in Chapter 3 (Section 3.7) of the toxicological profile.

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1.7 How can families reduce their risk of expsoure to polychlorinated biphenyls (PCBs)?

If your doctor finds that you have been exposed to significant amounts of polychlorinated biphenyls, ask whether your children might also be exposed. Your doctor might need to ask your state health department to investigate.

You and your children may be exposed to PCBs by eating fish or wildlife caught from contaminated locations. Certain states, Native American tribes, and U.S. territories have issued fish and wildlife advisories to warn people about PCB-contaminated fish and fish-eating wildlife. These advisories will tell you what types and sizes of fish and game animals are of concern. An advisory may completely ban eating fish or game or tell you to limit your meals of a certain fish or game type. For example, an advisory may tell you not to eat a certain type of fish or game more than once a month. The advisory may tell you only to eat certain parts of the fish or game and how to prepare or cook the fish or game to decrease your exposure to PCBs. The fish or wildlife advisory may have special restrictions to protect pregnant women, nursing mothers, and young children. To reduce your children's exposure to PCBs, obey these advisories. Additional information on fish and wildlife advisories for PCBs, including states that have advisories, is provided in Chapter 6 (Section 6.7) and Chapter 8 of the toxicological profile. You can consult your local and state health departments or state natural resources department on how to obtain PCB advisories, as well as other important information, such as types of fish and wildlife and the locations that the advisories apply to.

Children should be told that they should not play with old appliances, electrical equipment, or transformers, since they may contain PCBs. Children who live near hazardous waste sites should be discouraged from playing in the dirt near these sites and should not play in areas where there was a transformer fire. In addition, children should be discouraged from eating dirt, and careful handwashing practices should be followed.

As mentioned in Section 1.3 of the profile, workplace exposure to PCBs can still occur during repair and maintenance of old PCB transformers; accidents, fires, or spills involving these transformers or other PCB-containing items; and disposal of PCB materials. If you are exposed to PCBs in the workplace, it may be possible to carry them home from work. Your occupational health and safety officer at work can tell you whether the chemicals you work with may contain PCBs and are likely to be carried home on your clothes, body, or tools. If this is the case, you should shower and change clothing before leaving work, and your work clothes should be kept separate from other clothes and laundered

separately.

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1.8 Is there a medical test to determine whether I have been exposed to polychlorinated biphenyls (PCBs)?

Levels of PCBs in the environment were zero before PCBs were manufactured. Now, all people in industrial countries have some PCBs in their bodies. There are tests to determine whether PCBs are in the blood, body fat, and breast milk. These are not regular or routine clinical tests, such as the one for cholesterol, but could be ordered by a doctor to detect PCBs in people exposed to them in the environment and at work. If your PCB levels are higher than the background levels, this will show that you have been exposed to high levels of PCBs. However, these measurements cannot determine the exact amount or type of PCBs that you have been exposed to, or how long you have been exposed. Although these tests can indicate whether you have been exposed to PCBs to a greater extent than the general population, they do not predict whether you will develop harmful health effects. Blood tests are the easiest, safest, and probably the best method for detecting recent exposures to large amounts of PCBs. Results of such tests should be reviewed and carefully interpreted by physicians with a background in environmental and occupational medicine. Nearly everyone has been exposed to PCBs because they are found throughout the environment, and people are likely to have detectable amounts of PCBs in their blood, fat, and breast milk. Recent studies have shown that PCB levels in tissues from United States population are now declining. Additional information on tests used to determine whether you have been exposed to PCBs can be found in Chapter 3 (Section 3.11) and Chapter 7 (Section 7.1) of the toxicological profile.

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1.9 What recommendations has the federal government made to protect human health?

The federal government develops regulations and recommendations to protect public health . Regulations can be enforced by law. Federal agencies that develop regulations for toxic substances include the Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), and the Food and Drug Administration (FDA). Recommendations provide valuable guidelines to protect public health but cannot be enforced by law. Federal organizations that develop recommendations for toxic substances include the Agency for Toxic Substances and Disease Registry (ATSDR) and the National Institute for Occupational Safety and Health (NIOSH).

Regulations and recommendations can be expressed in not-to-exceed levels in air, water, soil, or food that are usually based on levels that affect animals; then they are adjusted to help protect people. Sometimes these not-to-exceed levels differ among federal organizations because of different exposure times (an 8-hour workday or a 24-hour day), the use of different animal studies, or other factors.

Recommendations and regulations are periodically updated as more information becomes available. For the most current information, check with the federal agency or organization that provides it. Some regulations and recommendations for PCBs include the following:

The EPA standard for PCBs in drinking water is 0.5 parts of PCBs per billion parts (ppb) of water. For the protection of human health from the possible effects of drinking the water or eating the fish or shellfish from lakes and streams that are contaminated with PCBs, the EPA regulates that the level of PCBs in these waters be no greater than 0.17 parts of PCBs per trillion parts (ppt) of water. States with fish and wildlife consumption advisories for PCBs are identified in Chapter 6 (Section 6.7) and Chapter 8 of the toxicological profile.

The FDA has set residue limits for PCBs in various foods to protect from harmful health effects. FDA required limits include 0.2 parts of PCBs per million parts (ppm) in infant and junior foods, 0.3 ppm in eggs, 1.5 ppm in milk and other dairy products (fat basis), 2 ppm in fish and shellfish (edible portions), and 3 ppm in poultry and red meat (fat basis).

OSHA regulates that workers not be exposed by inhalation over a period of 8 hours for 5 days per week to more than 1 milligram per cubic meter of air (mg/m^3) for 42% chlorine PCBs, or to 0.5 mg/m^3 for 54% chlorine PCBs.

NIOSH recommends that workers not breathe air containing 42 or 54% chlorine PCB levels higher than 1 microgram per cubic meter of air ($\mu g/m^3$) for a 10-hour workday, 40-hour workweek.

EPA requires that companies that transport, store, or dispose of PCBs follow the rules and regulations of the federal hazardous waste management program. EPA also limits the amount of PCBs put into publicly owned waste water treatment plants. To minimize exposure of people to PCBs, EPA requires that industry tell the National Response Center each time 1 pound or more of PCBs have been released to the environment.

For more information on federal and state regulations and guidelines for PCBs, see Chapter 8 of the toxicological profile.

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1.10 Where can I get more information?

If you have any more questions or concerns, please contact your community or state health or environmental quality department or:

Agency for Toxic Substances and Disease Registry
Division of Toxicology
1600 Clifton Road NE, Mailstop F-32
Atlanta, GA 30333

Information line and technical assistance:

Phone: 888-422-8737
FAX: (770)-488-4178

ATSDR can also tell you the location of occupational and environmental health clinics. These clinics specialize in recognizing, evaluating, and treating illnesses resulting from exposure to hazardous substances.

To order toxicological profiles, contact:

National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
Phone: 800-553-6847 or 703-605-6000

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References

Agency for Toxic Substances and Disease Registry (ATSDR). 2000. Toxicological profile for polychlorinated biphenyls (PCBs). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

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Division of Toxicology

May 1994

Public Health Statement for Chlordane

CAS# 12789-03-6

This Public Health Statement is the summary chapter from the Toxicological Profile for chlordane. It is one in a series of Public Health Statements about hazardous substances and their health effects. A shorter version, the ToxFAQs™, is also available. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present. For more information, call the ATSDR Information Center at 1-888-422-8737.

This Statement was prepared to give you information about chlordane and to emphasize the human health effects that may result from exposure to it. The Environmental Protection Agency (EPA) has identified 1,350 hazardous waste sites as the most serious in the nation. These sites comprise the "National Priorities List" (NPL): Those sites which are targeted for long-term federal cleanup activities. Chlordane has been found in at least 176 of the sites on the NPL. However, the number of NPL sites evaluated for chlordane is not known. As EPA evaluates more sites, the number of sites at which chlordane is found may increase. This information is important because exposure to chlordane may cause harmful health effects and because these sites are potential or actual sources of human exposure to chlordane.

When a substance is released from a large area, such as an industrial plant, or from a container, such as a drum or bottle, it enters the environment. This release does not always lead to exposure. You can be exposed to a substance only when you come in contact with it. You can be exposed by breathing, eating, drinking, or through skin contact with substances containing chlordane.

If you are exposed to a substance such as chlordane, many factors will determine whether harmful health effects will occur and what the type and severity of those health effects will be. These factors include the dose (how much), the duration (how long), the route or pathway by which you are exposed (breathing, eating, drinking, or skin contact), the other chemicals to which you are exposed, and your individual characteristics such as age, gender, nutritional status, family traits, life-style, and state of health.

1.1 What is chlordane?

Chlordane is a man-made chemical that was used as a pesticide in the United States from 1948 to 1988. It is sometimes referred to by the trade names Octachlor® and Velsicol 1068®. It is a thick liquid whose color ranges from colorless to amber, depending on its purity. It may have no smell or a mild, irritating smell. We do not know what it tastes like. Chlordane is not a single chemical, but is a mixture of many related chemicals, of which about 10 are major components. Some of the major components are trans-chlordane, cis-chlordane, beta-chlordene, heptachlor, and trans-nonachlor. Chlordane does not dissolve in water. Therefore, before it can be used as a spray, it must be placed in water with emulsifiers (soap-like substances), which results in a milky-looking mixture.

From 1983 until 1988, chlordane's only approved use was to control termites in homes. The pesticide was applied underground around the foundation of homes. When chlordane is used in the soil around a house, it kills termites that come into contact with it.

Before 1978, chlordane was also used as a pesticide on agricultural crops, lawns, and gardens and as a fumigating agent. Because of concerns over cancer risk, evidence of human exposure and build up in body fat, persistence in the environment, and danger to wildlife, the EPA canceled the use of chlordane on food crops and phased out other above-ground uses over the next 5 years. In 1988, when the EPA canceled chlordane's use for controlling termites, all approved use of chlordane in the United States stopped. Manufacture for export continues.

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1.2 What happens to chlordane when it enters the environment?

When used as a pesticide on crops, on lawns and gardens, and to control termites in houses, chlordane enters the environment. Although it is no longer used in the United States, it may be used in other countries. In soil, it attaches strongly to particles in the upper layers of soil and is unlikely to enter into groundwater. It is not known whether chlordane breaks down in most soils. If breakdown occurs, it is very slow. Chlordane is known to remain in some soils for over 20 years. Persistence is greater in heavy, clayey or organic soil than in sandy soil. Most chlordane is lost from soil by evaporation. Evaporation is more rapid from light, sandy soils than from heavy soils. Half of the chlordane applied to the soil surface may evaporate in 2 to 3 days. Evaporation is much slower after chlordane penetrates into the soil. In water, some chlordane attaches strongly to sediment and particles in the water column and some is lost by evaporation. It is not known whether much breakdown of chlordane occurs in water or in sediment. Chlordane breaks down in the atmosphere by reacting with light and with some chemicals in the atmosphere. However, it is sufficiently long lived that it may travel long distances and be deposited on land or in water far from its source. Chlordane or the

chemicals that chlordane changes into accumulate in fish, birds, and mammals. Chlordane stays in the environment for many years and is still found in food, air, water, and soil. Chlordane is still commonly found in some form in the fat of fish, birds, mammals, and almost all humans.

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1.3 How might I be exposed to chlordane?

Everyone in the United States has been exposed to low levels of chlordane. A more relevant question is whether or not you may have been exposed to high levels of chlordane. Before its ban in 1988, you might have been exposed to high levels of chlordane if you worked in the manufacture, formulation, or application of chlordane. Therefore, farmers and lawn-care workers may have been exposed to chlordane before 1978, and pest control workers may have been exposed to chlordane before 1988 by skin contact and breathing dust and vapor. A national survey conducted from 1980 to 1983 estimated that 3,732 workers were potentially exposed to chlordane in the United States. This number of potentially exposed workers should have decreased after chlordane's use was banned in the United States. However, the ban on chlordane did not eliminate it from your environment, and some of your opportunities for exposure to chlordane continue.

Today, people receive the highest exposure to chlordane from living in homes that were treated with chlordane for termites. Chlordane may be found in the air in these homes for many years after treatment. Houses in the deep south and southwest were most commonly treated. However, chlordane use extended from the lower New England States south and west to California. Houses built since 1988 have not been treated with chlordane for termite control. You can determine if your home was treated with chlordane by examining your records or contacting your termite treatment service.

Over 50 million persons have lived in chlordane-treated homes. Indoor air in the living spaces of treated homes have been found to contain average levels of between 0.00003 and 0.002 milligram (mg) of chlordane in a cubic meter of air (mg/m^3). However, levels as high as 0.06 mg/m^3 have been measured in the living areas of these homes. Even higher levels are found in basements and crawl spaces.

The most common source of chlordane exposure is from ingesting chlordane- contaminated food. Chlordane remains in the food supply because much of the farmland was treated with chlordane in the 1960s and 1970s, and it remains in some soil for over 20 years. However, since chlordane has been banned, the levels in soils would be expected to decrease with the passage of time. Chlordane may also be found in fish and shellfish caught in chlordane-contaminated waters. If you are in doubt about whether a lake or river is contaminated, call your local Game and Fish or Health departments. Chlordane is almost never detected in drinking water. A survey conducted by the Food and Drug

Administration (FDA) determined daily intake of chlordane from food to be 0.0013 microgram per kilogram of body weight (μg/kg) for infants and 0.0005-0.0015 μg/kg for teenagers and adults (a microgram is one thousandth of a milligram). The average adult would, therefore, consume about 0.11 μg of chlordane.

You may come into contact with chlordane while digging in soil around the foundation of homes where it was applied to protect the homes against termites. Soil may also be contaminated with chlordane around certain NPL hazardous waste sites. Chlordane has been found at 176 of 1,350 hazardous waste sites on the NPL in the United States. The highest level of chlordane found in soil near an NPL site was 344 ppm. People may be exposed to chlordane at these sites by breathing low levels of chlordane volatilizing from the soil or from touching the soil. Levels of chlordane found in groundwater near NPL sites containing chlordane ranged from 0.02 to 830 parts of chlordane per billion parts of water (ppb).

Finally, some chlordane may be left over from pre-ban days. Old containers of material thought to contain chlordane should be disposed of carefully and contact with the skin and breathing vapors should be avoided.

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1.4 How can chlordane enter and leave my body?

Chlordane can enter the body through the skin if skin contact occurs with contaminated soils, through the lungs if breathed in with contaminated air, and through the digestive tract if swallowed. Uptake through the skin and digestive tract increases if chlordane is in an oily mixture, which might occur at hazardous waste sites. The importance of each of these ways for chlordane to enter the body depends on the kind of exposure. For example, people living in houses that have been treated with chlordane will be exposed mostly by breathing the vapor in the air. Workers who sprayed chlordane as a pesticide were exposed mostly by breathing the compound in the air and by contact with the skin. Other people may be exposed to small quantities by eating food or drinking water that contains chlordane. People at or near waste sites may be exposed by touching chlordane in the soil, by breathing chlordane that evaporates into the air, by drinking water that contains chlordane or by eating contaminated fish or crops. The amount of chlordane that enters the body depends on the amount in air, food, or water, and the length of time a person is exposed to it. Most chlordane that enters the body leaves in a few days, mostly in the feces, and a much smaller amount leaves in the urine. Chlordane and its breakdown products may be stored in body fat, where they cause no bad effects, unless released from body fat in large amounts. It may take months or years before the chlordane and the breakdown products that are stored in fat are able to leave the body.

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1.5 How can chlordane affect my health?

Most health effects in humans that may be linked to chlordane exposure are on the nervous system, the digestive system, and the liver. These effects were seen mostly in people who swallowed chlordane mixtures. Large amounts of chlordane taken by mouth can cause convulsions and death. Convulsions occurred in a man who had long-term skin contact with soil containing large amounts of chlordane. Swallowing small amounts or breathing air containing high concentrations of chlordane vapors can cause a variety of nervous system effects, including headaches, irritation, confusion, weakness, and vision problems, as well as upset stomach, vomiting, stomach cramps, diarrhea, and jaundice.

No harmful effects on health have been confirmed in studies of workers who made chlordane. One study found minor changes in liver function in workers in Japan who used chlordane as a pesticide. There are indications that chlordane may cause anemia and other changes in the blood cells, but the evidence is not very strong.

Animals given high levels of chlordane by mouth for short periods of time died or had convulsions. Long-term exposure of animals to chlordane in their food caused harmful effects in the liver. It is not known whether chlordane will cause cancer in humans after long-term exposure. Studies of workers who made or used chlordane do not link exposure with cancer, but the information is not sufficient to know for sure. Mice fed low levels of chlordane in their food for most of their lifetimes developed liver cancer. The International Agency for Research on Cancer (IARC) has determined that chlordane is not classifiable as to its carcinogenicity to humans. It is not known whether chlordane will cause reproductive or birth defects in humans. Studies of workers who made or used chlordane do not link exposure to the chemical with birth defects, but there are not enough studies in humans to know for sure. There is some evidence that animals exposed before birth or while nursing develop behavioral effects while growing up.

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1.6 Is there a medical test to determine whether I have been exposed to chlordane?

Chlordane and its breakdown products (metabolites) can be measured in human blood, urine, feces, and breast milk. Tests have shown that most Americans have low levels of chlordane metabolites in their body fat. The breakdown products can stay in body fat for very long periods, so finding them in body fat or breast milk does not tell how much or how long ago exposure to chlordane occurred. Not all of the breakdown products are specific for chlordane. Finding chlordane and/or breakdown products in your body also cannot predict what health effects will occur, if any. Levels in blood and fat can be tested, although the tests are not routinely available.

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1.7 What recommendations has the federal government

made to protect human health?
The EPA guidelines for drinking water suggest that no more than 60 ppb chlordane should be present in drinking water that children consume for no longer than 10 days. Drinking water should contain no more than 0.5 ppb for children or 2 ppb for adults if they drink the water for longer periods.

EPA stopped all use of chlordane on food crops, effective March 1978. Until 1988, EPA permitted chlordane use for termite control or dipping the roots or tops of nonfood plants. On April 14, 1988, however, EPA stopped all sales and commercial use of chlordane.

The Food and Drug Administration has established that the levels of chlordane and its breakdown products in most fruits and vegetables should not be greater than 300 ppb and in animal fat and fish should not be greater than 100 ppb.

Federal regulations limit the amount of chlordane that factories can release into waste water. The EPA requires industry to report releases or spills of 1 pound or more. A temporary guideline of the National Research Council indicated that 0.005 mg/m^3 should be the maximum amount allowed in the air of military housing.

The Occupational Safety and Health Administration (OSHA) regulates chlordane levels in the workplace. The maximum allowable level in workplace air is 0.5 mg/m^3 for a person who is exposed for 8 hours per workday and 40 hours per workweek. The National Institute for Occupational Health and Safety (NIOSH) also recommends an exposure limit of 5 mg/m^3 for a person exposed to chlordane in the workplace for 8 hours per workday and 40 hours per workweek.

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1.8 Where can I get more information?

If you have any more questions or concerns, please contact your community or state health or environmental quality department or:

Agency for Toxic Substances and Disease Registry
Division of Toxicology
1600 Clifton Road NE, Mailstop F-32
Atlanta, GA 30333

Information line and technical assistance:

Phone: 888-422-8737
FAX: (770)-488-4178

ATSDR can also tell you the location of occupational and environmental health clinics. These clinics specialize in recognizing, evaluating, and treating illnesses resulting from exposure to hazardous substances.

To order toxicological profiles, contact:

National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
Phone: 800-553-6847 or 703-605-6000

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Agency for Toxic Substances and Disease Registry (ATSDR). 1994 Toxicological profile for chlordane. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

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September 2002

ToxFAQs™ for Aldrin/Dieldrin

(Aldrin/Dieldrin)

CAS# Aldrin 309-00-2
Dieldrin 60-57-1

This fact sheet answers the most frequently asked health questions about aldrin and dieldrin. For more information, you may call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to aldrin and dieldrin happens mostly from eating contaminated foods, such as root crops, fish, or seafood. Aldrin and dieldrin build up in the body after years of exposure and can affect the nervous system. Aldrin has been found in at least 207 of the 1,613 National Priorities List sites identified by the Environmental Protection Agency (EPA). Dieldrin has been found in at least 287 of the 1,613 sites.

What are aldrin and dieldrin?

Aldrin and dieldrin are insecticides with similar chemical structures. They are discussed together in this fact sheet because aldrin quickly breaks down to dieldrin in the body and in the environment. Pure aldrin and dieldrin are white powders with a mild chemical odor. The less pure commercial powders have a tan color. Neither substance occurs naturally in the environment

From the 1950s until 1970, aldrin and dieldrin were widely used pesticides for crops like corn and cotton. Because of concerns about damage to the environment and potentially to human health, EPA banned all uses of aldrin and dieldrin in 1974, except to control termites. In 1987, EPA banned all uses.

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What happens to aldrin and dieldrin when they enter the environment?

- Sunlight and bacteria change aldrin to dieldrin so that we mostly find dieldrin in the environment.
- They bind tightly to soil and slowly evaporate to the air.

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Priority List of Hazardous Substances
Division of Toxicology

- Dieldrin in soil and water breaks down very slowly.
- Plants take in and store aldrin and dieldrin from the soil.
- Aldrin rapidly changes to dieldrin in plants and animals.
- Dieldrin is stored in the fat and leaves the body very slowly.

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How might I be exposed to aldrin and dieldrin?

- Dieldrin is everywhere in the environment, but at very low levels.
- Eating food like fish or shellfish from lakes or streams contaminated with either chemical, or contaminated root crops, dairy products, or meats.
- Air, surface water, or soil near waste sites may contain higher levels.
- Living in homes that were once treated with aldrin or dieldrin to control termites.

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How can aldrin and dieldrin affect my health?

People who intentionally or accidentally ingested large amounts of aldrin or dieldrin suffered convulsions and some died. Health effects may also occur after a longer period of exposure to smaller amounts because these chemicals build up in the body.

Some workers exposed to moderate levels in the air for a long time had headaches, dizziness, irritability, vomiting, and uncontrolled muscle movements. Workers removed from the source of exposure rapidly recovered from most of these effects.

Animals exposed to high amounts of aldrin or dieldrin also had nervous system effects. In animals, oral exposure to lower levels for a long period also affected the liver and decreased their ability to fight infections. We do not know whether aldrin or dieldrin affect the ability of people to fight disease.

Studies in animals have given conflicting results about whether aldrin and dieldrin affect reproduction in male animals and whether these chemicals may damage the sperm. We do not know whether aldrin or dieldrin affect reproduction in humans.

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How likely are aldrin and dieldrin to cause cancer?

There is no conclusive evidence that aldrin or dieldrin cause cancer in humans. Aldrin and dieldrin have shown to cause liver cancer in mice. The International Agency for Research on Cancer (IARC) has determined that aldrin and dieldrin are not classifiable as to human carcinogenicity. The EPA has determined that aldrin and dieldrin are probable human carcinogens.

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How can aldrin and dieldrin affect children?

Children can be exposed to aldrin and dieldrin in the same way as adults. There are no known unique exposure pathways for children. Children who swallowed amounts of aldrin or dieldrin

much larger than those found in the environment suffered convulsions and some died, as occurred in adults. However, we do not know whether children are more susceptible than adults to the effects of aldrin or dieldrin.

We do not know whether aldrin or dieldrin cause birth defects in humans. Pregnant animals that ingested aldrin or dieldrin had some babies with low birth weight and some with alterations in the skeleton. Dieldrin has been found in human breast milk, therefore, it can be passed to suckling infants.

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How can families reduce their risk for exposure to aldrin and dieldrin?

- Since aldrin and dieldrin are no longer produced or used, exposure to these compounds will occur only from past usage.
- Because aldrin and dieldrin were applied to the basement of some homes for termite protection, before buying a home families should investigate what, if any, pesticides have been used within the home.

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Is there a medical test to show whether I've been exposed to aldrin and dieldrin?

There are laboratory tests that can measure aldrin and dieldrin in your blood, urine, and body tissues. Because aldrin changes to dieldrin fairly quickly in the body, the test has to be done shortly after you are exposed to aldrin. Since dieldrin can stay in the body for months, measurements of dieldrin can be made much longer after exposure to either aldrin or dieldrin. The tests cannot tell you whether harmful health effects will occur. These tests are not routinely available at the doctor's office because they require special equipment.

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Has the federal government made recommendations to protect human health?

The EPA limits the amount of aldrin and dieldrin that may be present in drinking water to 0.001 and 0.002 milligrams per liter (mg/L) of water, respectively, for protection against health effects other than cancer. The EPA has determined that a concentration of aldrin and dieldrin of 0.0002 mg/L in drinking water limits the lifetime risk of developing cancer from exposure to each compound to 1 in 10,000.

The Occupational Safety and Health Administration (OSHA) sets a maximum average of 0.25 milligrams of aldrin and dieldrin per cubic meter of air (0.25 mg/m^3) in the workplace during an 8-hour shift, 40 hour week. The National Institute for Occupational Safety and Health (NIOSH) also recommends a limit of 0.25 mg/m^3 for both compounds for up to a 10-hour work day, 40-hour week.

The Food and Drug Administration (FDA) regulates the residues

of aldrin and dieldrin in raw foods. The allowable range is from 0 to 0.1 ppm, depending on the type of food product.

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References

Agency for Toxic Substances and Disease Registry (ATSDR). 2002. Toxicological Profile for aldrin and dieldrin. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

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Where can I get more information?

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

For more information, contact:

Agency for Toxic Substances and Disease Registry
Division of Toxicology
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1. PUBLIC HEALTH STATEMENT

This public health statement tells you about mercury and the effects of exposure.

The Environmental Protection Agency (EPA) identifies the most serious hazardous waste sites in the nation. These sites make up the National Priorities List (NPL) and are the sites targeted for long-term federal cleanup activities. Mercury has been found in at least 714 of the 1,467 current or former NPL sites. However, the total number of NPL sites evaluated for this substance is not known. As more sites are evaluated, the sites at which mercury is found may increase. This information is important because exposure to this substance may harm you and because these sites may be sources of exposure.

When a substance is released from a large area, such as an industrial plant, or from a container, such as a drum or bottle, it enters the environment. This release does not always lead to exposure. You are exposed to a substance only when you come in contact with it. You may be exposed by breathing, eating, or drinking the substance or by skin contact.

If you are exposed to mercury, many factors determine whether you'll be harmed. These factors include the dose (how much), the duration (how long), and how you come in contact with it. You must also consider the other chemicals to which you're exposed, as well as your age, sex, diet, family traits, lifestyle, and state of health.

1.1 WHAT IS MERCURY?

Mercury occurs naturally in the environment and exists in several forms. These forms can be organized under three headings: metallic mercury (also known as elemental mercury), inorganic mercury, and organic mercury. Metallic mercury is a shiny, silver-white metal that is a liquid at room temperature. Metallic mercury is the elemental or pure form of mercury (i.e., it is not combined with other elements). Metallic mercury metal is the familiar liquid metal used in thermometers and some electrical switches. At room temperature, some of the metallic mercury

will evaporate and form mercury vapors. Mercury vapors are colorless and odorless. The higher the temperature, the more vapors will be released from liquid metallic mercury. Some people who have breathed mercury vapors report a metallic taste in their mouths. Metallic mercury has been found at 714 hazardous waste sites nationwide.

Inorganic mercury compounds occur when mercury combines with elements such as chlorine, sulfur, or oxygen. These mercury compounds are also called mercury salts. Most inorganic mercury compounds are white powders or crystals, except for mercuric sulfide (also known as cinnabar) which is red and turns black after exposure to light.

When mercury combines with carbon, the compounds formed are called "organic" mercury compounds or organomercurials. There is a potentially large number of organic mercury compounds; however, by far the most common organic mercury compound in the environment is methylmercury (also known as monomethylmercury). In the past, an organic mercury compound called phenylmercury was used in some commercial products. Another organic mercury compound called dimethylmercury is also used in small amounts as a reference standard for some chemical tests. Dimethylmercury is the only organic mercury compound that has been identified at hazardous waste sites. It was only found in extremely small amounts at two hazardous waste sites nationwide, but it is very harmful to people and animals. Like the inorganic mercury compounds, both methylmercury and phenylmercury exist as "salts" (for example, methylmercuric chloride or phenylmercuric acetate). When pure, most forms of methylmercury and phenylmercury are white crystalline solids. Dimethylmercury, however, is a colorless liquid.

Several forms of mercury occur naturally in the environment. The most common natural forms of mercury found in the environment are metallic mercury, mercuric sulfide (cinnabar ore), mercuric chloride, and methylmercury. Some microorganisms (bacteria and fungi) and natural processes can change the mercury in the environment from one form to another. The most common organic mercury compound that microorganisms and natural processes generate from other forms is methylmercury. Methylmercury is of particular concern because it can build up in certain edible

freshwater and saltwater fish and marine mammals to levels that are many times greater than levels in the surrounding water (see Section 1.2).

Mercury is mined as cinnabar ore, which contains mercuric sulfide. The metallic form is refined from mercuric sulfide ore by heating the ore to temperatures above 1,000 degrees Fahrenheit. This vaporizes the mercury in the ore, and the vapors are then captured and cooled to form the liquid metal mercury. There are many different uses for liquid metallic mercury. It is used in producing of chlorine gas and caustic soda, and in extracting gold from ore or articles that contain gold. It is also used in thermometers, barometers, batteries, and electrical switches. Silver-colored dental fillings typically contain about 50% metallic mercury. Metallic mercury is still used in some herbal or religious remedies in Latin America and Asia, and in rituals or spiritual practices in some Latin American and Caribbean religions such as Voodoo, Santeria, and Espiritismo. These uses may pose a health risk from exposure to mercury both for the user and for others who may be exposed to mercury vapors in contaminated air.

Some inorganic mercury compounds are used as fungicides. Inorganic salts of mercury, including ammoniated mercuric chloride and mercuric iodide, have been used in skin-lightening creams. Mercuric chloride is a topical antiseptic or disinfectant agent. In the past, mercurous chloride was widely used in medicinal products including laxatives, worming medications, and teething powders. It has since been replaced by safer and more effective agents. Other chemicals containing mercury are still used as antibacterials. These products include mercurochrome (contains a small amount of mercury, 2%), and thimerosal and phenylmercuric nitrate, which are used in small amounts as preservatives in some prescription and over-the-counter medicines. Mercuric sulfide and mercuric oxide may be used to color paints, and mercuric sulfide is one of the red coloring agents used in tattoo dyes.

Methylmercury is produced primarily by microorganisms (bacteria and fungi) in the environment, rather than by human activity. Until the 1970s, methylmercury and ethylmercury compounds were used to protect seed grains from fungal infections. Once the adverse health effects of methylmercury were known, the use of methymercury- and ethylmercury as fungicides was

banned. Up until 1991, phenylmercuric compounds were used as antifungal agents in both interior and exterior paints, but this use was also banned because mercury vapors were released from these paints.

Chapter 3 contains more information on the physical and chemical properties of mercury. Chapter 4 contains more information on the production and use of mercury.

1.2 WHAT HAPPENS TO MERCURY WHEN IT ENTERS THE ENVIRONMENT?

Mercury is a naturally occurring metal found throughout the environment. Mercury enters the environment as the result of the normal breakdown of minerals in rocks and soil from exposure to wind and water, and from volcanic activity. Mercury releases from natural sources have remained relatively constant in recent history, resulting in a steady rise in environmental mercury. Human activities since the start of the industrial age (e.g., mining, burning of fossil fuels) have resulted in additional release of mercury to the environment. Estimates of the total annual mercury releases that result from human activities range from one-third to two-thirds of the total mercury releases. A major uncertainty in these estimates is the amount of mercury that is released from water and soils that were previously contaminated by human activities as opposed to new natural releases. The levels of mercury in the atmosphere (i.e., the air you breathe in the general environment) are very, very low and do not pose a health risk; however, the steady release of mercury has resulted in current levels that are three to six times higher than the estimated levels in the preindustrial era atmosphere.

Approximately 80% of the mercury released from human activities is elemental mercury released to the air, primarily from fossil fuel combustion, mining, and smelting, and from solid waste incineration. About 15% of the total is released to the soil from fertilizers, fungicides, and municipal solid waste (for example, from waste that contains discarded batteries, electrical switches, or thermometers). An additional 5% is released from industrial wastewater to water in the environment.

With the exception of mercury ore deposits, the amount of mercury that naturally exists in any one place is usually very low. In contrast, the amount of mercury that may be found in soil at a particular hazardous waste site because of human activity can be high (over 200,000 times natural levels). The mercury in air, water, and soil at hazardous waste sites may come from both natural sources and human activity.

Most of the mercury found in the environment is in the form of metallic mercury and inorganic mercury compounds. Metallic and inorganic mercury enters the air from mining deposits of ores that contain mercury, from the emissions of coal-fired power plants, from burning municipal and medical waste, from the production of cement, and from uncontrolled releases in factories that use mercury. Metallic mercury is a liquid at room temperature, but some of the metal will evaporate into the air and can be carried long distances. In air, the mercury vapor can be changed into other forms of mercury, and can be further transported to water or soil in rain or snow. Inorganic mercury may also enter water or soil from the weathering of rocks that contain mercury, from factories or water treatment facilities that release water contaminated with mercury, and from incineration of municipal garbage that contains mercury (for example, in thermometers, electrical switches, or batteries that have been thrown away). Inorganic or organic compounds of mercury may be released to the water or soil if mercury-containing fungicides are used.

Microorganisms (bacteria, phytoplankton in the ocean, and fungi) convert inorganic mercury to methylmercury. Methylmercury released from microorganisms can enter the water or soil and remain there for a long time, particularly if the methylmercury becomes attached to small particles in the soil or water. Mercury usually stays on the surface of sediments or soil and does not move through the soil to underground water. If mercury enters the water in any form, it is likely to settle to the bottom where it can remain for a long time.

Mercury can enter and accumulate in the food chain. The form of mercury that accumulates in the food chain is methylmercury. Inorganic mercury does not accumulate up the food chain to any extent. When small fish eat the methylmercury in food, it goes into their tissues. When larger fish eat smaller fish or other organisms that contain methylmercury, most of the methylmercury

originally present in the small fish will then be stored in the bodies of the larger fish. As a result, the larger and older fish living in contaminated waters build up the highest amounts of methylmercury in their bodies. Saltwater fish (especially sharks and swordfish) that live a long time and can grow to a very large size tend to have the highest levels of mercury in their bodies. Plants (such as corn, wheat, and peas) have very low levels of mercury, even if grown in soils containing mercury at significantly higher than background levels. Mushrooms, however, can accumulate high levels if grown in contaminated soils. For further information on what happens to mercury in the environment, see Chapters 4 and 5.

1.3 HOW MIGHT I BE EXPOSED TO MERCURY?

Because mercury occurs naturally in the environment, everyone is exposed to very low levels of mercury in air, water, and food. Between 10 and 20 nanograms of mercury per cubic meter (ng/m^3) of air have been measured in urban outdoor air. These levels are hundreds of times lower than levels still considered to be "safe" to breathe. Background levels in nonurban settings are even lower, generally about 6 ng/m^3 or less. Mercury levels in surface water are generally less than 5 parts of mercury per trillion parts of water (5 ppt, or 5 ng per liter of water), about a thousand times lower than "safe" drinking water standards. Normal soil levels range from 20 to 625 parts of mercury per billion parts of soil (20–625 ppb; or 20,000–625,000 ng per kilogram of soil). A part per billion is one thousand times bigger than a part per trillion.

A potential source of exposure to metallic mercury for the general population is mercury released from dental amalgam fillings. An amalgam is a mixture of metals. The amalgam used in silver-colored dental fillings contains approximately 50% metallic mercury, 35% silver, 9% tin, 6% copper, and trace amounts of zinc. When the amalgam is first mixed, it is a soft paste which is inserted into the tooth surface. It hardens within 30 minutes. Once the amalgam is hard, the mercury is bound within the amalgam, but very small amounts are slowly released from the surface of the filling due to corrosion or chewing or grinding motions. Part of the mercury at the surface of the filling may enter the air as mercury vapor or be dissolved in the saliva. The total amount of mercury released from dental amalgam depends upon the total number of fillings and

surface areas of each filling, the chewing and eating habits of the person, and other chemical conditions in the mouth. Estimates of the amount of mercury released from dental amalgams range from 3 to 17 micrograms per day (μg/day). The mercury from dental amalgam may contribute from 0 to more than 75% of your total daily mercury exposure, depending on the number of amalgam fillings you have, the amount of fish consumed, the levels of mercury (mostly as methylmercury) in those fish, and exposure from other less common sources such as mercury spills, religious practices, or herbal remedies that contain mercury. However, it should be kept in mind that exposure to very small amounts of mercury, such as that from dental amalgam fillings, does not necessarily pose a health risk.

Whether the levels of exposure to mercury vapor from dental amalgam are sufficiently high to cause adverse health effects, and exactly what those effects are, continues to be researched and debated by scientists and health officials. U.S. government summaries on the effects of dental amalgam conclude that there is no apparent health hazard to the general population, but that further study is needed to determine the possibility of more subtle behavioral or immune system effects, and to determine the levels of exposure that may lead to adverse effects in sensitive populations. Sensitive populations may include pregnant women, children under the age of 6 (especially up to the age of 3), people with impaired kidney function, and people with hypersensitive immune responses to metals. If you belong to this group, you should discuss your medical condition with your dentist prior to any dental restoration work. Removal of dental amalgams in people who have no indication of adverse effects is not recommended and can put the person at greater risk, if performed improperly. Chelation therapy (used to remove metals from the body tissues) itself presents some health risks, and should be considered only when a licensed occupational or environmental health physician determines it necessary to reduce immediate and significant health risks due to high levels of mercury in the body. For additional information on health risks associated with mercury dental amalgam, see Section 2.5, "More on the Health Effects of Dental Amalgam."

Some religions have practices that may include the use of metallic mercury. Examples of these religions include Santeria (a Cuban-based religion whose followers worship both African deities

and Catholic saints), Voodoo (a Haitian-based set of beliefs and rituals), Palo Mayombe (a secret form of ancestor worship practiced mainly in the Caribbean), and Espiritismo (a spiritual belief system native to Puerto Rico). Not all people who observe these religions use mercury, but when mercury is used in religious, ethnic, or ritualistic practices, exposure to mercury may occur both at the time of the practice and afterwards from contaminated indoor air. Metallic mercury is sold under the name "azogue" (pronounced ah-SEW-gay) in stores called "botanicas." Botanicas are common in Hispanic and Haitian communities, where azogue may be sold as an herbal remedy or for spiritual practices. The metallic mercury is often sold in capsules or in glass containers. It may be placed in a sealed pouch to be worn on a necklace or in a pocket, or it may be sprinkled in the home or car. Some people may mix azogue in bath water or perfume, or place azogue in devotional candles. Because metallic mercury evaporates into the air, these practices may put anyone breathing the air in the room at risk of exposure to mercury. The longer people breathe the contaminated air, the greater their risk will be. The use of metallic mercury in a home or an apartment not only threatens the health of the people who live there now, but also threatens the health of future residents who may unknowingly be exposed to further release of mercury vapors from contaminated floors or walls.

Metallic mercury is used in a variety of household products and industrial items, including thermostats, fluorescent light bulbs, barometers, glass thermometers, and some blood pressure devices. The mercury in these devices is contained in glass or metal, and generally does not pose a risk unless the item is damaged or broken, and mercury vapors are released. Spills of metallic mercury from broken thermometers or damaged electrical switches in the home may result in exposure to mercury vapors in indoor air. You must be careful when you handle and dispose of all items in the home that contain metallic mercury.

Very small amounts of metallic mercury (for example, a few drops) can raise air concentrations of mercury to levels that may be harmful to health. The longer people breathe the contaminated air, the greater the risk to their health. Metallic mercury and its vapors are extremely difficult to remove from clothes, furniture, carpet, floors, walls, and other such items. If these items are not

properly cleaned, the mercury can remain for months or years, and continue to be a source of exposure.

It is possible for you to be exposed to metallic mercury vapors from breathing contaminated air around hazardous waste sites, waste incinerators, or power plants that burn mercury-containing fuels (such as coal or other fossil fuels), but most outdoor air is not likely to contain levels that would be harmful. Exposure to mercury compounds at hazardous waste sites is much more likely to occur from handling contaminated soil (i.e., children playing in or eating contaminated surface soil), drinking well-water, or eating fish from contaminated waters near those sites. Not all hazardous sites contain mercury, and not all waste sites that do contain mercury have releases of mercury to the air, water, or surface soils.

You can be exposed to mercury vapors from the use of fungicides that contain mercury. Excess use of these products may result in higher-than-average exposures. You may also be exposed to mercury from swallowing or applying to your skin outdated medicinal products (laxatives, worming medications, and teething powders) that contain mercurous chloride. Exposure may also occur from the improper or excessive use of other chemicals containing mercury, such as skin-lightening creams and some topical antiseptic or disinfectant agents (mercurochrome and thimerosal).

Workers are mostly exposed from breathing air that contains mercury vapors, but may also be exposed to other inorganic mercury compounds in the workplace. Occupations that have a greater potential for mercury exposure include manufacturers of electrical equipment or automotive parts that contain mercury, chemical processing plants that use mercury, metal processing, construction where building parts contain mercury (e.g., electrical switches, thermometers), and the medical professions (medical, dental, or other health services) where equipment may contain mercury (e.g., some devices that measure blood pressure contain liquid mercury). Dentists and their assistants may be exposed to metallic mercury from breathing in mercury vapor released from amalgam fillings and to a much lesser extent from skin contact with

amalgam restorations. Family members of workers who have been exposed to mercury may also be exposed to mercury if the worker's clothes are contaminated with mercury particles or liquid.

Some people may be exposed to higher levels of mercury in the form of methylmercury if they have a diet high in fish, shellfish, or marine mammals (whales, seals, dolphins, and walruses) that come from mercury-contaminated waters. Methylmercury accumulates up the food chain, so that fish at the top of the food chain will have the most mercury in their flesh. Of these fish, the largest (i.e., the oldest) fish will have the highest levels. The Food and Drug Administration (FDA) estimates that most people are exposed, on average, to about 50 ng of mercury per kilogram of body weight per day (50 ng/kg/day) in the food they eat. This is about 3.5 micrograms (μg) of mercury per day for an adult of average weight. This level is not thought to result in any harmful effects. A large part of this mercury is in the form of methylmercury and probably comes from eating fish. Commercial fish sold through interstate commerce that are found to have levels of methylmercury above an "action level" of 1 ppm (established by the FDA) cannot be sold to the public. This level itself is below a level associated with adverse effects. However, if you fish in contaminated waters and eat the fish you catch, you may be exposed to higher levels of mercury. Public health advisories are issued by state and federal authorities for local waters that are thought to be contaminated with mercury. These advisories can help noncommercial (sport and subsistence) fishermen and their families to avoid eating fish contaminated with mercury. Foods other than fish that may contain higher than average levels of mercury include wild game, such as wild birds and mammals (bear) that eat large amounts of contaminated fish. People in the most northern climates may be exposed to high levels of mercury from eating meat or fat from marine mammals including whales, dolphins, walruses, and seals. These marine mammals are at or near the top of their marine food chain. Plants contain very little methylmercury or other forms of mercury. Mushrooms grown in mercury-contaminated soil may contain levels of mercury that could pose some risk to health, if large amounts were eaten.

See Chapter 5 for more information on how you might be exposed to mercury.

1.4 HOW CAN MERCURY ENTER AND LEAVE MY BODY?

A person can be exposed to mercury from breathing in contaminated air, from swallowing or eating contaminated water or food, or from having skin contact with mercury. Not all forms of mercury easily enter your body, even if they come in contact with it; so it is important to know which form of mercury you have been exposed to, and by which route (air, food, or skin).

When you swallow small amounts of metallic mercury, for example, from a broken oral thermometer, virtually none (less than 0.01%) of the mercury will enter your body through the stomach or intestines, unless they are diseased. Even when a larger amount of metal mercury (a half of a tablespoon, about 204 grams) was swallowed by one person, very little entered the body. When you breathe in mercury vapors, however, most (about 80%) of the mercury enters your bloodstream directly from your lungs, and then rapidly goes to other parts of your body, including the brain and kidneys. Once in your body, metallic mercury can stay for weeks or months. When metallic mercury enters the brain, it is readily converted to an inorganic form and is "trapped" in the brain for a long time. Metallic mercury in the blood of a pregnant woman can enter her developing child. Most of the metallic mercury will accumulate in your kidneys, but some metallic mercury can also accumulate in the brain. Most of the metallic mercury absorbed into the body eventually leaves in the urine and feces, while smaller amounts leave the body in the exhaled breath.

Inorganic mercury compounds like mercurous chloride and mercuric chloride are white powders and do not generally vaporize at room temperatures like elemental mercury will. If they are inhaled, they are not expected to enter your body as easily as inhaled metallic mercury vapor. When inorganic mercury compounds are swallowed, generally less than 10% is absorbed through the intestinal tract; however, up to 40% may enter the body through the stomach and intestines in some instances. Some inorganic mercury can enter your body through the skin, but only a small amount will pass through your skin compared to the amount that gets into your body from swallowing inorganic mercury.

Once inorganic mercury enters the body and gets into the bloodstream, it moves to many different tissues. Inorganic mercury leaves your body in the urine or feces over a period of several weeks or months. A small amount of the inorganic mercury can be changed in your body to metallic mercury and leave in the breath as a mercury vapor. Inorganic mercury accumulates mostly in the kidneys and does not enter the brain as easily as metallic mercury. Inorganic mercury compounds also do not move as easily from the blood of a pregnant woman to her developing child. In a nursing woman, some of the inorganic mercury in her body will pass into her breast milk.

Methylmercury is the form of mercury most easily absorbed through the gastrointestinal tract (about 95% absorbed). After you eat fish or other foods that are contaminated with methylmercury, the methylmercury enters your bloodstream easily and goes rapidly to other parts of your body. Only small amounts of methylmercury enter the bloodstream directly through the skin, but other forms of organic mercury (in particular dimethylmercury) can rapidly enter the body through the skin. Organic mercury compounds may evaporate slowly at room temperature and may enter your body easily if you breathe in the vapors. Once organic mercury is in the bloodstream, it moves easily to most tissues and readily enters the brain. Methylmercury that is in the blood of a pregnant woman will easily move into the blood of the developing child and then into the child's brain and other tissues. Like metallic mercury, methylmercury can be changed by your body to inorganic mercury. When this happens in the brain, the mercury can remain there for a long time. When methylmercury does leave your body after you have been exposed, it leaves slowly over a period of several months, mostly as inorganic mercury in the feces. As with inorganic mercury, some of the methylmercury in a nursing woman's body will pass into her breast milk.

For more information on how mercury can enter and leave your body, please see Chapter 2.

1.5 HOW CAN MERCURY AFFECT MY HEALTH?

The nervous system is very sensitive to mercury. In poisoning incidents that occurred in other countries, some people who ate fish contaminated with large amounts of methylmercury or seed grains treated with methylmercury or other organic mercury compounds developed permanent

damage to the brain and kidneys. Permanent damage to the brain has also been shown to occur from exposure to sufficiently high levels of metallic mercury. Whether exposure to inorganic mercury results in brain or nerve damage is not as certain, since it does not easily pass from the blood into the brain.

Metallic mercury vapors or organic mercury may affect many different areas of the brain and their associated functions, resulting in a variety of symptoms. These include personality changes (irritability, shyness, nervousness), tremors, changes in vision (constriction (or narrowing) of the visual field), deafness, muscle incoordination, loss of sensation, and difficulties with memory.

Different forms of mercury have different effects on the nervous system, because they do not all move through the body in the same way. When metallic mercury vapors are inhaled, they readily enter the bloodstream and are carried throughout the body and can move into the brain. Breathing in or swallowing large amounts of methylmercury also results in some of the mercury moving into the brain and affecting the nervous system. Inorganic mercury salts, such as mercuric chloride, do not enter the brain as readily as methylmercury or metallic mercury vapor.

The kidneys are also sensitive to the effects of mercury, because mercury accumulates in the kidneys and causes higher exposures to these tissues, and thus more damage. All forms of mercury can cause kidney damage if large enough amounts enter the body. If the damage caused by the mercury is not too great, the kidneys are likely to recover once the body clears itself of the contamination.

Short-term exposure (hours) to high levels of metallic mercury vapor in the air can damage the lining of the mouth and irritate the lungs and airways, causing tightness of the breath, a burning sensation in the lungs, and coughing. Other effects from exposure to mercury vapor include nausea, vomiting, diarrhea, increases in blood pressure or heart rate, skin rashes, and eye irritation. Damage to the lining of the mouth and lungs can also occur from exposure to lower levels of mercury vapor over longer periods (for example, in some occupations where workers were exposed to mercury for many years). Levels of metallic mercury in workplace air are generally much greater than the levels normally encountered by the general population. Current

levels of mercury in workplace air are low, due to increased awareness of mercury's toxic effects. Because of the reduction in the allowable amount of mercury in workplace air, fewer workers are expected to have symptoms of mercury toxicity. Most studies of humans who breathed metallic mercury for a long time indicate that mercury from this type of exposure does not affect the ability to have children. Studies in workers exposed to metallic mercury vapors have also not shown any mercury-related increase in cancer. Skin contact with metallic mercury has been shown to cause an allergic reaction (skin rashes) in some people.

In addition to effects on the kidneys, inorganic mercury can damage the stomach and intestines, producing symptoms of nausea, diarrhea, or severe ulcers if swallowed in large amounts. Effects on the heart have also been observed in children after they accidentally swallowed mercuric chloride. Symptoms included rapid heart rate and increased blood pressure. There is little information on the effects in humans from long-term, low-level exposure to inorganic mercury.

To protect the public from the harmful effects of toxic chemicals and to find ways to treat people who have been harmed, scientists use many tests.

One way to see if a chemical will hurt people is to learn how the chemical is absorbed, used, and released by the body; for some chemicals, animal testing may be necessary. Animal testing may also be used to identify health effects such as cancer or birth defects. Without laboratory animals, scientists would lose a basic method to get information needed to make wise decisions to protect public health. Scientists have the responsibility to treat research animals with care and compassion. Laws today protect the welfare of research animals, and scientists must comply with strict animal care guidelines.

Studies using animals indicate that long-term oral exposure to inorganic mercury salts causes kidney damage, effects on blood pressure and heart rate, and effects on the stomach. Study results also suggest that reactions involving the immune system may occur in sensitive populations after swallowing inorganic mercury salts. Some animal studies report that nervous system damage occurs after long-term exposure to high levels of inorganic mercury. Short-term, high-

level exposure of laboratory animals to inorganic mercury has been shown to affect the developing fetus and may cause termination of the pregnancy.

Animals exposed orally to long-term, high levels of methylmercury or phenylmercury in laboratory studies experienced damage to the kidneys, stomach, and large intestine; changes in blood pressure and heart rate; adverse effects on the developing fetus, sperm, and male reproductive organs; and increases in the number of spontaneous abortions and stillbirths. Adverse effects on the nervous system of animals occur at lower doses than do harmful effects to most other systems of the body. This difference indicates that the nervous system is more sensitive to methylmercury toxicity than are other organs in the body. Animal studies also provide evidence of damage to the nervous system from exposure to methylmercury during development, and evidence suggests that the effects worsen with age, even after the exposure stops.

Some rat and mice strains that are susceptible to autoimmune responses develop kidney damage as a result of an immune response when exposed to relatively low levels of mercury vapor or mercury chloride.

Animals given inorganic mercury salts by mouth for most of their lifetime had increases in some kinds of tumors at the highest dose tested. Rats and mice that received organic mercury (methylmercury or phenylmercury) in their drinking water or feed for most of their lives had an increased incidence of cancer of the kidney, but this affected only the males that received the highest amount of mercury given (not the females). Since the high doses caused severe damage to the kidneys prior to the cancer, these animal studies provide only limited information about whether mercury causes cancer in humans. As a result, the Department of Health and Human Services (DHHS) and the International Agency for Research on Cancer (IARC) have not classified mercury as to its human carcinogenicity. The Environmental Protection Agency has determined that mercury chloride and methylmercury are possible human carcinogens. Chapter 2 contains more information on the health effects of mercury in humans and animals.

1.6 HOW CAN MERCURY AFFECT CHILDREN?

This section discusses potential health effects from exposures during the period from conception to maturity at 18 years of age in humans. Potential effects on children resulting from exposures of the parents are also considered.

Children are at risk of being exposed to metallic mercury that is not safely contained, to mercury that may be brought home on work clothes or tools, or to methylmercury-contaminated foods. Methylmercury eaten or swallowed by a pregnant woman or metallic mercury that enters her body from breathing contaminated air can also pass into the developing child. Inorganic mercury and methylmercury can also pass from a mother's body into breast milk and into a nursing infant. The amount of mercury in the milk will vary, depending on the degree of exposure and the amount of mercury that enter the nursing woman's body. There are significant benefits to breast feeding, so any concern that a nursing woman may have about mercury levels in her breast milk should be discussed with her doctor. Methylmercury can also accumulate in an unborn baby's blood to a concentration higher than the concentration in the mother.

For similar exposure routes and forms of mercury, the harmful health effects seen in children are similar to the effects seen in adults. High exposure to mercury vapor causes lung, stomach, and intestinal damage and death due to respiratory failure in severe cases. These effects are similar to those seen in adult groups exposed to inhaled metallic mercury vapors at work.

Children who had been exposed to excessive amounts of mercurous chloride tablets for worms or mercurous chloride-containing powders for teething discomfort had increased heart rates and elevated blood pressure. Abnormal heart rhythms were also seen in children who had eaten grains contaminated with very high levels of methylmercury.

Other symptoms of poisonings in children who were treated with mercurous chloride for constipation, worms, or teething discomfort included swollen red gums, excessive salivation, weight loss, diarrhea and/or abdominal pain, and muscle twitching or cramping in the legs and/or arms. Kidney damage is very common after exposure to toxic levels of inorganic mercury.

Metallic mercury or methylmercury that enters the body can also be converted to inorganic mercury and result in kidney damage.

Children who breathe metallic/elemental mercury vapors, eat foods or other substances containing phenylmercury or inorganic mercury salts, or use mercury-containing skin ointments for an extended period may develop a disorder known as acrodynia, or pink disease. Acrodynia can result in severe leg cramps; irritability; and abnormal redness of the skin, followed by peeling of the hands, nose, and soles of the feet. Itching, swelling, fever, fast heart rate, elevated blood pressure, excessive salivation or sweating, rashes, fretfulness, sleeplessness, and/or weakness may also be present. It was once believed that this syndrome occurred only in children, but recent reported cases in teenagers and adults have shown that they can also develop acrodynia.

In critical periods of development before they are born, and in the early months after birth, children and fetuses are particularly sensitive to the harmful effects of metallic mercury and methylmercury on the nervous system. Harmful developmental effects may occur when a pregnant woman is exposed to metallic mercury and some of the mercury is transferred into her developing child. Thus, women who are normally exposed to mercury vapors in the workplace (such as those working in thermometer/barometer or fluorescent light manufacturing or the chlor-alkali industry) should take measures to avoid mercury vapor exposures during pregnancy. Exposures to mercury vapors are relatively rare outside of the workplace, unless metallic mercury is present in the home.

As with mercury vapors, exposure to methylmercury is more dangerous for young children than for adults, because more methylmercury easily passes into the developing brain of young children and may interfere with the development process.

Methylmercury is the form of mercury most commonly associated with a risk for developmental effects. Exposure can come from foods contaminated with mercury on the surface (for example, from seed grain treated with methylmercury to kill fungus) or from foods that contain toxic levels of methylmercury (as in some fish, wild game, and marine mammals). Mothers who are exposed to methylmercury and breast-feed their infant may also expose the child through the milk. The

effects on the infant may be subtle or more pronounced, depending on the amount to which the fetus or young child was exposed. In cases in which the exposure was very small, some effects might not be apparent, such as small decreases in IQ or effects on the brain that may only be determined by the use of very sensitive neuropsychological testing. In instances in which the exposure is great, the effects may be more serious. In some such cases of mercury exposure involving serious exposure to the developing fetus, the effects are delayed. In such cases, the infant may be born apparently normal, but later show effects that may range from the infant being slower to reach developmental milestones, such as the age of first walking and talking, to more severe effects including brain damage with mental retardation, incoordination, and inability to move. Other severe effects observed in children whose mothers were exposed to very toxic levels of mercury during pregnancy include eventual blindness, involuntary muscle contractions and seizures, muscle weakness, and inability to speak. It is important to remember, however, that the severity of these effects depends upon the level of mercury exposure and the time of exposure. The very severe effects just mentioned were reported in large-scale poisoning instances in which pregnant and nursing women were exposed to extremely high levels of methylmercury in contaminated grain used to make bread (in Iraq) or seafood (in Japan) sold to the general population.

Researchers are currently studying the potential for less serious developmental effects, including effects on a child's behavior and ability to learn, think, and solve problems that may result from eating lower levels of methylmercury in foods. A main source of exposure to methylmercury for the pregnant woman and the young child is from eating fish. Most fish purchased in the market in the United States do not have mercury levels that pose a risk to anyone, including pregnant women. Since mercury accumulates in the muscles of fish, larger fish that feed on smaller fish and live for long periods usually have larger concentrations of methylmercury than fish that feed on plants. For example, shark and swordfish normally contain the highest levels of mercury out of all ocean fish. Scientists have an ongoing debate about the value of fish in the diet versus any risk from increased exposure of pregnant women to methylmercury that may be in the fish. The safety of most fish sold commercially in the United States is regulated by the FDA. These fish pose no health risk to those who purchase and eat them. Only fish or wildlife containing relatively high

levels of methylmercury are of concern, and these are discussed in Section 1.7 of this toxicological profile.

1.7 HOW CAN FAMILIES REDUCE THE RISK OF EXPOSURE TO MERCURY?

If your doctor finds that you have been exposed to significant amounts of mercury, ask whether your children might also be exposed. Your doctor might need to ask your state health department to investigate.

Children may be exposed to metallic mercury if they play with it. Metallic mercury is a heavy, shiny, silver liquid. When metallic mercury is spilled, it forms little balls or beads. Children are sometimes exposed to metallic mercury when they find it in abandoned warehouses or closed factories, and then play with it or pass it around to friends. Children have also taken metallic mercury from school chemistry and physics labs. Broken thermometers and some electrical switches are other sources of metallic mercury. Sometimes children find containers of metallic mercury that were improperly disposed of, or adults may bring home metallic mercury from work, not knowing that it is dangerous.

To protect your children from metallic mercury, teach them not to play with shiny, silver liquids. Schoolteachers (particularly science teachers) and school staff need to know about students' fascination with metallic mercury. Teachers and school staff should teach children about the dangers of getting sick from playing with mercury, and they should keep metallic mercury in a safe and secured area (such as a closed container in a locked storage room) so that children do not have access to it without the supervision of a teacher. Metallic mercury evaporates slowly, and if it is not stored in a closed container, children may breathe toxic mercury vapors.

In the past, mercurous chloride was widely used in medicinal products such as laxatives, worming medications, and teething powders. These older medicines should be properly disposed of and replaced with safer and more effective medicines. Other chemicals containing mercury, such as mercurochrome and thimerosal (sold as Merthiolate and other brands), are still used as antiseptics or as preservatives in eye drops, eye ointments, nasal sprays, and vaccines. Some skin-lightening

creams contain ammoniated mercuric chloride and mercuric iodide. These and all other mercury-containing medicines should be kept safely out of the reach of children to prevent an accidental poisoning. Nonmedicinal products, including some fungicides that contain mercury compounds and paints that contain mercuric sulfide or mercuric oxide, should also be safely stored out of the reach of children.

You should check to see if any medicines or herbal remedies that you or your child use contain mercury. Some traditional Chinese and Indian remedies for stomach disorders (for example, herbal balls) contain mercury, and if you give these remedies to your children, you may harm them. If you are pregnant or nursing a baby and you use mercury-containing ethnic or herbal remedies, you could pass some of the mercury to your unborn child or nursing infant.

If you use metallic mercury or azogue in religious practices, you may expose your children or unborn child to mercury or contaminate your home. Such practices in which mercury containing substances have traditionally been used include Santeria (a Cuban-based religion whose followers worship both African deities and Catholic saints), Voodoo (a Haitian-based set of beliefs and rituals), Palo Mayombe (a secret form of ancestor worship practiced mainly in the Caribbean), or Espiritismo (a spiritual belief system native to Puerto Rico).

Metallic mercury is used in a variety of household products and industrial items, including thermostats, fluorescent light bulbs, barometers, glass thermometers, and some blood pressure measuring devices. You must be careful when you handle and dispose of all items in the home that contain metallic mercury.

If small amounts of mercury are spilled, be very careful cleaning it up. Do not try to vacuum spilled metallic mercury. Using a vacuum cleaner to clean up the mercury causes the mercury to evaporate into the air, creating greater health risks. Trying to vacuum spilled metallic mercury also contaminates the vacuum cleaner. Also, take care not to step on the mercury and track it into other areas of the home. Metallic mercury vapors are very toxic and have no odor. Do not remain unnecessarily in that room, and try not to let metallic mercury contact your eyes, skin, or clothing. If you think you have been exposed directly to metallic mercury, wash yourself

thoroughly and discard contaminated clothing by placing them in a sealed plastic bag. Perhaps the most important thing to remember if you break a household thermometer is do not panic. The amount of mercury contained in an oral thermometer is small and does not present an immediate threat to human health. However, if it is not properly cleaned up and disposed of, it may present a health risk over time, particularly to infants, toddlers, and pregnant women.

If a thermometer breaks on a counter top or uncarpeted floor, remove children from the area. Mercury is not absorbent, so do not try to wipe or blot it up with a cloth or paper towel; that will only spread the mercury and break it up into smaller beads, making it more difficult to find and remove. Instead, clean up the beads of metallic mercury by using one sheet of paper to carefully roll them onto a second sheet of paper, or by sucking very small beads of mercury into an eye dropper. After picking up the metallic mercury in this manner, put it into a plastic bag or airtight container. The paper and eye dropper should also be bagged in a zip-lock plastic container. All plastic bags used in the cleanup should then be taken outside of the house or apartment and disposed of properly, according to instructions provided by your local health department or environmental officials. Try to ventilate the room with outside air, and close the room off from the rest of the home. Use fans (that direct the air to the outside and away from the inside of the house) for a minimum of one hour to speed the ventilation.

If a thermometer breaks and the liquid/metallic mercury spills onto a carpeted floor, try to collect the mercury beads in the manner described in the above paragraph. Depending on the cut or pile of the carpeting, however, it may not be possible to collect all of the spilled mercury. Regardless, do not vacuum. Instead, call your local (county, city, or state) health department and tell them of your situation. (You may also call the Agency for Toxic Substances and Disease Registry [ATSDR] toll-free at 1-888-42-ATSDR [1-888-422-8737] to obtain additional guidance, if local assistance cannot be obtained.)

If larger amounts of metallic mercury are found (for example, a jar of liquid mercury), it should be contained in an airtight container, and you should call your local health department for instructions on how to safely dispose of it. If the mercury is in an open container or the container does not have a lid, place a piece of plastic wrap around the top of the container to prevent

vapors from escaping; then wash your hands thoroughly. If a larger amount is spilled, leave the area and contact your local health department and fire department. Do not simply throw metallic mercury away, but instead seek professional help.

ATSDR and EPA strongly recommend against the use of metallic (liquid) mercury that is not properly enclosed in glass, as it is in thermometers. This form of mercury should not be used or stored in homes, automobiles, day-care centers, schools, offices, or other public buildings. If you notice a child with metallic mercury on his or her clothing, skin, or hair, call the fire department and let them know that the child needs to be decontaminated.

Metallic or inorganic mercury can be carried into the home from a workers' contaminated clothing and shoes. Increased exposure to mercury has been reported in children of workers who are exposed to mercury at work, and increased levels of mercury were measured in places where work clothes were stored and in some washing machines. The children most likely to be exposed to risky levels of mercury are those whose parents work in facilities that use mercury (for example, a scientific glassware manufacturing plant or a chlor-alkali chemical plant), but where no protective uniforms or footgear are used. In some reported cases in which children were exposed in this way, protective clothing was used in the workplace by the parent, but work gloves, clothes, and boots, which were contaminated with mercury, were taken home, thus exposing family members. If you have questions or concerns about exposure to mercury at work, you have a right to obtain information from your employer about your safety and health on the job without fear of punishment. The Occupational Safety and Health Administration (OSHA) requires employers to provide Material Safety Data Sheets (MSDSs) for many of the chemicals used at the workplace. Information on these sheets should include chemical names and hazardous ingredients, important properties (such as fire and explosion data), potential health effects, how you get the chemical(s) in your body, how to properly handle the materials, and what to do in an emergency. Your occupational health and safety officer at work can and should tell you whether chemicals you work with are dangerous and likely to be carried home on your clothes, body, or tools, and whether you should be showering and changing clothes before you leave work, storing your street clothes in a separate area of the workplace, or laundering your work clothes at home separately from other clothes.

Your employer is legally responsible for providing a safe workplace and should freely answer your questions about hazardous chemicals. Your OSHA-approved state occupational safety and health program or OSHA can also answer any further questions you might have, and help your employer identify and correct problems with hazardous substances. If you would like to make a formal complaint about health hazards in your workplace, your OSHA-approved state occupational safety and health program or OSHA office will listen to your complaint and inspect your workplace when necessary.

One way in which people are routinely exposed to extremely small amounts of mercury is through the gradual (but extremely slow) wearing-away process of dental amalgam fillings, which contain approximately 50% mercury. The amount of mercury to which a person might be exposed from dental amalgams would depend on the number of amalgams present and other factors. The Centers for Disease Control and Prevention (CDC) has determined that dental amalgam fillings do not pose a health risk, although they do account for some mercury exposure to those having such fillings. People who frequently grind their teeth or often chew gum can add to the small amount of mercury normally released from those fillings over time. If you are pregnant, the decision of whether to have dental amalgam or a nonmercury material used for fillings, or whether existing amalgam fillings should be repaired or replaced during pregnancy, should be made in consultation with your dentist. The practice of having all your dental amalgam fillings replaced with non-mercury filling materials just to remove the possibility of mercury exposure is not recommended by ATSDR. In fact, the removal of the mercury amalgam fillings would actually expose the patient to a greater amount of mercury for a while. Other sources of mercury may increase your overall exposure, such as the amount of fish consumed per week, especially if caught in local waters contaminated with mercury or of certain species known to be higher in mercury content (shark and swordfish), or an exposure to mercury from a nearby hazardous waste site or incinerator.

You or your children may be exposed to methylmercury when eating certain types of fish caught from contaminated waters, or when eating certain types of wildlife from mercury contaminated areas. Most states, Native American tribes, and U.S. Territories have issued fish and/or wildlife advisories to warn people about methylmercury contaminated fish and/or wildlife. Most of the

methylmercury advisories relate to specific types of freshwater or saltwater fish or shellfish, or freshwater turtles. Each state, Native American tribe, or U.S. Territory sets its own criteria for issuing fish and wildlife advisories. A fish or wildlife advisory will specify which bodies of water or hunting areas have restrictions. The advisory will tell you what types and sizes of fish or game are of concern. The advisory may completely ban eating fish or tell you to limit your meals of a certain type of fish. For example, an advisory may tell you to eat a certain type of fish no more than once a month; or an advisory may tell you only to eat certain parts of fish or game, or how to prepare it to decrease your exposure to methylmercury. The fish or wildlife advisory may be stricter to protect pregnant women, nursing women, and young children. To reduce your children's exposure to methylmercury, you should follow the instructions recommended in the fish or wildlife advisories. Information on Fish and Wildlife Advisories in your state is available from your state public health or natural resources department. Signs may also be posted in certain fishing and hunting areas with information about contaminated fish or wildlife.

FDA currently advises that pregnant women and women of childbearing age who may become pregnant limit their consumption of shark and swordfish to no more that one meal per month. This advice is given because methylmercury levels are relatively high in these fish species. Women of childbearing age are included in this advice because dietary practices immediately before the pregnancy could have a direct bearing on fetal exposure during pregnancy, particularly during the earlier months of pregnancy.

FDA further advises that persons other than pregnant women and women of childbearing age in the general population limit their regular consumption of shark and swordfish (which typically contains methylmercury around 1 ppm) to about 7 ounces per week (about one serving) to stay below the acceptable daily intake for methylmercury. For fish species with methylmercury levels averaging 0.5 ppm, regular consumption should be limited to 14 ounces per week. Recreational and subsistence fishers who eat larger amounts of fish than the general population and routinely fish the same waterbodies may have a higher exposure to methylmercury if these waters are contaminated. People who consume greater than 100 grams of fish (approximately 3.5 ounces) every day are considered high-end consumers. This is over 10 times more than the amount of fish consumed by members of the general population (6.5 g/day). No consumption advice is necessary

for the top ten seafood species that make up about 80% of the seafood sold in the United States: canned tuna, shrimp, pollock, salmon, cod, catfish, clams, flatfish, crabs, and scallops. The methylmercury in these species is generally less than 0.2 ppm, and few people eat more than the suggested weekly limit of fish (i.e., 2.2 pounds).

If you are concerned about a mercury exposure or think that you or your child are experiencing the adverse effects of mercury, you should consult with a doctor or public health official who is familiar with the health effects of mercury.

1.8 IS THERE A MEDICAL TEST TO DETERMINE WHETHER I HAVE BEEN EXPOSED TO MERCURY?

There are reliable and accurate ways to measure mercury levels in the body. These tests all involve taking blood, urine, or hair samples, and must be performed in a doctor's office or in a health clinic. Nursing women may have their breast milk tested for mercury levels, if any of the other samples tested are found to contain significant amounts of mercury. Most of these tests, however, do not determine the form of mercury to which you were exposed. Mercury levels found in blood, urine, breast milk, or hair may be used to determine if adverse health effects are likely to occur (see Section 2.5). Mercury in urine is used to test for exposure to metallic mercury vapor and to inorganic forms of mercury. Measurement of mercury in whole blood or scalp hair is used to monitor exposure to methylmercury. Urine is not useful for determining whether exposure has occurred to methylmercury. Levels found in blood, urine, and hair may be used together to predict possible health effects that may be caused by the different forms of mercury.

Blood and urine levels are used as markers to determine whether someone has been exposed to mercury. They are used to determine whether exposure to mercury has occurred and to give a rough idea of the extent of exposure, but they do not tell exactly how much exposure has occurred. Except for methylmercury exposures, blood is considered useful if samples are taken within a few days of exposure. This is because most forms of mercury in the blood decrease by one-half every three days if exposure has been stopped. Thus, mercury levels in the blood provide

more useful information after recent exposures than after long-term exposures. Several months after an exposure, mercury levels in the blood and urine are much lower. Hair, which is considered useful only for exposures to methylmercury, can be used to show exposures that occurred many months ago, or even more than a year ago if the hair is long enough and careful testing methods are used. After short-term exposures to metallic mercury, mercury vapor can be detected in the breath, but this occurs to a significant extent only within a few days after exposure, and is not a method normally used to determine if mercury exposure has occurred. For more information on testing for mercury levels in the body, see Chapters 2 and 6.

1.9 WHAT RECOMMENDATIONS HAS THE FEDERAL GOVERNMENT MADE TO PROTECT HUMAN HEALTH?

The federal government develops regulations and recommendations to protect public health. Regulations can be enforced by law. Federal agencies that develop regulations for toxic substances include the Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), and the Food and Drug Administration (FDA). Recommendations, on the other hand, provide valuable guidelines to protect public health, but cannot be enforced by law. Federal organizations that develop recommendations for toxic substances include the Agency for Toxic Substances and Disease Registry (ATSDR) and the National Institute for Occupational Safety and Health (NIOSH).

Regulations and recommendations can be expressed in not-to-exceed levels in air, water, soil, or food that are usually based on levels that affect animals; then they are adjusted to help protect people. Sometimes these not-to-exceed levels differ among federal organizations because of different exposure times (an 8-hour workday or a 24-hour day), the use of different animal studies, or other factors.

Recommendations and regulations are also periodically updated as more information becomes available. For the most current information, check with the federal agency or organization that provides it for the substance in which you are interested. Some regulations and recommendations for mercury include the following:

EPA and FDA have set a limit of 2 parts inorganic mercury per billion (ppb) parts of water in drinking water. EPA is in the process of revising the Water Quality Criteria for mercury. EPA currently recommends that the level of inorganic mercury in rivers, lakes, and streams be no more than 144 parts mercury per trillion (ppt) parts of water to protect human health (1 ppt is a thousand times less than 1 part per billion, or ppb). EPA has determined that a daily exposure (for an adult of average weight) to inorganic mercury in drinking water at a level up to 2 ppb is not likely to cause any significant adverse health effects. FDA has set a maximum permissible level of 1 part of methylmercury in a million parts (ppm) of seafood products sold through interstate commerce (1 ppm is a thousand times more than 1 ppb). FDA may seize shipments of fish and shellfish containing more than 1 ppm of methylmercury, and may seize treated seed grain containing more than 1 ppm of mercury.

OSHA regulates levels of mercury in the workplace. It has set limits of 0.1 milligrams of mercury per cubic meter of air (mg/m^3)for organic mercury and 0.05 mg/m^3 for metallic mercury vapor in workplace air to protect workers during an 8-hour shift and a 40-hour work week. NIOSH recommends that the amount of metallic mercury vapor in workplace air be limited to an average level of 0.05 mg/m^3 during a 10-hour work shift.

1.10 WHERE CAN I GET MORE INFORMATION?

If you have any more questions or concerns, please contact your community or state health or environmental quality department or

Agency for Toxic Substances and Disease Registry
Division of Toxicology
1600 Clifton Road NE, Mailstop E-29
Atlanta, GA 30333

* Information line and technical assistance

Phone: 1-888-42-ATSDR (1-888-422-8737)
Fax: (404) 639- 6315 or -6324

ATSDR can also tell you the location of occupational and environmental health clinics. These clinics specialize in recognizing, evaluating, and treating illnesses resulting from exposure to hazardous substances.

* To order toxicological profiles, contact

National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
Phone: (800) 553-6847 or (703) 605-6000

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

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Public Health Statements
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September 2000

Public Health Statement for Arsenic

CAS# 7440-38-2

This Public Health Statement is the summary chapter from the Toxicological Profile for arsenic. It is one in a series of Public Health Statements about hazardous substances and their health effects. A shorter version, the ToxFAQs™, is also available. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present. For more information, call the ATSDR Information Center at 1-888-422-8737.

This public health statement tells you about arsenic and the effects of exposure.

The Environmental Protection Agency (EPA) identifies the most serious hazardous waste sites in the nation. These sites make up the National Priorities List (NPL) and are the sites targeted for long-term federal cleanup activities. Arsenic has been found in at least 1,014 of the 1,598 current or former NPL sites. However, the total number of NPL sites evaluated for this substance is not known. As more sites are evaluated, the sites at which arsenic is found may increase. This information is important because exposure to this substance may harm you and because these sites may be sources of exposure.

When a substance is released from a large area, such as an industrial plant, or from a container, such as a drum or bottle, it enters the environment. This release does not always lead to exposure. You are exposed to a substance only when you come in contact with it. You may be exposed by breathing, eating, or drinking the substance, or by skin contact.

If you are exposed to arsenic, many factors determine whether you'll be harmed. These factors include the dose (how much), the duration (how long), and how you come in contact with it. You must also consider the other chemicals you are exposed to and your age, sex, diet, family traits, lifestyle, and state of health.

1.1 What is arsenic?

Arsenic is an element that is widely distributed in the earth's crust. Elemental arsenic is ordinarily a steel grey metal-like material that

Priority List of Hazardous Substances
Division of Toxicology

sometimes occurs naturally. However, arsenic is usually found in the environment combined with other elements such as oxygen, chlorine, and sulfur. Arsenic combined with these elements is called inorganic arsenic. Arsenic combined with carbon and hydrogen is referred to as organic arsenic. Understanding the difference between inorganic and organic arsenic is important because the organic forms are usually less harmful than the inorganic forms.

Most inorganic and organic arsenic compounds are white or colorless powders that do not evaporate. They have no smell, and most have no special taste. Thus, you usually cannot tell if arsenic is present in your food, water, or air.

Inorganic arsenic occurs naturally in soil and in many kinds of rock, especially in minerals and ores that contain copper or lead. When these ores are heated in smelters, most of the arsenic goes up the stack and enters the air as a fine dust. Smelters may collect this dust and take out the arsenic as arsenic trioxide. However, arsenic is no longer produced in the United States; all the arsenic we use is imported.

Presently about 90% of all arsenic produced is used as a preservative for wood to make it resistant to rotting and decay. The preservative is chromated copper arsenate (CCA) and the treated wood is referred to as "pressure-treated." In the past, arsenic was primarily used as a pesticide, primarily on cotton fields and in orchards. Inorganic arsenic compounds can no longer be used in agriculture. However, organic arsenicals, namely cacodylic acid, disodium methylarsenate (DSMA), and monosodium methylarsenate (MSMA) are still used as pesticides, principally on cotton. Small quantities of arsenic metal are added to other metals forming metal mixtures or alloys with improved properties. The greatest use of arsenic in alloys is in lead-acid batteries used in automobiles. Another important use of arsenic compounds is in semiconductors and light-emitting diodes.

To learn more about the properties and uses of arsenic, see Chapters 3 and 4 of the toxicological profile.

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1.2 What happens to arsenic when it enters the environment?
Arsenic occurs naturally in soil and minerals and therefore it may enter the air, water, and land from wind-blown dust and may get into water from runoff and leaching. Volcanic eruptions are another source of arsenic. Arsenic is associated with ores mined for metals, such as copper and lead, and may enter the environment during the mining and smelting of these ores. Small amounts of arsenic also may be released into the atmosphere from coal-fired power plants and incinerators because coal and waste products often contain some arsenic.

Arsenic cannot be destroyed in the environment. It can only change its form, or become attached or separated, from particles. It

may change its form by reacting with oxygen or other molecules present in air, water, or soil, or by the action of bacteria that live in soil or sediment. Arsenic released from power plants and other combustion processes is usually attached to very small particles. Arsenic contained in wind-borne soil is generally found in larger particles. These particles settle to the ground or are washed out of the air by rain. Arsenic that is attached to very small particles may stay in the air for many days and travel long distances. Many common arsenic compounds can dissolve in water. Thus, arsenic can get into lakes, rivers, or underground water by dissolving in rain or snow or through the discharge of industrial wastes. Some of the arsenic will stick to particles in the water or sediment on the bottom of the lakes or river, and some will be carried along by the water. Ultimately most arsenic ends up in the soil or sediment. Although some fish and shellfish take in arsenic which may build up in tissues, most of this arsenic is in a form (often called "fish arsenic") that is less harmful.

For more information on how arsenic behaves in the environment, see Chapter 5 of the toxicological profile.

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1.3 How might I be exposed to arsenic?

Arsenic is found naturally in the environment. You may be exposed to arsenic by eating food, drinking water, or breathing air. Children may also be exposed to arsenic by eating dirt. You may also be exposed by skin contact with soil or water that contains arsenic. Analytical methods used by scientists to determine the levels of arsenic in the environment generally do not determine the specific form of arsenic present. Therefore, we do not always know the form of arsenic a person may be exposed to. Similarly, we often do not know what forms of arsenic are present at hazardous waste sites. Some forms of arsenic may be so tightly attached to particles or embedded in minerals that they are not taken up by plants and animals.

The concentration of arsenic in soil varies widely, generally ranging from about 1 to 40 parts of arsenic to a million parts of soil (ppm) with an average level of 5 ppm. However soils in the vicinity of arsenic-rich geological deposits, some mining and smelting sites, or agricultural areas where arsenic pesticides had been applied in the past may contain much higher levels of arsenic. The concentration of arsenic in natural surface and groundwater is generally about 1 part in a billion parts of water (1 ppb) but may exceed 1,000 ppb in mining areas or where arsenic levels in soil are high. Groundwater is far more likely to contain high levels of arsenic than surface water. Surveys of U.S. drinking water indicate that about 80% of water supplies have less than 2 ppb of arsenic, but 2% of supplies exceed 20 ppb of arsenic. Levels of arsenic in food range from about 20 to 140 ppb. However, levels of inorganic arsenic, the form of most concern, are far lower. Levels of arsenic in the air generally range from less than 1 to about 2,000 nanograms (1 nanogram equals a billionth of a gram) of arsenic per cubic meter of air (less than 1–2,000 ng/m^3),

depending on location, weather conditions, and the level of industrial activity in the area. However urban areas generally have mean arsenic levels in air ranging from 20 to 30 ng/m^3, most of which is attached to small particles.

You normally take in small amounts of arsenic in the air you breathe, the water you drink, and the food you eat. Of these, food is usually the largest source of arsenic. Fish and seafood contain the greatest amounts of arsenic, but this is mostly the organic form of arsenic that is less harmful. Children are likely to eat small amounts of dust or dirt each day, so this is another way they may be exposed to arsenic. The total amount of arsenic you take in from these sources is generally about 50 μg each day. The level of inorganic arsenic (the form of most concern) you take in from these sources is generally about 3.5 μg/day.

In addition to the normal levels of arsenic in air, water, soil, and food, you could be exposed to higher levels in several ways, such as the following:

- Some areas of the United States contain unusually high natural levels of arsenic in rock, and this can lead to unusually high levels of arsenic in soil or water. If you live in an area like this, you could take in elevated amounts of arsenic in drinking water. Children may be taking in arsenic because of hand to mouth contact or eating dirt.
- Some hazardous waste sites contain large quantities of arsenic. If the material is not properly disposed of, it can get into surrounding water, air, or soil. If you live near such a site, you could be exposed to elevated levels of arsenic from these media.
- If you work in an occupation that involves arsenic production or use (for example, copper or lead smelting, wood treating, pesticide application), you could be exposed to elevated levels of arsenic during your work.
- If you saw or sand arsenic-treated wood, you could inhale some of the sawdust into your nose or throat. Similarly, if you burn arsenic-treated wood, you could inhale arsenic in the smoke.
- If you live in a formerly agricultural area where arsenic was used on crops, the soil could contain high levels of arsenic.
- In the past, several kinds of products used in the home (rat poison, ant poison, weed killer, some types of medicines) had arsenic in them. However, most of these uses of arsenic have ended, so you are not likely to be exposed from home products any longer.

You can find more information on how you may be exposed to arsenic in Chapter 5 of the toxicological profile.

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1.4 How can arsenic enter and leave my body?

If you swallow arsenic in water, soil, or food, most of the arsenic may quickly enter into your body. The amount that enters your

body will depend on how much you swallow and the kind of arsenic that you swallow. This is the most likely way for you to be exposed near a waste site. If you breathe air that contains arsenic dusts, many of the dust particles settle onto the lining of the lungs. Most of the arsenic in these particles is then taken up from the lungs into the body. You might be exposed in this way near waste sites where arsenic-contaminated soils are allowed to blow into the air. If you get arsenic-contaminated soil or water on your skin, only a small amount will go through your skin into your body, so this is usually not of concern.

If you are exposed to arsenic, your liver changes some of this to a less harmful organic form. Both inorganic and organic forms leave your body in your urine. Most of the arsenic will be gone within several days, although some will remain in your body for several months or even longer.

You can find more information on how arsenic enters and leaves your body in Chapter 2 of the toxicological profile.

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1.5 How can arsenic affect my health?

To protect the public from the harmful effects of toxic chemicals and to find ways to treat people who have been harmed, scientists use many tests.

One way to see if a chemical will hurt people is to learn how the chemical is absorbed, used, and released by the body; for some chemicals, animal testing may be necessary. Animal testing may also be used to identify health effects such as cancer or birth defects. Without laboratory animals, scientists would lose a basic method to get information needed to make wise decisions to protect public health. Scientists have the responsibility to treat research animals with care and compassion. Laws today protect the welfare of research animals, and scientists must comply with strict animal care guidelines.

Inorganic arsenic has been recognized as a human poison since ancient times, and large oral doses (above 60,000 ppb in food or water) can produce death. If you swallow lower levels of inorganic arsenic (ranging from about 300 to 30,000 ppb in food or water), you may experience irritation of your stomach and intestines, with symptoms such as stomach ache, nausea, vomiting, and diarrhea. Other effects you might experience from swallowing inorganic arsenic include decreased production of red and white blood cells which may cause fatigue, abnormal heart rhythm, blood-vessel damage resulting in bruising, and impaired nerve function causing a "pins and needles" sensation in your hands and feet.

Perhaps the single most characteristic effect of long-term oral exposure to inorganic arsenic is a pattern of skin changes. These include a darkening of the skin and the appearance of small "corns" or "warts" on the palms, soles, and torso. A small number of the corns may ultimately develop into skin cancer. Swallowing

arsenic has also been reported to increase the risk of cancer in the liver, bladder, kidneys, prostate, and lungs. The Department of Health and Human Services (DHHS) has determined that inorganic arsenic is a known carcinogen. The International Agency for Research on Cancer (IARC) has determined that inorganic arsenic is carcinogenic to humans. Both the EPA and the National Toxicology Program (NTP) have classified inorganic arsenic as a known human carcinogen.

If you breathe high levels of inorganic arsenic, you are likely to experience a sore throat and irritated lungs. You may also develop some of the skin effects mentioned above. The exposure level that produces these effects is uncertain, but it is probably above 100 micrograms of arsenic per cubic meter (g/m^3) for a brief exposure. Longer exposure at lower concentrations can lead to skin effects, and also to circulatory and peripheral nervous disorders. There are some data suggesting that inhalation of inorganic arsenic may also interfere with normal fetal development, although this is not certain. An important concern is the ability of inhaled inorganic arsenic to increase the risk of lung cancer. This has been seen mostly in workers exposed to arsenic at smelters, mines, and chemical factories, but also in residents living near smelters and arsenical chemical factories. People who live near waste sites with arsenic may have an increased risk of lung cancer as well.

If you have direct skin contact with inorganic arsenic compounds, your skin may become irritated, with some redness and swelling. However, it does not appear that skin contact is likely to lead to any serious internal effects.

Despite all the adverse health effects associated with inorganic arsenic exposure, there is some evidence that the small amounts of arsenic in the normal diet (10–50 ppb) may be beneficial to your health. For example, animals fed a diet with unusually low concentrations of arsenic did not gain weight normally. They also became pregnant less frequently than animals fed a diet containing a normal amount of arsenic. Further, the offspring from these animals tended to be smaller than normal, and some died at an early age. However, no cases of arsenic deficiency in humans have ever been reported.

Almost no information is available on the effects of organic arsenic compounds in humans. Studies in animals show that most simple organic arsenic compounds (such as methyl and dimethyl compounds) are less toxic than the inorganic forms and that some complex organic arsenic compounds are virtually non-toxic. However, high doses can produce some of the same effects. Thus, if you are exposed to high doses of an organic arsenic compound, you might develop nerve injury, stomach irritation, or other effects, but this is not known for certain.

You can find more information on the health effects of inorganic and organic arsenic in Chapter 2 of the toxicological profile.

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1.6 How can arsenic affect children?

This section discusses potential health effects from exposures during the period from conception to maturity at 18 years of age in humans.

Children are exposed to arsenic in many of the same ways that adults are. Since arsenic is found in the soil, water, food, and air, children may take in arsenic in the air they breathe, the water they drink, and the food they eat. Since children tend to eat or drink less of a variety of foods and beverages than do adults, ingestion of contaminated food or juice or infant formula made with arsenic-contaminated water may represent a significant source of exposure. In addition, since children often play in the dirt and put their hands in their mouths and sometimes intentionally eat dirt, ingestion of contaminated soil may be a more important source of arsenic exposure for children than for adults. In areas of the United States where natural levels of arsenic in the soil and water are high, or in areas in and around contaminated waste sites, exposure of children to arsenic through ingestion of soil and water may be significant. In addition, contact with adults who are wearing clothes contaminated with arsenic (e.g., with dust from copper- or lead-smelting factories, from wood-treating or pesticide application, or from arsenic-treated wood) could be a source of exposure. Because of the tendency of children to taste things that they find, accidental poisoning from ingestion of pesticides is also a possibility. Thus, although most of the exposure pathways for children are the same as those for adults, children may be at a higher risk of exposure because of their lack of consistent hygiene practices and their curiosity about unknown powders and liquids.

Children who are exposed to arsenic may have many of the same effects as adults, including irritation of the stomach and intestines, blood vessel damage, skin changes, and reduced nerve function. Thus, all health effects observed in adults are of potential concern in children. We do not know if absorption of arsenic from the gut in children differs from adults. There is some information suggesting that children may be less efficient at converting inorganic arsenic to the less harmful organic forms. For this reason, children may be more susceptible to health effects from inorganic arsenic than adults.

At present, there is no convincing evidence that inhaled or ingested arsenic can injure pregnant women or their fetuses, although studies in animals show that large doses of arsenic that cause illness in pregnant females can also cause low birth weight, fetal malformations, and even fetal death. Arsenic can cross the placenta and has been found in fetal tissues. Arsenic is found at low levels in breast milk.

You can find more information about how arsenic can affect children in Sections 2.7 and 5.6 of the toxicological profile.

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1.7 How can families reduce the risk of exposure to arsenic?
If your doctor finds that you have been exposed to significant amounts of arsenic, ask whether your children might also be exposed. Your doctor might need to ask your state health department to investigate.

If you use arsenic-treated wood in home projects, personal protection from exposure to arsenic-containing sawdust may be helpful in limiting exposure of family members. These measures may include dust masks, gloves, and protective clothing. If you live in an area with a high level of arsenic in the water or soil, substituting cleaner sources of water and limiting contact with soil (for example, through use of a dense groundcover or thick lawn) would reduce family exposure to arsenic. By paying careful attention to dust and dirt control in the home (air filters, frequent cleaning), you can reduce family exposure to contaminated dirt. Some children eat a lot of dirt. You should prevent your children from eating dirt. You should discourage your children from putting objects in their mouths. Make sure they wash their hands frequently and before eating. Discourage your children from putting their hands in their mouths or other hand-to-mouth activity. Since arsenic may be found in the home as a pesticide, household chemicals containing arsenic should be stored out of reach of young children to prevent accidental poisonings. Always store household chemicals in their original labeled containers; never store household chemicals in containers children would find attractive to eat or drink from, such as old soda bottles. Keep your Poison Control Center's number by the phone.

It is sometimes possible to carry arsenic from work on your clothing, skin, hair, tools, or other objects removed from the workplace. This is particularly likely if you work in the fertilizer, pesticide, glass, or copper/lead smelting industries. You may contaminate your car, home, or other locations outside work where children might be exposed to arsenic. You should know about this possibility if you work with arsenic.

Your occupational health and safety officer at work can and should tell you whether chemicals you work with are dangerous and likely to be carried home on your clothes, body, or tools and whether you should be showering and changing clothes before you leave work, storing your street clothes in a separate area of the workplace, or laundering your work clothes at home separately from other clothes. Material safety data sheets (MSDS) for many chemicals used should be found at your place of work, as required by the Occupational Safety and Health Administration (OSHA) in the U.S. Department of Labor. MSDS information should include chemical names and hazardous ingredients, and important properties, such as fire and explosion data, potential health effects, how you get the chemical(s) in your body, how to properly handle the materials, and what to do in the case of emergencies. Your employer is legally responsible for providing a safe workplace and should freely answer your questions about hazardous chemicals.

Your state OSHA-approved occupational safety and health program or U.S. OSHA can answer any further questions and help your employer identify and correct problems with hazardous substances. Your state OSHA-approved occupational safety and health program or U.S. OSHA will listen to your formal complaints about workplace health hazards and inspect your workplace when necessary. Employees have a right to seek safety and health on the job without fear of punishment.

You can find more information about how arsenic can affect children in Sections 2.7 and 5.6 of the toxicological profile.

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1.8 Is there a medical test to determine whether I have been exposed to arsenic?

Several sensitive and specific tests can measure arsenic in your blood, urine, hair, or fingernails, and these tests are often helpful in determining if you have been exposed to above-average levels of arsenic. These tests are not usually performed in a doctor's office. They require sending the sample to a testing laboratory.

Measurement of arsenic in your urine is the most reliable means of detecting arsenic exposures that you experienced within the last several days. Most tests measure the total amount of arsenic present in your urine. Sometimes this can be misleading, because the nonharmful forms of arsenic in fish and shellfish can give a high reading even if you have not been exposed to a toxic form of arsenic. For this reason, laboratories sometimes use a more complicated test to separate "fish arsenic" from other forms. Because most arsenic leaves your body within a few days, analysis of your urine cannot detect if you were exposed to arsenic in the past. Tests of your hair or fingernails can tell if you were exposed to high levels over the past 6–12 months, but these tests are not very useful in detecting low-level exposures. If high levels of arsenic are detected, this shows that you have been exposed, but unless more is known about when you were exposed and for how long, it is usually not possible to predict whether you will have any harmful health effects.

You can find more information on how arsenic can be measured in your hair, urine, nails, and other tissues in Chapters 2 and 6 of the toxicological profile.

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1.9 What recommendations has the federal government made to protect human health?

The federal government develops regulations and recommendations to protect public health. Regulations can be enforced by law. Federal agencies that develop regulations for toxic substances include the Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), and the Food and Drug Administration (FDA). Recommendations provide valuable guidelines to protect public health but cannot be enforced by law. Federal organizations that

develop recommendations for toxic substances include the Agency for Toxic Substances and Disease Registry (ATSDR) and the National Institute for Occupational Safety and Health (NIOSH).

Regulations and recommendations can be expressed in not-to-exceed levels in air, water, soil, or food that are usually based on levels that affect animals; then they are adjusted to help protect people. Sometimes these not-to-exceed levels differ among federal organizations because of different exposure times (an 8-hour workday or a 24-hour day), the use of different animal studies, or other factors.

Recommendations and regulations are also periodically updated as more information becomes available. For the most current information, check with the federal agency or organization that provides it. Some regulations and recommendations for arsenic include the following:

The federal government has taken several steps to protect humans from arsenic. First, EPA has set limits on the amount of arsenic that industrial sources can release into the environment. Second, EPA has restricted or canceled many of the uses of arsenic in pesticides and is considering further restrictions. Third, EPA has set a limit of 50 ppb for arsenic in drinking water. EPA has recently proposed lowering this value to 5 ppb. Finally, OSHA has established a permissible exposure limit (PEL), 8-hour time-weighted average, of 10 :g/m^3 for airborne arsenic in various workplaces that use inorganic arsenic.

You can find more information on regulations and guidelines that apply to arsenic in Chapter 7 of the toxicological profile.

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1.10 Where can I get more information?
If you have any more questions or concerns, please contact your community or state health or environmental quality department or:

Agency for Toxic Substances and Disease Registry
Division of Toxicology
1600 Clifton Road NE, Mailstop F-32
Atlanta, GA 30333

Information line and technical assistance:

Phone: 888-422-8737
FAX: (770)-488-4178

ATSDR can also tell you the location of occupational and environmental health clinics. These clinics specialize in recognizing, evaluating, and treating illnesses resulting from exposure to hazardous substances.

To order toxicological profiles, contact:

National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
Phone: 800-553-6847 or 703-605-6000

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References

Agency for Toxic Substances and Disease Registry (ATSDR). 2000. Toxicological profile for arsenic (*update*). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

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September 1996

ToxFAQs™ for Polycyclic Aromatic Hydrocarbons (PAHs)

(Hidrocarburos Aromáticos Policíclicos (HAPs))

This fact sheet answers the most frequently asked health questions about polycyclic aromatic hydrocarbons (PAHs). For more information, you may call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to polycyclic aromatic hydrocarbons usually occurs by breathing air contaminated by wild fires or coal tar, or by eating foods that have been grilled. PAHs have been found in at least 600 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What are polycyclic aromatic hydrocarbons (PAHs)?

Polycyclic aromatic hydrocarbons (PAHs) are a group of over 100 different chemicals that are formed during the incomplete burning of coal, oil and gas, garbage, or other organic substances like tobacco or charbroiled meat. PAHs are usually found as a mixture containing two or more of these compounds, such as soot.

Some PAHs are manufactured. These pure PAHs usually exist as colorless, white, or pale yellow-green solids. PAHs are found in coal tar, crude oil, creosote, and roofing tar, but a few are used in medicines or to make dyes, plastics, and pesticides.

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What happens to polycyclic aromatic hydrocarbons (PAHs) when they enter the environment?

- PAHs enter the air mostly as releases from volcanoes, forest fires, burning coal, and automobile exhaust.
- PAHs can occur in air attached to dust particles.
- Some PAH particles can readily evaporate into the air from soil or surface waters.
- PAHs can break down by reacting with sunlight and other chemicals in the air, over a period of days to weeks.
- PAHs enter water through discharges from industrial and wastewater treatment plants.

MMGs
MHMIs
Interaction Profiles
Priority List of Hazardous Substances
Division of Toxicology

- Most PAHs do not dissolve easily in water. They stick to solid particles and settle to the bottoms of lakes or rivers.
- Microorganisms can break down PAHs in soil or water after a period of weeks to months.
- In soils, PAHs are most likely to stick tightly to particles; certain PAHs move through soil to contaminate underground water.
- PAH contents of plants and animals may be much higher than PAH contents of soil or water in which they live.

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How might I be exposed to polycyclic aromatic hydrocarbons (PAHs)?

- Breathing air containing PAHs in the workplace of coking, coal-tar, and asphalt production plants; smokehouses; and municipal trash incineration facilities.
- Breathing air containing PAHs from cigarette smoke, wood smoke, vehicle exhausts, asphalt roads, or agricultural burn smoke.
- Coming in contact with air, water, or soil near hazardous waste sites.
- Eating grilled or charred meats; contaminated cereals, flour, bread, vegetables, fruits, meats; and processed or pickled foods.
- Drinking contaminated water or cow's milk.
- Nursing infants of mothers living near hazardous waste sites may be exposed to PAHs through their mother's milk.

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How can polycyclic aromatic hydrocarbons (PAHs) affect my health?

Mice that were fed high levels of one PAH during pregnancy had difficulty reproducing and so did their offspring. These offspring also had higher rates of birth defects and lower body weights. It is not known whether these effects occur in people.

Animal studies have also shown that PAHs can cause harmful effects on the skin, body fluids, and ability to fight disease after both short- and long-term exposure. But these effects have not been seen in people.

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How likely are polycyclic aromatic hydrocarbons (PAHs) to cause cancer?

The Department of Health and Human Services (DHHS) has determined that some PAHs may reasonably be expected to be carcinogens.

Some people who have breathed or touched mixtures of PAHs and other chemicals for long periods of time have developed cancer. Some PAHs have caused cancer in laboratory animals when they breathed air containing them (lung cancer), ingested them in food (stomach cancer), or had them applied to their skin (skin cancer).

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Is there a medical test to show whether I've been exposed to polycyclic aromatic hydrocarbons (PAHs)?

In the body, PAHs are changed into chemicals that can attach to substances within the body. There are special tests that can detect PAHs attached to these substances in body tissues or blood. However, these tests cannot tell whether any health effects will occur or find out the extent or source of your exposure to the PAHs. The tests aren't usually available in your doctor's office because special equipment is needed to conduct them.

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Has the federal government made recommendations to protect human health?

The Occupational Safety and Health Administration (OSHA) has set a limit of 0.2 milligrams of PAHs per cubic meter of air (0.2 mg/m^3). The OSHA Permissible Exposure Limit (PEL) for mineral oil mist that contains PAHs is 5 mg/m^3 averaged over an 8-hour exposure period.

The National Institute for Occupational Safety and Health (NIOSH) recommends that the average workplace air levels for coal tar products not exceed 0.1 mg/m^3 for a 10-hour workday, within a 40-hour workweek. There are other limits for workplace exposure for things that contain PAHs, such as coal, coal tar, and mineral oil.

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Glossary

Carcinogen: A substance that can cause cancer.

Ingest: Take food or drink into your body.

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References

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological Profile for polycyclic aromatic hydrocarbons (PAHs). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

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Where can I get more information?

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

For more information, contact:

Agency for Toxic Substances and Disease Registry
Division of Toxicology
1600 Clifton Road NE, Mailstop F-32
Atlanta, GA 30333
Phone: 1-888-42-ATSDR (1-888-422-8737)

FAX: (770)-488-4178
Email: ATSDRIC@cdc.gov

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