

Table 3-1
COPC Emission Rates Evaluated in the HHRA

Chemical	Modeled Emission Rate		
	Mercury (g/s)	Lead ^A (g/s)	Dioxin ^A (g/s)
PC Boiler	1.52E-03	9.88E-03	7.46E-10
Auxiliary Boiler	1.26E-05	--	--
Steam Boiler I	1.12E-05	--	--
Steam Boiler II	1.12E-05	--	--
Steam Boiler III	1.12E-05	--	--
Total	1.57E-03	9.88E-03	7.46E-10

^A Assumed only to be a constituent of coal.

Table 3-2
Emission Rates of Mercury Species Evaluated in the HHRA

Mercury Form	Symbol	% of Total Hg Emissions ^A	Modeled Mercury Emission Rate (g/s)
Elemental Vapor	Hg0	98.66	1.55E-03
Divalent Vapor	Hg2	1.34	2.10E-05
Particle Bound	HgP	0.00	0.00E+00
Totals		100.00	1.57E-03

^A Source: Large-Scale Testing of Enhanced Mercury Removal at W.A. Parish Unit 8, Hoot Lake Unit 3, and Hawthorn Unit 5 [DOE, 2006].

Table 4-1
Particle Size Distribution Selected for Air Modeling of Emissions

Lower Range of Particle Diameter (μm)	Upper Range of Particle Diameter (μm)	Mean Particle Diameter for Cumulative Range (μm)	Mean Particle Radius(μm)	Cumulative Mass% \leq Stated Size ^A	Fraction of Mass Within Range ^B	Surface Area/Volume ^C	Proportion Available Surface Area ^C	Fraction of Total Surface Area ^C
15	30	23.304	11.65	100%	0.030	0.257	0.008	0.002
10	15	12.664	6.33	97%	0.050	0.474	0.024	0.005
6	10	8.163	4.08	92%	0.150	0.735	0.110	0.025
2.5	6	4.478	2.24	77%	0.240	1.340	0.322	0.073
1.25	2.5	1.942	0.97	53%	0.220	3.090	0.680	0.155
1	1.25	1.130	0.56	31%	0.060	5.312	0.319	0.073
0.625	1	0.827	0.41	25%	0.110	7.258	0.798	0.182
0	0.625	0.394	0.20	14%	0.140	15.239	2.133	0.486
Totals				100%	1.000		4.393	1.000

^A Source: AP-42 Table 1.1-6

^B Based on AP-42 Table 1.1-6 for Baghouses.

^C Calculated per Section 3.2.3 of the HHRA guidance [USEPA, 2005]

Table 4-2
 Representative Plot File Generated Following AERMOD Run

UTMX	UTMY	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	ZELEV	ZHILL	ZFLAG	AVE	GRP	NUM YRS	NET ID
564790.9	4727858	0.00799	6.41006	6.13867	0.27140	176.78	216.71	0	ANNUAL	ALL	1	
565090.9	4727858	0.00812	6.62949	6.30201	0.32747	197.27	216.41	0	ANNUAL	ALL	1	
--	--	--	--	--	--	--	--	--	--	--	--	
565690.9	4727858	0.00950	8.14442	7.59997	0.54448	205.33	224.03	0	ANNUAL	ALL	1	
565990.9	4727858	0.01001	8.88733	8.24375	0.64356	192.02	192.02	0	ANNUAL	ALL	1	

Table 4-3
AERMOD Modeled COPC Impacts on Selected Residence Location

Chemical	Selected Residence Location		
	Air Concentration ($\mu\text{g}/\text{m}^3$)	Dry Deposition ($\text{g}/\text{m}^2\text{-yr}$)	Wet Deposition ($\text{g}/\text{m}^2\text{-yr}$)
Divalent Mercury-Vapor Phase	1.26E-05	1.42E-06	6.64E-09
Elemental Mercury-Vapor Phase ^A	1.63E-05	n/a	n/a
Lead ^B	3.58E-05	1.95E-05	2.46E-05
2,3,7,8-TCDD [Vapor Phase] ^C	1.79E-12	2.98E-13	7.92E-15
2,3,7,8-TCDD [Particle-Bound Phase] ^C	9.09E-13	8.77E-14	9.52E-14

^A Elemental mercury impacts are only evaluated for direct inhalation exposures in HHRA [USEPA, 2005].

^B Lead is assumed to exist completely in particle form.

^C Based on assumed Fv value of 0.664 as reported in USEPA, 2005.

Table 4-4
AERMOD Modeled COPC Impacts on Selected Farm Location

Chemical	Selected Farm Location		
	Air Concentration ($\mu\text{g}/\text{m}^3$)	Dry Deposition ($\text{g}/\text{m}^2\text{-yr}$)	Wet Deposition ($\text{g}/\text{m}^2\text{-yr}$)
Divalent Mercury-Vapor Phase	1.01E-05	7.12E-07	7.77E-09
Elemental Mercury-Vapor Phase ^A	1.20E-05	n/a	n/a
Lead ^B	3.53E-05	1.46E-05	3.41E-05
2,3,7,8-TCDD [Vapor Phase] ^C	1.76E-12	2.76E-13	9.90E-15
2,3,7,8-TCDD [Particle-Bound Phase] ^C	8.94E-13	6.26E-14	1.30E-13

^A Elemental mercury impacts are only evaluated for direct inhalation exposures in HHRA [USEPA, 2005].

^B Lead is assumed to exist completely in particle form.

^C Based on assumed Fv value of 0.664 as reported in USEPA, 2005.

Table 4-5
AERMOD Modeled COPC Impacts on Selected Surface Water Body

Chemical	Water Body		Watershed	
	Air Concentration ($\mu\text{g}/\text{m}^3$)	Total Deposition ($\text{g}/\text{m}^2\text{-yr}$)	Air Concentration ($\mu\text{g}/\text{m}^3$)	Total Deposition ($\text{g}/\text{m}^2\text{-yr}$)
Divalent Mercury-Vapor Phase	2.22E-06	1.58E-07	n/a	1.59E-07
Elemental Mercury-Vapor Phase ^A	n/a	n/a	n/a	n/a
Lead ^B	n/a	9.36E-06	n/a	9.41E-06
2,3,7,8-TCDD [Vapor Phase] ^C	9.46E-13	8.03E-14	n/a	8.06E-14
2,3,7,8-TCDD [Particle-Bound Phase] ^C	n/a	4.05E-14	n/a	4.08E-14

^A Elemental mercury impacts are only evaluated for direct inhalation exposures in HHRA [USEPA, 2005].

^B Lead is assumed to exist completely in particle form.

^C Based on assumed Fv value of 0.664 as reported in USEPA, 2005.

Table 5-1
Terrestrial and Atmospheric Fate and Transport Parameters Used in the HHRA

Parameter	Symbol	Units	Value	Source
Ambient Air Temperature	T	K	282.3	30-yr Average for Midland, MI [NOAA, 2007]
Average Annual Evapotranspiration	E	cm/yr	44.0	Surface Water Hydrology Model [Appendix A]
Average Annual Irrigation	I	cm/yr	19.8	Calculated: Geraghty, 1973.
Average Annual Precipitation	P	cm/yr	78.0	30-yr Average for Midland, MI [NOAA, 2007]
Average Annual Runoff	RO	cm/yr	12.7	Calculated: Geraghty, 1973.
Average Annual Wind Speed	W	m/s	4.04	Average for MBS Airport, MI [2004-2006]
Density of Air	ρ_a	g/cm ³	0.0012	Default: HHRA Guidance [USEPA, 2005]
Soil Mixing Depth - Tilled Soil	$Z_{s(\text{tilled})}$	cm	20	Default: HHRA Guidance [USEPA, 2005]
Soil Mixing Depth - Untilled Soil	$Z_{s(\text{untilled})}$	cm	2	Default: HHRA Guidance [USEPA, 2005]
Soil Particle Density	ρ_s	g/cm ₃	2.7	Default: HHRA Guidance [USEPA, 2005]
Time Unit Correction Factor	UCF _{yr}	d/yr	365	Default: HHRA Guidance [USEPA, 2005]
Total Deposition Time (i.e., Facility Operating Life)	tD	yr	30	Default: HHRA Guidance [USEPA, 2005]
Universal Gas Constant	R _{Gas}	atm-m ³ /mol-K	8.205E-05	Default: HHRA Guidance [USEPA, 2005]
Viscosity of Air	μ_a	g/cm-s	1.810E-04	Default: HHRA Guidance [USEPA, 2005]

Geraghty, 1973: Water Atlas of the United States

NOAA, 2007: Annual Climatological Survey [<http://hurricane.ncdc.noaa.gov/ancsum/ACS>]

USEPA, 2005: Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Office of Solid Waste.

Table 5-2
COPC Concentrations in Air
Selected Residence Location

Chemical	Cyv ($\mu\text{g}/\text{m}^3$)	Cyp _{SA} ($\mu\text{g}/\text{m}^3$)	Cyp _M ($\mu\text{g}/\text{m}^3$)	Cyp ($\mu\text{g}/\text{m}^3$)	Ca ($\mu\text{g}/\text{m}^3$)
Mercury (Hg+2)	1.26E-05	0.00E+00	0.00E+00	0.00E+00	1.3E-05
Mercury (MeHg)					
Mercury (Hg0)	1.63E-05	0.00E+00	0.00E+00	0.00E+00	1.6E-05
Lead	0.00E+00	0.00E+00	3.58E-05	3.58E-05	3.6E-05
TCDD (2,3,7,8-)	1.79E-12	9.07E-13	0.00E+00	9.07E-13	2.7E-12

Table 5-3
COPC Concentrations in Air
Selected Farm Location

Chemical	Cyv ($\mu\text{g}/\text{m}^3$)	Cyp _{SA} ($\mu\text{g}/\text{m}^3$)	Cyp _M ($\mu\text{g}/\text{m}^3$)	Cyp ($\mu\text{g}/\text{m}^3$)	Ca ($\mu\text{g}/\text{m}^3$)
Mercury (Hg+2)	1.01E-05	0.00E+00	0.00E+00	0.00E+00	1.0E-05
Mercury (MeHg)					
Mercury (Hg0)	1.20E-05	0.00E+00	0.00E+00	0.00E+00	1.2E-05
Lead	0.00E+00	0.00E+00	3.52E-05	3.52E-05	3.5E-05
TCDD (2,3,7,8-)	1.76E-12	8.92E-13	0.00E+00	8.92E-13	2.7E-12

Table 5-4
COPC Concentrations in Soil - Deposition Term
Selected Residence Location

Chemical	Dydv (g/m ² -yr)	Dyww (g/m ² -yr)	Dydp _{SA} (g/m ² -yr)	Dydp _M (g/m ² -yr)	Dydp (g/m ² -yr)	Dywp _{SA} (g/m ² -yr)	Dywp _M (g/m ² -yr)	Dywp (g/m ² -yr)	BD (g/cm ³)	Z _{s(untilled)} (cm)	Z _{s(tilled)} (cm)	Ds _{untilled} (mg/kg-yr)	Ds _{tilled} (mg/kg-yr)
Mercury (Hg+2)	1.42E-06	6.64E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.5	2	20	4.7E-05	4.7E-06
Mercury (MeHg)												9.5E-07	9.5E-08
Mercury (Hg0)													
Lead	0.00E+00	0.00E+00	0.00E+00	1.95E-05	1.95E-05	0.00E+00	2.46E-05	2.46E-05	1.5	2	20	1.5E-03	1.5E-04
TCDD (2,3,7,8-)	2.98E-13	7.92E-15	8.77E-14	0.00E+00	8.77E-14	9.52E-14	0.00E+00	9.52E-14	1.5	2	20	1.6E-11	1.6E-12

Note: Calculated deposition term for divalent mercury is partitioned into divalent mercury (98-percent) and methylmercury (2-percent) [USEPA, 2005].

Table 5-5
COPC Concentrations in Soil - Deposition Term
Selected Farm Location

Chemical	Dydv (g/m ² -yr)	Dyvw (g/m ² -yr)	Dydp _{SA} (g/m ² -yr)	Dydp _M (g/m ² -yr)	Dydp (g/m ² -yr)	Dywp _{SA} (g/m ² -yr)	Dywp _M (g/m ² -yr)	Dywp (g/m ² -yr)	BD (g/cm ³)	Z _{untilled} (cm)	Z _{tilled} (cm)	Ds _{untilled} (mg/kg-yr)	Ds _{tilled} (mg/kg-yr)
Mercury (Hg+2)	7.12E-07	7.77E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.5	2	20	2.4E-05	2.4E-06
Mercury (MeHg)												4.8E-07	4.8E-08
Mercury (Hg0)													
Lead	0.00E+00	0.00E+00	0.00E+00	1.46E-05	1.46E-05	0.00E+00	3.41E-05	3.41E-05	1.5	2	20	1.6E-03	1.6E-04
TCDD (2,3,7,8-)	2.76E-13	9.90E-15	6.26E-14	0.00E+00	6.26E-14	1.30E-13	0.00E+00	1.30E-13	1.5	2	20	1.6E-11	1.6E-12

Note: Calculated deposition term for divalent mercury is partitioned into divalent mercury (98-percent) and methylmercury (2-percent) [USEPA, 2005].

Table 5-6
COPC Concentrations in Soil Based on Potential Carcinogenic and Noncarcinogenic Endpoints
Selected Residence Location

Chemical	tD (yr)	Adult T ₁ (yr)	Adult T ₂ (yr)	Child T ₁ (yr)	Child T ₂ (yr)	Untilled Soil					Tilled Soil				
						Ds _{untilled} (mg/kg-yr)	ks _{untilled} (yr ⁻¹)	(All) Cs _{untilled} (NC) (mg/kg)	(Adult) Cs _{untilled} (C) (mg/kg)	(Child) Cs _{untilled} (C) (mg/kg)	Ds _{untilled} (mg/kg-yr)	ks _{untilled} (yr ⁻¹)	(All) Cs _{tilled} (NC) (mg/kg)	(Adult) Cs _{tilled} (C) (mg/kg)	(Child) Cs _{tilled} (C) (mg/kg)
Mercury (Hg+2)	30	0	30	24	30	4.7E-05	3.1E-04	1.4E-03	0.0E+00	0.0E+00	4.7E-06	3.1E-05	1.4E-04	0.0E+00	0.0E+00
Mercury (MeHg)	30	0	30	24	30	9.5E-07	2.8E-03	2.7E-05	0.0E+00	0.0E+00	9.5E-08	2.6E-04	2.8E-06	0.0E+00	0.0E+00
Mercury (Hg0)															
Lead	30	0	30	24	30	1.5E-03	2.0E-02	3.3E-02	0.0E+00	0.0E+00	1.5E-04	2.0E-03	4.3E-03	0.0E+00	0.0E+00
TCDD (2,3,7,8-)	30	0	30	24	30	1.6E-11	3.5E-02	3.0E-10	1.8E-10	2.8E-10	1.6E-12	3.0E-02	3.2E-11	1.8E-11	3.0E-11

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-7
COPC Concentrations in Soil Based on Potential Carcinogenic and Noncarcinogenic Endpoints
Selected Farm Location

Chemical	tD (yr)	Farmer T ₁ (yr)	Farmer T ₂ (yr)	Child T ₁ (yr)	Child T ₂ (yr)	Untilled Soil					Tilled Soil				
						D _s _{untilled} (mg/kg-yr)	k _s _{untilled} (yr ⁻¹)	(All) C _s _{untilled} (NC) (mg/kg)	(Adult) C _s _{untilled} (C) (mg/kg)	(Child) C _s _{untilled} (C) (mg/kg)	D _s _{untilled} (mg/kg-yr)	k _s _{untilled} (yr ⁻¹)	(All) C _s _{tilled} (NC) (mg/kg)	(Adult) C _s _{tilled} (C) (mg/kg)	(Child) C _s _{tilled} (C) (mg/kg)
Mercury (Hg+2)	30	0	40	24	30	2.4E-05	3.1E-04	7.0E-04	0.0E+00	0.0E+00	2.4E-06	3.1E-05	7.1E-05	0.0E+00	0.0E+00
Mercury (MeHg)	30	0	40	24	30	4.8E-07	2.8E-03	1.4E-05	0.0E+00	0.0E+00	4.8E-08	2.6E-04	1.4E-06	0.0E+00	0.0E+00
Mercury (Hg0)															
Lead	30	0	40	24	30	1.6E-03	2.0E-02	3.7E-02	0.0E+00	0.0E+00	1.6E-04	2.0E-03	4.7E-03	0.0E+00	0.0E+00
TCDD (2,3,7,8-)	30	0	40	24	30	1.6E-11	3.5E-02	3.0E-10	1.9E-10	2.8E-10	1.6E-12	3.0E-02	3.2E-11	2.0E-11	2.9E-11

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-8
Combined Soil Loss Constants

Chemical	$k_{sl_{untilled}}$ (yr^{-1})	$k_{se_{untilled}}$ (yr^{-1})	$k_{sr_{untilled}}$ (yr^{-1})	k_{sg} (yr^{-1})	$k_{sv_{untilled}}$ (yr^{-1})	$k_{s_{untilled}}$ (yr^{-1})	$k_{sl_{tilled}}$ (yr^{-1})	$k_{se_{tilled}}$ (yr^{-1})	$k_{sr_{tilled}}$ (yr^{-1})	k_{sg} (yr^{-1})	$k_{sv_{tilled}}$ (yr^{-1})	$k_{s_{tilled}}$ (yr^{-1})
Mercury (Hg+2)	2.4E-04	0.0E+00	7.3E-05	0.0E+00	3.1E-08	3.1E-04	2.4E-05	0.0E+00	7.3E-06	0.0E+00	3.1E-10	3.1E-05
Mercury (MeHg)	2.0E-03	0.0E+00	6.0E-04	0.0E+00	2.0E-04	2.8E-03	2.0E-04	0.0E+00	6.0E-05	0.0E+00	2.0E-06	2.6E-04
Mercury (Hg0)												
Lead	1.5E-02	0.0E+00	4.7E-03	0.0E+00	0.0E+00	2.0E-02	1.5E-03	0.0E+00	4.7E-04	0.0E+00	0.0E+00	2.0E-03
TCDD (2,3,7,8-)	3.5E-04	0.0E+00	1.1E-04	3.0E-02	4.9E-03	3.5E-02	3.5E-05	0.0E+00	1.1E-05	3.0E-02	4.9E-05	3.0E-02

Table 5-9
Soil Loss Constant Due to Leaching

Chemical	P (cm/yr)	I (cm/yr)	RO (cm/yr)	E _v (cm/yr)	θ _{sw} (mL/cm ³)	Z _{s(untilled)} (cm)	Z _{s(tilled)} (cm)	BD (g/cm ³)	K _{d_s} (cm ³ /g)	k _{sl_{untilled}} (yr ⁻¹)	k _{sl_{tilled}} (yr ⁻¹)
Mercury (Hg+2)	78.0	19.8	12.7	44.0	0.20	2	20	1.5	5.8E+04	2.4E-04	2.4E-05
Mercury (MeHg)	78.0	19.8	12.7	44.0	0.20	2	20	1.5	7.0E+03	2.0E-03	2.0E-04
Mercury (Hg0)											
Lead	78.0	19.8	12.7	44.0	0.20	2	20	1.5	9.0E+02	1.5E-02	1.5E-03
TCDD (2,3,7,8-)	78.0	19.8	12.7	44.0	0.20	2	20	1.5	3.9E+04	3.5E-04	3.5E-05

Table 5-10
Soil Loss Constant Due to Runoff

Chemical	RO (cm/yr)	Z _{s(untilled)} (cm)	Z _{s(tilled)} (cm)	θ _{sw} (mL/cm ³)	K _{d_s} (cm ³ /g)	BD (g/ml)	k _{sr_{untilled}} (yr ⁻¹)	k _{sr_{tilled}} (yr ⁻¹)
Mercury (Hg+2)	12.7	2	20	0.20	5.8E+04	1.5	7.3E-05	7.3E-06
Mercury (MeHg)	12.7	2	20	0.20	7.0E+03	1.5	6.0E-04	6.0E-05
Mercury (Hg0)								
Lead	12.7	2	20	0.20	9.0E+02	1.5	4.7E-03	4.7E-04
TCDD (2,3,7,8-)	12.7	2	20	0.20	3.9E+04	1.5	1.1E-04	1.1E-05

Table 5-11
Soil Loss Constant Due to Volatilization

Chemical	K_{ds} (cm ³ /g)	D_a (cm ² /s)	Z_{untilled} (cm)	$Z_{\text{s(tilled)}}$ (cm)	H (atm-m ³ /mol)	R_{Gas} (atm-m ³ /mol-K)	T (K)	BD (g/cm ³)	θ_{sw} (mL/cm ³)	ρ_s (g/cm ³)	$k_{\text{svuntilled}}$ (y ⁻¹)	k_{svtilled} (y ⁻¹)
Mercury (Hg+2)	5.8E+04	4.5E-02	2	20	7.1E-10	8.2E-05	282	1.5	0.20	2.7	3.1E-08	3.1E-10
Mercury (MeHg)	7.0E+03	5.3E-02	2	20	4.7E-07	8.2E-05	282	1.5	0.20	2.7	2.0E-04	2.0E-06
Mercury (Hg0)												
Lead	9.0E+02	7.7E-02	2	20	0.0E+00	8.2E-05	282	1.5	0.20	2.7	0.0E+00	0.0E+00
TCDD (2,3,7,8-)	3.9E+04	1.0E-01	2	20	3.3E-05	8.2E-05	282	1.5	0.20	2.7	4.9E-03	4.9E-05

Table 5-12
Aquatic Fate-and-Transport Parameters Used in the HHRA

Parameter	Symbol	Units	Value	Source
Non Water Body Specific Values				
Bed Sediment Concentration	BS	g/cm ³	1	Default: HHRA Guidance [USEPA, 2005]
Bed Sediment Porosity	θ_{bs}	L _{water} /L	0.6	Default: HHRA Guidance [USEPA, 2005]
Density of Water	ρ_w	g/cm ³	1	Default: HHRA Guidance [USEPA, 2005]
Depth of Upper Benthic Layer	d_b	m	0.03	Default: HHRA Guidance [USEPA, 2005]
Drag Coefficient	C_d	()	0.0011	Default: HHRA Guidance [USEPA, 2005]
Empirical Slope Coefficient	b	()	0.125	Default: HHRA Guidance [USEPA, 2005]
Fraction Organic Carbon in Bottom Sediment	OC _{sed}	()	0.04	Default: HHRA Guidance [USEPA, 2005]
Soil Bulk Density	BD	g/cm ³	1.5	Default: HHRA Guidance [USEPA, 2005]
Soil Enrichment Ratio (Organics)	ER	()	3	Default: HHRA Guidance [USEPA, 2005]
Soil Enrichment Ratio (Metals)	ER	()	1	Default: HHRA Guidance [USEPA, 2005]
Suspended Solids Deposition Rate	D _{ss}	m/yr	1825	Default: HHRA Guidance [USEPA, 2005]
Temperature Correction Factor - Surface Water	θ	()	1.026	Default: HHRA Guidance [USEPA, 2005]
Total Suspended Solids	TSS	mg/L	10	Default: HHRA Guidance [USEPA, 2005]
USLE Cover Management Factor	C	()	0.1	Default: HHRA Guidance [USEPA, 2005]
USLE Erodibility Factor	K	ton/acre	0.27	Calculated: State Average [MDEQ, 2006a]
USLE Length-slope Factor	LS	()	1.5	Default: HHRA Guidance [USEPA, 2005]
USLE Rainfall Factor	RF	yr ⁻¹	85	Default: Midland County [MDEQ, 2006a]
USLE Supporting Practice Factor	P	()	1	Default: HHRA Guidance [USEPA, 2005]
Viscous Sublayer Thickness-Dimensionless	λ_2	()	4	Default: HHRA Guidance [USEPA, 2005]
Viscosity of Water	μ_w	g/cm-s	0.0169	Default: HHRA Guidance [USEPA, 2005]
Volumetric Soil Water Content	θ_{sw}	cm ³ /cm ³	0.2	Default: HHRA Guidance [USEPA, 2005]
Von Karman's Constant	k	()	0.4	Default: HHRA Guidance [USEPA, 2005]
Waterbody Temperature	T _k	K	281.0	Estimated: From Shallow Ground Water [Geraghty, 1973]
Water Body Specific Values [Kiwasssee Lake]				
Average Volumetric Flow Through Waterbody	V _{fx}	m ³ /yr	1.65E+04	Calculated: Based on Runoff and Watershed Area
Current Velocity	u	m/s	0.0	Non-Flowing Water Body
Depth of Water Column	d_w	m	1.52	Estimated
Empirical Intercept Coefficient	a	()	2.1	Calculated: HHRA Guidance [USEPA, 2005] Table B-4-14
Water Body Area	WA _w	m ²	4.89E+04	Calculated: ArcGIS from DOQQ
Watershed Area	WA _L	m ²	1.30E+05	Calculated: ArcGIS from DOQQ Based on 100-m Buffer
Watershed Area, Impervious	WA _I	m ²	4.69E+03	Estimated: Based on Evaluation of DOQQ

MDEQ, 2006a: Soil Erosion and Sediment Control Training Manual MDEQ Water Bureau.

USEPA, 2005: Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities Office of Solid Waste.

Table 5-13
COPC Concentrations in Watershed Soil - Deposition Term

Chemical	Watershed				BD (g/cm ³)	Z _{untilled} (cm)	Ds (mg/kg-yr)
	Dyt _{wv} (g/m ² -yr)	Dyt _{wp_{SA}} (g/m ² -yr)	Dyt _{wp_M} (g/m ² -yr)	Dyt _{wp} (g/m ² -yr)			
Mercury (Hg+2)	1.59E-07	0.00E+00	0.00E+00	0.00E+00	1.5	2	5.2E-06
Mercury (MeHg)							1.1E-07
Mercury (Hg0)							
Lead	0.00E+00	0.00E+00	9.41E-06	9.41E-06	1.5	2	3.1E-04
TCDD (2,3,7,8-)	8.06E-14	4.08E-14	0.00E+00	4.08E-14	1.5	2	4.0E-12

Note: Calculated deposition term for divalent mercury is partitioned into divalent mercury (98-percent) and methylmercury (2-percent) [USEPA, 2005].

Table 5-14
COPC Concentrations in Watershed Soil Based on Potential Carcinogenic and Noncarcinogenic Endpoints

Chemical	tD (yr)	Adult T ₁ (yr)	Adult T ₂ (yr)	Child T ₁ (yr)	Child T ₂ (yr)	Ds (mg/kg-yr)	kS _{untilled} (yr ⁻¹)	(All) C _{S_{wshed}} (NC) (mg/kg)	(Adult) C _{S_{wshed}} (C) (mg/kg)	(Child) C _{S_{wshed}} (C) (mg/kg)
Mercury (Hg+2)	30	0	30	24	30	5.2E-06	1.3E-02	1.3E-04	0.0E+00	0.0E+00
Mercury (MeHg)	30	0	30	24	30	1.1E-07	4.0E-02	1.9E-06	0.0E+00	0.0E+00
Mercury (Hg0)										
Lead	30	0	30	24	30	3.1E-04	3.2E-02	6.0E-03	0.0E+00	0.0E+00
TCDD (2,3,7,8-)	30	0	30	24	30	4.0E-12	7.3E-02	4.9E-11	3.3E-11	4.8E-11

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-15
Soil Loss Constant Due to Erosion

Chemical	K_{ds} (cm^3/g)	X_e ($\text{kg}/\text{m}^2\text{-yr}$)	SD ($\text{}$)	ER ($\text{}$)	Z_{untilled} (cm)	BD (g/cm^3)	θ_{sw} (mL/cm^3)	$k_{\text{se}_{\text{untilled}}}$ (yr^{-1})
Mercury (Hg+2)	5.8E+04	0.77	0.48	1.0	2	1.5	0.2	1.2E-02
Mercury (MeHg)	7.0E+03	0.77	0.48	3.0	2	1.5	0.2	3.7E-02
Mercury (Hg0)								
Lead	9.0E+02	0.77	0.48	1.0	2	1.5	0.2	1.2E-02
TCDD (2,3,7,8-)	3.9E+04	0.77	0.48	3.0	2	1.5	0.2	3.7E-02

Table 5-16
 Combined Watershed Soil Loss Constant

Chemical	$k_{sl_{wshed}}$ (yr^{-1})	$k_{se_{wshed}}$ (yr^{-1})	$k_{sr_{wshed}}$ (yr^{-1})	$k_{sg_{wshed}}$ (yr^{-1})	$k_{sv_{wshed}}$ (yr^{-1})	$k_{s_{wshed}}$ (yr^{-1})
Mercury (Hg+2)	2.4E-04	1.2E-02	7.3E-05	0.0E+00	3.1E-08	1.3E-02
Mercury (MeHg)	2.0E-03	3.7E-02	6.0E-04	0.0E+00	2.0E-04	4.0E-02
Mercury (Hg0)						
Lead	1.5E-02	1.2E-02	4.7E-03	0.0E+00	0.0E+00	3.2E-02
TCDD (2,3,7,8-)	3.5E-04	3.7E-02	1.1E-04	3.0E-02	4.9E-03	7.3E-02

Table 5-17
Deposition Loading of COPCs to the Selected Water Body

Chemical	Water Body				A _w (m ²)	L _{dep} (g/yr)
	Dytwv (g/m ² -yr)	Dytwp _{SA} (g/m ² -yr)	Dytwp _M (g/m ² -yr)	Dytwp (g/m ² -yr)		
Mercury (Hg+2)	1.58E-07	0.00E+00	0.00E+00	0.00E+00	4.89E+04	7.7E-03
Mercury (MeHg)						
Mercury (Hg0)						
Lead	0.00E+00	0.00E+00	9.36E-06	9.36E-06	4.89E+04	4.6E-01
TCDD (2,3,7,8-)	8.03E-14	4.05E-14	0.00E+00	4.05E-14	4.89E+04	5.9E-09

Table 5-18
Diffusion Loading of COPCs to the Selected Water Body

Chemical	K_v (m/yr)	C_{yw} ($\mu\text{g}/\text{m}^3$)	A_w (m^2)	H ($\text{atm}\cdot\text{m}^3/\text{mol}$)	R ($\text{atm}\cdot\text{m}^3/\text{mol}\cdot\text{K}$)	T_{wk} (K)	L_{Dif} (g/yr)
Mercury (Hg+2)	7.86E-03	2.22E-06	4.89E+04	7.1E-10	8.21E-05	281.0	2.8E-02
Mercury (MeHg)							
Mercury (Hg0)							
Lead	0.00E+00	0.00E+00	4.89E+04	0.0E+00	8.21E-05	281.0	0.0E+00
TCDD (2,3,7,8-)	8.09E+01	9.46E-13	4.89E+04	3.3E-05	8.21E-05	281.0	2.6E-09

Table 5-19
Impervious Runoff Loading of COPCs to the Selected Water Body

Chemical	Watershed				A _I (m ²)	L _{RI} (g/yr)
	Dytwv (g/m ² -yr)	Dytwp _{SA} (g/m ² -yr)	Dytwp _M (g/m ² -yr)	Dytwp (g/m ² -yr)		
Mercury (Hg+2)	1.59E-07	0.00E+00	0.00E+00	0.00E+00	4.69E+03	7.5E-04
Mercury (MeHg)						
Mercury (Hg0)						
Lead	0.00E+00	0.00E+00	9.41E-06	9.41E-06	4.69E+03	4.4E-02
TCDD (2,3,7,8-)	8.06E-14	4.08E-14	0.00E+00	4.08E-14	4.69E+03	5.7E-10

Table 5-20
Pervious Runoff Loading of COPCs to the Selected Water Body

Chemical	(All) C _{S_{wshed}} (NC) (mg/kg)	(Adult) C _{S_{wshed}} (C) (mg/kg)	(Child) C _{S_{wshed}} (C) (mg/kg)	RO (cm/yr)	BD (g/cm ³)	K _{d_s} (L/kg)	A _L (m ²)	A _I (m ²)	θ _{sw} ()	UCF (cm ² -kg/ m ² -mg)	(All) L _R (NC) (g/yr)	(Adult) L _R (C) (g/yr)	(Child) L _R (C) (g/yr)
Mercury (Hg+2)	1.3E-04	0.0E+00	0.0E+00	12.7	1.5	5.8E+04	1.30E+05	4.69E+03	0.2	0.01	3.6E-05	0.0E+00	0.0E+00
Mercury (MeHg)	1.9E-06	0.0E+00	0.0E+00	12.7	1.5	7.0E+03	1.30E+05	4.69E+03	0.2	0.01	4.2E-06	0.0E+00	0.0E+00
Mercury (Hg0)													
Lead	6.0E-03	0.0E+00	0.0E+00	12.7	1.5	9.0E+02	1.30E+05	4.69E+03	0.2	0.01	1.1E-01	0.0E+00	0.0E+00
TCDD (2,3,7,8-)	4.9E-11	3.3E-11	4.8E-11	12.7	1.5	3.9E+04	1.30E+05	4.69E+03	0.2	0.01	2.0E-11	1.4E-11	2.0E-11

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-21
Erosion Loading of COPCs to the Selected Water Body

Chemical	(All) C _{S_wshed} (NC) (mg/kg)	(Adult) C _{S_wshed} (C) (mg/kg)	(Child) C _{S_wshed} (C) (mg/kg)	X _e (kg/m ² -yr)	A _L (m ²)	A _I (m ²)	SD ()	ER ()	K _{d_s} (L/kg)	θ _{sw} ()	BD (g/cm ³)	UCF (mg/g)	(All) L _E (NC) (g/yr)	(Adult) L _E (C) (g/yr)	(Child) L _E (C) (g/yr)
Mercury (Hg+2)	1.3E-04	0.0E+00	0.0E+00	0.77	1.30E+05	4.69E+03	0.48	1.0	5.8E+04	0.2	1.5	0.001	6.0E-03	0.0E+00	0.0E+00
Mercury (MeHg)	1.9E-06	0.0E+00	0.0E+00	0.77	1.30E+05	4.69E+03	0.48	3.0	7.0E+03	0.2	1.5	0.001	2.6E-04	0.0E+00	0.0E+00
Mercury (Hg0)															
Lead	6.0E-03	0.0E+00	0.0E+00	0.77	1.30E+05	4.69E+03	0.48	1.0	9.0E+02	0.2	1.5	0.001	2.8E-01	0.0E+00	0.0E+00
TCDD (2,3,7,8-)	4.9E-11	3.3E-11	4.8E-11	0.77	1.30E+05	4.69E+03	0.48	3.0	3.9E+04	0.2	1.5	0.001	6.9E-09	4.6E-09	6.7E-09

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-22
 Universal Soil Loss Equation and Sediment Delivery Ratio

RF (yr ⁻¹)	K (ton/acre)	LS ()	C ()	PF ()	X _e (kg/m ² -yr)	A _L (m ²)	b ()	a ()	SD ()
85.0	0.27	1.5	0.1	1.0	0.77	1.30E+05	0.125	2.1	0.48

Table 5-23
Total Water Body Loading of COPCs to the Selected Water Body

Chemical	L _{dep} (g/yr)	L _i (g/yr)	L _{Ri} (g/yr)	L _{Dif} (g/yr)	(All) L _R (NC) (g/yr)	(Adult) L _R (C) (g/yr)	(Child) L _R (C) (g/yr)	(All) L _E (NC) (g/yr)	(Adult) L _E (C) (g/yr)	(Child) L _E (C) (g/yr)	(All) L _T (NC) (g/yr)	(Adult) L _T (C) (g/yr)	(Child) L _T (C) (g/yr)
Mercury (Hg+2)	7.7E-03	0.0E+00	7.5E-04	2.8E-02	3.6E-05	0.0E+00	0.0E+00	6.0E-03	0.0E+00	0.0E+00	4.2E-02	0.0E+00	0.0E+00
Mercury (MeHg)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.2E-06	0.0E+00	0.0E+00	2.6E-04	0.0E+00	0.0E+00	2.6E-04	0.0E+00	0.0E+00
Mercury (Hg0)													
Lead	4.6E-01	0.0E+00	4.4E-02	0.0E+00	1.1E-01	0.0E+00	0.0E+00	2.8E-01	0.0E+00	0.0E+00	8.9E-01	0.0E+00	0.0E+00
TCDD (2,3,7,8-)	5.9E-09	0.0E+00	5.7E-10	2.6E-09	2.0E-11	1.4E-11	2.0E-11	6.9E-09	4.6E-09	6.7E-09	1.6E-08	1.4E-08	1.6E-08

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-24
Total Water Body Concentration of COPCs in the Selected Water Body

Chemical	(All) L _T (NC) (g/yr)	(Adult) L _T (C) (g/yr)	(Child) L _T (C) (g/yr)	Vf _x (m ³ /yr)	f _{wc} ()	d _{wc} (m)	d _{bs} (m)	k _{wt} (yr ⁻¹)	A _w (m ²)	(All) C _{wtot} (NC) (mg/L)	(Adult) C _{wtot} (C) (mg/L)	(Child) C _{wtot} (C) (mg/L)
Mercury (Hg+2)	4.2E-02	0.0E+00	0.0E+00	1.65E+04	0.001	1.52	0.03	3.29E-02	4.89E+04	1.7E-05	0.0E+00	0.0E+00
Mercury (MeHg)	2.6E-04	0.0E+00	0.0E+00	1.65E+04	0.020	1.52	0.03	9.07E-02	4.89E+04	3.7E-08	0.0E+00	0.0E+00
Mercury (Hg0)												
Lead	8.9E-01	0.0E+00	0.0E+00	1.65E+04	0.053	1.52	0.03	3.12E-02	4.89E+04	2.7E-04	0.0E+00	0.0E+00
TCDD (2,3,7,8-)	1.6E-08	1.4E-08	1.6E-08	1.65E+04	0.001	1.52	0.03	4.99E-02	4.89E+04	4.2E-12	3.6E-12	4.2E-12

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-25
 Fraction of COPCs in the Water Column and Benthic Sediment

Chemical	$K_{d_{sw}}$ (L/kg)	TSS (mg/L)	d_{wc} (m)	d_{bs} (m)	d_z (m)	θ_{bs} (L _w /L)	$K_{d_{bs}}$ (L/kg)	C_{BS} (g/cm ³)	f_{bs} ()	f_{wc} ()
Mercury (Hg+2)	1.0E+05	10.0	1.52	0.03	1.55	0.60	5.0E+04	1.0	0.998	0.002
Mercury (MeHg)	1.0E+05	10.0	1.52	0.03	1.55	0.60	3.0E+03	1.0	0.967	0.033
Mercury (Hg0)										
Lead	9.0E+02	10.0	1.52	0.03	1.55	0.60	9.0E+02	1.0	0.946	0.054
TCDD (2,3,7,8-)	2.9E+05	10.0	1.52	0.03	1.55	0.60	1.6E+05	1.0	0.999	0.001

Table 5-26
Total Dissipation Rate Constants for COPCs in the Selected Water Body

Chemical	f_{wc} ()	k_v (yr^{-1})	f_{bs} ()	k_b (yr^{-1})	k_{wt} (yr^{-1})
Mercury (Hg+2)	0.002	2.5E-03	0.998	0.03	3.28E-02
Mercury (MeHg)	0.033	1.8E+00	0.967	0.03	8.94E-02
Mercury (Hg0)					
Lead	0.054	0.0E+00	0.946	0.03	3.11E-02
TCDD (2,3,7,8-)	0.001	1.3E+01	0.999	0.03	4.98E-02

Table 5-27
Water Column Volatilization Loss Rate Constants for COPCs in the Selected Water Body

Chemical	K_v (m/yr)	d_w (m)	d_b (m)	d_z (m)	$K_{d_{sw}}$ (L/kg)	TSS (mg/L)	k_v (yr ⁻¹)
Mercury (Hg+2)	7.86E-03	1.52	0.03	1.55	1.0E+05	10.0	2.5E-03
Mercury (MeHg)	5.47E+00	1.52	0.03	1.55	1.0E+05	10.0	1.8E+00
Mercury (Hg0)							
Lead	0.00E+00	1.52	0.03	1.55	9.0E+02	10.0	0.0E+00
TCDD (2,3,7,8-)	8.09E+01	1.52	0.03	1.55	2.9E+05	10.0	1.3E+01

Table 5-28
Overall Transfer Rates for COPCs in the Selected Water Body

Chemical	K_L (m/yr)	K_G (m/yr)	H (atm-m ³ /mol)	R (atm-m ³ /mol-K)	T_{wk} (K)	θ ()	K_v (m/yr)
Mercury (Hg+2)	1.21E+02	3.5E+05	7.1E-10	8.205E-05	281.0	1.026	7.9E-03
Mercury (MeHg)	1.34E+02	3.9E+05	4.7E-07	8.205E-05	281.0	1.026	5.5E+00
Mercury (Hg0)							
Lead	1.81E+02	5.0E+05	0.0E+00	8.205E-05	281.0	1.026	0.0E+00
TCDD (2,3,7,8-)	1.26E+02	6.1E+05	3.3E-05	8.205E-05	281.0	1.026	8.1E+01

Table 5-29
Liquid Phase Transfer Coefficients for COPCs in the Selected Water Body

Chemical	D_w (cm ² /s)	u (m/s)	d_z (m)	C_d ()	W (m/s)	ρ_a (g/cm ³)	ρ_w (g/cm ³)	k ()	λ_z ()	μ_w (g/cm-s)	ForQ (1or0)	K_L (m/yr)
Mercury (Hg+2)	5.3E-06	0.00	1.55	1.1E-03	4.04	1.2E-03	1.0	0.4	4	1.69E-02	0	1.2E+02
Mercury (MeHg)	6.1E-06	0.00	1.55	1.1E-03	4.04	1.2E-03	1.0	0.4	4	1.69E-02	0	1.3E+02
Mercury (Hg0)												
Lead	9.6E-06	0.00	1.55	1.1E-03	4.04	1.2E-03	1.0	0.4	4	1.69E-02	0	1.8E+02
TCDD (2,3,7,8-)	5.6E-06	0.00	1.55	1.1E-03	4.04	1.2E-03	1.0	0.4	4	1.69E-02	0	1.3E+02

Table 5-30
Gas Phase Transfer Coefficients for COPCs in the Selected Water Body

Chemical	D_a (cm^2/s)	C_d ()	W (m/s)	k ()	λ ()	μ_a (g/cm-s)	ρ_a (g/cm^3)	ForQ (1or0)	K_G (m/yr)
Mercury (Hg+2)	4.5E-02	1.1E-03	4.04	0.4	4	1.81E-04	1.2E-03	0	3.5E+05
Mercury (MeHg)	5.3E-02	1.1E-03	4.04	0.4	4	1.81E-04	1.2E-03	0	3.9E+05
Mercury (Hg0)									
Lead	7.7E-02	1.1E-03	4.04	0.4	4	1.81E-04	1.2E-03	0	5.0E+05
TCDD (2,3,7,8-)	1.0E-01	1.1E-03	4.04	0.4	4	1.81E-04	1.2E-03	0	6.1E+05

Table 5-31
Benthic Burial Rate Constants for COPCs in the Selected Water Body

X_e (kg/m ² -yr)	A_L (m ²)	SD ()	V_{f_x} (m ³ /yr)	TSS (mg/L)	A_W (m ²)	C_{BS} (kg/L)	d_{bs} (m)	k_b (yr ⁻¹)
0.77	1.30E+05	0.48	1.65E+04	10.0	4.89E+04	1.0	0.03	0.03

Table 5-32
Total Water Column Concentration of COPCs in the Selected Water Body

Chemical	f_{wc} ()	(All) C_{wctot} (NC) (mg/L)	(Adult) C_{wctot} (C) (mg/L)	(Child) C_{wctot} (C) (mg/L)	d_{wc} (m)	d_{bs} (m)	(All) C_{wctot} (NC) (mg/L)	(Adult) C_{wctot} (C) (mg/L)	(Child) C_{wctot} (C) (mg/L)
Mercury (Hg+2)	0.002	1.7E-05	0.0E+00	0.0E+00	1.52	0.03	3.5E-08	0.0E+00	0.0E+00
Mercury (MeHg)	0.033	3.6E-08	0.0E+00	0.0E+00	1.52	0.03	1.2E-09	0.0E+00	0.0E+00
Mercury (Hg0)									
Lead	0.054	2.7E-04	0.0E+00	0.0E+00	1.52	0.03	1.5E-05	0.0E+00	0.0E+00
TCDD (2,3,7,8-)	0.001	4.2E-12	3.6E-12	4.2E-12	1.52	0.03	5.5E-15	4.7E-15	5.4E-15

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-33
Dissolved Water Concentration of COPCs in the Selected Water Body

Chemical	(All) C_{wctot} (NC) (mg/L)	(Adult) C_{wctot} (C) (mg/L)	(Child) C_{wctot} (C) (mg/L)	$K_{d_{sw}}$ (L/kg)	TSS (mg/L)	(All) C_{dw} (NC) (mg/L)	(Adult) C_{dw} (C) (mg/L)	(Child) C_{dw} (C) (mg/L)
Mercury (Hg+2)	3.5E-08	0.00E+00	0.00E+00	1.0E+05	10.0	1.5E-08	0.0E+00	0.0E+00
Mercury (MeHg)	1.2E-09	0.00E+00	0.00E+00	1.0E+05	10.0	3.2E-09	0.0E+00	0.0E+00
Mercury (Hg0)								
Lead	1.5E-05	0.00E+00	0.00E+00	9.0E+02	10.0	1.5E-05	0.0E+00	0.0E+00
TCDD (2,3,7,8-)	5.5E-15	4.7E-15	5.4E-15	2.9E+05	10.0	1.4E-15	1.2E-15	1.4E-15

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-34
Concentration of COPCs Sorbed to Bed Sediment in the Selected Water Body

Chemical	f_{bs} ()	(All) C_{wtot} (NC) (mg/L)	(Adult) C_{wtot} (C) (mg/L)	(Child) C_{wtot} (C) (mg/L)	Kd_{bs} (L/kg)	θ_{bs} ()	C_{BS} (kg/L)	d_{wc} (m)	d_{bs} (m)	(All) C_{sb} (NC) (mg/L)	(Adult) C_{sb} (C) (mg/L)	(Child) C_{sb} (C) (mg/L)
Mercury (Hg+2)	0.998	1.7E-05	0.0E+00	0.0E+00	5.0E+04	0.6	1.0	1.52	0.03	8.7E-04	0.0E+00	0.0E+00
Mercury (MeHg)	0.967	3.6E-08	0.0E+00	0.0E+00	3.0E+03	0.6	1.0	1.52	0.03	1.8E-06	0.0E+00	0.0E+00
Mercury (Hg0)												
Lead	0.946	2.7E-04	0.0E+00	0.0E+00	9.0E+02	0.6	1.0	1.52	0.03	1.3E-02	0.0E+00	0.0E+00
TCDD (2,3,7,8-)	0.999	4.2E-12	3.6E-12	4.2E-12	1.6E+05	0.6	1.0	1.52	0.03	2.2E-10	1.9E-10	2.2E-10

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-35
COPC Concentrations in Above-Ground Plants Resulting From Particle Deposition
Selected Residence Location

Chemical	Dydp _{SA} (g/m ² -yr)	Dydp _M (g/m ² -yr)	Dydp (g/m ² -yr)	Fw ()	Dywp _{SA} (g/m ² -yr)	Dywp _M (g/m ² -yr)	Dywp (g/m ² -yr)	Rp ()	kp (yr ⁻¹)	Tp (yr)	Yp (kg/m ²)	Pd (mg/kg)
Mercury (Hg+2)	0.00E+00	0.00E+00	0.00E+00	0.6	0.00E+00	0.00E+00	0.00E+00	0.39	18.0	0.16	2.24	0.0E+00
Mercury (MeHg)												
Mercury (Hg0)												
Lead	0.00E+00	1.95E-05	1.95E-05	0.6	0.00E+00	2.46E-05	2.46E-05	0.39	18.0	0.16	2.24	3.1E-04
TCDD (2,3,7,8-)	8.77E-14	0.00E+00	8.77E-14	0.6	9.52E-14	0.00E+00	9.52E-14	0.39	18.0	0.16	2.24	1.3E-12

Table 5-36
COPC Concentrations in Above-Ground Plants Resulting From Particle Deposition
Selected Farm Location

Chemical	Dydp _{SA} (g/m ² -yr)	Dydp _M (g/m ² -yr)	Dydp (g/m ² -yr)	Fw ()	Dywp _{SA} (g/m ² -yr)	Dywp _M (g/m ² -yr)	Dywp (g/m ² -yr)	Rp ()	kp (yr ⁻¹)	Tp (yr)	Yp (kg/m ²)	Pd (mg/kg)
Mercury (Hg+2)	0.00E+00	0.00E+00	0.00E+00	0.6	0.00E+00	0.00E+00	0.00E+00	0.39	18.0	0.16	2.24	0.0E+00
Mercury (MeHg)												
Mercury (Hg0)												
Lead	0.00E+00	1.46E-05	1.46E-05	0.6	0.00E+00	3.41E-05	3.41E-05	0.39	18.0	0.16	2.24	3.2E-04
TCDD (2,3,7,8-)	6.26E-14	0.00E+00	6.26E-14	0.6	1.30E-13	0.00E+00	1.30E-13	0.39	18.0	0.16	2.24	1.3E-12

Table 5-37
 COPC Concentrations in Above-Ground Plants Resulting From Air-to-Plant Transfer
 Selected Residence Location

Chemical	C _{yv} (μg/m ³)	B _{v_{ag}} [(mg/kg)/(μg/g)]	ρ _a (g/m ³)	V _{G_{ag}} ()	P _v (mg/kg)
Mercury (Hg+2)	1.26E-05	1.80E+03	1.2E+03	1.00	1.5E-05
Mercury (MeHg)					4.1E-06
Mercury (Hg0)					
Lead	0.00E+00	0.0E+00	1.2E+03	1.00	0.0E+00
TCDD (2,3,7,8-)	1.79E-12	6.6E+04	1.2E+03	0.01	9.8E-13

Table 5-38
COPC Concentrations in Above-Ground Plants Resulting From Air-to-Plant Transfer
Selected Farm Location

Chemical	Cyv ($\mu\text{g}/\text{m}^3$)	Bv _{ag} [(mg/kg)/($\mu\text{g}/\text{g}$)]	ρ_a (g/m^3)	VG _{ag} ()	Pv (mg/kg)
Mercury (Hg+2)	1.01E-05	1.8E+03	1.2E+03	1.00	1.2E-05
Mercury (MeHg)					3.3E-06
Mercury (Hg0)					
Lead	0.00E+00	0.0E+00	1.2E+03	1.00	0.0E+00
TCDD (2,3,7,8-)	1.76E-12	6.6E+04	1.2E+03	0.01	9.6E-13

Table 5-39
COPC Concentrations in Above-Ground Plants Resulting From Root Uptake
Selected Residence Location

Chemical	(All) Cs _{tilled} (NC) (mg/kg)	(Adult) Cs _{tilled} (C) (mg/kg)	(Child) Cs _{tilled} (C) (mg/kg)	Br [(mg/kg)/(mg/kg)]	(All) Pr _{ag} (NC) (mg/kg)	(Adult) Pr _{ag} (C) (mg/kg)	(Child) Pr _{ag} (C) (mg/kg)
Mercury (Hg+2)	1.4E-04	0.0E+00	0.0E+00	1.45E-02	2.0E-06	0.0E+00	0.0E+00
Mercury (MeHg)	2.8E-06	0.0E+00	0.0E+00	2.94E-02	8.4E-08	0.0E+00	0.0E+00
Mercury (Hg0)							
Lead	4.3E-03	0.0E+00	0.0E+00	1.4E-02	5.8E-05	0.0E+00	0.0E+00
TCDD (2,3,7,8-)	3.2E-11	1.8E-11	3.0E-11	4.6E-03	1.5E-13	8.4E-14	1.4E-13

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-40
COPC Concentrations in Above-Ground Plants Resulting From Root Uptake
Selected Farm Location

Chemical	(All) Cs _{tilled} (NC) (mg/kg)	(Adult) Cs _{tilled} (C) (mg/kg)	(Child) Cs _{tilled} (C) (mg/kg)	Br [(mg/kg)/(mg/kg)]	(All) Pr _{ag} (NC) (mg/kg)	(Adult) Pr _{ag} (C) (mg/kg)	(Child) Pr _{ag} (C) (mg/kg)
Mercury (Hg+2)	7.1E-05	0.0E+00	0.0E+00	1.45E-02	1.0E-06	0.0E+00	0.0E+00
Mercury (MeHg)	1.4E-06	0.0E+00	0.0E+00	2.94E-02	4.2E-08	0.0E+00	0.0E+00
Mercury (Hg0)							
Lead	4.7E-03	0.0E+00	0.0E+00	1.4E-02	6.4E-05	0.0E+00	0.0E+00
TCDD (2,3,7,8-)	3.2E-11	2.0E-11	2.9E-11	4.6E-03	1.4E-13	9.3E-14	1.3E-13

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-41
COPC Concentrations in Below-Ground Plants Resulting From Root Uptake
Selected Residence Location

Chemical	(All) Cs _{tilled} (NC) (mg/kg)	(Adult) Cs _{tilled} (C) (mg/kg)	(Child) Cs _{tilled} (C) (mg/kg)	RCF ()	K _{ds} (L/kg)	Br _{root} ()	Vg _{root} ()	(All) Pr _{bg} (NC) (mg/kg)	(Adult) Pr _{bg} (C) (mg/kg)	(Child) Pr _{bg} (C) (mg/kg)
Mercury (Hg+2)	1.4E-04	0.0E+00	0.0E+00	0.0E+00	5.8E+04	3.6E-02	1.00	5.0E-06	0.0E+00	0.0E+00
Mercury (MeHg)	2.8E-06	0.0E+00	0.0E+00	0.0E+00	7.0E+03	9.9E-02	1.00	2.8E-07	0.0E+00	0.0E+00
Mercury (Hg0)										
Lead	4.3E-03	0.0E+00	0.0E+00	0.0E+00	9.0E+02	9.0E-03	1.00	3.8E-05	0.0E+00	0.0E+00
TCDD (2,3,7,8-)	3.2E-11	1.8E-11	3.0E-11	4.0E+04	3.9E+04	1.0E+00	0.01	3.3E-13	1.9E-13	3.1E-13

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-42
COPC Concentrations in Below-Ground Plants Resulting From Root Uptake
Selected Farm Location

Chemical	(All) C _s tilled(NC) (mg/kg)	(Adult) C _s tilled(C) (mg/kg)	(Child) C _s tilled(C) (mg/kg)	RCF ()	K _d _s (L/kg)	B _r root ()	V _g root ()	(All) P _r bg(NC) (mg/kg)	(Adult) P _r bg(C) (mg/kg)	(Child) P _r bg(C) (mg/kg)
Mercury (Hg+2)	7.1E-05	0.0E+00	0.0E+00	0.0E+00	5.8E+04	3.6E-02	1.00	2.5E-06	0.0E+00	0.0E+00
Mercury (MeHg)	1.4E-06	0.0E+00	0.0E+00	0.0E+00	7.0E+03	9.9E-02	1.00	1.4E-07	0.0E+00	0.0E+00
Mercury (Hg0)										
Lead	4.7E-03	0.0E+00	0.0E+00	0.0E+00	9.0E+02	9.0E-03	1.00	4.3E-05	0.0E+00	0.0E+00
TCDD (2,3,7,8-)	3.2E-11	2.0E-11	2.9E-11	4.0E+04	3.9E+04	1.0E+00	0.01	3.2E-13	2.1E-13	3.0E-13

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-43
COPC Concentrations in Forage and Silage Resulting From Direct Particle Deposition
Selected Farm Location

Chemical	Dydp _{SA} (g/m ² -yr)	Dydp _M (g/m ² -yr)	Dydp (g/m ² -yr)	Fw ()	Dywp _{SA} (g/m ² -yr)	Dywp _M (g/m ² -yr)	Dywp (g/m ² -yr)	kp (yr ⁻¹)	Rp _{forage} ()	Tp _{forage} (yr)	Yp _{forage} (kg/m ²)	Pd _{forage} (mg/kg)	Rp _{silage} ()	Tp _{silage} (yr)	Yp _{silage} (kg/m ²)	Pd _{silage} (mg/kg)
Mercury (Hg+2)	0.00E+00	0.00E+00	0.00E+00	0.6	0.00E+00	0.00E+00	0.00E+00	18	0.5	0.12	0.24	0.0E+00	0.46	0.16	0.80	0.0E+00
Mercury (MeHg)																
Mercury (Hg0)																
Lead	0.00E+00	1.46E-05	1.46E-05	0.6	0.00E+00	3.41E-05	3.41E-05	18	0.5	0.12	0.24	3.6E-03	0.46	0.16	0.80	1.1E-03
TCDD (2,3,7,8-)	6.26E-14	0.00E+00	6.26E-14	0.6	1.30E-13	0.00E+00	1.30E-13	18	0.5	0.12	0.24	1.4E-11	0.46	0.16	0.80	4.2E-12

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Note: Methylmercury is not present in facility emissions.

Table 5-44
 COPC Concentrations in Forage and Silage Resulting From Air-to-Plant Transfer
 Selected Farm Location

Chemical	Cyv ($\mu\text{g}/\text{m}^3$)	BV _{ag} [(mg/kg)/($\mu\text{g}/\text{g}$)]	ρ_a (g/m^3)	VG _{ag(forage)} ()	PV _{forage} (mg/kg)	VG _{ag(silage)} ()	PV _{silage} (mg/kg)
Mercury (Hg+2)	1.01E-05	1.8E+03	1.2E+03	1.0	1.2E-05	0.5	5.0E-06
Mercury (MeHg)					3.3E-06		1.4E-06
Mercury (Hg0)							
Lead	0.00E+00	0.0E+00	1.2E+03	1.0	0.0E+00	0.5	0.0E+00
TCDD (2,3,7,8-)	1.76E-12	6.6E+04	1.2E+03	1.0	9.6E-11	0.5	4.8E-11

Note: Methylmercury is not present in facility emissions.

Table 5-45
COPC Concentrations in Forage, Silage and Grain Resulting From Root Uptake
Selected Farm Location

Chemical	(All)	(Adult)	(Child)	(All)	(Adult)	(Child)	Br _{forage/silage} [(mg/kg)/(mg/kg)]	Br _{grain}	All (NC)			Adult (C)			Child (C)		
	C _{stilled} (NC) (mg/kg)	C _{stilled} (C) (mg/kg)	C _{stilled} (C) (mg/kg)	C _{untilled} (NC) (mg/kg)	C _{untilled} (C) (mg/kg)	C _{untilled} (C) (mg/kg)			Pr _{forage} (mg/kg)	Pr _{silage} (mg/kg)	Pr _{grain} (mg/kg)	Pr _{forage} (mg/kg)	Pr _{silage} (mg/kg)	Pr _{grain} (mg/kg)	Pr _{forage} (mg/kg)	Pr _{silage} (mg/kg)	Pr _{grain} (mg/kg)
Mercury (Hg+2)	7.1E-05	0.0E+00	0.0E+00	7.0E-04	0.0E+00	0.0E+00	0.0E+00	9.3E-03	0.0E+00	0.0E+00	6.6E-07	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Mercury (MeHg)	1.4E-06	0.0E+00	0.0E+00	1.4E-05	0.0E+00	0.0E+00	0.0E+00	1.9E-02	0.0E+00	0.0E+00	2.7E-08	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Mercury (Hg0)																	
Lead	4.7E-03	0.0E+00	0.0E+00	3.7E-02	0.0E+00	0.0E+00	4.5E-02	9.0E-03	1.7E-03	1.7E-03	4.3E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TCDD (2,3,7,8-)	3.2E-11	2.0E-11	2.9E-11	3.0E-10	1.9E-10	2.8E-10	4.6E-03	4.6E-03	1.3E-12	1.3E-12	1.4E-13	8.7E-13	8.7E-13	9.3E-14	1.3E-12	1.3E-12	1.3E-13

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-46
Total COPC Concentrations in Forage, Silage and Grain Based on Potential Carcinogenic Endpoints
Selected Farm Location

Chemical	Forage						Silage						Grain					
	Pd _{forage} (mg/kg)	Pv _{forage} (mg/kg)	(Adult) Pr _{forage} (C) (mg/kg)	(Child) Pr _{forage} (C) (mg/kg)	(Adult) P _{forage} (C) (mg/kg)	(Child) P _{forage} (C) (mg/kg)	Pd _{silage} (mg/kg)	Pv _{silage} (mg/kg)	(Adult) Pr _{silage} (C) (mg/kg)	(Child) Pr _{silage} (C) (mg/kg)	(Adult) P _{silage} (C) (mg/kg)	(Child) P _{silage} (C) (mg/kg)	Pd _{grain} (mg/kg)	Pv _{grain} (mg/kg)	(Adult) Pr _{grain} (C) (mg/kg)	(Child) Pr _{grain} (C) (mg/kg)	(Adult) P _{grain} (C) (mg/kg)	(Child) P _{grain} (C) (mg/kg)
Mercury (Hg+2)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	na	na	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Mercury (MeHg)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	na	na	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Mercury (Hg0)																		
Lead	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	na	na	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TCDD (2,3,7,8-)	1.4E-11	9.6E-11	8.7E-13	1.3E-12	1.1E-10	1.1E-10	4.2E-12	4.8E-11	8.7E-13	1.3E-12	5.3E-11	5.4E-11	na	na	9.3E-14	1.3E-13	9.3E-14	1.3E-13

Table 5-47
Total COPC Concentrations in Forage, Silage and Grain Based on Potential Noncarcinogenic Endpoints
Selected Farm Location

Chemical	Forage				Silage				Grain			
	P _d _{forage} (mg/kg)	P _v _{forage} (mg/kg)	P _r _{forage} (NC) (mg/kg)	P _{forage} (NC) (mg/kg)	P _d _{silage} (mg/kg)	P _v _{silage} (mg/kg)	P _r _{silage} (NC) (mg/kg)	P _{silage} (NC) (mg/kg)	P _d _{grain} (mg/kg)	P _v _{grain} (mg/kg)	P _r _{grain} (NC) (mg/kg)	P _{grain} (NC) (mg/kg)
Mercury (Hg+2)	0.0E+00	1.2E-05	0.0E+00	1.2E-05	0.0E+00	5.0E-06	0.0E+00	5.0E-06	na	na	6.6E-07	6.6E-07
Mercury (MeHg)	0.0E+00	3.3E-06	0.0E+00	3.3E-06	0.0E+00	1.4E-06	0.0E+00	1.4E-06	na	na	2.7E-08	2.7E-08
Mercury (Hg0)												
Lead	3.6E-03	0.0E+00	1.7E-03	5.2E-03	1.1E-03	0.0E+00	1.7E-03	2.7E-03	na	na	4.3E-05	4.3E-05
TCDD (2,3,7,8-)	1.4E-11	9.6E-11	1.3E-12	1.1E-10	4.2E-12	4.8E-11	1.3E-12	5.4E-11	na	na	1.4E-13	1.4E-13

Table 5-48
Livestock Exposure Parameters Used in the HHRA^A

Parameter	Symbol	Units	Livestock			
			Beef Cattle	Dairy Cattle	Pigs	Poultry
Consumption Rate of Soil	Q _s	kg/d	0.50	0.4	0.37	0.022
Consumption Rate of Plant Material (Grain)	Q _{p_i}	kg DW/d	0.47	3	3.3	0.2
Consumption Rate of Plant Material (Forage)	Q _{p_i}	kg DW/d	8.8	13.2	0	0
Consumption Rate of Plant Material (Silage)	Q _{p_i}	kg DW/d	2.5	4.1	1.4	0
Fraction of Plant Material Contaminated	F _i	()	1.0	1.0	1.0	1.0

^A Unless otherwise noted, parameter values are from USEPA, 2005.

Table 5-49
COPC Concentrations in Beef Tissue Resulting From Feed and Soil Ingestion Based on Potential Carcinogenic Endpoints
Selected Farm Location

Chemical	(Adult) C _{S(untilled)} (C) (mg/kg)	(Child) C _{S(untilled)} (C) (mg/kg)	Q _s (kg/d)	B _s ()	(Adult) P _{forage} (C) (mg/kg)	(Child) P _{forage} (C) (mg/kg)	(Adult) P _{silage} (C) (mg/kg)	(Child) P _{silage} (C) (mg/kg)	(Adult) P _{grain} (C) (mg/kg)	(Child) P _{grain} (C) (mg/kg)	Q _{pforage} (kg/d)	Q _{psilage} (kg/d)	Q _{pgrain} (kg/d)	F _{for} ()	F _{sil} ()	F _{gr} ()	F _{soil} ()	B _a beef (d/kg)	MF ()	(Adult) A _{beef} (C) (mg/kg)	(Child) A _{beef} (C) (mg/kg)
Mercury (Hg+2)	0.0E+00	0.0E+00	0.50	1.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	8.8	2.5	0.47	1.0	1.0	1.0	1.0	5.2E-03	1.00	0.0E+00	0.0E+00
Mercury (MeHg)	0.0E+00	0.0E+00	0.50	1.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	8.8	2.5	0.47	1.0	1.0	1.0	1.0	7.8E-04	1.00	0.0E+00	0.0E+00
Mercury (Hg0)																					
Lead	0.0E+00	0.0E+00	0.50	1.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	8.8	2.5	0.47	1.0	1.0	1.0	1.0	3.0E-04	1.00	0.0E+00	0.0E+00
TCDD (2,3,7,8-)	1.9E-10	2.8E-10	0.50	1.0	1.1E-10	1.1E-10	5.3E-11	5.4E-11	9.3E-14	1.3E-13	8.8	2.5	0.47	1.0	1.0	1.0	1.0	2.6E-02	1.00	3.2E-11	3.3E-11

Table 5-50
COPC Concentrations in Beef Tissue Resulting From Feed and Soil Ingestion Based on Potential Noncarcinogenic Endpoints
Selected Farm Location

Chemical	CS _{untilled(NC)} (mg/kg)	Qs (kg/d)	Bs ()	P _{forage} (mg/kg)	P _{silage} (mg/kg)	P _{grain} (mg/kg)	Qp _{forage} (kg/d)	Qp _{silage} (kg/d)	Qp _{grain} (kg/d)	F _{for} ()	F _{sil} ()	F _{gr} ()	F _{soil} ()	Ba _{beef} (d/kg)	MF ()	A _{beef (NC)} (mg/kg)
Mercury (Hg+2)	7.0E-04	0.50	1.0	1.2E-05	5.0E-06	6.6E-07	8.8	2.5	0.47	1.0	1.0	1.0	1.0	5.2E-03	1.00	2.4E-06
Mercury (MeHg)	1.4E-05	0.50	1.0	3.3E-06	1.4E-06	2.7E-08	8.8	2.5	0.47	1.0	1.0	1.0	1.0	7.8E-04	1.00	3.1E-08
Mercury (Hg0)																
Lead	3.7E-02	0.50	1.0	5.2E-03	2.7E-03	4.3E-05	8.8	2.5	0.47	1.0	1.0	1.0	1.0	3.0E-04	1.00	2.1E-05
TCDD (2,3,7,8-)	3.0E-10	0.50	1.0	1.1E-10	5.4E-11	1.4E-13	8.8	2.5	0.47	1.0	1.0	1.0	1.0	2.61E-02	1.00	3.3E-11

Table 5-51
COPC Concentrations in Milk Resulting From Feed and Soil Ingestion by Dairy Cattle Based on Potential Carcinogenic Endpoints
Selected Farm Location

Chemical	(Adult) C _{S(untilled)} (C) (mg/kg)	(Child) C _{S(untilled)} (C) (mg/kg)	Q _s (kg/d)	B _s ()	(Adult) P _{forage} (C) (mg/kg)	(Child) P _{forage} (C) (mg/kg)	(Adult) P _{silage} (C) (mg/kg)	(Child) P _{silage} (C) (mg/kg)	(Adult) P _{grain} (C) (mg/kg)	(Child) P _{grain} (C) (mg/kg)	Q _{pforage} (kg/d)	Q _{psilage} (kg/d)	Q _{pgrain} (kg/d)	F _{for} ()	F _{sil} ()	F _{gr} ()	F _{soil} ()	B _a _{milk} (d/kg)	MF ()	(Adult) A _{milk} (C) (mg/kg)	(Child) A _{milk} (C) (mg/kg)
Mercury (Hg+2)	0.0E+00	0.0E+00	0.40	1.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	13.2	4.1	3.0	1.0	1.0	1.0	1.0	2.26E-03	1.00	0.0E+00	0.0E+00
Mercury (MeHg)	0.0E+00	0.0E+00	0.40	1.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	13.2	4.1	3.0	1.0	1.0	1.0	1.0	3.38E-04	1.00	0.0E+00	0.0E+00
Mercury (Hg0)																					
Lead	0.0E+00	0.0E+00	0.40	1.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	13.2	4.1	3.0	1.0	1.0	1.0	1.0	2.50E-04	1.00	0.0E+00	0.0E+00
TCDD (2,3,7,8-)	1.9E-10	2.8E-10	0.40	1.0	1.1E-10	1.1E-10	5.3E-11	5.4E-11	9.3E-14	1.3E-13	13.2	4.1	3.0	1.0	1.0	1.0	1.0	5.50E-03	1.00	9.7E-12	9.9E-12

Table 5-52
COPC Concentrations in Milk Resulting From Feed and Soil Ingestion by Dairy Cattle Based on Potential Noncarcinogenic Endpoints
Selected Farm Location

Chemical	CS _{(untilled)(NC)} (mg/kg)	Qs (kg/d)	Bs ()	P _{forage} (mg/kg)	P _{silage} (mg/kg)	P _{grain} (mg/kg)	Qp _{forage} (kg/d)	Qp _{silage} (kg/d)	Qp _{grain} (kg/d)	F _{water} ()	F _{for} ()	F _{sil} ()	F _{gr} ()	F _{soil} ()	Ba _{milk} (d/kg)	MF ()	A _{milk} (NC) (mg/kg)
Mercury (Hg+2)	7.0E-04	0.40	1.0	1.2E-05	5.0E-06	6.6E-07	13.2	4.1	3.0	1.0	1.0	1.0	1.0	1.0	2.26E-03	1.00	1.0E-06
Mercury (MeHg)	1.4E-05	0.40	1.0	3.3E-06	1.4E-06	2.7E-08	13.2	4.1	3.0	1.0	1.0	1.0	1.0	1.0	3.38E-04	1.00	1.9E-08
Mercury (Hg0)																	
Lead	3.7E-02	0.40	1.0	5.2E-03	2.7E-03	4.3E-05	13.2	4.1	3.0	1.0	1.0	1.0	1.0	1.0	2.50E-04	1.00	2.4E-05
TCDD (2,3,7,8-)	3.0E-10	0.40	1.0	1.1E-10	5.4E-11	1.4E-13	13.2	4.1	3.0	1.0	1.0	1.0	1.0	1.0	5.50E-03	1.00	1.0E-11

Table 5-53
COPC Concentrations in Pork Resulting From Feed and Soil Ingestion Based on Potential Carcinogenic Endpoints
Selected Farm Location

Chemical	(Adult) Cs _{(untilled)(C)} (mg/kg)	(Child) Cs _{(untilled)(C)} (mg/kg)	Qs (kg/d)	Bs ()	(Adult) P _{silage (C)} (mg/kg)	(Child) P _{silage (C)} (mg/kg)	(Adult) P _{grain (C)} (mg/kg)	(Child) P _{grain (C)} (mg/kg)	Qp _{silage} (kg/d)	Qp _{grain} (kg/d)	F _{sil} ()	F _{gr} ()	F _{soil} ()	Ba _{pork} (d/kg)	MF ()	(Adult) A _{pork (C)} (mg/kg)	(Child) A _{pork (C)} (mg/kg)
Mercury (Hg+2)	0.0E+00	0.0E+00	0.37	1.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.4	3.3	1.0	1.0	1.0	3.39E-05	1.00	0.0E+00	0.0E+00
Mercury (MeHg)	0.0E+00	0.0E+00	0.37	1.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.4	3.3	1.0	1.0	1.0	5.07E-06	1.00	0.0E+00	0.0E+00
Mercury (Hg0)																	
Lead	0.0E+00	0.0E+00	0.37	1.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.4	3.3	1.0	1.0	1.0	0.00E+00	1.00	0.0E+00	0.0E+00
TCDD (2,3,7,8-)	1.9E-10	2.8E-10	0.37	1.0	5.3E-11	5.4E-11	9.3E-14	1.3E-13	1.4	3.3	1.0	1.0	1.0	3.16E-02	1.00	4.6E-12	5.6E-12

Table 5-54
 COPC Concentrations in Pork Resulting From Feed and Soil Ingestion Based on Potential Noncarcinogenic Endpoints
 Selected Farm Location

Chemical	CS _(untilled) (NC) (mg/kg)	Qs (kg/d)	Bs ()	P _{silage} (mg/kg)	P _{grain} (mg/kg)	Qp _{silage} (kg/d)	Qp _{grain} (kg/d)	F _{sil} ()	F _{gr} ()	F _{soil} ()	Ba _{pork} (d/kg)	MF ()	A _{pork} (NC) (mg/kg)
Mercury (Hg+2)	7.0E-04	0.37	1.0	5.0E-06	6.6E-07	1.4	3.3	1.0	1.0	1.0	3.39E-05	1.00	9.1E-09
Mercury (MeHg)	1.4E-05	0.37	1.0	1.4E-06	2.7E-08	1.4	3.3	1.0	1.0	1.0	5.07E-06	1.00	3.6E-11
Mercury (Hg0)													
Lead	3.7E-02	0.37	1.0	2.7E-03	4.3E-05	1.4	3.3	1.0	1.0	1.0	0.00E+00	1.00	0.0E+00
TCDD (2,3,7,8-)	3.0E-10	0.37	1.0	5.4E-11	1.4E-13	1.4	3.3	1.0	1.0	1.0	3.16E-02	1.00	5.8E-12

Table 5-55
COPC Concentrations in Eggs Resulting From Feed and Soil Ingestion Based on Potential Carcinogenic Endpoints
Selected Farm Location

Chemical	(Adult) $C_{S(\text{untilled})}(C)$ (mg/kg)	(Child) $C_{S(\text{untilled})}(C)$ (mg/kg)	F_{soil} ()	Q_s (kg/d)	B_s ()	(Adult) $P_{\text{grain}}(C)$ (mg/kg)	(Child) $P_{\text{grain}}(C)$ (mg/kg)	F_{gr} ()	$Q_{p_{\text{grain}}}$ (kg/d)	$B_{a_{\text{egg}}}$ (d/kg FW)	(Adult) $A_{\text{eggs}}(C)$ (mg/kg FW)	(Child) $A_{\text{eggs}}(C)$ (mg/kg FW)
Mercury (Hg+2)	0.0E+00	0.0E+00	1.0	0.022	1.0	0.0E+00	0.0E+00	1.0	0.20	2.4E-02	0.0E+00	0.0E+00
Mercury (MeHg)	0.0E+00	0.0E+00	1.0	0.022	1.0	0.0E+00	0.0E+00	1.0	0.20	3.6E-03	0.0E+00	0.0E+00
Mercury (Hg0)												
Lead	0.0E+00	0.0E+00	1.0	0.022	1.0	0.0E+00	0.0E+00	1.0	0.20	0.0E+00	0.0E+00	0.0E+00
TCDD (2,3,7,8-)	1.9E-10	2.8E-10	1.0	0.022	1.0	9.3E-14	1.3E-13	1.0	0.20	1.1E-02	4.7E-14	6.7E-14

Table 5-56
COPC Concentrations in Eggs Resulting from Feed and Soil Ingestion Based on Potential Noncarcinogenic Endpoints
Selected Farm Location

Chemical	CS _(untilled) (NC) (mg/kg)	F _{soil} ()	Qs (kg/d)	Bs ()	P _{grain} (mg/kg)	F _{grain} ()	Qp _{grain} (kg/d)	Ba _{egg} (d/kg FW)	A _{eggs} (NC) (mg/kg FW)
Mercury (Hg+2)	7.0E-04	1.0	0.022	1.0	6.6E-07	1.0	0.20	2.4E-02	3.7E-07
Mercury (MeHg)	1.4E-05	1.0	0.022	1.0	2.7E-08	1.0	0.20	3.6E-03	1.1E-09
Mercury (Hg0)									
Lead	3.7E-02	1.0	0.022	1.0	4.3E-05	1.0	0.20	0.0E+00	0.0E+00
TCDD (2,3,7,8-)	3.0E-10	1.0	0.022	1.0	1.4E-13	1.0	0.20	1.1E-02	7.2E-14

Table 5-57
COPC Concentrations in Poultry Meat Resulting From Feed and Soil Ingestion Based on Potential Carcinogenic Endpoints
Selected Farm Location

Chemical	(Adult) $C_{S_{(untilled)}}(C)$ (mg/kg)	(Child) $C_{S_{(untilled)}}(C)$ (mg/kg)	F_{soil} ()	Q_s (kg/d)	B_s ()	(Adult) $P_{grain}(C)$ (mg/kg)	(Child) $P_{grain}(C)$ (mg/kg)	F_{gr} ()	$Q_{p_{grain}}$ (kg/d)	$B_{a_{poultry}}$ ()	(Adult) $A_{poultry}(C)$ (mg/kg FW)	(Child) $A_{poultry}(C)$ (mg/kg FW)
Mercury (Hg+2)	0.0E+00	0.0E+00	1.0	0.022	1.0	0.0E+00	0.0E+00	1.0	0.20	2.4E-02	0.0E+00	0.0E+00
Mercury (MeHg)	0.0E+00	0.0E+00	1.0	0.022	1.0	0.0E+00	0.0E+00	1.0	0.20	3.6E-03	0.0E+00	0.0E+00
Mercury (Hg0)												
Lead	0.0E+00	0.0E+00	1.0	0.022	1.0	0.0E+00	0.0E+00	1.0	0.20	0.0E+00	0.0E+00	0.0E+00
TCDD (2,3,7,8-)	1.9E-10	2.8E-10	1.0	0.022	1.0	9.3E-14	1.3E-13	1.0	0.20	1.9E-02	8.2E-14	1.2E-13

Table 5-58
COPC Concentrations in Poultry Meat Resulting From Feed and Soil Ingestion Based on Potential Noncarcinogenic Endpoints
Selected Farm Location

Chemical	$C_{S(\text{untilled})}(\text{NC})$ (mg/kg)	F_{soil} ()	Q_s (kg/d)	B_s ()	P_{grain} (mg/kg)	F_{grain} ()	$Q_{p_{\text{grain}}}$ (kg/d)	$B_{a_{\text{poultry}}}$ ()	$A_{\text{poultry}}(\text{NC})$ (mg/kg FW)
Mercury (Hg+2)	7.0E-04	1.0	0.022	1.0	6.6E-07	1.0	0.20	2.4E-02	3.7E-07
Mercury (MeHg)	1.4E-05	1.0	0.022	1.0	2.7E-08	1.0	0.20	3.6E-03	1.1E-09
Mercury (Hg0)									
Lead	3.7E-02	1.0	0.022	1.0	4.3E-05	1.0	0.20	0.0E+00	0.0E+00
TCDD (2,3,7,8-)	3.0E-10	1.0	0.022	1.0	1.4E-13	1.0	0.20	1.9E-02	1.3E-13

Table 5-59
COPC Concentrations in Fish Tissue From the Selected Water Body Based on Potential Carcinogenic Endpoints

Chemical	(Adult)	(Child)	(Adult)	(Child)	f_{lipid} ()	OC_{sed} (g/g)	BCF (L/kg)	BAF (L/kg)	BSAF ()	Fisher				Fisher Child			
	C_{dw} (C) (mg/L)	C_{dw} (C) (mg/L)	C_{sb} (C) (mg/L)	C_{sb} (C) (mg/L)						C_{fish} (C) BCF	C_{fish} (C) BAF	C_{fish} (C) BSAF	C_{fish} (C) (mg/kg)	C_{fish} (C) BCF	C_{fish} (C) BAF	C_{fish} (C) BSAF	C_{fish} (C) (mg/kg)
Mercury (Hg+2)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.07	0.04	0.0E+00	1.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Mercury (MeHg)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.07	0.04	0.0E+00	5.6E+06	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Mercury (Hg0)																	
Lead	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.07	0.04	9.0E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TCDD (2,3,7,8-)	1.2E-15	1.4E-15	1.9E-10	2.2E-10	0.07	0.04	3.4E+04	0.0E+00	9.0E-02	4.1E-11	0.0E+00	2.9E-11	4.1E-11	4.8E-11	0.0E+00	3.4E-11	4.8E-11

Table 5-60
COPC Concentrations in Fish Tissue From the Selected Water Body Based on Potential Noncarcinogenic Endpoints

Chemical	(All) C_{dw} (NC) (mg/L)	(All) C_{sb} (NC) (mg/L)	f_{lipid} ()	OC_{sed} (g/g)	BCF (L/kg)	BAF (L/kg)	BSAF ()	C_{fish} (NC) BCF	C_{fish} (NC) BAF	C_{fish} (NC) BSAF	C_{fish} (NC) (mg/kg)	C_{wctot} (NC) (mg/L)	C_{wctot} (NC) [Combined] (mg/L)	BAF (L/kg)	C_{fish} (NC) (mg/kg)
	USEPA Approach											MDEQ Approach			
Mercury (Hg+2)	1.5E-08	8.7E-04	0.07	0.04	0.0E+00	1.0E+00	0.0E+00	0.0E+00	1.5E-08	0.0E+00	1.5E-08	3.5E-08			
Mercury (MeHg)	3.2E-09	1.8E-06	0.07	0.04	0.0E+00	5.6E+06	0.0E+00	0.0E+00	1.8E-02	0.0E+00	1.8E-02	1.2E-09	3.6E-08	1.1E+05	4.1E-03
Mercury (Hg0)															
Lead	1.5E-05	1.3E-02	0.07	0.04	9.0E-02	0.0E+00	0.0E+00	1.3E-06	0.0E+00	0.0E+00	1.3E-06				1.3E-06
TCDD (2,3,7,8-)	1.4E-15	2.2E-10	0.07	0.04	3.4E+04	0.0E+00	9.0E-02	4.8E-11	0.0E+00	3.4E-11	4.8E-11				4.8E-11

Table 5-61
Bioaccumulation Factors for Modeling Fish Tissue Concentrations of Mercury

Parameter	MDEQ Daily Fish Intake ^A (g/d)	Fractional Intake ()	MDEQ BAF ^B (L/kg)	TL-Adjusted MDEQ BAF (L/kg)	USEPA BAF ^C (L/kg)	TL-Adjusted USEPA BAF (L/kg)
Trophic Level 4	11.4	0.76	1.40E+05	1.06E+05	6.80E+06	5.17E+06
Trophic Level 3	3.6	0.24	2.79E+04	6.70E+03	1.60E+06	3.84E+05
Total	15.0	1.00		1.13E+05		5.55E+06

^A Average for Michigan sports anglers and sports-caught fish.

^B Per the MDEQ water quality standards derivation protocol [Bob Sills, Personal Communication]

^C Mercury Study Report to Congress [USEPA, 1997].

Table 5-62
Exposure Parameters Considered in the HHRA

Parameter ^A	Symbol	Units	Resident	Resident Child	Recreational Fisher	Fisher Child	Nursing Infant
Daily Consumption Rate of Soil	CR _{soil}	g/d	0.1	0.2	0.1	0.2	
Fraction of Soil Contaminated	F _{soil}	()	1	1	1	1	
Daily Consumption Rate of Fish (Recreational Fisher) ^B	CR _{fish}	g FW/d	0	0	15	2.3	
Daily Consumption Rate of Trophic Level 3 Fish ^B	CR _{fish}	g FW/d	0	0	3.6	0.54	
Daily Consumption Rate of Trophic Level 4 Fish ^B	CR _{fish}	g FW/d	0	0	11.4	1.71	
Fraction of Fish Contaminated ^B	F _{fish}	()	1	1	1	1	
Daily Consumption Rate (Above-Ground Produce)	CR _{ag}	g DW/d	22.4	11.55	22.4	11.55	
Daily Consumption Rate (Below-Ground Produce)	CR _{bg}	g DW/d	9.8	3.45	9.8	3.45	
Daily Consumption Rate (Prot. Above-Ground Produce)	CR _{pp}	g DW/d	42.7	22.5	42.7	22.5	
Fraction of Produce Contaminated	F _{ag}	()	1	1	1	1	
Exposure Frequency	EF	d/yr	350	350	350	350	
Exposure Duration	ED	yr	30	6	30	6	
Body Weight	BW	kg	70	15	70	15	
Averaging Time (Non-Carcinogens)	AT _{nc}	yr	30	6	30	6	
Breast Milk Exposure to Dioxins							
Half-life of Dioxins in Adults	h	d					2555
Fraction of Ingested Dioxin Stored in Fat	f ₁	()					0.9
Fraction of Mother's Weight as Fat	f ₂	()					0.3
Fraction of Mother's Breast Milk as Fat	f ₃	()					0.04
Fraction of Ingested COPC Absorbed	f ₄	()					0.9
Ingestion Rate - Breast Milk	IR _{milk}	kg/d					0.688
Exposure Duration - Breast Milk	ED	yr					1
Body Weight - Nursing Infant	BW _{infant}	kg					9.4
Averaging Time - Nursing Infant	AT	yr					1

^A Unless otherwise noted, values are from USEPA, 2005.

^B Fish consumption rates for adults recommended by Bob Sills, MDEQ AQD based on average value for recreational Michigan fishermen.

Table 5-63
 Daily Intake of COPCs Resulting From the Incidental Ingestion of Soil
 Resident and Fisher

Chemical	Cs _{untilled} (C) (mg/kg)	Cs _{untilled} (NC) (mg/kg)	CR _{soil} (kg/d)	F _{soil} ()	I _{soil} (C) (mg/d)	I _{soil} (NC) (mg/d)
Mercury (Hg+2)	0.0E+00	1.4E-03	0.0001	1.0	0.0E+00	1.4E-07
Mercury (MeHg)	0.0E+00	2.7E-05	0.0001	1.0	0.0E+00	2.7E-09
Mercury (Hg0)	0.0E+00	0.0E+00	0.0001	1.0	0.0E+00	0.0E+00
Lead	0.0E+00	3.3E-02	0.0001	1.0	0.0E+00	3.3E-06
TCDD (2,3,7,8-)	1.8E-10	3.0E-10	0.0001	1.0	1.8E-14	3.0E-14

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-64
 Daily Intake of COPCs Resulting From the Incidental Ingestion of Soil
 Resident Child and Fisher Child

Chemical	C _{s_{untilled}} (C) (mg/kg)	C _{s_{untilled}} (NC) (mg/kg)	CR _{soil} (kg/d)	F _{soil} ()	I _{soil} (C) (mg/d)	I _{soil} (NC) (mg/d)
Mercury (Hg+2)	0.0E+00	1.4E-03	0.0002	1.0	0.0E+00	2.8E-07
Mercury (MeHg)	0.0E+00	2.7E-05	0.0002	1.0	0.0E+00	5.5E-09
Mercury (Hg0)	0.0E+00	0.0E+00	0.0002	1.0	0.0E+00	0.0E+00
Lead	0.0E+00	3.3E-02	0.0002	1.0	0.0E+00	6.6E-06
TCDD (2,3,7,8-)	2.8E-10	3.0E-10	0.0002	1.0	5.7E-14	6.0E-14

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-65
Daily Intake of COPCs Resulting From the Incidental Ingestion of Soil
Farmer

Chemical	Cs _{untilled} (C) (mg/kg)	Cs _{untilled} (NC) (mg/kg)	CR _{soil} (kg/d)	F _{soil} ()	I _{soil} (C) (mg/d)	I _{soil} (NC) (mg/d)
Mercury (Hg+2)	0.0E+00	7.0E-04	0.0001	1.0	0.0E+00	7.0E-08
Mercury (MeHg)	0.0E+00	1.4E-05	0.0001	1.0	0.0E+00	1.4E-09
Mercury (Hg0)	0.0E+00	0.0E+00	0.0001	1.0	0.0E+00	0.0E+00
Lead	0.0E+00	3.7E-02	0.0001	1.0	0.0E+00	3.7E-06
TCDD (2,3,7,8-)	1.9E-10	3.0E-10	0.0001	1.0	1.9E-14	3.0E-14

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-66
Daily Intake of COPCs Resulting From the Incidental Ingestion of Soil
Farmer Child

Chemical	Cs _{untilled} (C) (mg/kg)	Cs _{untilled} (NC) (mg/kg)	CR _{soil} (kg/d)	F _{soil} ()	I _{soil} (C) (mg/d)	I _{soil} (NC) (mg/d)
Mercury (Hg+2)	0.0E+00	7.0E-04	0.0002	1.0	0.0E+00	1.4E-07
Mercury (MeHg)	0.0E+00	1.4E-05	0.0002	1.0	0.0E+00	2.8E-09
Mercury (Hg0)	0.0E+00	0.0E+00	0.0002	1.0	0.0E+00	0.0E+00
Lead	0.0E+00	3.7E-02	0.0002	1.0	0.0E+00	7.3E-06
TCDD (2,3,7,8-)	2.8E-10	3.0E-10	0.0002	1.0	5.5E-14	5.9E-14

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-67
Daily Intake of COPCs Resulting From the Ingestion of Homegrown Produce
Resident and Fisher

Chemical	Pd (mg/kg)	Pv (mg/kg)	Pr _{ag} (C) (mg/kg)	Pr _{ag} (NC) (mg/kg)	Pr _{bg} (C) (mg/kg)	Pr _{bg} (NC) (mg/kg)	CR _{ag} (kg/d)	CR _{pp} (kg/d)	CR _{bg} (kg/d)	F _{veg} ()	I _{veg} (C) (mg/d)	I _{veg} (NC) (mg/d)
Mercury (Hg+2)	0.0E+00	1.5E-05	0.0E+00	2.0E-06	0.0E+00	5.0E-06	0.0224	0.0427	0.0098	1.0	0.0E+00	5.1E-07
Mercury (MeHg)	0.0E+00	4.1E-06	0.0E+00	8.4E-08	0.0E+00	2.8E-07	0.0224	0.0427	0.0098	1.0	0.0E+00	1.0E-07
Mercury (Hg0)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0224	0.0427	0.0098	1.0	0.0E+00	0.0E+00
Lead	3.1E-04	0.0E+00	0.0E+00	5.8E-05	0.0E+00	3.8E-05	0.0224	0.0427	0.0098	1.0	0.0E+00	1.1E-05
TCDD (2,3,7,8-)	1.3E-12	9.8E-13	8.4E-14	1.5E-13	1.9E-13	3.3E-13	0.0224	0.0427	0.0098	1.0	5.9E-14	6.4E-14

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-68
Daily Intake of COPCs Resulting From the Ingestion of Homegrown Produce
Resident Child and Fisher Child

Chemical	Pd (mg/kg)	Pv (mg/kg)	Pr _{ag} (C) (mg/kg)	Pr _{ag} (NC) (mg/kg)	Pr _{bg} (C) (mg/kg)	Pr _{bg} (NC) (mg/kg)	CR _{ag} (kg/d)	CR _{pp} (kg/d)	CR _{bg} (kg/d)	F _{veg} ()	I _{veg} (C) (mg/d)	I _{veg} (NC) (mg/d)
Mercury (Hg+2)	0.0E+00	1.5E-05	0.0E+00	2.0E-06	0.0E+00	5.0E-06	0.01155	0.0225	0.00345	1.0	1.7E-07	2.6E-07
Mercury (MeHg)	0.0E+00	4.1E-06	0.0E+00	8.4E-08	0.0E+00	2.8E-07	0.01155	0.0225	0.00345	1.0	4.8E-08	5.2E-08
Mercury (Hg0)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.01155	0.0225	0.00345	1.0	0.0E+00	0.0E+00
Lead	3.1E-04	0.0E+00	0.0E+00	5.8E-05	0.0E+00	3.8E-05	0.01155	0.0225	0.00345	1.0	3.6E-06	5.7E-06
TCDD (2,3,7,8-)	1.3E-12	9.8E-13	1.4E-13	1.5E-13	3.1E-13	3.3E-13	0.01155	0.0225	0.00345	1.0	3.2E-14	3.3E-14

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-69
Daily Intake of COPCs Resulting From the Ingestion of Homegrown Produce
Farmer

Chemical	Pd (mg/kg)	Pv (mg/kg)	Pr _{ag} (C) (mg/kg)	Pr _{ag} (NC) (mg/kg)	Pr _{bg} (C) (mg/kg)	Pr _{bg} (NC) (mg/kg)	CR _{ag} (kg/d)	CR _{pp} (kg/d)	CR _{bg} (kg/d)	F _{veg} ()	I _{veg} (C) (mg/d)	I _{veg} (NC) (mg/d)
Mercury (Hg+2)	0.0E+00	1.2E-05	0.0E+00	1.0E-06	0.0E+00	2.5E-06	0.0329	0.0448	0.0119	1.0	0.0E+00	5.0E-07
Mercury (MeHg)	0.0E+00	3.3E-06	0.0E+00	4.2E-08	0.0E+00	1.4E-07	0.0329	0.0448	0.0119	1.0	0.0E+00	1.1E-07
Mercury (Hg0)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0329	0.0448	0.0119	1.0	0.0E+00	0.0E+00
Lead	3.2E-04	0.0E+00	0.0E+00	6.4E-05	0.0E+00	4.3E-05	0.0329	0.0448	0.0119	1.0	0.0E+00	1.6E-05
TCDD (2,3,7,8-)	1.3E-12	9.6E-13	9.3E-14	1.4E-13	2.1E-13	3.2E-13	0.0329	0.0448	0.0119	1.0	8.4E-14	8.9E-14

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-70
Daily Intake of COPCs Resulting From the Ingestion of Homegrown Produce
Farmer Child

Chemical	Pd (mg/kg)	Pv (mg/kg)	Pr _{ag} (C) (mg/kg)	Pr _{ag} (NC) (mg/kg)	Pr _{bg} (C) (mg/kg)	Pr _{bg} (NC) (mg/kg)	CR _{ag} (kg/d)	CR _{pp} (kg/d)	CR _{bg} (kg/d)	F _{veg} ()	I _{veg} (C) (mg/d)	I _{veg} (NC) (mg/d)
Mercury (Hg+2)	0.0E+00	1.2E-05	0.0E+00	1.0E-06	0.0E+00	2.5E-06	0.01695	0.0236	0.0042	1.0	0.0E+00	2.5E-07
Mercury (MeHg)	0.0E+00	3.3E-06	0.0E+00	4.2E-08	0.0E+00	1.4E-07	0.01695	0.0236	0.0042	1.0	0.0E+00	5.9E-08
Mercury (Hg0)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.01695	0.0236	0.0042	1.0	0.0E+00	0.0E+00
Lead	3.2E-04	0.0E+00	0.0E+00	6.4E-05	0.0E+00	4.3E-05	0.01695	0.0236	0.0042	1.0	0.0E+00	8.2E-06
TCDD (2,3,7,8-)	1.3E-12	9.6E-13	1.3E-13	1.4E-13	3.0E-13	3.2E-13	0.01695	0.0236	0.0042	1.0	4.5E-14	4.5E-14

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-71
Daily Intake of COPCs Resulting From the Ingestion of Beef and Milk
Farmer

Chemical	A _{beef} (C) (mg/kg)	A _{beef} (NC) (mg/kg)	CR _{beef} (kg/d)	F _{beef} ()	I _{beef} (C) (mg/d)	I _{beef} (NC) (mg/d)	A _{milk} (C) (mg/kg)	A _{milk} (NC) (mg/kg)	CR _{milk} (kg/d)	F _{milk} ()	I _{milk} (C) (mg/d)	I _{milk} (NC) (mg/d)
Mercury (Hg+2)	0.0E+00	2.4E-06	0.085	1.0	0.0E+00	2.1E-07	0.0E+00	1.0E-06	0.957	1.0	0.0E+00	9.9E-07
Mercury (MeHg)	0.0E+00	3.1E-08	0.085	1.0	0.0E+00	2.6E-09	0.0E+00	1.9E-08	0.957	1.0	0.0E+00	1.8E-08
Mercury (Hg0)	0.0E+00	0.0E+00	0.085	1.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.957	1.0	0.0E+00	0.0E+00
Lead	0.0E+00	2.1E-05	0.085	1.0	0.0E+00	1.8E-06	0.0E+00	2.4E-05	0.957	1.0	0.0E+00	2.3E-05
TCDD (2,3,7,8-)	3.2E-11	3.3E-11	0.085	1.0	2.7E-12	2.8E-12	9.7E-12	1.0E-11	0.957	1.0	9.3E-12	9.6E-12

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-72
Daily Intake of COPCs Resulting From the Ingestion of Beef and Milk
Farmer Child

Chemical	A _{beef} (C) (mg/kg)	A _{beef} (NC) (mg/kg)	CR _{beef} (kg/d)	F _{beef} ()	I _{beef} (C) (mg/d)	I _{beef} (NC) (mg/d)	A _{milk} (C) (mg/kg)	A _{milk} (NC) (mg/kg)	CR _{milk} (kg/d)	F _{milk} ()	I _{milk} (C) (mg/d)	I _{milk} (NC) (mg/d)
Mercury (Hg+2)	0.0E+00	2.4E-06	0.011	1.0	0.0E+00	2.7E-08	0.0E+00	1.0E-06	0.340	1.0	0.0E+00	3.5E-07
Mercury (MeHg)	0.0E+00	3.1E-08	0.011	1.0	0.0E+00	3.5E-10	0.0E+00	1.9E-08	0.340	1.0	0.0E+00	6.4E-09
Mercury (Hg0)	0.0E+00	0.0E+00	0.011	1.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.340	1.0	0.0E+00	0.0E+00
Lead	0.0E+00	2.1E-05	0.011	1.0	0.0E+00	2.4E-07	0.0E+00	2.4E-05	0.340	1.0	0.0E+00	8.1E-06
TCDD (2,3,7,8-)	3.3E-11	3.3E-11	0.011	1.0	3.7E-13	3.7E-13	9.9E-12	1.0E-11	0.340	1.0	3.4E-12	3.4E-12

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-73
Daily Intake of COPCs Resulting From the Ingestion of Pork
Farmer

Chemical	A _{pork} (C) (mg/kg)	A _{pork} (NC) (mg/kg)	CR _{pork} (kg/d)	F _{pork} ()	I _{pork} (C) (mg/d)	I _{pork} (NC) (mg/d)
Mercury (Hg+2)	0.0E+00	9.1E-09	0.0385	1.0	0.0E+00	3.5E-10
Mercury (MeHg)	0.0E+00	3.6E-11	0.0385	1.0	0.0E+00	1.4E-12
Mercury (Hg0)	0.0E+00	0.0E+00	0.0385	1.0	0.0E+00	0.0E+00
Lead	0.0E+00	0.0E+00	0.0385	1.0	0.0E+00	0.0E+00
TCDD (2,3,7,8-)	4.6E-12	5.8E-12	0.0385	1.0	1.8E-13	2.2E-13

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-74
Daily Intake of COPCs Resulting From the Ingestion of Pork
Farmer Child

Chemical	A _{pork} (C) (mg/kg)	A _{pork} (NC) (mg/kg)	CR _{pork} (kg/d)	F _{pork} ()	I _{pork} (C) (mg/d)	I _{pork} (NC) (mg/d)
Mercury (Hg+2)	0.0E+00	9.1E-09	0.0063	1.0	0.0E+00	5.7E-11
Mercury (MeHg)	0.0E+00	3.6E-11	0.0063	1.0	0.0E+00	2.3E-13
Mercury (Hg0)	0.0E+00	0.0E+00	0.0063	1.0	0.0E+00	0.0E+00
Lead	0.0E+00	0.0E+00	0.0063	1.0	0.0E+00	0.0E+00
TCDD (2,3,7,8-)	5.6E-12	5.8E-12	0.0063	1.0	3.5E-14	3.7E-14

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-75
Daily Intake of COPCs Resulting From the Ingestion of Eggs and Poultry
Farmer

Chemical	A _{eggs} (C) (mg/kg)	A _{eggs} (NC) (mg/kg)	CR _{eggs} (kg/d)	F _{eggs} ()	I _{eggs} (C) (mg/d)	I _{eggs} (NC) (mg/d)	A _{poultry} (C) (mg/kg)	A _{poultry} (NC) (mg/kg)	CR _{poultry} (kg/d)	F _{poultry} ()	I _{poultry} (C) (mg/d)	I _{poultry} (NC) (mg/d)
Mercury (Hg+2)	0.0E+00	3.7E-07	0.0525	1.0	0.0E+00	2.0E-08	0.0E+00	3.7E-07	0.0462	1.0	0.0E+00	1.7E-08
Mercury (MeHg)	0.0E+00	1.1E-09	0.0525	1.0	0.0E+00	5.8E-11	0.0E+00	1.1E-09	0.0462	1.0	0.0E+00	5.1E-11
Mercury (Hg0)	0.0E+00	0.0E+00	0.0525	1.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0462	1.0	0.0E+00	0.0E+00
Lead	0.0E+00	0.0E+00	0.0525	1.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0462	1.0	0.0E+00	0.0E+00
TCDD (2,3,7,8-)	4.7E-14	7.2E-14	0.0525	1.0	2.5E-15	3.8E-15	8.2E-14	1.3E-13	0.0462	1.0	3.8E-15	5.8E-15

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-76
Daily Intake of COPCs Resulting From the Ingestion of Eggs and Poultry
Farmer Child

Chemical	A _{eggs} (C) (mg/kg)	A _{eggs} (NC) (mg/kg)	CR _{eggs} (kg/d)	F _{eggs} ()	I _{eggs} (C) (mg/d)	I _{eggs} (NC) (mg/d)	A _{poultry} (C) (mg/kg)	A _{poultry} (NC) (mg/kg)	CR _{poultry} (kg/d)	F _{poultry} ()	I _{poultry} (C) (mg/d)	I _{poultry} (NC) (mg/d)
Mercury (Hg+2)	0.0E+00	3.7E-07	0.0081	1.0	0.0E+00	3.0E-09	0.0E+00	3.7E-07	0.0068	1.0	0.0E+00	2.5E-09
Mercury (MeHg)	0.0E+00	1.1E-09	0.0081	1.0	0.0E+00	9.0E-12	0.0E+00	1.1E-09	0.0068	1.0	0.0E+00	7.5E-12
Mercury (Hg0)	0.0E+00	0.0E+00	0.0081	1.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0068	1.0	0.0E+00	0.0E+00
Lead	0.0E+00	0.0E+00	0.0081	1.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0068	1.0	0.0E+00	0.0E+00
TCDD (2,3,7,8-)	6.7E-14	7.2E-14	0.0081	1.0	5.5E-16	5.8E-16	1.2E-13	1.3E-13	0.0068	1.0	7.9E-16	8.5E-16

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-77
Daily Intake of COPCs Resulting From the Ingestion of Fish
Fisher

Chemical	C _{fish} (C) (mg/kg)	C _{fish} -USEPA (NC) (mg/kg)	C _{fish} -MDEQ (NC) (mg/kg)	CR _{fish} (kg/d)	F _{fish} ()	I _{fish} (C) (mg/d)	I _{fish} -USEPA (NC) (mg/d)	I _{fish} -MDEQ (NC) (mg/d)
Mercury (Hg+2)	0.0E+00	1.5E-08	0.0E+00	0.015	1.0	0.0E+00	2.2E-10	0.0E+00
Mercury (MeHg)	0.0E+00	1.8E-02	4.1E-03	0.015	1.0	0.0E+00	2.7E-04	6.1E-05
Mercury (Hg0)	0.0E+00	0.0E+00	0.0E+00	0.015	1.0	0.0E+00	0.0E+00	0.0E+00
Lead	0.0E+00	1.3E-06	1.3E-06	0.015	1.0	0.0E+00	2.0E-08	2.0E-08
TCDD (2,3,7,8-)	4.1E-11	4.8E-11	4.8E-11	0.015	1.0	6.2E-13	7.2E-13	7.2E-13

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-78
Daily Intake of COPCs Resulting From the Ingestion of Fish
Fisher Child

Chemical	C _{fish} (C) (mg/kg)	C _{fish-USEPA} (NC) (mg/kg)	C _{fish-MDEQ} (NC) (mg/kg)	CR _{fish} (kg/d)	F _{fish} ()	I _{fish} (C) (mg/d)	I _{fish-USEPA} (NC) (mg/d)	I _{fish-MDEQ} (NC) (mg/d)
Mercury (Hg+2)	0.0E+00	1.5E-08	0.0E+00	0.0023	1.0	0.0E+00	3.4E-11	0.0E+00
Mercury (MeHg)	0.0E+00	1.8E-02	4.1E-03	0.0023	1.0	0.0E+00	4.1E-05	9.3E-06
Mercury (Hg0)	0.0E+00	0.0E+00	0.0E+00	0.0023	1.0	0.0E+00	0.0E+00	0.0E+00
Lead	0.0E+00	1.3E-06	1.3E-06	0.0023	1.0	0.0E+00	3.1E-09	3.1E-09
TCDD (2,3,7,8-)	4.8E-11	4.8E-11	4.8E-11	0.0023	1.0	1.1E-13	1.1E-13	1.1E-13

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-79
Average Daily COPC Exposure Concentration
Resident

Chemical	C _{air} (μg/m ³)	EF (d/yr)	ED (yr)	AT (d)	UCF (d/yr)	EC (C) (μg/m ³)	EC (NC) (μg/m ³)
Mercury (Hg+2)	1.3E-05	350	30	70	365	0.0E+00	1.2E-05
Mercury (MeHg)	0.0E+00	350	30	70	365	0.0E+00	0.0E+00
Mercury (Hg0)	1.6E-05	350	30	70	365	0.0E+00	1.6E-05
Lead	3.6E-05	350	30	70	365	0.0E+00	3.4E-05
TCDD (2,3,7,8-)	2.7E-12	350	30	70	365	1.1E-12	2.6E-12

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-80
Average Daily COPC Exposure Concentration
Resident Child

Chemical	C _{air} (µg/m ³)	EF (d/yr)	ED (yr)	AT (d)	UCF (d/yr)	EC (C) (µg/m ³)	EC (NC) (µg/m ³)
Mercury (Hg+2)	1.3E-05	350	6	70	365	0.0E+00	1.2E-05
Mercury (MeHg)	0.0E+00	350	6	70	365	0.0E+00	0.0E+00
Mercury (Hg0)	1.6E-05	350	6	70	365	0.0E+00	1.6E-05
Lead	3.6E-05	350	6	70	365	0.0E+00	3.4E-05
TCDD (2,3,7,8-)	2.7E-12	350	6	70	365	2.2E-13	2.6E-12

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-81
 Combined Daily Intake of COPCs Resulting From Indirect Exposure Pathways
 Resident

Chemical	I _{soil} (C) (mg/d)	I _{veg} (C) (mg/d)	I _{dw} (C) (mg/d)	I _{tot} (C) (mg/d)	I _{soil} (NC) (mg/d)	I _{veg} (NC) (mg/d)	I _{dw} (NC) (mg/d)	I _{tot} (NC) (mg/d)
Mercury (Hg+2)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.4E-07	5.1E-07	0.0E+00	6.5E-07
Mercury (MeHg)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.7E-09	1.0E-07	0.0E+00	1.0E-07
Mercury (Hg0)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Lead	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.3E-06	1.1E-05	0.0E+00	1.4E-05
TCDD (2,3,7,8-)	1.8E-14	5.9E-14	0.0E+00	7.7E-14	3.0E-14	6.4E-14	0.0E+00	9.4E-14

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-82
 Combined Daily Intake of COPCs Resulting From Indirect Exposure Pathways
 Resident Child

Chemical	I _{soil} (C) (mg/d)	I _{veg} (C) (mg/d)	I _{dw} (C) (mg/d)	I _{tot} (C) (mg/d)	I _{soil} (NC) (mg/d)	I _{veg} (NC) (mg/d)	I _{dw} (NC) (mg/d)	I _{tot} (NC) (mg/d)
Mercury (Hg+2)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.8E-07	2.6E-07	0.0E+00	5.4E-07
Mercury (MeHg)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	5.5E-09	5.2E-08	0.0E+00	5.7E-08
Mercury (Hg0)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Lead	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.6E-06	5.7E-06	0.0E+00	1.2E-05
TCDD (2,3,7,8-)	5.7E-14	3.2E-14	0.0E+00	8.9E-14	6.0E-14	3.3E-14	0.0E+00	9.3E-14

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-83
Average Daily COPC Exposure Concentration
Farmer

Chemical	C _{air} ($\mu\text{g}/\text{m}^3$)	EF (d/yr)	ED (yr)	AT (d)	UCF (d/yr)	EC (C) ($\mu\text{g}/\text{m}^3$)	EC (NC) ($\mu\text{g}/\text{m}^3$)
Mercury (Hg+2)	1.0E-05	350	40	70	365	0.0E+00	9.7E-06
Mercury (MeHg)	0.0E+00	350	40	70	365	0.0E+00	0.0E+00
Mercury (Hg0)	1.2E-05	350	40	70	365	0.0E+00	1.1E-05
Lead	3.5E-05	350	40	70	365	0.0E+00	3.4E-05
TCDD (2,3,7,8-)	2.7E-12	350	40	70	365	1.3E-11	2.5E-12

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-84
Average Daily COPC Exposure Concentration
Farmer Child

Chemical	C _{air} ($\mu\text{g}/\text{m}^3$)	EF (d/yr)	ED (yr)	AT (d)	UCF (d/yr)	EC (C) ($\mu\text{g}/\text{m}^3$)	EC (NC) ($\mu\text{g}/\text{m}^3$)
Mercury (Hg+2)	1.0E-05	350	6	70	365	0.0E+00	9.7E-06
Mercury (MeHg)	0.0E+00	350	6	70	365	0.0E+00	0.0E+00
Mercury (Hg0)	1.2E-05	350	6	70	365	0.0E+00	1.1E-05
Lead	3.5E-05	350	6	70	365	0.0E+00	3.4E-05
TCDD (2,3,7,8-)	2.7E-12	350	6	70	365	2.2E-13	2.5E-12

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-85
 Combined Daily Intake of COPCs Resulting From Indirect Exposure Pathways Based on Potential Carcinogenic Endpoints
 Farmer

Chemical	I _{soil} (C) (mg/d)	I _{veg} (C) (mg/d)	I _{beef} (C) (mg/d)	I _{milk} (C) (mg/d)	I _{eggs} (C) (mg/d)	I _{poultry} (C) (mg/d)	I _{pork} (C) (mg/d)	I _{dw} (C) (mg/d)	I _{tot} (C) (mg/d)
Mercury (Hg+2)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Mercury (MeHg)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Mercury (Hg0)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Lead	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TCDD (2,3,7,8-)	1.9E-14	8.4E-14	2.7E-12	9.3E-12	2.5E-15	3.8E-15	1.8E-13	0.0E+00	1.2E-11

Table 5-86
 Combined Daily Intake of COPCs Resulting From Indirect Exposure Pathways Based on Potential Noncarcinogenic Endpoints
 Farmer

Chemical	I _{soil} (NC) (mg/d)	I _{veg} (NC) (mg/d)	I _{beef} (NC) (mg/d)	I _{milk} (NC) (mg/d)	I _{eggs} (NC) (mg/d)	I _{poultry} (NC) (mg/d)	I _{pork} (NC) (mg/d)	I _{dw} (NC) (mg/d)	I _{tot} (NC) (mg/d)
Mercury (Hg ⁺²)	7.0E-08	5.0E-07	2.1E-07	9.9E-07	2.0E-08	1.7E-08	3.5E-10	0.0E+00	1.8E-06
Mercury (MeHg)	1.4E-09	1.1E-07	2.6E-09	1.8E-08	5.8E-11	5.1E-11	1.4E-12	0.0E+00	1.4E-07
Mercury (Hg ⁰)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Lead	3.7E-06	1.6E-05	1.8E-06	2.3E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.4E-05
TCDD (2,3,7,8-)	3.0E-14	8.9E-14	2.8E-12	9.6E-12	3.8E-15	5.8E-15	2.2E-13	0.0E+00	1.3E-11

Table 5-87
 Combined Daily Intake of COPCs Resulting From Indirect Exposure Pathways Based on Potential Carcinogenic Endpoints
 Farmer Child

Chemical	I _{soil} (C) (mg/d)	I _{veg} (C) (mg/d)	I _{beef} (C) (mg/d)	I _{milk} (C) (mg/d)	I _{eggs} (C) (mg/d)	I _{poultry} (C) (mg/d)	I _{pork} (C) (mg/d)	I _{dw} (C) (mg/d)	I _{tot} (C) (mg/d)
Mercury (Hg ²⁺)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Mercury (MeHg)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Mercury (Hg ⁰)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Lead	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TCDD (2,3,7,8-)	5.5E-14	4.5E-14	3.7E-13	3.4E-12	5.5E-16	7.9E-16	3.5E-14	0.0E+00	3.9E-12

Table 5-88
 Combined Daily Intake of COPCs Resulting From Indirect Exposure Pathways Based on Potential Noncarcinogenic Endpoints
 Farmer Child

Chemical	I _{soil} (NC) (mg/d)	I _{veg} (NC) (mg/d)	I _{beef} (NC) (mg/d)	I _{milk} (NC) (mg/d)	I _{eggs} (NC) (mg/d)	I _{poultry} (NC) (mg/d)	I _{pork} (NC) (mg/d)	I _{dw} (NC) (mg/d)	I _{tot} (NC) (mg/d)
Mercury (Hg+2)	1.4E-07	2.5E-07	2.7E-08	3.5E-07	3.0E-09	2.5E-09	5.7E-11	0.0E+00	7.8E-07
Mercury (MeHg)	2.8E-09	5.9E-08	3.5E-10	6.4E-09	9.0E-12	7.5E-12	2.3E-13	0.0E+00	6.8E-08
Mercury (Hg0)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Lead	7.3E-06	8.2E-06	2.4E-07	8.1E-06	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.4E-05
TCDD (2,3,7,8-)	5.9E-14	4.5E-14	3.7E-13	3.4E-12	5.8E-16	8.5E-16	3.7E-14	0.0E+00	3.9E-12

Table 5-89
Average Daily COPC Exposure Concentration
Fisher

Chemical	C _{air} (μg/m ³)	EF (d/yr)	ED (yr)	AT (d)	UCF (d/yr)	EC (C) (μg/m ³)	EC (NC) (μg/m ³)
Mercury (Hg+2)	1.3E-05	350	30	70	365	0.0E+00	1.2E-05
Mercury (MeHg)	0.0E+00	350	30	70	365	0.0E+00	0.0E+00
Mercury (Hg0)	1.6E-05	350	30	70	365	0.0E+00	1.6E-05
Lead	3.6E-05	350	30	70	365	0.0E+00	3.4E-05
TCDD (2,3,7,8-)	2.7E-12	350	30	70	365	1.1E-12	2.6E-12

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-90
Average Daily COPC Exposure Concentration
Fisher Child

Chemical	C _{air} (µg/m ³)	EF (d/yr)	ED (yr)	AT (d)	UCF (d/yr)	EC (C) (µg/m ³)	EC (NC) (µg/m ³)
Mercury (Hg+2)	1.3E-05	350	6	70	365	0.0E+00	1.2E-05
Mercury (MeHg)	0.0E+00	350	6	70	365	0.0E+00	0.0E+00
Mercury (Hg0)	1.6E-05	350	6	70	365	0.0E+00	1.6E-05
Lead	3.6E-05	350	6	70	365	0.0E+00	3.4E-05
TCDD (2,3,7,8-)	2.7E-12	350	6	70	365	2.2E-13	2.6E-12

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-91
 Combined Daily Intake of COPCs Resulting From Indirect Exposure Pathways
 Fisher

Chemical	I _{soil} (C) (mg/d)	I _{veg} (C) (mg/d)	I _{fish} (C) (mg/d)	I _{dw} (C) (mg/d)	I _{tot} (C) (mg/d)	I _{soil} (NC) (mg/d)	I _{veg} (NC) (mg/d)	I _{fish-EPA} (NC) (mg/d)	I _{fish-MDEQ} (NC) (mg/d)	I _{dw} (NC) (mg/d)	I _{tot-EPA} (NC) (mg/d)	I _{tot-MDEQ} (NC) (mg/d)
Mercury (Hg+2)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.4E-07	5.1E-07	2.2E-10	0.0E+00	0.0E+00	6.5E-07	6.5E-07
Mercury (MeHg)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.7E-09	1.0E-07	2.7E-04	6.1E-05	0.0E+00	2.7E-04	6.1E-05
Mercury (Hg0)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Lead	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.3E-06	1.1E-05	2.0E-08	2.0E-08	0.0E+00	1.5E-05	1.5E-05
TCDD (2,3,7,8-)	1.8E-14	5.9E-14	6.2E-13	0.0E+00	7.0E-13	3.0E-14	6.4E-14	7.2E-13	7.2E-13	0.0E+00	8.2E-13	8.2E-13

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-92
 Combined Daily Intake of COPCs Resulting From Indirect Exposure Pathways
 Fisher Child

Chemical	I _{soil} (C) (mg/d)	I _{veg} (C) (mg/d)	I _{fish} (C) (mg/d)	I _{dw} (C) (mg/d)	I _{tot} (C) (mg/d)	I _{soil} (NC) (mg/d)	I _{veg} (NC) (mg/d)	I _{fish-EPA} (NC) (mg/d)	I _{fish_MDEQ} (NC) (mg/d)	I _{dw} (NC) (mg/d)	I _{tot-EPA} (NC) (mg/d)	I _{tot-MDEQ} (NC) (mg/d)
Mercury (Hg+2)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.8E-07	2.6E-07	3.4E-11	0.0E+00	0.0E+00	5.4E-07	5.4E-07
Mercury (MeHg)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	5.5E-09	5.2E-08	4.1E-05	9.3E-06	0.0E+00	4.1E-05	9.4E-06
Mercury (Hg0)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Lead	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.6E-06	5.7E-06	3.1E-09	3.1E-09	0.0E+00	1.2E-05	1.2E-05
TCDD (2,3,7,8-)	5.7E-14	3.2E-14	1.1E-13	0.0E+00	2.0E-13	6.0E-14	3.3E-14	1.1E-13	1.1E-13	0.0E+00	2.0E-13	2.0E-13

Note: Separate values are calculated based on potential carcinogenic (C) and noncarcinogenic (NC) endpoints.

Table 5-93
Average Daily Maternal Intake of 2,3,7,8-TCDD by Receptor Scenario

Receptor Scenario	Average Daily Dose (mg/kg-day)		
	Oral	Inhalation	Total
Farmer ^A	1.7E-13	7.3E-16	1.8E-13
Fisher ^B	1.1E-14	7.4E-16	1.2E-14
Resident ^C	1.3E-15	7.4E-16	2.0E-15

^A Source: Tables 5-83 and 5-85.

^B Source: Tables 5-89 and 5-91.

^C Source: Tables 5-79 and 5-91.

Table 5-94
Concentrations of 2,3,7,8-TCDD in Breast Milk

Receptor Scenario	ADD _{adult} ^A (mg/kg-d)	h ^B (d)	f ₁ ^C ()	f ₂ ^D ()	UCF (pg/mg)	C _{milkfat} (pg/kg)
Farmer	1.8E-13	2555	0.9	0.3	1E+09	1.9E+00
Fisher	1.2E-14	2555	0.9	0.3	1E+09	1.3E-01
Resident	2.0E-15	2555	0.9	0.3	1E+09	2.3E-02

^A Average maternal daily dose of dioxin for each adult exposure scenario.

^B Half-life of dioxin in adults.

^C Fraction of ingested dioxin stored in fat.

^D Fraction of maternal body weight that is fat.

Table 5-95
Average Daily Dose of 2,3,7,8-TCDD in the Nursing Infant

Receptor Scenario	C_{milkfat} (pg/kg)	f_3^A ()	f_4^B ()	IR_{milk}^C (kg/d)	ED^D (yr)	BW_{infant} (kg)	AT (yr)	ADD_{infant} (pg/kg-d)
Farmer	1.9E+00	0.04	0.9	0.688	1	9.4	1	5.1E-03
Fisher	1.3E-01	0.04	0.9	0.688	1	9.4	1	3.5E-04
Resident	2.3E-02	0.04	0.9	0.688	1	9.4	1	5.9E-05

^A Fraction of breast milk that is fat.

^B Fraction of ingested COPC that is absorbed.

^C Daily ingestion rate of breast milk.

^D Exposure duration.

Table 5-96
IEUBK Operating Parameters Selected for the Assessment of Lead

Operating Parameter	Units	Selected Value(s)	Reference
Target Blood Lead	(µg/dL)	10	CDC, 1991
Time Spent Outdoors	(hr/d)	1-4	USEPA, 2002
Ventilation Rate	(m ³ /d)	2-7	USEPA, 2002
Indoor Air Concentration (% of Outdoor)	(%)	30	USEPA, 2002
Soil/dust Ingestion Rate	(mg/d)	85-135	USEPA, 2002
Soil Ingestion Rate (% of Soil/dust Ingestion)	(%)	45	USEPA, 2002
Gastrointestinal Absorption (Soil/Dust Lead)	(%)	30	USEPA, 2002
Gastrointestinal Absorption (Dietary Lead)	(%)	50	USEPA, 2002
Gastrointestinal Absorption (Drinking Water Lead)	(%)	50	USEPA, 2002
Age-Related Water Consumption Rates	(L/d)	0.20-0.59	USEPA, 2002

CDC, 1991 - Preventing Lead Poisoning in Young Children. Centers for Disease Control.

USEPA, 2002 - User's Guide for the Integrated Exposure Uptake Biokinetic Model for Lead in Children (IEUBK) Windows Version-32 Bit Version.

Table 5-97
Media Concentrations Selected for the IEUBK Assessment of Lead

Selected Medium	Units	Background		MME Emission Impacts		Value Selected for IEUBK
		Value	Reference	Value	Reference	
Soil Lead Concentration	(mg/kg)	2.100E+01	MDEQ, 2006b	3.67E-02	HHRA Table 5-7	2.104E+01
Indoor Dust Lead [No Pb-Based Paint and Tracked Soil Pb]	(mg/kg)	1.570E+01	Calculated (see below)	2.92E-02	Calculated (see below)	1.573E+01
Indoor Dust Lead [Pb-Based Paint In Good Condition and Tracked Soil]	(mg/kg)	2.00E+02	USEPA, 2002	2.92E-02	Calculated (see below)	2.00E+02
Air Lead Concentration	($\mu\text{g}/\text{m}^3$)	1.00E-02	MDEQ, 2005	3.53E-05	HHRA Table 5-3	1.00E-02
Background Drinking Water Concentration	($\mu\text{g}/\text{L}$)	1.30E+01	Midland, 2006	n/a	n/a	1.30E+01
Dietary Lead Intake	($\mu\text{g}/\text{d}$)	5.53-7.00	USEPA, 2002	1.67E-02	HHRA Table 5-88	5.547-7.017
Maternal Blood Lead Concentration	($\mu\text{g}/\text{dL}$)	2.50E+00	USEPA, 2002	n/a	n/a	2.50E+00

Calculated: $0.70 \times \text{Soil Lead Concentration} + \text{Air Lead Contribution at rate of } 100 \text{ mg/kg soil lead per } 1 \text{ } \mu\text{g}^3/\text{m air lead.}$

Midland, 2006 - [90th Percentile Value] [2006 Drinking Water Quality Report.](#)

MDEQ, 2006b - Table 2. [Soil: Residential and Commercial I Part 201 Generic Cleanup Criteria and Screening Levels; Part 213 Tier 1 Risk-Based Screening Levels \(RBSLs\).](#)

MDEQ, 2005 - Table 5-1. [2005 Annual Air Quality Report.](#)

USEPA, 2002 - [User's Guide for the Integrated Exposure Uptake Biokinetic Model for Lead in Children \(IEUBK\) Windows Version-32 Bit Version.](#)

Table 6-1
Chronic Toxicity Criteria Used in HHRA

Chemical	Carcinogenic Criteria				Noncarcinogenic Criteria			
	CSF (kg-d/mg)	Reference	URF (m ³ /μg)	Reference	RfD (mg/kg-d)	Reference	RfC (mg/m ³)	Reference
Divalent Mercury [Hg ⁺²]	---		---		3.0E-04	IRIS	9.0E-05	CalEPA
Methylmercury [MeHg]	---		---		1.0E-04	IRIS	---	
Elemental Mercury [Hg ⁰]	---		---		---		3.0E-04	IRIS
Lead [Pb]	---		---		---		---	
2,3,7,8-Tetrachlorodibenzo[p]dioxin [2,3,7,8-TCDD]	1.5E+05	IRIS	---		1.0E-09	HHRAP	---	

IRIS: On-line IRIS Database [USEPA, 2007]

CalEPA: On-line chronic reference exposure level (REL) database [CalEPA, 2002]

HHRAP: Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities [USEPA, 2005]

Table 7-1
 Potential Lifetime Incremental Cancer Risks and Hazard Quotients Resulting from Direct Exposure to COPCs
 Resident

Chemical	C _{air} ($\mu\text{g}/\text{m}^3$)	EC (C) ($\mu\text{g}/\text{m}^3$)	EC (NC) ($\mu\text{g}/\text{m}^3$)	URF _i ($\text{m}^3/\mu\text{g}$)	RfC (mg/m^3)	LICR _i ()	HQ _i ()
Mercury (Hg+2)	1.3E-05	0.0E+00	1.2E-05	n/a	9.0E-05		1E-04
Mercury (MeHg)	0.0E+00	0.0E+00	0.0E+00	n/a	n/a		
Mercury (Hg0)	1.6E-05	0.0E+00	1.6E-05	n/a	3.0E-04		5E-05
Lead	3.6E-05	0.0E+00	3.4E-05	n/a	n/a		
TCDD (2,3,7,8-)	2.7E-12	1.1E-12	2.6E-12	n/a	n/a		
Total							2E-04

n/a: Toxicity criterion not available.

Table 7-2
 Potential Lifetime Incremental Cancer Risks Resulting from Indirect Exposure to COPCs
 Resident

Chemical	I_{tot} (C) (mg/d)	ED (yr)	EF (d/yr)	BW (kg)	AT (yr)	UCF (d/yr)	LADD (mg/kg-d)	CSFo (kg-d/mg)	$LICR_{ind}$ ()
Mercury (Hg+2)	0.0E+00	30	350	70	70	365	0.0E+00	n/a	
Mercury (MeHg)	0.0E+00	30	350	70	70	365	0.0E+00	n/a	
Mercury (Hg0)	0.0E+00	30	350	70	70	365	0.0E+00	n/a	
Lead	0.0E+00	30	350	70	70	365	0.0E+00	n/a	
TCDD (2,3,7,8-)	7.7E-14	30	350	70	70	365	4.5E-16	1.5E+05	7E-11
Total									7E-11

Note: According to current guidance [USEPA, 2005] elemental mercury is only evaluated for direct inhalation exposures.

n/a: Toxicity criterion not available.

Table 7-3
 Potential Hazard Indices Resulting from Indirect Exposure to COPCs
 Resident

Chemical	I _{tot} (NC) (mg/d)	EF (d/yr)	BW (kg)	UCF (d/yr)	ADD (mg/kg-d)	RfD (mg/kg-d)	HI _{ind} ()
Mercury (Hg+2)	6.5E-07	350	70	365	8.9E-09	3.0E-04	3E-05
Mercury (MeHg)	1.0E-07	350	70	365	1.4E-09	1.0E-04	1E-05
Mercury (Hg0)	0.0E+00	350	70	365	0.0E+00	n/a	
Lead	1.4E-05	350	70	365	2.0E-07	n/a	
TCDD (2,3,7,8-)	9.4E-14	350	70	365	1.3E-15	1.0E-09	1E-06
Total							5E-05

Note: According to current guidance [USEPA, 2005] elemental mercury is only evaluated for direct inhalation exposures.

n/a: Toxicity criterion not available.

Table 7-4
 Potential Lifetime Incremental Cancer Risks and Hazard Quotients Resulting from Direct Exposure to COPCs
 Resident Child

Chemical	C _{air} ($\mu\text{g}/\text{m}^3$)	EC (C) ($\mu\text{g}/\text{m}^3$)	EC (NC) ($\mu\text{g}/\text{m}^3$)	URF _i ($\text{m}^3/\mu\text{g}$)	RfC (mg/m^3)	LICR _i ()	HQ _i ()
Mercury (Hg+2)	1.3E-05	0.0E+00	1.2E-05	n/a	9.0E-05		1E-04
Mercury (MeHg)	0.0E+00	0.0E+00	0.0E+00	n/a	n/a		
Mercury (Hg0)	1.6E-05	0.0E+00	1.6E-05	n/a	3.0E-04		5E-05
Lead	3.6E-05	0.0E+00	3.4E-05	n/a	n/a		
TCDD (2,3,7,8-)	2.7E-12	2.2E-13	2.6E-12	n/a	n/a		
Total							2E-04

n/a: Toxicity criterion not available.

Table 7-5
 Potential Lifetime Incremental Cancer Risks Resulting from Indirect Exposure to COPCs
 Resident Child

Chemical	I _{tot} (C) (mg/d)	ED (yr)	EF (d/yr)	BW (kg)	AT (yr)	UCF (d/yr)	LADD (mg/kg-d)	CSFo (kg-d/mg)	LICR _{ind} ()
Mercury (Hg+2)	0.0E+00	6	350	15	70	365	0.0E+00	n/a	
Mercury (MeHg)	0.0E+00	6	350	15	70	365	0.0E+00	n/a	
Mercury (Hg0)	0.0E+00	6	350	15	70	365	0.0E+00	n/a	
Lead	0.0E+00	6	350	15	70	365	0.0E+00	n/a	
TCDD (2,3,7,8-)	8.9E-14	6	350	15	70	365	4.9E-16	1.5E+05	7E-11
Total									7E-11

Note: According to current guidance [USEPA, 2005] elemental mercury is only evaluated for direct inhalation exposures.

n/a: Toxicity criterion not available.

Table 7-6
 Potential Hazard Indices Resulting from Indirect Exposure to COPCs
 Resident Child

Chemical	I _{tot} (NC) (mg/d)	EF (d/yr)	BW (kg)	UCF (d/yr)	ADD (mg/kg-d)	RfD (mg/kg-d)	HI _{ind} ()
Mercury (Hg+2)	5.4E-07	350	15	365	3.4E-08	3.0E-04	1E-04
Mercury (MeHg)	5.7E-08	350	15	365	3.7E-09	1.0E-04	4E-05
Mercury (Hg0)	0.0E+00	350	15	365	0.0E+00	n/a	
Lead	1.2E-05	350	15	365	7.9E-07	n/a	
TCDD (2,3,7,8-)	9.3E-14	350	15	365	5.9E-15	1.0E-09	6E-06
Total							2E-04

Note: According to current guidance [USEPA, 2005] elemental mercury is only evaluated for direct inhalation exposures.

n/a: Toxicity criterion not available.

Table 7-7
 Potential Lifetime Incremental Cancer Risks and Hazard Quotients Resulting from Direct Exposure to COPCs
 Farmer

Chemical	C _{air} ($\mu\text{g}/\text{m}^3$)	EC (C) ($\mu\text{g}/\text{m}^3$)	EC (NC) ($\mu\text{g}/\text{m}^3$)	URF _i ($\text{m}^3/\mu\text{g}$)	RfC (mg/m^3)	LICR _i ()	HQ _i ()
Mercury (Hg+2)	1.0E-05	0.0E+00	9.7E-06	n/a	9.0E-05		1E-04
Mercury (MeHg)	0.0E+00	0.0E+00	0.0E+00	n/a	n/a		
Mercury (Hg0)	1.2E-05	0.0E+00	1.1E-05	n/a	3.0E-04		4E-05
Lead	3.5E-05	0.0E+00	3.4E-05	n/a	n/a		
TCDD (2,3,7,8-)	2.7E-12	1.3E-11	2.5E-12	n/a	n/a		
Total							1E-04

n/a: Toxicity criterion not available.

Table 7-8
 Potential Lifetime Incremental Cancer Risks Resulting from Indirect Exposure to COPCs
 Farmer

Chemical	I _{tot} (C) (mg/d)	ED (yr)	EF (d/yr)	BW (kg)	AT (yr)	UCF (d/yr)	LADD (mg/kg-d)	CSFo (kg-d/mg)	LICR _{ind} ()
Mercury (Hg+2)	0.0E+00	40	350	70	70	365	0.0E+00	n/a	
Mercury (MeHg)	0.0E+00	40	350	70	70	365	0.0E+00	n/a	
Mercury (Hg0)	0.0E+00	40	350	70	70	365	0.0E+00	n/a	
Lead	0.0E+00	40	350	70	70	365	0.0E+00	n/a	
TCDD (2,3,7,8-)	1.2E-11	40	350	70	70	365	9.6E-14	1.5E+05	1E-08
Total									1E-08

Note: According to current guidance [USEPA, 2005] elemental mercury is only evaluated for direct inhalation exposures.

n/a: Toxicity criterion not available.

Table 7-9
 Potential Hazard Indices Resulting from Indirect Exposure to COPCs
 Farmer

Chemical	I _{tot} (NC) (mg/d)	EF (d/yr)	BW (kg)	UCF (d/yr)	ADD (mg/kg-d)	RfD (mg/kg-d)	HI _{ind} ()
Mercury (Hg+2)	1.8E-06	350	70	365	2.5E-08	3.0E-04	8E-05
Mercury (MeHg)	1.4E-07	350	70	365	1.9E-09	1.0E-04	2E-05
Mercury (Hg0)	0.0E+00	350	70	365	0.0E+00	n/a	
Lead	4.4E-05	350	70	365	6.1E-07	n/a	
TCDD (2,3,7,8-)	1.3E-11	350	70	365	1.7E-13	1.0E-09	2E-04
Total							3E-04

Note: According to current guidance [USEPA, 2005] elemental mercury is only evaluated for direct inhalation exposures.

n/a: Toxicity criterion not available.

Table 7-10
 Potential Lifetime Incremental Cancer Risks and Hazard Quotients Resulting from Direct Exposure to COPCs
 Farmer Child

Chemical	C _{air} ($\mu\text{g}/\text{m}^3$)	EC (C) ($\mu\text{g}/\text{m}^3$)	EC (NC) ($\mu\text{g}/\text{m}^3$)	URF _i ($\text{m}^3/\mu\text{g}$)	RfC (mg/m^3)	LICR _i ()	HQ _i ()
Mercury (Hg+2)	1.0E-05	0.0E+00	9.7E-06	n/a	9.0E-05		1E-04
Mercury (MeHg)	0.0E+00	0.0E+00	0.0E+00	n/a	n/a		
Mercury (Hg0)	1.2E-05	0.0E+00	1.1E-05	n/a	3.0E-04		4E-05
Lead	3.5E-05	0.0E+00	3.4E-05	n/a	n/a		
TCDD (2,3,7,8-)	2.7E-12	2.2E-13	2.5E-12	n/a	n/a		
Total							1E-04

n/a: Toxicity criterion not available.

Table 7-11
 Potential Lifetime Incremental Cancer Risks Resulting from Indirect Exposure to COPCs
 Farmer Child

Chemical	I _{tot} (C) (mg/d)	ED (yr)	EF (d/yr)	BW (kg)	AT (yr)	UCF (d/yr)	LADD (mg/kg-d)	CSFo (kg-d/mg)	LICR _{ind} ()
Mercury (Hg+2)	0.0E+00	6	350	15	70	365	0.0E+00	n/a	
Mercury (MeHg)	0.0E+00	6	350	15	70	365	0.0E+00	n/a	
Mercury (Hg0)	0.0E+00	6	350	15	70	365	0.0E+00	n/a	
Lead	0.0E+00	6	350	15	70	365	0.0E+00	n/a	
TCDD (2,3,7,8-)	3.9E-12	6	350	15	70	365	2.1E-14	1.5E+05	3E-09
Total									3E-09

Note: According to current guidance [USEPA, 2005] elemental mercury is only evaluated for direct inhalation exposures.

n/a: Toxicity criterion not available.

Table 7-12
 Potential Hazard Indices Resulting from Indirect Exposure to COPCs
 Farmer Child

Chemical	I _{tot} (NC) (mg/d)	EF (d/yr)	BW (kg)	UCF (d/yr)	ADD (mg/kg-d)	RfD (mg/kg-d)	HI _{ind} ()
Mercury (Hg+2)	7.8E-07	350	15	365	5.0E-08	3.0E-04	2E-04
Mercury (MeHg)	6.8E-08	350	15	365	4.4E-09	1.0E-04	4E-05
Mercury (Hg0)	0.0E+00	350	15	365	0.0E+00	n/a	
Lead	2.4E-05	350	15	365	1.5E-06	n/a	
TCDD (2,3,7,8-)	3.9E-12	350	15	365	2.5E-13	1.0E-09	3E-04
Total							5E-04

Note: According to current guidance [USEPA, 2005] elemental mercury is only evaluated for direct inhalation exposures.

n/a: Toxicity criterion not available.

Table 7-13
 Potential Lifetime Incremental Cancer Risks and Hazard Quotients Resulting from Direct Exposure to COPCs
 Fisher

Chemical	C _{air} (µg/m ³)	EC (C) (µg/m ³)	EC (NC) (µg/m ³)	URF _i (m ³ /µg)	RfC (mg/m ³)	LICR _i ()	HQ _i ()
Mercury (Hg+2)	1.3E-05	0.0E+00	1.2E-05	n/a	9.0E-05		1E-04
Mercury (MeHg)	0.0E+00	0.0E+00	0.0E+00	n/a	n/a		
Mercury (Hg0)	1.6E-05	0.0E+00	1.6E-05	n/a	3.0E-04		5E-05
Lead	3.6E-05	0.0E+00	3.4E-05	n/a	n/a		
TCDD (2,3,7,8-)	2.7E-12	1.1E-12	2.6E-12	n/a	n/a		
Total							2E-04

n/a: Toxicity criterion not available.

Table 7-14
 Potential Lifetime Incremental Cancer Risks Resulting from Indirect Exposure to COPCs
 Fisher

Chemical	I _{tot} (C) (mg/d)	ED (yr)	EF (d/yr)	BW (kg)	AT (yr)	UCF (d/yr)	LADD (mg/kg-d)	CSFo (kg-d/mg)	LICR _{ind} ()
Mercury (Hg+2)	0.0E+00	30	350	70	70	365	0.0E+00	n/a	
Mercury (MeHg)	0.0E+00	30	350	70	70	365	0.0E+00	n/a	
Mercury (Hg0)	0.0E+00	30	350	70	70	365	0.0E+00	n/a	
Lead	0.0E+00	30	350	70	70	365	0.0E+00	n/a	
TCDD (2,3,7,8-)	7.0E-13	30	350	70	70	365	4.1E-15	1.5E+05	6E-10
Total									6E-10

Note: According to current guidance [USEPA, 2005] elemental mercury is only evaluated for direct inhalation exposures.

n/a: Toxicity criterion not available.

Table 7-15
 Potential Hazard Indices Resulting from Indirect Exposure to COPCs
 Fisher

Chemical	I _{tot-EPA} (NC) (mg/d)	I _{tot-MDEQ} (NC) (mg/d)	EF (d/yr)	BW (kg)	UCF (d/yr)	ADD _{EPA} (mg/kg-d)	ADD _{MDEQ} (mg/kg-d)	RfD (mg/kg-d)	HI _{ind-EPA} ()	HI _{ind-MDEQ} ()
Mercury (Hg+2)	6.5E-07	6.5E-07	350	70	365	8.9E-09	8.9E-09	3.0E-04	3E-05	3E-05
Mercury (MeHg)	2.7E-04	6.1E-05	350	70	365	3.6E-06	8.3E-07	1.0E-04	4E-02	8E-03
Mercury (Hg0)	0.0E+00	0.0E+00	350	70	365	0.0E+00	0.0E+00	n/a		
Lead	1.5E-05	1.5E-05	350	70	365	2.0E-07	2.0E-07	n/a		
TCDD (2,3,7,8-)	8.2E-13	8.2E-13	350	70	365	1.1E-14	1.1E-14	1.0E-09	1E-05	1E-05
Total									4E-02	8E-03

Note: According to current guidance [USEPA, 2005] elemental mercury is only evaluated for direct inhalation exposures.

n/a: Toxicity criterion not available.

Table 7-16
 Potential Lifetime Incremental Cancer Risks and Hazard Quotients Resulting from Direct Exposure to COPCs
 Fisher Child

Chemical	C _{air} ($\mu\text{g}/\text{m}^3$)	EC (C) ($\mu\text{g}/\text{m}^3$)	EC (NC) ($\mu\text{g}/\text{m}^3$)	URF _i ($\text{m}^3/\mu\text{g}$)	RfC (mg/m^3)	LICR _i ()	HQ _i ()
Mercury (Hg+2)	1.3E-05	0.0E+00	1.2E-05	n/a	9.0E-05		1E-04
Mercury (MeHg)	0.0E+00	0.0E+00	0.0E+00	n/a	n/a		
Mercury (Hg0)	1.6E-05	0.0E+00	1.6E-05	n/a	3.0E-04		5E-05
Lead	3.6E-05	0.0E+00	3.4E-05	n/a	n/a		
TCDD (2,3,7,8-)	2.7E-12	2.2E-13	2.6E-12	n/a	n/a		
Total							2E-04

n/a: Toxicity criterion not available.

Table 7-17
 Potential Lifetime Incremental Cancer Risks Resulting from Indirect Exposure to COPCs
 Fisher Child

Chemical	I _{tot} (C) (mg/d)	ED (yr)	EF (d/yr)	BW (kg)	AT (yr)	UCF (d/yr)	LADD (mg/kg-d)	CSFo (kg-d/mg)	LICR _{ind} ()
Mercury (Hg+2)	0.0E+00	6	350	15	70	365	0.0E+00	n/a	
Mercury (MeHg)	0.0E+00	6	350	15	70	365	0.0E+00	n/a	
Mercury (Hg0)	0.0E+00	6	350	15	70	365	0.0E+00	n/a	
Lead	0.0E+00	6	350	15	70	365	0.0E+00	n/a	
TCDD (2,3,7,8-)	2.0E-13	6	350	15	70	365	1.1E-15	1.5E+05	2E-10
Total									2E-10

Note: According to current guidance [USEPA, 2005] elemental mercury is only evaluated for direct inhalation exposures.

n/a: Toxicity criterion not available.

Table 7-18
 Potential Hazard Indices Resulting from Indirect Exposure to COPCs
 Fisher Child

Chemical	I _{tot-EPA} (NC) (mg/d)	I _{tot-MDEQ} (NC) (mg/d)	EF (d/yr)	BW (kg)	UCF (d/yr)	ADD _{EPA} (mg/kg-d)	ADD _{MDEQ} (mg/kg-d)	RfD (mg/kg-d)	HI _{ind-EPA} ()	HI _{ind-MDEQ} ()
Mercury (Hg+2)	5.4E-07	5.4E-07	350	15	365	3.4E-08	3.4E-08	3.0E-04	1E-04	1E-04
Mercury (MeHg)	4.1E-05	9.4E-06	350	15	365	2.6E-06	6.0E-07	1.0E-04	3E-02	6E-03
Mercury (Hg0)	0.0E+00	0.0E+00	350	15	365	0.0E+00	0.0E+00	n/a		
Lead	1.2E-05	1.2E-05	350	15	365	7.9E-07	7.9E-07	n/a		
TCDD (2,3,7,8-)	2.0E-13	2.0E-13	350	15	365	1.3E-14	1.3E-14	1.0E-09	1E-05	1E-05
Total									3E-02	6E-03

Note: According to current guidance [USEPA, 2005] elemental mercury is only evaluated for direct inhalation exposures.

n/a: Toxicity criterion not available.

Table 7-19
Summary of Lifetime Incremental Cancer Risks for Default Receptor Scenarios

Farmer				Fisher				Resident			
Adult		Child		Adult		Child		Adult		Child	
Direct LICR	Indirect LICR	Direct LICR	Indirect LICR	Direct LICR	Indirect LICR	Direct LICR	Indirect LICR	Direct LICR	Indirect LICR	Direct LICR	Indirect LICR
0E+00	1E-08	0E+00	3E-09	0E+00	6E-10	0E+00	2E-10	0E+00	7E-11	0E+00	7E-11
1E-08		3E-09		6E-10		2E-10		7E-11		7E-11	

Table 7-20
Summary of Hazard Indices for Default Receptor Scenarios

Farmer				Fisher				Resident			
Adult		Child		Adult		Child		Adult		Child	
Direct HI	Indirect HI	Direct HI	Indirect HI	Direct HI	Indirect HI ^A	Direct HI	Indirect HI ^A	Direct HI	Indirect HI	Direct HI	Indirect HI
1E-04	3E-04	1E-04	5E-04	2E-04	4E-02	2E-04	3E-02	2E-04	5E-05	2E-04	2E-04
4E-04		6E-04		4E-02		3E-02		2E-04		3E-04	

^A Indirect HI values for Fisher and Fisher Child are based on USEPA guidance for the modeling of mercury into fish tissue.

Table 7-21
 Comparison of Nursing Infant 2,3,7,8-TCDD Exposure Levels to Reference
 Background Levels

Receptor Scenario	ADD _{infant} (pg/kg-d) ^A	ADD _{reference} (pg/kg-d) ^B	ADD _{infant} /ADD _{reference} ()
Farmer	5.1E-03	60	8.5E-05
Fisher	3.5E-04	60	5.8E-06
Resident	5.9E-05	60	9.9E-07

^A From Table 5-93.

^B From Section 2.3.10.2 [USEPA, 2005].

Table 7-22
IEUBK Predicted Blood Lead Levels Under Modeled Exposure Scenarios

Scenario	Description	Description of Lead Paint in Homes	Predicted Blood Lead Concentration ^A (µg/dL)	Probability of Exceeding 10 µg/dL (%)
1	Background	None	2.401	0.120
2	Background	Lead Paint: Good Condition	3.495	1.265
3	Background + MME Emissions	None	2.404	0.121
4	Background + MME Emissions	Lead Paint: Good Condition	3.498	1.271

^A Geometric mean blood lead concentration predicted by IEUBK.

Table 7-23
Summary of IEUBK Modeled Output Parameters for Scenario 4 Run ^A

Year	Daily Lead Intake by Medium (µg/d)						Blood Lead (µg/dL)
	Air	Diet	Alternate	Water	Soil+Dust	Total	
0.5-1	0.002	2.572	0	1.206	2.825	6.605	3.6
1-2	0.003	2.653	0	2.974	4.428	10.059	4.1
2-3	0.006	3.006	0	3.122	4.470	10.604	3.9
3-4	0.007	2.923	0	3.219	4.520	10.669	3.7
4-5	0.007	2.858	0	3.391	3.399	9.655	3.3
5-6	0.009	3.032	0	3.596	3.077	9.714	3.0
6-7	0.009	3.356	0	3.669	2.914	9.949	2.8

^A Results are for combined impacts of MME emissions and background lead levels. Conservative assumption is that lead paint in good condition may be present in area homes.

Appendix A

**Candidate Surface Water Data Evaluated in the Selection
Process for the HHRA**

Appendix A
Candidate Surface Water Data Evaluated in the Selection Process for the HHRA

Parameter	Symbol	Units	Tittabawassee River	Kiwasssee Lake (100-m Watershed)		Kiwasssee Lake (Full Watershed)		Unnamed Lake	
Total Suspended Solids	TSS	mg/L	26.9	2	10	2	10	2	10
Average Volumetric Flow Through Waterbody	V _{fx}	m ³ /yr	1.66E+09	1.65E+04	1.65E+04	2.39E+05	2.39E+05	2.42E+05	2.42E+05
Current Velocity	u	m/s	0.287	0.0	0.0	0.0	0.0	0.0	0.0
Depth of Water Column	d _w	m	3.05	1.52	1.52	1.52	1.52	1.52	1.52
Empirical Intercept Coefficient	a	()	1.2	2.1	2.1	1.9	1.9	2.1	2.1
Total Suspended Solids	TSS	mg/L	26.9	2	10	2	10	2	10
Water Body Area	WA _w	m ²	2.07E+06	4.89E+04	4.89E+04	4.89E+04	4.89E+04	3.25E+04	3.25E+04
Watershed Area, Pervious	WA _L	m ²	1.73E+08	1.30E+05	1.30E+05	1.88E+06	1.88E+06	1.91E+06	1.91E+06
Watershed Area, Impervious	WA _I	m ²	8.64E+06	4.69E+03	4.69E+03	1.88E+04	18799	0.00E+00	0.00E+00
Methylmercury Concentration in Fish [USEPA Approach]	C _{fish}	mg/kg	5.24E-04	1.79E-02	1.78E-02	1.25E-02	1.17E-02	6.59E-03	6.16E-03
Indirect Hazard Index in Fisher [USEPA Approach]	HI	()	1.1E-03	3.7E-02	3.7E-02	2.6E-02	2.4E-02	1.4E-02	1.3E-02
Indirect Hazard Index in Fisher [MDEQ Approach]	HI	()	5.1E-04	5.1E-03	8.4E-03	1.7E-03	2.8E-03	8.3E-04	1.3E-03

Appendix B
IEUBK Output Files

LEAD MODEL FOR WINDOWS Version 1.0

```

=====
Model Version: 1.0 Build 263
User Name:
Date:
Site Name:
Operable Unit:
Run Mode: Background:No Lead Paint
=====
    
```

The time step used in this model run: 4 - Every 15 Minutes (96 times a day).

***** Air *****

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m ³ /day)	Lung Absorption (%)	Outdoor Air Pb Conc (ug Pb/m ³)
.5-1	1.000	2.000	32.000	0.010
1-2	2.000	3.000	32.000	0.010
2-3	3.000	5.000	32.000	0.010
3-4	4.000	5.000	32.000	0.010
4-5	4.000	5.000	32.000	0.010
5-6	4.000	7.000	32.000	0.010
6-7	4.000	7.000	32.000	0.010

***** Diet *****

Age	Diet Intake(ug/day)
.5-1	5.530
1-2	5.780
2-3	6.490
3-4	6.240
4-5	6.010
5-6	6.340
6-7	7.000

***** Drinking Water *****

Water Consumption:

Age	Water (L/day)
.5-1	0.200
1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 13.000 ug Pb/L

***** Soil & Dust *****

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
.5-1	21.000	15.700
1-2	21.000	15.700
2-3	21.000	15.700
3-4	21.000	15.700
4-5	21.000	15.700
5-6	21.000	15.700
6-7	21.000	15.700

***** Alternate Intake *****

Age	Alternate (ug Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

***** Maternal Contribution: Infant Model *****

Maternal Blood Concentration: 2.500 ug Pb/dL

 CALCULATED BLOOD LEAD AND LEAD UPTAKES:

Year	Air (ug/day)	Diet (ug/day)	Alternate (ug/day)	Water (ug/day)
.5-1	0.002	2.633	0.000	1.238
1-2	0.003	2.730	0.000	3.070
2-3	0.006	3.081	0.000	3.209
3-4	0.007	2.985	0.000	3.296
4-5	0.007	2.894	0.000	3.443
5-6	0.009	3.062	0.000	3.641
6-7	0.009	3.385	0.000	3.709

Year	Soil+Dust (ug/day)	Total (ug/day)	Blood (ug/dL)
.5-1	0.439	4.312	2.4
1-2	0.692	6.496	2.7
2-3	0.695	6.991	2.6
3-4	0.701	6.988	2.5
4-5	0.523	6.867	2.3
5-6	0.472	7.184	2.2
6-7	0.446	7.548	2.1

LEAD MODEL FOR WINDOWS Version 1.0

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Model Version: 1.0 Build 263
User Name:
Date:
Site Name:
Operable Unit:
Run Mode: Background: Lead Paint in Good Condition
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```

The time step used in this model run: 4 - Every 15 Minutes (96 times a day).

***** Air *****

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m ³ /day)	Lung Absorption (%)	Outdoor Air Pb Conc (ug Pb/m ³)
.5-1	1.000	2.000	32.000	0.010
1-2	2.000	3.000	32.000	0.010
2-3	3.000	5.000	32.000	0.010
3-4	4.000	5.000	32.000	0.010
4-5	4.000	5.000	32.000	0.010
5-6	4.000	7.000	32.000	0.010
6-7	4.000	7.000	32.000	0.010

***** Diet *****

Age	Diet Intake(ug/day)
.5-1	5.530
1-2	5.780
2-3	6.490
3-4	6.240
4-5	6.010
5-6	6.340
6-7	7.000

***** Drinking Water *****

Water Consumption:

Age	Water (L/day)
.5-1	0.200
1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 13.000 ug Pb/L

***** Soil & Dust *****

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
.5-1	21.000	200.000
1-2	21.000	200.000
2-3	21.000	200.000
3-4	21.000	200.000
4-5	21.000	200.000
5-6	21.000	200.000
6-7	21.000	200.000

***** Alternate Intake *****

Age	Alternate (ug Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

***** Maternal Contribution: Infant Model *****

Maternal Blood Concentration: 2.500 ug Pb/dL

CALCULATED BLOOD LEAD AND LEAD UPTAKES:

Year	Air (ug/day)	Diet (ug/day)	Alternate (ug/day)	Water (ug/day)
.5-1	0.002	2.564	0.000	1.206
1-2	0.003	2.645	0.000	2.975
2-3	0.006	2.998	0.000	3.123
3-4	0.007	2.915	0.000	3.219
4-5	0.007	2.850	0.000	3.391
5-6	0.009	3.024	0.000	3.596
6-7	0.009	3.348	0.000	3.669

Year	Soil+Dust (ug/day)	Total (ug/day)	Blood (ug/dL)
.5-1	2.825	6.597	3.6
1-2	4.428	10.051	4.1
2-3	4.469	10.596	3.9
3-4	4.520	10.661	3.7
4-5	3.399	9.647	3.3
5-6	3.077	9.706	3.0
6-7	2.914	9.941	2.8

LEAD MODEL FOR WINDOWS Version 1.0

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=====
Model Version: 1.0 Build 263
User Name:
Date:
Site Name:
Operable Unit:
Run Mode: MME Emissions: No Lead Paint
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The time step used in this model run: 4 - Every 15 Minutes (96 times a day).

***** Air *****

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m ³ /day)	Lung Absorption (%)	Outdoor Air Pb Conc (ug Pb/m ³)
.5-1	1.000	2.000	32.000	0.010
1-2	2.000	3.000	32.000	0.010
2-3	3.000	5.000	32.000	0.010
3-4	4.000	5.000	32.000	0.010
4-5	4.000	5.000	32.000	0.010
5-6	4.000	7.000	32.000	0.010
6-7	4.000	7.000	32.000	0.010

***** Diet *****

Age	Diet Intake(ug/day)
.5-1	5.547
1-2	5.797
2-3	6.507
3-4	6.257
4-5	6.027
5-6	6.357
6-7	7.017

***** Drinking Water *****

Water Consumption:

Age	Water (L/day)
.5-1	0.200
1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 13.000 ug Pb/L

***** Soil & Dust *****

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
.5-1	21.040	15.730
1-2	21.040	15.730
2-3	21.040	15.730
3-4	21.040	15.730
4-5	21.040	15.730
5-6	21.040	15.730
6-7	21.040	15.730

***** Alternate Intake *****

Age	Alternate (ug Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

***** Maternal Contribution: Infant Model *****

Maternal Blood Concentration: 2.500 ug Pb/dL

 CALCULATED BLOOD LEAD AND LEAD UPTAKES:

Year	Air (ug/day)	Diet (ug/day)	Alternate (ug/day)	Water (ug/day)
.5-1	0.002	2.641	0.000	1.238
1-2	0.003	2.738	0.000	3.070
2-3	0.006	3.089	0.000	3.209
3-4	0.007	2.993	0.000	3.296
4-5	0.007	2.902	0.000	3.443
5-6	0.009	3.070	0.000	3.641
6-7	0.009	3.393	0.000	3.708

Year	Soil+Dust (ug/day)	Total (ug/day)	Blood (ug/dL)
.5-1	0.440	4.321	2.4
1-2	0.693	6.505	2.7
2-3	0.697	7.000	2.6
3-4	0.702	6.997	2.5
4-5	0.524	6.876	2.3
5-6	0.472	7.192	2.2
6-7	0.447	7.557	2.1

LEAD MODEL FOR WINDOWS Version 1.0

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=====
Model Version: 1.0 Build 263
User Name:
Date:
Site Name:
Operable Unit:
Run Mode: MME Emissions: Lead Paint in Good Condition
=====
    
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The time step used in this model run: 4 - Every 15 Minutes (96 times a day).

***** Air *****

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m ³ /day)	Lung Absorption (%)	Outdoor Air Pb Conc (ug Pb/m ³)
.5-1	1.000	2.000	32.000	0.010
1-2	2.000	3.000	32.000	0.010
2-3	3.000	5.000	32.000	0.010
3-4	4.000	5.000	32.000	0.010
4-5	4.000	5.000	32.000	0.010
5-6	4.000	7.000	32.000	0.010
6-7	4.000	7.000	32.000	0.010

***** Diet *****

Age	Diet Intake(ug/day)
.5-1	5.547
1-2	5.797
2-3	6.507
3-4	6.257
4-5	6.027
5-6	6.357
6-7	7.017

***** Drinking Water *****

Water Consumption:

Age	Water (L/day)
.5-1	0.200
1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 13.000 ug Pb/L

***** Soil & Dust *****

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
.5-1	21.040	200.000
1-2	21.040	200.000
2-3	21.040	200.000
3-4	21.040	200.000
4-5	21.040	200.000
5-6	21.040	200.000
6-7	21.040	200.000

***** Alternate Intake *****

Age	Alternate (ug Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

***** Maternal Contribution: Infant Model *****

Maternal Blood Concentration: 2.500 ug Pb/dL

 CALCULATED BLOOD LEAD AND LEAD UPTAKES:

Year	Air (ug/day)	Diet (ug/day)	Alternate (ug/day)	Water (ug/day)
.5-1	0.002	2.572	0.000	1.206
1-2	0.003	2.653	0.000	2.974
2-3	0.006	3.006	0.000	3.122
3-4	0.007	2.923	0.000	3.219
4-5	0.007	2.858	0.000	3.391
5-6	0.009	3.032	0.000	3.596
6-7	0.009	3.356	0.000	3.669

Year	Soil+Dust (ug/day)	Total (ug/day)	Blood (ug/dL)
.5-1	2.825	6.605	3.6
1-2	4.428	10.059	4.1
2-3	4.470	10.604	3.9
3-4	4.521	10.669	3.7
4-5	3.399	9.655	3.3
5-6	3.077	9.714	3.0
6-7	2.914	9.949	2.8

Appendix C

Summary of Dioxin Furan Emission Factors from USEPA Database and AP42

Appendix C
Summary of Dioxin Furan Emission Factors from USEPA Database and AP-42

Congener Species	Emission Factor (lb/10 ¹² Btu)		Congener Species	Emission Factor (lb/10 ¹² Btu)	
	EPA Database ^A	AP-42 ^B		EPA Database ^A	AP-42 ^B
Dioxin Congeners			Furan Congeners		
2,3,7,8-Tetrachlorodibenzo(p)dioxin	1.65E-06	8.70E-07	2,3,7,8-Tetrachlorodibenzofuran	1.00E-05	3.10E-06
Total Tetrachlorodibenzo(p)dioxin	7.10E-06	5.65E-06	Total Tetrachlorodibenzofuran	--	2.46E-05
1,2,3,7,8-Pentachlorodibenzo(p)dioxin	2.35E-06	--	1,2,3,7,8-Pentachlorodibenzofuran	2.25E-06	--
Total Pentachlorodibenzo(p)dioxin	--	2.72E-06	2,3,4,7,8-Pentachlorodibenzofuran	1.90E-06	--
1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin	7.50E-06	--	Total Pentachlorodibenzofuran	--	2.15E-05
1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin	4.95E-06	--	1,2,3,4,7,8-Hexachlorodibenzofuran	8.00E-06	--
1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin	6.00E-06	--	1,2,3,6,7,8-Hexachlorodibenzofuran	2.90E-06	--
Total Hexachlorodibenzo(p)dioxin	--	1.75E-06	1,2,3,7,8,9-Hexachlorodibenzofuran	4.40E-06	--
1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin	1.30E-05	--	2,3,4,6,7,8-Hexachlorodibenzofuran	8.00E-06	--
Total Heptachlorodibenzo(p)dioxin	5.50E-06	5.08E-06	Total Hexachlorodibenzofuran	--	1.17E-05
1,2,3,4,6,7,8,9-Octachlorodibenzo(p)dioxin	6.50E-05	--	1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.20E-05	--
Total Octachlorodibenzo(p)dioxin	--	2.53E-05	1,2,3,4,7,8,9-Heptachlorodibenzofuran	7.50E-06	--
			Total Heptachlorodibenzofuran	--	4.67E-06
			1,2,3,4,6,7,8,9-Octachlorodibenzofuran	6.50E-05	--
			Total Octachlorodibenzofuran	--	4.03E-06

^A Source: [Database of Sources of Environmental Release of Dioxin-like Compounds in the United States](#) [Coal Creek, Springerville and Yates Power Plants] [USEPA, 2001].

^B Source: AP-42 Table 1.1-12 [ESP or FF column for subbituminous coal-fired units].