

**Table 6-1
Sediment Screening Values**

Analyte	Screening Value	Type of Screening Value
Metals (mg/kg)		
Aluminum	18000	NOAA Marine Sed AET
Antimony	2	NOAA Marine Sed ERL
Arsenic	8.2	NOAA Marine Sed ERL
Barium	48	NOAA Marine Sed AET
Beryllium	NSV	NSV
Boron	NSV	NSV
Cadmium	1.2	NOAA Marine Sed ERL
Calcium	NSV	NSV
Chromium	81	NOAA Marine Sed ERL
Cobalt	50	OME; Ontario open water disposal guideline.
Copper	34	NOAA Marine Sed ERL
Iron	20000	OME; LEL value based on Ontario sediments and benthic species
Lead	46.7	NOAA Marine Sed ERL
Magnesium	NSV	NSV
Manganese	460	OME; LEL value based on Ontario sediments and benthic species
Mercury	0.15	NOAA Marine Sed ERL
Molybdenum	NSV	NSV
Nickel	20.9	NOAA Marine Sed ERL
Potassium	NSV	NSV
Selenium	1	NOAA Marine Sed AET
Silver	1	NOAA Marine Sed ERL
Sodium	NSV	NSV
Thallium	NSV	NSV
Vanadium	57	NOAA Marine Sed AET
Zinc	150	NOAA Marine Sed ERL
Pesticides (ug/kg)		
4,4'-DDD	2	NOAA Marine Sed ERL
4,4'-DDE	2.2	NOAA Marine Sed ERL
4,4'-DDT	1.58	NOAA Marine Sed ERL
Aldrin	2	OME; LEL value based on Ontario sediments and benthic species
alpha-BHC	6	OME; LEL value based on Ontario sediments and benthic species
alpha-Chlordane	7	OME; LEL value based on Ontario sediments and benthic species
beta-BHC	5	OME; LEL value based on Ontario sediments and benthic species
delta-BHC	120	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
Dieldrin	0.02	NOAA Marine Sed ERL
Endosulfan I	2.9	EcoTox; Sediment Quality Benchmark calculated using the Tier II water value and equilibrium partitioning (value is based on 1% TOC)
Endosulfan II	14	EcoTox; Sediment Quality Benchmark calculated using the Tier II water value and equilibrium partitioning (value is based on 1% TOC)
Endosulfan sulfate	5.5	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
Endrin	0.02	NOAA Marine Sed ERL
Endrin aldehyde	NSV	NSV
Endrin ketone	NSV	NSV
gamma-BHC (Lindane)	3	OME; LEL value based on Ontario sediments and benthic species
gamma-Chlordane	7	OME; LEL value based on Ontario sediments and benthic species

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Analyte	Screening Value	Type of Screening Value
Heptachlor	0.3	NOAA Marine Sed AET
Heptachlor Epoxide	0.6	ECISQG (1999)
Methoxychlor	19	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
Toxaphene	0.1	ECISQG (1999)
PCBs		
Aroclor-1016	7	OME; LEL value based on Ontario sediments and benthic species
Aroclor-1221	120	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
Aroclor-1232	600	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
Aroclor-1242	170	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
Aroclor-1248	30	OME; LEL value based on Ontario sediments and benthic species
Aroclor-1254	63.3	ECISQG (1999)
Aroclor-1260	5	OME; LEL value based on Ontario sediments and benthic species
PCBS	22.7	NOAA Marine Sed ERL
SVOCs (ug/kg)		
1,2,4-Trichlorobenzene	4.8	NOAA Marine Sed AET
1,2-Dichlorobenzene	13	NOAA Marine Sed AET
1,3-Dichlorobenzene	1700	EcoTox; value is the Sediment Quality Benchmark calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
1,4-Dichlorobenzene	110	NOAA Marine Sed AET
2,4,5-Trichlorophenol	3	NOAA Marine Sed AET
2,4,6-Trichlorophenol	6	NOAA Marine Sed AET
2,4-Dichlorophenol	5	NOAA Marine Sed AET
2,4-Dimethylphenol	18	NOAA Marine Sed AET
2,4-Dinitrophenol	NSV	NSV
2,4-Dinitrotoluene	NSV	NSV
2,6-Dinitrotoluene	NSV	NSV
2-Chloronaphthalene	NSV	NSV
2-Chlorophenol	8	NOAA Marine Sed AET
2-Methylnaphthalene	70	NOAA Marine Sed ERL
2-Methylphenol	8	NOAA Marine Sed AET
2-Nitroaniline	NSV	NSV
2-Nitrophenol	NSV	NSV
3,3'-Dichlorobenzidine	NSV	NSV
3-Nitroaniline	NSV	NSV
4,6-Dinitro-2-methylphenol	NSV	NSV
4-Bromophenyl phenylether	1300	EcoTox; value is the Sediment Quality Benchmark calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
4-Chloro-3-methylphenol	NSV	NSV

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Analyte	Screening Value	Type of Screening Value
4-Chloroaniline	NSV	NSV
4-Chlorophenyl phenyl ether	NSV	NSV
4-Methylphenol	100	NOAA Marine Sed AET
4-Nitroaniline	NSV	NSV
4-Nitrophenol	NSV	NSV
Acenaphthene	16	NOAA Marine Sed ERL
Acenaphthylene	44	NOAA Marine Sed ERL
Anthracene	85.3	NOAA Marine Sed ERL
Benzo(a)anthracene	261	NOAA Marine Sed ERL
Benzo(a)pyrene	430	NOAA Marine Sed ERL
Benzo(b)fluoranthene	1800	NOAA Marine Sed AET
Benzo(g,h,i)perylene	170	OME; LEL value based on Ontario sediments and benthic species
Benzo(k)fluoranthene	240	OME; LEL value based on Ontario sediments and benthic species
bis(2-Chloroethoxy)methane	NSV	NSV
bis(2-Chloroethyl)ether	NSV	NSV
bis(2-Chloroisopropyl)ether	NSV	NSV
bis(2-Ethylhexyl)phthalate	182	NOAA Marine Sed TEL
Butyl benzyl phthalate	63	NOAA Marine Sed AET
Carbazole	NSV	NSV
Chrysene	384	NOAA Marine Sed ERL
Dibenz(a,h)anthracene	63.4	NOAA Marine Sed ERL
Dibenzofuran	110	NOAA Marine Sed AET
Diethylphthalate	6	NOAA Marine Sed AET
Dimethylphthalate	6	NOAA Marine Sed AET
Di-n-butyl phthalate	58	NOAA Marine Sed AET
Di-n-octyl phthalate	61	NOAA Marine Sed AET
Fluoranthene	600	NOAA Marine Sed ERL
Fluorene	19	
Hexachlorobenzene	20	OME; LEL value based on Ontario sediments and benthic species
Hexachlorobutadiene	1.3	NOAA Marine Sed AET
Hexachlorocyclopentadiene	NSV	NSV
Hexachloroethane	73	NOAA Marine Sed AET
Indeno(1,2,3-cd)pyrene	200	OME; LEL value based on Ontario sediments and benthic species
Isophorone	NSV	NSV
Naphthalene	160	NOAA Marine Sed ERL
Nitrobenzene	21	NOAA Marine Sed AET
N-Nitrosodiphenylamine	28	NOAA Marine Sed AET
N-Nitroso-dipropylamine	NSV	NSV
Pentachlorophenol	17	NOAA Marine Sed AET
Phenanthrene	240	NOAA Marine Sed ERL
Phenol	130	NOAA Marine Sed AET
Pyrene	665	NOAA Marine Sed ERL

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Sediment Screening Values**

Analyte	Screening Value	Type of Screening Value
VOCs (ug/kg)		
1,1,1-Trichloroethane	170	EcoTox; Sediment Quality Benchmark calculated using the Tier II water value and equilibrium partitioning (value is based on 1% TOC)
1,1,2,2-Tetrachloroethane	940	EcoTox; value is the Sediment Quality Benchmark calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
1,1,2-Trichloroethane	31	Sediment Fauna (Marine- NOAA Screening)
1,1-Dichloroethane	27	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
1,1-Dichloroethene	31	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
1,2-Dichloroethane	250	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
1,2-Dichloropropane	NSV	NSV
2-Butanone	270	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
2-Hexanone	22	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
4-Methyl-2-pentanone	33	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
Acetone	8.7	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
Benzene	57	EcoTox; Sediment Quality Benchmark calculated using the Tier II water value and equilibrium partitioning (value is based on 1% TOC)
Bromodichloromethane	NSV	NSV
Bromoform	NSV	NSV
Bromomethane	NSV	NSV
Carbon disulfide	0.85	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
Carbon tetrachloride	1200	EcoTox; value is the Sediment Quality Benchmark calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
Chlorobenzene	820	EcoTox; value is the Sediment Quality Benchmark calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
Chloroethane	NSV	NSV
Chloroform	22	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)

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Analyte	Screening Value	Type of Screening Value
Chloromethane	NSV	NSV
cis-1,2-Dichloroethene	400	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
cis-1,3-Dichloropropene	0.051	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
Dibromochloromethane	NSV	NSV
Ethylbenzene	4	NOAA Marine Sed AET
Methylene chloride	370	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
m-Xylene/p-Xylene	4	NOAA Marine Sed AET
Styrene	NSV	NSV
Tetrachloroethene	57	NOAA Marine Sed AET
Toluene	670	EcoTox; value is the Sediment Quality Benchmark calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
trans-1,2-Dichloroethene	400	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
trans-1,3-Dichloropropene	0.051	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
Trichloroethene	41	NOAA Marine Sed AET
Vinyl Chloride	NSV	NSV

Notes:

NOAA - National Oceanic and Atmospheric Administration

OME - Ontario Ministry of the Environment

ORNL - Oak Ridge National Laboratory

NSV - No Screening Value

AET - Apparent Effects Threshold

ERL - Effects Range Low

TEL - Threshold Effects Level

LEL - Lowest Effects Level

TOC - Total Organic Carbon

ECISQG - Environment Canada Interim Sediment Quality Guidelines

Table 6-2
Benchmark Quotients at Outfall 005/006 Intertidal Sediments

Analyte	MY06SD01 Benchmark Quotient	MY06SD02 Benchmark Quotient	MY06SD03 Benchmark Quotient	MY06SD04 Benchmark Quotient	Mean Benchmark Quotient
Metals					
Aluminum	0.9	0.8	1.1	1.2	1.0
Arsenic	1.3	1.0	1.3	1.6	1.3
Barium	0.9	0.7	0.9	1.0	0.9
Iron	1.2	1.0	1.4	1.6	1.3
Mercury	1.0	0.5	1.8	1.6	1.2
Nickel	1.2	1.1	1.4	1.5	1.3
SVOCs					
Acenaphthene	ND	ND	ND	4.9	4.9
Anthracene	1.1	ND	0.4	2.0	1.2
Benzo(a)anthracene	1.2	0.2	0.8	2.4	1.2
Benzo(g,h,i)perylene	0.8	0.2	0.8	1.2	0.8
Fluoranthene	0.8	0.1	0.4	1.3	0.6
Fluorene	ND	ND	1.2	5.8	3.5
Indeno(1,2,3-cd)pyrene	1.0	0.3	1.1	1.7	1.0
Phenanthrene	0.5	ND	0.6	1.2	0.8

Benchmark Quotient = Media Concentration / Screening Value

Note: Compounds highlighted indicate screening value is not a NOAA Marine Sediment ERL.

Benchmark Quotients that exceed 1.0 are highlighted.

ND- Contaminant not detected at the sample location

Table 6-3
Benchmark Quotients at Outfall 005/006 Subtidal Sediments

Analyte	MY06SD05 Benchmark Quotient	MY06SD06 Benchmark Quotient	Mean Benchmark Quotient
Metals			
Arsenic	1.9	1.6	1.8
Iron	1.5	1.4	1.4
Mercury	2.3	2.3	2.3
Nickel	1.3	1.2	1.3
SVOCs			
Indeno(1,2,3-cd)pyrene	0.6	1.1	0.9

Benchmark Quotient = Media Concentration / Screening Value

Note: Compounds highlighted indicate screening value is not a NOAA Marine Sediment ERL.

Benchmark Quotients that exceed 1.0 are highlighted.

Table 6-4
Benchmark Quotients at Outfall 008 Subtidal Sediments

Analyte	MY06SD10 Benchmark Quotient	MY06SD11 Benchmark Quotient	MY06SD12 Benchmark Quotient	Mean Benchmark Quotient
Metals				
Arsenic	1.1	1.0	1.1	1.1
Iron	1.1	1.1	1.2	1.1
Mercury	1.2	0.9	0.9	1.0
Nickel	1.1	1.0	1.1	1.1

Benchmark Quotient = Media Concentration / Screening Value

Note: Compounds highlighted indicate screening value is not a NOAA Marine Sediment ERL.

Benchmark Quotients that exceed 1.0 are highlighted.

Table 6-5
Benchmark Quotients at Outfall 009 Subtidal Sediments

Analyte	MY06SD16 Benchmark Quotient	MY06SD17 Benchmark Quotient	MY06SD18 Benchmark Quotient	Mean Benchmark Quotient
Metals				
Arsenic	0.7	1.5	1.4	1.2
Barium	0.9	1.1	0.9	1.0
Iron	1.3	1.4	1.4	1.4
Nickel	1.0	1.2	1.3	1.2
Zinc	1.3	0.6	0.5	0.8
SVOCs				
2-Methylnaphthalene	8.9	ND	ND	8.9
Anthracene	44.5	ND	0.4	22.5
Benzo(a)anthracene	26.4	0.6	1.3	9.5
Benzo(a)pyrene	14.2	0.2	0.5	5.0
Benzo(b)fluoranthene	4.3	0.1	0.2	1.5
Benzo(g,h,i)perylene	17.6	0.4	0.6	6.2
Benzo(k)fluoranthene	15.0	0.2	0.4	5.2
Chrysene	21.9	0.2	0.5	7.5
Dibenzofuran	17.3	ND	ND	17.3
Fluoranthene	40.0	0.5	0.2	13.6
Indeno(1,2,3-cd)pyrene	20.0	0.5	0.8	7.1
Naphthalene	5.0	ND	ND	5.0
Phenanthrene	28.8	0.5	0.4	9.9
Pyrene	24.1	0.2	0.8	8.4

Benchmark Quotient = Media Concentration / Adjusted Screening Value

Note: Compounds highlighted indicate screening value is not a NOAA Marine Sediment ERL.

ND- Contaminant not detected at the sample location

Benchmark Quotients that exceed 1.0 are highlighted.

Table 6-6
Benchmark Quotients at Outfall 010 Intertidal Sediments

Analyte	MY06SD19 Benchmark Quotient	MY06SD20 Benchmark Quotient	MY06SD21 Benchmark Quotient	Mean Benchmark Quotient
SVOCs				
Anthracene	0.2	17.6	0.3	6.0
Benzo(a)anthracene	0.3	14.9	0.3	5.2
Benzo(a)pyrene	0.1	8.1	0.2	2.8
Benzo(b)fluoranthene	0.0	2.4	0.1	0.8
Benzo(g,h,i)perylene	0.2	13.5	0.2	4.7
Benzo(k)fluoranthene	0.1	8.8	0.1	3.0
Chrysene	0.1	8.6	0.1	3.0
Dibenzofuran	ND	3.0	ND	3.0
Fluoranthene	0.2	13.3	0.2	4.6
Indeno(1,2,3-cd)pyrene	0.2	14.5	0.3	5.0
Phenanthrene	0.3	23.3	0.4	8.0
Pyrene	0.1	9.8	0.2	3.4

Benchmark Quotient = Media Concentration / Adjusted Screening Value

Note: Compounds highlighted indicate screening value is not a NOAA Marine Sediment ERL.

ND- Contaminant not detected at the sample location

Benchmark Quotients that exceed 1.0 are highlighted.

Table 6-7
Benchmark Quotients at Outfall 011 Intertidal Sediments

Analyte	MY06SD25 Benchmark Quotient	MY06SD26 Benchmark Quotient	MY06SD27 Benchmark Quotient	Mean Benchmark Quotient
SVOCs				
Benzo(a)anthracene	0.4	1.5	0.4	0.7
Benzo(g,h,i)perylene	0.3	1.1	0.3	0.6
bis(2-Ethylhexyl)phthalate	ND	1.5	ND	1.5
Indeno(1,2,3-cd)pyrene	0.3	1.2	0.3	0.6

Benchmark Quotient = Media Concentration / Adjusted Screening Value

Note: Compounds highlighted indicate screening value is not a NOAA Marine Sediment ERL.

ND- Contaminant not detected at the sample location

Benchmark Quotients that exceed 1.0 are highlighted.

Table 6-8
Benchmark Quotients at Outfall 011 Subtidal Sediments

Analyte	MY06SD28 Benchmark Quotient	MY06SD29 Benchmark Quotient	MY06SD30 Benchmark Quotient	Mean Benchmark Quotient
Metals				
Barium	1.2	0.3	0.9	0.8
Iron	1.2	0.4	0.7	0.7
Nickel	1.3	0.4	0.7	0.8

Benchmark Quotient = Media Concentration / Adjusted Screening Value

Note: Compounds highlighted indicate screening value is not a NOAA Marine Sediment ERL.

Benchmark Quotients that exceed 1.0 are highlighted.

Table 6-9
Comparison of Metal Concentrations at the Outfalls with the Reference Site

Analyte	Mean Benchmark Quotient	Standard Deviation	Maximum Reference Quotient	Mean Reference Quotient	Frequency of Exceedance (RQ > 1)	Standard Deviation
Metals						
Aluminum	0.7	0.4	1.3	0.7	7	0.3
Arsenic	0.9	0.4	1.5	0.8	7	0.3
Barium	0.7	0.2	1.5	0.9	12	0.4
Iron	0.9	0.4	1.4	0.8	8	0.3
Mercury	0.8	0.6	0.9	0.3	0	0.2
Nickel	0.9	0.3	1.4	0.8	8	0.3
Zinc	0.4	0.2	2.4	0.8	7	0.5

Benchmark Quotient = Media Concentration / Screening Value

Reference Quotient = Media Concentration / Reference Concentration

Table 6-10
Summary of Sediment Screening Benchmark Quotients

Analyte	Outfall 5/6				Outfall 9			Outfall 10	Outfall 11		Reference	
	Intertidal (01) ¹	Intertidal (03)	Intertidal (04)	Subtidal (06)	Subtidal (16)	Subtidal (17)	Subtidal (18)	Intertidal (20)	Intertidal (26)	Subtidal (28)	Maximum Intertidal	Maximum Subtidal
SVOCs												
2-Methylnaphthalene	<	<	<	<	8.9	<	<	<	<	<	ND	ND
Acenaphthene	<	<	4.9	<	<	<	<	<	<	<	ND	ND
Anthracene	1.1	<	2.0	<	44.5	<	<	17.6	<	<	0.3	ND
Benzo(a)anthracene	1.2	<	2.4	<	26.4	<	1.3	14.9	1.5	<	0.8	0.9
Benzo(a)pyrene	<	<	<	<	14.2	<	<	8.1	<	<	0.4	0.4
Benzo(b)fluoranthene	<	<	<	<	4.3	<	<	2.4	<	<	0.1	0.1
Benzo(g,h,i)perylene	<	<	1.2	<	17.6	<	<	13.5	1.1	<	0.8	0.7
Benzo(k)fluoranthene	<	<	<	<	15.0	<	<	8.8	<	<	0.4	ND
bis(2-Ethylhexyl)phthalate	<	<	<	<	<	<	<	<	1.5	<	ND	ND
Chrysene	<	<	<	<	21.9	<	<	8.6	<	<	0.4	ND
Dibenzofuran	<	<	<	<	17.3	<	<	3.0	<	<	ND	ND
Fluoranthene	<	<	1.3	<	40.0	<	<	13.3	<	<	0.5	0.4
Fluorene	<	1.2	5.8	<	<	<	<	<	<	<	ND	ND
Indeno(1,2,3-cd)pyrene	<	1.1	1.7	1.1	20.0	<	<	14.5	1.2	<	1.0	0.9
Naphthalene	<	<	<	<	5.0	<	<	<	<	<	ND	ND
Phenanthrene	<	<	1.2	<	28.8	<	<	23.3	<	<	0.2	0.3
Pyrene	<	<	<	<	24.1	<	<	9.8	<	<	0.3	0.3

Notes:

¹Intertidal (01) = Sample MY06SD01

"<" = Benchmark quotient less than 1.0

ND = Not Detected

Outfalls 008 and 012 did not have any benchmark quotients greater than 1.0 and are therefore not listed.

Table 6-11
Benchmark and Reference Quotients at the Transmission Line (Silt Spreading) Area

Analyte	Benchmark Quotients			Reference Quotients		
	BQ 50	BQ 51	BQ 52/53	RQ 50	RQ 51	RQ 52/53
Metals (mg/kg)						
Aluminum	1.1	1.3	1.4	1.3	1.5	1.6
Arsenic	1.8	1.8	2.0	1.7	1.7	1.9
Barium	1.0	1.2	1.3	1.5	1.7	1.8
Iron	1.5	1.6	2.1	1.3	1.4	1.9
Manganese	0.7	0.7	1.3	1.3	1.3	2.5
Mercury	1.4	2.3	1.5	0.6	0.9	0.6
Nickel	1.4	1.7	2.0	1.3	1.6	1.8
Vanadium	0.9	1.0	1.1	1.3	1.4	1.6
SVOCs (ug/kg)						
Acenaphthene	ND	ND	15.6			
Benzo(a)anthracene	1.2	1.3	ND			

Notes:

Benchmark Quotient = Media Concentration / Screening Value

Reference Quotient = Media Concentration / Maximum Reference Concentration

Highlighted Benchmark Quotients Exceed 1.0

ND = Not Detected

Table 6-12
Screening of Maximum Detected Residues in Clam Tissue

Chemical ³	Screening Value	Tissue Concentration Ratios ¹					Tissue Hazard Quotients ²					
		Outfall 005 / 006	Outfall 008	Outfall 010	Outfall 011	Outfall 012	Outfall 005 / 006	Outfall 008	Outfall 010	Outfall 011	Outfall 012	Reference Site
Inorganics (mg/kg)												
Aluminum	4.4	1.53	0.96	0.89	0.63	0.45	148.64	92.73	86.59	60.91	43.64	97.05
Arsenic	1.6	2.08	0.71	0.93	0.92	0.39	4.44	1.53	1.98	1.98	0.83	2.14
Barium	NA	1.70	0.85	0.88	0.65	0.42	NSV ⁴	NSV	NSV	NSV	NSV	NSV
Beryllium	0.1	1.87	0.96	0.91	0.78	2.74	0.43	0.22	0.21	0.18	0.63	0.23
Cadmium	0.042	1.26	0.98	1.04	1.02	0.92	1.50	1.17	1.24	1.21	1.10	1.19
Chromium	0.18	1.22	0.80	0.68	0.53	0.46	9.28	6.06	5.17	4.06	3.50	7.61
Cobalt	NA	3.33	0.87	0.97	1.13	0.78	NSV	NSV	NSV	NSV	NSV	NSV
Copper	0.17	3.47	0.60	1.56	1.34	3.50	8.80	1.50	4.00	3.40	8.90	2.50
Iron	NA	1.90	0.66	0.89	0.45	0.27	NSV	NSV	NSV	NSV	NSV	NSV
Lead	0.064	1.33	0.57	0.67	0.58	0.85	30.63	13.00	15.50	13.31	19.53	22.97
Manganese	NA	3.12	0.25	0.36	0.75	0.16	NSV	NSV	NSV	NSV	NSV	NSV
Mercury	0.06	0.80	1.00	1.20	0.80	1.00	0.67	0.83	1.00	0.67	0.83	0.83
Nickel	0.33	1.99	0.81	3.45	2.32	1.79	5.48	2.24	9.52	6.39	4.94	2.76
Vanadium	NA	2.20	0.77	0.76	0.61	0.40	NSV	NSV	NSV	NSV	NSV	NSV
Zinc	2.8	1.56	0.83	1.09	1.11	1.54	1.40	0.70	0.99	1.00	1.40	0.90
Pesticide/Polychlorinated Biphenyls (ug/kg)												
4,4'-DDT	0.054	0.29	0.29	1.48	1.69	-	<0.01	<0.01	<0.01	<0.01	-	<0.01
Dieldrin	0.0089	5.27	0.64	0.80	1.00	0.81	0.04	<0.01	<0.01	<0.01	<0.01	<0.01
Heptachlor epoxide	0.052	0.50	0.80	1.20	1.10	0.75	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
alpha-Chlordane	0.056	1.07	0.86	0.79	0.51	0.86	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Semi-volatile Organic Compounds (ug/kg)												
2,4,5-Trichlorophenol	1.2	1.10	-	-	-	-	0.09	-	-	-	-	0.08
2,4,6-Trichlorophenol	146	1.18	-	-	-	-	<0.01	-	-	-	-	<0.01
2,4-Dichlorophenol	15	1.26	-	-	-	-	<0.01	-	-	-	-	<0.01
2-Methylphenol	NA	1.06	0.37	0.49	0.29	0.15	NSV	NSV	NSV	NSV	NSV	NSV
4-Chloro-3-methylphenol	0.11	1.10	0.30	1.70	0.18	-	2.00	0.55	3.09	0.33	-	1.82
Anthracene	1	2.28	0.88	1.83	1.05	3.00	NSV	NSV	NSV	NSV	NSV	NSV
Benzo(g,h,i)perylene	1	0.86	0.70	1.08	0.54	0.72	NSV	NSV	NSV	NSV	NSV	NSV
Fluoranthene	18	1.10	0.74	1.22	0.69	1.23	NSV	NSV	NSV	NSV	NSV	NSV
Fluorene	1	0.73	0.55	1.06	-	-	NSV	NSV	NSV	NSV	NSV	NSV
Pentachlorophenol	2.5	1.88	-	0.82	-	-	0.13	-	0.06	-	-	0.07
Phenanthrene	12	2.00	0.60	1.65	1.00	2.80	NSV	NSV	NSV	NSV	NSV	NSV

Notes:

¹Tissue Concentration Ratio = Concentration at Facility / Concentration at Reference Site

² Hazard Quotient = Concentration / Screening Value

³ Only chemicals with at least one TCR > 1.0 are shown.

NSV = No Screening Value

Shading indicates > 1.0

Table 6-13
Tissue Concentration Ratios for Clam Tissue

Chemical ²	Tissue Concentration Ratios ¹									Tissue Concentration Ratios ¹								
	Outfall 005 / 006						Outfall 008			Outfall 010			Outfall 011			Outfall 012		
	BC01 ³	BC02	BC03	BC04	BC05	BC06	BC07	BC08	BC09	BC10	BC11	BC12	BC13	BC14	BC15	BC16	BC17	BC18
Inorganics																		
Aluminum	1.50	1.18	0.75	1.30	0.85	0.76	0.84	0.96	0.73	0.45	0.89	0.85	0.59	0.52	0.63	0.45	0.44	0.39
Arsenic	2.08	1.28	0.70	1.29	1.38	0.94	0.56	0.71	0.59	0.55	0.93	0.52	0.92	0.62	0.68	0.39	0.37	0.35
Barium	1.70	1.18	0.73	1.30	0.92	0.91	0.77	0.85	0.66	0.41	0.88	0.74	0.65	0.47	0.58	0.42	0.42	0.37
Beryllium	1.87	1.26	0.78	1.13	1.00	0.87	0.83	0.96	0.74	0.43	0.91	0.91	0.52	0.65	0.78	0.48	2.74	0.52
Cadmium	1.26	1.12	0.64	0.68	0.56	0.76	0.78	0.82	0.98	0.92	1.04	0.94	1.02	0.90	0.86	0.82	0.80	0.92
Chromium	1.22	0.82	1.05	0.97	0.70	0.61	0.80	0.64	0.53	0.35	0.68	0.58	0.53	0.37	0.44	0.46	0.38	0.31
Cobalt	3.33	1.33	0.48	0.99	0.53	0.58	0.83	0.87	0.77	0.68	0.97	0.82	1.01	0.82	1.13	0.64	0.78	0.73
Copper	0.33	3.47	0.32	0.21	0.18	0.70	0.26	0.60	0.35	0.31	1.56	0.49	0.24	1.05	1.34	3.50	0.82	0.76
Iron	1.90	1.16	0.72	1.41	1.39	1.09	0.49	0.66	0.47	0.32	0.89	0.46	0.41	0.42	0.45	0.27	0.23	0.21
Lead	1.22	1.33	0.58	0.73	0.67	0.83	0.38	0.57	0.42	0.29	0.67	0.35	0.26	0.44	0.58	0.85	0.35	0.27
Manganese	3.12	0.43	0.12	0.61	0.11	0.12	0.20	0.25	0.20	0.35	0.27	0.36	0.38	0.45	0.75	0.10	0.16	0.15
Mercury	0.80	0.80	0.40	0.60	0.60	0.60	1.00	1.00	1.00	0.60	1.20	0.80	0.80	0.80	0.80	1.00	1.00	1.00
Nickel	1.74	1.99	0.52	0.75	0.47	0.98	0.54	0.76	0.81	0.46	3.45	0.71	0.48	2.32	0.82	1.79	0.80	0.67
Vanadium	2.20	1.09	0.61	1.15	0.75	0.65	0.64	0.77	0.58	0.41	0.76	0.65	0.52	0.52	0.61	0.38	0.40	0.34
Zinc	1.01	1.56	0.52	0.81	0.54	0.94	0.66	0.83	0.76	0.68	1.09	0.81	0.66	0.98	1.11	1.54	0.90	0.76
Pesticide/Polychlorinated Biphenyls																		
4,4'-DDT	0.15	0.29	-	-	-	-	0.25	0.29	0.26	0.72	1.11	1.48	1.69	1.69	0.46	-	-	-
Dieldrin	5.27	1.76	1.27	2.03	0.96	1.62	0.51	0.50	0.64	0.72	0.80	0.70	1.00	0.89	0.86	0.64	0.81	0.81
Heptachlor epoxide	0.50	-	-	-	-	-	0.70	0.75	0.80	1.20	-	1.05	0.50	1.10	1.00	0.75	0.47	-
alpha-Chlordane	1.00	1.07	0.49	0.58	-	1.07	0.61	0.63	0.86	0.70	0.59	0.79	0.51	0.39	0.34	0.61	0.86	0.45
Semi-volatile Organic Compounds																		
2,4,5-Trichlorophenol	-	1.10	-	-	-	0.88	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	-	1.18	-	-	-	1.03	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	-	1.26	0.35	0.16	-	0.88	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylphenol	0.22	1.06	0.43	0.40	0.27	0.94	0.37	0.31	0.31	0.34	0.49	0.34	0.29	0.21	0.29	0.13	0.15	0.12
4-Chloro-3-methylphenol	-	1.10	0.45	0.32	0.17	0.60	0.30	0.19	0.18	0.22	1.70	0.70	0.18	0.09	0.18	-	-	-
Anthracene	0.78	1.05	0.85	2.28	0.98	1.23	0.58	0.60	0.88	0.53	1.83	0.98	1.05	1.00	1.05	0.55	3.00	0.78
Benzo(g,h,i)perylene	0.86	0.72	0.54	0.76	0.62	0.80	0.70	0.58	0.68	0.50	1.08	0.72	0.48	0.54	0.48	0.34	0.72	0.48
Fluoranthene	0.86	0.69	0.62	1.10	0.64	0.83	0.58	0.60	0.74	0.53	1.22	0.78	0.69	0.55	0.69	0.35	1.23	0.49
Fluorene	0.73	-	-	-	-	-	0.45	0.52	0.55	0.39	1.06	0.61	-	-	-	-	-	-
Pentachlorophenol	-	-	-	-	-	1.88	-	-	-	-	0.82	0.19	-	-	-	-	-	-
Phenanthrene	0.80	0.70	0.70	2.00	0.80	0.75	0.55	0.60	0.60	0.45	1.65	0.85	0.90	1.00	0.90	-	2.80	0.70

Notes:

¹ Tissue Concentration Ratio = Concentration at Facility / Concentration at Reference Site

² Only chemicals with at least one TCR > 1.0 are shown.

³ BC01 (Cooresponds to Benthic Clam, Station 01)

Shading indicates > 1.0

Table 6-14
Screening of Maximum Detected Residues in Mussel Tissue

Chemical ³	Screening Value	Tissue Concentration Ratios ¹					Tissue Hazard Quotients ²					Reference Site
		Outfall 008	Outfall 009	Outfall 010	Outfall 011	Outfall 012	Outfall 008	Outfall 009	Outfall 010	Outfall 011	Outfall 012	
Inorganics (mg/kg)												
Aluminum	4.4	0.96	1.54	1.66	1.04	1.04	20.45	32.73	35.23	22.20	22.18	21.27
Arsenic	1.6	0.91	0.77	0.88	0.85	1.03	0.87	0.74	0.84	0.81	0.98	0.96
Barium	NA	1.06	1.51	1.58	1.06	1.04	NSV ⁴	NSV	NSV	NSV	NSV	NSV
Beryllium	0.1	0.83	1.33	1.33	1.17	0.83	0.05	0.08	0.08	0.07	0.05	0.06
Chromium	0.18	1.62	0.98	0.92	3.32	1.13	5.39	3.28	3.06	11.06	3.78	3.33
Copper	3	0.69	0.42	0.42	0.71	1.06	0.88	0.53	0.53	0.90	1.35	1.27
Iron	NA	0.77	1.17	1.14	1.00	1.22	NSV	NSV	NSV	NSV	NSV	NSV
Manganese	NA	0.61	1.25	0.53	0.49	0.51	NSV	NSV	NSV	NSV	NSV	NSV
Mercury	0.06	1.20	1.20	1.20	1.20	1.60	1.00	1.00	1.00	1.00	1.33	0.83
Nickel	0.33	0.98	0.67	0.75	1.92	1.59	1.52	1.03	1.15	2.97	2.45	1.55
Zinc	20	0.93	0.77	0.87	0.94	1.05	0.65	0.54	0.61	0.66	0.74	0.70
Pesticide/Polychlorinated Biphenyls (ug/kg)												
Dieldrin	8.9	0.82	0.96	0.88	0.79	1.08	0.01	0.01	0.01	0.01	0.01	0.01
Endrin ketone	9.1	1.08	1.30	1.24	1.46	1.70	0.04	0.05	0.05	0.06	0.07	0.04
Heptachlor epoxide	52	1.27	-	-	1.36	1.36	0.00	-	-	0.00	0.00	0.00
alpha-BHC	4.9	0.88	1.00	1.15	0.74	1.09	0.01	0.01	0.01	0.01	0.01	0.01
gamma-BHC (Lindane)	10	0.77	0.89	1.02	0.73	0.95	0.00	0.00	0.00	0.00	0.00	0.00
Semi-volatile Organic Compounds (ug/kg)												
Anthracene	NA	0.77	4.29	1.04	1.34	0.93	NSV	NSV	NSV	NSV	NSV	NSV
Benzo(a)anthracene	NA	0.58	2.58	0.62	0.81	0.58	NSV	NSV	NSV	NSV	NSV	NSV
Benzo(a)pyrene	NA	0.53	3.53	0.71	0.94	0.57	NSV	NSV	NSV	NSV	NSV	NSV
Benzo(b)fluoranthene	NA	0.54	1.83	0.65	0.63	0.54	NSV	NSV	NSV	NSV	NSV	NSV
Benzo(k)fluoranthene	NA	0.63	2.00	0.63	0.81	0.69	NSV	NSV	NSV	NSV	NSV	NSV
Chrysene	NA	0.58	2.13	0.70	0.73	0.65	NSV	NSV	NSV	NSV	NSV	NSV
Dibenz(a,h)anthracene	NA	0.56	2.59	0.67	0.70	0.52	NSV	NSV	NSV	NSV	NSV	NSV
Fluoranthene	NA	0.78	3.00	1.00	1.03	0.93	NSV	NSV	NSV	NSV	NSV	NSV
Indeno(1,2,3-cd)pyrene	NA	0.56	2.80	0.73	0.80	0.59	NSV	NSV	NSV	NSV	NSV	NSV
Isophorone	1400	0.64	1.29	1.32	1.00	1.04	0.01	0.03	0.03	0.02	0.02	0.02
Pyrene	NA	0.62	1.92	0.76	0.74	0.74	NSV	NSV	NSV	NSV	NSV	NSV

Notes:

¹Tissue Concentration Ratio = Concentration at Facility / Concentration at Reference Site

² Hazard Quotient = Concentration / Screening Value

³ Only chemicals with at least one TCR > 1.0 are shown.

NSV = No Screening Value

Shading indicates > 1.0

Table 6-15
Tissue Concentration Ratios for Mussel Tissue

Chemical ²	Tissue Concentration Ratios ¹						Tissue Concentration Ratios ¹								
	Outfall 008			Outfall 009			Outfall 010			Outfall 011			Outfall 012		
	BM01 ³	BM02	BM03	BM04	BM05	BM06	BM07	BM08	BM09	BM10	BM11	BM12	BM13	BM14	BM15
Inorganics															
Aluminum	0.59	0.57	0.96	1.54	1.36	0.79	0.69	1.66	0.58	1.03	0.94	1.04	0.84	1.04	0.88
Arsenic	0.65	0.47	0.91	0.66	0.58	0.77	0.76	0.88	0.63	0.73	0.72	0.85	0.76	1.03	0.74
Barium	0.58	0.60	1.06	1.19	1.51	0.83	0.70	1.58	0.58	0.94	1.00	1.06	0.81	1.04	0.87
Beryllium	-	-	0.83	1.33	0.83	-	-	1.33	-	1.17	-	-	-	0.83	-
Chromium	0.57	1.62	0.77	0.90	0.92	0.98	0.55	0.92	0.48	3.32	1.10	0.78	0.62	1.13	0.63
Copper	0.57	0.27	0.69	0.42	0.23	0.32	0.29	0.42	0.24	0.49	0.23	0.71	1.06	0.64	0.27
Iron	0.52	0.41	0.77	1.11	1.17	0.67	0.54	1.14	0.53	0.85	0.80	1.00	0.63	1.22	0.82
Manganese	0.54	0.54	0.61	1.25	0.55	0.58	0.29	0.53	0.28	0.37	0.43	0.49	0.51	0.43	0.51
Mercury	0.80	0.80	1.20	1.00	0.80	1.20	1.00	1.20	0.80	0.80	0.80	1.20	1.00	1.60	1.00
Nickel	0.53	0.37	0.98	0.67	0.57	0.55	0.45	0.75	0.39	0.55	0.61	1.92	0.47	1.59	0.59
Vanadium	0.41	0.34	0.66	0.78	0.81	0.45	0.45	0.78	0.39	0.63	0.55	0.70	0.50	1.02	0.56
Zinc	0.64	0.52	0.93	0.77	0.49	0.72	0.80	0.87	0.52	0.69	0.50	0.94	0.84	1.05	0.63
Pesticide/Polychlorinated Biphenyls															
Dieldrin	0.62	0.81	0.82	0.84	0.96	0.74	0.88	0.75	0.77	0.79	0.70	0.71	0.64	1.08	0.77
Endrin ketone	1.08	-	1.00	1.30	0.81	1.24	1.24	-	0.89	1.24	0.97	1.46	1.70	1.19	1.70
Heptachlor epoxide	-	-	1.27	-	-	-	-	-	-	1.36	-	-	-	1.36	-
alpha-BHC	0.56	0.59	0.88	0.50	0.65	1.00	1.15	-	0.88	0.71	0.74	0.62	0.71	1.09	0.68
gamma-BHC (Lindane)	0.70	0.55	0.77	0.64	0.52	0.89	0.93	1.02	0.73	0.73	0.68	0.59	0.55	0.84	0.95
Semi-volatile Organic Compounds															
Anthracene	0.77	0.54	0.75	4.29	0.57	0.75	0.95	1.04	0.63	0.73	1.34	0.71	0.57	0.93	0.64
Benzo(a)anthracene	0.58	0.38	0.58	2.58	0.54	0.62	0.50	0.62	0.50	0.50	0.81	0.50	0.42	0.58	0.58
Benzo(a)pyrene	0.52	0.38	0.53	3.53	0.48	0.58	0.41	0.71	0.44	0.47	0.94	0.49	0.35	0.57	0.47
Benzo(b)fluoranthene	0.54	0.35	0.54	1.83	0.50	0.58	0.46	0.65	0.46	0.38	0.63	0.42	0.35	0.54	0.46
Benzo(k)fluoranthene	0.63	0.46	0.62	2.00	0.54	0.63	0.36	0.54	0.63	0.44	0.81	0.55	0.40	0.69	0.53
Chrysene	0.55	0.40	0.58	2.13	0.53	0.58	0.60	0.70	0.50	0.48	0.73	0.53	0.40	0.65	0.55
Dibenz(a,h)anthracene	0.56	0.32	0.44	2.59	0.41	0.48	0.44	0.67	0.41	0.36	0.70	0.37	0.33	0.52	0.44
Fluoranthene	0.72	0.53	0.78	3.00	0.65	0.77	0.88	1.00	0.65	0.72	1.03	0.73	0.58	0.93	0.73
Indeno(1,2,3-cd)pyrene	0.51	0.37	0.56	2.80	0.49	0.58	0.45	0.73	0.48	0.43	0.80	0.45	0.35	0.59	0.47
Isophorone	0.54	0.36	0.64	0.33	1.29	0.89	0.86	1.32	0.57	0.68	0.79	1.00	0.82	1.04	0.93
Pyrene	0.58	0.44	0.62	1.92	0.51	0.58	0.65	0.76	0.54	0.54	0.74	0.54	0.46	0.74	0.56

Notes:

¹ Tissue Concentration Ratio = Concentration at Facility / Concentration at Reference Site

² Only chemicals with at least one TCR > 1.0 are shown.

³ BM01 (Corresponds to Blue Mussel, Station 01)

Shading indicates > 1.0

Table 6-16
Screening of Maximum Detected Residues in Mummichog Tissue

Chemical	Screening Value (mg/kg, wet)	Tissue Residue Concentrations (mg/kg, wet)				Tissue Concentration Ratios ¹			Tissue Hazard Quotients ²			
		West Side of Facility	East Side of Facility	East Side of Facility	Reference Site	West Side of Facility	East Side of Facility	East Side of Facility	West Side of Facility	East Side of Facility	East Side of Facility	Reference Site
Inorganics												
Antimony	50	0.006	0.033	0.011	0.009	0.7	3.7	1.2	<0.01	<0.01	<0.01	<0.01
Arsenic	1.6	0.78	0.76	0.78	0.65	1.2	1.2	1.2	0.49	0.48	0.49	0.41
Barium	NA	0.4	1.51	0.4	0.23	1.7	6.6	1.7	NA	NA	NA	NA
Beryllium	0.1	ND	0.024	ND	ND	-	>1.0	-	-	0.24	-	-
Chromium	19.8	0.14	0.74	0.13	0.14	1.0	5.3	0.9	<0.01	0.04	<0.01	<0.01
Cobalt	NA	0.018	0.118	0.017	0.016	1.1	7.4	1.1	NA	NA	NA	NA
Copper	34	3.51	34.5	19.4	28.4	0.1	1.2	0.7	0.10	1.01	0.57	0.84
Iron	NA	36	616	37	29	1.2	21.2	1.3	NA	NA	NA	NA
Lead	26.2	0.102	0.356	0.281	0.484	0.2	0.7	0.6	<0.01	0.01	0.01	0.02
Manganese	NA	4.87	10.3	4.16	4.18	1.2	2.5	1.0	NA	NA	NA	NA
Mercury	1.36	0.04	0.05	0.05	0.04	1.0	1.3	1.3	0.03	0.04	0.04	0.03
Nickel	29.2	0.81	3.33	0.58	0.48	1.7	6.9	1.2	0.03	0.11	0.02	0.02
Selenium	0.56	0.46	0.51	0.52	0.43	1.1	1.2	1.2	0.82	0.91	0.93	0.77
Silver	1.3	0.047	0.043	0.052	0.044	1.1	1.0	1.2	0.04	0.03	0.04	0.03
Thallium	4.6	ND	0.007	ND	ND	-	>1.0	-	-	<0.01	-	-
Vanadium	24	0.18	1.26	0.18	0.12	1.5	10.5	1.5	<0.01	0.05	<0.01	<0.01
Zinc	40	41.5	37.2	42.5	39.4	1.1	0.9	1.1	1.04	0.93	1.06	0.99
Pesticide/Polychlorinated Biphenyls												
4,4'-DDD	19	0.0011	0.0015	0.0012	0.002	0.6	0.8	0.6	<0.01	<0.01	<0.01	<0.01
4,4'-DDE	19	0.003	0.0049	0.0043	0.0051	0.6	1.0	0.8	<0.01	<0.01	<0.01	<0.01
4,4'-DDT	19	0.000099	0.00019	0.00013	0.00018	0.6	1.1	0.7	<0.01	<0.01	<0.01	<0.01
Aroclor-1254	36	0.02	0.03	0.028	0.042	0.5	0.7	0.7	<0.01	<0.01	<0.01	<0.01
Aroclor-1260	3500	0.02	0.029	0.024	0.037	0.5	0.8	0.6	<0.01	<0.01	<0.01	<0.01
Dieldrin	21.3	0.00043	0.0006	0.00056	0.00061	0.7	1.0	0.9	<0.01	<0.01	<0.01	<0.01
Endosulfan sulfate	0.03	0.00006	0.00012	0.000095	0.00017	0.4	0.7	0.6	<0.01	<0.01	<0.01	<0.01
Endrin aldehyde	0.94	ND	ND	ND	0.0016	-	-	-	-	-	-	<0.01
Endrin ketone	0.94	0.00085	0.00072	0.00096	0.003	0.3	0.2	0.3	<0.01	<0.01	<0.01	<0.01
Heptachlor	53	0.00001	ND	ND	ND	>1.0	-	-	<0.01	-	-	-
Heptachlor epoxide	37	0.000079	0.00012	0.000094	0.00016	0.5	0.8	0.6	<0.01	<0.01	<0.01	<0.01
alpha-BHC	4.86	0.00016	0.00032	0.00022	0.00024	0.7	1.3	0.9	<0.01	<0.01	<0.01	<0.01
alpha-Chlordane	31.8	0.00027	0.00049	0.00036	0.00046	0.6	1.1	0.8	<0.01	<0.01	<0.01	<0.01
beta-BHC	4.86	ND	ND	0.000018	ND	-	-	>1.0	-	-	<0.01	-

Table 6-16
Screening of Maximum Detected Residues in Mummichog Tissue

Chemical	Screening Value (mg/kg, wet)	Tissue Residue Concentrations (mg/kg, wet)				Tissue Concentration Ratios ¹			Tissue Hazard Quotients ²			
		West Side of Facility	East Side of Facility	East Side of Facility	Reference Site	West Side of Facility	East Side of Facility	East Side of Facility	West Side of Facility	East Side of Facility	East Side of Facility	Reference Site
delta-BHC	4.86	ND	ND	0.000027	ND	-	-	>1.0	-	-	<0.01	-
gamma-BHC (Lindane)	4.86	0.000059	0.0001	0.000072	0.00015	0.4	0.7	0.5	<0.01	<0.01	<0.01	<0.01
gamma-Chlordane	31.8	0.00015	0.00026	0.00032	0.00028	0.5	0.9	1.1	<0.01	<0.01	<0.01	<0.01
Semi-volatile Organic Compounds												
1,2,4-Trichlorobenzene	465	ND	ND	ND	0.00001	-	-	-	-	-	-	<0.01
2,4,5-Trichlorophenol	1000	ND	ND	ND	0.00023	-	-	-	-	-	-	<0.01
2,4,6-Trichlorophenol	0.052	ND	ND	ND	0.000094	-	-	-	-	-	-	<0.01
2,4-Dichlorophenol	2300	ND	ND	ND	0.00012	-	-	-	-	-	-	<0.01
2,4-Dimethylphenol	15300	ND	ND	ND	0.00036	-	-	-	-	-	-	<0.01
2-Chlorophenol	128	0.000044	ND	ND	0.00038	0.1	-	-	<0.01	-	-	<0.01
2-Methylphenol	765	0.000017	0.000019	0.000031	0.00017	0.1	0.1	0.2	<0.01	<0.01	<0.01	<0.01
4-Chloro-3-methylphenol	110	0.00046	0.0002	0.00012	0.0042	0.1	0.0	0.0	<0.01	<0.01	<0.01	<0.01
4-Methylphenol	765	ND	ND	ND	0.00026	-	-	-	-	-	-	<0.01
4-Nitrophenol	35	ND	ND	ND	ND	-	-	-	-	-	-	-
Acenaphthene	35000	0.00025	0.00036	0.00027	0.00021	1.2	1.7	1.3	<0.01	<0.01	<0.01	<0.01
Acenaphthylene	NA	0.00024	0.00017	0.00014	0.00022	1.1	0.8	0.6	NA	NA	NA	NA
Anthracene	NA	0.00019	0.00017	0.00018	0.00014	1.4	1.2	1.3	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	0.00024	0.00011	0.00014	0.00018	1.3	0.6	0.8	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	ND	ND	ND	ND	-	-	-	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	0.00013	0.000043	0.000066	0.000097	1.3	0.4	0.7	NA	NA	NA	NA
Chrysene	NA	0.0002	0.00011	0.00018	0.00021	1.0	0.5	0.9	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	0.00013	0.000023	0.000027	0.000081	1.6	0.3	0.3	NA	NA	NA	NA
Fluoranthene	NA	ND	ND	ND	ND	-	-	-	NA	NA	NA	NA
Fluorene	NA	0.00029	0.0004	0.00031	0.00032	0.9	1.3	1.0	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	0.00018	0.000044	0.000061	0.000077	2.3	0.6	0.8	NA	NA	NA	NA
Naphthalene	1700	ND	0.0016	0.0014	0.0017	-	0.9	0.8	-	<0.01	<0.01	<0.01
Pentachlorophenol	65	ND	ND	ND	0.0022	-	-	-	-	-	-	<0.01
Phenanthrene	NA	ND	ND	ND	ND	-	-	-	NA	NA	NA	NA
Pyrene	NA	ND	ND	ND	ND	-	-	-	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	390	0.000051	0.00005	0.000049	ND	*	*	*	<0.01	<0.01	<0.01	-

Notes:

¹ Site Concentration / Reference Concentration

² Tissue Concentration / Screening Value

Table 6-17
Comparison of Sediment Benchmark Quotients Between First and Second Rounds of Sampling

Analyte	Outfall 5/6- Intertidal Station 04		Outfall 9- Subtidal Station 16		Outfall 10- Intertidal Station 20		Intertidal Reference Station (SS02)	
	Sept-01 Sampling	Nov-01 Sampling	Sept-01 Sampling	Nov-01 Sampling	Sept-01 Sampling	Nov-01 Sampling	Sept-01 Sampling	Nov-01 Sampling
Metals								
Aluminum	1.2	0.1	0.5	0.6	0.5	0.5	0.8	0.8
Arsenic	1.6	1.5	0.7	0.7	0.7	0.6	1.1	1.1
Barium	1.0	0.9	0.9	0.9	0.6	0.6	0.7	0.9
Cadmium	0.2	ND	0.2	0.1	0.1	0.1	0.2	0.2
Chromium	0.7	0.7	0.5	0.4	0.3	0.3	0.6	0.6
Cobalt	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2
Copper	0.7	0.6	0.7	0.7	0.5	0.4	0.6	0.5
Iron	1.6	1.4	1.3	0.8	0.7	0.7	1.1	1.0
Lead	0.6	0.6	0.3	0.4	0.2	0.2	0.5	0.5
Manganese	0.7	0.7	0.5	0.5	0.4	0.4	0.5	0.6
Mercury	1.6	1.1	0.6	0.5	0.8	0.3	2.4	1.8
Nickel	1.5	1.4	1.0	0.8	0.6	0.6	1.1	1.1
Selenium	0.8	ND	ND	ND	ND	0.1	0.6	0.7
Silver	0.2	ND	0.1	0.1	0.1	ND	0.2	0.2
Vanadium	0.9	0.8	0.5	0.5	0.5	0.5	0.7	0.7
Zinc	0.7	0.6	1.3	0.8	0.4	0.4	0.5	0.5
SVOCs								
2-Methylnaphthalene	ND	ND	8.9	ND	ND	ND	ND	ND
Acenaphthene	4.9	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND	ND	ND	0.7	ND
Anthracene	2.0	ND	44.5	35.2	17.6	ND	0.3	ND
Benzo(a)anthracene	2.4	0.6	26.4	28.0	14.9	10.7	0.7	0.8
Benzo(a)pyrene	0.9	0.3	14.2	11.9	8.1	4.7	0.4	0.4
Benzo(b)fluoranthene	0.3	0.1	4.3	3.9	2.4	1.7	0.1	0.1
Benzo(g,h,i)perylene	1.2	0.5	17.6	17.6	13.5	ND	0.8	0.6
Benzo(k)fluoranthene	0.7	0.2	15.0	8.8	8.8	ND	0.4	0.3
Chrysene	0.9	0.3	21.9	14.3	8.6	6.3	0.4	0.4
Dibenz(a,h)anthracene	1.0	ND	ND	ND	ND	ND	0.5	ND
Dibenzofuran	ND	ND	17.3	5.0	3.0	6.8	ND	ND
Dimethylphthalate	ND	ND	ND	86.7	ND	ND	ND	ND
Fluoranthene	1.3	0.4	40.0	41.7	13.3	12.3	0.2	0.4
Fluorene	5.8	ND	ND	110.5	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	1.7	0.7	20.0	22.0	14.5	8.0	1.0	0.7
Naphthalene	ND	ND	5.0	ND	ND	ND	ND	ND
Phenanthrene	1.2	0.6	28.8	75.0	23.3	26.7	0.2	0.4
Pyrene	0.9	0.3	24.1	16.5	9.8	6.6	0.3	0.4
Bulk Chemistry								
Total Organic Carbon (%)	2.2	2.4	1.4	0.87	1.4	1.3	2.6	2.1

Notes:

Shading indicates exceedence of screening value

Table 6-18
Risk Ranking for Biota Tissue Concentration Ratios

Chemical ²	Soft-shell Clam Tissue Concentration Ratios ¹					Blue Mussel Tissue Concentration Ratios ¹					Mummichog Tissue Concentration Ratios ¹		
	Outfall 005 / 006	Outfall 008	Outfall 010	Outfall 011	Outfall 012	Outfall 008	Outfall 009	Outfall 010	Outfall 011	Outfall 012	West Side of Facility	East Side of Facility	East Side of Facility
Inorganics													
Arsenic	2.08 (+)	0.71 (-)	0.93 (-)	0.92 (-)	0.39 (-)	0.91 (-)	0.77 (-)	0.88 (-)	0.85 (-)	1.03 (+)	1.2 (+)	1.17 (+)	1.20 (+)
Barium	1.70 (+)	0.85 (-)	0.88 (-)	0.65 (-)	0.42 (-)	1.06 (+)	1.51 (+)	1.58 (+)	1.06 (+)	1.04 (+)	1.74 (+)	6.57 (+)	1.74 (+)
Chromium	1.22 (+)	0.80 (-)	0.68 (-)	0.53 (-)	0.46 (-)	1.62 (+)	0.98 (-)	0.92 (-)	3.32 (+)	1.13 (+)	1.00 (-)	5.29 (+)	0.93 (-)
Cobalt	3.33 (+)	0.87 (-)	0.97 (-)	1.13 (+)	0.78 (-)	0.93 (-)	0.90 (-)	0.91 (-)	0.76 (-)	0.79 (-)	1.13 (+)	7.38 (+)	1.07 (+)
Copper	3.47 (+)	0.60 (-)	1.56 (+)	1.34 (+)	3.50 (+)	0.69 (-)	0.42 (-)	0.42 (-)	0.71 (-)	1.06 (+)	0.12 (-)	1.21 (+)	0.68 (-)
Iron	1.90 (+)	0.66 (-)	0.89 (-)	0.45 (-)	0.27 (-)	0.77 (-)	1.17 (+)	1.14 (+)	1.00 (-)	1.22 (+)	1.24 (+)	21 (+)	1.28 (+)
Manganese	3.12 (+)	0.25 (-)	0.36 (-)	0.75 (-)	0.16 (-)	0.61 (-)	1.25 (+)	0.53 (-)	0.49 (-)	0.51 (-)	1.17 (+)	2.46 (+)	1.00 (-)
Nickel	1.99 (+)	0.81 (-)	3.45 (+)	2.31 (+)	1.79 (+)	0.98 (-)	0.67 (-)	0.75 (-)	1.92 (+)	1.59 (+)	1.69 (+)	6.94 (+)	1.21 (+)
Vanadium	2.20 (+)	0.77 (-)	0.76 (-)	0.61 (-)	0.40 (-)	0.66 (-)	0.81 (-)	0.78 (-)	0.70 (-)	1.02 (+)	1.50 (+)	10.5 (+)	1.50 (+)
Semi-volatile Organic Compounds													
Anthracene	2.28 (+)	0.88 (-)	1.83 (+)	1.05 (+)	3.00 (+)	0.77 (-)	4.29 (+)	1.04 (+)	1.34 (+)	0.93 (-)	1.36 (+)	1.21 (+)	1.29 (+)
Benzo(a)anthracene	0.90 (-)	0.58 (-)	0.93 (-)	0.45 (-)	0.90 (-)	0.58 (-)	2.58 (+)	0.62 (-)	0.81 (-)	0.58 (-)	-	-	-
Benzo(a)pyrene	0.85 (-)	0.44 (-)	0.76 (-)	0.37 (-)	0.68 (-)	0.53 (-)	3.53 (+)	0.71 (-)	0.94 (-)	0.57 (-)	-	-	-
Benzo(k)fluoranthene	0.80 (-)	0.48 (-)	0.84 (-)	0.44 (-)	0.68 (-)	0.63 (-)	2.00 (+)	0.63 (-)	0.81 (-)	0.69 (-)	1.34 (+)	0.44 (-)	0.68 (-)
Chrysene	0.73 (-)	0.55 (-)	0.82 (-)	0.44 (-)	0.66 (-)	0.58 (-)	2.13 (+)	0.70 (-)	0.73 (-)	0.65 (-)	0.95 (-)	0.52 (-)	0.86 (-)
Dibenz(a,h)anthracene	0.74 (-)	0.42 (-)	0.74 (-)	0.34 (-)	0.52 (-)	0.56 (-)	2.59 (+)	0.67 (-)	0.70 (-)	0.52 (-)	1.60 (+)	0.28 (-)	0.33 (-)
Fluoranthene	1.10 (+)	0.74 (-)	1.22 (+)	0.69 (-)	1.23 (+)	0.78 (-)	3.00 (+)	1.00 (-)	1.03 (+)	0.93 (-)	-	-	-
Indeno(1,2,3-cd)pyrene	0.84 (-)	0.47 (-)	0.75 (-)	0.38 (-)	0.56 (-)	0.56 (-)	2.80 (+)	0.73 (-)	0.80 (-)	0.59 (-)	2.34 (+)	0.57 (-)	0.79 (-)

Notes:

¹ Tissue Concentration Ratio = Concentration at Facility / Concentration at Reference Site

² Only chemicals with at least one TCR > 1.0 are shown

Table 6-19
Risk Ranking of Biota Tissue Hazard Quotients

Chemical	Soft-shell Clam Tissue Hazard Quotients ¹						Blue Mussel Tissue Hazard Quotients ¹						Mummichog Tissue Hazard Quotients ¹				
	Outfall 005 / 006	Outfall 008	Outfall 010	Outfall 011	Outfall 012	Reference Site	Outfall 008	Outfall 009	Outfall 010	Outfall 011	Outfall 012	Reference Site	West Side of Facility	East Side of Facility	East Side of Facility	Reference Site	
Inorganics																	
Arsenic	4.44 (+)	1.53 (+)	1.98 (+)	1.98 (+)	0.83 (-)	2.14 (+)	0.87 (-)	0.74 (-)	0.84 (-)	0.81 (-)	0.98 (-)	0.96 (-)	0.49 (-)	0.48 (-)	0.49 (-)	0.41 (-)	
Barium	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NA	NA	NA	NA	
Chromium	9.28 (+)	6.06 (+)	5.17 (+)	4.06 (+)	3.50 (+)	7.61 (+)	5.39 (+)	3.28 (+)	3.06 (+)	11 (++)	3.78 (+)	3.33 (+)	<0.01 (-)	0.04 (-)	<0.01 (-)	<0.01 (-)	
Cobalt	NSV	NSV	NSV	NSV	NSV	NSV	-	-	-	-	-	-	NA	NA	NA	NA	
Copper	8.80 (+)	1.50 (+)	4.00 (+)	3.40 (+)	8.90 (+)	2.50 (+)	0.88 (-)	0.53 (-)	0.53 (-)	0.90 (-)	1.35 (+)	1.27 (+)	0.10 (-)	1.01 (+)	0.57 (-)	0.84 (-)	
Iron	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NA	NA	NA	NA	
Manganese	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NA	NA	NA	NA	
Nickel	5.48 (+)	2.24 (+)	9.52 (+)	6.39 (+)	4.94 (+)	2.76 (+)	1.52 (+)	1.03 (+)	1.15 (+)	2.97 (+)	2.45 (+)	1.55 (+)	0.03 (-)	0.11 (-)	0.02 (-)	0.02 (-)	
Vanadium	NSV	NSV	NSV	NSV	NSV	NSV	-	-	-	-	-	-	<0.01 (-)	0.05 (-)	<0.01 (-)	<0.01 (-)	
Semi-volatile Organic Compounds																	
Anthracene	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NA	NA	NA	NA
Benzo(a)anthracene	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	-	-	-	-	
Benzo(a)pyrene	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	-	-	-	-	
Benzo(k)fluoranthene	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NA	NA	NA	NA	
Chrysene	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NA	NA	NA	NA	
Dibenz(a,h)anthracene	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NA	NA	NA	NA	
Fluoranthene	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NA	NA	NA	NA	
Indeno(1,2,3-cd)pyrene	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NA	NA	NA	NA	

Notes:

¹ Hazard Quotient = Concentration / Screening Value

NSV = No Screening Value

Table 6-20
Exposure Parameters for Avian Receptor Species

Receptor Species	Body Weight (kg)	Assumed Diet (% of diet)			Food Ingestion Rate (kg/day, dry)	Area Use Factor (unitless)
		Mussels	Fish	Sediment		
Herring gull (<i>Larus argentatus</i>)	0.999 [a]	40% [b]	50% [b]	10% [c]	0.04301 [a]	1 [d]
Osprey (<i>Pandion haliaetus</i>)	1.403 [a]	---	100% [a]	0% [c]	0.07365 [a]	1 [d]
Belted kingfisher (<i>Ceryle alcyon</i>)	0.136 [a]	---	100% [a]	0% [c]	0.01700 [a]	1 [d]

[a] USEPA, 1993b.

[b] Assumed for purposes of risk assessment.

[c] Assumption based on feeding habits.

[d] Conservative assumption that receptor feeds exclusively at site.

Table 6-21
Tissue Residue Screening Values for Mummichog

Chemical	Screening Value (mg/kg, wet)	Tissue Benchmark (mg/kg, wet)	Benchmark Type	Species Scientific Name	Species Common Name	Effect	Tissue	Exposure Route
Inorganics								
Aluminum	4.4	4.4	TSC					
Antimony	50	5	NOAEL	<i>Oncorhynchus mykiss</i>	Rainbow trout	Survival - no effect	Whole body	Water
Arsenic	1.6	1.6	TSC					
Barium	NA	NA						
Beryllium	0.1	0.1	TSC					
Cadmium	0.042	0.042	TSC					
Chromium	19.8	1.98	NOAEL	<i>Oncorhynchus mykiss</i>	Rainbow trout	Survival- no effect	Whole Body	Water
Cobalt	NA	NA						
Copper	34	3.4	NOAEL	<i>Salvelinus fontinalis</i>	Brook trout	Survival, Growth, Reproduction - no effect	Muscle	Water
Cyanide	NA	NA						
Iron	NA	NA						
Lead	26.2	26.2	LOAEL	<i>Pimephales promelas</i>	Fathead minnow	Behavior	Whole body	Water
Manganese	NA	NA						
Mercury	1.36	1.36	LOAEL	<i>Pimephales promelas</i>	Fathead minnow	Reduced Growth	Whole body	Water
Nickel	29.2	2.92	NOAEL	<i>Oncorhynchus mykiss</i>	Rainbow trout	Survival- no effect	Liver	Water
Selenium	0.56	0.56	TSC					
Silver	1.3	0.13	NOAEL	<i>Oncorhynchus mykiss</i>	Rainbow trout	Survival - no effect	Whole body	Water
Thallium	4.6	4.6	TSC					
Vanadium	24	2.4	NOAEL	<i>Jordanella floridae</i>	Flagfish	Survival - no effect	Whole body	Water
Zinc	40	40	LOAEL	<i>Jordanella floridae</i>	Flagfish	Survival - no effect; Growth - reduced	Whole body	Water

Table 6-21
Tissue Residue Screening Values for Mummichog

Chemical	Life-Stage	Reference	Comments
Inorganics			
Aluminum		Shepard 1998	Derived using AWQC and BCF values
Antimony	Fingerling	Jarvinen and Ankley, 1999	
Arsenic		Shepard 1998	Derived using AWQC and BCF values
Barium			
Beryllium		Shepard 1998	Derived using AWQC and BCF values
Cadmium		Shepard 1998	Derived using AWQC and BCF values
Chromium	150g	Jarvinen and Ankley, 1999	
Cobalt			
Copper	Embryo-Adult	Jarvinen and Ankley, 1999	720 day exposure
Cyanide			
Iron			
Lead	Juvenile	Environmental Residues Effects Database (ACOE)	Significant reduction in feeding rate and ability to capture and eat prey.
Manganese			
Mercury	Adult	Spry and Wiener, 1991	41-week exposure; aqueous mercuric chloride
Nickel		Jarvinen and Ankley, 1999	
Selenium		Shepard 1998	Derived using AWQC and BCF values
Silver	Embryo	Guadagnolo et al. 2001	32 day exposure (AgNO ₃ , hardness 120); Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
Thallium		Shepard 1998	Derived using AWQC and BCF values
Vanadium	Larvae	Jarvinen and Ankley, 1999	28 day exposure
Zinc	Larvae - Adult	Jarvinen and Ankley, 1999	100 day exposure

Table 6-21
Tissue Residue Screening Values for Mummichog

Chemical	Screening Value (mg/kg, wet)	Tissue Benchmark (mg/kg, wet)	Benchmark Type	Species Scientific Name	Species Common Name	Effect	Tissue	Exposure Route
Pesticide/Polychlorinated Biphenyls								
4,4'-DDD	19	19	LOAEL	<i>Pimephales promelas</i>	Fathead minnow	Survival - reduced 25%	Whole body	Diet
4,4'-DDE	19	19	LOAEL	<i>Pimephales promelas</i>	Fathead minnow	Survival - reduced 25%	Whole body	Diet
4,4'-DDT	19	19	LOAEL	<i>Pimephales promelas</i>	Fathead minnow	Survival - reduced 25%	Whole body	Diet
Aroclor-1254	36	36	LOAEL	<i>Pimephales promelas</i>	Fathead minnow	Reproduction	Whole body	Sediment
Aroclor-1260	3500	350	NOAEL	<i>Pimephales promelas</i>	Fathead minnow	Survival, Growth, Reproduction - no	Whole body	Water
Dieldrin	21.3	2.13	NOAEL	<i>Oncorhynchus mykiss</i>	Rainbow trout	Survival, Growth - no effect	Whole body	Diet
Endosulfan sulfate	0.03	0.03	LOAEL	<i>Leiostomus xanthurus</i>	Spot	Survival - reduced	Whole body	Water
Endrin aldehyde	0.94	0.94	LOAEL	<i>Cyprinodon variegatus</i>	Sheepshead minnow	Reproduction - reduced	Whole body	Water
Endrin ketone	0.94	0.94	LOAEL	<i>Cyprinodon variegatus</i>	Sheepshead minnow	Reproduction - reduced	Whole body	Water
Heptachlor	53	5.3	NOAEL	<i>Leiostomus xanthurus</i>	Spot	Survival - no effect	Whole body	Water
Heptachlor epoxide	37	3.7	NOAEL	<i>Leiostomus xanthurus</i>	Spot	Survival - no effect	Whole body	Water
alpha-BHC	4.86	0.486	NOAEL	<i>Lagodon rhomboides</i>	Pinfish	Survival - reduced >50% at 48.6 ug/kg	Whole body	Water
alpha-Chlordane	31.8	3.18	NOAEL	<i>Cyprinodon variegatus</i>	Sheepshead minnow	Reproduction - fry hatching success reduced	Whole body	Combined
beta-BHC	4.86	0.486	NOAEL	<i>Lagodon rhomboides</i>	Pinfish	Survival - reduced >50% at 48.6 ug/kg	Whole body	Water

Table 6-21
Tissue Residue Screening Values for Mummichog

Chemical	Life-Stage	Reference	Comments
Pesticide/Polychlorinated Biphenyls			
4,4'-DDD	Juvenile-Adult	Jarvinen and Ankley, 1999	Test Duration: 266 days (Residue: 57mg/kg, DDT,DDD, and DDE combined)
4,4'-DDE	Juvenile-Adult	Jarvinen and Ankley, 1999	Test Duration: 266 days (Residue: 57mg/kg, DDT,DDD, and DDE combined)
4,4'-DDT	Juvenile-Adult	Jarvinen and Ankley, 1999	Test Duration: 266 days (Residue: 57mg/kg, DDT,DDD, and DDE combined)
Aroclor-1254	Adult	ACOE 1988	16 week exposure
Aroclor-1260	Adult / embryo	Jarvinen and Ankley, 1999	Females has highest residues; Reported value NOAEL (converted to LOAEL with uncertainty factor)
Dieldrin	Juvenile	Jarvinen and Ankley, 1999	Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
Endosulfan sulfate	Juvenile	Jarvinen and Ankley, 1999	Residues in surviving organisms (control 10% morality)
Endrin aldehyde	Adult	Jarvinen and Ankley, 1999	Value for Endrin (used as surrogate)
Endrin ketone	Adult	Jarvinen and Ankley, 1999	Value for Endrin (used as surrogate)
Heptachlor	Juvenile	Jarvinen and Ankley, 1999	Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
Heptachlor epoxide	Juvenile	Jarvinen and Ankley, 1999	Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
alpha-BHC	Adult	Jarvinen and Ankley, 1999	Sum of alpha, gamma, beta, and delta isomers (residues in surviving organisms); An uncertainty factor of 100 was used to convert the acute LC50 to a chronic NOAEL; Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
alpha-Chlordane	Adult	Environmental Residues Effects Database (ACOE)	NOAEL = 3180 ug/g; Parents exposed; Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
beta-BHC	Adult	Jarvinen and Ankley, 1999	Sum of alpha, gamma, beta, and delta isomers (residues in surviving organisms); An uncertainty factor of 100 was used to convert the acute LC50 to a chronic NOAEL; Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).

Table 6-21
Tissue Residue Screening Values for Mummichog

Chemical	Screening Value (mg/kg, wet)	Tissue Benchmark (mg/kg, wet)	Benchmark Type	Species Scientific Name	Species Common Name	Effect	Tissue	Exposure Route
delta-BHC	4.86	0.486	NOAEL	<i>Lagodon rhomboides</i>	Pinfish	Survival - reduced >50% at 48.6 ug/kg	Whole body	Water
gamma-BHC (Lindane)	4.86	0.486	NOAEL	<i>Lagodon rhomboides</i>	Pinfish	Survival - reduced >50% at 48.6 ug/kg	Whole body	Water
gamma-Chlordane	31.8	3.18	NOAEL	<i>Cyprinodon variegatus</i>	Sheepshead minnow	Reproduction - fry hatching success reduced	Whole body	Combined
Semi-volatile Organic Compounds								
1,2,4-Trichlorobenzene	465	465	LOAEL	<i>Pimephales promelas</i>	Fathead minnow	Survival, Growth - reduced	Whole body	Water
2,4,5-Trichlorophenol	1000	100	NOAEL	<i>Pimephales promelas</i>	Fathead minnow	Survival - no effect	Whole body	Water
2,4,6-Trichlorophenol	0.052	0.052	LOAEL	<i>Poecilia reticulata</i>	Guppy	Reproduction - reduced 50%	Whole body	Water
2,4-Dichlorophenol	2300	230	NOAEL	<i>Carassius auratus</i>	Goldfish	Survival - reduced	Whole body	Water
2,4-Dimethylphenol	15300	1530	NOAEL	<i>Lepomis macrochirus</i>	Bluegill	Survival - no effect	Whole body	Water
2-Chlorophenol	128	128	LOAEL	<i>Carassius auratus</i>	Goldfish	Survival - reduced	Whole body	Water
2-Methylphenol	765	765	LOAEL	<i>Oncorhynchus mykiss</i>	Rainbow trout	Survival - reduced	Whole body	Injection
4-Chloro-3-methylphenol	110	110	TSC					

Table 6-21
Tissue Residue Screening Values for Mummichog

Chemical	Life-Stage	Reference	Comments
delta-BHC	Adult	Jarvinen and Ankley, 1999	Sum of alpha, gamma, beta, and delta isomers (residues in surviving organisms); An uncertainty factor of 100 was used to convert the acute LC50 to a chronic NOAEL; Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
gamma-BHC (Lindane)	Adult	Jarvinen and Ankley, 1999	Sum of alpha, gamma, beta, and delta isomers (residues in surviving organisms); An uncertainty factor of 100 was used to convert the acute LC50 to a chronic NOAEL; Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
gamma-Chlordane	Adult	Environmental Residues Effects Database (ACOE)	NOAEL = 3180 ug/g; Parents exposed; Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
Semi-volatile Organic Compounds			
1,2,4-Trichlorobenzene	Embryo-Juvenile	Jarvinen and Ankley, 1999	DO: 8.1 mg/L; (NOAEL = 170 ug/g)
2,4,5-Trichlorophenol	Juvenile	Jarvinen and Ankley, 1999	Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
2,4,6-Trichlorophenol	Adult	Jarvinen and Ankley, 1999	Maternal exposure (0.052-1.22 ug/g)
2,4-Dichlorophenol	Juvenile	Jarvinen and Ankley, 1999	Value for 2,6-Dichlorophenol used as surrogate; LOAEL = 321-431 ug/g (residue in dead fish); Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
2,4-Dimethylphenol	Juvenile	Environmental Residues Effects Database (ACOE)	Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
2-Chlorophenol	Juvenile	Jarvinen and Ankley, 1999	NOAEL = 50-250 ug/g; different study (residue in surviving fish)
2-Methylphenol	NA	Environmental Residues Effects Database (ACOE)	Value for 4-methylphenol used as surrogate; based on LD50 of 76,500 ug/g with safety factor of 100 applied.
4-Chloro-3-methylphenol			

Table 6-21
Tissue Residue Screening Values for Mummichog

Chemical	Screening Value (mg/kg, wet)	Tissue Benchmark (mg/kg, wet)	Benchmark Type	Species Scientific Name	Species Common Name	Effect	Tissue	Exposure Route
4-Methylphenol	765	765	LOAEL	<i>Oncorhynchus mykiss</i>	Rainbow trout	Survival - reduced	Whole body	Injection
4-Nitrophenol	35	35	LOAEL	<i>Cyprinodon variegatus</i>	Sheepshead minnow	Survival - reduced 50%	Whole body	Water
Acenaphthene	35000	3500	NOAEL	<i>Lepomis macrochirus</i>	Bluegill	Survival - no effect	Whole body	Water
Acenaphthylene	NA							
Anthracene	NA							
Benzo(b)fluoranthene	NA							
Benzo(g,h,i)perylene	NA							
Benzo(k)fluoranthene	NA							
Chrysene	NA							
Dibenz(a,h)anthracene	NA							
Fluoranthene	NA							
Fluorene	NA							
Indeno(1,2,3-cd)pyrene	NA							
Naphthalene	1700	1700	LOAEL	<i>Fundulus heteroclitus</i>	Mummichog	Survival - reduced	Whole body	Water
Pentachlorophenol	65	65	LOAEL	<i>Oryzias latipes</i>	Killifish	Survival -reduced	Whole body	Water
Phenanthrene	NA							
Pyrene	NA							
bis(2-Ethylhexyl)phthalate	390	390	TSC					
n-Nitrosodiphenylamine	20000	2000	NOAEL	<i>Lepomis macrochirus</i>	Bluegill	Survival - no effect	Whole body	Water

Table 6-21
Tissue Residue Screening Values for Mummichog

Chemical	Life-Stage	Reference	Comments
4-Methylphenol	NA	Environmental Residues Effects Database (ACOE)	Based on LD50 of 76,500 ug/g with safety factor of 100 applied.
4-Nitrophenol	Juvenile	Jarvinen and Ankley, 1999	NOAEL = 25.1 ug/g, different study
Acenaphthene	Juvenile	Environmental Residues Effects Database (ACOE)	Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
Acenaphthylene			
Anthracene			
Benzo(b)fluoranthene			
Benzo(g,h,i)perylene			
Benzo(k)fluoranthene			
Chrysene			
Dibenz(a,h)anthracene			
Fluoranthene			
Fluorene			
Indeno(1,2,3-cd)pyrene			
Naphthalene	Adult	Environmental Residues Effects Database (ACOE)	
Pentachlorophenol	Juvenile	Jarvinen and Ankley, 1999	NOAEL = 35 ug/g
Phenanthrene			
Pyrene			
bis(2-Ethylhexyl)phthalate			
n-Nitrosodiphenylamine	Juvenile	Environmental Residues Effects Database (ACOE)	Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).

Table 6-22
Tissue Chemical Residue Screening Values for Shortnose Sturgeon

Chemical	Screening Value	Benchmark Type	Tissue Benchmark mg/kg wet	Species Scientific Name	Species Common Name	Effect
Inorganics						
Arsenic	3.00	LOAEL	3.00	<i>Oncorhynchus mykiss</i>	Rainbow trout	Growth - reduced
Cadmium	0.40	LOAEL	0.40	<i>Salmo salar</i>	Atlantic salmon	Growth - reduced
Chromium	19.80	NOAEL	1.98	<i>Oncorhynchus mykiss</i>	Rainbow trout	Survival- no effect
Copper	1.84	LOAEL	1.84	<i>Ictalurus punctatus</i>	Channel catfish	Growth - reduced
Lead	4.00	LOAEL	4.00	<i>Salvelinus fontinalis</i>	Brook trout	Growth - reduced
Mercury	1.35	NOAEL	0.14	<i>Perca flavescens</i>	Yellow perch	Growth - no effect
Nickel	29.20	NOAEL	2.92	<i>Oncorhynchus mykiss</i>	Rainbow trout	Survival- no effect
Selenium	0.80	LOAEL	0.80	<i>Oncorhynchus tshawytscha</i>	Chinook salmon	Growth - reduced
Silver	0.60	NOAEL	0.06	<i>Lepomis macrochirus</i>	Bluegill	Growth - no effect
Zinc	600.00	NOAEL	60.00	<i>Salmo salar</i>	Atlantic salmon	Growth - no effect
Pesticide/PCBs						
4,4'-DDD	19.00	LOAEL	19.00	<i>Pimephales promelas</i>	Fathead minnow	Survival - reduced 25%
4,4'-DDE	19.00	LOAEL	19.00	<i>Pimephales promelas</i>	Fathead minnow	Survival - reduced 25%
4,4'-DDT	19.00	LOAEL	19.00	<i>Pimephales promelas</i>	Fathead minnow	Survival - reduced 25%
alpha-BHC	4.86	NOAEL	0.49	<i>Lagodon rhomboides</i>	Pinfish	Survival - reduced >50% at 48.6 ug/kg
alpha-Chlordane	31.80	NOAEL	3.18	<i>Cyprinodon variegatus</i>	Sheepshead minnow	Reproduction - fry hatching success reduced
Aroclor-1254	210.00	NOAEL	21.00	<i>Ictalurus punctatus</i>	Channel Catfish	Survival, Growth - no effect
Aroclor-1260	320.00	NOAEL	32.00	<i>Ictalurus punctatus</i>	Channel Catfish	Survival, Growth - no effect
beta-BHC	4.86	LOAEL	4.86	<i>Lagodon rhomboides</i>	Pinfish	Survival - reduced >50% at 48.6 ug/kg

Table 6-22
Tissue Chemical Residue Screening Values for Shortnose Sturgeon

Chemical	Tissue	Exposure Route	Life-Stage	Reference	Comments
Inorganics					
Arsenic	Whole Body	Water	Fingerling	Jarvinen and Ankley, 1999	
Cadmium	Whole Body	Water	Embryo - alevin	Jarvinen and Ankley, 1999	
Chromium	Whole Body	Water	150g	Jarvinen and Ankley, 1999	
Copper	Liver	Water	Fingerling	Jarvinen and Ankley, 1999	
Lead	Whole Body	Water	Egg-embryo	Holcombe, et al., 1976	
Mercury	Whole Body	Water	Adult	Weiner, et al., 1990	
Nickel	Liver	Water		Jarvinen and Ankley, 1999	
Selenium	Whole Body	Water	Larvae	Jarvinen and Ankley, 1999	
Silver	Whole Body	Water	Young of year	Jarvinen and Ankley, 1999	
Zinc	Whole Body	Water	Juvenile	Jarvinen and Ankley, 1999	
Pesticide/PCBs					
4,4'-DDD	Whole body	Diet	Juvenile-Adult	Jarvinen and Ankley, 1999	Test Duration: 266 days (Residue: 57mg/kg, DDT,DDD, and DDE combined)
4,4'-DDE	Whole body	Diet	Juvenile-Adult	Jarvinen and Ankley, 1999	Test Duration: 266 days (Residue: 57mg/kg, DDT,DDD, and DDE combined)
4,4'-DDT	Whole body	Diet	Juvenile-Adult	Jarvinen and Ankley, 1999	Test Duration: 266 days (Residue: 57mg/kg, DDT,DDD, and DDE combined)
alpha-BHC	Whole body	Water	Adult	Jarvinen and Ankley, 1999	Sum of alpha, gamma, beta, and delta isomers (residues in surviving organisms); An uncertainty factor of 100 was used to convert the acute LC50 to a chronic NOAEL
alpha-Chlordane	Whole body	Combined	Adult	Environmental Residues Effects Database	NOAEL = 3180 ug/g; Parents exposed; Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
Aroclor-1254	Whole Body	Diet	Fingerling	Jarvinen and Ankley, 1999	
Aroclor-1260	Whole Body	Diet	Fingerling	Jarvinen and Ankley, 1999	
beta-BHC	Whole body	Water	Adult	Jarvinen and Ankley, 1999	Sum of alpha, gamma, beta, and delta isomers (residues in surviving organisms); An uncertainty factor of 100 was used to convert the acute LC50 to a chronic NOAEL; Reported

Table 6-22
Tissue Chemical Residue Screening Values for Shortnose Sturgeon

Chemical	Screening Value	Benchmark Type	Tissue Benchmark mg/kg wet	Species Scientific Name	Species Common Name	Effect
delta-BHC	4.86	LOAEL	4.86	<i>Lagodon rhomboides</i>	Pinfish	Survival - reduced >50% at 48.6 ug/kg
Dieldrin	21.30	LOAEL	21.30	<i>Oncorhynchus mykiss</i>	Rainbow trout	Survival, Growth - no effect
Endosulfan I	0.03	LOAEL	0.03	<i>Leiostomus xanthurus</i>	Spot	Survival - reduced
Endosulfan II	0.03	LOAEL	0.03	<i>Leiostomus xanthurus</i>	Spot	Survival - reduced
Endosulfan Sulfate	0.03	LOAEL	0.03	<i>Leiostomus xanthurus</i>	Spot	Survival - reduced
Endrin	3.10	NOAEL	0.31	<i>Ictalurus punctatus</i>	Channel Catfish	Survival, Growth - no effect
Endrin Aldehyde	3.10	NOAEL	0.31	<i>Ictalurus punctatus</i>	Channel Catfish	Survival, Growth - no effect
Endrin Ketone	3.10	NOAEL	0.31	<i>Ictalurus punctatus</i>	Channel Catfish	Survival, Growth - no effect
Gamma-BHC (Lindane)	4.86	LOAEL	4.86	<i>Lagodon rhomboides</i>	Pinfish	Survival - reduced >50% at 48.6 ug/kg
Gamma-Chlordane	31.80	NOAEL	3.18	<i>Cyprinodon variegatus</i>	Sheepshead minnow	Reproduction - fry hatching success reduced
Heptachlor	53.00	NOAEL	5.30	<i>Leiostomus xanthurus</i>	Spot	Survival - no effect
Heptachlor Epoxide	37.00	NOAEL	3.70	<i>Leiostomus xanthurus</i>	Spot	Survival - no effect
SVOCs						
Acenaphthene	35.00	NOAEL	3.50	<i>Lepomis macrochirus</i>	Bluegill	Survival - no effect
Acenaphthylene	35.00	NOAEL	3.50	<i>Lepomis macrochirus</i>	Bluegill	Survival - no effect
Anthracene	300.00	NOAEL	30.00	<i>Oncorhynchus mykiss</i>	Rainbow trout	Biochemical- no effect
Benzo(a)anthracene	12.30	LOAEL	12.30	<i>Oncorhynchus mykiss</i>	Rainbow trout	Growth - reduced
Benzo(a)pyrene	12.30	LOAEL	12.30	<i>Oncorhynchus mykiss</i>	Rainbow trout	Growth - reduced

Table 6-22
Tissue Chemical Residue Screening Values for Shortnose Sturgeon

Chemical	Tissue	Exposure Route	Life-Stage	Reference	Comments
delta-BHC	Whole body	Water	Adult	Jarvinen and Ankley, 1999	Sum of alpha, gamma, beta, and delta isomers (residues in surviving organisms); An uncertainty factor of 100 was used to convert the acute LC50 to a chronic NOAEL; Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
Dieldrin	Whole body	Diet	Juvenile	Jarvinen and Ankley, 1999	Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
Endosulfan I	Whole Body	Water	Juvenile	Jarvinen and Ankley, 1999	
Endosulfan II	Whole Body	Water	Juvenile	Jarvinen and Ankley, 1999	Value for Endosulfan used as surrogate
Endosulfan Sulfate	Whole Body	Water	Juvenile	Jarvinen and Ankley, 1999	Value for Endosulfan used as surrogate
Endrin	Whole Body	Diet	Juvenile	Jarvinen and Ankley, 1999	
Endrin Aldehyde	Whole Body	Diet	Juvenile	Jarvinen and Ankley, 1999	Value for Endrin used as surrogate
Endrin Ketone	Whole Body	Diet	Juvenile	Jarvinen and Ankley, 1999	Value for Endrin used as surrogate
Gamma-BHC (Lindane)	Whole body	Water	Adult	Jarvinen and Ankley, 1999	Sum of alpha, gamma, beta, and delta isomers (residues in surviving organisms); An uncertainty factor of 100 was used to convert the acute LC50 to a chronic NOAEL; Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
Gamma-Chlordane	Whole body	Combined	Adult	Environmental Residues Effects Database	NOAEL = 3180 ug/g; Parents exposed; Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
Heptachlor	Whole Body	Water	Juvenile	Jarvinen and Ankley, 1999	24 day exposure
Heptachlor Epoxide	Whole Body	Water	Juvenile	Jarvinen and Ankley, 1999	24 day exposure
SVOCs					
Acenaphthene	Whole Body	Water	Subadult	Barrows, et al., 1980	
Acenaphthylene	Whole Body	Water	Subadult	Barrows, et al., 1980	Value for Acenaphthene used as surrogate
Anthracene	Whole Body	Water	Immature	Gerhart, E.H. and R.H. Carlson, 1978	Value for Phenanthrene used as surrogate
Benzo(a)anthracene	Whole Body	Water	Alevin	Jarvinen and Ankley, 1999	Value for Benzo(a)pyrene used as surrogate
Benzo(a)pyrene	Whole Body	Water	Alevin	Jarvinen and Ankley, 1999	

Table 6-22
Tissue Chemical Residue Screening Values for Shortnose Sturgeon

Chemical	Screening Value	Benchmark Type	Tissue Benchmark mg/kg wet	Species Scientific Name	Species Common Name	Effect
Benzo(b)fluoranthene	12.30	LOAEL	12.30	<i>Oncorhyncus mykiss</i>	Rainbow trout	Growth - reduced
Benzo(g,h,i)perylene	12.30	LOAEL	12.30	<i>Oncorhyncus mykiss</i>	Rainbow trout	Growth - reduced
Benzo(k)fluoranthene	12.30	LOAEL	12.30	<i>Oncorhyncus mykiss</i>	Rainbow trout	Growth - reduced
Chrysene	30.00	LOAEL	30.00	<i>Oncorhyncus mykiss</i>	Rainbow trout	Biochemical- no effect
Dibenz(a,h)anthracene	12.30	LOAEL	12.30	<i>Oncorhyncus mykiss</i>	Rainbow trout	Growth - reduced
Fluoranthene	300.00	NOAEL	30.00	<i>Oncorhyncus mykiss</i>	Rainbow trout	Biochemical- no effect
Fluorene	300.00	NOAEL	30.00	<i>Oncorhyncus mykiss</i>	Rainbow trout	Biochemical- no effect
Indeno(1,2,3-cd)pyrene	12.30	LOAEL	12.30	<i>Oncorhyncus mykiss</i>	Rainbow trout	Growth - reduced
Pentachlorophenol	22.10	LOAEL	22.10	<i>Pimephales promelas</i>	Fathead minnow	Growth - reduced
Phenanthrene	300.00	NOAEL	30.00	<i>Oncorhyncus mykiss</i>	Rainbow trout	Biochemical- no effect
Pyrene	30	LOAEL	30	<i>Oncorhyncus mykiss</i>	Rainbow trout	Biochemical- reduced effect

Table 6-22
Tissue Chemical Residue Screening Values for Shortnose Sturgeon

Chemical	Tissue	Exposure Route	Life-Stage	Reference	Comments
Benzo(b)fluoranthene	Whole Body	Water	Alevin	Jarvinen and Ankley, 1999	Value for Benzo(a)pyrene used as surrogate
Benzo(g,h,i)perylene	Whole Body	Water	Alevin	Jarvinen and Ankley, 1999	Value for Benzo(a)pyrene used as surrogate
Benzo(k)fluoranthene	Whole Body	Water	Alevin	Jarvinen and Ankley, 1999	Value for Benzo(a)pyrene used as surrogate
Chrysene	Whole Body	Water	Immature	Gerhart, E.H. and R.H. Carlson, 1978	
Dibenz(a,h)anthracene	Whole Body	Water	Alevin	Jarvinen and Ankley, 1999	Value for Benzo(a)pyrene used as surrogate
Fluoranthene	Whole Body	Water	Immature	Gerhart, E.H. and R.H. Carlson, 1978	
Fluorene	Whole Body	Water	Immature	Gerhart, E.H. and R.H. Carlson, 1978	Value for Phenanthrene used as surrogate
Indeno(1,2,3-cd)pyrene	Whole Body	Water	Alevin	Jarvinen and Ankley, 1999	Value for Benzo(a)pyrene used as surrogate
Pentachlorophenol	Whole Body	Water	Larvae-Juvenile	Jarvinen and Ankley, 1999	
Phenanthrene	Whole Body	Water	Immature	Gerhart, E.H. and R.H. Carlson, 1978	
Pyrene	Whole Body	Water	Immature	Gerhart, E.H. and R.H. Carlson, 1978	

Table 6-23
Ingestion Screening Values for Birds

Chemical	Test Organism	Body Weight (kg)	Duration	Exposure Route	Effect/Endpoint	LOAEL (mg/kg/d)	NOAEL (mg/kg/d)	Reference
Inorganics								
Arsenic	mallard	1	128 days	oral in diet	mortality	12.84	5.14	Sample et al. 1996
Cadmium	mallard	1.153	90 days	oral in diet	reproduction	20	1.45	Sample et al. 1996
Chromium	American black duck	1.25	10 months	oral in diet	reproduction	5	1	Sample et al. 1996
Copper	chicks	0.534	10 weeks	oral in diet	growth/mortality	61.7	47	Sample et al. 1996
Lead	American kestrel	0.13	7 months	oral in diet	reproduction	38.5	3.85	Sample et al. 1996
Mercury	mallard	1	3 generations	oral in diet	reproduction	0.064	0.0064	Sample et al. 1996
Nickel	mallard	0.782	90 days	oral in diet	growth/mortality	107	77.4	Sample et al. 1996
Selenium	mallard	1	100 days	oral in diet	reproduction	0.8	0.4	Sample et al. 1996
Silver	mallard	?	14 days	oral	?	1780	178	USEPA 1999b
Zinc	chicken	1.935	44 weeks	oral in diet	reproduction	131	14.5	Sample et al. 1996
Pesticides/PCBs								
4,4'-DDD	mallard	1.134	chronic	oral	reproduction	5.2	0.52	Stickel 1973
4,4'-DDE	brown pelican	3.5	chronic	oral	reproduction	1.31	0.131	Beyer et al. 1996
4,4'-DDT	mallard	1.134	chronic	oral	reproduction	1.04	0.104	Davison and Sell 1974
Aldrin	mallard	1.134	chronic	oral	mortality	5	0.5	Tucker and Crabtree
alpha-BHC	Japanese quail	0.15	90 days	oral in diet	reproduction	2.25	0.56	Sample et al. 1996
alpha-Chlordane	red-winged blackbird	0.064	84 days	oral in diet	mortality	10.7	2.14	Sample et al. 1996
Aroclor-1016	screech owl	0.181	2 generations	oral in diet	reproduction	4.1	0.41	Sample et al. 1996
Aroclor-1221	screech owl	0.181	2 generations	oral in diet	reproduction	4.1	0.41	Sample et al. 1996
Aroclor-1232	screech owl	0.181	2 generations	oral in diet	reproduction	4.1	0.41	Sample et al. 1996
Aroclor-1242	screech owl	0.181	2 generations	oral in diet	reproduction	4.1	0.41	Sample et al. 1996
Aroclor-1248	ring-necked pheasant	1	17 weeks	oral	reproduction	1.8	0.18	Sample et al. 1996
Aroclor-1254	ring-necked pheasant	1	17 weeks	oral	reproduction	1.8	0.18	Sample et al. 1996
Aroclor-1260	ring-necked pheasant	1	17 weeks	oral	reproduction	1.8	0.18	Sample et al. 1996
PCBs (total)	--	--	--	--	--	NA	NA	--
beta-BHC	Japanese quail	0.15	90 days	oral in diet	reproduction	2.25	0.56	Sample et al. 1996
delta-BHC	Japanese quail	0.15	90 days	oral in diet	reproduction	2.25	0.56	Sample et al. 1996
Dieldrin	barn owl	0.466	2 years	oral in diet	reproduction	0.77	0.077	Sample et al. 1996
Endosulfan I	gray partridge	0.4	4 weeks	oral in diet	reproduction	100	10	Sample et al. 1996
Endosulfan II	gray partridge	0.4	4 weeks	oral in diet	reproduction	100	10	Sample et al. 1996
Endosulfan Sulfate	gray partridge	0.4	4 weeks	oral in diet	reproduction	100	10	Sample et al. 1996
Endrin	mallard	1.15	>200 days	oral in diet	reproduction	3	0.3	Sample et al. 1996
Endrin Aldehyde	mallard	1.15	>200 days	oral in diet	reproduction	3	0.3	Sample et al. 1996

Table 6-23
Ingestion Screening Values for Birds

Chemical	Test Organism	Body Weight (kg)	Duration	Exposure Route	Effect/Endpoint	LOAEL (mg/kg/d)	NOAEL (mg/kg/d)	Reference
Endrin Ketone	mallard	1.15	>200 days	oral in diet	reproduction	3	0.3	Sample et al. 1996
Endrin Ketone	screech owl	0.181	>83 days	oral in diet	reproduction	0.1	0.01	Sample et al. 1996
Gamma-BHC (Lindane)	mallard	1	8 weeks	oral (intubation)	reproduction	20	2	Sample et al. 1996
Gamma-Chlordane	red-winged blackbird	0.064	84 days	oral in diet	mortality	10.7	2.14	Sample et al. 1996
Heptachlor	quail	0.191	5 days	oral in diet	mortality	4.05	0.405	Hill et al. 1975
Heptachlor Epoxide	quail	0.191	5 days	oral in diet	mortality	4.05	0.405	Hill et al. 1975
Methoxychlor	quail	0.191	5 days	oral in diet	mortality	4050	405	Hill and Camardese 1986
Toxaphene	mallard	1.043	5 days	oral in diet	mortality	3.07	0.307	Hill and Camardese 1986
Semivolatile Organic Compounds								
Acenaphthene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Acenaphthylene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Anthracene	mallard	1.043	7 months	oral in diet	hepatic	228	22.8	Patton and Dieter 1980
Benzo(a)anthracene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Benzo(a)pyrene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Benzo(b)fluoranthene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Benzo(g,h,i)perylene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Benzo(k)fluoranthene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Chrysene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Dibenz(a,h)anthracene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Fluoranthene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Fluorene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Indeno(1,2,3-cd)pyrene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Pentachlorophenol	chicken	1.5	8 weeks	oral	growth	200	100	Eisler 1989
Phenanthrene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Pyrene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963

Table 6-24
Screening of Estimated Chemical Residues in Shortnose Sturgeon Tissue

Chemical	Screening Value (mg/kg, wet)	Estimated Tissue Residues (mg/kg, wet)			Hazard Quotients		
		Reference Site	West Side of Facility	East Side of Facility	Reference Site	West Side of Facility	East Side of Facility
Inorganics							
Arsenic	3.00	19.527	36.547	14.293	6.51 (+)	12 (++)	4.76 (+)
Cadmium	0.40	1.281	0.335	1.143	3.20 (+)	0.84 (-)	2.86 (+)
Chromium	19.80	6.580	10.080	6.082	0.33 (-)	0.51 (-)	0.31 (-)
Copper	1.84	86.717	59.833	89.499	47 (+++)	33 (++)	49 (+++)
Lead	4.00	7.047	10.711	4.331	1.76 (+)	2.68 (+)	1.08 (+)
Mercury	1.35	0.470	0.333	0.486	0.35 (-)	0.25 (-)	0.36(-)
Nickel	29.20	5.310	9.433	9.537	0.18 (-)	0.32 (-)	0.33 (-)
Selenium	0.80	3.000	3.880	4.205	3.75 (+)	4.85 (+)	5.26 (+)
Silver	0.60	0.777	0.978	0.125	1.29 (+)	1.63 (+)	0.21 (-)
Zinc	600.00	195.680	212.253	185.172	0.33 (-)	0.35 (-)	0.31 (-)
Pesticides/PCBs							
4,4'-DDD	19.00	0.006	0.003	0.004	<0.01 (-)	<0.01 (-)	<0.01 (-)
4,4'-DDE	19.00	0.015	0.008	0.012	<0.01 (-)	<0.01 (-)	<0.01 (-)
4,4'-DDT	19.00	0.001	0.000	0.001	<0.01 (-)	<0.01 (-)	<0.01 (-)
Aldrin	-	ND	ND	ND	-	-	-
alpha-BHC	4.86	0.001	0.000	0.000	<0.01 (-)	<0.01 (-)	<0.01 (-)
alpha-Chlordane	31.80	0.002	0.001	0.002	<0.01 (-)	<0.01 (-)	<0.01 (-)
Aroclor-1016	-	ND	ND	ND	-	-	-
Aroclor-1221	-	ND	ND	ND	-	-	-
Aroclor-1232	-	ND	ND	ND	-	-	-
Aroclor-1242	-	ND	ND	ND	-	-	-
Aroclor-1248	-	ND	ND	ND	-	-	-
Aroclor-1254	210.00	0.100	0.059	0.066	<0.01 (-)	<0.01 (-)	<0.01 (-)
Aroclor-1260	320.00	0.089	0.062	0.061	<0.01 (-)	<0.01 (-)	<0.01 (-)
beta-BHC	4.86	0.001	0.000	0.000	<0.01 (-)	<0.01 (-)	<0.01 (-)
delta-BHC	4.86	0.000	0.000	0.001	<0.01 (-)	<0.01 (-)	<0.01 (-)
Dieldrin	21.30	0.002	0.002	0.002	<0.01 (-)	<0.01 (-)	<0.01 (-)
Endosulfan I	0.03	0.000	0.000	0.000	<0.01 (-)	<0.01 (-)	<0.01 (-)
Endosulfan II	0.03	0.000	0.001	0.001	<0.01 (-)	0.04 (-)	0.02 (-)
Endosulfan Sulfate	0.03	0.001	0.000	0.001	0.03 (-)	0.02 (-)	0.02 (-)
Endrin	3.10	0.000	0.000	0.000	<0.01 (-)	<0.01 (-)	<0.01 (-)

Table 6-24
Screening of Estimated Chemical Residues in Shortnose Sturgeon Tissue

Chemical	Screening Value (mg/kg, wet)	Estimated Tissue Residues (mg/kg, wet)			Hazard Quotients		
		Reference Site	West Side of Facility	East Side of Facility	Reference Site	West Side of Facility	East Side of Facility
Endrin Aldehyde	3.10	0.003	0.001	0.000	<0.01 (-)	<0.01 (-)	<0.01 (-)
Endrin Ketone	3.10	0.009	0.002	0.005	<0.01 (-)	<0.01 (-)	<0.01 (-)
Gamma-BHC (Lindane)	4.86	0.001	0.000	0.000	<0.01 (-)	<0.01 (-)	<0.01 (-)
Gamma-Chlordane	31.80	0.001	0.001	0.001	<0.01 (-)	<0.01 (-)	<0.01 (-)
Heptachlor	53.00	0.000	0.000	0.000	<0.01 (-)	<0.01 (-)	<0.01 (-)
Heptachlor Epoxide	37.00	0.000	0.000	0.000	<0.01 (-)	<0.01 (-)	<0.01 (-)
Methoxychlor	-	ND	ND	ND	-	-	-
Toxaphene	-	ND	ND	ND	-	-	-
Semivolatile Organic Compounds							
1,2,4-Trichlorobenzene	-	ND	ND	ND	-	-	-
1,2-Dichlorobenzene	-	ND	ND	ND	-	-	-
1,3-Dichlorobenzene	-	ND	ND	ND	-	-	-
1,4-Dichlorobenzene	-	ND	ND	ND	-	-	-
4-Bromophenyl-Phenylether	-	ND	ND	ND	-	-	-
4-Chlorophenyl-Phenylether	-	ND	ND	ND	-	-	-
Acenaphthene	35.00	0.000	0.001	0.007	<0.01 (-)	<0.01 (-)	<0.01 (-)
Acenaphthylene	35.00	0.004	0.004	0.003	<0.01 (-)	<0.01 (-)	<0.01 (-)
Anthracene	300.00	0.004	0.004	0.004	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(a)anthracene	12.30	0.024	0.020	0.016	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(a)pyrene	12.30	0.022	0.021	0.012	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(b)fluoranthene	12.30	0.044	0.038	0.025	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(g,h,i)perylene	12.30	0.019	0.029	0.029	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(k)fluoranthene	12.30	0.015	0.013	0.009	<0.01 (-)	<0.01 (-)	<0.01 (-)
Chrysene	30.00	0.035	0.030	0.023	<0.01 (-)	<0.01 (-)	<0.01 (-)
Dibenz(a,h)anthracene	12.30	0.003	0.003	0.002	<0.01 (-)	<0.01 (-)	<0.01 (-)
Fluoranthene	300.00	0.048	0.049	0.044	<0.01 (-)	<0.01 (-)	<0.01 (-)
Fluorene	300.00	0.002	0.003	0.005	<0.01 (-)	<0.01 (-)	<0.01 (-)
Hexachlorobutadiene	-	ND	ND	ND	-	-	-
Hexachlorobenzene	-	ND	ND	ND	-	-	-
Hexachlorocyclopentadiene	-	ND	ND	ND	-	-	-
Hexachloroethane	-	ND	ND	ND	-	-	-
Indeno(1,2,3-cd)pyrene	12.30	0.018	0.017	0.010	<0.01 (-)	<0.01 (-)	<0.01 (-)

Table 6-24
Screening of Estimated Chemical Residues in Shortnose Sturgeon Tissue

Chemical	Screening Value (mg/kg, wet)	Estimated Tissue Residues (mg/kg, wet)			Hazard Quotients		
		Reference Site	West Side of Facility	East Side of Facility	Reference Site	West Side of Facility	East Side of Facility
Pentachlorophenol	22.10	0.442	2.560	0.346	0.02 (-)	0.12 (-)	0.02 (-)
Phenanthrene	300.00	0.008	0.015	0.020	<0.01 (-)	<0.01 (-)	<0.01 (-)
Pyrene	30	0.060	0.050	0.021	<0.01 (-)	<0.01 (-)	<0.01 (-)

Table 6-25
Summary of Hazard Quotients for Herring Gull

Chemical	Outfall 005/006		Outfall 008		Outfall 009		Outfall 010		Outfall 011		Outfall 012		Reference Site	
	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Inorganics														
Arsenic	0.03 (-)	0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Cadmium	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Chromium	0.03 (-)	<0.01 (-)	0.03 (-)	<0.01 (-)	0.03 (-)	<0.01 (-)	0.03 (-)	<0.01 (-)	0.05 (-)	0.01 (-)	0.03 (-)	<0.01 (-)	0.01 (-)	<0.01 (-)
Copper	0.01 (-)	<0.01 (-)	0.02 (-)	0.01 (-)	0.02 (-)	0.01 (-)	0.02 (-)	0.01 (-)	0.02 (-)	0.01 (-)	0.02 (-)	0.01 (-)	0.02 (-)	0.01 (-)
Lead	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Mercury	0.25 (-)	0.03 (-)	0.35 (-)	0.03 (-)	0.35 (-)	0.03 (-)	0.35 (-)	0.03 (-)	0.35 (-)	0.03 (-)	0.40 (-)	0.04 (-)	0.28 (-)	0.03 (-)
Nickel	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Selenium	0.04 (-)	0.01 (-)	0.05 (-)	0.01 (-)	0.04 (-)	0.01 (-)	0.05 (-)	0.01 (-)	0.05 (-)	0.01 (-)	0.05 (-)	0.01 (-)	0.05 (-)	0.01 (-)
Silver	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Zinc	0.10 (-)	0.01 (-)	0.08 (-)	<0.01 (-)	0.08 (-)	<0.01 (-)	0.08 (-)	<0.01 (-)	0.08 (-)	<0.01 (-)	0.08 (-)	<0.01 (-)	0.08 (-)	<0.01 (-)
Pesticides/PCBs														
4,4'-DDD	0.08 (-)	<0.01 (-)	0.16 (-)	0.02 (-)	0.16 (-)	0.02 (-)	0.19 (-)	0.02 (-)	0.17 (-)	0.02 (-)	0.20 (-)	0.02 (-)	0.23 (-)	0.02 (-)
4,4'-DDE	0.56 (-)	0.06 (-)	0.93 (-)	0.09 (-)	0.92 (-)	0.09 (-)	0.95 (-)	0.10 (-)	0.94 (-)	0.09 (-)	0.96 (-)	0.10 (-)	1.00 (-)	0.10 (-)
4,4'-DDT	0.50 (-)	0.05 (-)	0.70 (-)	0.07 (-)	0.70 (-)	0.07 (-)	0.69 (-)	0.07 (-)	0.69 (-)	0.07 (-)	0.70 (-)	0.07 (-)	0.91 (-)	0.09 (-)
alpha-BHC	<0.01 (-)	<0.01 (-)	0.01 (-)	<0.01 (-)	0.01 (-)	<0.01 (-)	0.01 (-)	<0.01 (-)	0.01 (-)	<0.01 (-)	0.01 (-)	<0.01 (-)	0.01 (-)	<0.01 (-)
alpha-Chlordane	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Aroclor-1254	2.82 (+)	0.28 (-)	3.77 (+)	0.38 (-)	3.77 (+)	0.38 (-)	3.77 (+)	0.38 (-)	3.77 (+)	0.38 (-)	3.77 (+)	0.38 (-)	5.28 (+)	0.53 (-)
Aroclor-1260	2.86 (+)	0.29 (-)	3.65 (+)	0.36 (-)	3.65 (+)	0.36 (-)	3.65 (+)	0.36 (-)	3.65 (+)	0.36 (-)	3.65 (+)	0.36 (-)	4.65 (+)	0.47 (-)
beta-BHC	ND	ND	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	NA	NA
delta-BHC	ND	ND	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	NA	NA
Dieldrin	0.22 (-)	0.02 (-)	0.19 (-)	0.02 (-)	0.19 (-)	0.02 (-)	0.19 (-)	0.02 (-)	0.19 (-)	0.02 (-)	0.20 (-)	0.02 (-)	0.20 (-)	0.02 (-)
Endosulfan I	<0.01 (-)	<0.01 (-)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan II	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan Sulfate	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Endrin Aldehyde	0.33 (-)	0.03 (-)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.62 (+)	0.36 (-)
Endrin Ketone	1.92 (+)	0.19 (-)	2.90 (+)	0.29 (-)	3.04 (+)	0.30 (-)	3.01 (+)	0.30 (-)	3.15 (+)	0.32 (-)	3.31 (+)	0.33 (-)	7.46 (+)	0.75 (-)
Gamma-BHC (Lindane)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Gamma-Chlordane	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Heptachlor	<0.01 (-)	<0.01 (-)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Heptachlor Epoxide	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Semivolatile Organic Compounds														
Acenaphthene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Acenaphthylene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Anthracene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(a)anthracene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(a)pyrene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(b)fluoranthene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(g,h,i)perylene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(k)fluoranthene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)

Table 6-25
Summary of Hazard Quotients for Herring Gull

Chemical	Outfall 005/006		Outfall 008		Outfall 009		Outfall 010		Outfall 011		Outfall 012		Reference Site	
	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Chrysene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Dibenz(a,h)anthracene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Fluoranthene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Fluorene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Indeno(1,2,3-cd)pyrene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Pentachlorophenol	0.06 (-)	0.03 (-)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<0.01 (-)	<0.01 (-)
Phenanthrene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Pyrene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)

Notes:

ND = Not Detected

Table 6-26
Summary of Hazard Quotients for Belted Kingfisher

Chemical	Reference Area		East Side of Facility		West Side of Facility	
	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Inorganics						
Arsenic	0.06 (-)	0.03 (-)	0.07 (-)	0.03 (-)	0.08 (-)	0.03 (-)
Chromium	0.07 (-)	0.01 (-)	0.22 (-)	0.04 (-)	0.07 (-)	0.01 (-)
Copper	0.30 (-)	0.23 (-)	0.29 (-)	0.22 (-)	0.04 (-)	0.03 (-)
Lead	0.06 (-)	<0.01 (-)	0.04 (-)	<0.01 (-)	0.01 (-)	<0.01 (-)
Mercury	3.13 (+)	0.31 (-)	3.91 (+)	0.39 (-)	3.13 (-)	0.31 (-)
Nickel	<0.01 (-)	<0.01 (-)	0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01
Selenium	0.54 (-)	0.27 (-)	0.64 (-)	0.32 (-)	0.58 (-)	0.29 (-)
Silver	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Zinc	1.36 (+)	0.15 (-)	1.37 (+)	0.15 (-)	1.43 (+)	0.16 (-)
Pesticides/PCBs						
4,4'-DDD	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
4,4'-DDE	0.02 (-)	<0.01 (-)	0.02 (-)	<0.01 (-)	0.01	<0.01 (-)
4,4'-DDT	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
alpha-BHC	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
alpha-Chlordane	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Aroclor-1254	0.12 (-)	0.01 (-)	0.08 (-)	<0.01 (-)	0.06 (-)	<0.01 (-)
Aroclor-1260	0.10 (-)	0.01 (-)	0.07 (-)	<0.01 (-)	0.06 (-)	<0.01 (-)
beta-BHC	ND	ND	<0.01 (-)	<0.01 (-)	ND	ND
delta-BHC	ND	ND	<0.01 (-)	<0.01 (-)	ND	ND
Dieldrin	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Endosulfan Sulfate	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Endrin Aldehyde	<0.01 (-)	<0.01 (-)	ND	ND	ND	ND
Endrin Ketone	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Gamma-BHC (Lindane)	<0.01 (-)	<0.01 (-)	ND	ND	<0.01 (-)	<0.01 (-)
Gamma-Chlordane	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Heptachlor	ND	ND	ND	ND	<0.01 (-)	<0.01 (-)
Heptachlor Epoxide	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Semivolatile Organic Compounds						
Acenaphthene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Acenaphthylene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Anthracene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(b)fluoranthene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(k)fluoranthene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Chrysene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Dibenz(a,h)anthracene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Fluorene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Indeno(1,2,3-cd)pyrene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Pentachlorophenol	<0.01 (-)	<0.01 (-)	ND	ND	ND	ND

Notes:

ND = Not Detected

Chemicals not detected in any prey tissue at any location are not shown.

Table 6-27
Summary of Hazard Quotients for Osprey

Chemical	Reference		East Side		West Side	
	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Inorganics						
Arsenic	0.80 (-)	0.32 (-)	0.58 (-)	0.23 (-)	1.49 (+)	0.60 (-)
Cadmium	0.19 (-)	0.01 (-)	0.17 (-)	0.01 (-)	0.05 (-)	<0.01 (-)
Chromium	1.38 (+)	0.28 (-)	1.28 (+)	0.26 (-)	2.12 (+)	0.42 (-)
Copper	0.39 (-)	0.30 (-)	0.40 (-)	0.30 (-)	0.27 (-)	0.20 (-)
Lead	0.38 (-)	0.04 (-)	0.24 (-)	0.02 (-)	0.58 (-)	0.06 (-)
Mercury	15 (++)	1.54 (+)	16 (++)	1.59 (+)	10.9 (++)	1.09 (+)
Nickel	0.01 (-)	0.01 (-)	0.03 (-)	0.02 (-)	0.03 (-)	0.02 (-)
Selenium	1.43 (+)	0.42 (-)	2.01 (+)	0.59 (-)	1.85 (+)	0.54 (-)
Silver	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Zinc	2.83 (+)	0.31 (-)	2.68 (+)	0.30 (-)	3.07 (+)	0.34 (-)
Pesticides/PCBs						
4,4'-DDD	0.02 (-)	<0.01 (-)	0.02 (-)	<0.01 (-)	0.01 (-)	<0.01 (-)
4,4'-DDE	0.02 (-)	<0.01 (-)	0.02 (-)	<0.01 (-)	0.01 (-)	<0.01 (-)
4,4'-DDT	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
alpha-BHC	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
alpha-Chlordane	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Aroclor-1254	0.12 (-)	0.01 (-)	0.08 (-)	<0.01 (-)	0.07 (-)	<0.01 (-)
Aroclor-1260	0.10 (-)	0.01 (-)	0.07 (-)	<0.01 (-)	0.07 (-)	<0.01 (-)
beta-BHC	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	ND	ND
delta-BHC	<0.01 (-)	<0.01 (-)	ND	ND	ND	ND
Dieldrin	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Endosulfan Sulfate	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Endrin	ND	ND	<0.01 (-)	<0.01 (-)	ND	ND
Endrin Aldehyde	0.07 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	0.02 (-)	<0.01 (-)
Endrin Ketone	0.19 (-)	0.02 (-)	0.10 (-)	0.01 (-)	0.04 (-)	<0.01 (-)
Gamma-BHC (Lindane)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Gamma-Chlordane	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Heptachlor	ND	ND	ND	ND	<0.01 (-)	<0.01 (-)
Heptachlor Epoxide	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Semivolatile Organic Compounds						
Acenaphthene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Acenaphthylene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Anthracene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(a)anthracene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(a)pyrene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(b)fluoranthene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(g,h,i)perylene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(k)fluoranthene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Chrysene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Dibenz(a,h)anthracene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Fluoranthene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Fluorene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Indeno(1,2,3-cd)pyrene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Pentachlorophenol	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Phenanthrene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Pyrene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)

Notes:

ND = Not Detected

Chemicals not detected in any prey tissue at any location are not shown.

Table 6-33
Comparison of Sediment PAH Concentrations (ug/kg) with Concentrations Linked to Cancer in Fish

Chemical	1982 ¹	1987 ²	1994 ²	Maximum Sediment Concentrations		
	Cancer Rate ³ (31%)	Cancer Rate ³ (7%)	Cancer Rate ³ (0%)	Outfall 005/006	Outfall 009	Outfall 010
Acenaphthene	36,000	140	55	78	ND	ND
Acenaphthylene	40,000	80	13	22	ND	ND
Anthracene	NA	NA	NA	170	3800	1500
Benzo(a)anthracene	51,000	370	313	620	6900	3900
Benzo(a)pyrene	43,000	240	237	400	6100	3500
Benzo(b)fluoranthene	75,000	580	838	530	7800	4300
Benzo(g,h,l)perylene	24,000	30	NA	210	3000	2300
Benzo(k)fluoranthene	75,000	580	838	160	3600	2100
Chrysene	51,000	370	NA	340	8400	3300
Dibenz(a,h)anthracene	9,400	NA	NA	61	30	ND
Fluoranthene	220,000	790	3,460	750	24000	8000
Fluorene	NA	NA	NA	110	ND	ND
Indeno(1,2,3-cd)pyrene	26,000	10	195	330	4000	2900
2-Methylnaphthalene	15,000	NA	NA	ND	620	ND
Naphthalene	31,000	NA	NA	ND	800	ND
Phenanthrene	390,000	730	1,860	290	6900	5600
Pyrene	140,000	930	2,860	600	16000	6500
Total PAHs	1,226,400	4,850	10,669	4,671	91,950	43,900

Notes:

¹Baumann, et al., 1982

²Baumann and Harshbarger, 1998

³ Percentage of age 3 brown bullhead having cancerous hepatic lesions

NA - Not Available (value for chemical not reported in the study)

ND - Not Detected