Norlite Corporation
Cohoes, New York

2002 Update Report
Multipathway Risk Assessment
Light-Weight Aggregate Kilns

Volume II
Technical Appendices

ENSR Corporation
April 2002 – revised October 2002
Document Number 09514-046-501

Norlite Corporation
Cohoes, New York

2002 Update Report
Multipathway Risk Assessment
Light-Weight Aggregate Kilns

Volume II
Technical Appendices

ENSR Corporation
April 2002 – revised October 2002
Document Number 09514-046-501

Appendix A

Results of Risk Ranking (Tables 1 – 6)

Table 1
Risk Ranking based on Inhalation Carcinogenic Risk and Emission Rate
Norlite - Cohoes, New York

Compound	CAS No.	Inhalation Carcinogenic Slope Factor $(mg/kg\text{-}day)^{-1}$	Emission Rate (g/sec)	Inhalation CSF x Emission Rate	Percent Contribution to Risk
CHROMIUM (VI)	18540-29-9	2.94E+02	3.69E-06	1.08E-03	38.6832%
2,3,7,8-TCDD - TE	1746-01-6	1.50E+05	4.14E-09	6.21E-04	22.1432%
1,3-BUTADIENE	106-99-0	9.80E-01	3.20E-04	3.14E-04	11.1821%
ARSENIC	7440-38-2	1.50E+01	1.23E-05	1.85E-04	6.5788%
HEXACHLOROBENZENE	118-74-1	1.61E+00	8.87E-05	1.43E-04	5.0930%
NICKEL	7440-02-0	8.40E-01	1.70E-04	1.43E-04	5.0919%
2,4-DINITROTOLUENE	121-14-2	6.80E-01	7.04E-05	4.79E-05	1.7082%
2,6-DINITROTOLUENE	606-20-2	6.80E-01	7.04E-05	4.79E-05	1.7082%
PENTACHLOROPHENOL	87-86-5	1.20E-01	2.82E-04	3.38E-05	1.2058%
CADMIUM	7440-43-9	6.30E+00	4.86E-06	3.06E-05	1.0918%
CHLOROFORM	67-66-3	8.10E-02	3.20E-04	2.60E-05	0.9255%
1,1,2,2-TETRACHLOROETHANE	79-34-5	2.00E-01	1.07E-04	2.14E-05	0.7644%
1,1-DICHLOROETHYLENE	75-35-4	2.00E-01	1.07E-04	2.14E-05	0.7644%
BENZENE	71-43-2	2.70E-02	4.64E-04	1.25E-05	0.4472%
BERYLLIUM	7440-41-7	8.40E+00	1.21E-06	1.02E-05	0.3624%
VINYL CHLORIDE	75-01-4	3.10E-02	3.20E-04	9.92E-06	0.3537%
1,2-DICHLOROETHANE	107-06-2	9.10E-02	1.07E-04	9.75E-06	0.3478%
BROMODICHLOROMETHANE	75-27-4	6.20E-02	1.20E-04	7.45E-06	0.2655%
1,2-DICHLOROPROPANE	78-87-5	6.80E-02	1.07E-04	7.29E-06	0.2599%
1,1,2-TRICHLOROETHANE	79-00-5	5.60E-02	1.07E-04	6.00E-06	0.2140%
CARBON TETRACHLORIDE	56-23-5	5.30E-02	9.69E-05	5.13E-06	0.1831%
1,1,1,2-TETRACHLOROETHANE	630-20-6	2.62E-02	1.07E-04	2.81E-06	0.1001%
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	1.40E-02	1.88E-04	2.63E-06	0.0937%
2,4,6-TRICHLOROPHENOL (a)	88-06-2	1.09E-02	2.03E-04	2.21E-06	0.0790%
CHLOROMETHANE	74-87-3	6.30E-03	3.20E-04	2.02E-06	0.0719%
TRANS-1,3-DICHLOROPROPENE	10061-02-6	1.40E-02	1.07E-04	1.50E-06	0.0535%
CIS-1,3-DICHLOROPROPENE (a)	10061-01-5	1.40E-02	1.05E-04	1.47E-06	0.0524%
1,4-DICHLOROBENZENE (a)	106-46-7	2.20E-02	5.74E-05	1.26E-06	0.0451%
HEXACHLOROBUTADIENE	87-68-3	7.70E-02	1.41E-05	1.08E-06	0.0387%
METHYLENE CHLORIDE	75-09-2	1.60E-03	3.92E-04	6.26E-07	0.0223%
TRICHLOROETHYLENE	79-01-6	6.00E-03	9.61E-05	5.76E-07	0.0205%
BROMOFORM	75-25-2	3.90E-03	1.20E-04	4.68E-07	0.0167%
TETRACHLOROETHYLENE	127-18-4	2.03E-03	1.23E-04	2.49E-07	0.0089%
HEXACHLOROETHANE	67-72-1	1.40E-02	1.41E-05	1.97E-07	0.0070%
STYRENE	100-42-5	2.00E-03	8.52E-05	1.70E-07	0.0061%
BENZO(A)PYRENE	50-32-8	3.10E+00	5.16E-08	1.60E-07	0.0057%
DIBENZ(A,H)ANTHRACENE	53-70-3	3.10E+00	3.53E-08	1.09E-07	0.0039%
BENZO(B)FLUORANTHENE	205-99-2	3.10E-01	3.46E-08	1.07E-08	0.0004%
INDENO(1,2,3-CD)PYRENE	193-39-5	3.10E-01	4.92E-09	1.53E-09	0.0001%
BENZO(A)ANTHRACENE	56-55-3	3.10E-01	4.27E-09	1.32E-09	0.0000%
BENZO(K)FLUORANTHENE	207-08-9	3.10E-02	4.64E-10	1.44E-11	0.0000%
CHRYSENE	218-01-9	3.10E-03	2.47E-10	7.66E-13	0.0000%

Notes:
a) Used toxicity values from surrogate compound.
CSF = Cancer Slope Factor
*** = Percent Contribution to risk less than 0.001% and greater than zero.

Table 2
Risk Ranking based on Inhalation Reference Dose and Emission Rate
Norlite - Cohoes, New York

Compound	CAS No.	Inhalation Reference Dose	Emission Rate (g/sec)	Emission Rate/ Inhalation RFD	Percent Contribution to Risk
NICKEL	7440-02-0	5.71E-06	1.70E-04	2.98E+01	62.6728%
HEXACHLOROCYCLOPENTADIENE	77-47-4	5.71E-05	2.82E-04	4.94E+00	10.3889%
CHLOROFORM	67-66-3	8.60E-05	3.20E-04	3.73E+00	7.8433%
MERCURY	7439-97-6	8.57E-05	2.71E-04	3.16E+00	6.6566%
2-NITROANILINE	88-74-4	5.71E-05	1.41E-04	2.47E+00	5.1944%
CADMIUM	7440-43-9	5.71E-06	4.86E-06	8.51E-01	1.7917%
CHROMIUM (TOTAL)	7440-47-3	2.86E-05	1.42E-05	4.97E-01	1.0452%
BENZENE	71-43-2	1.71E-03	4.64E-04	2.72E-01	0.5718%
BROMOMETHANE	74-83-9	1.43E-03	3.20E-04	2.24E-01	0.4711%
BERYLLIUM	7440-41-7	5.71E-06	1.21E-06	2.12E-01	0.4461%
CARBON TETRACHLORIDE	56-23-5	5.71E-04	9.69E-05	1.70E-01	0.3572%
CHROMIUM (VI)	18540-29-9	2.86E-05	3.69E-06	1.29E-01	0.2716%
HEXACHLOROBENZENE	118-74-1	8.00E-04	8.87E-05	1.11E-01	0.2334%
BARIUM	7440-39-3	1.43E-04	1.38E-05	9.65E-02	0.2031%
1,2-DICHLOROPROPANE	78-87-5	1.14E-03	1.07E-04	9.40E-02	0.1979%
THALLIUM	7440-28-0	6.60E-05	6.08E-06	9.21E-02	0.1939%
2,6-DINITROTOLUENE	606-20-2	1.00E-03	7.04E-05	7.04E-02	0.1483%
HEXACHLOROBUTADIENE	87-68-3	2.00E-04	1.41E-05	7.04E-02	0.1483%
NAPHTHALENE	91-20-3	8.57E-04	4.25E-05	4.96E-02	0.1044%
ARSENIC	7440-38-2	3.00E-04	1.23E-05	4.10E-02	0.0863%
1,2-DICHLOROETHANE	107-06-2	2.86E-03	1.07E-04	3.75E-02	0.0789%
2,4-DINITROTOLUENE	121-14-2	2.00E-03	7.04E-05	3.52E-02	0.0742%
4-NITROPHENOL	100-02-7	8.00E-03	2.82E-04	3.52E-02	0.0742%
2,3,7,8-TCDD - TE	1746-01-6	1.30E-07	4.14E-09	3.18E-02	0.0670%
1,1,2-TRICHLOROETHANE	79-00-5	4.00E-03	1.07E-04	2.68E-02	0.0564%
NITROBENZENE	98-95-3	5.71E-04	1.41E-05	2.47E-02	0.0519%
2,4-DICHLOROPHENOL	120-83-2	3.00E-03	7.04E-05	2.35E-02	0.0494%
4-METHYLPHENOL	106-44-5	5.00E-03	9.57E-05	1.91E-02	0.0403%
TRANS-1,3-DICHLOROPROPENE (a)	10061-02-6	5.71E-03	1.07E-04	1.88E-02	0.0395%
CIS-1,3-DICHLOROPROPENE (a)	10061-01-5	5.71E-03	1.05E-04	1.84E-02	0.0387%
TRICHLOROETHYLENE	79-01-6	6.00E-03	9.61E-05	1.60E-02	0.0337%
CHLOROBENZENE	108-90-7	1.70E-02	2.68E-04	1.58E-02	0.0332%
2-CHLOROPHENOL	95-57-8	5.00E-03	7.04E-05	1.41E-02	0.0297%
HEXACHLOROETHANE	67-72-1	1.00E-03	1.41E-05	1.41E-02	0.0297%
ANTIMONY	7440-36-0	4.00E-04	4.86E-06	1.22E-02	0.0256%
1,1-DICHLOROETHYLENE	75-35-4	9.00E-03	1.07E-04	1.19E-02	0.0251%
DIBROMOMETHANE	74-95-3	1.00E-02	1.07E-04	1.07E-02	0.0226%
PENTACHLOROPHENOL	87-86-5	3.00E-02	2.82E-04	9.39E-03	0.0198%
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	2.00E-02	1.88E-04	9.39E-03	0.0198%
4-METHYL-2-PENTANONE	108-10-1	2.29E-02	2.14E-04	9.36E-03	0.0197%
BROMODICHLOROMETHANE	75-27-4	2.00E-02	1.20E-04	6.01E-03	0.0126%
BROMOFORM	75-25-2	2.00E-02	1.20E-04	6.01E-03	0.0126%
DICHLORODIFLUOROMETHANE	75-71-8	5.70E-02	3.20E-04	5.61E-03	0.0118%
TRANS-1,2-DICHLOROETHENE	156-60-5	2.00E-02	1.07E-04	5.36E-03	0.0113%
CHLOROMETHANE	74-87-3	8.60E-02	3.20E-04	3.72E-03	0.0078%
1,1,1,2-TETRACHLOROETHANE	630-20-6	3.00E-02	1.07E-04	3.57E-03	0.0075%
2,4-DIMETHYLPHENOL	105-67-9	2.00E-02	7.04E-05	3.52E-03	0.0074%
DI-N-OCTYLPHTHALATE	117-84-0	2.00E-02	7.04E-05	3.52E-03	0.0074%

Table 2
Risk Ranking based on Inhalation Reference Dose and Emission Rate
Norlite - Cohoes, New York

Compound	CAS No.	Inhalation Reference Dose	Emission Rate (g/sec)	Emission Rate/ Inhalation RFD	Percent Contribution to Risk
1,3-DICHLOROBENZENE	541-73-1	3.00E-02	9.34E-05	3.11E-03	0.0066%
1,2,4-TRICHLOROBENZENE	120-82-1	5.71E-02	1.70E-04	2.98E-03	0.0063%
2-METHYLNAPHTHALENE	91-57-6	8.57E-04	2.07E-06	2.41E-03	0.0051%
2,4,6-TRICHLOROPHENOL (a)	88-06-2	1.00E-01	2.03E-04	2.03E-03	0.0043%
1,2-DICHLOROBENZENE	95-50-1	5.71E-02	1.03E-04	1.80E-03	0.0038%
1,1,2,2-TETRACHLOROETHANE	79-34-5	6.00E-02	1.07E-04	1.79E-03	0.0038%
TRICHLOROFLUOROMETHANE	75-69-4	2.00E-01	3.20E-04	1.60E-03	0.0034%
2-METHYLPHENOL	95-48-7	5.00E-02	7.94E-05	1.59E-03	0.0033%
TOLUENE	108-88-3	1.14E-01	1.71E-04	1.50E-03	0.0031%
COPPER	7440-50-8	3.70E-02	4.90E-05	1.32E-03	0.0028%
SELENIUM	7782-49-2	5.00E-03	6.08E-06	1.22E-03	0.0026%
M/P-XYLENE	1330-20-7	8.57E-02	1.04E-04	1.22E-03	0.0026%
TETRACHLOROETHYLENE	127-18-4	1.10E-01	1.23E-04	1.12E-03	0.0023%
ZINC	7440-66-6	3.00E-01	2.88E-04	9.60E-04	0.0020%
1,1-DICHLOROETHANE	75-34-3	1.40E-01	1.07E-04	7.66E-04	0.0016%
2-BUTANONE	78-93-3	2.86E-01	2.03E-04	7.09E-04	0.0015%
2,4,5-TRICHLOROPHENOL	95-95-4	1.00E-01	7.04E-05	7.04E-04	0.0015%
DI-N-BUTYLPHTHALATE	84-74-2	1.00E-01	7.04E-05	7.04E-04	0.0015%
O-XYLENE	95-47-6	2.00E-01	1.07E-04	5.36E-04	0.0011%
SILVER	7440-22-4	5.00E-03	2.58E-06	5.16E-04	0.0011%
METHYLENE CHLORIDE	75-09-2	8.60E-01	3.92E-04	4.55E-04	0.0010%
1,1,1-TRICHLOROETHANE	71-55-6	2.86E-01	1.07E-04	3.75E-04	0.0008%
ETHYLBENZENE	100-41-4	2.86E-01	1.07E-04	3.75E-04	0.0008%
BUTYLBENZYLPHTHALATE	85-68-7	2.00E-01	7.04E-05	3.52E-04	0.0007%
STYRENE	100-42-5	2.86E-01	8.52E-05	2.98E-04	0.0006%
1,4-DICHLOROBENZENE	106-46-7	2.30E-01	5.74E-05	2.50E-04	0.0005%
2-CHLORONAPHTHALENE	91-58-7	8.00E-02	1.41E-05	1.76E-04	0.0004%
PHENOL	108-95-2	6.00E-01	1.05E-04	1.75E-04	0.0004%
PHENANTHRENE	85-01-8	3.00E-02	2.47E-06	8.22E-05	0.0002%
DIETHYLPHTHALATE	84-66-2	8.00E-01	5.53E-05	6.91E-05	0.0001%
FLUORENE	86-73-7	4.00E-02	1.27E-06	3.17E-05	0.0001%
ACENAPHTHYLENE	208-96-8	6.00E-02	1.77E-06	2.96E-05	0.0001%
FLUORANTHENE	206-44-0	4.00E-02	8.45E-07	2.11E-05	0.0000%
PYRENE	129-00-0	3.00E-02	5.92E-07	1.97E-05	0.0000%
DIMETHYLPHTHALATE	131-11-3	1.10E+01	7.04E-05	6.40E-06	0.0000%
BENZO(E)PYRENE (a)	BEP	3.00E-02	1.76E-07	5.87E-06	0.0000%
BENZO(G,H,I)PERYLENE	191-24-2	3.00E-02	1.27E-07	4.24E-06	0.0000%
ACENAPHTHENE	83-32-9	6.00E-02	1.83E-07	3.05E-06	0.0000%
BENZO(A)PYRENE	50-32-8	3.00E-02	5.16E-08	1.72E-06	0.0000%
PERYLENE (a)	PERYLENE	3.00E-02	4.39E-08	1.46E-06	0.0000%
ANTHRACENE	120-12-7	3.00E-01	4.23E-07	1.41E-06	0.0000%
DIBENZ(A,H)ANTHRACENE	53-70-3	3.00E-02	3.53E-08	1.18E-06	0.0000%
BENZO(B)FLUORANTHENE	205-99-2	3.00E-02	3.46E-08	1.15E-06	0.0000%
INDENO(1,2,3-CD)PYRENE	193-39-5	3.00E-02	4.92E-09	1.64E-07	0.0000%
BENZO(A)ANTHRACENE	56-55-3	3.00E-02	4.27E-09	1.42E-07	0.0000%
BENZO(K)FLUORANTHENE	207-08-9	3.00E-02	4.64E-10	1.55E-08	0.0000%
CHRYSENE	218-01-9	3.00E-02	2.47E-10	8.23E-09	0.0000%

Notes:
a) Used toxicity values from surrogate compound.
RFD = Reference Dose
*** = Percent Contribution to risk less than 0.001% and greater than zero.

Table 3
Risk Ranking based on Oral Carcinogenic Risk and Emission Rate
Norlite - Cohoes, New York

Compound	CAS No.	Oral Carcinogenic Slope Factor $(mg/kg\text{-}day)^{-1}$	Emission Rate (g/sec)	Oral CSF x Emission Rate	Percent Contribution to Risk
2,3,7,8-TCDD - TE	1746-01-6	1.50E+05	4.14E-09	6.21E-04	38.7078%
VINYL CHLORIDE	75-01-4	1.50E+00	3.20E-04	4.80E-04	29.9190%
HEXACHLOROBENZENE	118-74-1	1.60E+00	8.87E-05	1.42E-04	8.8477%
1,1-DICHLOROETHYLENE	75-35-4	6.00E-01	1.07E-04	6.43E-05	4.0085%
2,4-DINITROTOLUENE	121-14-2	6.80E-01	7.04E-05	4.79E-05	2.9860%
2,6-DINITROTOLUENE	606-20-2	6.80E-01	7.04E-05	4.79E-05	2.9860%
PENTACHLOROPHENOL	87-86-5	1.20E-01	2.82E-04	3.38E-05	2.1078%
BENZENE	71-43-2	5.50E-02	4.64E-04	2.55E-05	1.5923%
1,1,2,2-TETRACHLOROETHANE	79-34-5	2.00E-01	1.07E-04	2.14E-05	1.3362%
TRANS-1,3-DICHLOROPROPENE (a)	10061-02-6	1.80E-01	1.07E-04	1.93E-05	1.2025%
ARSENIC	7440-38-2	1.50E+00	1.23E-05	1.85E-05	1.1500%
CARBON TETRACHLORIDE	56-23-5	1.30E-01	9.69E-05	1.26E-05	0.7851%
CIS-1,3-DICHLOROPROPENE (a)	10061-01-5	1.00E-01	1.05E-04	1.05E-05	0.6546%
1,2-DICHLOROETHANE	107-06-2	9.10E-02	1.07E-04	9.75E-06	0.6080%
BROMODICHLOROMETHANE	75-27-4	6.20E-02	1.20E-04	7.45E-06	0.4642%
1,2-DICHLOROPROPANE	78-87-5	6.80E-02	1.07E-04	7.29E-06	0.4543%
TETRACHLOROETHYLENE	127-18-4	5.20E-02	1.23E-04	6.38E-06	0.3976%
1,1,2-TRICHLOROETHANE	79-00-5	5.70E-02	1.07E-04	6.11E-06	0.3808%
CHLOROMETHANE	74-87-3	1.30E-02	3.20E-04	4.16E-06	0.2593%
METHYLENE CHLORIDE	75-09-2	7.50E-03	3.92E-04	2.94E-06	0.1830%
1,1,1,2-TETRACHLOROETHANE	630-20-6	2.60E-02	1.07E-04	2.79E-06	0.1737%
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	1.40E-02	1.88E-04	2.63E-06	0.1639%
STYRENE	100-42-5	3.00E-02	8.52E-05	2.56E-06	0.1593%
2,4,6-TRICHLOROPHENOL (a)	88-06-2	1.10E-02	2.03E-04	2.23E-06	0.1393%
1,4-DICHLOROBENZENE (a)	106-46-7	2.40E-02	5.74E-05	1.38E-06	0.0859%
HEXACHLOROBUTADIENE	87-68-3	7.80E-02	1.41E-05	1.10E-06	0.0685%
TRICHLOROETHYLENE	79-01-6	1.10E-02	9.61E-05	1.06E-06	0.0659%
BROMOFORM	75-25-2	7.90E-03	1.20E-04	9.49E-07	0.0591%
BENZO(A)PYRENE	50-32-8	7.30E+00	5.16E-08	3.76E-07	0.0235%
DIBENZ(A,H)ANTHRACENE	53-70-3	7.30E+00	3.53E-08	2.58E-07	0.0161%
HEXACHLOROETHANE	67-72-1	1.40E-02	1.41E-05	1.97E-07	0.0123%
BENZO(B)FLUORANTHENE	205-99-2	7.30E-01	3.46E-08	2.52E-08	0.0016%
INDENO(1,2,3-CD)PYRENE	193-39-5	7.30E-01	4.92E-09	3.59E-09	0.0002%
BENZO(A)ANTHRACENE	56-55-3	7.30E-01	4.27E-09	3.12E-09	0.0002%
BENZO(K)FLUORANTHENE	207-08-9	7.30E-02	4.64E-10	3.39E-11	0.0000%
CHRYSENE	218-01-9	7.30E-03	2.47E-10	1.80E-12	0.0000%

Notes:
a) Used toxicity values from surrogate compound.
CSF = Cancer Slope Factor
*** = Percent Contribution to risk less than 0.001% and greater than zero.

Table 4
Risk Ranking based on Oral Carcinogenic Slope Factor, LogKOW and Emission Rate
Norlite - Cohoes, New York

Compound	CAS No.	Oral Carcinogenic Slope Factor $(mg/kg\text{-}day)^{-1}$	Log Kow	Emission Rate (g/sec)	Oral CSF x Emission Rate x LogKOW	Percent Contribution to Risk
2,3,7,8-TCDD - TE	1746-01-6	1.50E+05	6.64	4.14E-09	4.12E-03	63.3162%
HEXACHLOROBENZENE	118-74-1	1.60E+00	5.89	8.87E-05	8.36E-04	12.8379%
VINYL CHLORIDE	75-01-4	1.50E+00	1.5	3.20E-04	7.20E-04	11.0557%
PENTACHLOROPHENOL	87-86-5	1.20E-01	5.09	2.82E-04	1.72E-04	2.6430%
1,1-DICHLOROETHYLENE	75-35-4	6.00E-01	2.13	1.07E-04	1.37E-04	2.1033%
2,4-DINITROTOLUENE	121-14-2	6.80E-01	2.01	7.04E-05	9.63E-05	1.4786%
2,6-DINITROTOLUENE	606-20-2	6.80E-01	1.87	7.04E-05	8.96E-05	1.3756%
BENZENE	71-43-2	5.50E-02	2.13	4.64E-04	5.44E-05	0.8355%
1,1,2,2-TETRACHLOROETHANE	79-34-5	2.00E-01	2.39	1.07E-04	5.12E-05	0.7867%
TRANS-1,3-DICHLOROPROPENE (a)	10061-02-6	1.80E-01	2	1.07E-04	3.86E-05	0.5925%
CARBON TETRACHLORIDE	56-23-5	1.30E-01	2.73	9.69E-05	3.44E-05	0.5280%
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	1.40E-02	7.3	1.88E-04	1.92E-05	0.2947%
TETRACHLOROETHYLENE	127-18-4	5.20E-02	2.67	1.23E-04	1.70E-05	0.2615%
BROMODICHLOROMETHANE	75-27-4	6.20E-02	2.1	1.20E-04	1.56E-05	0.2401%
CIS-1,3-DICHLOROPROPENE (a)	10061-01-5	1.00E-01	1.41	1.05E-04	1.48E-05	0.2274%
1,2-DICHLOROPROPANE	78-87-5	6.80E-02	1.97	1.07E-04	1.44E-05	0.2205%
1,2-DICHLOROETHANE	107-06-2	9.10E-02	1.47	1.07E-04	1.43E-05	0.2202%
1,1,2-TRICHLOROETHANE	79-00-5	5.70E-02	2.05	1.07E-04	1.25E-05	0.1923%
1,1,1,2-TETRACHLOROETHANE	630-20-6	2.60E-02	3.04	1.07E-04	8.47E-06	0.1301%
2,4,6-TRICHLOROPHENOL (a)	88-06-2	1.10E-02	3.7	2.03E-04	8.27E-06	0.1270%
STYRENE	100-42-5	3.00E-02	2.94	8.52E-05	7.51E-06	0.1154%
HEXACHLOROBUTADIENE	87-68-3	7.80E-02	4.78	1.41E-05	5.25E-06	0.0807%
1,4-DICHLOROBENZENE (a)	106-46-7	2.40E-02	3.42	5.74E-05	4.71E-06	0.0724%
CHLOROMETHANE	74-87-3	1.30E-02	0.91	3.20E-04	3.79E-06	0.0581%
METHYLENE CHLORIDE	75-09-2	7.50E-03	1.25	3.92E-04	3.67E-06	0.0564%
TRICHLOROETHYLENE	79-01-6	1.10E-02	2.42	9.61E-05	2.56E-06	0.0393%
BENZO(A)PYRENE	50-32-8	7.30E+00	6.11	5.16E-08	2.30E-06	0.0353%
BROMOFORM	75-25-2	7.90E-03	2.35	1.20E-04	2.23E-06	0.0342%
DIBENZ(A,H)ANTHRACENE	53-70-3	7.30E+00	6.69	3.53E-08	1.72E-06	0.0265%
HEXACHLOROETHANE	67-72-1	1.40E-02	4	1.41E-05	7.89E-07	0.0121%
BENZO(B)FLUORANTHENE	205-99-2	7.30E-01	6.2	3.46E-08	1.56E-07	0.0024%
INDENO(1,2,3-CD)PYRENE	193-39-5	7.30E-01	6.65	4.92E-09	2.39E-08	0.0004%
BENZO(A)ANTHRACENE	56-55-3	7.30E-01	5.7	4.27E-09	1.78E-08	0.0003%
BENZO(K)FLUORANTHENE	207-08-9	7.30E-02	6.2	4.64E-10	2.10E-10	0.0000%
CHRYSENE	218-01-9	7.30E-03	5.7	2.47E-10	1.03E-11	0.0000%

Notes:
a) Used toxicity values from surrogate compound.
CSF = Cancer Slope Factor
*** = Percent Contribution to risk less than 0.001% and greater than zero.

Table 5
Risk Ranking based on Oral Reference Dose and Emission Rate
Norlite - Cohoes, New York

Compound	CAS No.	Oral Reference Dose	Emission Rate (g/sec)	Emission Rate/ Oral RFD	Percent Contribution to Risk
2-NITROANILINE	88-74-4	6.0E-05	1.41E-04	2.35E+00	49.5633%
MERCURY	7439-97-6	3.0E-04	2.71E-04	9.03E-01	19.0656%
BROMOMETHANE	74-83-9	1.4E-03	3.20E-04	2.29E-01	4.8242%
BENZENE	71-43-2	3.0E-03	4.64E-04	1.55E-01	3.2677%
CARBON TETRACHLORIDE	56-23-5	7.0E-04	9.69E-05	1.38E-01	2.9212%
HEXACHLOROBENZENE	118-74-1	8.0E-04	8.87E-05	1.11E-01	2.3405%
CHLOROMETHANE	74-87-3	4.0E-03	3.20E-04	8.00E-02	1.6885%
THALLIUM	7440-28-0	8.0E-05	6.08E-06	7.60E-02	1.6040%
2,6-DINITROTOLUENE	606-20-2	1.0E-03	7.04E-05	7.04E-02	1.4869%
HEXACHLOROBUTADIENE	87-68-3	2.0E-04	1.41E-05	7.04E-02	1.4869%
HEXACHLOROCYCLOPENTADIENE	77-47-4	6.0E-03	2.82E-04	4.70E-02	0.9913%
ARSENIC	7440-38-2	3.0E-04	1.23E-05	4.10E-02	0.8653%
2,4-DINITROTOLUENE	121-14-2	2.0E-03	7.04E-05	3.52E-02	0.7434%
4-NITROPHENOL	100-02-7	8.0E-03	2.82E-04	3.52E-02	0.7434%
CHLOROFORM	67-66-3	1.0E-02	3.20E-04	3.20E-02	0.6763%
2,3,7,8-TCDD - TE	1746-01-6	1.3E-07	4.14E-09	3.18E-02	0.6721%
NITROBENZENE	98-95-3	5.0E-04	1.41E-05	2.82E-02	0.5948%
1,1,2-TRICHLOROETHANE	79-00-5	4.0E-03	1.07E-04	2.68E-02	0.5655%
2,4-DICHLOROPHENOL	120-83-2	3.0E-03	7.04E-05	2.35E-02	0.4956%
4-METHYLPHENOL	106-44-5	5.0E-03	9.57E-05	1.91E-02	0.4040%
1,2,4-TRICHLOROBENZENE	120-82-1	1.0E-02	1.70E-04	1.70E-02	0.3597%
TRICHLOROETHYLENE	79-01-6	6.0E-03	9.61E-05	1.60E-02	0.3379%
2-CHLOROPHENOL	95-57-8	5.0E-03	7.04E-05	1.41E-02	0.2974%
HEXACHLOROETHANE	67-72-1	1.0E-03	1.41E-05	1.41E-02	0.2974%
CHLOROBENZENE	108-90-7	2.0E-02	2.68E-04	1.34E-02	0.2826%
TETRACHLOROETHYLENE	127-18-4	1.0E-02	1.23E-04	1.23E-02	0.2589%
ANTIMONY	7440-36-0	4.0E-04	4.86E-06	1.22E-02	0.2564%
1,1-DICHLOROETHYLENE	75-35-4	9.0E-03	1.07E-04	1.19E-02	0.2514%
DIBROMOMETHANE	74-95-3	1.0E-02	1.07E-04	1.07E-02	0.2262%
CADMIUM	7440-43-9	5.0E-04	4.86E-06	9.72E-03	0.2051%
PENTACHLOROPHENOL	87-86-5	3.0E-02	2.82E-04	9.39E-03	0.1983%
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	2.0E-02	1.88E-04	9.39E-03	0.1982%
NICKEL	7440-02-0	2.0E-02	1.70E-04	8.50E-03	0.1794%
METHYLENE CHLORIDE	75-09-2	6.0E-02	3.92E-04	6.53E-03	0.1377%
BROMODICHLOROMETHANE	75-27-4	2.0E-02	1.20E-04	6.01E-03	0.1268%
BROMOFORM	75-25-2	2.0E-02	1.20E-04	6.01E-03	0.1268%
TRANS-1,2-DICHLOROETHENE	156-60-5	2.0E-02	1.07E-04	5.36E-03	0.1131%
1,1,1,2-TETRACHLOROETHANE	630-20-6	3.0E-02	1.07E-04	3.57E-03	0.0754%
1,2-DICHLOROETHANE	107-06-2	3.0E-02	1.07E-04	3.57E-03	0.0754%
TRANS-1,3-DICHLOROPROPENE (a)	10061-02-6	3.0E-02	1.07E-04	3.57E-03	0.0754%
2,4-DIMETHYLPHENOL	105-67-9	2.0E-02	7.04E-05	3.52E-03	0.0743%
DI-N-OCTYLPHTHALATE	117-84-0	2.0E-02	7.04E-05	3.52E-03	0.0743%
CIS-1,3-DICHLOROPROPENE (a)	10061-01-5	3.0E-02	1.05E-04	3.50E-03	0.0739%
1,3-DICHLOROBENZENE (a)	541-73-1	3.0E-02	9.34E-05	3.11E-03	0.0657%
4-METHYL-2-PENTANONE	108-10-1	8.0E-02	2.14E-04	2.68E-03	0.0566%

Table 5
Risk Ranking based on Oral Reference Dose and Emission Rate
Norlite - Cohoes, New York

Compound	CAS No.	Oral Reference Dose	Emission Rate (g/sec)	Emission Rate/ Oral RFD	Percent Contribution to Risk
NAPHTHALENE	91-20-3	2.0E-02	4.25E-05	2.12E-03	0.0448%
2,4,6-TRICHLOROPHENOL (a)	88-06-2	1.0E-01	2.03E-04	2.03E-03	0.0429%
1,4-DICHLOROBENZENE (a)	106-46-7	3.0E-02	5.74E-05	1.91E-03	0.0404%
1,1,2,2-TETRACHLOROETHANE	79-34-5	6.0E-02	1.07E-04	1.79E-03	0.0377%
DICHLORODIFLUOROMETHANE	75-71-8	2.0E-01	3.20E-04	1.60E-03	0.0338%
2-METHYLPHENOL	95-48-7	5.0E-02	7.94E-05	1.59E-03	0.0335%
COPPER	7440-50-8	3.7E-02	4.90E-05	1.32E-03	0.0280%
CHROMIUM (VI)	18540-29-9	3.0E-03	3.69E-06	1.23E-03	0.0260%
SELENIUM	7782-49-2	5.0E-03	6.08E-06	1.22E-03	0.0257%
1,2-DICHLOROPROPANE	78-87-5	9.0E-02	1.07E-04	1.19E-03	0.0251%
1,2-DICHLOROBENZENE	95-50-1	9.0E-02	1.03E-04	1.14E-03	0.0241%
1,1-DICHLOROETHANE	75-34-3	1.0E-01	1.07E-04	1.07E-03	0.0226%
ETHYLBENZENE	100-41-4	1.0E-01	1.07E-04	1.07E-03	0.0226%
TRICHLOROFLUOROMETHANE	75-69-4	3.0E-01	3.20E-04	1.07E-03	0.0225%
ZINC	7440-66-6	3.0E-01	2.88E-04	9.60E-04	0.0203%
TOLUENE	108-88-3	2.0E-01	1.71E-04	8.53E-04	0.0180%
2,4,5-TRICHLOROPHENOL	95-95-4	1.0E-01	7.04E-05	7.04E-04	0.0149%
DI-N-BUTYLPHTHALATE	84-74-2	1.0E-01	7.04E-05	7.04E-04	0.0149%
BERYLLIUM	7440-41-7	2.0E-03	1.21E-06	6.05E-04	0.0128%
SILVER	7440-22-4	5.0E-03	2.58E-06	5.16E-04	0.0109%
STYRENE	100-42-5	2.0E-01	8.52E-05	4.26E-04	0.0090%
1,1,1-TRICHLOROETHANE	71-55-6	2.8E-01	1.07E-04	3.83E-04	0.0081%
BUTYLBENZYLPHTHALATE	85-68-7	2.0E-01	7.04E-05	3.52E-04	0.0074%
2-BUTANONE	78-93-3	6.0E-01	2.03E-04	3.38E-04	0.0071%
BARIUM	7440-39-3	7.0E-02	1.38E-05	1.97E-04	0.0042%
2-CHLORONAPHTHALENE	91-58-7	8.0E-02	1.41E-05	1.76E-04	0.0037%
PHENOL	108-95-2	6.0E-01	1.05E-04	1.75E-04	0.0037%
2-METHYLNAPHTHALENE (a)	91-57-6	2.0E-02	2.07E-06	1.03E-04	0.0022%
PHENANTHRENE	85-01-8	3.0E-02	2.47E-06	8.22E-05	0.0017%
DIETHYLPHTHALATE	84-66-2	8.0E-01	5.53E-05	6.91E-05	0.0015%
O-XYLENE	95-47-6	2.0E+00	1.07E-04	5.36E-05	0.0011%
M/P-XYLENE	1330-20-7	2.0E+00	1.04E-04	5.21E-05	0.0011%
FLUORENE	86-73-7	4.0E-02	1.27E-06	3.17E-05	0.0007%
ACENAPHTHYLENE	208-96-8	6.0E-02	1.77E-06	2.96E-05	0.0006%
FLUORANTHENE	206-44-0	4.0E-02	8.45E-07	2.11E-05	0.0004%
PYRENE	129-00-0	3.0E-02	5.92E-07	1.97E-05	0.0004%
CHROMIUM (TOTAL)	7440-47-3	1.5E+00	1.42E-05	9.47E-06	0.0002%
DIMETHYLPHTHALATE	131-11-3	1.1E+01	7.04E-05	6.40E-06	0.0001%
BENZO(E)PYRENE (a)	BEP	3.0E-02	1.76E-07	5.87E-06	0.0001%
BENZO(G,H,I)PERYLENE	191-24-2	3.0E-02	1.27E-07	4.24E-06	0.0001%
ACENAPHTHENE	83-32-9	6.0E-02	1.83E-07	3.05E-06	0.0001%
BENZO(A)PYRENE	50-32-8	3.0E-02	5.16E-08	1.72E-06	0.0000%
PERYLENE (a)	PERYLENE	3.0E-02	4.39E-08	1.46E-06	0.0000%
ANTHRACENE	120-12-7	3.0E-01	4.23E-07	1.41E-06	0.0000%
DIBENZ(A,H)ANTHRACENE	53-70-3	3.0E-02	3.53E-08	1.18E-06	0.0000%

Table 5
Risk Ranking based on Oral Reference Dose and Emission Rate
Norlite - Cohoes, New York

Compound	CAS No.	Oral Reference Dose	Emission Rate (g/sec)	Emission Rate/ Oral RFD	Percent Contribution to Risk
BENZO(B)FLUORANTHENE	205-99-2	3.0E-02	3.46E-08	1.15E-06	0.0000%
INDENO(1,2,3-CD)PYRENE	193-39-5	3.0E-02	4.92E-09	1.64E-07	0.0000%
BENZO(A)ANTHRACENE	56-55-3	3.0E-02	4.27E-09	1.42E-07	0.0000%
BENZO(K)FLUORANTHENE	207-08-9	3.0E-02	4.64E-10	1.55E-08	0.0000%
CHRYSENE	218-01-9	3.0E-02	2.47E-10	8.23E-09	0.0000%

Notes:
a) Used toxicity values from surrogate compound.
RFD = Reference Dose
*** = Percent Contribution to risk less than 0.001% and greater than zero.

Table 6
Risk Ranking based on Oral Reference Dose, Log KOW and Emission Rate
Norlite - Cohoes, New York

Compound	CAS No.	Oral Reference Dose	Log Kow	Emission Rate (g/sec)	Emission Rate/ Oral RFD x LogKOW	Percent Contribution to Risk
2-NITROANILINE	88-74-4	6.0E-05	1.83	1.41E-04	4.30E+00	54.1165%
HEXACHLOROBENZENE	118-74-1	8.0E-04	5.89	8.87E-05	6.53E-01	8.2252%
CARBON TETRACHLORIDE	56-23-5	7.0E-04	2.73	9.69E-05	3.78E-01	4.7582%
HEXACHLOROBUTADIENE	87-68-3	2.0E-04	4.78	1.41E-05	3.37E-01	4.2406%
BENZENE	71-43-2	3.0E-03	2.13	4.64E-04	3.30E-01	4.1528%
HEXACHLOROCYCLOPENTADIENE	77-47-4	6.0E-03	5.39	2.82E-04	2.53E-01	3.1878%
BROMOMETHANE	74-83-9	1.4E-03	1.1	3.20E-04	2.51E-01	3.1662%
2,3,7,8-TCDD - TE	1746-01-6	1.3E-07	6.64	4.14E-09	2.11E-01	2.6629%
2,6-DINITROTOLUENE	606-20-2	1.0E-03	1.87	7.04E-05	1.32E-01	1.6590%
CHLOROMETHANE	74-87-3	4.0E-03	0.91	3.20E-04	7.28E-02	0.9168%
2,4-DINITROTOLUENE	121-14-2	2.0E-03	2.01	7.04E-05	7.08E-02	0.8916%
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	2.0E-02	7.3	1.88E-04	6.85E-02	0.8632%
1,2,4-TRICHLOROBENZENE	120-82-1	1.0E-02	4.01	1.70E-04	6.83E-02	0.8606%
4-NITROPHENOL	100-02-7	8.0E-03	1.91	2.82E-04	6.73E-02	0.8472%
2,4-DICHLOROPHENOL	120-83-2	3.0E-03	2.75	7.04E-05	6.46E-02	0.8132%
CHLOROFORM	67-66-3	1.0E-02	1.92	3.20E-04	6.15E-02	0.7747%
HEXACHLOROETHANE	67-72-1	1.0E-03	4	1.41E-05	5.64E-02	0.7097%
1,1,2-TRICHLOROETHANE	79-00-5	4.0E-03	2.05	1.07E-04	5.49E-02	0.6917%
NITROBENZENE	98-95-3	5.0E-04	1.84	1.41E-05	5.19E-02	0.6529%
PENTACHLOROPHENOL	87-86-5	3.0E-02	5.09	2.82E-04	4.78E-02	0.6021%
TRICHLOROETHYLENE	79-01-6	6.0E-03	2.42	9.61E-05	3.87E-02	0.4879%
CHLOROBENZENE	108-90-7	2.0E-02	2.86	2.68E-04	3.83E-02	0.4823%
4-METHYLPHENOL	106-44-5	5.0E-03	1.94	9.57E-05	3.71E-02	0.4676%
TETRACHLOROETHYLENE	127-18-4	1.0E-02	2.67	1.23E-04	3.28E-02	0.4124%
2-CHLOROPHENOL	95-57-8	5.0E-03	2.15	7.04E-05	3.03E-02	0.3815%
DI-N-OCTYLPHTHALATE	117-84-0	2.0E-02	8.06	7.04E-05	2.84E-02	0.3575%
1,1-DICHLOROETHYLENE	75-35-4	9.0E-03	2.13	1.07E-04	2.54E-02	0.3194%
DIBROMOMETHANE	74-95-3	1.0E-02	2.09	1.07E-04	2.24E-02	0.2821%
BROMOFORM	75-25-2	2.0E-02	2.35	1.20E-04	1.41E-02	0.1777%
BROMODICHLOROMETHANE	75-27-4	2.0E-02	2.1	1.20E-04	1.26E-02	0.1588%
TRANS-1,2-DICHLOROETHENE	156-60-5	2.0E-02	2.07	1.07E-04	1.11E-02	0.1397%
1,1,1,2-TETRACHLOROETHANE	630-20-6	3.0E-02	3.04	1.07E-04	1.09E-02	0.1368%
2,4-DIMETHYLPHENOL	105-67-9	2.0E-02	3.08	7.04E-05	1.08E-02	0.1366%
1,3-DICHLOROBENZENE (a)	541-73-1	3.0E-02	3.38	9.34E-05	1.05E-02	0.1325%
METHYLENE CHLORIDE	75-09-2	6.0E-02	1.25	3.92E-04	8.16E-03	0.1027%
2,4,6-TRICHLOROPHENOL (a)	88-06-2	1.0E-01	3.7	2.03E-04	7.52E-03	0.0946%
TRANS-1,3-DICHLOROPROPENE (a)	10061-02-6	3.0E-02	2	1.07E-04	7.15E-03	0.0900%
NAPHTHALENE	91-20-3	2.0E-02	3.3	4.25E-05	7.01E-03	0.0883%
1,4-DICHLOROBENZENE (a)	106-46-7	3.0E-02	3.42	5.74E-05	6.55E-03	0.0824%
1,2-DICHLOROETHANE	107-06-2	3.0E-02	1.47	1.07E-04	5.25E-03	0.0661%
CIS-1,3-DICHLOROPROPENE (a)	10061-01-5	3.0E-02	1.41	1.05E-04	4.94E-03	0.0622%
1,1,2,2-TETRACHLOROETHANE	79-34-5	6.0E-02	2.39	1.07E-04	4.27E-03	0.0538%
1,2-DICHLOROBENZENE	95-50-1	9.0E-02	3.43	1.03E-04	3.91E-03	0.0493%
DICHLORODIFLUOROMETHANE	75-71-8	2.0E-01	2.16	3.20E-04	3.46E-03	0.0435%
ETHYLBENZENE	100-41-4	1.0E-01	3.14	1.07E-04	3.37E-03	0.0424%
DI-N-BUTYLPHTHALATE	84-74-2	1.0E-01	4.61	7.04E-05	3.25E-03	0.0409%
4-METHYL-2-PENTANONE	108-10-1	8.0E-02	1.19	2.14E-04	3.19E-03	0.0402%
2-METHYLPHENOL	95-48-7	5.0E-02	1.99	7.94E-05	3.16E-03	0.0398%
2,4,5-TRICHLOROPHENOL	95-95-4	1.0E-01	3.9	7.04E-05	2.75E-03	0.0346%
TRICHLOROFLUOROMETHANE	75-69-4	3.0E-01	2.53	3.20E-04	2.70E-03	0.0340%
1,2-DICHLOROPROPANE	78-87-5	9.0E-02	1.97	1.07E-04	2.35E-03	0.0295%
TOLUENE	108-88-3	2.0E-01	2.75	1.71E-04	2.34E-03	0.0295%
1,1-DICHLOROETHANE	75-34-3	1.0E-01	1.79	1.07E-04	1.92E-03	0.0242%

Table 6
Risk Ranking based on Oral Reference Dose, Log KOW and Emission Rate
Norlite - Cohoes, New York

Compound	CAS No.	Oral Reference Dose	Log Kow	Emission Rate (g/sec)	Emission Rate/ Oral RFD x LogKOW	Percent Contribution to Risk
BUTYLBENZYLPHTHALATE	85-68-7	2.0E-01	4.84	7.04E-05	1.70E-03	0.0215%
STYRENE	100-42-5	2.0E-01	2.94	8.52E-05	1.25E-03	0.0158%
1,1,1-TRICHLOROETHANE	71-55-6	2.8E-01	2.48	1.07E-04	9.49E-04	0.0120%
2-CHLORONAPHTHALENE	91-58-7	8.0E-02	4.12	1.41E-05	7.26E-04	0.0091%
2-METHYLNAPHTHALENE (a)	91-57-6	2.0E-02	3.86	2.07E-06	3.99E-04	0.0050%
PHENANTHRENE	85-01-8	3.0E-02	4.46	2.47E-06	3.67E-04	0.0046%
PHENOL	108-95-2	6.0E-01	1.48	1.05E-04	2.59E-04	0.0033%
DIETHYLPHTHALATE	84-66-2	8.0E-01	2.5	5.53E-05	1.73E-04	0.0022%
O-XYLENE	95-47-6	2.0E+00	3.13	1.07E-04	1.68E-04	0.0021%
M/P-XYLENE	1330-20-7	2.0E+00	3.2	1.04E-04	1.67E-04	0.0021%
FLUORENE	86-73-7	4.0E-02	4.12	1.27E-06	1.31E-04	0.0016%
ACENAPHTHYLENE	208-96-8	6.0E-02	4.07	1.77E-06	1.20E-04	0.0015%
FLUORANTHENE	206-44-0	4.0E-02	5.12	8.45E-07	1.08E-04	0.0014%
PYRENE	129-00-0	3.0E-02	5.11	5.92E-07	1.01E-04	0.0013%
2-BUTANONE	78-93-3	6.0E-01	.26	2.03E-04	8.79E-05	0.0011%
BENZO(G,H,I)PERYLENE	191-24-2	3.0E-02	7.23	1.27E-07	3.06E-05	0.0004%
BENZO(E)PYRENE (a)	BEP	3.0E-02	5.11	1.76E-07	3.00E-05	0.0004%
DIMETHYLPHTHALATE	131-11-3	1.1E+01	1.87	7.04E-05	1.20E-05	0.0002%
ACENAPHTHENE	83-32-9	6.0E-02	3.92	1.83E-07	1.20E-05	0.0002%
BENZO(A)PYRENE	50-32-8	3.0E-02	6.11	5.16E-08	1.05E-05	0.0001%
DIBENZ(A,H)ANTHRACENE	53-70-3	3.0E-02	6.69	3.53E-08	7.87E-06	0.0001%
PERYLENE (a)	PERYLENE	3.0E-02	5.11	4.39E-08	7.48E-06	0.0001%
BENZO(B)FLUORANTHENE	205-99-2	3.0E-02	6.2	3.46E-08	7.14E-06	0.0001%
ANTHRACENE	120-12-7	3.0E-01	4.55	4.23E-07	6.41E-06	0.0001%
INDENO(1,2,3-CD)PYRENE	193-39-5	3.0E-02	6.65	4.92E-09	1.09E-06	0.0000%
BENZO(A)ANTHRACENE	56-55-3	3.0E-02	5.7	4.27E-09	8.12E-07	0.0000%
BENZO(K)FLUORANTHENE	207-08-9	3.0E-02	6.2	4.64E-10	9.60E-08	0.0000%
CHRYSENE	218-01-9	3.0E-02	5.7	2.47E-10	4.69E-08	0.0000%

Notes:
a) Used toxicity values from surrogate compound.
RFD = Reference Dose
*** = Percent Contribution to risk less than 0.001% and greater than zero.

Appendix B

Chemical-specific Model Parameters

(Tables 1 – 40, plus 17 PCDD/PCDF Congeners and 3 Individual Forms of Mercury)

Table 1
[C]hemical Specific Parameters for Arsenic
[N]orlite Corporation Light Aggregate Facility
[C]ohoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	7.49E+01	U.S.EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	0.00E+00	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	0.00E+00	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	2.90E+01	U.S.EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	2.90E+01	U.S.EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	2.90E+01	U.S.EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	0.00E+00	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	1.07E-01	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	1.24E-05	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	0.00E+00	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	0.00E+00	U.S.EPA, 1998
Transfer factors			
Bv (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	NA	U.S.EPA, 1998
Brbg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	8.00E-03	U.S.EPA, 1998
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	6.33E-03	U.S.EPA, 1998
Ba (beef)	Biotransfer factor for beef (day/kg)	2.00E-03	U.S.EPA, 1998
Ba (milk)	Biotranser factor for milk (day/kg)	6.00E-05	U.S.EPA, 1998
BCF	Fish bioconcentration factor (L/kg)	2.00E+01	U.S.EPA, 1999
BAF	Fish bioaccumulation factor (L/kg)	NA	U.S.EPA, 1998
BSAF	Fish biota to sediment accumulation factor (unitless)	NA	U.S.EPA, 1998
Other Parameters			
RCF	Root concentration factor (unitless)		
Fw (a)	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	6.00E-01	U.S. EPA, 1994c
Health Benchmarks			
CSFo	Oral cancer slope factor (mg/kg-day)$^{-1}$	1.50E+00	IRIS, 2002
RfDo	Oral reference dose (mg/kg/day)	3.00E-04	IRIS, 2002
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	1.50E+01	IRIS, 2002
RfCi	Inhalation reference concentration (mg/m^3)	1.05E-03	(b)
RfDi	Inhalation reference dose (mg/kg/day)	3.00E-04	O
URFi	Inhalation unit risk factor (per ug/m^3)	4.30E-03	IRIS, 2002

(a) - Assumed to behave as a cation.
(b) - Calculated from inhalation reference dose assuming 20 m^3/day inhalation rate of a 70-kg adult.
- Used oral toxicity value in accordance with NYSDOH request.

Table 2
Chemical Specific Parameters for Antimony
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	1.22E+02	U.S.EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	0.00E+00	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	0.00E+00	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	4.50E+01	U.S.EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	4.50E+01	U.S.EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	4.50E+01	U.S.EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	0.00E+00	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	7.73E-02	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	8.96E-06	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	0.00E+00	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	0.00E+00	U.S.EPA, 1998
Transfer factors			
Bv (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	NA	U.S.EPA, 1998
Brbg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	3.00E-02	U.S.EPA, 199[illegible]
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	3.19E-02	U.S.EPA, 1998
Ba (beef)	Biotransfer factor for beef (day/kg)	1.00E-03	U.S.EPA, 1998
Ba (milk)	Biotranser factor for milk (day/kg)	1.00E-04	U.S.EPA, 1998
BCF	Fish bioconcentration factor (L/kg)	4.00E+01	U.S.EPA, 1998
BAF	Fish bioaccumulation factor (L/kg)	NA	U.S.EPA, 1998
BSAF	Fish biota to sediment accumulation factor (unitless)	NA	U.S.EPA, 1998
Other Parameters			
RCF	Root concentration factor (unitless)		
Fw (a)	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	6.00E-01	U.S.EPA, 1994c
Health Benchmarks			
CSFo	Oral cancer slope factor (mg/kg-day)$^{-1}$	NA	IRIS, 2002
RfDo	Oral reference dose (mg/kg/day)	4.00E-04	IRIS, 2002
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	NA	IRIS, 2002
RfCi	Inhalation reference concentration (mg/m^3)	1.43E-03	(a)
RfDi	Inhalation reference dose (mg/kg/day)	4.00E-04	O
URFi	Inhalation unit risk factor (per ug/m^3)	NA	IRIS, 2000

(a) - Calculated from inhalation reference dose assuming 20 m^3/day inhalation rate of a 70-kg adult.
O - Used oral toxicity value in accordance with NYSDOH request.

Table 3
emical Specific Parameters for Barium
rlite Corporation Light Aggregate Facility
ohoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	1.37E+02	U.S.EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	0.00E+00	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	0.00E+00	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	4.10E+01	U.S.EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	4.10E+01	U.S.EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	4.10E+01	U.S.EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	0.00E+00	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	7.14E-02	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	8.26E-06	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	0.00E+00	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	0.00E+00	U.S.EPA, 1998
Transfer factors			
(above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	NA	U.S.EPA, 1998
rbg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	1.50E-02	U.S.EPA, 1998
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	3.22E-02	U.S.EPA, 1998
Ba (beef)	Biotransfer factor for beef (day/kg)	1.50E-04	U.S.EPA, 1998
Ba (milk)	Biotranser factor for milk (day/kg)	3.50E-04	U.S.EPA, 1998
BCF	Fish bioconcentration factor (L/kg)	6.33E+02	U.S.EPA, 1998
BAF	Fish bioaccumulation factor (L/kg)	NA	U.S.EPA, 1998
BSAF	Fish biota to sediment accumulation factor (unitless)	NA	U.S.EPA, 1998
Other Parameters			
RCF	Root concentration factor (unitless)		
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	6.00E-01	U.S.EPA, 1994c
Health Benchmarks			
CSFo	Oral cancer slope factor (mg/kg-day)$^{-1}$	NA	IRIS, 2002
RfDo	Oral reference dose (mg/kg/day)	7.00E-02	IRIS, 2002
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	NA	IRIS, 2002
RfCi	Inhalation reference concentration (mg/m^3)	5.00E-04	HEAST, 1997
RfDi	Inhalation reference dose (mg/kg/day)	1.43E-04	(a)
URFi	Inhalation unit risk factor (per ug/m^3)	NA	IRIS, 2000

(a) - Calculated from inhalation reference concentration assuming 20 m^3/day inhalation rate of a 70-kg adult.

Table 4
Chemical Specific Parameters for Beryllium
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	9.01E+00	U.S.EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	0.00E+00	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	NA	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	7.90E+02	U.S.EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	7.90E+02	U.S.EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	7.90E+02	U.S.EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	0.00E+00	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	4.39E-01	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	5.08E-05	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	0.00E+00	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	NA	U.S.EPA, 1998
Transfer factors			
Bv (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	NA	U.S.EPA, 1998
Brbg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	1.50E-03	U.S.EPA, 19[illegible]
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	2.58E-03	U.S.EPA, 1998
Ba (beef)	Biotransfer factor for beef (day/kg)	1.00E-03	U.S.EPA, 1998
Ba (milk)	Biotranser factor for milk (day/kg)	9.00E-07	U.S.EPA, 1998
BCF	Fish bioconcentration factor (L/kg)	6.20E+01	U.S.EPA, 1998
BAF	Fish bioaccumulation factor (L/kg)	NA	U.S.EPA, 1998
BSAF	Fish biota to sediment accumulation factor (unitless)	NA	U.S.EPA, 1998
Other Parameters			
RCF	Root concentration factor (unitless)		
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	6.00E-01	U.S.EPA, 1994c
Health Benchmarks			
CSFo	Oral cancer slope factor (mg/kg-day)$^{-1}$	NA	W
RfDo	Oral reference dose (mg/kg/day)	2.00E-03	IRIS, 2002
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	8.40E+00	Heast, 1997
RfCi	Inhalation reference concentration (mg/m^3)	2.00E-05	IRIS, 2002
RfDi	Inhalation reference dose (mg/kg/day)	5.71E-06	(a)
URFi	Inhalation unit risk factor (per ug/m^3)	2.40E-03	IRIS, 2002

(a) - Calculated from inhalation reference concentration assuming 20 m^3/day inhalation rate of a 70-kg adult.
W - Withdrawn from IRIS, 4/98.

Table 5
emical Specific Parameters for Cadmium
rlite Corporation Light Aggregate Facility
ohoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	1.12E+02	U.S.EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	0.00E+00	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	0.00E+00	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	7.50E+01	U.S.EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	7.50E+01	U.S.EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	7.50E+01	U.S.EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	0.00E+00	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	8.16E-02	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	9.45E-06	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	0.00E+00	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	0.00E+00	
Transfer factors			
v (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	NA	
rbg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	6.40E-02	U.S.EPA, 1998
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	1.25E-01	U.S.EPA, 1998
Ba (beef)	Biotransfer factor for beef (day/kg)	1.20E-04	U.S.EPA, 1998
Ba (milk)	Biotranser factor for milk (day/kg)	6.50E-06	U.S.EPA, 1998
BCF	Fish bioconcentration factor (L/kg)	2.50E+02	U.S.EPA, 1998
BAF	Fish bioaccumulation factor (L/kg)	NA	U.S.EPA, 1998
BSAF	Fish biota to sediment accumulation factor (unitless)	NA	U.S.EPA, 1998
Other Parameters			
RCF	Root concentration factor (unitless)		
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	6.00E-01	U.S.EPA, 1994c
Health Benchmarks			
CSFo	Oral cancer slope factor $(mg/kg\text{-}day)^{-1}$	NA	
RfDo	Oral reference dose (mg/kg/day)	5.00E-04 (a)	IRIS, 2002
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	6.30E+00	IRIS, 2002
RfCi	Inhalation reference concentration (mg/m^3)	2.00E-04 (b)	NCEA
RfDi	Inhalation reference dose (mg/kg/day)	5.70E-05	NCEA
URFi	Inhalation unit risk factor (per ug/m^3)	1.80E-03	IRIS, 2002

(a) - Reference dose based on water ingestion.
) - Calculated from inhalation reference concentration assuming 20 m^3/day inhalation rate of a 70-kg adult.

Table 6
Chemical Specific Parameters for Total Chromium
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	5.20E+01	U.S. EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	0.00E+00	U.S. EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	NA	U.S. EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	1.80E+06	U.S. EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	1.80E+06	U.S. EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	1.80E+06	U.S. EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	0.00E+00	U.S. EPA, 1998
Da	Diffusivity in air (cm^2/sec)	1.01E-01	U.S. EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	4.63E-05	U.S. EPA, 1998
VP	Ambient vapor pressure (atm)	0.00E+00	U.S. EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	0.00E+00	U.S. EPA, 1998
Transfer factors			
Bv (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	NA	U.S. EPA, 1[illegible]
Brbg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	4.50E-03	U.S. EPA, [illegible]
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	4.88E-03	U.S. EPA, 1998
Ba (beef)	Biotransfer factor for beef (day/kg)	5.50E-03	U.S. EPA, 1998
Ba (milk)	Biotranser factor for milk (day/kg)	1.50E-03	U.S. EPA, 1998
BCF	Fish bioconcentration factor (L/kg)	1.90E+02	U.S. EPA, 1998
BAF	Fish bioaccumulation factor (L/kg)	NA	U.S. EPA, 1998
BSAF	Fish biota to sediment accumulation factor (unitless)	NA	U.S. EPA, 1998
Other Parameters			
RCF	Root concentration factor (unitless)		
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	6.00E-01	U.S. EPA, 1994
Health Benchmarks			
CSFo	Oral cancer slope factor $(mg/kg\text{-}day)^{-1}$		
RfDo	Oral reference dose (mg/kg/day)	1.50E+00	IRIS, 2002
CSFi	Inhalation cancer slope factor (mg/kg-day)-1		
RfCi	Inhalation reference concentration (mg/m^3)	1.00E-04	(b)
RfDi	Inhalation reference dose (mg/kg/day)	2.86E-05	NYSDOH
URFi	Inhalation unit risk factor (per ug/m^3)		

(a) - As Chromium III.

(b) - Calculated from inhalation reference dose assuming 20 m^3/day inhalation rate of a 70-kg adult rate of a 70-kg adult.

Table 7
emical Specific Parameters for Chromium VI
lite Corporation Light Aggregate Facility
hoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	5.20E+01	U.S.EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	0.00E+00	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	NA	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	1.90E+01	U.S.EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	1.90E+01	U.S.EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	1.90E+01	U.S.EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	0.00E+00	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	1.36E-01	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	1.58E-05	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	0.00E+00	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	0.00E+00	
Transfer factors			
(above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	NA	
bg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	4.50E-03	U.S.EPA, 1998
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	4.88E-03	U.S.EPA, 1998
Ba (beef)	Biotransfer factor for beef (day/kg)	5.50E-03	U.S.EPA, 1998
Ba (milk)	Biotranser factor for milk (day/kg)	1.50E-03	U.S.EPA, 1998
BCF	Fish bioconcentration factor (L/kg)	3.00E+00	U.S.EPA, 1998
BAF	Fish bioaccumulation factor (L/kg)	NA	U.S.EPA, 1998
BSAF	Fish biota to sediment accumulation factor (unitless)	NA	U.S.EPA, 1998
Other Parameters			
RCF	Root concentration factor (unitless)		
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	6.00E-01	U.S.EPA, 1994c
Health Benchmarks			
CSFo	Oral cancer slope factor $(mg/kg\text{-}day)^{-1}$	NA	
RfDo	Oral reference dose (mg/kg/day)	3.00E-03	IRIS, 2002
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	2.90E+02	US EPA Region 9
RfCi	Inhalation reference concentration (mg/m^3)	1.05E-04	IRIS, 2002
RfDi	Inhalation reference dose (mg/kg/day)	3.00E-05	(a)
URFi	Inhalation unit risk factor (per ug/m^3)	1.20E-02	IRIS, 2002

(a) Calculated from RfC assuming 20 m^3/day inhalation rate for a 70 kg adult.

Table 8
Chemical Specific Parameters for Lead
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	2.07E+02	U.S.EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	0.00E+00	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	NA	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	9.00E+02	U.S.EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	9.00E+02	U.S.EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	9.00E+02	U.S.EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	0.00E+00	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	5.43E-02	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	6.28E-06	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	0.00E+00	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	0.00E+00	
Transfer factors			
Bv (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	NA	
Brbg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	9.00E-03	U.S.EPA,
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	1.36E-02	U.S.EPA, 1998
Ba (beef)	Biotransfer factor for beef (day/kg)	3.00E-04	U.S.EPA, 1998
Ba (milk)	Biotranser factor for milk (day/kg)	2.50E-04	U.S.EPA, 1998
BCF	Fish bioconcentration factor (L/kg)	NA	U.S.EPA, 1998
BAF	Fish bioaccumulation factor (L/kg)	8.00E+00	U.S.EPA, 1998
BSAF	Fish biota to sediment accumulation factor (unitless)	NA	U.S.EPA, 1998
Other Parameters			
RCF	Root concentration factor (unitless)		
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	6.00E-01	U.S.EPA, 1994
Health Benchmarks			
CSFo	Oral cancer slope factor $(mg/kg\text{-}day)^{-1}$	NA	
RfDo	Oral reference dose (mg/kg/day)	NA	
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	NA	
RfCi	Inhalation reference concentration (mg/m^3)	NA	
RfDi	Inhalation reference dose (mg/kg/day)	NA	
URFi	Inhalation unit risk factor (per ug/m^3)	NA	

Table 9
emical Specific Parameters for Nickel
rlite Corporation Light Aggregate Facility
ohoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	5.87E+01	U.S.EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	0.00E+00	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	NA	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	6.50E+01	U.S.EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	6.50E+01	U.S.EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	6.50E+01	U.S.EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	0.00E+00	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	1.26E-01	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	1.46E-05	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	0.00E+00	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	NA	
Transfer factors			
v (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	NA	
rbg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	8.00E-03	U.S.EPA, 1998
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	9.31E-03	U.S.EPA, 1998
Ba (beef)	Biotransfer factor for beef (day/kg)	6.00E-03	U.S.EPA, 1998
Ba (milk)	Biotranser factor for milk (day/kg)	1.00E-03	U.S.EPA, 1998
BCF	Fish bioconcentration factor (L/kg)	7.80E+01	U.S.EPA, 1999
BAF	Fish bioaccumulation factor (L/kg)	NA	U.S.EPA, 1998
BSAF	Fish biota to sediment accumulation factor (unitless)	NA	U.S.EPA, 1998
Other Parameters			
RCF	Root concentration factor (unitless)		
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	6.00E-01	U.S.EPA, 1994c
Health Benchmarks			
CSFo	Oral cancer slope factor (mg/kg-day)$^{-1}$	NA	
RfDo	Oral reference dose (mg/kg/day)	2.00E-02	IRIS, 2002
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	8.40E-01	IRIS, 2002
RfCi	Inhalation reference concentration (mg/m^3)	2.00E-05	NYSDOH, 1989b
RfDi	Inhalation reference dose (mg/kg/day)	5.71E-06	NYSDOH, 1989b
URFi	Inhalation unit risk factor (per ug/m^3)	2.40E-04	HEAST, 1997

Table 10
Chemical Specific Parameters for Selenium
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	7.90E+01	U.S.EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	0.00E+00	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	NA	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	5.00E+00	U.S.EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	5.00E+00	U.S.EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	5.00E+00	U.S.EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	0.00E+00	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	1.03E-01	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	1.20E-05	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	NA	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	NA	U.S.EPA, 1998
Transfer factors			
Bv (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	NA	U.S.EPA, 1998
Brbg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	2.20E-02	U.S.EPA, 1998
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	1.95E-02	U.S.EPA, 1998
Ba (beef)	Biotransfer factor for beef (day/kg)	2.27E-03	U.S.EPA, 1998
Ba (milk)	Biotranser factor for milk (day/kg)	5.86E-03	U.S.EPA, 1998
BCF	Fish bioconcentration factor (L/kg)	1.29E+02	U.S.EPA, 1998
BAF	Fish bioaccumulation factor (L/kg)	NA	U.S.EPA, 1994c
BSAF	Fish biota to sediment accumulation factor (unitless)	NA	U.S.EPA, 1998
Other Parameters			
RCF	Root concentration factor (unitless)	ND	U.S.EPA, 1998
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	6.00E-01	U.S.EPA, 1998
Health Benchmarks			
CSFo	Oral cancer slope factor (mg/kg-day)$^{-1}$	NA	IRIS, 2002
RfDo	Oral reference dose (mg/kg/day)	5.00E-03	IRIS, 2002
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	NA	IRIS, 2002
RfCi	Inhalation reference concentration (mg/m^3)	1.80E-02	(a)
RfDi	Inhalation reference dose (mg/kg/day)	5.00E-03	O
URFi	Inhalation unit risk factor (per ug/m^3)	NA	IRIS, 2002

(a) - Calculated from inhalation reference dose assuming 20 m^3/day inhalation rate of a 70-kg adult.
O - Used oral toxicity value in accordance with NYSDOH request.

Table 11
mical Specific Parameters for Silver
lite Corporation Light Aggregate Facility
hoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	1.08E+02	U.S.EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	0.00E+00	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	NA	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	8.30E+00	U.S.EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	8.30E+00	U.S.EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	8.30E+00	U.S.EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	0.00E+00	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	8.38E-02	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	9.71E-06	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	0.00E+00	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	NA	U.S.EPA, 1998
Transfer factors			
Bv (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	NA	U.S.EPA, 1998
bg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	1.00E-01	U.S.EPA, 1998
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	1.38E-01	U.S.EPA, 1998
Ba (beef)	Biotransfer factor for beef (day/kg)	3.00E-03	U.S.EPA, 1998
Ba (milk)	Biotranser factor for milk (day/kg)	2.00E-02	U.S.EPA, 1998
BCF	Fish bioconcentration factor (L/kg)	2.04E+02	U.S.EPA, 1998
BAF	Fish bioaccumulation factor (L/kg)	NA	U.S.EPA, 1998
BSAF	Fish biota to sediment accumulation factor (unitless)	NA	U.S.EPA, 1998
Other Parameters			
RCF	Root concentration factor (unitless)		
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	6.00E-01	U.S.EPA, 1994c
Health Benchmarks			
CSFo	Oral cancer slope factor $(mg/kg\text{-}day)^{-1}$	NA	
RfDo	Oral reference dose (mg/kg/day)	5.00E-03	IRIS, 2002
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	NA	
RfCi	Inhalation reference concentration (mg/m^3)	1.80E-02	(a)
RfDi	Inhalation reference dose (mg/kg/day)	5.00E-03	O
URFi	Inhalation unit risk factor (per ug/m^3)	NA	

(a) - Calculated from inhalation reference dose assuming 20 m^3/day inhalation rate of a 70-kg adult.
O - Used oral toxicity value in accordance with NYSDOH request.

Table 12
Chemical Specific Parameters for Thallium
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	2.04E+02	U.S.EPA, 199
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	0.00E+00	U.S.EPA, 199
ksg	Soil loss constant due to degradation (yr-1)	NA	U.S.EPA, 199
Kds	Soil-water partition coefficient (mL/g or L/kg)	7.10E+01	U.S.EPA, 199
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	7.10E+01	U.S.EPA, 199
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	7.10E+01	U.S.EPA, 199
H	Henry's Law Constant (atm-m^3/mol)	0.00E+00	U.S.EPA, 199
Da	Diffusivity in air (cm^2/sec)	5.48E-02	U.S.EPA, 199
Dw	Diffusivity in water (cm^2/sec)	6.34E-06	U.S.EPA, 199
VP	Ambient vapor pressure (atm)	0.00E+00	U.S.EPA, 199
Kow	Octanol-water partition coefficient (unitless)	0.00E+00	
Transfer factors			
Bv (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	NA	
Brbg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	4.00E-04	U.S.EPA
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	8.58E-04	U.S.EPA, 199
Ba (beef)	Biotransfer factor for beef (day/kg)	4.00E-02	U.S.EPA, 199
Ba (milk)	Biotranser factor for milk (day/kg)	2.00E-03	U.S.EPA, 199
BCF	Fish bioconcentration factor (L/kg)	1.00E+00	U.S.EPA, 199
BAF	Fish bioaccumulation factor (L/kg)	NA	U.S.EPA, 199
BSAF	Fish biota to sediment accumulation factor (unitless)	NA	U.S.EPA, 199
Other Parameters			
RCF	Root concentration factor (unitless)		
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	6.00E-01	U.S.EPA, 199
Health Benchmarks			
CSFo	Oral cancer slope factor (mg/kg-day)$^{-1}$	NA	
RfDo	Oral reference dose (mg/kg/day)	8.00E-05	IRIS, 2002
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	NA	
RfCi	Inhalation reference concentration (mg/m^3)	2.80E-04	(a)
RfDi	Inhalation reference dose (mg/kg/day)	8.00E-05	O
URFi	Inhalation unit risk factor (per ug/m^3)	NA	

(a) - Calculated from inhalation reference dose assuming 20 m^3/day inhalation rate of a 70-kg adult.
O - Used oral toxicity value in accordance with NYSDOH request.

Table 13
mical Specific Parameters for Zinc
lite Corporation Light Aggregate Facility
hoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	6.54E+01	U.S.EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	0.00E+00	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	NA	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	6.20E+01	U.S.EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	6.20E+01	U.S.EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	6.20E+01	U.S.EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	0.00E+00	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	1.17E-01	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	1.36E-05	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	0.00E+00	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	NA	U.S.EPA, 1998
Transfer factors			
Bv (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	NA	U.S.EPA, 1998
bg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	4.40E-02	U.S.EPA, 1998
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	7.20E-02	U.S.EPA, 1998
Ba (beef)	Biotransfer factor for beef (day/kg)	9.00E-05	U.S.EPA, 1998
Ba (milk)	Biotranser factor for milk (day/kg)	3.25E-05	U.S.EPA, 1998
BCF	Fish bioconcentration factor (L/kg)	2.06E+03	U.S.EPA, 1999
BAF	Fish bioaccumulation factor (L/kg)	NA	U.S.EPA, 1998
BSAF	Fish biota to sediment accumulation factor (unitless)	NA	
Other Parameters			
RCF	Root concentration factor (unitless)		
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	6.00E-01	U.S.EPA, 1994c
Health Benchmarks			
CSFo	Oral cancer slope factor $(mg/kg\text{-}day)^{-1}$	NA	
RfDo	Oral reference dose (mg/kg/day)	3.00E-01	IRIS, 2002
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	NA	
RfCi	Inhalation reference concentration (mg/m^3)	1.05E+00	(a)
RfDi	Inhalation reference dose (mg/kg/day)	3.00E-01	O
URFi	Inhalation unit risk factor (per ug/m^3)	NA	

(a) - Calculated from inhalation reference dose assuming 20 m^3/day inhalation rate of a 70-kg adult.
O - Used oral toxicity value in accordance with NYSDOH request.

Table 14
Chemical Specific Parameters for Benzo(a)anthracene
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Parameter	Definition	Value		Reference
Chemical/Physical Properties				
MW	Molecular Weight (g/mol)	2.28E+02		U.S.EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	8.80E-01	(a)	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	3.72E-01		U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	2.60E+03	(a)	U.S.EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	1.95E+04	(a)	U.S.EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	1.04E+04	(a)	U.S.EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	3.62E-06		U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	2.47E-02		U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	6.21E-06		U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	2.03e10-		U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	4.77E+05		U.S.EPA, 1998
Transfer factors				
Bv (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	1.72E+04		U.S.EPA, 1998
Brbg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	2.11E+00		U.S.EPA, 19[illegible]
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	2.02E-02	(a)	U.S.EPA, 1998
Ba (beef)	Biotransfer factor for beef (day/kg)	1.20E-02	(a)	U.S.EPA, 1998
Ba (milk)	Biotranser factor for milk (day/kg)	3.79E-03	(a)	U.S.EPA, 1998
BCF	Fish bioconcentration factor (L/kg)	NA		U.S.EPA, 1998
BAF	Fish bioaccumulation factor (L/kg)	5.10E+03		U.S.EPA, 1998
BSAF	Fish biota to sediment accumulation factor (unitless)	NA		
Other Parameters				
RCF	Root concentration factor (unitless)	5.48E+03		
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	6.00E-01		U.S.EPA, 1994c
Health Benchmarks				
CSFo	Oral cancer slope factor (mg/kg-day)$^{-1}$	7.30E-01	(b)	IRIS, 2002
RfDo	Oral reference dose (mg/kg/day)	3.00E-02	(d)	IRIS, 2002
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	2.10E+00		NYSDOH, 1989c
RfCi	Inhalation reference concentration (mg/m^3)	1.05E-01		(c)
RfDi	Inhalation reference dose (mg/kg/day)	3.00E-02		O
URFi	Inhalation unit risk factor (per ug/m^3)	NA		

(a) - Calculated value.
(b) - Uses CSFo for benzo(a)pyrene and the appropriate toxicity equivalency factor (U.S. EPA, 1993b).
(c) - Calculated from inhalation reference dose assuming 20 m^3/day inhalation rate of a 70-kg adult.
(d) - Uses RfDo for pyrene.
O - Used oral toxicity value in accordance with NYSDOH request.

Table 15
emical Specific Parameters for Benzo(a)pyrene
lite Corporation Light Aggregate Facility
hoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	2.52E+02	U.S.EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	2.65E-01	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	4.77E-01	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	9.69E+03	U.S.EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	7.27E+04	U.S.EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	3.87E+04	U.S.EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	8.40E-07	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	2.18E-02	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	5.85E-06	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	6.43E-12	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	1.35E+06	U.S.EPA, 1998
Transfer factors			
(above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	2.25E+05	U.S.EPA, 1998
og	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	1.26E+00	U.S.EPA, 1998
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	1.10E-02	U.S.EPA, 1998
Ba (beef)	Biotransfer factor for beef (day/kg)	3.40E-02	U.S.EPA, 1998
Ba (milk)	Biotranser factor for milk (day/kg)	1.10E-02	U.S.EPA, 1998
BCF	Fish bioconcentration factor (L/kg)	NA	U.S.EPA, 1998
BAF	Fish bioaccumulation factor (L/kg)	9.95E+03	U.S.EPA, 1998
BSAF	Fish biota to sediment accumulation factor (unitless)	NA	U.S.EPA, 1998
Other Parameters			
RCF	Root concentration factor (unitless)		
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	6.00E-01	U.S.EPA, 1994c
Health Benchmarks			
CSFo	Oral cancer slope factor $(mg/kg\text{-}day)^{-1}$	7.30E+00	IRIS, 2002
RfDo	Oral reference dose (mg/kg/day)	3.00E-02 (b)	IRIS, 2002
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	2.10E+00	NYSDOH, 1989c
RfCi	Inhalation reference concentration (mg/m^3)	1.05E-01	(a)
RfDi	Inhalation reference dose (mg/kg/day)	3.00E-02	O
URFi	Inhalation unit risk factor (per ug/m^3)	NA	

(a) - Calculated from inhalation reference dose assuming 20 m^3/day inhalation rate of a 70-kg adult.
` - Uses RfDo for pyrene.
Used oral toxicity value in accordance with NYSDOH request.

Table 16
Chemical Specific Parameters for Benzo(b)fluoranthene
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	2.52E+02	U.S.EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	8.22E-01	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	4.15E-01	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	8.36E+03	U.S.EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	6.27E+04	U.S.EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	3.34E+04	U.S.EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	6.18E-06	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	2.28E-02	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	5.49E-06	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	1.06E-10	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	1.59E+06	U.S.EPA, 1998
Transfer factors			
Bv (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	3.65E+04	U.S.EPA, 1998
Brbg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	1.66E+00	U.S.EPA, 1998
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	1.01E-02	U.S.EPA, 1998
Ba (beef)	Biotransfer factor for beef (day/kg)	4.00E-02	U.S.EPA, 1998
Ba (milk)	Biotranser factor for milk (day/kg)	1.27E-02	U.S.EPA, 1998
BCF	Fish bioconcentration factor (L/kg)	NA	U.S.EPA, 1998
BAF	Fish bioaccumulation factor (L/kg)	9.95E+03	U.S.EPA, 1998
BSAF	Fish biota to sediment accumulation factor (unitless)	NA	
Other Parameters			
RCF	Root concentration factor (unitless)	1.39E+04	
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	6.00E-01	U.S.EPA, 1994c
Health Benchmarks			
CSFo	Oral cancer slope factor $(mg/kg\text{-}day)^{-1}$	7.30E-01 (b)	IRIS, 2002
RfDo	Oral reference dose (mg/kg/day)	3.00E-02 (d)	IRIS, 2002
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	2.10E+00	NYSDOH, 1989c
RfCi	Inhalation reference concentration (mg/m^3)	1.05E-01	(c)
RfDi	Inhalation reference dose (mg/kg/day)	3.00E-02	O
URFi	Inhalation unit risk factor (per ug/m^3)	NA	

(a) - Calculated value.
(b) - Uses CSFo for benzo(a)pyrene and the appropriate toxicity equivalency factor (U.S. EPA, 1993b).
(c) - Calculated from inhalation reference dose assuming 20 m^3/day inhalation rate of a 70-kg adult.
(d) - Uses RfDo for pyrene.
O - Used oral toxicity value in accordance with NYSDOH request.

Table 17
'emical Specific Parameters for Benzo(k)fluoranthene
orlite Corporation Light Aggregate Facility
ohoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	2.52E+02	U.S.EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	1.49E-01	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	1.18E-01	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	8.32E+03	U.S.EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	6.24E+04	U.S.EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	3.33E+04	U.S.EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	4.15E-07	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	2.28E-02	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	5.49E-06	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	1.32E-12	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	1.56E+06	U.S.EPA, 1998
Transfer factors			
Bv (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	5.40E+05	U.S.EPA, 1998
'bg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	1.66E+00	U.S.EPA, 1998
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	1.01E-02	U.S.EPA, 1998
Ba (beef)	Biotransfer factor for beef (day/kg)	3.98E-02	U.S.EPA, 1998
Ba (milk)	Biotranser factor for milk (day/kg)	1.26E-02	U.S.EPA, 1998
BCF	Fish bioconcentration factor (L/kg)	NA	U.S.EPA, 1998
BAF	Fish bioaccumulation factor (L/kg)	9.95E+03	U.S.EPA, 1998
BSAF	Fish biota to sediment accumulation factor (unitless)	NA	U.S.EPA, 1998
Other Parameters			
RCF	Root concentration factor (unitless)	1.38E+04	
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	6.00E-01	U.S.EPA, 1994c
Health Benchmarks			
CSFo	Oral cancer slope factor (mg/kg-day)$^{-1}$	7.30E-02 (c)	IRIS, 2002
RfDo	Oral reference dose (mg/kg/day)	3.00E-02 (d)	IRIS, 2002
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	2.10E+00	NYSDOH, 1989c
RfCi	Inhalation reference concentration (mg/m^3)	1.05E-01	(b)
RfDi	Inhalation reference dose (mg/kg/day)	3.00E-02	O
URFi	Inhalation unit risk factor (per ug/m^3)	NA	

(a) - Calculated value.
(b) - Calculated from inhalation reference dose assuming 20 m^3/day inhalation rate of a 70-kg adult.
(c) - Uses CSFo for benzo(a)pyrene and the appropriate toxicity equivalency factor (U.S. EPA, 1993b).
) - Uses RfDo for pyrene.
' - Used oral toxicity value in accordance with NYSDOH request.

Table 18
Chemical Specific Parameters for Chrysene
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	2.28E+02	U.S.EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	7.61E-01	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	2.53E-01	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	2.97E+03	U.S.EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	2.23E+04	U.S.EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	1.19E+04	U.S.EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	1.21E-06	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	2.48E-02	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	6.21E-06	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	1.03E-11	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	5.48E+05	U.S.EPA, 1998
Transfer factors			
Bv (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	5.97E+04	U.S.EPA, 1998
Brbg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	2.05E+00	U.S.EPA, 1998
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	1.87E-02	U.S.EPA, 1998
Ba (beef)	Biotransfer factor for beef (day/kg)	1.38E-02	U.S.EPA, 1998
Ba (milk)	Biotranser factor for milk (day/kg)	4.36E-03	U.S.EPA, 1998
BCF	Fish bioconcentration factor (L/kg)	NA	U.S.EPA, 1998
BAF	Fish bioaccumulation factor (L/kg)	6.00E+03	U.S.EPA, 1998
BSAF	Fish biota to sediment accumulation factor (unitless)	NA	U.S.EPA, 1998
Other Parameters			
RCF	Root concentration factor (unitless)	6.10E-03	
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	6.00E-01	U.S.EPA, 1994c
Health Benchmarks			
CSFo	Oral cancer slope factor (mg/kg-day)$^{-1}$	7.30E-03 (b)	IRIS, 2002
RfDo	Oral reference dose (mg/kg/day)	3.00E-02 (d)	IRIS, 2002
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	2.10E+00	NYSDOH, 1989c
RfCi	Inhalation reference concentration (mg/m^3)	1.05E-01	(c)
RfDi	Inhalation reference dose (mg/kg/day)	3.00E-02	O
URFi	Inhalation unit risk factor (per ug/m^3)	NA	

(a) - Calculated value.
(b) - Uses CSFo for benzo(a)pyrene and the appropriate toxicity equivalency factor (U.S. EPA, 1993b).
(c) - Calculated from inhalation reference dose assuming 20 m^3/day inhalation rate of a 70-kg adult.
(d) - Uses RfDo for pyrene.
O - Used oral toxicity value in accordance with NYSDOH request.

Table 19
emical Specific Parameters for Dibenzo(a,h)anthracene
/lite Corporation Light Aggregate Facility
ohoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	2.78E+02	U.S.EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	1.10E-02	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	2.69E-01	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	1.79E+04	U.S.EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	1.34E+05	U.S.EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	7.16E+04	U.S.EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	1.12E-08	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	1.80E-02	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	6.01E-06	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	2.70E-14	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	3.53E+06	U.S.EPA, 1998
Transfer factors			
Bv (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	4.68E+07	U.S.EPA, 1998
og	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	1.43E+00	U.S.EPA, 1998
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	6.36E-03	U.S.EPA, 1998
Ba (beef)	Biotransfer factor for beef (day/kg)	8.86E-02	U.S.EPA, 1998
Ba (milk)	Biotranser factor for milk (day/kg)	2.80E-02	U.S.EPA, 1998
BCF	Fish bioconcentration factor (L/kg)		U.S.EPA, 1998
BAF	Fish bioaccumulation factor (L/kg)	1.28E+04	U.S.EPA, 1998
BSAF	Fish biota to sediment accumulation factor (unitless)		U.S.EPA, 1998
Other Parameters			
RCF	Root concentration factor (unitless)	2.56E+04	U.S.EPA, 1998
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	6.00E-01	U.S.EPA, 1994c
Health Benchmarks			
CSFo	Oral cancer slope factor (mg/kg-day)$^{-1}$	7.30E+00 (b)	IRIS, 2002
RfDo	Oral reference dose (mg/kg/day)	3.00E-02 (d)	IRIS, 2002
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	2.10E+00	NYSDOH, 1989c
RfCi	Inhalation reference concentration (mg/m^3)	1.05E-01	(c)
RfDi	Inhalation reference dose (mg/kg/day)	3.00E-02	O
URFi	Inhalation unit risk factor (per ug/m^3)	NA	

(a) - Calculated value.
(b) - Uses CSFo for benzo(a)pyrene and the appropriate toxicity equivalency factor (U.S. EPA, 1993b).
(c) - Calculated from inhalation reference dose assuming 20 m^3/day inhalation rate of a 70-kg adult.
- Uses RfDo for pyrene.
- Used oral toxicity value in accordance with NYSDOH request.

Table 20
Chemical Specific Parameters for Indeno(1,2,3-cd)pyrene
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	2.76E+02	U.S.EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	7.00E-03	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	3.47E-01	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	4.11E+04	U.S.EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	3.08E+05	U.S.EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	1.64E+05	U.S.EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	4.86E-09	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	1.90E-02	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	5.66E-06	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	1.88E-13	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	8.22E+06	U.S.EPA, 1998
Transfer factors			
Bv (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	2.67E+08	U.S.EPA, 1998
Brbg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	1.19E+00	U.S.EPA, 1998
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	3.90E-03	U.S.EPA, 1998
Ba (beef)	Biotransfer factor for beef (day/kg)	2.07E-01	U.S.EPA, 1998
Ba (milk)	Biotranser factor for milk (day/kg)	6.53E-02	U.S.EPA, 1998
BCF	Fish bioconcentration factor (L/kg)		U.S.EPA, 1998
BAF	Fish bioaccumulation factor (L/kg)	1.31E+04	U.S.EPA, 1998
BSAF	Fish biota to sediment accumulation factor (unitless)		U.S.EPA, 1998
Other Parameters			
RCF	Root concentration factor (unitless)	4.91E+04	U.S.EPA, 1998
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	6.00E-01	U.S.EPA, 1994c
Health Benchmarks			
CSFo	Oral cancer slope factor (mg/kg-day)$^{-1}$	7.30E-01 (b)	IRIS, 2002
RfDo	Oral reference dose (mg/kg/day)	3.00E-02 (d)	IRIS, 2002
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	2.10E+00	NYSDOH, 1989c
RfCi	Inhalation reference concentration (mg/m^3)	1.05E-01	(c)
RfDi	Inhalation reference dose (mg/kg/day)	3.00E-02	O
URFi	Inhalation unit risk factor (per ug/m^3)	NA	

(a) - Calculated value.
(b) - Uses CSFo for benzo(a)pyrene and the appropriate toxicity equivalency factor (U.S. EPA, 1993b).
(c) - Calculated from inhalation reference dose assuming 20 m^3/day inhalation rate of a 70-kg adult.
(d) - Uses RfDo for pyrene.
O - Used oral toxicity value in accordance with NYSDOH request.

Table 21
hemical Specific Parameters for Bis(2-ethylhexyl)phthalate
rlite Corporation Light Aggregate Facility
ohoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	3.91E+02	U.S. EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	9.35E-01	U.S. EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	1.10E+01	U.S. EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	1.11E+03	U.S. EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	8.33E+03	U.S. EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	4.44E+03	U.S. EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	8.37E-06	U.S. EPA, 1998
Da	Diffusivity in air (cm^2/sec)	1.32E-02	U.S. EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	4.22E-06	U.S. EPA, 1998
VP	Ambient vapor pressure (atm)	8.49E-09	U.S. EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	1.60E+05	U.S. EPA, 1998
Transfer factors			
v (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	2.33E+03	U.S. EPA, 1998
rbg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	2.13E+00	U.S. EPA, 1998
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	3.80E-02	U.S. EPA, 1998
Ba (beef)	Biotransfer factor for beef (day/kg)	4.03E-03	U.S. EPA, 1998
Ba (milk)	Biotranser factor for milk (day/kg)	1.27E-03	U.S. EPA, 1998
BCF	Fish bioconcentration factor (L/kg)		U.S. EPA, 1998
BAF	Fish bioaccumulation factor (L/kg)	3.36E+02	U.S. EPA, 1998
BSAF	Fish biota to sediment accumulation factor (unitless)		U.S. EPA, 1998
Other Parameters			
RCF	Root concentration factor (unitless)	2.37E+03	U.S. EPA, 1998
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	6.00E-01	U.S. EPA, 1994c
Health Benchmarks			
CSFo	Oral cancer slope factor (mg/kg-day)$^{-1}$	1.40E-02	IRIS, 2002
RfDo	Oral reference dose (mg/kg/day)	2.00E-02	IRIS, 2002
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	1.40E-02	O
RfCi	Inhalation reference concentration (mg/m^3)	7.00E-02	(a)
RfDi	Inhalation reference dose (mg/kg/day)	2.00E-02	O
URFi	Inhalation unit risk factor (per ug/m^3)		

(a) - Calculated from inhalation reference dose assuming 20 m^3/day inhalation rate of a 70-kg adult.
 - Used oral toxicity value in accordance with NYSDOH request.

Table 22
Chemical Specific Parameters for Hexachlorobenzene
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	2.85E+02	U.S.EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	1.00E+00	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	1.21E-01	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	8.00E+02	U.S.EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	6.00E+03	U.S.EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	3.20E+03	U.S.EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	5.35E-04	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	1.41E-02	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	7.84E-06	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	1.62E-08	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	3.18E+05	U.S.EPA, 1998
Transfer factors			
Bv (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	7.57E+01	U.S.EPA, 1998
Brbg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	5.02E+00	U.S.EPA, 199
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	2.56E-02	U.S.EPA, 1998
Ba (beef)	Biotransfer factor for beef (day/kg)	8.00E-03	U.S.EPA, 1998
Ba (milk)	Biotranser factor for milk (day/kg)	2.53E-03	U.S.EPA, 1998
BCF	Fish bioconcentration factor (L/kg)	0.00E+00	U.S.EPA, 1998
BAF	Fish bioaccumulation factor (L/kg)	1.79E+03	U.S.EPA, 1998
BSAF	Fish biota to sediment accumulation factor (unitless)	0.00E+00	U.S.EPA, 1998
Other Parameters			
RCF	Root concentration factor (unitless)	4.02E+03	U.S.EPA, 1998
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	6.00E-01	U.S.EPA, 1994c
Health Benchmarks			
CSFo	Oral cancer slope factor $(mg/kg\text{-}day)^{-1}$	1.60E+00	IRIS, 2002
RfDo	Oral reference dose (mg/kg/day)	8.00E-04	IRIS, 2002
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	1.60E+00	HEAST, 1997
RfCi	Inhalation reference concentration (mg/m^3)	2.80E-03	(a)
RfDi	Inhalation reference dose (mg/kg/day)	8.00E-04	O
URFi	Inhalation unit risk factor (per ug/m^3)	4.60E-04	IRIS, 2002

(a) - Calculated from inhalation reference dose assuming 20 m^3/day inhalation rate of a 70-kg adult.
O - Used oral toxicity value in accordance with NYSDOH request.

Table 23
emical Specific Parameters for Benzene
rlite Corporation Light Aggregate Facility
ohoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	7.81E+01	U.S. EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	1.00E+00	U.S. EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	3.89E+00	U.S. EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	6.20E-01	U.S. EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	4.65E+00	U.S. EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	2.48E+00	U.S. EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	5.49E-03	U.S. EPA, 1998
Da	Diffusivity in air (cm^2/sec)	1.71E-01	U.S. EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	1.02E-05	U.S. EPA, 1998
VP	Ambient vapor pressure (atm)	1.25E-01	U.S. EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	1.37E+02	U.S. EPA, 1998
Transfer factors			
ᐟ (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	0.00E+00	
rbg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	0.00E+00	
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	0.00E+00	
Ba (beef)	Biotransfer factor for beef (day/kg)	0.00E+00	
Ba (milk)	Biotranser factor for milk (day/kg)	0.00E+00	
BCF	Fish bioconcentration factor (L/kg)	0.00E+00	
BAF	Fish bioaccumulation factor (L/kg)	0.00E+00	
BSAF	Fish biota to sediment accumulation factor (unitless)	0.00E+00	
Other Parameters			
RCF	Root concentration factor (unitless)	0.00E+00	
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	0.00E+00	
Health Benchmarks			
CSFo	Oral cancer slope factor (mg/kg-day)$^{-1}$	5.50E-02	IRIS, 2002
RfDo	Oral reference dose (mg/kg/day)	3.00E-03	NCEA
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	2.90E-02	HEAST, 1997
RfCi	Inhalation reference concentration (mg/m^3)	6.00E-03	NCEA
RfDi	Inhalation reference dose (mg/kg/day)	1.71E-03 (b)	
URFi	Inhalation unit risk factor (per ug/m^3)	7.80E-06	IRIS, 2002

(a) - Calculated from inhalation reference dose assuming a 20 m^3/day inhalation rate for a 70-kg adult.
) - Calculated from inhalation reference concentration assuming a 20 m^3/day inhalation rate for a 70 kg adult.

Table 24
Chemical Specific Parameters for Bromomethane
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	9.49E+01	U.S.EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	1.00E+00 (a)	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	9.03E+00	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	9.00E-02	U.S.EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	6.75E-01	U.S.EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	3.60E-01	U.S.EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	1.41E-02	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	7.28E-02	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	1.21E-05	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	2.16E+00	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	1.30E+01	U.S.EPA, 1998
Transfer factors			
Bv (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	0.00E+00	
Brbg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	0.00E+00	
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	0.00E+00	
Ba (beef)	Biotransfer factor for beef (day/kg)	0.00E+00	
Ba (milk)	Biotranser factor for milk (day/kg)	0.00E+00	
BCF	Fish bioconcentration factor (L/kg)	0.00E+00	
BAF	Fish bioaccumulation factor (L/kg)	0.00E+00	
BSAF	Fish biota to sediment accumulation factor (unitless)	0.00E+00	
Other Parameters			
RCF	Root concentration factor (unitless)		
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	0.00E+00	
Health Benchmarks			
CSFo	Oral cancer slope factor (mg/kg-day)$^{-1}$	NA	
RfDo	Oral reference dose (mg/kg/day)	1.40E-03	IRIS, 2002
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	NA	
RfCi	Inhalation reference concentration (mg/m^3)	5.00E-03	IRIS, 2002
RfDi	Inhalation reference dose (mg/kg/day)	1.43E-03	(b)
URFi	Inhalation unit risk factor (per ug/m^3)	NA	

(a) - Calculated value.
(b) - Calculated from inhalation reference concentration assuming 20 m^3/day inhalation rate of a 70-kg adult.

Table 25
mical Specific Parameters for Carbon Tetrachloride
iite Corporation Light Aggregate Facility
hoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	1.54E+02	U.S.EPA, 1998
Fv (a)	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	1.00E+00	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	7.03E-01	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	1.52E+00	U.S.EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	1.14E+01	U.S.EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	6.08E+00	U.S.EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	2.87E-02	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	3.56E-02	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	9.77E-06	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	1.48E-01	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	5.21E+02	U.S.EPA, 1998
Transfer factors			
(above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	0.00E+00	
bg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	0.00E+00	
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	0.00E+00	
Ba (beef)	Biotransfer factor for beef (day/kg)	0.00E+00	
Ba (milk)	Biotranser factor for milk (day/kg)	0.00E+00	
BCF	Fish bioconcentration factor (L/kg)	0.00E+00	
BAF	Fish bioaccumulation factor (L/kg)	0.00E+00	
BSAF	Fish biota to sediment accumulation factor (unitless)	0.00E+00	
Other Parameters			
RCF	Root concentration factor (unitless)	0.00E+00	
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	0.00E+00	
Health Benchmarks			
CSFo	Oral cancer slope factor (mg/kg-day)$^{-1}$	1.30E-01	IRIS, 2002
RfDo	Oral reference dose (mg/kg/day)	7.00E-04	IRIS, 2002
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	5.30E-02	(b)
RfCi	Inhalation reference concentration (mg/m^3)	2.00E-03	NCEA
RfDi	Inhalation reference dose (mg/kg/day)	5.71E-04	(c)
URFi	Inhalation unit risk factor (per ug/m^3)	1.50E-05	IRIS, 2002

(a) - Calculated value.
- Calculated from inhalation unit risk factor assuming a 20 m^3/day ihalation rate of a 70 kg adult.
- Calculated from inhalation reference concentration assuming 20 m^3/day inhalation rate of a 70-kg adult.

Table 26
Chemical Specific Parameters for Dichlorodifluoromethane
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	1.21E+02	U.S.EPA, 1998
Fv (a)	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	1.00E+00	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	1.41E+00	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	6.85E-01	U.S.EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	5.14E+00	U.S.EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	2.74E+00	U.S.EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	2.58E+00	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	7.77E-02	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	9.00E-06	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	6.40E+00	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	8.07E+04	U.S.EPA, 1998
Transfer factors			
Bv (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	0.00E+00	
Brbg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	0.00E+00	
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	0.00E+00	
Ba (beef)	Biotransfer factor for beef (day/kg)	0.00E+00	
Ba (milk)	Biotranser factor for milk (day/kg)	0.00E+00	
BCF	Fish bioconcentration factor (L/kg)	0.00E+00	
BAF	Fish bioaccumulation factor (L/kg)	0.00E+00	
BSAF	Fish biota to sediment accumulation factor (unitless)	0.00E+00	
Other Parameters			
RCF	Root concentration factor (unitless)	0.00E+00	
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	0.00E+00	
Health Benchmarks			
CSFo	Oral cancer slope factor $(mg/kg\text{-}day)^{-1}$	8.40E-02	IRIS, 2002
RfDo	Oral reference dose (mg/kg/day)	2.00E-01	IRIS, 2002
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	NA	
RfCi	Inhalation reference concentration (mg/m^3)	2.00E-01	HEAST, 1997
RfDi	Inhalation reference dose (mg/kg/day)	5.71E-02	(b)
URFi	Inhalation unit risk factor (per ug/m^3)	NA	

(a) - Calculated value.
(b) - Calculated from inhalation reference concentration assuming 20 m^3/day inhalation rate of a 70-kg adult.

Table 27
ical Specific Parameters for Trans-1,3-Dichloropropene
ite Corporation Light Aggregate Facility
oes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	1.11E+02	U.S.EPA, 1998
Fv (a)	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	1.00E+00	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	2.24E+01	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	2.70E-01	U.S.EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	2.03E+00	U.S.EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	1.08E+00	U.S.EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	2.94E-03	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	6.26E-02	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	1.00E-05	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	4.11E-02	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	5.60E+01	U.S.EPA, 1998
Transfer factors			
above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	0.00E+00	
g	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	0.00E+00	
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	0.00E+00	
Ba (beef)	Biotransfer factor for beef (day/kg)	0.00E+00	
Ba (milk)	Biotranser factor for milk (day/kg)	0.00E+00	
BCF	Fish bioconcentration factor (L/kg)	0.00E+00	
BAF	Fish bioaccumulation factor (L/kg)	0.00E+00	
BSAF	Fish biota to sediment accumulation factor (unitless)	0.00E+00	
Other Parameters			
RCF	Root concentration factor (unitless)	0.00E+00	
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	0.00E+00	
Health Benchmarks			
CSFo	Oral cancer slope factor (mg/kg-day)$^{-1}$	1.00E-01	IRIS, 2002
RfDo	Oral reference dose (mg/kg/day)	3.00E-02	IRIS, 2002
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	1.40E-01	(b)
RfCi	Inhalation reference concentration (mg/m^3)	2.00E-02	IRIS, 2002
RfDi	Inhalation reference dose (mg/kg/day)	5.71E-03	(a)
URFi	Inhalation unit risk factor (per ug/m^3)	4.00E-06	IRIS, 2002

(a) - Calculated from inhalation reference concentration assuming a 20 m^3/day inhalation rate for a 70-kg adult.

- Calculated form inhalation unit risk factor assuming a 20 m^3/day inhalation rate for a 70 kg adult

te: Chemical/Physical properties for Cis-1,3-dichloropropene available in U.S. EPA 1998 were utilized based on the assumption of structural similarity. Health benchmarks are values for 1,3-dichloropropene.

Table 28
Chemical Specific Parameters for Trichlorofluoromethane
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	1.37E+02	U.S.EPA, 1998
Fv (a)	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	1.00E+00	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	7.03E-01	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	1.34E+00	U.S.EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	1.00E+01	U.S.EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	5.34E+00	U.S.EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	1.37E-01	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	4.27E-02	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	1.00E-05	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	1.10E+00	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	3.40E+02	U.S.EPA, 1998
Transfer factors			
Bv (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	0.00E+00	
Brbg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	0.00E+00	
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	0.00E+00	
Ba (beef)	Biotransfer factor for beef (day/kg)	0.00E+00	
Ba (milk)	Biotranser factor for milk (day/kg)	0.00E+00	
BCF	Fish bioconcentration factor (L/kg)	0.00E+00	
BAF	Fish bioaccumulation factor (L/kg)	0.00E+00	
BSAF	Fish biota to sediment accumulation factor (unitless)	0.00E+00	
Other Parameters			
RCF	Root concentration factor (unitless)	0.00E+00	
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	0.00E+00	
Health Benchmarks			
CSFo	Oral cancer slope factor (mg/kg-day)$^{-1}$	NA	
RfDo	Oral reference dose (mg/kg/day)	3.00E-01	IRIS, 2002
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	NA	
RfCi	Inhalation reference concentration (mg/m^3)	7.00E-01	HEAST, 1997
RfDi	Inhalation reference dose (mg/kg/day)	2.00E-01	(b)
URFi	Inhalation unit risk factor (per ug/m^3)	NA	

(a) - Calculated value.
(b) - Calculated from inhalation reference concentration assuming 20 m^3/day inhalation rate of a 70-kg adult.

Table 29
ɘmical Specific Parameters for Vinyl Chloride
ɾlite Corporation Light Aggregate Facility
ɔhoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	6.25E+01	U.S.EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	1.00E+00	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	1.41E+00	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	1.11E-01	U.S.EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	8.32E-01	U.S.EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	4.44E-01	U.S.EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	3.15E-01	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	1.58E-01	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	1.19E-05	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	3.68E+00	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	1.40E+01	U.S.EPA, 1998
Transfer factors			
‹ (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	0.00E+00	
ɾbg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	0.00E+00	
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	0.00E+00	
Ba (beef)	Biotransfer factor for beef (day/kg)	0.00E+00	
Ba (milk)	Biotranser factor for milk (day/kg)	0.00E+00	
BCF	Fish bioconcentration factor (L/kg)	0.00E+00	
BAF	Fish bioaccumulation factor (L/kg)	0.00E+00	
BSAF	Fish biota to sediment accumulation factor (unitless)	0.00E+00	
Other Parameters			
RCF	Root concentration factor (unitless)	0.00E+00	
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	0.00E+00	
Health Benchmarks			
CSFo	Oral cancer slope factor (mg/kg-day)$^{-1}$	1.50E+00	IRIS, 2002
RfDo	Oral reference dose (mg/kg/day)	3.00E-03	IRIS, 2002
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	3.08E-02 (a)	
RfCi	Inhalation reference concentration (mg/m^3)	1.00E-01	IRIS, 2002
RfDi	Inhalation reference dose (mg/kg/day)	2.86E-02 (b)	
URFi	Inhalation unit risk factor (per ug/m^3)	8.80E-06	IRIS, 2002

(a) - Derived from the inhalation unit risk factor assuming an inhalation rate of 20 m^3/day for a 70 kg adult.
) - Derived from the inhalation reference concentrations assuming an inhalation rate of 20 m^3/day for a 70 kg adult.

Table 30
Chemical Specific Parameters for Hexachlorocyclopentadiene
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	2.73E+02	U.S.EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	1.00E+00	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	9.03E+00	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	9.51E+01	U.S.EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	7.13E+02	U.S.EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	3.80E+02	U.S.EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	1.72E-02	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	1.61E-02	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	7.21E-06	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	9.63E-05	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	8.07E+04	U.S.EPA, 1998
Transfer factors			
Bv (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	5.47E-01	U.S.EPA, 1998
Brbg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	1.47E+01	U.S.EPA, 199
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	5.65E-02	U.S.EPA, 1998
Ba (beef)	Biotransfer factor for beef (day/kg)	2.03E-03	U.S.EPA, 1998
Ba (milk)	Biotranser factor for milk (day/kg)	6.14E-04	U.S.EPA, 1998
BCF	Fish bioconcentration factor (L/kg)	0.00E+00	U.S.EPA, 1998
BAF	Fish bioaccumulation factor (L/kg)	5.25E+02	U.S.EPA, 1998
BSAF	Fish biota to sediment accumulation factor (unitless)	0.00E+00	U.S.EPA, 1998
Other Parameters			
RCF	Root concentration factor (unitless)	1.40E+03	U.S.EPA, 1998
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	6.00E-01	U.S.EPA, 1994c
Health Benchmarks			
CSFo	Oral cancer slope factor $(mg/kg\text{-}day)^{-1}$	NA	
RfDo	Oral reference dose (mg/kg/day)	6.00E-03	IRIS, 2002
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	NA	
RfCi	Inhalation reference concentration (mg/m^3)	2.00E-04	IRIS, 2002
RfDi	Inhalation reference dose (mg/kg/day)	5.71E-05	(a)
URFi	Inhalation unit risk factor (per ug/m^3)	NA	

(a) - Calculated from inhalation reference concentration assuming 20 m^3/day inhalation rate of a 70-kg adult.

Table 31
nical Specific Parameters for 2-Nitroaniline
ite Corporation Light Aggregate Facility
hoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	1.38E+02	U.S.EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	1.00E+00	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	0.00E+00	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	3.93E-01	U.S.EPA, 1999
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	2.95E+00	U.S.EPA, 1999
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	1.57E+00	U.S.EPA, 1999
H	Henry's Law Constant (atm-m^3/mol)	1.17E-06	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	4.29E-02	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	9.81E-06	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	1.07E-05	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	7.08E+01	U.S.EPA, 1998
Transfer factors			
(above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	4.47E+00	U.S.EPA, 1998
bg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	3.18E+01	U.S.EPA, 1999
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	3.30E+00	U.S.EPA, 1998
Ba (beef)	Biotransfer factor for beef (day/kg)	1.78E-06	U.S.EPA, 1998
Ba (milk)	Biotranser factor for milk (day/kg)	5.62E-07	U.S.EPA, 1998
BCF	Fish bioconcentration factor (L/kg)	1.50E+01	U.S.EPA, 1998
BAF	Fish bioaccumulation factor (L/kg)	0.00E+00	U.S.EPA, 1998
BSAF	Fish biota to sediment accumulation factor (unitless)	0.00E+00	U.S.EPA, 1998
Other Parameters			
RCF	Root concentration factor (unitless)	1.25E+01	U.S.EPA, 1998
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	6.00E-01	U.S.EPA, 1998
Health Benchmarks			
CSFo	Oral cancer slope factor (mg/kg-day)$^{-1}$	NA	
RfDo	Oral reference dose (mg/kg/day)	6.00E-05	HEAST, 1991(W)
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	NA	
RfCi	Inhalation reference concentration (mg/m^3)	2.00E-04	HEAST, 1997
RfDi	Inhalation reference dose (mg/kg/day)	5.71E-05	(a)
URFi	Inhalation unit risk factor (per ug/m^3)	NA	

(a) - Calculated from inhalation reference concentration assuming 20 m^3/day inhalation rate of a 70-kg adult.

Table 32
Chemical Specific Parameters for 2,4-Dinitrotoluene
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Parameter	Definition	Value		Reference
Chemical/Physical Properties				
MW	Molecular Weight (g/mol)	1.82E+02		U.S.EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	9.90E-01		U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	1.41E+00		U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	5.10E-01		U.S.EPA, 1999
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	3.83E+00		U.S.EPA, 1999
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	2.04E+00		U.S.EPA, 1999
H	Henry's Law Constant (atm-m^3/mol)	1.46E-07		U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	3.09E-02		U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	7.86E-06		U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	2.29E-07		U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	9.90E+01		U.S.EPA, 1998
Transfer factors				
Bv (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	5.10E+01		U.S.EPA, 1998
Brbg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	2.80E+01		U.S.EPA, 19[illegible]
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	2.72E+00		U.S.EPA, 1998
Ba (beef)	Biotransfer factor for beef (day/kg)	2.49E-06		U.S.EPA, 1998
Ba (milk)	Biotranser factor for milk (day/kg)	7.86E-07		U.S.EPA, 1998
BCF	Fish bioconcentration factor (L/kg)	5.92E+00		U.S.EPA, 1998
BAF	Fish bioaccumulation factor (L/kg)	0.00E+00		U.S.EPA, 1998
BSAF	Fish biota to sediment accumulation factor (unitless)	0.00E+00		U.S.EPA, 1998
Other Parameters				
RCF	Root concentration factor (unitless)	1.43E+01		U.S.EPA, 1998
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	6.00E-01		U.S.EPA, 1998
Health Benchmarks				
CSFo	Oral cancer slope factor $(mg/kg\text{-}day)^{-1}$	6.80E-01	(a)	IRIS, 2002
RfDo	Oral reference dose (mg/kg/day)	2.00E-03		IRIS, 2002
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	6.80E-01		O
RfCi	Inhalation reference concentration (mg/m^3)	7.00E-03	(b)	
RfDi	Inhalation reference dose (mg/kg/day)	2.00E-03		O
URFi	Inhalation unit risk factor (per ug/m^3)	1.94E-04	(c)	

(a) - Oral cancer slope factor for 2,4/2,6-dinitrotoluene mixture was used.
(b) - Derived from the oral reference dose assuming an inhalation rate of 20 m^3/day for a 70 kg adult.
(c) - Derived from the oral cancer slope factor assuming an inhalation rate of 20 m^3/day for a 70 kg adult.
O - Used oral toxicity value in accordance with NYSDOH request.

Table 33
Chemical Specific Parameters for 2,6-Dinitrotoluene
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	1.82E+02	U.S.EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	1.00E+00	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	1.41E+00	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	4.19E-01	U.S.EPA, 1999
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	3.14E+00	U.S.EPA, 1999
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	1.68E+00	U.S.EPA, 1999
H	Henry's Law Constant (atm-m^3/mol)	1.30E-07	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	3.11E-02	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	7.76E-06	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	7.47E-07	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	7.70E+01	U.S.EPA, 1998
Transfer factors			
Bv (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	4.41E+01	U.S.EPA, 1998
Brbg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	3.08E+01	U.S.EPA, 1999
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	3.15E+00	U.S.EPA, 1998
Ba (beef)	Biotransfer factor for beef (day/kg)	1.93E-06	U.S.EPA, 1998
Ba (milk)	Biotranser factor for milk (day/kg)	6.12E-07	U.S.EPA, 1998
BCF	Fish bioconcentration factor (L/kg)	5.92E+00	U.S.EPA, 1998
BAF	Fish bioaccumulation factor (L/kg)	0.00E+00	U.S.EPA, 1998
BSAF	Fish biota to sediment accumulation factor (unitless)	0.00E+00	U.S.EPA, 1998
Other Parameters			
RCF	Root concentration factor (unitless)	1.29E+01	U.S.EPA, 1998
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	6.00E-01	U.S.EPA, 1998
Health Benchmarks			
CSFo	Oral cancer slope factor (mg/kg-day)$^{-1}$	6.80E-01 (a)	IRIS, 2002
RfDo	Oral reference dose (mg/kg/day)	1.00E-03	HEAST, 1997
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	6.80E-01	O
RfCi	Inhalation reference concentration (mg/m^3)	3.50E-03 (b)	
RfDi	Inhalation reference dose (mg/kg/day)	1.00E-03	O
URFi	Inhalation unit risk factor (per ug/m^3)	1.94E-04 (c)	

(a) - Oral cancer slope factor for 2,4/2,6-dinitrotoluene mixture was used.
(b) - Derived from the oral reference dose assuming an inhalation rate of 20 m^3/day for a 70 kg adult.
(c) - Derived from the oral cancer slope factor assuming an inhalation rate of 20 m^3/day for a 70 kg adult.
(O) - Used oral toxicity value in accordance with NYSDOH request.

Table 34
Chemical Specific Parameters for Chloromethane
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	5.05E+01	U.S.EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	1.00E+00	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	9.03E+00	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	6.00E-02	U.S.EPA, 1999
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	4.05E-01	U.S.EPA, 1999
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	2.40E-01	U.S.EPA, 1999
H	Henry's Law Constant (atm-m^3/mol)	4.52E-02	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	2.13E-01	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	1.39E-05	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	5.68E+00	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	8.00E+00	U.S.EPA, 1998
Transfer factors			
Bv (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	0.00E+00	
Brbg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	0.00E+00	
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	0.00E+00	
Ba (beef)	Biotransfer factor for beef (day/kg)	0.00E+00	
Ba (milk)	Biotranser factor for milk (day/kg)	0.00E+00	
BCF	Fish bioconcentration factor (L/kg)	0.00E+00	
BAF	Fish bioaccumulation factor (L/kg)	0.00E+00	
BSAF	Fish biota to sediment accumulation factor (unitless)	0.00E+00	
Other Parameters			
RCF	Root concentration factor (unitless)	0.00E+00	
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	0.00E+00	
Health Benchmarks			
CSFo	Oral cancer slope factor (mg/kg-day)$^{-1}$	1.30E-02	HEAST, 1997
RfDo	Oral reference dose (mg/kg/day)	4.00E-03	NYSDOH
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	6.30E-03	HEAST, 1997
RfCi	Inhalation reference concentration (mg/m^3)	9.00E-02	IRIS, 2002
RfDi	Inhalation reference dose (mg/kg/day)	2.57E-02 (a)	
URFi	Inhalation unit risk factor (per ug/m^3)	1.80E-06	HEAST, 1997

(a) - Derived from the inhalation reference concentration assuming an inhalation rate of 20 m^3/day for a 70 kg adult.
NYSDOH Recommended value from Table 1 of January 24, 2002 response to comments.

Table 35
emical Specific Parameters for Pentachlorophenol
lite Corporation Light Aggregate Facility
hoes, NY

Parameter	**Definition**	**Value**	**Reference**
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	2.66E+02	U.S.EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	1.00E+00	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	1.42E+00	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	5.05E+00	U.S.EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	3.79E+01	U.S.EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	2.02E+01	U.S.EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	1.41E-05	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	1.56E-02	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	8.01E-06	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	7.11E-07	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	1.20E+05	U.S.EPA, 1998
Transfer factors			
Bv (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	1.02E+03	U.S.EPA, 1998
g	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	3.77E+02	U.S.EPA, 1998
rag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	4.48E-02	U.S.EPA, 1998
Ba (beef)	Biotransfer factor for beef (day/kg)	3.02E-03	U.S.EPA, 1998
Ba (milk)	Biotranser factor for milk (day/kg)	9.55E-04	U.S.EPA, 1998
BCF	Fish bioconcentration factor (L/kg)	NA	U.S.EPA, 1998
BAF	Fish bioaccumulation factor (L/kg)	3.97E+02	U.S.EPA, 1998
BSAF	Fish biota to sediment accumulation factor (unitless)	NA	U.S.EPA, 1998
Other Parameters			
RCF	Root concentration factor (unitless)	1.90E+03	
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	6.00E-01	U.S. EPA 1994c
Health Benchmarks			
CSFo	Oral cancer slope factor $(mg/kg\text{-}day)^{-1}$	1.20E-01	IRIS, 2002
RfDo	Oral reference dose (mg/kg/day)	3.00E-02	IRIS, 2002
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	1.20E-01	O
RfCi	Inhalation reference concentration (mg/m^3)	1.05E-01	(a)
RfDi	Inhalation reference dose (mg/kg/day)	3.00E-02	O
URFi	Inhalation unit risk factor (per ug/m^3)	3.43E-05	(b)

(a) - Calculated from inhalation reference dose assuming 20 m^3/day inhalation rate of a 70-kg adult.
(b) - Calculated from the inhalation Cancer Slope Factor assuming a 20 m^3/day inhalation rate for a 70-kg adult.

Table 36
Chemical Specific Parameters for 1,1-Dichloroethylene
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	9.70E+01	U.S.EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	1.00E+00	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	1.41E+00	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	6.50E-01	U.S.EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	4.88E+00	U.S.EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	2.60E+00	U.S.EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	2.55E-02	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	7.53E-02	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	1.09E-05	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	7.88E-01	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	1.32E+02	U.S.EPA, 1998
Transfer factors			
Bv (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	0.00E+00	
Brbg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	0.00E+00	
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	0.00E+00	
Ba (beef)	Biotransfer factor for beef (day/kg)	0.00E+00	
Ba (milk)	Biotranser factor for milk (day/kg)	0.00E+00	
BCF	Fish bioconcentration factor (L/kg)	0.00E+00	
BAF	Fish bioaccumulation factor (L/kg)	0.00E+00	
BSAF	Fish biota to sediment accumulation factor (unitless)	0.00E+00	
Other Parameters			
RCF	Root concentration factor (unitless)	0.00E+00	
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	0.00E+00	
Health Benchmarks			
CSFo	Oral cancer slope factor (mg/kg-day)$^{-1}$	6.00E-01	IRIS, 2002
RfDo	Oral reference dose (mg/kg/day)	9.00E-03	IRIS, 2002
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	1.75E-01	(a)
RfCi	Inhalation reference concentration (mg/m^3)	3.20E-02	(b)
RfDi	Inhalation reference dose (mg/kg/day)	9.00E-03	O
URFi	Inhalation unit risk factor (per ug/m^3)	5.00E-05	IRIS, 2002

(a) - Calculated from the inhalation unit risk factor assuming a 20 m^3/day inhalation rate for a 70 kg adult.
(b) - Calculated from inhalation reference dose assuming a 20 m^3/day inhalation rate for a 70-kg adult.
O - Used oral toxicity value in accordance with NYSDOH request.

Table 37
mical Specific Parameters for 1,1,2,2-Tetrachloroethane
lite Corporation Light Aggregate Facility
hoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	1.68E+02	U.S.EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	1.00E+00	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	5.75E+00	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	7.90E-01	U.S.EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	5.93E+00	U.S.EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	3.16E+00	U.S.EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	3.72E-04	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	3.16E-02	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	9.26E-06	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	6.80E-03	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	4.40E+04	U.S.EPA, 1998
Transfer factors			
Bv (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	0.00E+00	
g	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	0.00E+00	
rag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	0.00E+00	
Ba (beef)	Biotransfer factor for beef (day/kg)	0.00E+00	
Ba (milk)	Biotranser factor for milk (day/kg)	0.00E+00	
BCF	Fish bioconcentration factor (L/kg)	0.00E+00	
BAF	Fish bioaccumulation factor (L/kg)	0.00E+00	
BSAF	Fish biota to sediment accumulation factor (unitless)	0.00E+00	
Other Parameters			
RCF	Root concentration factor (unitless)	0.00E+00	
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	0.00E+00	
Health Benchmarks			
CSFo	Oral cancer slope factor (mg/kg-day)$^{-1}$	2.00E-01	IRIS, 2001
RfDo	Oral reference dose (mg/kg/day)	6.00E-02	NCEA
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	2.00E-01	HEAST, 1997
RfCi	Inhalation reference concentration (mg/m^3)	2.10E-01	(a)
RfDi	Inhalation reference dose (mg/kg/day)	6.00E-02	O
URFi	Inhalation unit risk factor (per ug/m^3)	5.80E-05	IRIS, 2001

(a) - Calculated from inhalation reference dose assuming 20 m^3/day inhalation rate of a 70-kg adult.

Table 38
Chemical Specific Parameters for Chloroform
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	1.19E+02	U.S.EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	1.00E+00	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	1.41E+00	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	5.30E-01	U.S.EPA, 1999
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	3.98E+00	U.S.EPA, 1999
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	2.12E+00	U.S.EPA, 1999
H	Henry's Law Constant (atm-m^3/mol)	4.03E-03	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	5.17E-02	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	1.09E-05	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	2.69E-01	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	8.90E+01	U.S.EPA, 1998
Transfer factors			
Bv (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	0.00E+00	
Brbg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	0.00E+00	
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	0.00E+00	
Ba (beef)	Biotransfer factor for beef (day/kg)	0.00E+00	
Ba (milk)	Biotranser factor for milk (day/kg)	0.00E+00	
BCF	Fish bioconcentration factor (L/kg)	0.00E+00	
BAF	Fish bioaccumulation factor (L/kg)	0.00E+00	
BSAF	Fish biota to sediment accumulation factor (unitless)	0.00E+00	
Other Parameters			
RCF	Root concentration factor (unitless)	0.00E+00	
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	0.00E+00	
Health Benchmarks			
CSFo	Oral cancer slope factor (mg/kg-day)$^{-1}$	NA	
RfDo	Oral reference dose (mg/kg/day)	1.00E-02	IRIS, 2002
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	8.10E-02	HEAST, 1997
RfCi	Inhalation reference concentration (mg/m^3)	3.00E-04	NCEA
RfDi	Inhalation reference dose (mg/kg/day)	8.57E-05 (a)	
URFi	Inhalation unit risk factor (per ug/m^3)	2.30E-05	IRIS, 2002

(a) - Derived from the inhalation reference concentration assuming an inhalation rate of 20 m^3/day for a 70 kg adult.

Table 39
mical Specific Parameters for 1,3-Butadiene
.lite Corporation Light Aggregate Facility
hoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	5.41E+01	U.S.EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	1.00E+00	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	0.00E+00	U.S.EPA, 1998
Kds	Soil-water partition coefficient (mL/g or L/kg)	5.05E-01	U.S.EPA, 1999
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	3.79E+00	U.S.EPA, 1999
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	2.02E+00	U.S.EPA, 1999
H	Henry's Law Constant (atm-m^3/mol)	7.36E-02	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	1.33E-01	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	1.54E-05	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	2.78E+00	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	9.77E+01	U.S.EPA, 1998
Transfer factors			
(above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	0.00E+00	
bg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	0.00E+00	
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	0.00E+00	
Ba (beef)	Biotransfer factor for beef (day/kg)	0.00E+00	
Ba (milk)	Biotranser factor for milk (day/kg)	0.00E+00	
BCF	Fish bioconcentration factor (L/kg)	0.00E+00	
BAF	Fish bioaccumulation factor (L/kg)	0.00E+00	
BSAF	Fish biota to sediment accumulation factor (unitless)	0.00E+00	
Other Parameters			
RCF	Root concentration factor (unitless)	0.00E+00	
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	0.00E+00	
Health Benchmarks			
CSFo	Oral cancer slope factor (mg/kg-day)$^{-1}$	NA	
RfDo	Oral reference dose (mg/kg/day)	NA	
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	1.80E+00	HEAST, 1997
RfCi	Inhalation reference concentration (mg/m^3)	NA	
RfDi	Inhalation reference dose (mg/kg/day)	NA	
URFi	Inhalation unit risk factor (per ug/m^3)	5.14E-04 (a)	

(a) - Derived from the inhalation cancer slope factor assuming an inhalation rate of 20 m^3/day for a 70 kg adult.

Table 40
Chemical Specific Parameters for Hexachlorobutadiene
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Parameter	Definition	Value	Reference
Chemical/Physical Properties			
MW	Molecular Weight (g/mol)	2.61E+02	U.S.EPA, 1998
Fv	Fraction of pollutant air concentration present in the vapor phase (dimensionless)	1.00E+00	U.S.EPA, 1998
ksg	Soil loss constant due to degradation (yr-1)	0.00E+00	
Kds	Soil-water partition coefficient (mL/g or L/kg)	6.94E+01	U.S.EPA, 1998
Kdsw	Suspended sediment-surface water partition coefficient (L/kg)	5.20E+02	U.S.EPA, 1998
Kdbs	Bottom sediment-sediment pore water partition coefficient (L/kg)	2.77E+02	U.S.EPA, 1998
H	Henry's Law Constant (atm-m^3/mol)	2.39E-02	U.S.EPA, 1998
Da	Diffusivity in air (cm^2/sec)	1.73E-02	U.S.EPA, 1998
Dw	Diffusivity in water (cm^2/sec)	7.33E-06	U.S.EPA, 1998
VP	Ambient vapor pressure (atm)	2.33E-04	U.S.EPA, 1998
Kow	Octanol-water partition coefficient (unitless)	5.38E+04	U.S.EPA, 1998
Transfer factors			
Bv (above ground vegetables)	Air-to-plant biotransfer factor ([ug pollutant/g plant tissue DW]/ug pollutant/g air])	2.55E-01	U.S.EPA, 1998
Brbg	Soil-to-plant biotransfer factor ([ug pollutant/g below ground veg. FW]/ug pollutant/g air])	1.48E+01	U.S.EPA, 199
Brag	Soil-to-plant biotransfer factor ([ug pollutant/g above ground veg. DW]/ug pollutant/g air])	7.14E-02	U.S.EPA, 1998
Ba (beef)	Biotransfer factor for beef (day/kg)	1.35E-03	U.S.EPA, 1998
Ba (milk)	Biotranser factor for milk (day/kg)	4.28E-04	U.S.EPA, 1998
BCF	Fish bioconcentration factor (L/kg)	NA	U.S.EPA, 1998
BAF	Fish bioaccumulation factor (L/kg)	1.92E+03	U.S.EPA, 1998
BSAF	Fish biota to sediment accumulation factor (unitless)	NA	U.S.EPA, 1998
Other Parameters			
RCF	Root concentration factor (unitless)		
Fw (a)	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	6.00E-01	U.S. EPA, 1994c
Health Benchmarks			
CSFo	Oral cancer slope factor (mg/kg-day)$^{-1}$	7.80E-02	IRIS, 2001
RfDo	Oral reference dose (mg/kg/day)	2.00E-04	HEAST, 1997
CSFi	Inhalation cancer slope factor (mg/kg-day)-1	7.80E-02	HEAST, 1997
RfCi	Inhalation reference concentration (mg/m^3)	7.00E-04	(b)
RfDi	Inhalation reference dose (mg/kg/day)	2.00E-04	O
URFi	Inhalation unit risk factor (per ug/m^3)	2.20E-05	(c)

(a) - Assumed to behave as a cation.
(b) - Calculated from inhalation reference dose assuming 20 m^3/day inhalation rate of a 70-kg adult.
(c) - Calculated from inhalation Cancer Slope Factor assuming a 20 m^3/day inhalation rate for a 70-kg adult.
O - Used oral toxicity value in accordance with NYSDOH request.

TABLE A-3-131

CHEMICAL-SPECIFIC INPUTS FOR MERCURY (7439-97-6)

Parameter	Reference and Explanation	Equations	Value
Chemical/Physical Properties			
MW (g/mole)	Budavari, O'Neil, Smith, and Heckelman (1989)	–	200.59
T_m (°K)	Budavari, O'Neil, Smith, and Heckelman (1989)	–	234.23
Vp (atm)	Budavari, O'Neil, Smith, and Heckelman (1989)	–	2.63E-06 at 25°C
S (mg/L)	Budavari, O'Neil, Smith, and Heckelman (1989)	–	5.62E-02
H (atm·m^3/mol)	U.S. EPA (1997g)	B-1-6; B-2-6; B-2-8; B-3-6; B-4-6; B-4-12; B-4-19	7.1E-03
D_a (cm^2/s)	D_a value was obtained from CHEMDAT8 database in U.S. EPA (1994d). CHEMDAT8 uses correlations with density and molecular weight to calculate D_a values. A density value of 13.546 g/cc for mercury was used.	B-1-6; B-2-6; B-3-6; B-4-6; B-4-21	1.09E-02
D_w (cm^2/s)	D_w value was obtained from CHEMDAT8 database in U.S. EPA (1994d). CHEMDAT8 uses correlations with density and molecular weight to calculate D_w values. A density value of 13.546 g/cc for mercury was used.	B-4-20	3.01E-05
K_{ow} (unitless)	–	–	NA
K_{oc} (mL/g)	–	–	NA
Kd_s (mL/g)	U.S.EPA (1997g)	B-1-3; B-1-4; B-1-5; B-1-6; B-2-3; B-2-4; B-2-5; B-2-6; B-2-10; B-3-3; B-3-4; B-3-5; B-3-6; B-4-3; B-4-4; B-4-5; B-4-6; B-4-10; B-4-11	1.00E+03
Kd_{sw} (L/Kg)	U.S.EPA (1997g)	B-4-16; B-4-18; B-4-24	1.00E+03
Kd_{bs} (mL/g)	U.S.EPA (1997g)	B-4-16; B-4-25	3.00E+03
ksg (yr)$^{-1}$	U.S. EPA (1996a)	B-1-2; B-2-2; B-3-2; B-4-2	0.0

TABLE A-3-131

CHEMICAL-SPECIFIC INPUTS FOR MERCURY (7439-97-6)

(Page 2 of 3)

Parameter	Reference and Explanation	Equations	Value
Chemical/Physical Properties (Continued)			
Fv (unitless)	Fv value was calculated by using the equation cited in Junge (1977). Recommended value of Fv was calculated by using the Vp value that is provided in this table.	B-1-1; B-2-1; B-2-7; B-2-8; B-3-1; B-3-7; B-3-8; B-4-1; B-4-8; B-4-9; B-4-12; B-5-1	1.0
Biotransfer Factors for Plants			
RCF $\left(\frac{\mu g/g\ DW\ plant}{\mu g/mL\ soil\ water}\right)$	–	B-2-10	ND
$Br_{root\ veg}$ $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	Elemental mercury does not deposit onto soils. Therefore, it is assumed that there is no plant uptake through the soil.	B-2-10	NA
Br_{ag} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	Br_{ag} value for fruits was obtained from Baes, Sharp, Sjoreen, and Shor (1984). Br values for nonvegetative growth (reproductive) in Baes, Sharp, Sjoreen, and Shor (1984) were used for Br_{ag} (fruits). Br_{ag} value for vegetables was calculated using data obtained from Baes, Sharp, Sjoreen, and Shor (1984). Br values for nonvegetative (reproductive) growth and Bv values for vegetative growth weighted as 75% (reproductive) and 25% vegetative (Baes, Sharp, Sjoreen, and Shor [1984])—were used for Br_{ag} (vegetables). The weighted average Br_{ag} value for aboveground produce was obtained as follows: (1) Br_{ag} values for fruits combined with a human consumption rate of fruits of 1.44E-03 kg/kg/day, and (2) Br_{ag} values for vegetables combined with a human consumption rate of vegetables of 1.49E-03 kg/kg/day.	B-2-9	NA
Br_{forage} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	Elemental mercury is assumed not to deposit onto soils. Therefore, it is assumed that there is no transfer of mercury to the aboveground plant parts through root uptake.	B-3-8	NA
Br_{grain} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	Elemental mercury is assumed not to deposit onto soils. Therefore, it is assumed that there is no transfer of mercury to the aboveground plant parts through root uptake.	B-3-8	NA
Bv_{ag} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air}\right)$	Elemental mercury exists in very low concentrationsin the vapor phase. Therefore, Bv_{ag} value for elemental mercury is not modeled for the indirect exposure pathways. Elemental mercury is modeled for the inhalation pathway only. No literature data is available to calculate a Bv_{ag} value for elemental mercury.	B-2-8	ND
Bv_{forage} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air}\right)$	Elemental mercury exists in very low concentrationsin the vapor phase. Therefore, Bv_{forage} value for elemental mercury is not modeled for the indirect exposure pathways. Elemental mercury is modeled for the inhalation pathway only. No literature data is available to calculate a Bv_{forage} value for elemental mercury.	B-3-8	ND

TABLE A-3-131

CHEMICAL-SPECIFIC INPUTS FOR MERCURY (7439-97-6)

Parameter	Reference and Explanation	Equations	Value
Biotransfer Factors for Animals			
Ba_{milk} (day/kg FW)	Elemental mercury does not deposit onto soils nor gets transferred to the aboveground plant parts. Therefore, there is no transfer of elemetal mercury into the animal tissue.	B-3-11	NA
Ba_{beef} (day/kg FW)	Elemental mercury does not deposit onto soils nor gets transferred to the aboveground plant parts. Therefore, there is no transfer of elemetal mercury into the animal tissue.	B-3-10	NA
Ba_{pork} (day/kg FW)	Elemental mercury does not deposit onto soils nor gets transferred to the aboveground plant parts. Therefore, there is no transfer of elemetal mercury into the animal tissue.	B-3-12	NA
Ba_{egg} (day/kg FW)	Elemental mercury does not deposit onto soils nor gets transferred to the aboveground plant parts. Therefore, there is no transfer of elemetal mercury into the animal tissue.	B-3-13	NA
$Ba_{chicken}$ (day/kg FW)	Elemental mercury does not deposit onto soils nor gets transferred to the aboveground plant parts. Therefore, there is no transfer of elemetal mercury into the animal tissue.	B-3-14	NA
BCF_{fish} (L/g FW tissue)	–	B-4-26	NA
BAF_{fish} (L/kg FW)	Elemental mercury does not deposit onto soils and surface water. Therefore, there is no transfer of elemetal mercury into the fish tissue.	B-4-27	NA
$BSAF_{fish}$ (unitless)	–	B-4-28	NA
Health Benchmarks			
RfD (mg/kg/day)	Calculated from *RfC* using an inhalation rate of 20 m^3/day and a human body weight of 70 kg.	C-1-8	8.60E-05
Oral CSF $(mg/kg/day)^{-1}$	–	C-1-7	ND
RfC (mg/m^3)	U.S. EPA (1997b)	C-2-3	3.0E-04
Inhalation URF $(\mu g/m^3)^{-1}$	–	C-2-1	ND
Inhalation CSF $(mg/kg/day)^{-1}$	–	C-2-2	ND

Note:
NA = Not available
ND = No data available
All parameters are defined in list of FATE AND TRANSPORT PARAMETERS on page A-3-iii.

TABLE A-3-130

CHEMICAL-SPECIFIC INPUTS FOR MERCURIC CHLORIDE (7487-94-7)

Parameter	Reference and Explanation	Equations	Value
Chemical/Physical Properties			
MW (g/mole)	Budavari, O'Neil, Smith, and Heckelman (1989)	--	271.52
T_m (°K)	Budavari, O'Neil, Smith, and Heckelman (1989)	--	550.1
Vp (atm)	U.S. EPA (1996a)	--	1.20E-04
S (mg/L)	Budavari, O'Neil, Smith, and Heckelman (1989)	--	6.90E+04
H (atm·m^3/mol)	U.S. EPA (1997g)	B-1-6; B-2-6; B-2-8; B-3-6; B-4-6; B-4-12; B-4-19	7.1E-10
D_a (cm^2/s)	D_a value was calculated using the equation cited in U.S. EPA (1997g).	B-1-6; B-2-6; B-3-6; B-4-6; B-4-21	4.53E-02
D_w (cm^2/s)	D_w value was calculated using the equation cited in U.S. EPA (1996a).	B-4-20	5.25E-06
K_{ow} (unitless)	U.S. EPA (1996a)	--	6.10E-01
K_{oc} (mL/g)	--	--	NA
Kd_s (mL/g)	U.S. EPA (1997g)	B-1-3; B-1-4; B-1-5; B-1-6; B-2-3; B-2-4; B-2-5; B-2-6; B-2-10; B-3-3; B-3-4; B-3-5; B-3-6; B-4-3; B-4-4; B-4-5; B-4-6; B-4-10; B-4-11	5.80E+04
Kd_{sw} (L/Kg)	U.S. EPA (1997g)	B-4-16; B-4-18; B-4-24	1.00E+05
Kd_{bs} (mL/g)	U.S. EPA (1997g)	B-4-16; B-4-25	5.00E+04
ksg (year)$^{-1}$	U.S. EPA (1996a)	B-1-2; B-2-2; B-3-2; B-4-2	0.0
Fv (unitless)	Estimated based on discussions concerning divalent mercury provided in U.S. EPA (1996a).	B-1-1; B-2-1; B-2-7; B-2-8; B-3-1; B-3-7; B-3-8; B-4-1; B-4-8; B-4-9; B-4-12; B-5-1	0.85

TABLE A-3-130

CHEMICAL-SPECIFIC INPUTS FOR MERCURIC CHLORIDE (7487-94-7)

Parameter	Reference and Explanation	Equations	Value
Biotransfer Factors for Plants			
RCF $\left(\frac{\mu g/g\ WW\ plant}{\mu g/mL\ soil\ water}\right)$	--	B-2-10	ND
$Br_{rootveg}$ $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	U.S. EPA (1997g)	B-2-10	3.60E-02
Br_{ag} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	Br_{ag} value for fruits was obtained from Baes, Sharp, Sjoreen, and Shor (1984). *Br* values for nonvegetative growth (reproductive) in Baes, Sharp, Sjoreen, and Shor (1984) were used for Br_{ag} (fruits). Br_{ag} value for vegetables was calculated using data obtained from Baes, Sharp, Sjoreen, and Shor (1984). *Br* values for nonvegetative (reproductive) growth and *Bv* values for vegetative growth weighted as 75% (reproductive) and 25% vegetative (Baes, Sharp, Sjoreen, and Shor [1984])—were used for Br_{ag} (vegetables). The weighted average Br_{ag} value for aboveground produce was obtained as follows: (1) Br_{ag} values for fruits combined with a human consumption rate of fruits of 1.44E-03 kg/kg/day, and (2) Br_{ag} values for vegetables combined with a human consumption rate of vegetables of 1.49E-03 kg/kg/day.	B-2-9	1.45E-02
Br_{forage} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	U.S. EPA (1997g)	B-3-9	0.0
Bv_{ag} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air}\right)$	U.S. EPA (1997g)	B-2-8	1.8E+03
Bv_{forage} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air}\right)$	U.S. EPA (1997g)	B-3-8	1.8E+03

TABLE A-3-130

CHEMICAL-SPECIFIC INPUTS FOR MERCURIC CHLORIDE (7487-94-7)

Parameter	Reference and Explanation	Equations	Value
Biotransfer Factors for Animals			
Ba_{milk} (day/kg FW)	Default Ba_{milk} (dry weight value) obtained from U.S. EPA (1997g) was converted to a wet weight basis assuming a 87% moisture content in milk. U.S. EPA U.S. EPA (1997g) does not differentiate between different forms of mercury. Mercury is assumed to be in the form of 87% divalent mercury and 13% methyl mercury in herbivore animals. Therefore, the calculated Ba_{milk} (wet weight) value was multiplied by 0.87.	B-3-11	2.26E-03
Ba_{beef} (day/kg FW)	Default Ba_{beef} (dry weight value) obtained from U.S. EPA (1997g) was converted to a wet weight basis assuming a 70% moisture content in beef. U.S. EPA (1997g) does not differentiate between different forms of mercury. Mercury is assumed to be in the form of 87% divalent mercury and 13% methyl mercury in herbivore animals. Therefore, the calculated Ba_{beef} (wet weight) value was multiplied by 0.87.	B-3-10	5.22E-03
Ba_{pork} (day/kg FW)	Default Ba_{pork} (dry weight value) of 0.00013 day/kg DW btained from U.S. EPA (1997g) was converted to a wet weight basis assuming a 70 % moisture content in pork. U.S. EPA (1997g) does not differentiate between different forms of mercury. Mercury is assumed to be in the form of 87% divalent mercury and 13% methyl mercury in herbivore animals. Therefore, the calculated Ba_{pork} (wet weight) value was multiplied by 0.87.	B-3-12	3.39E-05
Ba_{egg} (day/kg FW)	Default Ba_{egg} (dry weight value) of 0.11 day/kg DW obtained from U.S. EPA (1997g) was converted to a wet weight basis assuming a 75 % moisture content in eggs. U.S. EPA (1997g) does not differentiate between different forms of mercury. Mercury is assumed to be in the form of 87% divalent mercury and 13% methyl mercury in herbivore animals. Therefore, the calculated Ba_{egg} (wet weight) value was multiplied by 0.87.	B-3-13	2.39E-02
$Ba_{chicken}$ (day/kg FW)	Default $Ba_{chicken}$ (dry weight value) of 0.11 day/kg DW obtained from U.S. EPA (1997g) was converted to a wet weight basis assuming a 75 % moisture content in chicken. U.S. EPA (1997g) does not differentiate between different forms of mercury. Mercury is assumed to be in the form of 87% divalent mercury and 13% methyl mercury in herbivore animals. Therefore, the calculated $Ba_{chicken}$ (wet weight) value was multiplied by 0.87.	B-3-14	2.39E-02
BCF_{fish} (L/kg FW)	–	B-4-26	NA
BAF_{fish} (L/kg FW)	–	B-4-27	NA
$BSAF_{fish}$ (unitless)	–	B-4-28	NA
Health Benchmarks			
RfD (mg/kg/day)	U.S.EPA (1997b)	C-1-8	3.0E-04
Oral CSF $(mg/kg/day)^{-1}$	–	C-1-7	ND
RfC (mg/m^3)	Calculated from RfD using an inhalation rate of 20 m^3/day and a human body weight of 70 kg.	C-2-3	1.1E-03

TABLE A-3-130

CHEMICAL-SPECIFIC INPUTS FOR MERCURIC CHLORIDE (7487-94-7)

Parameter	Reference and Explanation	Equations	Value
Health Benchmarks (Continued)			
Inhalation URF $(\mu g/m^3)^{-1}$	–	C-2-1	ND
Inhalation CSF $(mg/kg/day)^{-1}$	–	C-2-2	ND

Note:

NA = Not Applicable
ND = No data available

All parameters are defined in list of FATE AND TRANSPORT PARAMETERS on page A-3-iii.

TABLE A-3-140

CHEMICAL-SPECIFIC INPUTS FOR METHYL MERCURY (22967-92-6)

Parameter	Reference and Explanation	Equations	Value
Chemical/Physical Properties			
MW (g/mole)	U.S. EPA (1997g)	–	216.0
T_m (°K)	–	–	ND
Vp (atm)	–	–	ND
S (mg/L)	–	–	ND
H (atm·m^3/mol)	U.S. EPA (1997g)	B-1-6; B-2-6; B-2-8; B-3-6; B-4-6; B-4-12; B-4-19	4.7E-07
D_a (cm^2/s)	D_a value was calculated using the equation cited in U.S. EPA (1997g).	B-1-6; B-2-6; B-3-6; B-4-6; B-4-21	5.28E-02
D_w (cm^2/s)	D_w value was calculated using the equation cited in U.S. EPA (1996a).	B-4-20	6.11E-06
K_{ow} (unitless)	–	–	ND
K_{oc} (mL/g)	–	–	ND
Kd_s (mL/g)	USEPA (1997g)	B-1-3; B-1-4; B-1-5; B-1-6; B-2-3; B-2-4; B-2-5; B-2-6; B-2-10; B-3-3; B-3-4; B-3-5; B-3-6; B-4-3; B-4-4; B-4-5; B-4-6; B-4-10; B-4-11	7.00E+03
Kd_{sw} (L/Kg)	USEPA (1997g)	B-4-16; B-4-18; B-4-24	1.00E+05
Kd_{bs} (mL/g)	USEPA (1997g)	B-4-16; B-4-25	3.00E+03
ksg (year)$^{-1}$	U.S. EPA (1996a)	B-1-2; B-2-2; B-3-2; B-4-2	0.0
Fv (unitless)	Based on discussions provided in U.S. EPA (1996a), methyl mercury does not exist in the air/vapor phase.	B-1-1; B-2-1; B-2-7; B-2-8; B-3-1; B-3-7; B-3-8; B-4-1; B-4-8; B-4-9; B-4-12; B-5-1	0.0

TABLE A-3-140

CHEMICAL-SPECIFIC INPUTS FOR METHYL MERCURY (22967-92-6)

Parameter	Reference and Explanation	Equations	Value
Biotransfer Factors for Plants			
RCF $\left(\frac{\mu g/g\ DW\ plant}{\mu g/mL\ soil\ water}\right)$	–	B-2-10	ND
$Br_{rootveg}$ $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	U.S. EPA (1997g)	B-2-10	9.9E-02
Br_{ag} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	Br_{ag} value for fruits was obtained from Baes, Sharp, Sjoreen, and Shor (1984). *Br* values for nonvegetative growth (reproductive) in Baes, Sharp, Sjoreen, and Shor (1984) were used for Br_{ag} (fruits). Br_{ag} value for vegetables was calculated using data obtained from Baes, Sharp, Sjoreen, and Shor (1984). *Br* values for nonvegetative (reproductive) growth and *Bv* values for vegetative growth weighted as 75% (reproductive) and 25% vegetative (Baes, Sharp, Sjoreen, and Shor [1984])—were used for Br_{ag} (vegetables). The weighted average Br_{ag} value for aboveground produce was obtained as follows: (1) Br_{ag} values for fruits combined with a human consumption rate of fruits of 1.44E-03 kg/kg/day, and (2) Br_{ag} values for vegetables combined with a human consumption rate of vegetables of 1.49E-03 kg/kg/day.	B-2-9	2.94E-02
Br_{forage} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	U.S. EPA (1997g)	B-3-9	0.0
Bv_{ag} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air}\right)$	Methyl mercury is assumed not to exist in the air phase. Therefore, there is no biotransfer of methyl mercury from air into plants.	B-2-8	NA
Bv_{forage} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air}\right)$	Methyl mercury is assumed not to exist in the air phase. Therefore, there is no biotransfer of methyl mercury from air into plants.	B-3-8	NA

TABLE A-3-140

CHEMICAL-SPECIFIC INPUTS FOR METHYL MERCURY (22967-92-6)

Parameter	Reference and Explanation	Equations	Value
Biotransfer Factors for Animals			
Ba_{milk} (day/kg FW)	Default Ba_{milk} (dry weight value) of 0.02 day/kg DW for mercury obtained from U.S. EPA (1997g) was converted to a wet weight basis assuming a 87% moisture content in milk. U.S. EPA (1997g) does not differentiate between different forms of mercury. Mercury is assumed to be in the form of 87% divalent mercury and 13% methyl mercury in herbivore animals. Therefore, the calculated Ba_{milk} (wet weight) value was multiplied by 0.13.	B-3-11	3.38E-04
Ba_{beef} (day/kg FW)	Default Ba_{beef} (dry weight value) of 0.02 day/kg DW obtained from U.S. EPA (1997g) was converted to a wet weight basis assuming a 70% moisture content in beef. U.S. EPA (1997g) does not differentiate between different forms of mercury. Mercury is assumed to be in the form of 87% divalent mercury and 13% methyl mercury in herbivore animals. Therefore, the calculated Ba_{beef} (wet weight) value was multiplied by 0.13.	B-3-10	7.80E-04
Ba_{pork} (day/kg FW)	Default Ba_{pork} (dry weight value) of 0.00013 day/kg DW obtained from U.S. EPA (1997g) was converted to a wet weight basis assuming a 70 % moisture content in pork. U.S. EPA (1997g) does not differentiate between different forms of mercury. Mercury is assumed to be in the form of 87% divalent mercury and 13% methyl mercury in herbivore animals. Therefore, the calculated Ba_{pork} (wet weight) value was multiplied by 0.13.	B-3-12	5.07E-06
Ba_{egg} (day/kg FW)	Default Ba_{egg} (dry weight value) of 0.11 day/kg DW obtained from U.S. EPA (1997g) was converted to a wet weight basis assuming a 75 % moisture content in eggs.U.S. EPA (1997g) does not differentiate between different forms of mercury. Mercury is assumed to be in the form of 87% divalent mercury and 13% methyl mercury in herbivore animals. Therefore, the calculated Ba_{egg} (wet weight) value was multiplied by 0.13.	B-3-13	3.58E-03
$Ba_{chicken}$ (day/kg FW)	Default $Ba_{chicken}$ (dry weight value) of 0.11 day/kg DW obtained from U.S. EPA (1997g) was converted to a wet weight basis assuming a 75 % moisture content in chicken.U.S. EPA (1997g) does not differentiate between different forms of mercury. Mercury is assumed to be in the form of 87% divalent mercury and 13% methyl mercury in herbivore animals. Therefore, the calculated $Ba_{chicken}$ (wet weight) value was multiplied by 0.13.	B-3-14	3.58E-03
BCF_{fish} (L/kg FW tissue)	–	B-4-26	NA
BAF_{fish} (L/kg FW)	Default value cited in U.S. EPA (1997g) for a Trophic Level 4 fish.	B-4-27	6.80E+06
$BSAF_{fish}$ (unitless)	–	B-4-28	NA
Health Benchmarks			
RfD (mg/kg/day)	U.S. EPA (1997b)	C-1-8	1.0E-04
Oral CSF $(mg/kg/day)^{-1}$	–	C-1-7	ND
RfC (mg/m^3)	Calculated from *Oral CSF* using an inhalation rate of 20 m^3/day and a human body weight of 70 kg.	C-2-3	3.5E-04
Inhalation URF $(\mu g/m^3)^{-1}$	–	C-2-1	ND

TABLE A-3-140

CHEMICAL-SPECIFIC INPUTS FOR METHYL MERCURY (22967-92-6)

Parameter	Reference and Explanation	Equations	Value
Inhalation CSF (mg/kg/day)$^{-1}$	--	C-2-2	ND

Note:

NA = Not Applicable
ND = No data available

All parameters are defined in list of FATE AND TRANSPORT PARAMETERS on page A-3-iii.

TABLE A-3-108

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,4,6,7,8-HEPTACHLORODIBENZO(P)DIOXIN (35822-46-9)

Parameter	Reference and Explanation	Equations	Value
Chemical/Physical Properties			
MW (g/mole)	U.S. EPA (1994a)	–	425.31
T_m (K)	U.S. EPA (1994a)	–	537.1
Vp (atm)	U.S. EPA (1994a)	–	4.22E-14 at 25°C (solid)
S (mg/L)	U.S. EPA (1994a)	–	2.40E-06
H (atm·m^3/mol)	U.S. EPA (1994a)	B-1-6; B-2-6; B-2-8; B-3-6; B-4-6; B-4-12; B-4-19	7.50E-06
D_a (cm^2/s)	D_a value was obtained from CHEMDAT8 database (U.S. EPA 1994d).	B-1-6; B-2-6; B-3-6; B-4-6; B-4-21	1.11E-02
D_w (cm^2/s)	D_w value was calculated using the equation cited in U.S. EPA (1996a).	B-4-20	3.89E-06
K_{ow} (unitless)	U.S. EPA (1992d)	–	1.58E+08
K_{oc} (mL/g)	K_{oc} value was calculated by using the correlation equation with K_{ow} for dioxins and furans that is cited in U.S. EPA (1994a) and U.S. EPA (1994c). Recommended value was calculated by using the recommended K_{ow} value that is provided in this table.	–	9.77E+07
Kd_s (cm^3/g)	Kd_s value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.01 in soil. Measured organic carbon in soil, specific to site conditions, should be used to calculate Kd_s, because the value varies, depending on the fraction of organic carbon in soil. Recommended Kd_s value was calculated by using the K_{oc} value that is provided in this table.	B-1-3; B-1-4; B-1-5; B-1-6; B-2-3; B-2-4; B-2-5; B-2-6; B-2-10; B-3-3; B-3-4; B-3-5; B-3-6; B-4-3; B-4-4; B-4-5; B-4-6; B-4-10; B-4-11	9.77E+05
Kd_{sw} (L/Kg)	Kd_{sw} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.075 in suspended sediment. Measured organic carbon in suspended sediment, specific to site conditions, should be used to calculate Kd_{sw}, because the value varies, depending on the fraction of organic carbon in suspended sediment. Recommended Kd_{sw} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-18; B-4-24	7.33E+06

TABLE A-3-108

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,4,6,7,8-HEPTACHLORODIBENZO(P)DIOXIN (35822-46-9)

Parameter	Reference and Explanation	Equations	Value
Chemical/Physical Properties (Continued)			
Kd_{bs} (cm^3/g)	Kd_{bs} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.04 in bottom sediment. Measured organic carbon in bottom sediment, specific to site conditions, should be used to calculate Kd_{bs}, because the value varies depending on the fraction of organic carbon in bottom sediment. Recommended Kd_{bs} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-25	3.91E+06
ksg $(year)^{-1}$	ksg value was calculated by using the chemical half-life in soil, as cited in Mackay, Shiu, and Ma (1992).	B-1-1; B-1-2; B-2-1; B-2-2; B-3-1; B-3-2; B-4-1; B-4-2	1.09E-01
Fv (unitless)	Fv value was calculated by using equations cited in Junge (1977) and Bidleman (1988). Recommended value of Fv was calculated by using T_m and Vp values that are provided in this table. Vp value for this compound was converted to a liquid-phase value before being used in the calculations.	B-1-1; B-2-1; B-2-7; B-2-8; B-3-1; B-3-7; B-3-8; B-4-1; B-4-8; B-4-9; B-4-12; B-5-1	1.62E-02
Biotransfer Factors for Plants			
RCF $\left(\frac{\mu g/g\ DW\ plant}{\mu g/mL\ soil\ water}\right)$	RCF value was calculated by using the correlation equation with K_{ow} that is cited in Briggs (1982). Recommended value was calculated by using the K_{ow} value that is provided in this table. The value was then converted to a dry weight basis by using a moisture content of 87 percent.	B-2-10	4.79E+05
$Br_{rootveg}$ $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	$Br_{rootveg}$ value was calculated by dividing the RCF value with the Kd_s value provided in this table.	B-2-10	4.90E-01
Br_{ag} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	Br_{ag} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-2-9	7.05E-04
Br_{forage} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	Br_{forage} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-3-9	7.05E-04
Bv_{ag} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air}\right)$	Bv_{ag} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-2-8	3.50E+05

TABLE A-3-108

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,4,6,7,8-HEPTACHLORODIBENZO(P)DIOXIN (35822-46-9)

Parameter	Reference and Explanation	Equations	Value
Biotransfer Factors for Plants (Continued)			
Bv_{forage} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air}\right)$	Bv_{forage} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-3-8	3.50E+05
Biotransfer Factors for Animals			
Ba_{milk} (day/kg FW)	U.S. EPA (1995a)	B-3-11	1.00E-03
Ba_{beef} (day/kg FW)	Ba_{beef} value was calculated by increasing Ba_{milk} values by a factor of 5.43, as discussed in Section A3.3.14.	B-3-10	5.4E-03
Ba_{pork} (day/kg FW)	Ba_{pork} value was calculated by increasing Ba_{milk} values by a factor of 6.57, as discussed in Section A3.3.15.	B-3-12	6.57E-03
Ba_{egg} (L/kg FW tissue)	Ba_{egg} value was calculated by multiplying the BCF value for chicken eggs by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for eggs was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-13	2.55E-02
$Ba_{chicken}$ (L/kg FW tissue)	$Ba_{chicken}$ value was calculated by multiplying the BCF value for chicken by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for chicken was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-14	8.58E-03
BCF_{fish} (L/kg FW tissue)	–	B-4-26	NA
BAF_{fish} (L/kg FW)	–	B-4-27	NA
$BSAF_{fish}$ (unitless, lipid based)	U.S. EPA (1994a)	B-4-28	5.00E-03
Other Parameters			
TEF (unitless)	U.S. EPA (1994a)	–	0.01
Health Benchmarks			
Oral CSF $(mg/kg/day)^{-1}$	–	C-1-8	ND
Inhalation CSF $(mg/kg/day)^{-1}$	–	C-1-7	ND
RfD (mg/kg/day)	–	C-2-3	ND
Inhalation URF $(\mu g/m^3)^{-1}$	–	C-2-1	ND
RfC (mg/m^3)	–	C-2-2	ND

Note:

NA = Not Applicable; ND = No Data Available
All parameters are defined in list of FATE AND TRANSPORT PARAMETERS on page A-3-iii.

TABLE A-3-109

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,4,6,7,8-HEPTACHLORODIBENZO(P)FURAN (67562-39-4)

Parameter	Reference and Explanation	Equations	Value
Chemical/Physical Properties			
MW (g/mole)	U.S. EPA (1994a)	–	409.31
T_m (K)	U.S. EPA (1994a)	–	509.1
Vp (atm)	U.S. EPA (1994a)	–	1.75E-13 at 25°C (solid)
S (mg/L)	U.S. EPA (1994a)	–	1.35E-06
H (atm·m^3/mol)	U.S. EPA (1994a)	B-1-6; B-2-6; B-2-8; B-3-6; B-4-6; B-4-12; B-4-19	5.30E-05
D_a (cm^2/s)	D_a value was calculated by using Equation A-3-2. Recommended value was calculated by using the MW and D_a values that are provided in the tables in Appendix A-3 for 2,3,7,8-TCDF.	B-1-6; B-2-6; B-3-6; B-4-6; B-4-21	1.55E-02
D_w (cm^2/s)	D_w value was calculated using the equation cited in U.S. EPA (1996a).	B-4-20	3.99E-06
K_{ow} (unitless)	U.S. EPA (1992d)	–	8.32E+07
K_{oc} (mL/g)	K_{oc} value was calculated by using the correlation equation with K_{ow} for dioxins and furans that is cited in U.S. EPA (1994a) and U.S. EPA (1994c). Recommended value was calculated by using the recommended K_{ow} value that is provided in this table.	–	5.13E+07
Kd_s (cm^3/g)	Kd_s value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.01 in soil. Measured organic carbon in soil, specific to site conditions, should be used to calculate Kd_s, because the value varies, depending on the fraction of organic carbon in soil. Recommended Kd_s value was calculated by using the K_{oc} value that is provided in this table.	B-1-3; B-1-4; B-1-5; B-1-6; B-2-3; B-2-4; B-2-5; B-2-6; B-2-10; B-3-3; B-3-4; B-3-5; B-3-6; B-4-3; B-4-4; B-4-5; B-4-6; B-4-10; B-4-11	5.13E+05
Kd_{sw} (L/Kg)	Kd_{sw} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.075 in suspended sediment. Measured organic carbon in suspended sediment, specific to site conditions, should be used to calculate Kd_{sw}, because the value varies, depending on the fraction of organic carbon in suspended sediment. Recommended Kd_{sw} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-18; B-4-24	3.85E+06

TABLE A-3-109

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,4,6,7,8-HEPTACHLORODIBENZO(P)FURAN (67562-39-4)

Parameter	Reference and Explanation	Equations	Value
Chemical/Physical Properties			
Kd_{bs} (cm^3/g)	Kd_{bs} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.04 in bottom sediment. Measured organic carbon in bottom sediment, specific to site conditions, should be used to calculate Kd_{bs}, because the value varies depending on the fraction of organic carbon in bottom sediment. Recommended Kd_{bs} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-25	2.05E+06
ksg $(year)^{-1}$	ksg value was calculated by using the chemical half-life in soil, as cited in Mackay, Shiu, and Ma (1992).	B-1-1; B-1-2; B-2-1; B-2-2; B-3-1; B-3-2; B-4-1; B-4-2	3.57E-01
Fv (unitless)	Fv value was calculated by using equations cited in Junge (1977) and Bidleman (1988). Recommended value of Fv was calculated by using T_m and Vp values that are provided in this table. Vp value for this compound was converted to a liquid phase value before being used in the calculations.	B-1-1; B-2-1; B-2-7; B-2-8; B-3-1; B-3-7; B-3-8; B-4-1; B-4-8; B-4-9; B-4-12; B-5-1	3.47E-02
Biotransfer Factors for Plants			
RCF $\left(\frac{\mu g/g\ DW\ plant}{\mu g/mL\ soil\ water}\right)$	RCF value was calculated by using the correlation equation with K_{ow} that is cited in Briggs (1982). Recommended value was calculated by using the K_{ow} value that is provided in this table. The value was then converted to a dry weight basis by using a moisture content of 87 percent.	B-2-10	2.91E+05
$Br_{rootveg}$ $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	$Br_{rootveg}$ value was calculated by dividing the RCF value with the Kd_s value provided in this table.	B-2-10	5.68E-01
Br_{ag} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	Br_{ag} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-2-9	1.02E-03
Br_{forage} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	Br_{forage} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-3-9	1.02E-03
Bv_{ag} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air}\right)$	Bv_{ag} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-2-8	4.40E+05

TABLE A-3-109

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,4,6,7,8-HEPTACHLORODIBENZO(P)FURAN (67562-39-4)

Parameter	Reference and Explanation	Equations	Value
Biotransfer Factors for Plants (Continued)			
Bv_{forage} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air}\right)$	Bv_{forage} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-3-8	4.40E+05
Biotransfer Factors for Animals			
Ba_{milk} (day/kg FW)	U.S. EPA (1995a)	B-3-11	1.00E-03
Ba_{beef} (day/kg FW)	Ba_{beef} value was calculated by increasing Ba_{milk} values by a factor of 5.43, as discussed in Section A3.3.14.	B-3-10	5.43E-03
Ba_{pork} (day/kg FW)	Ba_{pork} value was calculated by increasing Ba_{milk} values by a factor of 6.57, as discussed in Section A3.3.15.	B-3-12	6.57E-03
Ba_{egg} (L/kg FW tissue)	Ba_{egg} value was calculated by multiplying the BCF value for chicken eggs by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for eggs was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-13	2.09E-02
$Ba_{chicken}$ (L/kg FW tissue)	$Ba_{chicken}$ value was calculated by multiplying the BCF value for chicken by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for chicken was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-14	7.04E-03
BCF_{fish} (L/kg FW tissue)	–	B-4-26	NA
BAF_{fish} (L/kg FW)	–	B-4-27	NA
$BSAF_{fish}$ (unitless, lipid based)	U.S. EPA (1994a)	B-4-28	5.00E-03
Other Parameters			
TEF (unitless)	U.S. EPA (1994a)	–	0.01
Health Benchmarks			
Oral CSF $(mg/kg/day)^{-1}$	–	C-1-8	ND
Inhalation CSF $(mg/kg/day)^{-1}$	–	C-1-7	ND
RfD (mg/kg/day)	–	C-2-3	ND
Inhalation URF $(\mu g/m^3)^{-1}$	–	C-2-1	ND
RfC (mg/m^3)	–	C-2-2	ND

Note:

NA = Not Applicable; ND = No Data Available
All parameters are defined in list of FATE AND TRANSPORT PARAMETERS on page A-3-iii.

TABLE A-3-110

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,4,7,8,9-HEPTACHLORODIBENZO(P)FURAN (55673-89-7)

Parameter	Reference and Explanation	Equations	Value
Chemical/Physical Properties			
MW (g/mole)	U.S. EPA (1994a)	–	409.31
T_m (K)	U.S. EPA (1994a)	–	494.1
Vp (atm)	U.S. EPA (1994a)	–	1.41E-13 at 25°C (solid)
S (mg/L)	Homologue group average value obtained from U.S. EPA (1994a).	–	1.40E-06
H (atm·m³/mol)	U.S. EPA (1994a)	B-1-6; B-2-6; B-2-8; B-3-6; B-4-6; B-4-12; B-4-19	5.30E-05
D_a (cm²/s)	D_a value was calculated by using Equation A-3-2. Recommended value was calculated by using the MW and D_a values that are provided in the tables in Appendix A-3 for 2,3,7,8-TCDF.	B-1-6; B-2-6; B-3-6; B-4-6; B-4-21	1.55E-02
D_w (cm²/s)	D_w value was calculated using the equation cited in U.S. EPA (1996a).	B-4-20	3.99E-06
K_{ow} (unitless)	Homologue group average value obtained from U.S. EPA (1992d).	–	8.32E+07
K_{oc} (mL/g)	K_{oc} value was calculated by using the correlation equation with K_{ow} for dioxins and furans that is cited in U.S. EPA (1994a) and U.S. EPA (1994c). Recommended value was calculated by using the recommended K_{ow} value that is provided in this table.	–	5.13E+07
Kd_s (cm³/g)	Kd_s value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.01 in soil. Measured organic carbon in soil, specific to site conditions, should be used to calculate Kd_s, because the value varies, depending on the fraction of organic carbon in soil. Recommended Kd_s value was calculated by using the K_{oc} value that is provided in this table.	B-1-3; B-1-4; B-1-5; B-1-6; B-2-3; B-2-4; B-2-5; B-2-6; B-2-10; B-3-3; B-3-4; B-3-5; B-3-6; B-4-3; B-4-4; B-4-5; B-4-6; B-4-10; B-4-11	5.13E+05
Kd_{sw} (L/Kg)	Kd_{sw} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.075 in suspended sediment. Measured organic carbon in suspended sediment, specific to site conditions, should be used to calculate Kd_{sw}, because the value varies, depending on the fraction of organic carbon in suspended sediment. Recommended Kd_{sw} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-18; B-4-24	3.85E+06

TABLE A-3-110

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,4,7,8,9-HEPTACHLORODIBENZO(P)FURAN (55673-89-7)

Parameter	Reference and Explanation	Equations	Value
Chemical/Physical Properties (Continued)			
Kd_{bs} (cm^3/g)	Kd_{bs} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.04 in bottom sediment. Measured organic carbon in bottom sediment, specific to site conditions, should be used to calculate Kd_{bs}, because the value varies depending on the fraction of organic carbon in bottom sediment. Recommended Kd_{bs} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-25	2.05E+06
ksg (year)$^{-1}$	*ksg* value was calculated using the chemical half-life in soil, as cited in Mackay, Shiu, and Ma (1992).	B-1-1; B-1-2; B-2-1; B-2-2; B-3-1; B-3-2; B-4-1; B-4-2	3.57E-01
Fv (unitless)	*Fv* value was calculated by using equations cited in Junge (1977) and Bidleman (1988). Recommended value of Fv was calculated by using T_m and *Vp* values that are provided in this table. *Vp* value for this compound was converted to a liquid phase value before being used in the calculations.	B-1-1; B-2-1; B-2-7; B-2-8; B-3-1; B-3-7; B-3-8; B-4-1; B-4-8; B-4-9; B-4-12; B-5-1	2.01E-02
Biotransfer Factors for Plants			
RCF $\left(\frac{\mu g/g\ DW\ plant}{\mu g/mL\ soil\ water}\right)$	*RCF* value was calculated by using the correlation equation with K_{ow} that is cited in Briggs (1982). Recommended value was calculated by using the K_{ow} value that is provided in this table. The value was then converted to a dry weight basis by using a moisture content of 87 percent.	B-2-10	2.91E+05
$Br_{rootveg}$ $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	$Br_{rootveg}$ value was calculated by dividing the *RCF* value with the Kd_s value provided in this table.	B-2-10	5.68E-01
Br_{ag} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	Br_{ag} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-2-9	1.02E-03
Br_{forage} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	Br_{forage} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-3-9	1.02E-03
Bv_{ag} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air}\right)$	Bv_{ag} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-2-8	4.40E+05

TABLE A-3-110

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,4,7,8,9-HEPTACHLORODIBENZO(P)FURAN (55673-89-7)

Parameter	Reference and Explanation	Equations	Value
Biotransfer Factors for Plants (Continued)			
Bv_{forage} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air}\right)$	Bv_{forage} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-3-8	4.40E+05
Biotransfer Factors for Animals			
Ba_{milk} (day/kg FW)	U.S. EPA (1995a)	B-3-11	3.00E-03
Ba_{beef} (day/kg FW)	Ba_{beef} value was calculated by increasing Ba_{milk} values by a factor of 5.43, as discussed in Section A3.3.14.	B-3-10	1.63E-02
Ba_{pork} (day/kg FW)	Ba_{pork} value was calculated by increasing Ba_{milk} values by a factor of 6.57, as discussed in Section A3.3.15.	B-3-12	1.97E-02
Ba_{egg} (L/kg FW tissue)	Ba_{egg} value was calculated by multiplying the BCF value for chicken eggs by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for eggs was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-13	2.42E-02
$Ba_{chicken}$ (L/kg FW tissue)	$Ba_{chicken}$ value was calculated by multiplying the BCF value for chicken by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for chicken was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-14	1.06E-02
BCF_{fish} (L/kg FW tissue)	–	B-4-26	NA
BAF_{fish} (L/kg FW)	–	B-4-27	NA
$BSAF_{fish}$ (unitless, lipid based)	U.S. EPA (1994a)	B-4-28	5.00E-03
Other Parameters			
TEF (unitless)	U.S. EPA (1994a)	–	0.01
Health Benchmarks			
Oral CSF $(mg/kg/day)^{-1}$	–	C-1-8	ND
Inhalation CSF $(mg/kg/day)^{-1}$	–	C-1-7	ND
RfD (mg/kg/day)	–	C-2-3	ND
Inhalation URF $(\mu g/m^3)^{-1}$	–	C-2-1	ND
RfC (mg/m^3)	–	C-2-2	ND

Note:
NA = Not Applicable; ND = No Data Available
All parameters are defined in list of FATE AND TRANSPORT PARAMETERS on page A-3-iii.

TABLE A-3-113

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,4,7,8-HEXACHLORODIBENZO(P)DIOXIN (39227-28-6)

Parameter	Reference and Explanation	Equations	Value
Chemical/Physical Properties			
MW (g/mole)	U.S. EPA (1994a)	–	390.87
T_m (K)	U.S. EPA (1994a)	–	546.1
Vp (atm)	U.S. EPA (1994a)	–	1.33E-13 at 25°C (solid)
S (mg/L)	U.S. EPA (1994a)	–	4.40E-06
H (atm·m³/mol)	U.S. EPA (1994a)	B-1-6; B-2-6; B-2-8; B-3-6; B-4-6; B-4-12; B-4-19	1.20E-05
D_a (cm²/s)	D_a value was obtained from CHEMDAT8 database (U.S. EPA 1994d).	B-1-6; B-2-6; B-3-6; B-4-6; B-4-21	1.15E-02
D_w (cm²/s)	D_w value was calculated using the equation cited in U.S. EPA (1996a).	B-4-20	4.12E-06
K_{ow} (unitless)	U.S. EPA (1992d)	–	6.17E+07
K_{oc} (mL/g)	K_{oc} value was calculated by using the correlation equation with K_{ow} for dioxins and furans that is cited in U.S. EPA (1994a; 1994c). Recommended value was calculated by using the recommended K_{ow} value that is provided in this table.	–	3.80E+07
Kd_s (cm³/g)	Kd_s value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.01 in soil. Measured organic carbon in soil, specific to site conditions, should be used to calculate Kd_s, because the value varies, depending on the fraction of organic carbon in soil. Recommended Kd_s value was calculated by using the K_{oc} value that is provided in this table.	B-1-3; B-1-4; B-1-5; B-1-6; B-2-3; B-2-4; B-2-5; B-2-6; B-2-10; B-3-3; B-3-4; B-3-5; B-3-6; B-4-3; B-4-4; B-4-5; B-4-6; B-4-10; B-4-11	3.80E+05
Kd_{sw} (L/Kg)	Kd_{sw} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.075 in suspended sediment. Measured organic carbon in suspended sediment, specific to site conditions, should be used to calculate Kd_{sw}, because the value varies, depending on the fraction of organic carbon in suspended sediment. Recommended Kd_{sw} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-18; B-4-24	2.85E+06

TABLE A-3-113

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,4,7,8-HEXACHLORODIBENZO(P)DIOXIN (39227-28-6)

Parameter	Reference and Explanation	Equations	Value
	Chemical/Physical Properties (Continued)		
Kd_{bs} (cm^3/g)	Kd_{bs} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.04 in bottom sediment. Measured organic carbon in bottom sediment, specific to site conditions, should be used to calculate Kd_{bs}, because the value varies depending on the fraction of organic carbon in bottom sediment. Recommended Kd_{bs} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-25	1.52E+06
ksg $(year)^{-1}$	ksg value was calculated by using the chemical half-life in soil, as cited in Mackay, Shiu, and Ma (1992).	B-1-1; B-1-2; B-2-1; B-2-2; B-3-1; B-3-2; B-4-1; B-4-2	1.09E-01
Fv (unitless)	Fv value was calculated by using equations cited in Junge (1977) and Bidleman (1988). Recommended value of Fv was calculated by using T_m and Vp values that are provided in this table. Vp value for this compound was converted to a liquid phase value before being used in the calculations.	B-1-1; B-2-1; B-2-7; B-2-8; B-3-1; B-3-7; B-3-8; B-4-1; B-4-8; B-4-9; B-4-12; B-5-1	5.96E-02
	Biotransfer Factors for Plants		
RCF $\left(\frac{\square g/g\ DW\ plant}{\square g/mL\ soil\ water}\right)$	RCF value was calculated by using the correlation equation with K_{ow} that is cited in Briggs (1982). Recommended value was calculated by using the K_{ow} value that is provided in this table. The value was then converted to a dry weight basis by using a moisture content of 87 percent.	B-2-10	2.31E+05
$Br_{rootveg}$ $\left(\frac{\square g/g\ DW\ plant}{\square g/g\ soil}\right)$	$Br_{rootveg}$ value was calculated by dividing the RCF value with the Kd_s value provided in this table.	B-2-10	6.09E-01
Br_{ag} $\left(\frac{\square g/g\ DW\ plant}{\square g/g\ soil}\right)$	Br_{ag} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-2-9	1.22E-03
Br_{forage} $\left(\frac{\square g/g\ DW\ plant}{\square g/g\ soil}\right)$	Br_{forage} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-3-9	1.22E-03
Bv_{ag} $\left(\frac{\square g/g\ DW\ plant}{\square g/g\ air}\right)$	Bv_{ag} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-2-8	4.50E+05

TABLE A-3-113

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,4,7,8-HEXACHLORODIBENZO(P)DIOXIN (39227-28-6)

Parameter	Reference and Explanation	Equations	Value
Biotransfer Factors for Plants (Continued)			
Bv_{forage} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air}\right)$	Bv_{forage} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-3-8	4.50E+05
Biotransfer Factors for Animals			
Ba_{milk} (day/kg FW)	U.S. EPA (1995a)	B-3-11	6.00E-03
Ba_{beef} (day/kg FW)	Ba_{beef} value was calculated by increasing Ba_{milk} values by a factor of 5.43, as discussed in Section A3.3.14.	B-3-10	3.26E-02
Ba_{pork} (day/kg FW)	Ba_{pork} value was calculated by increasing Ba_{milk} values by a factor of 6.57, as discussed in Section A3.3.15.	B-3-12	3.94E-02
Ba_{egg} (L/kg FW tissue)	Ba_{egg} value was calculated by multiplying the BCF value for chicken eggs by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for eggs was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-13	4.53E-02
$Ba_{chicken}$ (L/kg FW tissue)	$Ba_{chicken}$ value was calculated by multiplying the BCF value for chicken by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for chicken was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-14	4.03E-02
BCF_{fish} (L/kg FW tissue)	–	B-4-26	NA
BAF_{fish} (L/kg FW)	–	B-4-27	NA
$BSAF_{fish}$ (unitless, lipid based)	U.S. EPA (1994a)	B-4-28	4.00E-02
Other Parameters			
TEF (unitless)	U.S. EPA (1994a)	–	0.10
Health Benchmarks			
Oral CSF $(mg/kg/day)^{-1}$	–	C-1-8	ND
Inhalation CSF $(mg/kg/day)^{-1}$	–	C-1-7	ND
RfD (mg/kg/day)	–	C-2-3	ND
Inhalation URF $(\mu g/m^3)^{-1}$	–	C-2-1	ND
RfC (mg/m^3)	–	C-2-2	ND

Note:
NA = Not Applicable; ND = No Data Available
All parameters are defined in list of FATE AND TRANSPORT PARAMETERS on page A-3-iii.

TABLE A-3-114

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,6,7,8-HEXACHLORODIBENZO(P)DIOXIN (57653-85-7)

Parameter	Reference and Explanation	Equations	Value
Chemical/Physical Properties			
MW (g/mole)	U.S. EPA (1994a)	–	390.87
T_m (K)	U.S. EPA (1994a)	–	558.1
Vp (atm)	U.S. EPA (1994a)	–	4.74E-14 at 25°C (solid)
S (mg/L)	Homologue group average value obtained from U.S. EPA (1994a).	–	4.40E-06
H (atm-m³/mol)	U.S. EPA (1994a)	B-1-6; B-2-6; B-2-8; B-3-6; B-4-6; B-4-12; B-4-19	1.20E-05
D_a (cm²/s)	D_a value was calculated by using Equation A-3-2. Recommended value was calculated by using the *MW* and D_a values that are provided in the tables in Appendix A-3 for 2,3,7,8-TCDD.	B-1-6; B-2-6; B-3-6; B-4-6; B-4-21	1.15E-02
D_w (cm²/s)	D_w value was calculated using the equation cited in U.S. EPA (1996a).	B-4-20	4.12E-06
K_{ow} (unitless)	Homologue group average value obtained from U.S. EPA (1992d).	–	1.78E+07
K_{oc} (mL/g)	K_{oc} value was calculated by using the correlation equation with K_{ow} for dioxins and furans that is cited in U.S. EPA (1994a) and U.S. EPA (1994c). Recommended value was calculated by using the recommended K_{ow} value that is provided in this table.	–	1.10E+07
Kd_s (cm³/g)	Kd_s value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.01 in soil. Measured organic carbon in soil, specific to site conditions, should be used to calculate Kd_s, because the value varies, depending on the fraction of organic carbon in soil. Recommended Kd_s value was calculated by using the K_{oc} value that is provided in this table.	B-1-3; B-1-4; B-1-5; B-1-6; B-2-3; B-2-4; B-2-5; B-2-6; B-2-10; B-3-3; B-3-4; B-3-5; B-3-6; B-4-3; B-4-4; B-4-5; B-4-6; B-4-10; B-4-11	1.10E+05
Kd_{sw} (L/Kg)	Kd_{sw} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.075 in suspended sediment. Measured organic carbon in suspended sediment, specific to site conditions, should be used to calculate Kd_{sw}, because the value varies, depending on the fraction of organic carbon in suspended sediment. Recommended Kd_{sw} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-18; B-4-24	8.22E+05

TABLE A-3-114

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,6,7,8-HEXACHLORODIBENZO(P)DIOXIN (57653-85-7)

Parameter	Reference and Explanation	Equations	Value
Chemical/Physical Properties (Continued)			
Kd_{bs} (cm^3/g)	Kd_{bs} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.04 in bottom sediment. Measured organic carbon in bottom sediment, specific to site conditions, should be used to calculate Kd_{bs}, because the value varies depending on the fraction of organic carbon in bottom sediment. Recommended Kd_{bs} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-25	4.39E+05
ksg (year)$^{-1}$	ksg value assumed to be the same as the ksg value calculated for 1,2,3,4,7,8-HexaCDD. ksg value was calculated by using the chemical half-life in soil, as cited in Mackay, Shiu, and Ma (1992).	B-1-1; B-1-2; B-2-1; B-2-2; B-3-1; B-3-2; B-4-1; B-4-2	1.09E-01
Fv (unitless)	Fv value was calculated by using equations cited in Junge (1977) and Bidleman (1988). Recommended value of Fv was calculated by using T_m and Vp values that are provided in this table. Vp value for this compound was converted to a liquid phase value before being used in the calculations.	B-1-1; B-2-1; B-2-7; B-2-8; B-3-1; B-3-7; B-3-8; B-4-1; B-4-8; B-4-9; B-4-12; B-5-1	2.89E-02
Biotransfer Factors for Plants			
RCF $\left(\frac{\mu g/g\ DW\ plant}{\mu g/mL\ soil\ water}\right)$	RCF value was calculated by using the correlation equation with K_{ow} that is cited in Briggs (1982). Recommended value was calculated by using the K_{ow} value that is provided in this table. The value was then converted to a dry weight basis by using a moisture content of 87 percent.	B-2-10	8.88E+04
$Br_{rootveg}$ $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	$Br_{rootveg}$ value was calculated by dividing the RCF value with the Kd_s value provided in this table.	B-2-10	8.10E-01
Br_{ag} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	Br_{ag} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-2-9	2.50E-03
Br_{forage} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	Br_{forage} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-3-9	2.50E-03
Bv_{ag} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air}\right)$	Bv_{ag} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-2-8	4.50E+05

TABLE A-3-114

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,6,7,8-HEXACHLORODIBENZO(P)DIOXIN (57653-85-7)

Parameter	Reference and Explanation	Equations	Value
Biotranfer Factors for Plants (Continued)			
Bv_{forage} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air}\right)$	Bv_{forage} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-3-8	4.50E+05
Biotransfer Factors for Animals			
Ba_{milk} (day/kg FW)	U.S. EPA (1995a)	B-3-11	5.00E-03
Ba_{beef} (day/kg FW)	Ba_{beef} value was calculated by increasing Ba_{milk} values by a factor of 5.43, as discussed in Section A3.3.14.	B-3-10	2.71E-02
Ba_{pork} (day/kg FW)	Ba_{pork} value was calculated by increasing Ba_{milk} values by a factor of 6.57, as discussed in Section A3.3.15.	B-3-12	3.29E-02
Ba_{egg} (L/kg FW tissue)	Ba_{egg} value was calculated by multiplying the BCF value for chicken eggs by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for eggs was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-13	3.70E-02
$Ba_{chicken}$ (L/kg FW tissue)	$Ba_{chicken}$ value was calculated by multiplying the BCF value for chicken by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for chicken was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-14	2.57E-02
BCF_{fish} (L/kg FW tissue)	--	B-4-26	NA
BAF_{fish} (L/kg FW)	--	B-4-27	NA
$BSAF_{fish}$ (unitless, lipid based)	U.S. EPA (1994a)	B-4-28	4.00E-02
Other Parameters			
TEF (unitless)	U.S. EPA (1994a)	--	0.10
Health Benchmarks			
Oral CSF $(mg/kg/day)^{-1}$	--	C-1-8	ND
Inhalation CSF $(mg/kg/day)^{-1}$	--	C-1-7	ND
RfD (mg/kg/day)	--	C-2-3	ND
Inhalation URF $(\mu g/m^3)^{-1}$	--	C-2-1	ND
RfC (mg/m^3)	--	C-2-2	ND

Note:
NA = Not Applicable; ND = No Data Available
All parameters are defined in list of FATE AND TRANSPORT PARAMETERS on page A-3-iii.

TABLE A-3-115

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,7,8,9-HEXACHLORODIBENZO(P)DIOXIN (19408-74-3)

Parameter	Reference and Explanation	Equations	Value
Chemical/Physical Properties			
MW (g/mole)	U.S. EPA (1994a)	–	390.87
T_m (K)	U.S. EPA (1994a)	–	516.1
Vp (atm)	U.S. EPA (1994a)	–	6.45E-14 at 25°C (solid)
S (mg/L)	Homologue group average value obtained from U.S. EPA (1994a).	–	4.40E-06
H (atm·m³/mol)	U.S.EPA (1994a)	B-1-6; B-2-6; B-2-8; B-3-6; B-4-6; B-4-12; B-4-19	1.20E-05
D_a (cm²/s)	D_a value was obtained from CHEMDAT8 database (U.S. EPA 1994d).	B-1-6; B-2-6; B-3-6; B-4-6; B-4-21	1.15E-02
D_w (cm²/s)	D_w value was calculated using the equation cited in U.S. EPA (1996a).	B-4-20	4.12E-06
K_{ow} (unitless)	Homologue group average value obtained from U.S. EPA (1994a).	–	1.78E+07
K_{oc} (mL/g)	K_{oc} value was calculated by using the correlation equation with K_{ow} for dioxins and furans that is cited in U.S. EPA (1994a; 1994c). Recommended value was calculated by using the recommended K_{ow} value that is provided in this table.	–	1.10E+07
Kd_s (cm³/g)	Kd_s value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.01 in soil. Measured organic carbon in soil, specific to site conditions, should be used to calculate Kd_s, because the value varies, depending on the fraction of organic carbon in soil. Recommended Kd_s value was calculated by using the K_{oc} value that is provided in this table.	B-1-3; B-1-4; B-1-5; B-1-6; B-2-3; B-2-4; B-2-5; B-2-6; B-2-10; B-3-3; B-3-4; B-3-5; B-3-6; B-4-3; B-4-4; B-4-5; B-4-6; B-4-10; B-4-11	1.10E+05
Kd_{sw} (L/Kg)	Kd_{sw} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.075 in suspended sediment. Measured organic carbon in suspended sediment, specific to site conditions, should be used to calculate Kd_{sw}, because the value varies, depending on the fraction of organic carbon in suspended sediment. Recommended Kd_{sw} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-18; B-4-24	8.22E+05

TABLE A-3-115

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,7,8,9-HEXACHLORODIBENZO(P)DIOXIN (19408-74-3)

Parameter	Reference and Explanation	Equations	Value
Chemical/Physical Properties (Continued)			
Kd_{bs} (cm^3/g)	Kd_{bs} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.04 in bottom sediment. Measured organic carbon in bottom sediment, specific to site conditions, should be used to calculate Kd_{bs}, because the value varies depending on the fraction of organic carbon in bottom sediment. Recommended Kd_{bs} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-25	4.39E+05
ksg $(year)^{-1}$	*ksg* value was assumed to be the same as the *ksg* value for 1,2,3,4,7,8-HexaCDD. *ksg* value was calculated by using the chemical half-life in soil, as cited in Mackay, Shiu, and Ma (1992).	B-1-1; B-1-2; B-2-1; B-2-2; B-3-1; B-3-2; B-4-1; B-4-2	1.09E-01
Fv (unitless)	*Fv* value was calculated by using equations cited in Junge (1977) and Bidleman (1988). Recommended value of Fv was calculated by using T_m and *Vp* values that are provided in this table. *Vp* value for this compound was converted to a liquid phase value before being used in the calculations.	B-1-1; B-2-1; B-2-7; B-2-8; B-3-1; B-3-7; B-3-8; B-4-1; B-4-8; B-4-9; B-4-12; B-5-1	1.53E-02
Biotransfer Factors for Plants			
RCF $(\frac{\mu g/g\ DW\ plant}{\mu g/mL\ soil\ water})$	*RCF* value was calculated by using the correlation equation with K_{ow} that is cited in Briggs (1982). Recommended value was calculated by using the K_{ow} value that is provided in this table. The value was then converted to a dry weight basis by using a moisture content of 87 percent.	B-2-10	8.88E+04
$Br_{rootveg}$ $(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil})$	$Br_{rootveg}$ value was calculated by dividing the *RCF* value with the Kd_s value provided in this table.	B-2-10	8.10E-01
Br_{ag} $(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil})$	Br_{ag} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-2-9	2.50E-03
Br_{forage} $(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil})$	Br_{forage} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-3-9	2.50E-03
Bv_{ag} $(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air})$	Bv_{ag} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-2-8	4.50E+05

TABLE A-3-115

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,7,8,9-HEXACHLORODIBENZO(P)DIOXIN (19408-74-3)

Parameter	Reference and Explanation	Equations	Value
	Biotransfer Factors for Plants		
Bv_{forage} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air}\right)$	Bv_{forage} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-3-8	4.50E+05
	Biotransfer Factors for Animals		
Ba_{milk} (day/kg FW)	U.S. EPA (1995a)	B-3-11	5.00E-03
Ba_{beef} (day/kg FW)	Ba_{beef} value was calculated by increasing Ba_{milk} values by a factor of 5.43, as discussed in Section A3.3.14.	B-3-10	2.71E-02
Ba_{pork} (day/kg FW)	Ba_{pork} value was calculated by increasing Ba_{milk} values by a factor of 6.57, as discussed in Section A3.3.15.	B-3-12	3.29E-02
Ba_{egg} (L/kg FW tissue)	Ba_{egg} value was calculated by multiplying the BCF value for chicken eggs by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for eggs was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-13	2.33E-02
$Ba_{chicken}$ (L/kg FW tissue)	$Ba_{chicken}$ value was calculated by multiplying the BCF value for chicken by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for chicken was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-14	1.39E-02
BCF_{fish} (L/kg FW tissue)	–	B-4-26	NA
BAF_{fish} (L/kg FW)	–	B-4-27	NA
$BSAF_{fish}$ (unitless, lipid based)	U.S. EPA (1994a)	B-4-28	4.00E-02
	Other Parameters		
TEF (unitless)	U.S. EPA (1994a)	–	0.10
	Health Benchmarks		
Oral CSF $(mg/kg/day)^{-1}$	–	C-1-8	ND
Inhalation CSF $(mg/kg/day)^{-1}$	–	C-1-7	ND
RfD (mg/kg/day)	–	C-2-3	ND
Inhalation URF $(\mu g/m^3)^{-1}$	–	C-2-1	ND
RfC (mg/m^3)	–	C-2-2	ND

Note:
NA = Not Applicable; ND = No Data Available
All parameters are defined in list of FATE AND TRANSPORT PARAMETERS on page A-3-iii.

TABLE A-3-116

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,4,7,8-HEXACHLORODIBENZO(P)FURAN (70648-26-9)

Parameter	Reference and Explanation	Equations	Value
Chemical/Physical Properties			
MW (g/mole)	U.S. EPA (1994a)	–	374.87
T_m (K)	U.S. EPA (1994a)	–	498.6
Vp (atm)	U.S. EPA (1994a)	–	3.16E-13 at 25°C (solid)
S (mg/L)	U.S. EPA (1994a)	–	8.25E-06
H (atm·m^3/mol)	U.S. EPA (1994a)	B-1-6; B-2-6; B-2-8; B-3-6; B-4-6; B-4-12; B-4-19	1.40E-05
D_a (cm^2/s)	D_a value was calculated by using Equation A-3-2. Recommended value was calculated by using the MW and D_a values that are provided in the tables in Appendix A-3 for 2,3,7,8-TCDF.	B-1-6; B-2-6; B-3-6; B-4-6; B-4-21	1.62E-02
D_w (cm^2/s)	D_w value was calculated using the equation cited in U.S. EPA (1996a).	B-4-20	4.23E-06
K_{ow} (unitless)	Homologue group average value obtained from U.S. EPA (1992d)	–	1.78E+07
K_{oc} (mL/g)	K_{oc} value was calculated by using the correlation equation with K_{ow} for dioxins and furans that is cited in U.S. EPA (1994a) and U.S. EPA (1994c). Recommended value was calculated by using the recommended K_{ow} value that is provided in this table.	–	1.10E+07
Kd_s (cm^3/g)	Kd_s value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.01 in soil. Measured organic carbon in soil, specific to site conditions, should be used to calculate Kd_s, because the value varies, depending on the fraction of organic carbon in soil. Recommended Kd_s value was calculated by using the K_{oc} value that is provided in this table.	B-1-3; B-1-4; B-1-5; B-1-6; B-2-3; B-2-4; B-2-5; B-2-6; B-2-10; B-3-3; B-3-4; B-3-5; B-3-6; B-4-3; B-4-4; B-4-5; B-4-6; B-4-10; B-4-11	1.10E+05
Kd_{sw} (L/Kg)	Kd_{sw} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.075 in suspended sediment. Measured organic carbon in suspended sediment, specific to site conditions, should be used to calculate Kd_{sw}, because the value varies, depending on the fraction of organic carbon in suspended sediment. Recommended Kd_{sw} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-18; B-4-24	8.22E+05

TABLE A-3-116

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,4,7,8-HEXACHLORODIBENZO(P)FURAN (70648-26-9)

Parameter	Reference and Explanation	Equations	Value
	Chemical/Physical Properties (Continued)		
Kd_{bs} (cm^3/g)	Kd_{bs} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.04 in bottom sediment. Measured organic carbon in bottom sediment, specific to site conditions, should be used to calculate Kd_{bs}, because the value varies depending on the fraction of organic carbon in bottom sediment. Recommended Kd_{bs} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-25	4.39E+05
ksg (year)$^{-1}$	*Ksg* value was assumed to be 0 due to a lack of data.	B-1-2; B-2-2; B-3-2; B-4-2	0.0
Fv (unitless)	*Fv* value was calculated by using equations cited in Junge (1977) and Bidleman (1988). Recommended value of Fv was calculated by using T_m and *Vp* values that are provided in this table. *Vp* value for this compound was converted to a liquid phase value before being used in the calculations.	B-1-1; B-2-1; B-2-7; B-2-8; B-3-1; B-3-7; B-3-8; B-4-1; B-4-8; B-4-9; B-4-12; B-5-1	4.86E-02
	Biotransfer Factors for Plants		
RCF $(\frac{\square g/g\ DW\ plant}{\square g/mL\ soil\ water})$	*RCF* value was calculated by using the correlation equation with K_{ow} that is cited in Briggs (1982). Recommended value was calculated by using the K_{ow} value that is provided in this table. The value was then converted to a dry weight basis by using a moisture content of 87 percent.	B-2-10	8.88E+04
$Br_{rootveg}$ $(\frac{\square g/g\ DW\ plant}{\square g/g\ soil})$	$Br_{rootveg}$ value was calculated by dividing the *RCF* value with the Kd_s value provided in this table.	B-2-10	8.10E-01
Br_{ag} $(\frac{\square g/g\ DW\ plant}{\square g/g\ soil})$	Br_{ag} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-2-9	2.50E-03
Br_{forage} $(\frac{\square g/g\ DW\ plant}{\square g/g\ soil})$	Br_{forage} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-3-9	2.50E-03
Bv_{ag} $(\frac{\square g/g\ DW\ plant}{\square g/g\ air})$	Bv_{ag} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-2-8	1.50E+05
Bv_{forage} $(\frac{\square g/g\ DW\ plant}{\square g/g\ air})$	Bv_{forage} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-3-8	1.50E+05

TABLE A-3-116

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,4,7,8-HEXACHLORODIBENZO(P)FURAN (70648-26-9)

Parameter	Reference and Explanation	Equations	Value
Biotransfer Factors for Animals			
Ba_{milk} (day/kg FW)	U.S. EPA (1995a)	B-3-11	7.00E-03
Ba_{beef} (day/kg FW)	Ba_{beef} value was calculated by increasing Ba_{milk} values by a factor of 5.43, as discussed in Section A3.3.14.	B-3-10	3.80E-02
Ba_{pork} (day/kg FW)	Ba_{pork} value was calculated by increasing Ba_{milk} values by a factor of 6.57, as discussed in Section A3.3.15.	B-3-12	4.60E-02
Ba_{egg} (L/kg FW tissue)	Ba_{egg} value was calculated by multiplying the BCF value for chicken eggs by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for eggs was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-13	4.51E-02
$Ba_{chicken}$ (L/kg FW tissue)	$Ba_{chicken}$ value was calculated by multiplying the BCF value for chicken by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for chicken was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-14	3.48E-02
BCF_{fish} (L/kg FW tissue)	–	B-4-26	NA
BAF_{fish} (L/kg FW)	–	B-4-27	NA
$BSAF_{fish}$ (unitless, lipid based)	U.S. EPA (1994a)	B-4-28	4.00E-02
Other Parameters			
TEF (unitless)	U.S. EPA (1994a)	–	0.10
Health Benchmarks			
Oral CSF $(mg/kg/day)^{-1}$	–	C-1-8	ND
Inhalation CSF $(mg/kg/day)^{-1}$	–	C-1-7	ND
RfD (mg/kg/day)	–	C-2-3	ND
Inhalation URF $(\mu g/m^3)^{-1}$	–	C-2-1	ND
RfC (mg/m^3)	–	C-2-2	ND

Note:

NA = Not Applicable; ND = No Data Available

All parameters are defined in list of FATE AND TRANSPORT PARAMETERS on page A-3-iii.

TABLE A-3-117

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,6,7,8-HEXACHLORODIBENZO(P)FURAN (57117-44-9)

Parameter	Reference and Explanation	Equations	Value
Chemical/Physical Properties			
MW (g/mole)	U.S. EPA (1994a)	–	374.87
T_m (K)	U.S. EPA (1994a)	–	505.1
Vp (atm)	U.S. EPA (1994a)	–	2.89E-13 at 25°C (solid)
S (mg/L)	U.S. EPA (1994a)	–	1.77E-05
H (atm·m^3/mol)	U.S. EPA (1994a)	B-1-6; B-2-6; B-2-8; B-3-6; B-4-6; B-4-12; B-4-19	6.10E-06
D_a (cm^2/s)	D_a value was calculated by using Equation A-3-2. Recommended value was calculated by using the MW and D_a values that are provided in the tables in Appendix A-3 for 2,3,7,8-TCDF.	B-1-6; B-2-6; B-3-6; B-4-6; B-4-21	1.62E-02
D_w (cm^2/s)	D_w value was calculated using the equation cited in U.S. EPA (1996a).	B-4-20	4.23E-06
K_{ow} (unitless)	Homologue groupaverage value obtained from U.S. EPA (1992d)	–	1.78E+07
K_{oc} (mL/g)	K_{oc} value was calculated by using the correlation equation with K_{ow} for dioxins and furans that is cited in U.S. EPA (1994a) and U.S. EPA (1994c). Recommended value was calculated by using the recommended K_{ow} value that is provided in this table.	–	1.10E+07
Kd_s (cm^3/g)	Kd_s value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.01 in soil. Measured organic carbon in soil, specific to site conditions, should be used to calculate Kd_s, because the value varies, depending on the fraction of organic carbon in soil. Recommended Kd_s value was calculated by using the K_{oc} value that is provided in this table.	B-1-3; B-1-4; B-1-5; B-1-6; B-2-3; B-2-4; B-2-5; B-2-6; B-2-10; B-3-3; B-3-4; B-3-5; B-3-6; B-4-3; B-4-4; B-4-5; B-4-6; B-4-10; B-4-11	1.10E+05
Kd_{sw} (L/Kg)	Kd_{sw} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.075 in suspended sediment. Measured organic carbon in suspended sediment, specific to site conditions, should be used to calculate Kd_{sw}, because the value varies, depending on the fraction of organic carbon in suspended sediment. Recommended Kd_{sw} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-18; B-4-24	8.22E+05

TABLE A-3-117

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,6,7,8-HEXACHLORODIBENZO(P)FURAN (57117-44-9)

Parameter	Reference and Explanation	Equations	Value
	Chemical/Physical Properties (Continued)		
Kd_{bs} (cm^3/g)	Kd_{bs} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.04 in bottom sediment. Measured organic carbon in bottom sediment, specific to site conditions, should be used to calculate Kd_{bs}, because the value varies depending on the fraction of organic carbon in bottom sediment. Recommended Kd_{bs} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-25	4.39E+05
ksg (year)$^{-1}$	Ksg value was assumed to be 0 due to a lack of data.	B-1-1; B-1-2; B-2-1; B-2-2; B-3-1; B-3-2; B-4-1; B-4-2	0.0
Fv (unitless)	Fv value was calculated by using equations cited in Junge (1977) and Bidleman (1988). Recommended value of Fv was calculated by using T_m and Vp values that are provided in this table. Vp value for this compound was converted to a liquid phase value before being used in the calculations.	B-1-1; B-2-1; B-2-7; B-2-8; B-3-1; B-3-7; B-3-8; B-4-1; B-4-8; B-4-9; B-4-12; B-5-1	5.15E-02
	Biotransfer Factors for Plants		
RCF $\left(\frac{\Box g/g\ DW\ plant}{\Box g/mL\ soil\ water}\right)$	RCF value was calculated by using the correlation equation with K_{ow} that is cited in Briggs (1982). Recommended value was calculated by using the K_{ow} value that is provided in this table. The value was then converted to a dry weight basis by using a moisture content of 87 percent.	B-2-10	8.88E+04
$Br_{rootveg}$ $\left(\frac{\Box g/g\ DW\ plant}{\Box g/g\ soil}\right)$	$Br_{rootveg}$ value was calculated by dividing the RCF value with the Kd_s value provided in this table.	B-2-10	8.10E-01
Br_{ag} $\left(\frac{\Box g/g\ DW\ plant}{\Box g/g\ soil}\right)$	Br_{ag} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-2-9	2.50E-03
Br_{forage} $\left(\frac{\Box g/g\ DW\ plant}{\Box g/g\ soil}\right)$	Br_{forage} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-3-9	2.50E-03
Bv_{ag} $\left(\frac{\Box g/g\ DW\ plant}{\Box g/g\ air}\right)$	Bv_{ag} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-2-8	1.50E+05

TABLE A-3-117

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,6,7,8-HEXACHLORODIBENZO(P)FURAN (57117-44-9)

(Page 3 of 3)

Parameter	Reference and Explanation	Equations	Value
	Biotransfer Factors for Plants (Continued)		
Bv_{forage} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air}\right)$	Bv_{forage} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-3-8	1.50E+05
	Biotransfer Factors for Animals		
Ba_{milk} (day/kg FW)	U.S. EPA (1995a)	B-3-11	6.00E-03
Ba_{beef} (day/kg FW)	Ba_{beef} value was calculated by increasing Ba_{milk} values by a factor of 5.43, as discussed in Section A3.3.14.	B-3-10	3.26E-02
Ba_{pork} (day/kg FW)	Ba_{pork} value was calculated by increasing Ba_{milk} values by a factor of 6.57, as discussed in Section A3.3.15.	B-3-12	3.94E-02
Ba_{egg} (L/kg FW tissue)	Ba_{egg} value was calculated by multiplying the BCF value for chicken eggs by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for eggs was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-13	4.53E-02
$Ba_{chicken}$ (L/kg FW tissue)	$Ba_{chicken}$ value was calculated by multiplying the BCF value for chicken by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for chicken was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-14	3.56E-02
BCF_{fish} (L/kg FW tissue)	–	B-4-26	NA
BAF_{fish} (L/kg FW)	–	B-4-27	NA
$BSAF_{fish}$ (unitless, lipid based)	U.S. EPA (1994a)	B-4-28	4.00E-02
	Other Parameters		
TEF (unitless)	U.S. EPA (1994a)	–	0.10
	Health Benchmarks		
Oral CSF $(mg/kg/day)^{-1}$	–	C-1-8	ND
Inhalation CSF $(mg/kg/day)^{-1}$	–	C-1-7	ND
RfD (mg/kg/day)	–	C-2-3	ND
Inhalation URF $(\mu g/m^3)^{-1}$	–	C-2-1	ND
RfC (mg/m^3)	–	C-2-2	ND

Note:
NA = Not Applicable; ND = No Data Available
All parameters are defined in list of FATE AND TRANSPORT PARAMETERS on page A-3-iii.

TABLE A-3-118

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,7,8,9-HEXACHLORODIBENZO(P)FURAN (72918-21-9)

Parameter	Reference and Explanation	Equations	Value
Chemical/Physical Properties			
MW (g/mole)	U.S. EPA (1994a)	–	374.87
T_m (K)	U.S. EPA (1994a)	–	519.1
Vp (atm)	U.S. EPA (1994a)	–	2.37E-13 at 25°C (solid)
S (mg/L)	Homologue group average value obtained from U.S. EPA (1994a).	–	1.30E-05
H (atm·m³/mol)	U.S. EPA (1994a)	B-1-6; B-2-6; B-2-8; B-3-6; B-4-6; B-4-12; B-4-19	1.00E-05
D_a (cm^2/s)	D_a value was calculated by using Equation A-3-2. Recommended value was calculated by using the *MW* and D_a values that are provided in the tables in Appendix A-3 for 2,3,7,8-TCDF.	B-1-6; B-2-6; B-3-6; B-4-6; B-4-21	1.62E-02
D_w (cm^2/s)	D_w value was calculated using the equation cited in U.S. EPA (1996a).	B-4-20	4.23E-06
K_{ow} (unitless)	Homologue group average value obtained from U.S. EPA (1992d).	–	1.78E+07
K_{oc} (mL/g)	K_{oc} value was calculated by using the correlation equation with K_{ow} for dioxins and furans that is cited in U.S. EPA (1994a) and U.S. EPA (1994c). Recommended value was calculated by using the recommended K_{ow} value that is provided in this table.	–	1.10E+07
Kd_s (cm^3/g)	Kd_s value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.01 in soil. Measured organic carbon in soil, specific to site conditions, should be used to calculate Kd_s, because the value varies, depending on the fraction of organic carbon in soil. Recommended Kd_s value was calculated by using the K_{oc} value that is provided in this table.	B-1-3; B-1-4; B-1-5; B-1-6; B-2-3; B-2-4; B-2-5; B-2-6; B-2-10; B-3-3; B-3-4; B-3-5; B-3-6; B-4-3; B-4-4; B-4-5; B-4-6; B-4-10; B-4-11	1.10E+05
Kd_{sw} (L/Kg)	Kd_{sw} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.075 in suspended sediment. Measured organic carbon in suspended sediment, specific to site conditions, should be used to calculate Kd_{sw}, because the value varies, depending on the fraction of organic carbon in suspended sediment. Recommended Kd_{sw} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-18; B-4-24	8.22E+05

TABLE A-3-118

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,7,8,9-HEXACHLORODIBENZO(P)FURAN (72918-21-9)

Parameter	Reference and Explanation	Equations	Value
Chemical/Physical Properties (Continued)			
Kd_{bs} (cm^3/g)	Kd_{bs} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.04 in bottom sediment. Measured organic carbon in bottom sediment, specific to site conditions, should be used to calculate Kd_{bs}, because the value varies depending on the fraction of organic carbon in bottom sediment. Recommended Kd_{bs} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-25	4.39E+05
ksg $(year)^{-1}$	Ksg value was assumed to be 0 due to a lack of data.	B-1-2; B-2-2; B-3-2; B-4-2	0.0
Fv (unitless)	Fv value was calculated by using equations cited in Junge (1977) and Bidleman (1988). Recommended value of Fv was calculated by using T_m and Vp values that are provided in this table. Vp value for this compound was converted to a liquid phase value before being used in the calculations.	B-1-1; B-2-1; B-2-7; B-2-8; B-3-1; B-3-7; B-3-8; B-4-1; B-4-8; B-4-9; B-4-12; B-5-1	5.76E-0
Biotransfer Factors for Plants			
RCF $\left(\frac{\mu g/g\ DW\ plant}{\mu g/mL\ soil\ water}\right)$	RCF value was calculated by using the correlation equation with K_{ow} that is cited in Briggs (1982). Recommended value was calculated by using the K_{ow} value that is provided in this table. The value was then converted to a dry weight basis by using a moisture content of 87 percent.	B-2-10	8.88E+04
$Br_{rootveg}$ $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	$Br_{rootveg}$ value was calculated by dividing the RCF value with the Kd_s value provided in this table.	B-2-10	8.10E-01
Br_{ag} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	Br_{ag} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-2-9	2.50E-03
Br_{forage} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	Br_{forage} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-3-9	2.50E-03
Bv_{ag} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air}\right)$	Bv_{ag} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-2-8	1.50E+05

TABLE A-3-118

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,7,8,9-HEXACHLORODIBENZO(P)FURAN (72918-21-9)

Parameter	Reference and Explanation	Equations	Value
Biotranfer Factors for Plants (Continued)			
Bv_{forage} $\left(\frac{\Box g/g\ DW\ plant}{\Box g/g\ air}\right)$	Bv_{forage} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-3-8	1.50E+05
Biotransfer Factors for Animals			
Ba_{milk} (day/kg FW)	U.S. EPA (1995a)	B-3-11	6.00E-03
Ba_{beef} (day/kg FW)	Ba_{beef} value was calculated by increasing Ba_{milk} values by a factor of 5.43, as discussed in Section A3.3.14.	B-3-10	3.26E-02
Ba_{pork} (day/kg FW)	Ba_{pork} value was calculated by increasing Ba_{milk} values by a factor of 6.57, as discussed in Section A3.3.15.	B-3-12	3.94E-02
Ba_{egg} (L/kg FW tissue)	Ba_{egg} value was calculated by multiplying the BCF value for chicken eggs by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for eggs was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-13	ND
$Ba_{chicken}$ (L/kg FW tissue)	$Ba_{chicken}$ value was calculated by multiplying the BCF value for chicken by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for chicken was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-14	ND
BCF_{fish} (L/kg FW tissue)	–	B-4-26	NA
BAF_{fish} (L/kg FW)	–	B-4-27	NA
$BSAF_{fish}$ (unitless, lipid based)	U.S. EPA (1994a)	B-4-28	4.00E-02
Other Parameters			
TEF (unitless)	U.S. EPA (1994a)	–	0.10
Health Benchmarks			
Oral CSF $(mg/kg/day)^{-1}$	–	C-1-8	ND
Inhalation CSF $(mg/kg/day)^{-1}$	–	C-1-7	ND
RfD (mg/kg/day)	–	C-2-3	ND
Inhalation URF $(\Box g/m^3)^{-1}$	–	C-2-1	ND
RfC (mg/m^3)	–	C-2-2	ND

TABLE A-3-119

CHEMICAL-SPECIFIC INPUTS FOR 2,3,4,6,7,8-HEXACHLORODIBENZO(P)FURAN (60851-34-5)

Parameter	Reference and Explanation	Equations	Value
Chemical/Physical Properties			
MW (g/mole)	U.S. EPA (1994a)	–	374.87
T_m (K)	U.S. EPA (1994a)	–	512.1
Vp (atm)	U.S. EPA (1994a)	–	2.63E-13 at 25°C (solid)
S (mg/L)	Homologue group average value obtained from U.S. EPA (1994a).	–	1.30E-05
H (atm·m³/mol)	U.S. EPA (1994a)	B-1-6; B-2-6; B-2-8; B-3-6; B-4-6; B-4-12; B-4-19	1.00E-05
D_a (cm²/s)	D_a value was calculated by using Equation A-3-2. Recommended value was calculated by using the MW and D_a values that are provided in the tables in Appendix A-3 for 2,3,7,8-TCDF.	B-1-6; B-2-6; B-3-6; B-4-6; B-4-21	1.62E-02
D_w (cm²/s)	D_w value was calculated using the equation cited in U.S. EPA (1996a).	B-4-20	4.23E-06
K_{ow} (unitless)	Homologue group average value obtained from U.S. EPA (1992d).	–	1.78E+07
K_{oc} (mL/g)	K_{oc} value was calculated by using the correlation equation with K_{ow} for dioxins and furans that is cited in U.S. EPA (1994a) and U.S. EPA (1994c). Recommended value was calculated by using the recommended K_{ow} value that is provided in this table.	–	1.10E+07
Kd_s (cm³/g)	Kd_s value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.01 in soil. Measured organic carbon in soil, specific to site conditions, should be used to calculate Kd_s, because the value varies, depending on the fraction of organic carbon in soil. Recommended Kd_s value was calculated by using the K_{oc} value that is provided in this table.	B-1-3; B-1-4; B-1-5; B-1-6; B-2-3; B-2-4; B-2-5; B-2-6; B-2-10; B-3-3; B-3-4; B-3-5; B-3-6; B-4-3; B-4-4; B-4-5; B-4-6; B-4-10; B-4-11	1.10E+05
Kd_{sw} (L/Kg)	Kd_{sw} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.075 in suspended sediment. Measured organic carbon in suspended sediment, specific to site conditions, should be used to calculate Kd_{sw}, because the value varies, depending on the fraction of organic carbon in suspended sediment. Recommended Kd_{sw} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-18; B-4-24	8.22E+05

TABLE A-3-119

CHEMICAL-SPECIFIC INPUTS FOR 2,3,4,6,7,8-HEXACHLORODIBENZO(P)FURAN (60851-34-5)

Parameter	Reference and Explanation	Equations	Value
Chemical/Physical Properties (Continued)			
Kd_{bs} (cm^3/g)	Kd_{bs} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.04 in bottom sediment. Measured organic carbon in bottom sediment, specific to site conditions, should be used to calculate Kd_{bs}, because the value varies depending on the fraction of organic carbon in bottom sediment. Recommended Kd_{bs} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-25	4.39E+05
ksg $(year)^{-1}$	Ksg value was assumed to be 0 due to a lack of data.	B-1-1; B-1-2; B-2-1; B-2-2; B-3-1; B-3-2; B-4-1; B-4-2	0.0
Fv (unitless)	Fv value was calculated by using equations cited in Junge (1977) and Bidleman (1988). Recommended value of Fv was calculated by using T_m and Vp values that are provided in this table. Vp value for this compound was converted to a liquid phase value before being used in the calculations.	B-1-1; B-2-1; B-2-7; B-2-8; B-3-1; B-3-7; B-3-8; B-4-1; B-4-8; B-4-9; B-4-12; B-5-1	5.47E-02
Biotransfer Factors for Plants			
RCF $(\frac{\mu g/g\ DW\ plant}{\mu g/mL\ soil\ water})$	RCF value was calculated by using the correlation equation with K_{ow} that is cited in Briggs (1982). Recommended value was calculated by using the K_{ow} value that is provided in this table. The value was then converted to a dry weight basis by using a moisture content of 87 percent.	B-2-10	8.88E+04
$Br_{rootveg}$ $(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil})$	$Br_{rootveg}$ value was calculated by dividing the RCF value with the Kd_s value provided in this table.	B-2-10	8.10E-01
Br_{ag} $(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil})$	Br_{ag} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-2-9	2.50E-03
Br_{forage} $(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil})$	Br_{forage} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-3-9	2.50E-03
Bv_{ag} $(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air})$	Bv_{ag} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-2-8	1.50E+05

TABLE A-3-119

CHEMICAL-SPECIFIC INPUTS FOR 2,3,4,6,7,8-HEXACHLORODIBENZO(P)FURAN (60851-34-5)

Parameter	Reference and Explanation	Equations	Value
Biotransfer Factors for Plants (Continued)			
Bv_{forage} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air}\right)$	Bv_{forage} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-3-8	1.50E+05
Biotransfer Factors for Animals			
Ba_{milk} (day/kg FW)	U.S. EPA (1995a)	B-3-11	5.00E-03
Ba_{beef} (day/kg FW)	Ba_{beef} value was calculated by increasing Ba_{milk} values by a factor of 5.43, as discussed in Section A3.3.14.	B-3-10	2.71E-02
Ba_{pork} (day/kg FW)	Ba_{pork} value was calculated by increasing Ba_{milk} values by a factor of 6.57, as discussed in Section A3.3.15.	B-3-12	3.29E-02
Ba_{egg} (L/kg FW tissue)	Ba_{egg} value was calculated by multiplying the BCF value for chicken eggs by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for eggs was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-13	2.11E-02
$Ba_{chicken}$ (L/kg FW tissue)	$Ba_{chicken}$ value was calculated by multiplying the BCF value for chicken by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for chicken was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-14	1.74E-02
BCF_{fish} (L/kg FW tissue)	–	B-4-26	NA
BAF_{fish} (L/kg FW)	–	B-4-27	NA
$BSAF_{fish}$ (unitless, lipid based)	U.S. EPA (1994a)	B-4-28	4.00E-02
Other Parameters			
TEF (unitless)	U.S. EPA (1994a)	–	0.10
Health Benchmarks			
Oral CSF $(mg/kg/day)^{-1}$	–	C-1-8	ND
Inhalation CSF $(mg/kg/day)^{-1}$	–	C-1-7	ND
RfD (mg/kg/day)	–	C-2-3	ND
Inhalation URF $(\mu g/m^3)^{-1}$	–	C-2-1	ND
RfC (mg/m^3)	–	C-2-2	ND

TABLE A-3-119

CHEMICAL-SPECIFIC INPUTS FOR 2,3,4,6,7,8-HEXACHLORODIBENZO(P)FURAN (60851-34-5)

Note:

NA = Not Applicable; ND = No Data Available

All parameters are defined in list of FATE AND TRANSPORT PARAMETERS on page A-3-iii.

TABLE A-3-155

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,4,6,7,8,9-OCTACHLORODIBENZO(P)DIOXIN (3268-87-9)

Parameter	Reference and Explanation	Equations	Value
Chemical/Physical Properties			
MW (g/mole)	U.S. EPA (1994a)	–	460.76
T_m (K)	U.S. EPA (1994a)	–	598.1
Vp (atm)	U.S. EPA (1994a)	–	8.61E-11 at 25°C (solid)
S (mg/L)	U.S. EPA (1994a)	–	4.00E-07
H (atm·m^3/mol)	U.S. EPA (1994a)	B-1-6; B-2-6; B-2-8; B-3-6; B-4-6; B-4-12; B-4-19	7.00E-09
D_a (cm^2/s)	D_a value was obtained from CHEMDAT8 database (U.S. EPA 1994d).	B-1-6; B-2-6; B-3-6; B-4-6; B-4-21	1.06E-02
D_w (cm^2/s)	D_w value was calculated using the equation cited in U.S. EPA (1996a).	B-4-20	3.69E-07
K_{ow} (unitless)	U.S. EPA (1994a)	–	3.89E+07
K_{oc} (mL/g)	K_{oc} value was calculated by using the correlation equation with K_{ow} for dioxins and furans that is cited in U.S. EPA (1994a; 1994c). Recommended value was calculated by using the recommended K_{ow} value that is provided in this table.	–	2.40E+07
Kd_s (cm^3/g)	Kd_s value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.01 in soil. Measured organic carbon in soil, specific to site conditions, should be used to calculate Kd_s, because the value varies, depending on the fraction of organic carbon in soil. Recommended Kd_s value was calculated by using the K_{oc} value that is provided in this table.	B-1-3; B-1-4; B-1-5; B-1-6; B-2-3; B-2-4; B-2-5; B-2-6; B-2-10; B-3-3; B-3-4; B-3-5; B-3-6; B-4-3; B-4-4; B-4-5; B-4-6; B-4-10; B-4-11	2.40E+05
Kd_{sw} (L/Kg)	Kd_{sw} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.075 in suspended sediment. Measured organic carbon in suspended sediment, specific to site conditions, should be used to calculate Kd_{sw}, because the value varies, depending on the fraction of organic carbon in suspended sediment. Recommended Kd_{sw} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-18; B-4-24	1.80E+06

TABLE A-3-155

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,4,6,7,8,9-OCTACHLORODIBENZO(P)DIOXIN (3268-87-9)

Parameter	Reference and Explanation	Equations	Value
Kd_{bs} (cm^3/g)	Kd_{bs} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.04 in bottom sediment. Measured organic carbon in bottom sediment, specific to site conditions, should be used to calculate Kd_{bs}, because the value varies depending on the fraction of organic carbon in bottom sediment. Recommended Kd_{bs} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-25	9.60E+05
Chemical/Physical Properties (Continued)			
ksg $(year)^{-1}$	*ksg* value was calculated by using the chemical half-life in soil, as cited in Mackay, Shiu, and Ma (1992).	B-1-1; B-1-2; B-2-1; B-2-2; B-3-1; B-3-2; B-4-1; B-4-2	1.09E-01
Fv (unitless)	*Fv* value was calculated by using equations cited in Junge (1977) and Bidleman (1988). Recommended value of Fv was calculated by using T_m and *Vp* values that are provided in this table. *Vp* value for this compound was converted to a liquid-phase value before being used in the calculations.	B-1-1; B-2-1; B-2-7; B-2-8; B-3-1; B-3-7; B-3-8; B-4-1; B-4-8; B-4-9; B-4-12; B-5-1	9.93E-01
Biotransfer Factors for Plants			
RCF $(\frac{\mu g/g\ DW\ plant}{\mu g/mL\ soil\ water})$	*RCF* value was calculated by using the correlation equation with K_{ow} that is cited in Briggs (1982). Recommended value was calculated by using the K_{ow} value that is provided in this table. The value was then converted to a dry weight basis by using a moisture content of 87 percent.	B-2-10	1.62E+05
$Br_{root\ veg}$ $(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil})$	$Br_{root\ veg}$ value was calculated by dividing the *RCF* value with the Kd_s value provided in this table.	B-2-10	6.77E-01
Br_{ag} $(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil})$	Br_{ag} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-2-9	1.59E-03
Br_{forage} $(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil})$	Br_{forage} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-3-9	1.59E-03
Bv_{ag} $(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air})$	Bv_{ag} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-2-8	8.60E+06

TABLE A-3-155

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,4,6,7,8,9-OCTACHLORODIBENZO(P)DIOXIN (3268-87-9)

Parameter	Reference and Explanation	Equations	Value
Bv_{forage} $(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air})$	Bv_{forage} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-3-8	8.60E+06
Biotransfer Factors for Animals			
Ba_{milk} (day/kg FW)	U.S. EPA (1995a)	B-3-11	1.00E-03
Ba_{beef} (day/kg FW)	Ba_{beef} value was calculated by increasing Ba_{milk} values by a factor of 5.43, as discussed in Section A3.3.14.	B-3-10	5.43E-03
Biotransfer Factors for Animals (Continued)			
Ba_{pork} (day/kg FW)	Ba_{pork} value was calculated by increasing Ba_{milk} values by a factor of 6.57, as discussed in Section A3.3.15.	B-3-12	6.57E-03
Ba_{egg} (L/kg FW tissue)	Ba_{egg} value was calculated by multiplying the BCF value for chicken eggs by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for eggs was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-13	9.90E-03
$Ba_{chicken}$ (unitless, FW tissue)	$Ba_{chicken}$ value was calculated by multiplying the BCF value for chicken by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for chicken was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-14	1.10E-03
BCF_{fish} (L/kg FW tissue)	–	B-4-26	NA
BAF_{fish} (L/kg FW)	–	B-4-27	NA
$BSAF_{fish}$ (unitless, lipid based)	U.S. EPA (1994a)	B-4-28	1.00E-04
Other Parameters			
TEF (unitless)	U.S. EPA (1994a)	–	0.001
Health Benchmarks			
Oral CSF (mg/kg/day)$^{-1}$	–	C-1-8	ND
Inhalation CSF (mg/kg/day)$^{-1}$	–	C-1-7	ND
RfD (mg/kg/day)	–	C-2-3	ND
Inhalation URF (μg/m^3)$^{-1}$	–	C-2-1	ND
RfC (mg/m^3)	–	C-2-2	ND

Note:
NA = Not Applicable; ND = No Data Available
All parameters are defined in list of FATE AND TRANSPORT PARAMETERS on page A-3-iii.

TABLE A-3-156

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,4,6,7,8,9-OCTACHLORODIBENZO(P)FURAN (39001-02-0)

Parameter	Reference and Explanation	Equations	Value
Chemical/Physical Properties			
MW (g/mole)	U.S. EPA (1994a)	–	444.76
T_m (K)	U.S. EPA (1994a)	–	531.1
Vp (atm)	U.S. EPA (1994a)	–	4.93E-15 at 25°C (solid)
S (mg/L)	U.S. EPA (1994a)	–	1.20E-06
H (atm⋅m^3/mol)	U.S.EPA (1994a)	B-1-6; B-2-6; B-2-8; B-3-6; B-4-6; B-4-12; B-4-19	1.90E-06
D_a (cm^2/s)	D_a value was obtained from CHEMDAT8 database (U.S. EPA 1994d).	B-1-6; B-2-6; B-3-6; B-4-6; B-4-21	1.48E-02
D_w (cm^2/s)	D_w value was calculated using the equation cited in U.S. EPA (1996a).	B-4-20	3.78E-06
K_{ow} (unitless)	U.S. EPA (1994a)	–	6.03E+08
K_{oc} (mL/g)	K_{oc} value was calculated by using the correlation equation with K_{ow} for dioxins and furans that is cited in U.S. EPA (1994a) and U.S. EPA (1994c). Recommended value was calculated by using the recommended K_{ow} value that is provided in this table.	–	3.72E+08
Kd_s (cm^3/g)	Kd_s value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.01 in soil. Measured organic carbon in soil, specific to site conditions, should be used to calculate Kd_s, because the value varies, depending on the fraction of organic carbon in soil. Recommended Kd_s value was calculated by using the K_{oc} value that is provided in this table.	B-1-3; B-1-4; B-1-5; B-1-6; B-2-3; B-2-4; B-2-5; B-2-6; B-2-10; B-3-3; B-3-4; B-3-5; B-3-6; B-4-3; B-4-4; B-4-5; B-4-6; B-4-10; B-4-11	3.72E+06
Kd_{sw} (L/Kg)	Kd_{sw} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.075 in suspended sediment. Measured organic carbon in suspended sediment, specific to site conditions, should be used to calculate Kd_{sw}, because the value varies, depending on the fraction of organic carbon in suspended sediment. Recommended Kd_{sw} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-18; B-4-24	2.79E+07

TABLE A-3-156

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,4,6,7,8,9-OCTACHLORODIBENZO(P)FURAN (39001-02-0)

Parameter	Reference and Explanation	Equations	Value
Kd_{bs} (cm^3/g)	Kd_{bs} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.04 in bottom sediment. Measured organic carbon in bottom sediment, specific to site conditions, should be used to calculate Kd_{bs}, because the value varies depending on the fraction of organic carbon in bottom sediment. Recommended Kd_{bs} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-25	1.49E+07
ksg $(year)^{-1}$	ksg value was calculated by using the chemical half-life in soil, as cited in Mackay, Shiu, and Ma (1992).	B-1-1; B-1-2; B-2-1; B-2-2; B-3-1; B-3-2; B-4-1; B-4-2	1.10E-01
Fv (unitless)	Fv value was calculated by using equations cited in Junge (1977) and Bidleman (1988). Recommended value of Fv was calculated by using T_m and Vp values that are provided in this table. Vp value for this compound was converted to a liquid phase value before being used in the calculations.	B-1-1; B-2-1; B-2-7; B-2-8; B-3-1; B-3-7; B-3-8; B-4-1; B-4-8; B-4-9; B-4-12; B-5-1	1.67E-03
Biotransfer Factors for Plants			
RCF $\left(\frac{\mu g/g\ DW\ plant}{\mu g/mL\ soil\ water}\right)$	RCF value was calculated by using the correlation equation with K_{ow} that is cited in Briggs (1982). Recommended value was calculated by using the K_{ow} value that is provided in this table. The value was then converted to a dry weight basis by using a moisture content of 87 percent.	B-2-10	1.34E+06
$Br_{rootveg}$ $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	$Br_{rootveg}$ value was calculated by dividing the RCF value with the Kd_s value provided in this table.	B-2-10	3.60E-01
Br_{ag} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	Br_{ag} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-2-9	3.26E-04
Br_{forage} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	Br_{forage} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-3-9	3.26E-04
Bv_{ag} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air}\right)$	Bv_{ag} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-2-8	1.30E+06

TABLE A-3-156

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,4,6,7,8,9-OCTACHLORODIBENZO(P)FURAN (39001-02-0)

Parameter	Reference and Explanation	Equations	Value
Biotransfer Factors for Plants (Continued)			
Bv_{forage} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air}\right)$	Bv_{forage} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-3-8	1.30E+06
Biotransfer Factors for Animals			
Ba_{milk} (day/kg FW)	U.S. EPA (1995a)	B-3-11	1.00E-03
Ba_{beef} (day/kg FW)	Ba_{beef} value was calculated by increasing Ba_{milk} values by a factor of 5.43, as discussed in Section A3.3.14.	B-3-10	5.43E-03
Ba_{pork} (day/kg FW)	Ba_{pork} value was calculated by increasing Ba_{milk} values by a factor of 6.57, as discussed in Section A3.3.15.	B-3-12	6.57E-03
Ba_{egg} (L/kg FW tissue)	Ba_{egg} value was calculated by multiplying the BCF value for chicken eggs by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for eggs was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-13	7.92E-03
$Ba_{chicken}$ (L/kg FW tissue)	$Ba_{chicken}$ value was calculated by multiplying the BCF value for chicken by a chicken soil consumption rate of 0.02 kg (DW)/day (see Appendix A-3). BCF value for chicken was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-14	4.40E-04
BCF_{fish} (L/kg FW tissue)	–	B-4-26	NA
BAF_{fish} (L/kg FW)	–	B-4-27	NA
$BSAF_{fish}$ (unitless, lipid based)	U.S. EPA (1994a)	B-4-28	1.00E-04
Other Parameters			
TEF (unitless)	U.S. EPA (1994a)	–	0.001
Health Benchmarks			
Oral CSF (mg/kg/day)$^{-1}$	–	C-1-8	ND
Inhalation CSF (mg/kg/day)$^{-1}$	–	C-1-7	ND
RfD (mg/kg/day)	–	C-2-3	ND
Inhalation URF ($\mu g/m^3$)$^{-1}$	–	C-2-1	ND
RfC (mg/m^3)	–	C-2-2	ND

Note:
NA = Not Applicable; ND = No Data Available
All parameters are defined in list of FATE AND TRANSPORT PARAMETERS on page A-3-iii.

TABLE A-3-194

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,7,8-PENTACHLORODIBENZO(P)DIOXIN (40321-76-4)

Parameter	Reference and Explanation	Equations	Value
Chemical/Physical Properties			
MW (g/mole)	U.S. EPA (1994a)	–	356.42
T_m (K)	U.S. EPA (1994a)	–	513.1
Vp (atm)	U.S. EPA (1994a)	–	1.25E-12 at 25°C (solid)
S (mg/L)	Homologue group average value obtained from U.S. EPA (1994a).	–	1.20E-04
H (atm-m³/mol)	U.S. EPA (1994a)	B-1-6; B-2-6; B-2-8; B-3-6; B-4-6; B-4-12; B-4-19	2.60E-06
D_a (cm²/s)	D_a value was obtained from CHEMDAT8 database (U.S. EPA 1994d).	B-1-6; B-2-6; B-3-6; B-4-6; B-4-21	1.21E-02
D_w (cm²/s)	D_w value was calculated using the equation cited in U.S. EPA (1996a).	B-4-20	4.38E-06
K_{ow} (unitless)	U.S. EPA (1992d)	–	4.37E+06
K_{oc} (mL/g)	K_{oc} value was calculated by using the correlation equation with K_{ow} for dioxins and furans that is cited in U.S. EPA (1994a) and U.S. EPA (1994c). Recommended value was calculated by using the recommended K_{ow} value that is provided in this table.	–	2.69E+06
Kd_s (cm³/g)	Kd_s value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.01 in soil. Measured organic carbon in soil, specific to site conditions, should be used to calculate Kd_s, because the value varies, depending on the fraction of organic carbon in soil. Recommended Kd_s value was calculated by using the K_{oc} value that is provided in this table.	B-1-3; B-1-4; B-1-5; B-1-6; B-2-3; B-2-4; B-2-5; B-2-6; B-2-10; B-3-3; B-3-4; B-3-5; B-3-6; B-4-3; B-4-4; B-4-5; B-4-6; B-4-10; B-4-11	2.69E+04
Kd_{sw} (L/Kg)	Kd_{sw} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.075 in suspended sediment. Measured organic carbon in suspended sediment, specific to site conditions, should be used to calculate Kd_{sw}, because the value varies, depending on the fraction of organic carbon in suspended sediment. Recommended Kd_{sw} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-18; B-4-24	2.02E+05

TABLE A-3-194

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,7,8-PENTACHLORODIBENZO(P)DIOXIN (40321-76-4)

(Page 2 of 3)

Parameter	Reference and Explanation	Equations	Value
	Chemical/Physical Properties (Continued)		
Kd_{bs} (cm^3/g)	Kd_{bs} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.04 in bottom sediment. Measured organic carbon in bottom sediment, specific to site conditions, should be used to calculate Kd_{bs}, because the value varies depending on the fraction of organic carbon in bottom sediment. Recommended Kd_{bs} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-25	1.08E+05
ksg $(year)^{-1}$	Ksg value was assumed to be 0 due to a lack of data.	B-1-1; B-1-2; B-2-1; B-2-2; B-3-1; B-3-2; B-4-1; B-4-2	0.0
Fv (unitless)	Fv value was calculated by using equations cited in Junge (1977) and Bidleman (1988). Recommended value of Fv was calculated by using T_m and Vp values that are provided in this table. Vp value for this compound was converted to a liquid-phase value before being used in the calculations.	B-1-1; B-2-1; B-2-7; B-2-8; B-3-1; B-3-7; B-3-8; B-4-1; B-4-8; B-4-9; B-4-12; B-5-1	2.19E-01
	Biotransfer Factors for Plants		
RCF $\left(\frac{\mu g/g\ DW\ plant}{\mu g/mL\ soil\ water}\right)$	RCF value was calculated by using the correlation equation with K_{ow} that is cited in Briggs (1982). Recommended value was calculated by using the K_{ow} value that is provided in this table. The value was then converted to a dry weight basis by using a moisture content of 87 percent.	B-2-10	3.01E+04
$Br_{rootveg}$ $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	$Br_{rootveg}$ value was calculated by dividing the RCF value with the Kd_s value provided in this table.	B-2-10	1.12E+00
Br_{ag} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	Br_{ag} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-2-9	5.62E-03
Br_{forage} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	Br_{forage} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-3-9	5.62E-03
Bv_{ag} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air}\right)$	Bv_{ag} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-2-8	1.20E+05

TABLE A-3-194

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,7,8-PENTACHLORODIBENZO(P)DIOXIN (40321-76-4)

Parameter	Reference and Explanation	Equations	Value
Biotransfer Factors for Plants (Continued)			
Bv_{forage} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air}\right)$	Bv_{forage} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-3-8	1.20E+05
Biotransfer Factors for Animals			
Ba_{milk} (day/kg FW)	U.S. EPA (1995a)	B-3-11	1.00E-02
Ba_{beef} (day/kg FW)	Ba_{beef} value was calculated by increasing Ba_{milk} values by a factor of 5.43, as discussed in Section A3.3.14.	B-3-10	5.43E-02
Ba_{pork} (day/kg FW)	Ba_{pork} value was calculated by increasing Ba_{milk} values by a factor of 6.57, as discussed in Section A3.3.15.	B-3-12	6.57E-02
Ba_{egg} (L/kg FW tissue)	Ba_{egg} value was calculated by multiplying the BCF value for chicken eggs by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for eggs was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-13	4.71E-02
$Ba_{chicken}$ (L/kg FW tissue)	$Ba_{chicken}$ value was calculated by multiplying the BCF value for chicken by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for chicken was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-14	5.50E-02
BCF_{fish} (L/kg FW tissue)	–	B-4-26	NA
BAF_{fish} (L/kg FW)	–	B-4-27	NA
$BSAF_{fish}$ (unitless, lipid based)	U.S. EPA (1994a)	B-4-28	9.00E-02
Other Parameters			
TEF (unitless)	U.S. EPA (1994a)	–	0.50
Health Benchmarks			
Oral CSF $(mg/kg/day)^{-1}$	–	C-1-8	ND
Inhalation CSF $(mg/kg/day)^{-1}$	–	C-1-7	ND
RfD (mg/kg/day)	–	C-2-3	ND
Inhalation URF $(\mu g/m^3)^{-1}$	–	C-2-1	ND
RfC (mg/m^3)	–	C-2-2	ND

Note:
NA = Not Applicable; ND = No Data Available
All parameters are defined in list of FATE AND TRANSPORT PARAMETERS on page A-3-iii.

TABLE A-3-158

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,7,8-PENTACHLORODIBENZO(P)FURAN (57117-41-6)

Parameter	Reference and Explanation	Equations	Value
Chemical/Physical Properties			
MW (g/mole)	U.S. EPA (1994a)	–	340.42
T_m (K)	U.S. EPA (1994a)	–	498.1
Vp (atm)	U.S. EPA (1994a)	–	3.58E-12 at 25°C (solid)
S (mg/L)	Homologue group average value obtained from U.S. EPA (1994a).	–	2.40E-04
H (atm·m^3/mol)	U.S. EPA (1994a)	B-1-6; B-2-6; B-2-8; B-3-6; B-4-6; B-4-12; B-4-19	6.20E-06
D_a (cm^2/s)	D_a value was calculated by using Equation A-3-2. Recommended value was calculated by using the *MW* and D_a values that are provided in the tables in Appendix A-3 for 2,3,7,8-TCDF.	B-1-6; B-2-6; B-3-6; B-4-6; B-4-21	1.70E-02
D_w (cm^2/s)	D_w value was calculated using the equation cited in U.S. EPA (1996a).	B-4-20	4.51E-06
K_{ow} (unitless)	U.S. EPA (1992d)	–	6.17E+06
K_{oc} (mL/g)	K_{oc} value was calculated by using the correlation equation with K_{ow} for dioxins and furans that is cited in U.S. EPA (1994a) and U.S. EPA (1994c). Recommended value was calculated by using the recommended K_{ow} value that is provided in this table.	–	3.80E+06
Kd_s (cm^3/g)	Kd_s value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.01 in soil. Measured organic carbon in soil, specific to site conditions, should be used to calculate Kd_s, because the value varies, depending on the fraction of organic carbon in soil. Recommended Kd_s value was calculated by using the K_{oc} value that is provided in this table.	B-1-3; B-1-4; B-1-5; B-1-6; B-2-3; B-2-4; B-2-5; B-2-6; B-2-10; B-3-3; B-3-4; B-3-5; B-3-6; B-4-3; B-4-4; B-4-5; B-4-6; B-4-10; B-4-11	3.80E+04
Kd_{sw} (L/Kg)	Kd_{sw} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.075 in suspended sediment. Measured organic carbon in suspended sediment, specific to site conditions, should be used to calculate Kd_{sw}, because the value varies, depending on the fraction of organic carbon in suspended sediment. Recommended Kd_{sw} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-18; B-4-24	2.85E+05

TABLE A-3-158

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,7,8-PENTACHLORODIBENZO(P)FURAN (57117-41-6)

Parameter	Reference and Explanation	Equations	Value
Chemical/Physical Properties			
Kd_{bs} (cm^3/g)	Kd_{bs} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.04 in bottom sediment. Measured organic carbon in bottom sediment, specific to site conditions, should be used to calculate Kd_{bs}, because the value varies depending on the fraction of organic carbon in bottom sediment. Recommended Kd_{bs} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-25	1.52E+05
ksg $(year)^{-1}$	ksg value assumed to be the same as the ksg value calculated for 2,3,4,7,8-PentaCDF. ksg value was calculated by using the chemical half-life in soil, as cited in Mackay, Shiu, and Ma (1992).	B-1-1; B-1-2; B-2-1; B-2-2; B-3-1; B-3-2; B-4-1; B-4-2	3.57E-01
Fv (unitless)	Fv value was calculated by using equations cited in Junge (1977) and Bidleman (1988). Recommended value of Fv was calculated by using T_m and Vp values that are provided in this table. Vp value for this compound was converted to a liquid phase value before being used in the calculations.	B-1-1; B-2-1; B-2-7; B-2-8; B-3-1; B-3-7; B-3-8; B-4-1; B-4-8; B-4-9; B-4-12; B-5-1	3.64E-01
Biotransfer Factors for Plants			
RCF $(\frac{\Box g/g\ DW\ plant}{\Box g/mL\ soil\ water})$	RCF value was calculated by using the correlation equation with K_{ow} that is cited in Briggs (1982). Recommended value was calculated by using the K_{ow} value that is provided in this table. The value was then converted to a dry weight basis by using a moisture content of 87 percent.	B-2-10	3.93E+04
$Br_{rootveg}$ $(\frac{\Box g/g\ DW\ plant}{\Box g/g\ soil})$	$Br_{rootveg}$ value was calculated by dividing the RCF value with the Kd_s value provided in this table.	B-2-10	1.03E+00
Br_{ag} $(\frac{\Box g/g\ DW\ plant}{\Box g/g\ soil})$	Br_{ag} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-2-9	4.61E-03
Br_{forage} $(\frac{\Box g/g\ DW\ plant}{\Box g/g\ soil})$	Br_{forage} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-3-9	4.61E-03
Bv_{ag} $(\frac{\Box g/g\ DW\ plant}{\Box g/g\ air})$	Bv_{ag} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-2-8	4.60E+04

TABLE A-3-158

CHEMICAL-SPECIFIC INPUTS FOR 1,2,3,7,8-PENTACHLORODIBENZO(P)FURAN (57117-41-6)

Parameter	Reference and Explanation	Equations	Value
Biotransfer Factors for Plants (Continued)			
Bv_{forage} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air}\right)$	Bv_{forage} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-3-8	4.60E+04
Biotransfer Factors for Animals			
Ba_{milk} (day/kg FW)	U.S. EPA (1995a)	B-3-11	2.00E-03
Ba_{beef} (day/kg FW)	Ba_{beef} value was calculated by increasing Ba_{milk} values by a factor of 5.43, as discussed in Section A3.3.14.	B-3-10	1.09E-02
Ba_{pork} (day/kg FW)	Ba_{pork} value was calculated by increasing Ba_{milk} values by a factor of 6.57, as discussed in Section A3.3.15.	B-3-12	1.31E-02
Ba_{egg} (L/kg FW tissue)	Ba_{egg} value was calculated by multiplying the BCF value for chicken eggs by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for eggs was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-13	ND
$Ba_{chicken}$ (L/kg FW tissue)	$Ba_{chicken}$ value was calculated by multiplying the BCF value for chicken by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for chicken was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-14	ND
BCF_{fish} (L/kg FW tissue)	–	B-4-26	NA
BAF_{fish} (L/kg FW)	–	B-4-27	NA
$BSAF_{fish}$ (unitless, lipid based)	U.S. EPA (1994a)	B-4-28	9.00E-02
Other Parameters			
TEF (unitless)	U.S. EPA (1994a)	–	0.05
Health Benchmarks			
Oral CSF $(mg/kg/day)^{-1}$	–	C-1-8	ND
Inhalation CSF $(mg/kg/day)^{-1}$	–	C-1-7	ND
RfD (mg/kg/day)	–	C-2-3	ND
Inhalation URF $(\mu g/m^3)^{-1}$	–	C-2-1	ND
RfC (mg/m^3)	–	C-2-2	ND

Note:
NA = Not Applicable; ND = No Data Available
All parameters are defined in list of FATE AND TRANSPORT PARAMETERS on page A-3-iii.

TABLE A-3-159

CHEMICAL-SPECIFIC INPUTS FOR 2,3,4,7,8-PENTACHLORODIBENZO(P)FURAN (57117-31-4)

Parameter	Reference and Explanation	Equations	Value
Chemical/Physical Properties			
MW (g/mole)	U.S. EPA (1994a)	–	340.42
T_m (K)	U.S. EPA (1994a)	–	469.1
Vp (atm)	U.S. EPA (1994a)	–	4.33E-12 at 25°C (solid)
S (mg/L)	U.S. EPA (1994a)	–	2.36E-04
H (atm·m³/mol)	U.S. EPA (1994a)	B-1-6; B-2-6; B-2-8; B-3-6; B-4-6; B-4-12; B-4-19	6.20E-06
D_a (cm²/s)	D_a value was calculated by using Equation A-3-2. Recommended value was calculated by using the MW and D_a values that are provided in the tables in Appendix A-3 for 2,3,7,8-TCDF.	B-1-6; B-2-6; B-3-6; B-4-6; B-4-21	1.70E-02
D_w (cm²/s)	D_w value was calculated using the equation cited in U.S. EPA (1996a).	B-4-20	4.51E-06
K_{ow} (unitless)	U.S. EPA (1992d)	–	8.32E+06
K_{oc} (mL/g)	K_{oc} value was calculated by using the correlation equation with K_{ow} for dioxins and furans that is cited in U.S. EPA (1994a) and U.S. EPA (1994c). Recommended value was calculated by using the recommended K_{ow} value that is provided in this table.	–	5.13E+06
Kd_s (cm³/g)	Kd_s value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.01 in soil. Measured organic carbon in soil, specific to site conditions, should be used to calculate Kd_s, because the value varies, depending on the fraction of organic carbon in soil. Recommended Kd_s value was calculated by using the K_{oc} value that is provided in this table.	B-1-3; B-1-4; B-1-5; B-1-6; B-2-3; B-2-4; B-2-5; B-2-6; B-2-10; B-3-3; B-3-4; B-3-5; B-3-6; B-4-3; B-4-4; B-4-5; B-4-6; B-4-10; B-4-11	5.13E+04
Kd_{sw} (L/Kg)	Kd_{sw} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.075 in suspended sediment. Measured organic carbon in suspended sediment, specific to site conditions, should be used to calculate Kd_{sw}, because the value varies, depending on the fraction of organic carbon in suspended sediment. Recommended Kd_{sw} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-18; B-4-24	3.85E+05

TABLE A-3-159

CHEMICAL-SPECIFIC INPUTS FOR 2,3,4,7,8-PENTACHLORODIBENZO(P)FURAN (57117-31-4)

Parameter	Reference and Explanation	Equations	Value
Chemical/Physical Properties (Continued)			
Kd_{bs} (cm^3/g)	Kd_{bs} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.04 in bottom sediment. Measured organic carbon in bottom sediment, specific to site conditions, should be used to calculate Kd_{bs}, because the value varies depending on the fraction of organic carbon in bottom sediment. Recommended Kd_{bs} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-25	2.05E+05
ksg (year)$^{-1}$	ksg value was calculated by using the chemical half-life in soil, as cited in Mackay, Shiu, and Ma (1992).	B-1-1; B-1-2; B-2-1; B-2-2; B-3-1; B-3-2; B-4-1; B-4-2	3.57E-01
Fv (unitless)	Fv value was calculated by using equations cited in Junge (1977) and Bidleman (1988). Recommended value of Fv was calculated by using T_m and Vp values that are provided in this table. Vp value for this compound was converted to a liquid phase value before being used in the calculations.	B-1-1; B-2-1; B-2-7; B-2-8; B-3-1; B-3-7; B-3-8; B-4-1; B-4-8; B-4-9; B-4-12; B-5-1	2.63E-01
Biotransfer Factors for Plants			
RCF $\left(\frac{\mu g/g\ DW\ plant}{\mu g/mL\ soil\ water}\right)$	RCF value was calculated by using the correlation equation with K_{ow} that is cited in Briggs (1982). Recommended value was calculated by using the K_{ow} value that is provided in this table. The value was then converted to a dry weight basis by using a moisture content of 87 percent.	B-2-10	4.95E+04
$Br_{rootveg}$ $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	$Br_{rootveg}$ value was calculated by dividing the RCF value with the Kd_s value provided in this table.	B-2-10	9.65E-01
Br_{ag} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	Br_{ag} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-2-9	3.87E-03
Br_{forage} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	Br_{forage} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-3-9	3.87E-03
Bv_{ag} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air}\right)$	Bv_{ag} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-2-8	4.60E+04

TABLE A-3-159

CHEMICAL-SPECIFIC INPUTS FOR 2,3,4,7,8-PENTACHLORODIBENZO(P)FURAN (57117-31-4)

(Page 3 of 3)

Parameter	Reference and Explanation	Equations	Value
Biotransfer Factors for Plants (Continued)			
Bv_{forage} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air}\right)$	Bv_{forage} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-3-8	4.60E+04
Biotransfer Factors for Animals			
Ba_{milk} (day/kg FW)	U.S. EPA (1995a)	B-3-11	9.00E-03
Ba_{beef} (day/kg FW)	Ba_{beef} value was calculated by increasing Ba_{milk} values by a factor of 5.43, as discussed in Section A3.3.14.	B-3-10	4.89E-02
Ba_{pork} (day/kg FW)	Ba_{pork} value was calculated by increasing Ba_{milk} values by a factor of 6.57, as discussed in Section A3.3.15.	B-3-12	5.91E-02
Ba_{egg} (L/kg FW tissue)	Ba_{egg} value was calculated by multiplying the BCF value for chicken eggs by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for eggs was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-13	5.61E-02
$Ba_{chicken}$ (L/kg FW tissue)	$Ba_{chicken}$ value was calculated by multiplying the BCF value for chicken by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for chicken was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-14	7.32E-02
BCF_{fish} (L/kg FW tissue)	–	B-4-26	NA
BAF_{fish} (L/kg FW)	–	B-4-27	NA
$BSAF_{fish}$ (unitless, lipid based)	U.S. EPA (1994a)	B-4-28	9.00E-02
Other Parameters			
TEF (unitless)	U.S. EPA (1994a)	–	0.50
Health Benchmarks			
Oral CSF $(mg/kg/day)^{-1}$	–	C-1-8	ND
Inhalation CSF $(mg/kg/day)^{-1}$	–	C-1-7	ND
RfD (mg/kg/day)	–	C-2-3	ND
Inhalation URF $(\mu g/m^3)^{-1}$	–	C-2-1	ND
RfC (mg/m^3)	–	C-2-2	ND

Note:
NA = Not Applicable; ND = No Data Available
All parameters are defined in list of FATE AND TRANSPORT PARAMETERS on page A-3-iii.

TABLE A-3-176

CHEMICAL-SPECIFIC INPUTS FOR 2,3,7,8-TETRACHLORODIBENZO(P)DIOXIN (1746-01-6)

Parameter	Reference and Explanation	Equations	Value
Chemical/Physical Properties			
MW (g/mole)	U.S. EPA (1994a)	--	321.98
T_m (K)	U.S. EPA (1994a)	--	578.1
Vp (atm)	U.S. EPA (1994a)	--	4.45E-11 at 25°C (solid)
S (mg/L)	U.S. EPA (1994a)	--	4.83E-04
H (atm·m^3/mol)	U.S. EPA (1994a)	B-1-6; B-2-6; B-2-8; B-3-6; B-4-6; B-4-12; B-4-19	1.60E-05
D_a (cm^2/s)	D_a value was obtained from CHEMDAT8 database (U.S. EPA 1994d).	B-1-6; B-2-6; B-3-6; B-4-6; B-4-21	1.27E-02
D_w (cm^2/s)	D_w value was obtained from CHEMDAT8 database (U.S. EPA 1994d).	B-4-20	6.81E-06
K_{ow} (unitless)	U.S. EPA (1994a)	--	4.37E+06
K_{oc} (mL/g)	K_{oc} value was calculated by using the correlation equation with K_{ow} for dioxins and furans that is cited in U.S. EPA (1994a; 1994b). Recommended value was calculated by using the recommended K_{ow} value that is provided in this table.	--	2.69E+04
Kd_s (mL/g)	Kd_s value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.01 in soil. Measured organic carbon in soil, specific to site conditions, should be used to calculate Kd_s, because the value varies, depending on the fraction of organic carbon in soil. Recommended Kd_s value was calculated by using the K_{oc} value that is provided in this table.	B-1-3; B-1-4; B-1-5; B-1-6; B-2-3; B-2-4; B-2-5; B-2-6; B-2-10; B-3-3; B-3-4; B-3-5; B-3-6; B-4-3; B-4-4; B-4-5; B-4-6; B-4-10; B-4-11	2.69E+04
Kd_{sw} (L/Kg)	Kd_{sw} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.075 in suspended sediment. Measured organic carbon in suspended sediment, specific to site conditions, should be used to calculate Kd_{sw}, because the value varies, depending on the fraction of organic carbon in suspended sediment. Recommended Kd_{sw} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-18; B-4-24	2.02E+05

TABLE A-3-176

CHEMICAL-SPECIFIC INPUTS FOR 2,3,7,8-TETRACHLORODIBENZO(P)DIOXIN (1746-01-6)

Parameter	Reference and Explanation	Equations	Value
Kd_{bs} (mL/g)	Kd_{bs} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.04 in bottom sediment. Measured organic carbon in bottom sediment, specific to site conditions, should be used to calculate Kd_{bs}, because the value varies, depending on the fraction of organic carbon in bottom sediment. Recommended Kd_{bs} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-25	1.08E+05
	Chemical/Physical Properties (Continued)		
ksg (year)$^{-1}$	ksg value was calculated by using the chemical half-life in soil, as cited in Mackay, Shiu, and Ma (1992).	B-1-2; B-2-2; B-3-2; B-4-2	4.29E-01
Fv (unitless)	Fv value was calculated by using equations cited in Junge (1977) and Bidleman (1988). Recommended value of Fv was calculated by using S, T_m, and Vp values that are provided in this table. Vp value for this compound was converted to a liquid phase value before being used in the calculations.	B-1-1; B-2-1; B-2-7; B-2-8; B-3-1; B-3-7; B-3-8; B-4-1; B-4-8; B-4-9; B-4-12; B-5-1	9.78E-01
	Biotransfer Factors for Plants		
RCF $\left(\frac{\mu g/g\ DW\ plant}{\mu g/mL\ soil\ water}\right)$	RCF value was calculated by using the correlation equation with K_{ow} that is cited in Briggs (1982). Recommended value was calculated by using the K_{ow} value that is provided in this table. The value was then converted to a dry weight basis by using a moisture content of 87 percent.	B-2-10	3.01E+04
$Br_{root\ veg}$ $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	$Br_{root\ veg}$ value was calculated by dividing the RCF value with the Kd_s value provided in this table.	B-2-10	1.12E+00
Br_{ag} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	Br_{ag} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-2-9	5.62E-03
Br_{forage} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ soil}\right)$	Br_{forage} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-3-9	5.62E-03
Bv_{ag} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air}\right)$	Bv_{ag} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-2-8	6.10E+04

TABLE A-3-176

CHEMICAL-SPECIFIC INPUTS FOR 2,3,7,8-TETRACHLORODIBENZO(P)DIOXIN (1746-01-6)

Parameter	Reference and Explanation	Equations	Value
Bv_{forage} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air}\right)$	Bv_{forage} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-3-8	6.10E+04
Biotransfer Factors for Animals			
Ba_{milk} (day/kg FW)	U.S. EPA (1995a)	B-3-11	1.00E-02
Ba_{beef} (day/kg FW)	Ba_{beef} value was calculated by increasing Ba_{milk} values by a factor of 5.43, as discussed in Section A3.3.14.	B-3-10	5.43E-02
Ba_{pork} (day/kg FW)	Ba_{pork} value was calculated by increasing Ba_{milk} values by a factor of 6.57, as discussed in Section A3.3.15.	B-3-12	6.57E-02
Ba_{egg} (L/kg FW tissue)	Ba_{egg} value was calculated by multiplying the BCF value for chicken eggs by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for eggs was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-13	5.42E-02
$Ba_{chicken}$ (L/kg FW tissue)	$Ba_{chickens}$ value was calculated by multiplying the BCF value for chicken by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for chicken was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-14	7.30E-02
BCF_{fish} (L/kg FW tissue)	–	B-4-26	NA
BAF_{fish} (L/kg FW)	–	B-4-27	NA
$BSAF_{fish}$ (unitless, lipid based)	U.S. EPA (1994a)	B-4-28	9.00E-02
Other Parameters			
TEF (unitless)	U.S. EPA (1994a)	–	1.00
Health Benchmarks			
RfD (mg/kg/day)		C-1-8	ND
Oral CSF $(mg/kg/day)^{-1}$	U.S.EPA (1997c)	C-1-7	1.5E+05
RfC (mg/m^3)	–	C-2-3	ND
Inhalation URF $(\mu g/m^3)^{-1}$	U.S.EPA (1997c)	C-2-1	3.3E-08
Inhalation CSF $(mg/kg/day)^{-1}$	U.S.EPA (1997c)	C-2-2	1.5E+05

Note:
NA = Not Applicable; ND = No Data Available
All parameters are defined in in list of FATE AND TRANSPORT PARAMETERS on page A-3-iii.

TABLE A-3-177

CHEMICAL-SPECIFIC INPUTS FOR 2,3,7,8-TETRACHLORODIBENZO(P)FURAN (51207-31-9)

Parameter	Reference and Explanation	Equations	Value
Chemical/Physical Properties			
MW (g/mole)	U.S. EPA (1994a)	–	305.98
T_m (K)	U.S. EPA (1994a)	–	500.1
Vp (atm)	U.S. EPA (1994a)	–	1.97E-11 at 25°C (solid)
S (mg/L)	U.S. EPA (1994a)	–	4.19E-04
H (atm·m^3/mol)	U.S. EPA (1994a).	B-1-6; B-2-6; B-2-8; B-3-6; B-4-6; B-4-12; B-4-19	8.60E-06
D_a (cm^2/s)	D_a value was obtained from WATER8 model database (U.S. EPA 1995d).	B-1-6; B-2-6; B-3-6; B-4-6; B-4-21	1.79E-02
D_w (cm^2/s)	D_w value was calculated using the equation cited in U.S. EPA (1996a).	B-4-20	4.85E-06
K_{ow} (unitless)	U.S. EPA (1992d)	–	3.39E+06
K_{oc} (mL/g)	K_{oc} value was calculated by using the correlation equation with K_{ow} for dioxins and furans that is cited in U.S. EPA (1994a; 1994c). Recommended value was calculated by using the recommended K_{ow} value that is provided in this table.	–	2.09E+06
Kd_s (cm^3/g)	Kd_s value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.01 in soil. Measured organic carbon in soil, specific to site conditions, should be used to calculate Kd_s, because the value varies, depending on the fraction of organic carbon in soil. Recommended Kd_s value was calculated by using the K_{oc} value that is provided in this table.	B-1-3; B-1-4; B-1-5; B-1-6; B-2-3; B-2-4; B-2-5; B-2-6; B-2-10; B-3-3; B-3-4; B-3-5; B-3-6; B-4-3; B-4-4; B-4-5; B-4-6; B-4-10; B-4-11	2.09E+04
Kd_{sw} (L/Kg)	Kd_{sw} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.075 in suspended sediment. Measured organic carbon in suspended sediment, specific to site conditions, should be used to calculate Kd_{sw}, because the value varies, depending on the fraction of organic carbon in suspended sediment. Recommended Kd_{sw} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-18; B-4-24	1.57E+05

TABLE A-3-177

CHEMICAL-SPECIFIC INPUTS FOR 2,3,7,8-TETRACHLORODIBENZO(P)FURAN (51207-31-9)

Parameter	Reference and Explanation	Equations	Value
Chemical/Physical Properties (Continued)			
Kd_{bs} (cm^3/g)	Kd_{bs} value was calculated by using the correlation equation with K_{oc} that is cited in U.S. EPA (1993d) for an assumed organic carbon fraction of 0.04 in bottom sediment. Measured organic carbon in bottom sediment, specific to site conditions, should be used to calculate Kd_{bs}, because the value varies depending on the fraction of organic carbon in bottom sediment. Recommended Kd_{bs} value was calculated by using the K_{oc} value that is provided in this table.	B-4-16; B-4-25	8.36E+04
ksg (year)$^{-1}$	*ksg* value was calculated by using the chemical half-life in soil, as cited in Mackay, Shiu, and Ma (1992).	B-1-1; B-1-2; B-2-1; B-2-2; B-3-1; B-3-2; B-4-1; B-4-2	3.57E-01
Fv (unitless)	*Fv* value was calculated by using equations cited in Junge (1977) and Bidleman (1988). Recommended value of Fv was calculated by using T_m and *Vp* values that are provided in this table. *Vp* value for this compound was converted to a liquid phase value before being used in the calculations.	B-1-1; B-2-1; B-2-7; B-2-8; B-3-1; B-3-7; B-3-8; B-4-1; B-4-8; B-4-9; B-4-12; B-5-1	7.68E-01
Biotransfer Factors for Plants			
RCF $\left(\frac{\square g/g\ DW\ plant}{\square g/mL\ soil\ water}\right)$	*RCF* value was calculated by using the correlation equation with K_{ow} that is cited in Briggs (1982). Recommended value was calculated by using the K_{ow} value that is provided in this table. The value was then converted to a dry weight basis by using a moisture content of 87 percent.	B-2-10	2.48E+04
$Br_{rootveg}$ $\left(\frac{\square g/g\ DW\ plant}{\square g/g\ soil}\right)$	$Br_{rootveg}$ value was calculated by dividing the *RCF* value with the Kd_s value provided in this table.	B-2-10	1.19E+00
Br_{ag} $\left(\frac{\square g/g\ DW\ plant}{\square g/g\ soil}\right)$	Br_{ag} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-2-9	6.51E-03
Br_{forage} $\left(\frac{\square g/g\ DW\ plant}{\square g/g\ soil}\right)$	Br_{forage} value was calculated by using the correlation equation with K_{ow} that is cited in Travis and Arms (1988). No distinction was made between values for aboveground produce and forage. Recommended value was calculated by using the K_{ow} value that is provided in this table.	B-3-9	6.51E-03
Bv_{ag} $\left(\frac{\square g/g\ DW\ plant}{\square g/g\ air}\right)$	Bv_{ag} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-2-8	8.10E+04

TABLE A-3-177

CHEMICAL-SPECIFIC INPUTS FOR 2,3,7,8-TETRACHLORODIBENZO(P)FURAN (51207-31-9)

Parameter	Reference and Explanation	Equations	Value
Biotransfer Factors for Plants (Continued)			
Bv_{forage} $\left(\frac{\mu g/g\ DW\ plant}{\mu g/g\ air}\right)$	Bv_{forage} value was obtained from Lorber (1995). No distinction was made between aboveground produce and forage.	B-3-8	8.10E+04
Biotransfer Factors for Animals			
Ba_{milk} (day/kg FW)	U.S. EPA (1995a)	B-3-11	3.00E-03
Ba_{beef} (day/kg FW)	Ba_{beef} value was calculated by increasing Ba_{milk} values by a factor of 5.43, as discussed in Section A3.3.14.	B-3-10	1.63E-02
Ba_{pork} (day/kg FW)	Ba_{pork} value was calculated by increasing Ba_{milk} values by a factor of 6.57, as discussed in Section A3.3.15.	B-3-12	1.97E-02
Ba_{egg} (L/kg FW tissue)	Ba_{egg} value was calculated by multiplying the BCF value for chicken eggs by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for eggs was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-13	3.61E-02
$Ba_{chicken}$ (L/kg FW tissue)	$Ba_{chicken}$ value was calculated by multiplying the BCF value for chicken by a chicken soil consumption rate of 0.02 kg (DW)/day (See Appendix A-3). BCF value for chicken was obtained from Stephens, Petreas, and Hayward (1995) for the high exposure chicken group.	B-3-14	5.63E-02
BCF_{fish} (L/kg FW tissue)	–	B-4-26	NA
BAF_{fish} (L/kg FW)	–	B-4-27	NA
$BSAF_{fish}$ (unitless, lipid based)	U.S. EPA (1994a)	B-4-28	9.00E-02
Other Parameters			
TEF (unitless)	U.S. EPA (1994a)	–	0.10
Health Benchmarks			
Oral CSF $(mg/kg/day)^{-1}$	–	C-1-8	ND
Inhalation CSF $(mg/kg/day)^{-1}$	–	C-1-7	ND
RfD (mg/kg/day)	–	C-2-3	ND
Inhalation URF $(\mu g/m^3)^{-1}$	–	C-2-1	ND
RfC (mg/m^3)	–	C-2-2	ND

Note:

NA = Not Applicable; ND = No Data Available
All parameters are defined in list of FATE AND TRANSPORT PARAMETERS on page A-3-iii.

Appendix C

EQUATIONS USED IN MRA

C-1: Fate and Transport Equations and Risk Characterization Equations Provided in NCDEHNR (1997)

C-2: Equation for Soil Concentration Due to Depostion

C-3: Equation for Uptake into Below-ground Vegetables [Except for PCDD/PCDFs, which use U.S. EPA (1998a)]

Appendix C-1

Fate and Transport Equations and Risk Characterization Equations Provided in NCDEHNR (1997)

Table B.1.1. Soil Concentration Due to Deposition

Equation

Carcinogens: Soil Concentration

$$Sc = \frac{\left(\frac{Ds \cdot Tc - Sc_{Tc}}{ks}\right) + \left(\frac{Sc_{Tc}}{ks} \cdot [1 - exp(-ks \cdot (T_2 - Tc)]\right)}{(T_2 - T_1)} \quad for\ T_1 < T_c < T_2$$

$$\frac{Ds}{ks \bullet (Tc - T_1)} \bullet \left[\left(Tc + \frac{\exp(-ks \bullet Tc)}{ks}\right) - \left(T_1 + \frac{\exp(-ks \bullet T_1)}{ks}\right)\right] for\ T_2 \le T_c$$

Noncarcinogens: Highest Annual Average Soil Concentration

$$Sc_{Tc} = \frac{Ds \cdot (1 - exp(-ks \cdot Tc))}{ks}$$

$$Ds = \frac{100 \cdot Q}{z \cdot BD} \cdot [F_v (0.31536 \cdot Vdv \cdot Cyv + Dywv) + (Dydp + Dywp) \cdot (1 - F_v)]$$

Parameter	Definition	Default Value
Sc	Average soil concentration of pollutant over exposure duration (mg/kg)	
Ds	Deposition term (mg/kg-yr)	
Tc	Time period over which deposition occurs (time period of combustion) (yr)	site-specific
Sc_{Tc}	Soil concentration at time Tc (mg/kg)	
ks	Soil loss constant (yr^{-1})	calculated (see Table B.1.2)
T_1	Time period at the beginning of combustion (yr)	scenario-specific (see Section 5.1)
T_2	Length of Exposure duration (yr)	scenario-specific (see Section 5.1)
Z	Soil mixing depth (cm)	1
BD	Soil bulk density (g/cm^3)	1.5
0.31536	Units conversion factor (m-g-s/cm-µg-yr)	
Vdv	Dry deposition velocity (cm/s)	3

Table B.1.1. Soil Concentration Due to Deposition Continued

Parameter	Definition	Default Value
Cyv	Normalized vapor phase air concentration (μg-s/g-m^3)	modeled (see Section 5.2.1)
Q	Stack emissions (g/sec)	site-specific
F_v	Fraction of air concentration in vapor phase (dimensionless)	chemical-specific (see Appendix A)
Dywv	Normalized yearly wet deposition from vapor phase (s/m^2-yr)	modeled (see Section 5.2.1)
Dydp	Normalized yearly dry deposition from particle phase (s/m^2-yr)	modeled (see Section 5.2.1)
Dywp	Normalized yearly wet deposition from particle phase (s/m^2-yr)	modeled (see Section 5.2.1)
100	Units conversion factor ([mg-m^2]/[kg-cm^2])	

Description

These equations calculate an average soil concentration over the exposure duration as a result of wet and dry deposition of particles and vapors to soil. Contaminants are assumed to be incorporated only to a finite depth (the mixing depth, Z).

The soil concentration averaged over the exposure duration should be used for carcinogenic chemicals, where the risk is averaged over the lifetime of an individual. Since the hazard quotient associated with noncarcinogenic chemicals is based on a reference dose and not on a lifetime exposure, the highest annual average soil concentration occurring within the exposure duration period should be used for noncarcinogenic chemicals. The highest annual average soil concentration would occur at the end of the time period of combustion and is represented by Sc_{TC}.

Table B.1.2. Soil Loss Constant

Equation

$$ks = ksl + kse + ksr + ksg + ksv$$

Parameter	Definition	Default Value
ks	Soil loss constant due to all processes (yr^{-1})	
ksl	Loss constant due to leaching (yr^{-1})	calculated (see Table B.1.3)
kse	Loss constant due to soil erosion (yr^{-1})	0
ksr	Loss constant due to surface runoff (yr^{-1})	calculated (see Table B.1.4)
ksg	Loss constant due to degradation (yr^{-1})	0
ksv	Loss constant due to volatilization (yr^{-1})	calculated (see Table B.1.5)

Description

This equation calculates the soil loss constant, which accounts for the loss of contaminant from soil by several mechanisms. The loss term for erosion is assumed to be zero due to contaminated soil eroding onto the site as well as off.

Table B.1.3. Loss Constant Due to Leaching

Equation
$$ksl = \frac{q}{\theta_s \cdot z \cdot [1.0 + (BD \cdot Kd_s / \theta_s)]}$$

Parameter	Definition	Default Value
ksl	Loss constant due to leaching (yr^{-1})	
q	Average annual recharge (cm/yr)	site-specific
θ_s	Soil volumetric water content (mL/cm^3)	0.2
z	Soil depth from which leaching removal occurs (cm)	1
Kd_s	Soil-water partition coefficient (cm^3/g)	chemical-specific (see Appendix A)
BD	Soil bulk density (g/cm^3)	1.5

Description
This equation calculates the contaminant loss constant due to leaching from soil.

Table B.1.4. Loss Constant Due to Runoff

Equation

$$ksr = \frac{R}{\theta_s \cdot z} \cdot \left(\frac{1}{1 + (Kd_s \cdot BD / \theta_s)} \right)$$

Parameter	Definition	Default Value
ksr	Loss constant due to runoff (yr^{-1})	
R	Average annual runoff (cm/yr)	site-specific
θ_s	Soil volumetric water content (mL/cm^3)	0.2
z	Soil mixing depth (cm)	1
Kd_s	Soil-water partition coefficient (cm^3/g)	chemical-specific (see Appendix A)
BD	Soil bulk density (g/cm^3)	1.5

Description

This equation calculates the contaminant loss constant due to runoff from soil.

Table B.1.5. Loss Constant Due to Volatilization

Equation

$$ksv = \left[\frac{3.1536x10^{7} \cdot H}{z \cdot Kd_s \cdot R \cdot T \cdot BD}\right] \cdot \left[0.482 \cdot u^{0.78} \cdot \left(\frac{\mu_a}{\rho_a \cdot D_a}\right)^{-0.67} \cdot \left(\sqrt{\frac{4 \cdot A}{\pi}}\right)^{-0.11}\right]$$

Parameter	Definition	Default Value
ksv	Loss constant due to volatilization (yr^{-1})	
$3.1536x10^7$	Conversion constant (s/yr)	
H	Henry's Law constant ($atm\text{-}m^3/mol$)	chemical-specific (see Appendix A)
z	Soil mixing depth (cm)	1
Kd_s	Soil-water partition coefficient (cm^3/g)	chemical-specific (see Appendix A)
R	Universal gas constant ($atm\text{-}m^3/mol\text{-}K$)	$8.205x10^{-5}$
BD	Soil bulk density (g/cm^3)	1.5
T	Ambient air temperature (K)	site-specific
u	Average annual wind speed (m/s)	site-specific
μ_a	Viscosity of air (g/cm-s)	$1.81x10^{-4}$
ρ_a	Density of air (g/cm^3)	$1.2x10^{-3}$
D_a	Diffusivity of contaminant in air (cm^2/s)	chemical-specific (see Appendix A)
A	Surface area of contaminated area (m^2)	site-specific

Description

This equation calculates the contaminant loss constant due to volatilization from soil.

This Page Intentionally Left Blank

B.2 Consumption of Aboveground Produce

The equations in this section calculate contaminant concentrations in aboveground produce that are eaten by humans.

Aboveground produce may be contaminated by combustion emissions through several mechanisms, including direct deposition of contaminants onto the plant, direct uptake of vapor phase contaminants, and root uptake of contaminants deposited on the soil.

The site-specific parameters required for this pathway are:

- Total time of deposition (Tc): This should be set to the expected lifetime of the combustion source (e.g., 30 years.)

- Average annual recharge (q): Appropriate recharge values

- Average annual surface runoff (R): Surface runoff, R, can be estimated using the Water Atlas. This reference provides maps with isolines of annual average surface water runoff, which are defined as all flow contributions to surface water bodies, including direct runoff, shallow interflow, and ground water recharge. The range of values shown for North Carolina is 10 to 40 in/yr, with the lowest values occurring in the coastal region and increasing to the highest values in the mountains. Since these values are total contributions and not just surface runoff, they need to be reduced to estimate surface runoff. A reduction of 50 percent, or one half, should suffice if using the Water Atlas for the R term. More detailed, site-specific procedures for estimating the amount of surface runoff, such as those based on the U.S. Soil Conservation Service curve number equation (CNE), may also be used (see, for example, U.S. EPA, 1985). (Note that all values must be converted to cm/yr.)

Table B.2.1. Soil Concentration Due to Deposition

Equation

Soil Concentration Averaged over Exposure Duration

$$Sc = \frac{\left(\dfrac{Ds \cdot Tc - Sc_{Tc}}{ks}\right) + \left(\dfrac{Sc_{Tc}}{ks} \cdot [1 - exp(-ks \cdot (T_2 - Tc)]\right)}{(T_2 - T_1)}$$

Highest Annual Average Soil Concentration

$$Sc_{Tc} = \frac{Ds \cdot (1 - exp(-ks \cdot Tc))}{ks}$$

$$Ds = \frac{100 \cdot Q}{z \cdot BD} \cdot [F_v (0.31536 \cdot Vdv \cdot Cyv + Dywv) + (Dydp + Dywp) \cdot (1 - F_v)]$$

Parameter	Definition	Default Value
Sc	Average soil concentration over exposure duration (mg/kg)	
Ds	Deposition term (mg/kg-yr)	
Tc	Time period over which deposition occurs (yr)	site-specific
Sc_{Tc}	Soil concentration at time Tc (mg/kg)	
ks	Soil loss constant (yr^{-1})	calculated (see Table B.1.2)
T_2	Exposure duration (yr)	scenario-specific (see Section 5.1)
z	Soil mixing depth (cm)	20
BD	Soil bulk density (g/cm^3)	1.5

Table B.2.1. Soil Concentration Due to Deposition Continued

Parameter	Definition	Default Value
0.31536	Units conversion factor (m-g-s/cm-μg-yr)	
Vdv	Dry deposition velocity (cm/s)	3
Q	Stack emissions (g/sec)	site-specific
F_v	Fraction of air concentration in vapor phase (dimensionless)	chemical-specific (see Appendix A)
Dywv	Normalized yearly wet deposition from vapor phase (s/m^2-yr)	modeled (see Section 5.2.1)
Dydp	Normalized yearly dry deposition from particle phase (s/m^2-yr)	modeled (see Section 5.2.1)
Dywp	Normalized yearly wet deposition from particle phase (s/m^2-yr)	modeled (see Section 5.2.1)
100	Units conversion factor ([mg-m^2]/[kg-cm^2])	

Description
These equations calculate an average soil concentration over the exposure duration as a result of wet and dry deposition of particles and vapors to soil. Contaminants are assumed to be incorporated only to a finite depth (the mixing depth, Z). The soil concentration averaged over the exposure duration should be used for carcinogenic chemicals, where the risk is averaged over the lifetime of an individual. Since the hazard quotient associated with noncarcinogenic chemicals is based on a reference dose and not on a lifetime exposure, the highest annual average soil concentration occurring within the exposure duration period should be used for noncarcinogenic chemicals. The highest annual average soil concentration would occur at the end of the time period of combustion and is represented by Sc_{T_c}.

Table B.2.2. Soil Loss Constant

Equation

$$ks = ksl + kse + ksr + ksg + ksv$$

Parameter	Definition	Default Value
ks	Soil loss constant due to all processes (yr^{-1})	
ksl	Loss constant due to leaching (yr^{-1})	calculated (see Table B.2.3)
kse	Loss constant due to soil erosion (yr^{-1})	0
ksr	Loss constant due to surface runoff (yr^{-1})	calculated (see Table B.2.4)
ksg	Loss constant due to degradation (yr^{-1})	0
ksv	Loss constant due to volatilization (yr^{-1})	calculated (see Table B.2.5)

Description

This equation calculates the soil loss constant, which accounts for the loss of contaminant from soil by several mechanisms. The loss term for erosion is assumed to be zero due to contaminated soil eroding onto the site as well as off.

Table B.2.3. Loss Constant Due to Leaching

Equation

$$ksl = \frac{q}{\theta_s \cdot z \cdot [1.0 + (BD \cdot Kd_s / \theta_s)]}$$

Parameter	Definition	Default Value
ksl	Loss constant due to leaching (yr^{-1})	
q	Average annual recharge (cm/yr)	site-specific
θ_s	Soil volumetric water content (mL/cm^3)	0.2
z	Soil depth from which leaching removal occurs (cm)	20
Kd_s	Soil-water partition coefficient (cm^3/g)	chemical-specific (see Appendix A)
BD	Soil bulk density (g/cm^3)	1.5

Description

This equation calculates the contaminant loss constant due to leaching from soil.

Table B.2.4. Loss Constant Due to Runoff

Equation

$$ksr = \frac{R}{\theta_s \cdot z} \cdot \left(\frac{1}{1 + (Kd_s \cdot BD / \theta_s)} \right)$$

Parameter	Definition	Default Value
ksr	Loss constant due to runoff (yr^{-1})	
R	Average annual runoff (cm/yr)	site-specific
θ_s	Soil volumetric water content (mL/cm^3)	0.2
z	Soil mixing depth (cm)	20
Kd_s	Soil-water partition coefficient (cm^3/g)	chemical-specific (see Appendix A)
BD	Soil bulk density (g/cm^3)	1.5

Description

This equation calculates the contaminant loss constant due to runoff from soil.

Table B.2.5. Loss Constant Due to Volatilization

Equation

$$ksv = \left[\frac{3.1536x10^{7} \cdot H}{z \cdot Kd_s \cdot R \cdot T \cdot BD}\right] \cdot \left[0.482 \cdot u^{0.78} \cdot \left(\frac{\mu_a}{\rho_a \cdot D_a}\right)^{-0.67} \cdot \left(\sqrt{\frac{4 \cdot A}{\pi}}\right)^{-0.11}\right]$$

Parameter	Definition	Default Value
ksv	Loss constant due to volatilization (yr^{-1})	
$3.1536x10^7$	Conversion constant (s/yr)	
H	Henry's Law constant (atm-m^3/mol)	chemical-specific (see Appendix A)
z	Soil mixing depth (cm)	20
Kd_s	Soil-water partition coefficient (cm^3/g)	chemical-specific (see Appendix A)
R	Universal gas constant (atm-m^3/mol-K)	$8.205x10^{-5}$
BD	Soil bulk density (g/cm^3)	1.5
T	Ambient air temperature (K)	site-specific
u	Average annual wind speed (m/s)	site-specific
μ_a	Viscosity of air (g/cm-s)	$1.81x10^{-4}$
ρ_a	Density of air (g/cm^3)	$1.2x10^{-3}$
D_a	Diffusivity of contaminant in air (cm^2/s)	chemical-specific (see Appendix A)
A	Surface area of contaminated area (m^2)	site-specific

Description

This equation calculates the contaminant loss constant due to volatilization from soil.

Table B.2.6. Aboveground Produce Concentration Due to Direct Deposition

Equation

$$Pd = \frac{1000 \cdot Q \cdot (1 - F_v) \cdot [Dydp + (Fw \cdot Dywp)] \cdot Rp \cdot [(1.0 - \exp(-kp \cdot Tp))]}{Yp \cdot kp}$$

Parameter	Definition	Default Value
Pd	Concentration in plant due to direct deposition (mg/kg DW)	
1000	Units conversion factor (mg/g)	
Q	Stack emissions (g/sec)	site-specific
F_v	Fraction of air concentration in vapor phase (dimensionless)	chemical-specific (see Appendix A)
Dydp	Normalized yearly dry deposition from particle phase (s/m^2-yr)	modeled (see Section 5.2.1)
Fw	Fraction of wet deposition that adheres to plant (dimensionless)	0.6 for Cations 0.2 for Anions
Dywp	Normalized yearly wet deposition from particle phase ($s/m^2/yr$)	modeled (see Section 5.2.1)
Rp	Interception fraction of edible portion of plant (dimensionless)	0.04
kp	Plant surface loss coefficient (yr^{-1})	18
Tp	Length of plant's exposure to deposition per harvest of edible portion of plant (yrs)	0.16
Yp	Yield or standing crop biomass of the edible portion of the plant (kg DW/m^2)	1.6

Description

This equation calculates the contaminant concentration in aboveground vegetation due to wet and dry deposition of contaminant on the plant surface.

Table B.2.7. Aboveground Produce Concentration Due to Air-to-Plant Transfer

Exposure Scenarios		
$$Pv = Q \cdot F_v \cdot \frac{Cyv \cdot Bv \cdot VG_{ag}}{\rho_a}$$		
Parameter	**Definition**	**Default Value**
Pv	Concentration of pollutant in the plant due to air-to-plant transfer (mg/kg)	
Q	Stack emissions (g/sec)	site-specific
F_v	Fraction of air concentration in vapor phase (dimensionless)	chemical-specific (see Appendix A)
Cyv	Normalized vapor phase air concentration (µg-sec/g-m^3)	modeled (see Section 5.2.1)
Bv	Air-to-plant biotransfer factor ([mg pollutant/kg plant tissue DW]/[µg pollutant/g air])	chemical-specific (see Appendix A)
Vg_{ag}	Empirical correction factor for aboveground vegetation (dimensionless)	Organics 0.1 for human aboveground produce consumption Metals 1.0 for aboveground produce
ρ_a	Density of air (g/m^3)	1.2×10^3
Description		
This equation calculates the contaminant concentration in aboveground vegetation due to direct uptake of vapor phase contaminants into the plant leaves.		

Table B.2.8. Aboveground Produce Concentration Due to Root Uptake

Equation

$$Pr = Sc \cdot Br$$

Parameter	Definition	Default Value
Pr	Concentration of pollutant in the plant due to direct uptake from soil (mg/kg)	
Sc	Average soil concentration of pollutant over exposure duration (mg/kg)	calculated (see Table B.2.1)
Br	Plant-soil bioconcentration factor for aboveground produce [µg/g DW]/[µg/g soil]	chemical-specific (see Appendix A)

Description

This equation calculates the contaminant concentration in aboveground vegetation due to direct uptake of contaminants from soil.

B.3 Consumption of Animal Products

The equations in this section are used to calculate contaminant concentrations in the animal products, which include beef, pork, milk, poultry, and eggs. The consumption of animal products is dependant on scenario and tier. For Tiers 1 and 2, only the subsistence farmer is considered to eat beef and milk. For Tier 3, all scenarios are assumed to eat beef and milk; and pork, eggs, and poultry should also be considered if appropriate to site-specific circumstances. Therefore, equations for determining the concentration in all of these types of animal products are included here.

Animal tissue (beef, pork, poultry, eggs, and milk) may be contaminated through ingestion of contaminated forage, grain, silage and soil by livestock. Beef and dairy cattle ingest grain, silage, forage, and soil. Hogs ingest grain, silage, and soil. Chickens raised by the subsistence farmer are assumed to consume 10% of their diet as contaminated soil. Chickens raised by the typical farmer are assumed not to be free range. These chickens consume contaminated grain but no soil.

The contamination of plant matter consumed by livestock differs depending on the type of plant. Forage (pasture grass and hay) and silage may be contaminated by combustion emissions through direct deposition of contaminants onto the plant, direct uptake of vapor phase contaminants, and root uptake of contaminants deposited on the soil. Grain is assumed to be protected, and thus are only contaminated by root uptake of contaminants in soil. Direct deposition and root uptake of contaminants are calculated at the location of the given scenario.

The site-specific parameters required for this pathway are:

- Total time of deposition (Tc): This should be set to the expected lifetime of the combustion source (e.g., 30 years.)
- Average annual recharge (q): Appropriate recharge values
- Average annual surface runoff (R): Surface runoff, R, can be estimated using the Water Atlas. This reference provides maps with isolines of annual average surface water runoff, which are defined as all flow contributions to surface water bodies, including direct runoff, shallow interflow, and ground water recharge. The range of values shown for North Carolina is 10 to 40 in/yr, with the lowest values occurring in the coastal region and increasing to the highest values in the mountains. Since these values are total contributions and not just surface runoff, they need to be reduced to estimate surface runoff. A reduction of 50 percent, or one half, should suffice if using the Water Atlas for the R term. More detailed, site-specific procedures for estimating the amount of surface runoff, such as those based on the U.S. Soil Conservation Service curve number equation (CNE), may also be used (see, for example, U.S. EPA, 1985). (Note that all values must be converted to cm/yr.)

Table B.3.1. Soil Concentration Due to Deposition

Equation

Soil Concentration Averaged over Exposure Duration

$$Sc = \frac{\left(\frac{Ds \cdot Tc - Sc_{Tc}}{ks}\right) + \left(\frac{Sc_{Tc}}{ks} \cdot [1 - exp(-ks \cdot (T_2 - Tc)]\right)}{(T_2 - T_1)}$$

Highest Annual Average Soil Concentration

$$Sc_{Tc} = \frac{Ds \cdot (1 - exp(-ks \cdot Tc))}{ks}$$

$$Ds = \frac{100 \cdot Q}{z \cdot BD} \cdot [F_v (0.31536 \cdot Vdv \cdot Cyv + Dywv) + (Dydp + Dywp) \cdot (1 - F_v)]$$

Parameter	Definition	Default Value
Sc	Average soil concentration of pollutant over exposure duration (mg/kg)	
Ds	Deposition term (mg/kg-yr)	
Tc	Time period over which deposition occurs (yr)	site-specific
Sc_{Tc}	Soil concentration at time Tc (mg/kg)	
ks	Soil loss constant (yr^{-1})	calculated (see Table B.1.2)
T_2	Exposure duration (yr)	scenario-specific (see Section 5.1)
Z	Soil mixing depth (cm)	20-grain & silage from tilled field 1.0-forage & soil
BD	Soil bulk density (g/cm^3)	1.5
0.31536	Units conversion factor (m-g-s/cm-µg-yr)	

Table B.3.1 Soil Concentration Due to Deposition Continued

Parameter	Definition	Default Value
Vdv	Dry deposition velocity (cm/s)	3
Q	Stack emission (g/s)	site-specific
F_v	Fraction of air concentration in vapor phase (dimensionless)	chemical-specific (see Appendix A)
Cyv	Normalized vapor phase air concentration (μg-s/g-m³)	modeled (see Section 5.2.1)
Dywv	Normalized yearly wet deposition from vapor phase (s/m²-yr)	modeled (see Section 5.2.1)
Dydp	Normalized yearly dry deposition from particle phase (3/m²-yr)	modeled (see Section 5.2.1)
Dywp	Normalized yearly wet deposition from particle phase (s/m²-yr)	modeled (see Section 5.2.1)
100	Units conversion factor ([mg-m²]/[kg-cm²])	

Description

These equations calculate an average soil concentration over the exposure duration as a result of wet and dry deposition of particles and vapors to soil. Contaminants are assumed to be incorporated only to a finite depth (the mixing depth, Z).

The soil concentration averaged over the exposure duration should be used for carcinogenic chemicals, where the risk is averaged over the lifetime of an individual. Since the hazard quotient associated with noncarcinogenic chemicals is based on a reference dose and not on a lifetime exposure, the highest annual average soil concentration occurring within the exposure duration period should be used for noncarcinogenic chemicals. The highest annual average soil concentration would occur at the end of the time period of combustion and is represented by Sc_{tD}.

Table B.3.2. Soil Loss Constant

Equation

$$ks = ksl + kse + ksr + ksg + ksv$$

Parameter	Definition	Default Value
ks	Soil loss constant due to all processes (yr^{-1})	
ksl	Loss constant due to leaching (yr^{-1})	calculated (see Table B.3.3)
kse	Loss constant due to soil erosion (yr^{-1})	0
ksr	Loss constant due to surface runoff (yr^{-1})	calculated (see Table B.3.4)
ksg	Loss constant due to degradation (yr^{-1})	0
ksv	Loss constant due to volatilization (yr^{-1})	calculated (see Table B.3.5)

Description

This equation calculates the soil loss constant, which accounts for the loss of contaminant from soil by several mechanisms. The loss term for erosion is assumed to be zero due to contaminated soil eroding onto the site as well as off.

Table B.3.3. Loss Constant Due to Leaching

Equation

$$ksl = \frac{q}{\theta_s \cdot z \cdot [1.0 + (BD \cdot Kd_s/\theta_s)]}$$

Parameter	Definition	Default Value
ksl	Loss constant due to leaching (yr^{-1})	
q	Average annual recharge (cm/yr)	site-specific
θ_s	Soil volumetric water content (mL/cm^3)	0.2
z	Soil depth from which leaching removal occurs (cm)	20-grain & silage from tilled field 1.0-forage & soil
Kd_s	Soil-water partition coefficient (cm^3/g)	chemical-specific (see Appendix A)
BD	Soil bulk density (g/cm^3)	1.5

Description

This equation calculates the contaminant loss constant due to leaching from soil.

Table B.3.4. Loss Constant Due to Runoff

Equation

$$ksr = \frac{R}{\theta_s \cdot z} \cdot \left(\frac{1}{1 + (Kd_s \cdot BD / \theta_s)} \right)$$

Parameter	Definition	Default Value
ksr	Loss constant due to runoff (yr^{-1})	
R	Average annual runoff (cm/yr)	site-specific
θ_s	Soil volumetric water content (mL/cm^3)	0.2
z	Soil mixing depth (cm)	20-grain & silage from tilled field 1.0-forage & soil
Kd_s	Soil-water partition coefficient (cm^3/g)	chemical-specific (see Appendix A)
BD	Soil bulk density (g/cm^3)	1.5

Description

This equation calculates the contaminant loss constant due to runoff from soil.

Table B.3.5. Loss Constant Due to Volatilization

Equation

$$ksv = \left[\frac{3.1536x10^{7} \cdot H}{z \cdot Kd_s \cdot R \cdot T \cdot BD}\right] \cdot \left[0.482 \cdot u^{0.78} \cdot \left(\frac{\mu_a}{\rho_a \cdot D_a}\right)^{-0.67} \cdot \left(\sqrt{\frac{4 \cdot A}{\pi}}\right)^{-0.11}\right]$$

Parameter	Definition	Default Value
ksv	Loss constant due to volatilization (yr^{-1})	
$3.1536x10^7$	Conversion constant (s/yr)	
H	Henry's Law constant ($atm\text{-}m^3/mol$)	chemical-specific (see Appendix A)
z	Soil mixing depth (cm)	20-grain & silage from tilled field 1.0-forage & soil
Kd_s	Soil-water partition coefficient (cm^3/g)	chemical-specific (see Appendix A)
R	Universal gas constant ($atm\text{-}m^3/mol\text{-}K$)	$8.205x10^{-5}$
BD	Soil bulk density (g/cm^3)	1.5
T	Ambient air temperature (K)	site-specific
u	Average annual wind speed (m/s)	site-specific
μ_a	Viscosity of air (g/cm-s)	$1.81x10^{-4}$
ρ_a	Density of air (g/cm^3)	$1.2x10^{-3}$
D_a	Diffusivity of contaminant in air (cm^2/s)	chemical-specific (see Appendix A)
A	Surface area of contaminated area (m^2)	site-specific

Description

This equation calculates the contaminant loss constant due to volatilization from soil.

Table B.3.6. Forage and Silage Concentration Due to Direct Deposition

Equation

$$Pd = \frac{1000 \cdot Q \cdot (1 - F_v)[Dydp + (Fw \cdot Dywp)] \cdot Rp \cdot [(1.0 - exp(-kp \cdot Tp)]}{Yp \cdot kp}$$

Parameter	Definition	Default Value
Pd	Concentration in plant due to direct deposition (mg/kg DW)	
1000	Units conversion factor (mg/g)	
Q	Stack emissions (g/s)	site-specific
Dydp	Normalized yearly dry deposition from particle phase (s/m^2-yr)	modeled (see Section 5.2.1)
Fw	Fraction of wet deposition that adheres to plant surfaces (dimensionless)	0.6 for Cations 0.2 for Anions
F_v	Fraction of air concentration in vapor phase (dimensionless)	chemical-specific (see Appendix A)
Dywp	Yearly particle phase wet deposition rate ($g/m^2/yr$)	modeled (see Section 5.2.1)
Rp	Interception fraction of the edible portion of the plant tissue (dimensionless)	forage - 0.5 silage - 0.46
kp	Plant surface loss coefficient (yr^{-1})	18
Tp	Length of the plant's exposure to deposition per harvest of the edible portion of the plant (yrs)	forage - 0.12 silage - 0.16
Yp	Yield or standing crop biomass of the edible portion of the plant (kg DW/m^2)	forage - 0.24 silage - 0.8

Description

This equation calculates the contaminant concentration in aboveground vegetation due to wet and dry deposition of contaminant on the plant surface.

Table B.3.7. Forage and Silage Concentration Due to Air-to-Plant Transfer

Equation
$$Pv = Q \cdot F_v \cdot \frac{Cyv \cdot Bv \cdot VG_{ag}}{\rho_a}$$

Parameter	Definition	Default Value
Pv	Concentration of pollutant in the plant due to air-to-plant transfer (mg/kg)	
Q	Stack emissions (g/s)	site-specific
F_v	Fraction of air concentration in vapor phase (dimensionless)	chemical-specific (see Appendix A)
Cyv	Normalized vapor phase air concentration (µg-s/g-m^3)	modeled (see Section 5.2.1)
Bv	Air-to-plant biotransfer factor ([mg pollutant/kg plant tissue DW]/[µg pollutant/g air])	chemical-specific (see Appendix A)
Vg_{ag}	Empirical correction factor for above ground vegetation (unitless)	<u>Organics</u> forage - 1.0 silage - 0.5 <u>Metals</u> 1.0 for aboveground produce
ρ_a	Density of air (g/m^3)	1.2×10^3

Description
This equation calculates the contaminant concentration in aboveground vegetation due to direct uptake of vapor phase contaminants into the plant leaves.

Table B.3.8. Forage/Silage/Grain Concentration Due to Root Uptake

Equation		
$$Pr = Sc \cdot Br$$		
Parameter	**Definition**	**Default Value**
Pr	Concentration of pollutant in the plant due to direct uptake from soil (mg/kg)	
Sc	Average soil concentration of pollutant over exposure duration (mg/kg)	calculated (see Table B.3.1)
Br_i	Plant-soil bioconcentration factor for plant [µg/g DW]/[µg/g soil]	chemical-specific (see Appendix A)
Description		
This equation calculates the contaminant concentration in aboveground vegetation due to direct uptake of contaminants from soil.		

Table B.3.9. Beef Concentration Due to Plant and Soil Ingestion

Equation

$$A_{beef} = (\Sigma(F_i \cdot Qp_i \cdot P_i) + Qs \cdot Sc) \cdot Ba_{beef}$$

Parameter	Definition	Default Value
A_{beef}	Concentration of pollutant in beef (mg/kg)	
F_i	Fraction of plant grown on contaminated soil and eaten by the animal (dimensionless) for each plant type	1
Qp_i	Quantity of plant eaten by the animal each day (kg plant tissue DW/day)	forage - 8.8 silage - 2.5 grain - 0.47
P_i	Total concentration of pollutant in the plant eaten by the animal (mg/kg DW) P = Pd + Pv + Pr Pd and Pv are not used for grain.	calculated (see Tables B.3.6, B.3.7, B.3.8)
Qs	Quantity of soil eaten by the animal (kg soil/day)	0.5
Sc	Average soil concentration of pollutant over exposure duration (mg/kg)	calculated (see Table B.3.1)
Ba_{beef}	Biotransfer factor for beef (d/kg)	chemical-specific (see Appendix A)

Description

This equation calculates the concentration of contaminant in beef from ingestion of forage, grain, silage, and soil. The consumption rates given in the table reflect default values for cattle raised by subsistence farmers.

Table B.3.10. Milk Concentration Due to Plant and Soil Ingestion

Equation

$$A_{milk} = (\Sigma(F_i \cdot Qp_i \cdot P_i) + Qs \cdot Sc) \cdot Ba_{milk}$$

Parameter	Definition	Default Value
A_{milk}	Concentration of pollutant in milk (mg/kg)	
F_i	Fraction of plant grown on contaminated soil and eaten by the animal (dimensionless) for each plant group	1
Qp_i	Quantity of plant eaten by the animal each day (kg plant tissue DW/day) for each plant type	forage - 13.2 silage - 4.1 grain - 3.0
P_i	Total concentration of pollutant in each plant eaten by the animal (mg/kg) = Pd + Pv + Pr	calculated (see Tables B.3.6, B.3.7, B.3.8)
Qs	Quantity of soil eaten by the animal (kg soil/day)	0.4
Sc	Average soil concentration of pollutant over exposure duration (mg/kg)	calculated (see Table B.3.1)
Ba_{milk}	Biotransfer factor for milk (day/kg)	chemical-specific (see Appendix A)

Description

This equation calculates the concentration of contaminant in milk from ingestion of forage, silage, grain, and soil. The consumption rates given in the table reflect default values for cattle raised by subsistence farmers.

This Page Intentionally Left Blank

B.4 Consumption of Drinking Water and Fish

The equations in this section calculate the contaminant concentration in the waterbody partitioned between dissolved phase, suspended sediment, and benthic sediment. Contaminant concentrations in fish are calculated from the contaminant concentrations in the waterbody, either dissolved or total water column concentrations or sediment concentrations. This is done in several steps.

The first step is to calculate the soil concentration resulting from deposition of particle phase and wet vapor phase contaminants onto soils and diffusion of dry vapor phase contaminant into soils at the location of maximum combined (wet and dry) deposition. The calculation of soil concentration includes a loss term which can account for loss of contaminant from the soil after deposition by several mechanisms, including leaching, erosion, runoff, degradation, and volatilization. These loss mechanisms all lower the soil concentration associated with a specific deposition rate. The degradation term is chemical-specific. However, the degradation term is also set to zero for all contaminants.

The second step is to calculate the load of contaminant to the waterbody (Tables B.4.7 through B.4.12) at the location of maximum combined (wet and dry) deposition. Five pathways cause contaminant loading of the waterbody: 1) direct deposition; 2) runoff from impervious surfaces within the watershed; 3) runoff from pervious surfaces within the watershed; 4) soil erosion from the watershed; and 5) direct diffusion of dry vapor phase contaminant into the surface water. Other pathways have been omitted or their contributions would be negligible compared with the pathways being evaluated. Internal transformation may be considered as a waterbody loading pathway but this pathway has also been omitted from the analysis. Instead, the effects of transformation processes for constituents which are transformed (e.g., inorganic mercury to methyl mercury) are implicit in the waterbody to fish tissue partitioning factor (e.g., the bioaccumulation factor for mercury). For each chemical, only the most important pathways are used.

The third step is to calculate the total waterbody concentration (in the water column and sediments) from the waterbody load (Table B.4.15) and to partition the total concentration into a dissolved water concentration, a total water column concentration, and a bed sediment concentration (Tables B.4.23 through B.4.25). Only one of these three concentrations is calculated for each chemical. Chemical dissipation from within the waterbody is also considered in this analysis. specifically the dissipation due to volatilization and burial in benthic sediment.

At this point the dissolved water concentration can be used to calculate the exposure due to drinking water ingestion (see Appendix C for equations). The dissolved water concentration is used because it is assumed that the drinking water is treated to remove suspended particles.

The final step is to calculate the concentration in fish from the total water column concentration, the dissolved water concentration, or the bed sediment concentration using a bioconcentration factor, a bioaccumulation factor, or a sediment bioaccumulation factor, as appropriate (Tables B.4.26 through B.4.28).

There are a number of site-specific parameters in the fish consumption pathway, including total time of deposition (Tc), meteorologic data, and the various parameters characterizing the waterbody. The total time of deposition should be set to the expected lifetime of the combustion source (e.g., 30 years). The following guidance is provided on the waterbody parameters:

- Average annual recharge (q): Appropriate recharge values

- Average annual surface runoff (R): Surface runoff, R, can be estimated using the Water Atlas. This reference provides maps with isolines of annual average surface water runoff, which are defined as all flow contributions to surface water bodies, including direct runoff, shallow interflow, and ground water recharge. The range of values shown for North Carolina is 10 to 40 in/yr, with the lowest values occurring in the coastal region and increasing to the highest values in the mountains. Since these values are total contributions and not just surface runoff, they need to be reduced to estimate surface runoff. A reduction of 50 percent, or one half, should suffice if using the Water Atlas for the R term. More detailed, site-specific procedures for estimating the amount of surface runoff, such as those based on the U.S. Soil Conservation Service curve number equation (CNE), may also be used (see, for example, U.S. EPA, 1985). (Note that all values must be converted to cm/yr.)

- Waterbody surface area (WA_w): this should be estimated from local maps.

- Average volumetric flow (Vfx): average flows can be obtained from river and stream gauging stations. If data from gauging stations are not available, the average flow can be estimated based on the total upstream watershed area and the average runoff. The total upstream watershed area (in length squared units) is multiplied by a unit area surface water runoff (in length per time). The *Water Atlas of the United States* (Geraghty, et al., 1973) provides maps with isolines of annual average surface water runoff, which is defined as all flow contributions to surface water bodies, including direct runoff, shallow interflow, and groundwater recharge. Flows may vary from 10^5 m^3/yr in small streams or ponds draining less than a square kilometer to 10^9 m^3/yr or more in large rivers.

- Depth of the water column (d_w): depths can be obtained from gauging stations or be estimated based on other local data. Depths should represent the average depth of the water column, so far as is possible.

- Total watershed area (WA_L): see Section 5.2.1 for guidance on estimating the watershed area. This area should be the same as the effective drainage area.

- Impervious watershed area (WA_I): this is the portion of the total effective watershed area that is impervious to rainfall (e.g., roofs, driveways, streets, parking lots, etc.) and drains to the waterbody through a conveyance such as a gutter, storm sewer, ditch, or canal. It can be estimated based on land use and other local information.

- USLE rainfall factor (RF): The RF term represents the influence of precipitation on erosion, and is derived from data on the frequency and intensity of storms. This value is typically derived on a storm-by-storm basis, but average annual values have been compiled by county for North Carolina (U.S. Department of Agriculture, 1991) and range from 170 to 350. Values by county are provided in Table B.4.0.

Table B.4.0. Values of the USLE Rainfall Factor "R" for North Carolina by County

Alamance	230	Cumberland	300	Johnston	290	Randolph	240
Alexander	230	Currituck	320	Jones	340	Richmond	270
Alleghany	180	Dare	350	Lee	270	Robeson	310
Anson	260	Davidson	240	Lenoir	330	Rockingham	190
Ashe	180	Davie	230	Lincoln	260	Rowan	240
Avery	190	Duplin	330	McDowell	230	Rutherford	270
Beaufort	350	Durham	240	Macon	290	Sampson	320
Bertie	310	Edgecombe	290	Madison	170	Scotland	290
Bladen	320	Forsyth	210	Martin	310	Stanly	250
Brunswick	350	Franklin	260	Mecklinburg	250	Stokes	190
Buncombe	200	Gaston	260	Mitchell	170	Surry	200
Burke	250	Gates	300	Montgomery	260	Swain	230
Cabarrus	250	Graham	240	Moore	260	Transylvania	300
Caldwell	230	Granville	240	Nash	280	Tyrell	340
Camden	320	Greene	310	New Hanover	350	Union	250
Carteret	350	Guilford	220	Northampton	270	Vance	240
Caswell	200	Halifax	280	Onslow	350	Wake	270
Catawba	260	Harnett	280	Orange	240	Warren	250
Chatham	260	Haywood	200	Pamlico	350	Washington	330
Cherokee	260	Henderson	300	Pasquotank	320	Watauga	200
Chowan	320	Hertford	290	Pender	340	Wayne	310
Clay	270	Hoke	290	Perquimans	320	Wilkes	220
Cleveland	270	Hyde	350	Person	220	Wilson	290
Columbus	330	Iredell	240	Pitt	320	Yadkin	210
Craven	350	Jackson	290	Polk	270	Yancey	180

Table B.4.1. Watershed Soil Concentration Due to Deposition

Equation

Soil Concentration Averaged over Exposure Duration

$$Sc = \frac{\left(\dfrac{Ds \cdot Tc - Sc_{Tc}}{ks}\right) + \left(\dfrac{Sc_{Tc}}{ks} \cdot [1 - exp(-ks \cdot (T_2 - Tc)]\right)}{(T_2 - T_c)}$$

Highest Annual Average Soil Concentration

$$Sc_{Tc} = \frac{Ds \cdot (1 - exp(-ks \cdot Tc))}{ks}$$

$$Ds = \frac{100 \cdot Q}{z \cdot BD} \cdot [F_v \cdot (0.31536 \cdot Vdv \cdot Cywv + Dywwv) + (1 - F_v) \cdot Dytwp]$$

Parameter	Definition	Default Value
Sc	Average soil concentration of pollutant over exposure duration (mg/kg)	
Ds	Deposition term (mg/kg-yr)	
Tc	Time period over which deposition occurs (yr)	site-specific
Sc_{Tc}	Soil concentration at time Tc (mg/kg)	
ks	Soil loss constant (yr^{-1})	calculated (see Table B.1.2)
T_2	Exposure duration (yr)	scenario-specific (see Section 5.1)
Z	Soil mixing depth (cm)	1
BD	Soil bulk density (g/cm^3)	1.5
0.31536	Units conversion factor (m-g-s/cm-μg-yr)	

Table B.4.1. Soil Concentration Due to Deposition Continued

Parameter	Definition	Default Value
Vdv	Dry deposition velocity (cm/s)	3
Cywv	Normalized yearly watershed average vapor phase air concentration (μg-s/g-m^3)	modeled (see Section 5.2.1)
Q	Stack emissions (g/s)	site-specific
F_v	Fraction of air concentration in vapor phase (dimensionless)	chemical-specific (see Appendix A)
Dywwv	Normalized yearly watershed average wet deposition from vapor phase (s/m^2-yr)	modeled (see Section 5.2.1)
Dytwp	Normalized yearly watershed average total (wet and dry) deposition from particle phase (s/m^2-yr)	modeled (see Section 5.2.1)
100	Units conversion factor ([mg-m^2]/[kg-cm^2])	

Description

These equations calculate an average soil concentration over the exposure duration as a result of wet and dry deposition of particles and vapors to soil. Contaminants are assumed to be incorporated only to a finite depth (the mixing depth, Z).

The soil concentration averaged over the exposure duration should be used for carcinogenic chemicals, where the risk is averaged over the lifetime of an individual. Since the hazard quotient associated with noncarcinogenic chemicals is based on a reference dose and not on a lifetime exposure, the highest annual average soil concentration occurring within the exposure duration period should be used for noncarcinogenic chemicals. The highest annual average soil concentration would occur at the end of the time period of combustion and is represented by Sc_{TC}.

Table B.4.2. Soil Loss Constant

Equation		
$ks = ksl + kse + ksr + ksg + ksv$		
Parameter	**Definition**	**Default Value**
ks	Soil loss constant due to all processes (yr^{-1})	
ksl	Loss constant due to leaching (yr^{-1})	calculated (see Table B.4.3)
kse	Loss constant due to soil erosion (yr^{-1})	calculated (see Table B.4.4)
ksr	Loss constant due to surface runoff (yr^{-1})	calculated (see Table B.4.5)
ksg	Loss constant due to degradation (yr^{-1})	0
ksv	Loss constant due to volatilization (yr^{-1})	calculated (see Table B.4.6)
Description		
This equation calculates the soil loss constant, which accounts for the loss of contaminant from soil by several mechanisms.		

Table B.4.3. Loss Constant Due to Leaching

Equation

$$ksl = \frac{q}{\theta_s \cdot z \cdot [1.0 + (BD \cdot Kd_s / \theta_s)]}$$

Parameter	Definition	Default Value
ksl	Loss constant due to leaching (yr^{-1})	
q	Average annual recharge (cm/yr)	site-specific
θ_s	Soil volumetric water content (mL/cm^3)	0.2
z	Soil depth from which leaching removal occurs (cm)	1
Kd_s	Soil-water partition coefficient (cm^3/g)	chemical-specific (see Appendix A)
BD	Soil bulk density (g/cm^3)	1.5

Description

This equation calculates the contaminant loss constant due to leaching from soil.

Table B.4.4. Loss Constant Due to Erosion

Equation

$$kse = \frac{0.1 \cdot X_e \cdot SD \cdot ER}{BD \cdot z} \cdot \left(\frac{Kd_s \cdot BD}{\theta_s + (Kd_s \cdot BD)} \right)$$

Parameter	Definition	Default Value
kse	Loss constant due to erosion (yr^{-1})	
X_e	Unit soil loss ($kg/m^2/yr$)	calculated (see Table B.4.13)
SD	Sediment delivery ratio (unitless)	calculated (see Table B.4.14)
ER	Soil enrichment ratio (unitless)	3
z	Soil mixing depth (cm)	1
θ_s	Soil volumetric water content (mL/cm^3)	0.2
Kd_s	Soil-water partition coefficient (cm^3/g)	chemical-specific (see Appendix A)
BD	Soil bulk density (g/cm^3)	1.5

Description

This equation calculates the contaminant loss constant due to runoff from soil.

Table B.4.5. Loss Constant Due to Runoff

Equation

$$ksr = \frac{R}{\theta_s \cdot z} \cdot \left(\frac{1}{1 + (Kd_s \cdot BD / \theta_s)} \right)$$

Parameter	Definition	Default Value
ksr	Loss constant due to runoff (yr^{-1})	
R	Average annual runoff (cm/yr)	site-specific
θ_s	Soil volumetric water content (mL/cm^3)	0.2
z	Soil mixing depth (cm)	1
Kd_s	Soil-water partition coefficient (cm^3/g)	chemical-specific (see Appendix A)
BD	Soil bulk density (g/cm^3)	1.5

Description

This equation calculates the contaminant loss constant due to runoff from soil.

Table B.4.6. Loss Constant Due to Volatilization

Equation

$$ksv = \left[\frac{3.1536x10^{7} \cdot H}{z \cdot Kd_s \cdot R \cdot T \cdot BD}\right] \cdot \left[0.482 \cdot u^{0.78} \cdot \left(\frac{\mu_a}{\rho_a \cdot D_a}\right)^{-0.67} \cdot \left(\sqrt{\frac{4 \cdot A}{\pi}}\right)^{-0.11}\right]$$

Parameter	Definition	Default Value
ksv	Loss constant due to volatilization (yr^{-1})	
$3.1536x10^7$	Units conversion constant (s/yr)	
H	Henry's Law constant ($atm\text{-}m^3/mol$)	chemical-specific (see Appendix A)
z	Soil mixing depth (cm)	1
Kd_s	Soil-water partition coefficient (cm^3/g)	chemical-specific (see Appendix A)
R	Universal gas constant ($atm\text{-}m^3/mol\text{-}K$)	$8.205x10^{-5}$
BD	Soil bulk density (g/cm^3)	1.5
T	Ambient air temperature (K)	site-specific
u	Average annual wind speed (m/s)	site-specific
μ_a	Viscosity of air (g/cm-s)	$1.81x10^{-4}$
ρ_a	Density of air (g/cm^3)	$1.2x10^{-3}$
D_a	Diffusivity of contaminant in air (cm^2/s)	chemical-specific (see Appendix A)
A	Surface area of contaminated area (m^2)	site-specific

Description

This equation calculates the contaminant loss constant due to volatilization from soil.

Table B.4.7. Total Waterbody Load

Equation
$$L_T = L_{Dep} + L_{Dif} + L_{RI} + L_R + L_E$$

Parameter	Definition	Default Value
L_T	Total contaminant load to the water body (g/yr)	
L_{Dep}	Total (wet and dry) particle phase and wet vapor phase contaminant direct deposition load to waterbody (g/yr)	calculated (see Table B.4.8)
L_{Dif}	Vapor phase contaminant diffusion (dry deposition) load to waterbody (g/yr)	calculated (see Table B.4.12)
L_{RI}	Runoff load from impervious surfaces (g/yr)	calculated (see Table B.4.9)
L_R	Runoff load from pervious surfaces (g/yr)	calculated (see Table B.4.10)
L_E	Soil erosion load (g/yr)	calculated (see Table B.4.11)

Description
This equation calculates the total average waterbody load from wet and dry vapor and particle deposition, runoff, and erosion loads.

Table B.4.8. Deposition to Waterbody

Equation		
$$L_{Dep} = Q \cdot [F_v \cdot Dywwv + (1 - F_v) \cdot Dytwp] \cdot WA_w$$		
Parameter	**Definition**	**Default Value**
L_{Dep}	Total (wet and dry) particle phase and wet vapor phase contaminant direct deposition load to waterbody (g/yr)	
Q	Stack emissions (g/s)	site-specific
F_v	Fraction of air concentration in vapor phase (dimensionless)	chemical-specific (see Appendix A)
Dywwv	Normalized yearly watershed average wet deposition from vapor phase (s/m^2-yr)	modeled (see Section 5.2.1)
Dytwp	Normalized yearly watershed average total (wet and dry) deposition from particle phase (s/m^2-yr)	modeled (see Section 5.2.1)
WA_w	Water body area (m^2)	site-specific
Description		
This equation calculates the average load to the waterbody from direct deposition of wet and dry particles and wet vapors onto the surface of the waterbody.		

Table B.4.9. Impervious Runoff Load to Waterbody

Equation
$L_{RI} = Q \cdot [F_v \cdot Dywwv + (1.0 - F_v) \cdot Dytwp] \cdot WA_I$

Parameter	Definition	Default Value
L_{RI}	Impervious surface runoff load (g/yr)	
WA_I	Impervious watershed area receiving pollutant deposition (m^2)	site-specific
Q	Stack emissions (g/s)	site-specific
F_v	Fraction of air concentration in vapor phase (dimensionless)	chemical-specific (see Appendix A)
Dywwv	Normalized yearly watershed average wet deposition from vapor phase (s/m^2-yr)	modeled (see Section 5.2.1)
Dytwp	Normalized yearly watershed average total (wet and dry) deposition from particle phase (s/m^2-yr)	modeled (see Section 5.2.1)

Description
This equation calculates the average runoff load to the waterbody from impervious surfaces in the watershed from which runoff is conveyed directly to the waterbody.

Table B.4.10. Pervious Runoff Load to Waterbody

Equation

$$L_R = R \cdot (WA_L - WA_I) \cdot \frac{Sc \cdot BD}{\theta_s + Kd_s \cdot BD} \cdot 0.01$$

Parameter	Definition	Default Value
L_R	Pervious surface runoff load (g/yr)	
R	Average annual surface runoff (cm/yr)	site-specific
Sc	Average soil concentration of pollutant over exposure duration in watershed soils (mg/kg)	calculated (see Table B.4.1)
BD	Soil bulk density (g/cm^3)	1.5
Kd_s	Soil-water partition coefficient (L/kg)	chemical-specific (see Appendix A)
WA_L	Total watershed area receiving pollutant deposition (m^2)	site-specific
WA_I	Impervious watershed area receiving pollutant deposition (m^2)	site-specific
0.01	Units conversion factor (kg-cm^2/mg-m^2)	
θ_s	Volumetric soil water content (cm^3/cm^3)	0.2

Description

This equation calculates the average runoff load to the waterbody from pervious soil surfaces in the watershed.

Table B.4.11. Erosion Load to Waterbody

Equation

$$L_E = X_e \cdot (WA_L - WA_I) \cdot SD \cdot ER \cdot \frac{Sc \cdot Kd_s \cdot BD}{\theta_s + Kd_s \cdot BD} \cdot 0.001$$

Parameter	Definition	Default Value
L_E	Soil erosion load (g/yr)	
X_e	Unit soil loss (kg/m^2/yr)	calculated (see Table B.4.13)
Sc	Average soil concentration of pollutant over exposure duration in watershed soils (mg/kg)	calculated (see Table B.4.1)
BD	Soil bulk density (g/cm^3)	1.5
θ_s	Volumetric soil water content (cm^3/cm^3)	0.2
Kd_s	Soil-water partition coefficient (L/kg)	chemical-specific (see Appendix A)
WA_L	Total watershed area receiving pollutant deposition (m^2)	site-specific
WA_I	Impervious watershed area receiving pollutant deposition (m^2)	site-specific
SD	Watershed sediment delivery ratio (unitless)	calculated (see Table B.4.14)
ER	Soil enrichment ratio (unitless)	3
0.001	Units conversion factor ([g/kg]/[mg/kg])	

Description

This equation calculates the load to the waterbody from soil erosion.

Table B.4.12. Diffusion Load to Waterbody

Equation

$$L_{Df} = \frac{Kv \cdot Q \cdot F_v \cdot Cywv \cdot WA_w \cdot 10^{-6}}{\frac{H}{R \cdot T_w}}$$

Parameter	Definition	Default Value
L_{Df}	Dry vapor phase contaminant diffusion load to waterbody (g/yr)	
Q	Stack emissions (g/s)	site-specific
F_v	Fraction of air concentration in vapor phase (dimensionless)	chemical-specific (see Appendix A)
Kv	Diffusive mass transfer coefficient (m/yr)	calculated (see Table B.4.19)
Cywv	Normalized yearly watershed average vapor phase air concentration (μg-s/g-m³)	modeled (see Section 5.2.1)
WA_w	Waterbody surface area (m²)	site-specific
H	Henry's Law constant (atm-m³/mol)	chemical-specific (see Appendix A)
R	Universal gas constant (atm-m³/mol-K)	8.205×10^{-5}
T_w	Waterbody temperature (K)	298
10^{-6}	Units conversion factor (g/μg)	

Description

This equation calculates the load to the waterbody from soil erosion.

Table B.4.13. Universal Soil Loss Equation (USLE)

Equation

$$X_e = RF \cdot K \cdot LS \cdot C \cdot P \cdot \frac{907.18}{4047}$$

Parameter	Definition	Default Value
X_e	Unit soil loss (kg/m²/yr)	
RF	USLE rainfall (or erosivity) factor (yr^{-1})	site-specific
K	USLE erodibility factor (ton/acre)	0.36
LS	USLE length-slope factor (unitless)	1.5
C	USLE cover management factor (unitless)	0.1
P	USLE supporting practice factor (unitless)	1
907.18	Conversion factor (kg/ton)	
4047	Conversion factor (m²/acre)	

Description

This equation calculates the soil loss rate from the watershed, using the Universal Soil Loss Equation; the result is used in the soil erosion load equation.

Table B.4.14. Sediment Delivery Ratio

Equation

$$SD = a \cdot (WA_L)^{-b}$$

Parameter	Definition	Default Value
SD	Watershed sediment delivery ratio (unitless)	
WA_L	Total watershed area receiving pollutant deposition (m^2)	site-specific
b	Empirical slope coefficient	0.125
a	Empirical intercept coefficient	depends on watershed area; see table below

Description

This equation calculates the sediment delivery ratio for the watershed; the result is used in the soil erosion load equation.

Values for Empirical Intercept Coefficient, a

Watershed area (sq. miles)	"a" coefficient (unitless)
≤ 0.1	2.1
1	1.9
10	1.4
100	1.2
1,000	0.6
1 sq. mile = 2.59×10^6 m^2	

Table B.4.15. Total Waterbody Concentration

Equation

$$C_{wct} = \frac{L_T}{Vf_x \cdot f_{water} + kwt \cdot WA_w \cdot (d_w + d_b)}$$

Parameter	Definition	Default Value
C_{wct}	Total water body concentration, including water column and bed sediment (mg/L)	
L_T	Total chemical load into water body, including deposition, runoff, and erosion (g/yr)	calculated (see Table B.4.7)
Vf_x	Average volumetric flow rate through water body (m^3/yr)	site-specific
f_{water}	Fraction of total water body contaminant concentration that occurs in the water column (unitless)	calculated (see Table B.4.16)
kwt	Overall total waterbody dissipation rate constant (unitless)	calculated (see Table B.4.17)
WA_w	Water body surface area (m^2)	site-specific
d_w	Depth of water column (m)	site-specific
d_b	Depth of upper benthic layer (m)	0.03

Description

This equation calculates the total waterbody concentration, including both the water column and the bed sediment.

Table B.4.16. Fraction in Water Column and Benthic Sediment

Equation

$$f_{water} = \frac{(1 + Kd_{sw} \cdot TSS \cdot 10^{-6}) \cdot d_w/d_z}{(1 + Kd_{sw} \cdot TSS \cdot 10^{-6}) \cdot d_w/d_z + (\theta_{bs} + Kd_{bs} \cdot BS) \cdot d_b/d_z}$$

$$f_{benth} = 1 - f_{water}$$

Parameter	Definition	Default Value
f_{water}	Fraction of total water body contaminant concentration that occurs in the water column (unitless)	
Kd_{sw}	Suspended sediment/surface water partition coefficient (L/kg)	chemical-specific (see Appendix A)
TSS	Total suspended solids (mg/L)	10
10^{-6}	Conversion factor (kg/mg)	
d_w	Depth of water column (m)	site-specific
d_b	Depth of upper benthic layer (m)	0.03
d_z	Total waterbody depth (m)	calculated (d_w+d_b)
θ_{bs}	Bed sediment porosity (L_{water}/L)	0.6
Kd_{bs}	Bed sediment/sediment pore water partition coefficient (L/kg)	chemical-specific (see Appendix A)
BS	Bed sediment concentration (g/cm^3)	1.0
f_{benth}	Fraction of total water body contaminant concentration that occurs in the benthic sediment (unitless)	

Description

These equations calculate the fraction of total waterbody concentration occurring in the water column and the bed sediments.

Table B.4.17. Overall Total Waterbody Dissipation Rate Constant

Equation

$$k_{wt} = f_{water} \cdot k_v + f_{benth} \cdot k_b$$

Parameter	Definition	Default Value
k_{wt}	Overall total waterbody dissipation rate constant (yr^{-1})	
f_{water}	Fraction of total waterbody contaminant concentration that occurs in the water column (unitless)	calculated (see Table B.4.16)
k_v	Water column volatilization rate constant (yr^{-1})	calculated (see Table B.4.18)
f_{benth}	Fraction of total waterbody contaminant concentration that occurs in the benthic sediment (unitless)	calculated (see Table B.4.16)
k_b	Benthic burial rate constant (yr^{-1})	calculated (see Table B.4.22)

Description

This equation calculates the overall dissipation rate of contaminant in surface water due to volatilization and benthic burial.

Table B.4.18. Water Column Volatilization Loss Rate Constant

Equation

$$k_v = \frac{K_v}{d_z \cdot (1 + Kd_{sw} \cdot TSS \cdot 10^{-6})}$$

Parameter	Definition	Default Value
k_v	Water column volatilization rate constant (yr^{-1})	
K_v	Overall transfer rate (m/yr)	calculated (see Table B.4.19)
d_z	Total waterbody depth (m)	calculated (d_w+d_b)
Kd_{sw}	Suspended sediment/surface water partition coefficient (L/kg)	chemical-specific (see Appendix A)
TSS	Total suspended solids (mg/L)	10
10^{-6}	Conversion factor (kg/mg)	

Description

This equation calculates the water column contaminant loss due to volatilization.

Table B.4.19. Overall Transfer Rate

Equation
$$K_v = \left[K_L^{-1} + \left(K_G \frac{H}{R \cdot T_k}\right)^{-1}\right]^{-1} \cdot \theta^{(T_k - 293)}$$

Parameter	Definition	Default Value
K_v	Overall transfer rate (m/yr)	
K_L	Liquid phase transfer coefficient (m/yr)	calculated (see Table B.4.20)
K_G	Gas phase transfer coefficient (m/yr)	calculated (see Table B.4.21)
H	Henry's Law constant (atm-m^3/mol)	chemical-specific (see Appendix A)
R	Universal gas constant (atm-m^3/mol-K)	8.205×10^{-5}
T_k	Waterbody temperature (K)	298
θ	Temperature correction factor (unitless)	1.026

Description
This equation calculates the overall transfer rate of contaminant from the liquid and gas phases in surface water.

Table B.4.20. Liquid Phase Transfer Coefficient

Equation

- Flowing stream or river

$$K_L = \sqrt{\frac{10^{-4} \cdot D_w \cdot u}{d_z}} \cdot 3.15x10^7$$

- Quiescent lake or pond

$$K_L = (C_d^{0.5} \cdot W) \cdot \left(\frac{\rho_a}{\rho_w}\right)^{0.5} \cdot \left(\frac{k^{0.33}}{\lambda_2}\right) \cdot \left(\frac{\mu_w}{\rho_w \cdot D_w}\right)^{-0.67} \cdot 3.15x10^7$$

Parameter	Definition	Default Value
K_L	Liquid phase transfer coefficient (m/yr)	
D_w	Diffusivity of chemical in water (cm^2/s)	chemical-specific (see Appendix A)
u	Current velocity (m/s)	site-specific
d_z	Total waterbody depth (m)	calculated (d_w+d_b)
C_d	Drag coefficient	0.0011
W	Wind velocity,10m above water surface (m/s)	site-specific
ρ_a	Density of air corresponding to water temperature (g/cm^3)	1.2×10^{-3}
ρ_w	Density of water corresponding to water temperature (g/cm^3)	1
k	von Karman's constant	0.4
λ_2	Dimensionless viscous sublayer thickness	4
μ_w	Viscosity of water corresponding to water temperature (g/cm-s)	1.69×10^{-2}
$3.15x10^7$	Conversion constant (s/yr)	

Description

This equation calculates the transfer rate of contaminant from the liquid phase for a flowing or quiescent system.

Table B.4.21. Gas Phase Transfer Coefficient

Equation
- Flowing stream or river $$K_G = 36500\ m/yr$$ - Quiescent lake or pond $$K_G = (C_d^{0.5} \cdot W) \cdot \left(\frac{k^{0.33}}{\lambda_2}\right) \cdot \left(\frac{\mu_a}{\rho_a \cdot D_a}\right)^{-0.67} \cdot 3.15x10^7$$

Parameter	Definition	Default Value
K_G	Gas phase transfer coefficient (m/yr)	
C_d	Drag coefficient	0.0011
W	Wind velocity,10m above water surface (m/s)	site-specific
k	von Karman's constant	0.4
λ_2	Dimensionless viscous sublayer thickness	4
μ_a	Viscosity of air corresponding to the air temperature (g/cm-s)	1.81×10^{-4}
ρ_a	Density of air corresponding to water temperature (g/cm^3)	1.2×10^{-3}
D_a	Diffusivity of chemical in air (cm^2/s)	chemical-specific (see Appendix A)
$3.15x10^7$	Conversion constant (s/yr)	

Description
This equation calculates the transfer rate of contaminant from the gas phase for a flowing or quiescent system.

Table B.4.22. Benthic Burial Rate Constant

Equation		
$$k_b = \left(\frac{X_e \cdot WA_L \cdot SD \cdot 10^3 - Vf_x \cdot TSS}{WA_w \cdot TSS}\right)\left(\frac{TSS \cdot 10^{-6}}{BS \cdot d_b}\right)$$		
Parameter	**Definition**	**Default Value**
k_b	Benthic burial rate constant (yr^{-1})	
X_e	Unit soil loss ($kg/m^2/yr$)	calculated (see Table B.4.13)
WA_L	Watershed area receiving fallout (m^2)	site-specific
SD	Watershed sediment delivery ratio (unitless)	calculated (see Table B.4.14)
10^3	Conversion factor (g/kg)	
Vf_x	Average volumetric flow rate through waterbody (m^3/yr)	site-specific
TSS	Total suspended solids (mg/L) or (g/m^3)	10
WA_w	Water body surface area (m^2)	site-specific
BS	Benthic solids concentration (kg/L)	1
d_b	Depth of upper benthic layer (m)	0.03
10^{-6}	Conversion factor (kg/mg)	
Description		
This equation calculates the water column contaminant loss due to burial in benthic sediment.		

Table B.4.23. Total Water Column Concentration

Equation		
$$C_{w} = f_{water} \cdot C_{wct} \cdot \frac{d_w + d_b}{d_w}$$		
Parameter	**Definition**	**Default Value**
C_{wt}	Total concentration in water column (mg/L)	
f_{water}	Fraction of total water body contaminant concentration that occurs in the water column (unitless)	calculated (see Table B.4.16)
C_{wctot}	Total water concentration in surface water system, including water column and bed sediment (mg/L)	calculated (see Table B.4.15)
d_b	Depth of upper benthic layer (m)	0.03
d_w	Depth of water column (m)	site-specific
Description		
This equation calculates the total water column concentration of contaminant; this includes both dissolved contaminant and contaminant sorbed to suspended solids.		

Table B.4.24. Dissolved Water Concentration

Equation		
$$C_{dw} = \frac{C_{wt}}{1 + Kd_{sw} \cdot TSS \cdot 10^{-6}}$$		
Parameter	**Definition**	**Default Value**
C_{dw}	Dissolved phase water concentration (mg/L)	
C_{wt}	Total water column concentration (mg/L)	calculated (see Table B.4.23)
Kd_{sw}	Suspended sediment/surface water partition coefficient (L/kg)	chemical-specific (see Appendix A)
TSS	Total suspended solids (mg/L)	10
Description		
This equation calculates the concentration of contaminant dissolved in the water column.		

Table B.4.25. Concentration Sorbed to Bed Sediment

Equation

$$C_{sb} = f_{benth} \cdot C_{wtot} \cdot \frac{Kd_{bs}}{\theta_{bs} + Kd_{bs} \cdot BS} \cdot \frac{d_w + d_b}{d_b}$$

Parameter	Definition	Default Value
C_{sb}	Concentration sorbed to bed sediments (mg/kg)	
f_{benth}	Fraction of total water body contaminant concentration that occurs in the bed sediment (unitless)	calculated (see Table B.4.16)
C_{wtot}	Total water body concentration, including water column and bed sediment (mg/L)	calculated (see Table B.4.15)
d_w	Depth of water column (m)	site-specific
d_b	Depth of the upper benthic layer (m)	0.03
θ_{bs}	Bed sediment porosity (unitless)	0.6
Kd_{bs}	Bed sediment/sediment pore water partition coefficient (L/kg)	chemical-specific (see Appendix A)
BS	Bed sediment concentration (kg/L)	1.0

Description

This equation calculates the concentration of contaminant sorbed to bed sediments.

Table B.4.26. Fish Concentration from Dissolved Water Concentration

Equation		
$$C_{fish} = C_{dw} \cdot BCF$$		
Parameter	**Definition**	**Default Value**
C_{fish}	Fish concentration (mg/kg)	
C_{dw}	Dissolved phase water concentration (mg/L)	calculated (see Table B.4.24)
BCF	Bioconcentration factor (L/kg)	chemical-specific (see Appendix A)
Description		
This equation calculates fish concentration from dissolved water concentration, using a bioconcentration factor.		

Table B.4.27. Fish Concentration from Total Water Column Concentration

Equation		
$$C_{fish} = C_{w} \cdot BAF$$		
Parameter	**Definition**	**Default Value**
C_{fish}	Fish concentration (mg/kg)	
C_{wt}	Total water column concentration (mg/L)	calculated (see Table B.4.23)
BAF	Bioaccumulation factor (L/kg)	chemical-specific (see Appendix A)
Description		
This equation calculates fish concentration from total water column concentration, using a bioaccumulation factor.		

Table B.4.28. Fish Concentration from Bed Sediments

Equation		
$C_{fish} = \dfrac{C_{sb} \cdot f_{lipid} \cdot BSAF}{OC_{sed}}$		
Parameter	**Definition**	**Default Value**
C_{fish}	Fish concentration (mg/kg)	
C_{sb}	Concentration sorbed to bed sediment (mg/kg)	calculated (see Table B.4.25)
f_{lipid}	Fish lipid content (fraction)	0.07
BSAF	Biota to sediment accumulation factor (unitless)	chemical-specific (see Appendix A)
OC_{sed}	Fraction organic carbon in bottom sediment (unitless)	0.04
Description		
This equation calculates fish concentration from bed sediment concentration, using a biota-to-sediment accumulation factor.		

This Page Intentionally Left Blank

B.5 Direct Inhalation

The following equation is used to calculate the air concentration of a pollutant based on separate air modeling runs for the vapor phase and particle phase described in Section 5.2.1. It should be noted that this equation applies to a much larger group of constituents than those used for the indirect pathways. Direct inhalation calculations should be completed for all emissions from the stack that have inhalation health benchmarks such as a Reference Concentration (RfC) or inhalation slope factor or unit risk estimate. The *"Implementation Guidance for Conducting Indirect Exposure Analysis at RCRA Combustion Units"* provides guidance on the particles of incomplete combustion (PICs) that should be included in an assessment and the health benchmarks available for each.

Table B.5.1 Air Concentration

Equation

$$C_a = Q \cdot [F_v \cdot Cyv + (1.0 - F_v) \cdot Cyp]$$

Parameter	Definition	Default Value
C_a	Total air concentration (μg/m³)	
Q	Stack emissions (g/s)	site-specific
F_v	Fraction of air concentration in vapor phase (dimensionless)	chemical-specific (see Appendix A)
Cyv	Normalized vapor phase air concentration (μg - s/g - m³)	modeled (see Section 5.2.1)
Cyp	Normalized particle phase air concentration (μg - s/g - m³)	modeled (see Section 5.2.1)

Description

This equation calculates the total air concentration of a constituent based on the fraction in vapor phase and the fraction in particle phase.

This Page Intentionally Left Blank

APPENDIX C

RISK CHARACTERIZATION EQUATIONS

This appendix presents the equations needed to calculate dose estimates and risk assessment endpoints. Attachment C provides examples of the types of tables that would be presented in this appendix.

APPENDIX C. RISK CHARACTERIZATION

Characterization of risk is the final step of the risk assessment. In this step, for each exposure scenario the health effects criteria or benchmarks are used in conjunction with dose estimates which are calculated for each exposure pathway to arrive at the risk assessment endpoints. The assessment endpoints of the risk assessment are as follows: a) the increased probability of cancer in an individual over a lifetime, referred to as the excess lifetime individual cancer risk (or simply, individual cancer risk) arising from both oral and inhalation routes of exposure; b) for oral exposures, a measure of an individual's exposure to chemicals with noncancer health effects relative to the reference dose (RfD), referred to as the hazard quotient; c) for inhalation exposures, a hazard quotient relative to the reference concentration (RfC) in air; and d) where appropriate, a hazard index which represents the combined hazard quotients for those chemicals with the same noncancer health effects. Although oral and inhalation routes of exposure are handled separately in the assessment, the individual risks associated with exposures to carcinogenic chemicals are combined for the oral and inhalation routes of exposure.

Indirect Exposures

In the indirect exposure equations, an estimate is made of the dose (or intake) of each contaminant from all oral routes of exposure (Tables C.1.1 to C.1.5). Exposure parameters listed in the equations (the consumption rates, body weights, and exposure durations) will vary for different scenarios. The total daily oral intake is calculated by summing the intake from each pathway, as appropriate for the tier and the scenario (Table C.1.6). For the carcinogens, cancer risks are added across chemicals (Table C.1.9). For noncancer health effects, hazard quotients are added across chemicals only when they target the same organ. Therefore, the hazard quotients from chemicals that target the same organ are added together to calculate an overall hazard index for each organ effect (Table C.1.10).

Infant Exposure Through Breast Milk

The dioxin exposure assessment document released by the Office of Research and Development in April 1994, presents procedures for calculating infant exposures to dioxins and other lipophilic compounds through ingestion of human breast milk. The procedures are based on the intake of the contaminant by the mother. The exposure to an infant from breast feeding can be presented as an average daily dose (ADD) or a lifetime average daily dose (LADD). The ADD to the infant over a one year averaging time is predicted to be much higher (e.g. 30 to 60 times higher) than the ADD for the mother. However, if a 70 year averaging time is used, then the LADD to the infant is below the lower end of the range for the mother's LADD. Research is incomplete however in the area of calculating risk for infant exposures to dioxin-like compounds in breast milk. One method of risk characterization, and the method used in this document, is comparison of the ADD to the average adult background level for dioxin exposure, 50 pg/kg/day. Algorithms for calculating the ADD for infant exposure are presented as Equations C.3.1 and C.3.2.

The remainder of this section is organized as follows. The tables for characterizing risk from indirect exposures are given in Section C.1. Characterizing risk from direct inhalation exposures is covered in Section C.2. Characterizing the risk to breast-fed infants is discussed for adult exposure scenarios in Section C.3.

The overall cancer risk for an individual is calculated by the following equation:

$$\text{Overall Cancer Risk} = \sum \text{Cancer Risk}_{\text{inhalation}} + \sum \text{Cancer Risk}_{\text{oral}}$$

The overall hazard index for noncancer health effects is calculated by the following equation:

$$\text{Overall Hazard Index} = \text{Hazard Index}_{\text{inhalation}} + \text{Hazard Index}_{\text{oral}}$$

Table C.1.1. Contaminant Intake from Soil

$$I_{soil} = Sc \cdot CR_{soil} \cdot F_{soil}$$

Parameter	Description	Values
I_{soil}	Daily intake of contaminant from soil (mg/d)	
Sc	Average soil concentration of pollutant over exposure duration (mg/kg)	calculated (see Appendix B)
CR_{soil}	Consumption rate of soil (kg/d)	varies (see Section 5.1 or Appendix D)
F_{soil}	Fraction of consumed soil contaminated (unitless)	1

Description

This equation calculates the daily intake of contaminant from soil consumption. The soil concentration will vary with each scenario, and the soil consumption rate varies for children and adults.

Table C.1.2. Contaminant Intake from Aboveground Produce

$$I_{ag} = (Pd + Pv + Pr) \cdot CR_{ag} \cdot F_{ag}$$

Parameter	Description	Values
I_{ag}	Daily intake of contaminant from aboveground produce (mg/day)	
Pd	Concentration in above-ground produce due to deposition (mg/kg Dw)	calculated (see Appendix B)
Pv	Concentration in above-ground produce due to air-to-plant transfer (mg/kg Dw)	calculated (see Appendix B)
Pr	Concentration in aboveground produce due to root uptake (mg/kg Dw)	calculated (see Appendix B)
CR_{ag}	Consumption rate of aboveground produce for dioxins (kg Fw/d); metals (kg Dw/d)	varies (see Section 5.1 or Appendix D)
F_{ag}	Fraction of above-ground produce contaminated (unitless)	varies (see Section 5.1)

Description
This equation calculates the daily intake of contaminant from ingestion of aboveground produce. The consumption rate varies for children and adults and for the type of produce. The contaminated fraction and the concentration in aboveground produce will also vary with each scenario.

Table C.1.3. Contaminant Intake from Beef, Milk, Pork, Poultry and Eggs

$$I_i = A_i \bullet CR_i \bullet F_i$$

Parameter	Description	Values
I_i	Daily intake of contaminant from animal tissue i (mg/d)	
A_i	Concentration in animal tissue i (mg/kg Fw)[1]	calculated (see Appendix B)
CR_i	Consumption rate of animal tissue i (kg Fw/d)[1]	varies (see Section 5.1 or Appendix D)
F_i	Fraction of animal tissue i contaminated (unitless)	varies (see Section 5.1)

Description

This equation calculates the daily intake of contaminant from ingestion of animal tissue (where the "i" in the above equation refers to beef, milk, pork, poultry, or eggs). Intake of poultry and eggs is only applicable to dioxins. The consumption rate varies for children and adults and for the type of animal tissue. The contaminated fraction and the concentration in the animal tissue will also vary with each scenario.

1 For the metals mercury, selenium, and cadmium, the concentration in beef, milk, and pork and the consumption rate are in kilograms dry weight per day. Wet weight to dry weight conversion factors for beef and milk are 0.4 and 0.1, respectively. The pork conversion factor is assumed equal to the beef conversion factor.

Table C.1.4. Contaminant Intake from Fish

$$I_{fish} = C_{fish} \cdot CR_{fish} \cdot F_{fish}$$

Parameter	Description	Values
I_{fish}	Daily intake of contaminant from fish (mg/d)	
C_{fish}	Fish concentration (mg/kg)	calculated (see Appendix B)
CR_{fish}	Consumption rate of fish (kg/d)	varies (see Section 5.1 or Appendix D)
F_{fish}	Fraction of fish contaminated (unitless)	varies (see Section 5.1)

Description

This equation calculates the daily intake of contaminant from ingestion of fish. The contaminant concentration in fish will vary for each waterbody. The consumption rate varies for children and adults and for scenario. The contaminated fraction will also vary with each scenario, with the subsistence and recreational fisher contaminated fraction equal to 1.

Table C.1.5. Contaminant Intake from Drinking Water

$$I_{dw} = C_{dw} \cdot CR_{dw} \cdot F_{d}$$

Parameter	Description	Values
I_{dw}	Daily intake of contaminant from drinking water (mg/d)	
C_{dw}	Dissolved phase water concentration (mg/L)	calculated (see Appendix B)
CR_{dw}	Consumption rate of drinking water (L/d)	varies (see Section 5.1 or Appendix D)
F_{dw}	Fraction of drinking water contaminated (unitless)	1

Description

This equation calculates the intake of contaminant from drinking water. The contaminant concentration will vary for each waterbody. The consumption rate varies for adult and children.

Table C1.6. (Continued) Total Daily Intake - Tier 3 Analysis

$$I = I_{soil} + I_{ag} + I_{beef} + I_{milk} + I_{pork} + I_{poultry} + I_{eggs} + I_{fish} + I_{dw}$$

Parameter	Description	Values
I	Total daily intake of contaminant (mg/d)	
I_{soil}	Daily intake of contaminant from soil (mg/d)	calculated (see Table C.1.1)
I_{ag}	Daily intake of contaminant from above-ground produce (mg/d)	calculated (see Table C.1.2)
I_{beef}, I_{milk}, I_{pork}, $I_{poultry}$, I_{eggs}	Daily intake of contaminant from animal tissue (mg/d)	calculated (see Table C.1.3)
I_{fish}	Daily intake of contaminant from fish (mg/d)	calculated (see Table C.1.4)
I_{dw}	Daily intake of contaminant from drinking water (mg/d)	calculated (see Table C.1.5)

Description

This equation calculates the daily intake of contaminant via all indirect pathways. In the Tier 3 analysis, each scenario may be exposed through all of the pathways, as noted in the table, depending upon site-specific activity patterns. The intake of drinking water should be included only if a surface water body has been identified as a drinking water source. Ingestion of poultry and eggs is only applicable to dioxins.

A description of the scenarios recommended for the Tier 3 analysis is given in Section 5.1.

Table C.1.7. Individual Cancer Risk: Carcinogens

$$Cancer\ Risk = \frac{I \cdot ED \cdot EF \cdot CSF}{BW \cdot AT \cdot 365}$$

Parameter	Description	Values
Cancer Risk	Individual lifetime cancer risk (unitless)	--
I	Total daily intake of contaminant (mg/d)	calculated (see Table C.1.6)
ED	Exposure duration (yr)	subsistence farmer: 40 subsistence fisher: 30 adult resident: 30 child resident: 6
EF	Exposure frequency (day/yr)	350
BW	Body weight (kg)	adult: 70 child: 15
AT	Averaging time (yr)	70
365	Units conversion factor (day/yr)	
CSF	Oral cancer slope factor (per mg/kg/d)	chemical-specific (see Appendix A)

Description

This equation calculates the individual cancer risk from indirect exposure to carcinogenic chemicals. The body weight varies for the child and the adult. The exposure duration varies for different scenarios.

Table C.1.8. Hazard Quotient : Noncarcinogens

$$HQ = \frac{I}{BW \cdot RfD}$$

Parameter	Description	Values
HQ	Hazard quotient (unitless)	
I	Total daily intake of contaminant (mg/d)	calculated (see Table C.1.6)
BW	Body weight (kg)	adult: 70 child: 15
RfD	Reference Dose (mg/kg/d)	chemical-specific (see Appendix A)

Description

This equation calculates the hazard quotient for indirect exposure to noncarcinogenic chemicals. The body weight varies for the child and the adult.

Table C.1.9. Total Cancer Risk for Subsistence Farmer Scenario: Carcinogens		
$$Total\ Cancer\ Risk = \sum_i Cancer\ Risk_i$$		
Parameter	**Description**	**Value**
Total Cancer Risk	Total individual lifetime cancer risk for all chemicals (unitless)	
Cancer Risk$_i$	Individual lifetime cancer risk for chemical carcinogen I (unitless)	calculated (see Table C.1.7)
Description		
For carcinogens, cancer risks are added across all carcinogenic chemicals. See Appendix A for identification of carcinogens.		

Table C.1.10. Hazard Index for Specific Organ Effects for Subsistence Farmer Scenario: Noncarcinogens

$$HI_j = \sum_i HQ_i$$

Parameter	Description	Value
HI_j	Hazard index for specific organ effect j (unitless)	
HQ_i	Hazard quotient for chemical I with specific organ effect j (unitless)	calculated (see Table C.1.8)

Description

For noncancer health effects, hazard quotients are added across chemicals when they target the same organ to calculate an overall hard index. See Appendix A for identification of noncarcinogens and their associated target organ.

This Page Intentionally Left Blank

C.2 Direct Inhalation Exposures

This section provides the equations needed for characterizing risk from direct inhalation exposures for all exposure scenarios. The following equation tables are included:

Table C.2.1. Inhalation Cancer Risk for Individual Chemicals from Unit Risk Factor: Carcinogens		
$$Cancer\ Risk = C_a \cdot URF$$		
Parameter	**Description**	**Value**
Cancer Risk	Individual Lifetime cancer risk (unitless)	
C_a	Concentration in air ($\mu g/m^3$)	calculated (see Appendix B)
URF	Inhalation Unit Risk Factor (per $\mu g/m^3$)	chemical-specific (see Appendix A)

Table C.2.2. Inhalation Cancer Risk for Individual Chemicals from Carcinogenic Slope Factor: Carcinogens

$$Cancer\ Risk = ADI \cdot CSF_{inh}$$

$$ADI = \frac{C_a \cdot IR \cdot ET \cdot EF \cdot ED \cdot 0.001\ mg/\mu g}{BW \cdot AT \cdot 365\ day/yr}$$

Parameter	Description	Value
Cancer Risk	Individual Lifetime cancer risk (unitless)	
ADI	Average daily intake via inhalation (mg/kg/day)	
C_a	Concentration in air (µg/m^3)	calculated (see Appendix B)
IR	Inhalation rate (m^3/hr)	adult: 0.83 child: 0.3
ET	Exposure time (hr/day)	24
EF	Exposure frequency (day/yr)	350
ED	Exposure duration (yr)	subsistence farmer: 40 subsistence fisher: 30 adult resident: 30 child resident: 6
BW	Body weight (kg)	adult: 70 child: 15
AT	Averaging time (yr)	70
CSF_{inh}	Inhalation Carcinogenic Slope Factor (per mg/kg/day)	chemical-specific (see Appendix A)

Table C.2.3. Inhalation Hazard Quotient for Individual Chemicals: Noncarcinogens

$$HQ = \frac{C_a \cdot 0.001\ mg/\mu g}{RfC}$$

Parameter	Description	Value
HQ	Hazard quotient (unitless)	
C_a	Concentration in air ($\mu g/m^3$)	calculated (see Appendix B)
RfC	Reference Concentration (mg/m^3)	chemical-specific (see Appendix A)

Table C.2.4. Total Inhalation Cancer Risk: Carcinogens		
$$Total\ Cancer\ Risk = \sum_i Cancer\ Risk_i$$		
Parameter	**Description**	**Value**
Total Cancer Risk	Total individual lifetime cancer risk for all chemicals (unitless)	
Cancer $Risk_i$	Individual lifetime cancer risk for chemical carcinogen I (unitless)	calculated (see Tables C.2.1, C.2.2)
Description		
For carcinogens, cancer risks are added across all carcinogenic chemicals. See Appendix A for identification of carcinogens.		

Table C.2.5. Hazard Index for Inhalation: Noncarcinogens

$$HI_{inh} = \sum_i HQ_i$$

Parameter	Description	Value
HI_{inh}	Hazard index for inhalation (unitless)	
HQ_i	Hazard quotient for chemical I (unitless)	calculated (see Table C.2.3)

Description

For noncancer health effects, hazard quotients are added across chemicals when they target the same organ to calculate an overall hazard index. See Appendix A for identification of noncarcinogens and their associated target organ.

C.3 Breast Milk Exposure for Dioxins

To determine the average daily dose for a breast-feeding infant, the concentration of dioxin in the mother's milk must first be determined. Table C.3.1 provides equations for calculating the concentration of dioxin in maternal milk. Once the contaminant concentration in maternal milk is determined, the equation in Table C.3.2 is used to determine the average daily dose for infant exposure in pg/kg/day.

Further research is required in the area of risk characterization of infant exposures. Many questions still exist about how to quantify a lifetime risk for exposure during this very short and developmentally critical period of time. The significance of the average daily dose calculation is unclear, especially considering that many dioxin-like compounds reach steady-state levels only during chronic exposures. As research provides new and better methods of characterizing breastmilk exposure they should be thoughtfully considered. Until that point, this guidance suggests that the average daily dose for one year of breastmilk exposure be compared to the average adult background exposure level for 2,3,7,8-TCDD-TEQ of 50 pg/kg/day, as suggested in the Dioxin Exposure Document.

Table C.3.1. Concentration in Maternal Milk

$$C_{(milkfat)} = \frac{I \cdot 10^9 \cdot h \cdot f_1}{0.693 \cdot f_2 \cdot BW_{adult}}$$

Parameter	Description	Value
$C_{(milkfat)}$	Concentration in maternal milk for a given exposure scenario (pg/kg of milkfat)	
I	Average maternal intake of dioxin for each adult exposure scenario (mg/day)	calculated (see Table C.1.6)
10^9	Conversion constant (pg/mg)	
h	Half-life of dioxin in adults (days)	2555
f_1	Proportion of ingested dioxin that is stored in fat (unitless)	0.9
f_2	Proportion of mother's weight that is fat (unitless)	0.3
BW (adult)	Adult Body Weight (kg)	70

Table C.3.2. Average Daily Dose to the Exposed Infant

$$ADD_{(infant)} = \frac{C_{(milkfat)} \cdot f_3 \cdot f_4 \cdot IR_{milk} \cdot ED}{BW_{infant} \cdot AT}$$

Parameter	Description	Value
$ADD_{(infant)}$	Average daily dose for infant exposed to contaminated breastmilk (pg/kg/day)	
$C_{(milkfat)}$	Concentration in maternal milk for a given exposure scenario (pg/kg of milkfat)	calculated (see Table C.3.1)
f_3	Fraction of fat in breastmilk (unitless)	0.04
f_4	Fraction ingested contaminant which is absorbed (unitless)	0.9
IR_{milk}	Ingestion rate of breastmilk (kg/d)	0.8
ED	Exposure duration (year)	1
BW_{infant}	Body weight of infant (kg)	10
AT	Averaging time (year)	1

Appendix C-2

Equation for Soil Concentration Due to Depostion

EVOLUTION OF SCREENING-LEVEL RISK ANALYSES FOR COMBUSTION SOURCES

Michael T. Mills
ENSR
Acton, MA 01720

Alexandra S. French
Massachusetts Department of Public Health
Boston, MA 02108

ABSTRACT

Over the last several years, the U.S. EPA has developed a number of guidance documents to aid in assessing potential health risks associated with direct and indirect exposures to compounds emitted from combustion facilities. The complete screening risk assessment process, from the initial emissions characterization to the calculation of potential health risks, continues to be refined. Evaluation of exposures and risks for several different types of receptors are now based on the latest U.S. EPA modeling recommendations for air dispersion and deposition as well as fate and transport. The screening guidance presents the algorithms for this process in the form of coupled algebraic equations, which can be evaluated by use of a computerized spreadsheet.

During the course of development of screening guidance, the list of candidate compounds of concern that must be evaluated, as well as the number of properties for each compound, have expanded over time. Additional exposure pathways have also been recommended for inclusion, such as the consumption of drinking water, ingestion of poultry and eggs, and infant exposure to dioxins in breast milk. In addition, default exposure assumptions and parameters have changed. Although the guidance documents provide a means of establishing consistency in evaluating the potential carcinogenic and non-carcinogenic risks due to emissions from many facilities across the U.S., uncertainties still remain concerning the choice of input parameters and the modeling of transport phenomena.

INTRODUCTION

The U.S. EPA has developed a number of guidance documents (References 1-4) for estimating health impacts associated with the operation of combustion sources, particularly those which burn hazardous wastes. In these documents equations are presented for the calculation of carcinogenic and non-carcinogenic effects due to both direct exposure (inhalation) and indirect exposure (ingestion) of a number of target compounds. The mechanisms for indirect exposure involve the ingestion of contaminated soil, vegetables, beef, pork, milk, poultry, eggs, fish and drinking water. Since they included a limited number of pathways, chemicals and receptors, the early guidance documents described what could be considered "screening-level" risk assessments. Each succeeding document introduced a greater degree of complexity into the analysis so that today the level of detail approaches that of a "full" risk assessment. This paper examines the evolution of the risk assessment guidance for combustion sources, its computer implementation and approaches to sensitivity and uncertainty analysis of the results. It also presents a method for the calculation of average soil concentrations, at topic that has been the subject of some confusion in the guidance documents.

PHENOMENA CONSIDERED

The transport of toxic chemicals from the point of release to the point of inhalation or ingestion is a complex process. The analysis must consider widely diverse phenomena such as atmospheric turbulence; vapor and particle deposition; soil leaching and erosion; and the bio-accumulation of chemicals. The risk to a receptor can depend in a non-linear fashion upon input variables such as precipitation and soil mixing depth. The various phenomena included in the risk assessment methodology are summarized below.

Dispersion and Deposition of Particles and Gases

Compounds of concern are assumed to be released either from point sources of combustion or as fugitive emissions from area or volume sources. For each compound of concern, one must specify which fraction of the mass is associated with a particle and which fraction is emitted to the atmosphere as a vapor. The calculation of the transport and dispersion of these emissions into the air is performed by use of the EPA Industrial Source Complex (ISC) Model. The model accounts for dispersion phenomena such as plume rise, atmospheric turbulence and dilution from building wakes. Calculated annual average concentrations are based upon historical meteorological data for the area in question.

Particle dry and wet deposition is calculated on the basis of the particle size distribution and the assumption of whether a particular compound is distributed over the particle surface or uniformly throughout the volume of the particle. Calculated particle air concentrations reflect the depletion of the plume due to upwind deposition. Vapor wet deposition is calculated by ISC based upon a user-specified washout coefficient and historical precipitation data. Vapor dry deposition on dry surfaces is calculated by multiplying the annual average air concentration by a pollutant-specific deposition velocity. The vapor transfer to a water body is calculated as the product of the air concentration and a transfer "velocity" which depends upon the wind speed; the vapor pressure of the substance; its solubility and diffusivity in water; and its diffusivity in air.

Concentration of Toxic Compounds in the Soil

Compounds which reach the soil by means of dry and wet deposition are assumed to be mixed uniformly within a given depth which ranges from 1 cm for soil which can be directly ingested (by humans or livestock) to 20 cm for garden soil for above-ground vegetables. With the assumption of a soil bulk density (e.g. 1.5 g/cm^3), the concentration of a compound can be expressed in terms of the mass of the compound per mass of dry soil. Compounds can be removed from the soil by the following processes:

- Soil leaching;
- Soil erosion (only considered for the drinking water and fishing pathways);
- Surface runoff;
- Biological degradation (usually neglected in for screening risk assessments); and
- Volatilization of vapors

The coefficients of depletion for all the processes listed above are inversely proportional to the soil mixing depth. The leaching and runoff losses depend upon precipitation characteristics, the volumetric water content of the soil, the soil-water partition coefficient for the particular compound, and the soil bulk density. In addition to these parameters, the erosion loss coefficient depends upon a number of empirical soil loss parameters that must be estimated for the watershed in question.

These addition and removal processes for each compound can be described by a non-linear equation that gives the soil concentration as a function of time from the operation of the combustion source in question. For use in the calculation of excess cancer risk, these soil concentrations must be averaged over the exposure duration of the individual receptor (e.g. adult, child, farmer or fisher). For the assessment of non-cancer impacts, the guidance recommends the use of the calculated soil concentration at the end of the facility-operating period (maximum value) rather than an average value.

Concentration of Toxic Compounds in Plants

Leafy garden vegetables as well as animal forage and silage can incorporate toxic compounds through direct deposition of particles; air-to-plant transfer of vapors; and root uptake of compounds from contaminated soil. Grains for animal feed can only be contaminated through root uptake of toxic compounds. The original guidance considered root vegetables, but these were omitted from consideration in subsequent guidance documents. For each of the uptake routes, concentration factors are specified for each target chemical.

Toxic Compound Concentrations in Drinking and Fishing Water Bodies

Water bodies can receive toxic compounds by the following mechanisms:

- Dry and wet deposition of particles from the atmosphere;
- Wet deposition of vapors from the atmosphere;
- Diffusion of toxic vapors to the body of water;
- Runoff from pervious surfaces;
- Runoff from impervious surfaces; and
- Erosion of soil

Compounds entering the water body are diluted by the flow through the water body. Compounds are also removed from the water body by means of volatilization from the surface and burial in the benthic sediments at the bottom. The following chemical concentrations are calculated for the water body:

- Total concentration in the water column;
- Dissolved phase water concentration; and
- Concentration sorbed to bed sediments

Depending upon the type of compound, the concentration of a compound in fish is determined from one of the above concentrations and a compound-specific concentration factor. The dissolved phase water concentration is used in the calculation of drinking water exposure since the water is likely to be filtered.

Along with the addition, dilution and removal rates, these calculated water body concentrations depend upon the following parameters:

- Bed sediment/sediment pore water partition coefficient (chemical specific),
- Suspended sediment/surface water partition coefficient (chemical specific),
- Concentration of suspended solids,
- Bed sediment porosity,
- Bed sediment concentration, and
- Depth of the water column and the benthic layer

Toxic Compound Concentrations in Animal Products

Calculated toxic chemical concentrations in animal products are based upon consumption rates of different types of feed; the chemical concentrations in the feed; and the chemical-specific transfer factors for the different animal products. In addition to the ingestion of chemicals from the feed, animals are assumed to ingest a given amount of contaminated soil during feeding. The following animal products are currently addressed in the risk assessment guidance: beef, milk, pork, poultry and eggs.

Human Intake of Toxic Compounds

In the risk assessments, the intake of toxic compounds is assumed to take place through the following pathways:

- Inhalation of toxic particles and vapors,
- Drinking contaminated water,
- Ingestion of contaminated soil,
- Consumption of above-ground garden vegetables,
- Consumption of animal products (beef, milk, pork, poultry and eggs), and
- Consumption of fish

Consumption rates for each of these pathways are specified for the different receptors (e.g. adult resident, child resident, farmer and fisher).

Calculated Risks for Carcinogens and Non-carcinogens

Excess lifetime cancer risk is calculated separately for inhalation and ingestion exposures and the two risks are summed to estimate the combined risk. The cancer risk for inhalation of a particular compound is calculated as a function of the inhalation rate, the concentration of the compound in air, the body weight of the individual, the duration of exposure and the inhalation cancer slope factor for the compound in question. The cancer risk for the ingestion of a particular compound is calculated as a function of the ingestion rate of the compound, the body weight of the individual, the duration of exposure and the oral cancer slope factor for the compound in question. For screening purposes the lifetime risk for inhalation and ingestion combined is compared to a threshold value of 10^{-5}.

For non-carcinogens a hazard quotient for ingestion is computed as the ratio of the chemical ingestion rate to the product of the body weight of the individual and a reference dose for the compound in question. The hazard quotient for inhalation is calculated as the ratio of the air concentration of the compound to a reference concentration. For non-carcinogens that have similar effects upon an organ, a hazard index should be calculated as the sum of the relevant inhalation and ingestion hazard quotients. For screening purposes these hazard indices are compared to a threshold value of 0.25.

EVOLUTION FROM SCREENING TO DETAILED ANALYSIS

Although the guidance for combustion sources was originally intended for screening-level risk assessments, with successive refinements it is now approaching the guidance for a full risk assessment. Examples of this increased level of detail from the original guidance are given below.

Increased number of receptors - From four receptors (adult resident, child resident, farmer and fisher), two more have been added in the EPA guidance (farmer's child and fisher's child) (Reference 4). The North Carolina guidance (Reference 3) lists up to 12 possible receptors.

Expanded list of target chemicals - The default number of target chemicals has been increased from 15 to 29 in the latest EPA guidance (Reference 4).

More chemical-specific parameters - New chemical specific parameters are the diffusivity in water, diffusivity in air, Henry's Law Coefficient, vapor deposition velocity, soil enrichment ratio, and the air-to-plant transfer correction factor.

Hazard-Indices - The list of organs and health effects has been expanded for the calculation of hazard indices.

New exposure pathways - The following exposure pathways have been added: drinking water, pork, chicken, eggs and breast milk. For each of these added pathways, chemical-specific transfer factors have been added to the list of chemical parameters.

New depletion mechanisms - Updated guidance now considers the depletion of compounds from soil and surface water by means of volatilization.

Average soil concentrations - Initial guidance recommended the use of soil concentrations corresponding to the time at which emissions from the facility would cease. This would be the maximum soil concentration because, after the emissions cease, the concentrations would no longer build up in the soil and would begin to drop due to processes such as leaching and volatilization. Recent guidance recommends that soil concentrations used in the calculation of excess cancer risk correspond to the average over the exposure time of the individual in question. To date recommended equations have been in error in each of the guidance documents. This issue of soil averaging time is explored in detail in the Appendix. Hazard quotients continue to be calculated by use of the maximum soil concentration.

It is interesting to examine the evolution of predicted cancer risk as the guidance documents have evolved. One notable example is benzo(a)pyrene (BAP) for a subsistence fisher receptor. For a particular source the cancer risk to a subsistence fisher due to ingestion of BAP was calculated as 1.7×10^{-4} on the basis of the EPA December 1994 Guidance (Reference 2). Based upon the North Carolina Guidance (Reference 3), the risk dropped to 6.4×10^{-8}. Based upon the latest EPA guidance (Reference 4), the risk has increased to 8.0×10^{-8}. These extreme variations in calculated risk were due only to changes in the transport and bio-accumulation parameters with no changes to the cancer slope factor!

SPREADSHEET IMPLEMENTATION OF THE GUIDANCE

The linked algebraic equations for the transport and bio-accumulation of toxic compounds can be incorporated in a spreadsheet format. The following input ranges are required for the risk and hazard calculations:

- Constants such as air/water density and viscosity,
- Non-compound specific parameters such as rainfall and water body volumetric flow rate,
- Body weight and exposure duration for each receptor,
- Intake rates for air, soil, vegetables and animal products for each of the receptors,
- Air concentrations and deposition rates for each chemical, and
- Compound-specific physical, chemical and toxicological parameters

Hundreds of parameters and thousands of equations are evaluated by the spreadsheet to calculate excess cancer risk and organ-specific hazard indices by chemical, receptor and pathway. Fortunately, advances in personal computer speed, memory and storage space make it possible to handle spreadsheets of this size and complexity. The resultant risk assessment spreadsheet is very much like a large financial accounting application.

Due to the large number of equations and input parameters, the development of the risk assessment spreadsheet is a tedious and time-consuming process. Approximately twice as much time must be devoted to quality assurance (QA) as to coding the equations and inputs in the first place. Within the spreadsheet workbook, each of the various types of inputs can be assigned to a different named sheet. The computations should, however, be assigned to a single sheet. This facilitates QA because the equations do not have to contain sheet references. Selected results from the main calculation sheet are referenced in output summary sheets that can serve as report tables or graphs.

The latest spreadsheet programs such as EXCEL and Lotus have the following additional powerful features that can extend the results of the risk assessment:

- Capability of generating 1, 2 or 3-way "what-if" tables to examine the effect of the joint variation of inputs parameters upon the final risk results.

- A linear programming feature which can minimize (or maximize) a given function consistent with constraints imposed on one or more output parameters. If the cost of emissions control can be expressed as a function of the toxic compound emissions, then this cost can be minimized by varying the emission rates with the constraint that the cancer risk and hazard quotient be less than a threshold value.

- Spreadsheet "add-in" applications allow one to compute the uncertainty of an output value based upon the uncertainty in one or more input values. These Monte-Carlo simulations give the model user an understanding of the cumulative effect of input parameter uncertainty.

CONCLUSION

Risk assessment guidance for combustion sources has evolved from a screening procedure with a limited number of chemicals, pathways and receptors to a scale full-risk assessment. The spreadsheet implementation of this guidance offers a number of powerful tools for the analysis of model sensitivity and uncertainty. Screening results can also be optimized to yield the lowest cost emissions configuration consistent with the attainment of risk and hazard thresholds.

REFERENCES

1. "Guidance for Performing Screening Level Risk Analyses at Combustion Facilities Burning Hazardous Wastes," Office of Emergency and Remedial Response, EPA Office of Solid Waste, April 15, 1994.

2. "Guidance for Performing Screening Level Risk Analyses at Combustion Facilities Burning Hazardous Wastes," Office of Emergency and Remedial Response, EPA Office of Solid Waste, December 14, 1994.

3. "North Carolina Protocol for Performing Indirect Exposure Risk Assessments for Hazardous Waste Combustion Units," Prepared for the State of North Carolina Division of Waste Management by Research Triangle Institute, January 1997.

4. "Protocol for Screening Level Human Risk Assessment at Hazardous Waste Combustion Facilities," EPA-R6-096-002, EPA Office of Solid Waste, February 28, 1997.

APPENDIX - SOIL CONCENTRATION AVERAGING FOR COMBUSTOR RISK ASSESSMENTS

In the various EPA guidance documents the buildup and decay of chemical concentration in soil is described by the following simple differential equation:

$$\frac{dS_c}{dt} = -k_s S_c + D_s \qquad \text{(A-1)}$$

where

S_c = concentration of chemical in soil (mg-chemical/kg-soil)

k_s = soil loss constant (yr^{-1})

D_s = deposition term (mg-chemical/kg-soil/year)

t = time (year)

If the deposition term is assumed to be a constant value, D_s, during the facility operating period of T_c years and then zero thereafter, then Equation (A-1) can be solved to yield the following expression of soil-chemical concentration as a function of time:

$$S_c = \frac{D_s(1-\exp(-k_s t))}{k_s} \quad for\ t \leq T_c \qquad \text{(A-2)}$$

$$S_c = S_c(T_c)\exp(-k_s(t-T_c)) \quad for\ t > T_c \qquad \text{(A-3)}$$

where

$$S_c(T_c) = \frac{D_s(1-\exp(-k_s T_c))}{k_s} \qquad \text{(A-4)}$$

Rather than deal with the soil loss constant, k_s, it is more convenient to use the half-life of the chemical in soil, $T_{1/2}$. This is the time required for the soil concentration to decay to half its value in the absence of any chemical input from atmospheric dry and wet deposition. The half-life is given in terms of the soil loss constant by the following expression:

$$T_{1/2} = \frac{\ln(2)}{k_s} \qquad \text{(A-5)}$$

The variation of soil concentration with time, for a facility lifetime of 30 years and a chemical half-life of 20 years, is shown in Figure (A-1). For convenience of plotting, the non-dimensionalized concentration, $S_c k_s/D_s$, has been used. The concentration is seen to increase until it reaches a maximum at $t = T_c$, and then fall thereafter. Consider the following two extremes for the variation of soil concentrations with time:

- The half-life is relatively small (e.g. 1 year) so that the soil concentration quickly approaches a steady state which is maintained until $t = T_c$ and then falls rapidly (see Figure (A-2)).

- The half-life is relatively large (e.g. 500 years) so that the soil concentration increases almost linearly with time until $T = T_c$, after which it falls quite slowly (see Figure (A-3)).

In the April 1994 version of the EPA screening guidance (Reference 1), the maximum soil concentration $S_c(T_c)$ was recommended for use in the risk assessment calculations. The December 1994 Guidance (Reference 2) and the North Caroline Guidance (Reference 3) recommended the use of a soil concentration averaged over the exposure time of an individual, but the equations presented in the Guidance documents were incorrect. A method for calculating a maximum exposure-time-averaged soil concentration is presented below.

Let the exposure to an individual start at a time T_s after the beginning of facility operation. If T_e is the exposure duration, then the maximum exposure-averaged soil concentration will occur when $T_s \le T_c \le T_s + T_e$. This is due to the fact that the maximum concentration occurs at $t = T_c$. The average soil concentration, S_{ca}, over the period $(T_s, T_s + T_e)$ is found by integration of the concentration over this interval with respect to time and then dividing by the exposure time, T_e, to obtain:

$$S_{ca} = \frac{D_s(T_c - T_s)}{k_s T_e} + \left(\frac{D_s}{k_s^2 T_e}\right)\left(\exp(-k_s T_c) - \exp(-k_s T_s)\right) - \left(\frac{S_c(T_c)}{k_s T_e}\right)\left(\exp(-k_s(T_s + T_e - T_c)) - 1\right) \tag{A-6}$$

The average concentration, S_{ca}, is plotted in Figure (A-4) as a function of exposure start time, T_s, for the case of a facility operating time of 30 years, an exposure time of 40 years and a chemical half-life in the soil of 20 years. Again, for convenience of plotting, this concentration has been normalized by multiplication by k_s and division by D_s. There is clearly a value of T_s for which the average concentration is a maximum. This start time, T_s, for maximum concentration can be found by differentiating Equation (A-6) with respect to T_s, setting the result to zero and then solving for start time, T_{smax}, which gives the maximum average concentration. This start time for maximum average concentration is given by:

$$T_{smax} = \frac{\ln\left(1 + (1 - \exp(-k_s T_c))\exp(-k_s(T_e - T_c))\right)}{k_s} \tag{A-7}$$

When this value of T_{smax} is substituted for T_s in Equation (A-6), we obtain the maximum concentration, S_{camax}, averaged over the exposure time.

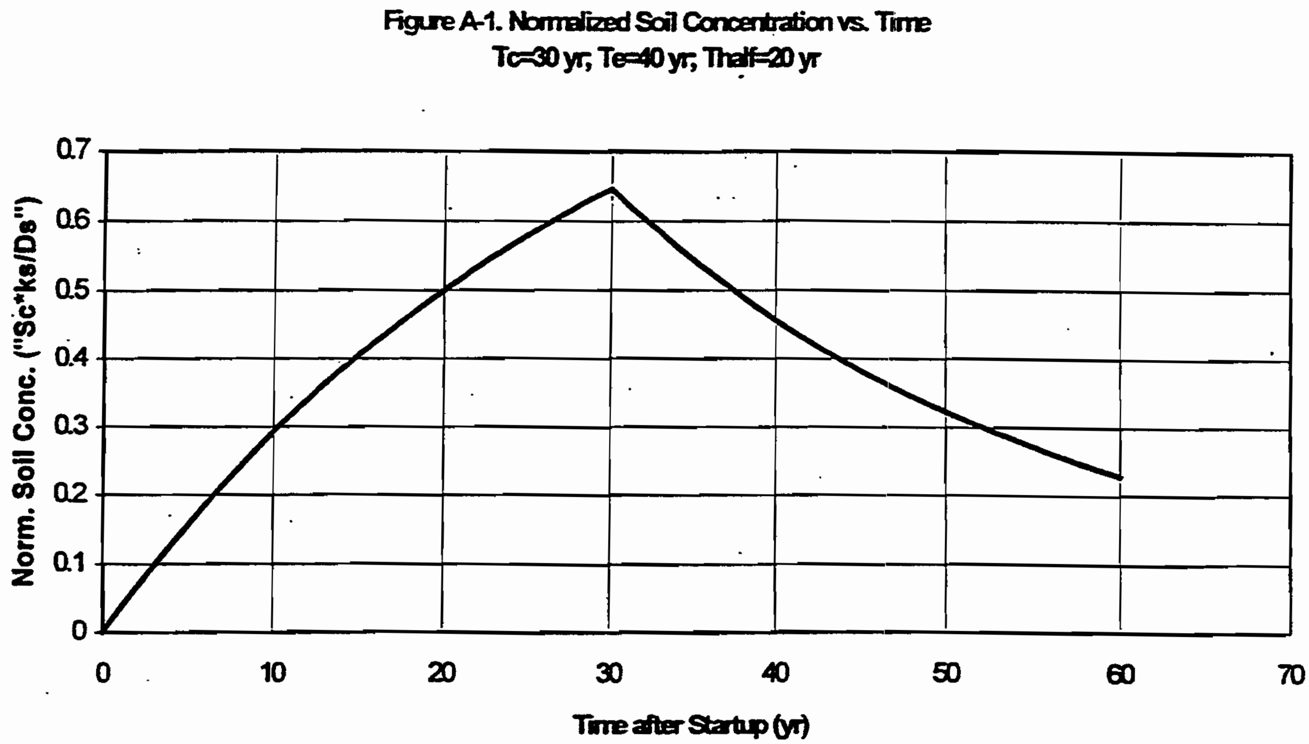


Figure A-1. Normalized Soil Concentration vs. Time
Tc=30 yr; Te=40 yr; Thalf=20 yr
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Norm. Soil Conc. ("Sc*ks/Ds")
0
10
20
30
40
50
60
70
Time after Startup (yr)

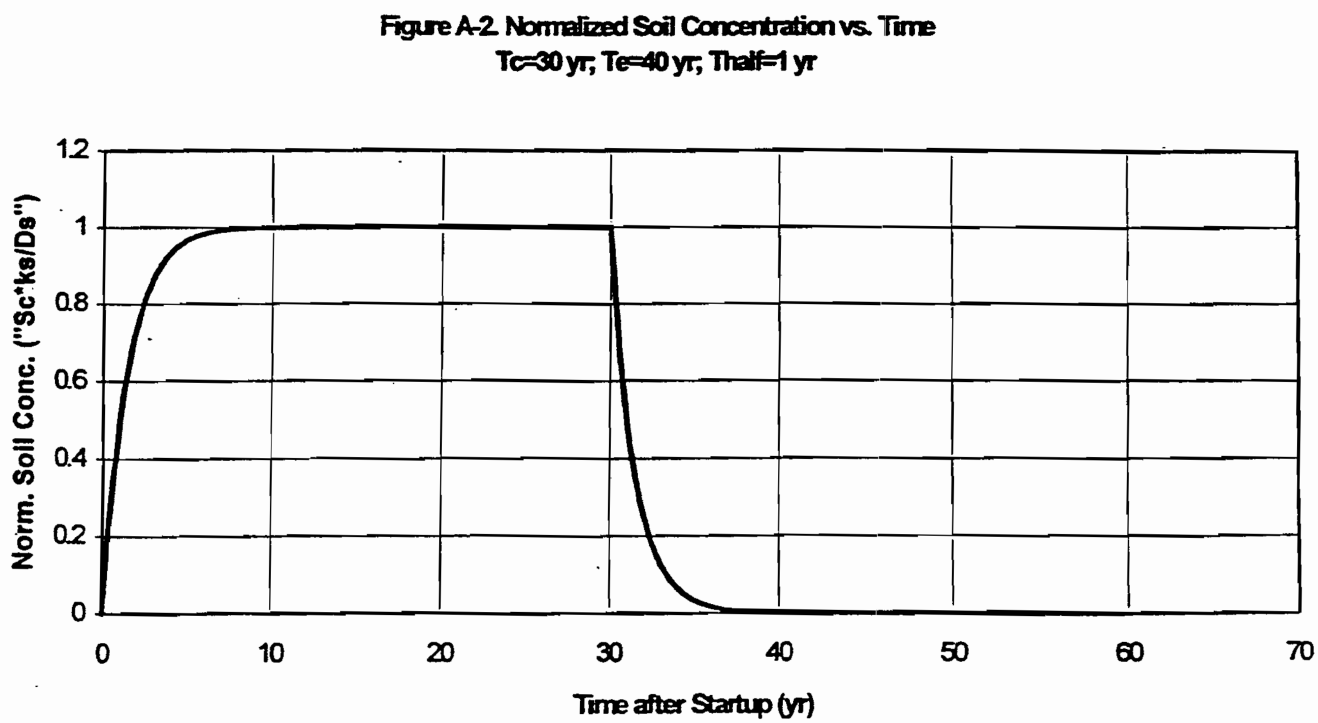


Figure A-2. Normalized Soil Concentration vs. Time
Tc=30 yr; Te=40 yr; Thalf=1 yr
1.2
1
0.8
0.6
0.4
0.2
0
Norm. Soil Conc. ("Sc*ks/Ds")
0
10
20
30
40
50
60
70
Time after Startup (yr)

Figure A-3. Normalized Soil Concentration vs. Time
Tc=30 yr; Te=40 yr; Thalf=500 yr

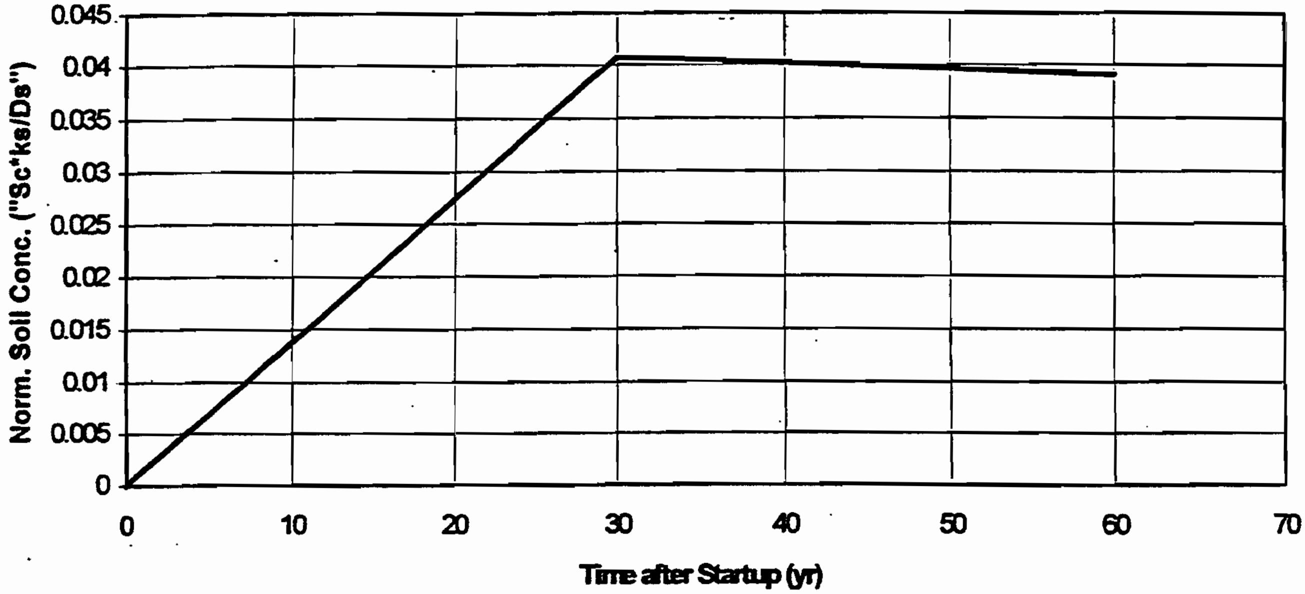
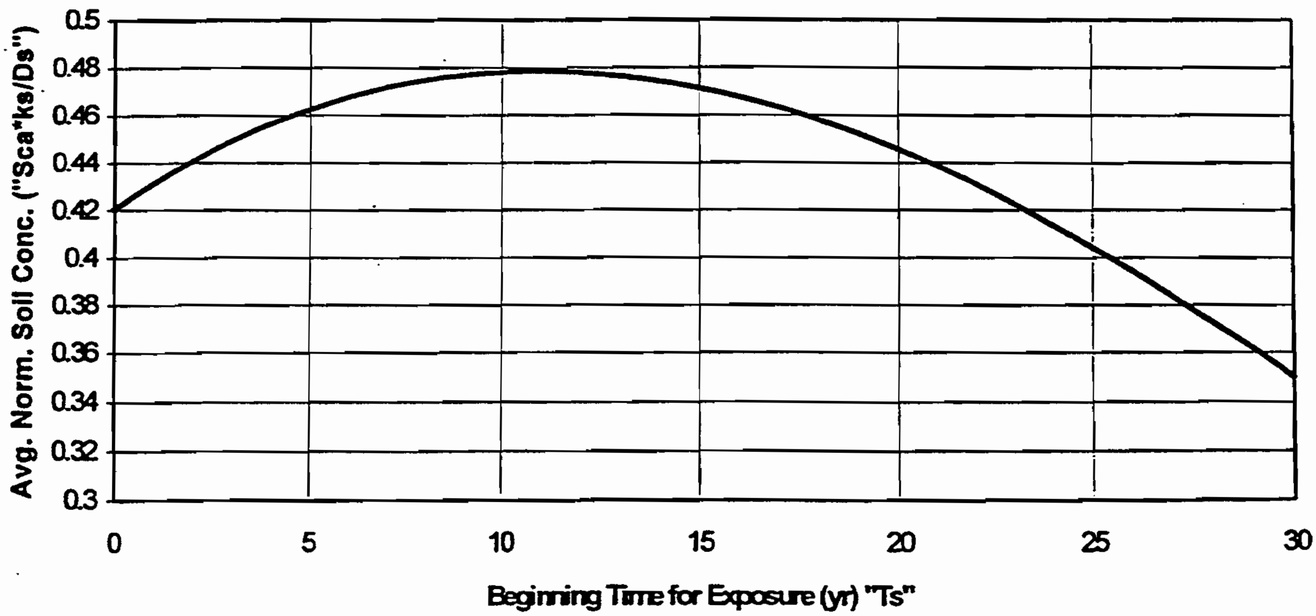


Figure A-4. Average Normalized Soil Conconcentration vs Expposure Start
Tc=30 yr; Te=40 yr; Thalf=20 yr



Appendix C-3

Equation for Uptake into Below-ground Vegetables [Except for PCDD/PCDFs, which use U.S. EPA (1998a)]

EQUATION FOR UPTAKE INTO BELOW GROUND VEGETABLE

Equation for Uptake into Below-Ground Vegetable

Since the root-vegetable pathway had been dropped from U.S. EPA (1994e) and NCDEHNR (1997), the contaminant concentration in root-vegetables was calculated by use of the following equation (Reference 2):

$$C_{bgv} = \frac{C_s \ RCF \ V_{bg}}{Kd_s}$$

where

C_{bgv} = fresh-weight concentration of contaminant in below-ground vegetables (mg/kg)

C_s = contaminant concentration in soil (mg/kg)

K_{ds} = soil-water partition coefficient (L/kg)

RCF = root concentration factor equaling the ratio of the contaminant concentration in roots (fresh weight basis) and the concentration in soil water (unitless)

VG_{bg} = empirical correction factor for below-ground vegetation which accounts for the differences in the barley roots for which the RCF was derived and bulky below-ground vegetables (unitless)

For all of the contaminants considered in the Oxychem risk assessment, the empirical correction factor was conservatively set equal to 1. The RCF values were obtained from References 1 and 3. If no value was found, the RCF was calculated by use of the following equation (Reference 4):

$$RCF = 0.82 + 10^{(0.77 \log(Kow) - 1.52)}$$

where

Kow = octanol-water partition coefficient (dimensionless)

References

1) "North Carolina Protocol for Performing Indirect Exposure Risk Assessments for Hazardous Waste Combustion Units." January, 1997.

2) "Estimating Exposure to Dioxin-Like Compounds. Volume II: Site-Specific Assessment Procedures." EPA/600/6-88/005Cc, June 1994. Pages 4-48 to 4-49.

3) "Protocol for Screening Level Human Risk Assessment at Hazardous Waste Combustion Facilities." EPA-R6-096-002. EPA Office of Solid Waste. February 28, 1997.

4) "Addendum to the Methodology for Assessing Health Risks Associated with Indirect Exposure to Combustor Emissions." EPA Office of Research and Development. EPA/600/AP-93/003. November, 1993.

Appendix D-1

Non-Chemical-specific Model parameters

Table D-1

*** Non-Chemical Specific Parameters ***

Note: <ss> = site-specific; <def> = default

=== Constants and Non-Scenario Specific Parameters ===
(Volatilization from Soil)

Ambient air temperature (degK) "T" (for Henry's Law) <ss>	2.980E+02
Average annual wind speed (m/s) "u" <ss>	3.900E+00
Universal Gas Constant (atm-m**3/(mole degK)) "Rgas" <const>	8.205E-05
Viscosity of air (g/(cm s)) "MUa" <def>	1.810E-04
Upwind area for volatilization calculation (m**2) "A"<ASTM>	1.000E+00
Density of air (g/cm**3) <def>	1.200E-03

(Liquid/Gas Phase Transfer Coefficients)

Drag coefficient (quiescent water) "Cd" <def>	1.100E-03
Wind speed @10m (quiescent water) (m/s) "W" <ss>	3.900E+00
Density of air @water temp. (quiescent water) (g/cm**3)<def>	1.200E-03
Density of water @water temp.(quiescent water)(g/cm**3)<def>	1.000E+00
Water temperature (degK) "Tk" <ss>	2.980E+02
Von Karman's constant (quiescent water) "k" <const>	4.000E-01
Dimensionless sublayer thickness (quiescent water) "lamda2"	4.000E+00
Water viscosity (quiescent water) (g/(cm s)) "Muw" <def>	1.690E-02
Temperature correction factor "theta" <def>	1.026E+00

======= Soil Ingestion =======

--- Soil Concentration Due to Deposition ---

Total time over which deposition occurs (yrs) "Tc"<ss>	3.000E+01
Soil mixing depth (cm) "Z"<ss>	5.000E+00
Soil bulk density (g/cm**3) "BD"<def>	1.500E+00
Volumetric soil water content (cm**3/cm**3) "THETAs"<def>	2.000E-01
Annual precipitation (cm/yr) "P"<ss>	1.120E+02
Annual irrigation (cm/yr) "I"<ss>	1.230E+01
Annual runoff (cm/yr) "R" <ss>	2.540E+01
Annual evapotranspiration (cm/yr) "EV" <ss>	3.050E+01
Loss constant due to soil erosion (yr**-1) "kse"<def>	0.000E+00
Calculate soil volatilization (1); or use data base (2)?	1
Average soil concentration calculation index (see options below) --------->	2

(1) Average over facility operating time
(2) Follow North Carolina Guidance
(3) ENSR exact solution

======= Consumption of Above-Ground Vegetables ======

--- Above Ground Vegetable Concentration Due to Root Uptake ---

Total time over which deposition occurs (yrs) "Tc"<ss> (same as for soil ingest.)	3.000E+01
Soil mixing depth (cm) "Z"<ss>	1.500E+01
Soil bulk density (g/cm**3) "BD"<def>	1.500E+00
Volumetric soil water content (cm**3/cm**3) "THETAs"<def>	2.000E-01
Annual precipitation (cm/yr) "P"<ss>	1.120E+02

Table D-1

*** Non-Chemical Specific Parameters ***

Note: <ss> = site-specific; <def> = default	
Annual irrigation (cm/yr) "I"<ss>	1.230E+01
Annual runoff (cm/yr) "R" <ss>	2.540E+01
Annual evapotranspiration (cm/yr) "EV" <ss>	3.050E+01
Loss constant due to soil erosion (yr**-1) "kse"<def>	0.000E+00
Calculate soil volatilization (1); or use data base (2)?	1
Average soil concentration calculation index (see options below) --------->	2
(1) Average over facility operating time	
(2) Follow North Carolina Guidance	
(3) ENSR exact solution	

--- Above Ground Vegetable Concentration Due to Direct Deposition ---

Interception fraction of edible portion of plant "Rp"<def>	4.000E-02
Plant surface loss coefficient (yr**-1) "kp"<def>	1.800E+01
Length of plant exposure of edible portion of plant, per harvest (yrs) "Tp"<def>	1.600E-01
Yield or standing crop biomass of the edible portion of the plant (kg DW/m**2) "Yp"<def>	1.700E+00

--- Above Ground Vegetable Concentration for Air-to-Plant Transfer ---

Density of air (g/m**3) "rhoa"<def>	1.200E+03

======== Consumption of Root Vegetables ========

(Pathway not Included in Dec. 1994 Guidance, but was in April 1994 Guidance)

--- Soil Concentration Due to Deposition ---

Below ground vegetable correction factor "VGbg"	1.000E-02
Total time over which deposition occurs (yrs) "Tc"<ss>(same as soil ingestion)	3.000E+01
Soil mixing depth (cm) "Z"<ss>	1.500E+01
Soil bulk density (g/cm**3) "BD"<def>	1.500E+00
Volumetric soil water content (cm**3/cm**3) "THETAs"<def>	2.000E-01
Annual precipitation (cm/yr) "P"<ss>	1.120E+02
Annual irrigation (cm/yr) "I"<ss>	1.230E+01
Annual runoff (cm/yr) "R" <ss>	2.540E+01
Annual evapotranspiration (cm/yr) "EV" <ss>	3.050E+01
Loss constant due to soil erosion (yr**-1) "kse"<def>	0.000E+00
Calculate soil volatilization (1); or use data base (2)?	1
Average soil concentration calculation index (see options below) --------->	2
(1) Average over facility operating time	
(2) Follow North Carolina Guidance	
(3) ENSR exact solution	

======== Consumption of Beef, Milk, Pork, Eggs and Chicken ========

--- Soil Concentration Due to Deposition ---

Total time over which deposition occurs (yrs) "Tc"<ss> (same as soil ingestion)	3.000E+01
Soil mixing depth for animal ingestion (cm) "Zingest"<ss>	5.000E+00
Soil mixing depth for animal forage (cm) "Zfor"<ss>	5.000E+00

Table D-1

*** Non-Chemical Specific Parameters ***

Note: <ss> = site-specific; <def> = default	
Soil mixing depth for animal silage (cm) "Zsil"<ss>	5.000E+00
Soil mixing depth for animal grain (m) "Zgrain"<ss>	5.000E+00
Soil bulk density (g/cm**3) "BD"<def>	1.500E+00
Volumetric soil water content (cm**3/cm**3) "THETAs"<def>	2.000E-01
Annual precipitation (cm/yr) "P"<ss>	1.120E+02
Annual irrigation (cm/yr) "I"<ss>	1.230E+01
Annual runoff (cm/yr) "R" <ss>	2.540E+01
Annual evapotranspiration (cm/yr) "EV" <ss>	3.050E+01
Loss constant due to soil erosion (yr**-1) "kse"<def>	0.000E+00
Calculate soil volatilization (1); or use data base (2)?	1
Average soil concentration calculation index (see options below) --------->	2
(1) Average over facility operating time	
(2) Follow North Carolina Guidance	
(3) ENSR exact solution	

---Forage Concentration Due to Direct Deposition ---

Interception fraction of edible portion of forage "Rp1"<def>	5.000E-01
Forage surface loss coefficient (yr**-1) "kp1"<def>	1.800E+01
Length of exposure of edible portion of forage, per harvest (yrs) "Tp1"<def>	1.200E-01
Yield or standing crop biomass of the edible portion of the forage (kg DW/m**2) "Yp1"<def>	2.400E-01

---Silage Concentration Due to Direct Deposition ---

Interception fraction of edible portion of silage "Rp2"<def>	4.600E-01
Silage surface loss coefficient (yr**-1) "kp2"<def>	1.800E+01
Length of exposure of edible portion of silage per harvest (yrs) "Tp2"<def>	1.200E-01
Yield or standing crop biomass of the edible portion of the silage (kg DW/m**2) "Yp2"<def>	8.000E-01

--- Beef Concentration Due to Plant and Soil Ingestion ---

Fraction of forage grown on contaminated soil and eaten by the beef cow "F1beef"<def>	1.000E+00
Quantity of forage eaten by the beef cow each day (kg plant tissue DW/day) "Qp1beef"<ss>	8.800E+00
Fraction of silage grown on contaminated soil and eaten by the beef cow "F2beef"<def>	1.000E+00
Quantity of silage eaten by the beef cow each day (kg plant tissue DW/day) "Qp2beef"<ss>	0.000E+00
Fraction of grain grown on contaminated soil and eaten by the beef cow "F3beef"<def>	1.000E+00
Quantity of grain eaten by the beef cow each day (kg plant tissue DW/day) "Qp3beef"<ss>	0.000E+00
Quantity of soil eaten the beef cow (kg soil/day) "Qsbeef"<def>	5.000E-01

--- Milk Concentration Due to Plant and Soil Ingestion ---

Table D-1

*** Non-Chemical Specific Parameters ***

Note: <ss> = site-specific; <def> = default	
Fraction of forage grown on contaminated soil and eaten by the milk cow "F1milk"<def>	1.000E+00
Quantity of forage eaten by the milk cow each day (kg plant tissue DW/day) "Qp1milk"<ss>	1.750E+01
Fraction of silage grown on contaminated soil and eaten by the milk cow "F2milk"<def>	1.000E+00
Quantity of silage eaten by the milk cow each day (kg plant tissue DW/day) "Qp2milk"<ss>	0.000E+00
Fraction of grain grown on contaminated soil and eaten by the milk cow "F3milk"<def>	1.000E+00
Quantity of grain eaten by the milk cow each day (kg plant tissue DW/day) "Qp3milk"<ss>	0.000E+00
Quantity of soil eaten by the milk cow (kg soil/day) "Qsmilk"<def>	4.000E-01

--- Pork Concentration Due to Plant and Soil Ingestion --- NA ---

Fraction of forage grown on contaminated soil and eaten by the pig "F1pork"<def>	1.000E+00
Quantity of forage eaten by the pig each day (kg plant tissue DW/day) "Qp1pork"<ss>	0.000E+00
Fraction of silage grown on contaminated soil and eaten by the pig "F2pork"<def>	1.000E+00
Quantity of silage eaten by the pig each day (kg plant tissue DW/day) "Qp2pork"<ss>	1.400E+00
Fraction of grain grown on contaminated soil and eaten by the pig "F3pork"<def>	1.000E+00
Quantity of grain eaten by the pig each day (kg plant tissue DW/day) "Qp3pork"<ss>	3.300E+00
Quantity of soil eaten by the pig (kg soil/day) "Qspork"<def>	3.700E-01

--- Egg/Chicken Parameters --- NA ---

Fraction of chicken diet which is soil <def>	1.000E-01

======= Consumption of Fish =======
(Wright/Bradley Lake)
--- Watershed Soil Concentration Due to Deposition ---

Total time period over which deposition has occurred (yr) "Tc"<ss> (same period as asumed for soil ingestion)	3.000E+01
Representative watershed mixing depth to which deposited pollutant is incorporated (cm) "Z"<def>	5.000E+00
Representative watershed soil bulk density (g/cm**3) "BD"<def>	1.500E+00
Volumetric soil water content (cm**3/cm**3) "THETAs"<def>	2.000E-01
Annual precipitation (cm/yr) "P"<ss>	1.120E+02
Annual irrigation (cm/yr) "I"<ss>	1.230E+01
Annual runoff (cm/yr) "R" <ss>	2.540E+01
Annual evapotranspiration (cm/yr) "EV" <ss>	3.050E+01
Calculate soil volatilization (1); or use data base (2)?	1

NOTE: Loss constant for soil erosion "kse" is calculated

Table D-1

*** Non-Chemical Specific Parameters ***

Note: <ss> = site-specific; <def> = default

Average soil concentration calculation index (see options below) --------->	2
(1) Average over facility operating time	
(2) Follow North Carolina Guidance	
(3) ENSR exact solution	

--- Fishing Waterbody Characteristics ---

Calculate volatilization from water(1); or use data base(2)?	1
Flowing stream or river (1); Quiescent lake or pond (2)? <ss>	2
If a flowing stream or river, what is the current (m/s)? "u" <ss>	3.420E-04

--- Deposition to Fishing Waterbody ---

Waterbody area (m**2) "WAw"<ss>	5.860E+04

--- Impervious Runoff Load to Fishing Waterbody ---

Impervious watershed area receiving pollutant deposition (m**2) "WAi"<ss>	3.000E+04

--- Pervious Runoff Load to Fishing Waterbody ---

Average annual surface runoff (cm/yr) "R"<ss> (copied from above)	2.540E+01
Soil bulk density (g/cm**3) "BD"<def>	1.500E+00
Total watershed receiving pollutant deposition (m**2) "WAl"<ss>	3.000E+06
Impervious watershed area receiving pollutant deposition (m**2) "WAi"<ss>	3.000E+04
Volumetric soil water content (cm**3/cm**3) "THETAs"<def>	2.000E-01

--- Erosion Load to Fishing Waterbody ---

Soil bulk density (g/cm**3) "BD"<def> (copied from above)	1.500E+00
Volumetric soil water content (cm**3/cm**3) "THETAs"<def> (copied)	2.000E-01
Total watershed area receiving pollutant deposition (m**2) "WAl"<ss> (copied from above)	3.000E+06
Impervious watershed area receiving pollutant deposition (m**2) "WAi"<ss> (copied from above)	3.000E+04

--- Universal Soil Loss Equation (USLE) ---

USLE rainfall (or erosivity) factor (yr**-1) "RF"<ss>	1.000E+02
USLE erodibility factor (ton/acre) "K"<def>	3.600E-01
USLE length-slope factor "LS"<def>	1.500E+00
USLE cover management factor "C"<def>	1.000E-01
USLE supporting practice factor "P"<def>	1.000E+00
Unit soil loss (kg/m**2/yr) "Xe"<calculated>	1.210E+00

--- Sediment Delivery Ratio to Fishing Waterbody ---

Total watershed area receiving pollutant deposition

Table D-1

*** Non-Chemical Specific Parameters ***

Note: <ss> = site-specific; <def> = default	
(m**2) "WAl"<ss> (copied from above)	3.000E+06
Empirical slope coefficient "b"<def>	1.250E-01
Watershed area (mi**2) <units conversion>	1.159E+00
Empirical intercept coefficient "a" <calculated>	1.891E+00
Watershed sediment delivery ratio "SD" <calculated>	2.932E-01
--- Total Fishing Waterbody Concentration ---	
Average volumetric flow rate through water body (m**3/yr) "VFx"<ss>	5.390E+06
--- Fraction in Water Column and Bed Sediment ---	
Total suspended solids (mg/l) "TSS"<def>	1.000E+01
Depth of the water column (m) "Dw"<ss>	1.000E+01
Depth of the upper benthic layer (m) "Db"<def>	3.000E-02
Bed sediment porosity (Lwater/L) "THETAbs"<def>	6.000E-01
Benthic solids concentration (g/cm**3) "BS"<def>	1.000E+00
---- Benthic Burial Rate Constant ----	
Benthic burial rate constant (yr**-1) "kb"<calculated>	5.688E-01
--- Total Water Column Concentration ---	
Depth of the upper benthic layer (m) "Db"<def> (copied from above)	3.000E-02
Depth of the water column (m) "Dw"<ss> (copied from above)	1.000E+01
--- Dissolved Water Concentration ---	
Total suspended solids (mg/L) "TSS"<def> (copied from above)	1.000E+01
--- Concentration Sorbed to Bed Sediment ---	
Total depth of water column (m) "Dw"<ss> (copied from above)	1.000E+01
Depth of the upper benthic layer (m) "Db"<def>(copied from above)	3.000E-02
Bed sediment porosity (Lwater/L) "THETAbs"<def>(copied from above)	6.000E-01
Bed sediment concentration (g/cm**3) "BS"<def>(copied from above)	1.000E+00
--- Fish Concentration from Bed Sediments ---	
Fish lipid content (fraction) "Flipid"<def>	7.000E-02
Fraction organic carbon in bottom sed. "focbs","OCsed"<def>	4.000E-02
===== Consumption of Drinking Water ===== (Mohawk River - Direct Deposition/Runoff, Erosion, Etc) --- Watershed Soil Concentration Due to Deposition ---	
Total time period over which deposition has occurred (yr) "Tc"<ss>(same as for soil ingestion)	3.000E+01
Representative watershed mixing depth to which	

Table D-1

*** Non-Chemical Specific Parameters ***

Note: <ss> = site-specific; <def> = default	
deposited pollutant is incorporated (cm) "Z"<def>	5.000E+00
Representative watershed soil bulk density (g/cm**3) "BD"<def>	1.500E+00
Volumetric soil water content (cm**3/cm**3) "THETAs"<def>	2.000E-01
Annual precipitation (cm/yr) "P"<ss>	1.120E+02
Annual irrigation (cm/yr) "I"<ss>	1.230E+01
Annual runoff (cm/yr) "R" <ss>	2.540E+01
Annual evapotranspiration (cm/yr) "EV" <ss>	3.050E+01
Calculate soil volatilization (1); or use data base (2)?	1
NOTE: Loss constant for soil erosion "kse" is calculated	
Average soil concentration calculation index (see options below) --------->	2
(1) Average over facility operating time	
(2) Follow North Carolina Guidance	
(3) ENSR exact solution	

--- Drinking Waterbody Characteristics ---

Calculate volatilization from water(1); or use data base(2)?	1
Flowing stream or river (1); Quiescent lake or pond (2)? <ss>	1
If a flowing stream or river, what is the current (m/s)?	1.500E-01

--- Deposition to Drinking Waterbody ---

Waterbody area (m**2) - within 20 km radius - "WAw"<ss>	6.314E+06

--- Impervious Runoff Load to Drinking Waterbody ---

Impervious watershed area receiving pollutant deposition (m**2) "WAi"<ss>	8.010E+06

--- Pervious Runoff Load to Drinking Waterbody ---

Average annual surface runoff (cm/yr) "R"<ss>(copied from above)	2.540E+01
Soil bulk density (g/cm**3) "BD"<def>	1.500E+00
Total watershed receiving pollutant deposition (m**2) "WAl"<ss>	2.670E+08
Impervious watershed area receiving pollutant deposition (m**2) "WAi"<ss>(copied from above)	8.010E+06
Volumetric soil water content (cm**3/cm**3) "THETAs"<def>(copied)	2.000E-01

--- Erosion Load to Drinking Waterbody ---

Soil bulk density (g/cm**3) "BD"<def>(copied from above)	1.500E+00
Volumetric soil water content (cm**3/cm**3) "THETAs"<def>(copied)	2.000E-01
Total watershed area receiving pollutant deposition (m**2) "WAl"<ss>(copied from above)	2.670E+08
Impervious watershed area receiving pollutant deposition (m**2) "WAi"<ss>(copied from above)	8.010E+06

--- Universal Soil Loss Equation (USLE) ---

Table D-1

*** Non-Chemical Specific Parameters ***

Note: <ss> = site-specific; <def> = default	
USLE rainfall (or erosivity) factor (yr**-1) "RF"<ss>	1.000E+02
USLE erodibility factor (ton/acre) "K"<def>	3.600E-01
USLE length-slope factor "LS"<def>	1.500E+00
USLE cover management factor "C"<def>	1.000E-01
USLE supporting practice factor "P"<def>	1.000E+00
Unit soil loss (kg/m**2/yr) "Xe"<calculated>	1.210E+00
--- Sediment Delivery Ratio to Drinking Water Body ---	
Total watershed area receiving pollutant deposition (m**2) "WAI"<ss>(copied from above)	2.670E+08
Empirical slope coefficient "b"<def>	1.250E-01
Watershed area (mi**2) <units conversion>	1.031E+02
Empirical intercept coefficient "a" <calculated>	1.198E+00
Watershed sediment delivery ratio "SD" <calculated>	1.060E-01
--- Total Drinking Waterbody Concentration ---	
Average volumetric flow rate through water body (m**3/yr) "VFx"<ss>	3.070E+09
--- Fraction in Water Column and Bed Sediment ---	
Total suspended solids (mg/l) "TSS"<def>	1.000E+01
Depth of the water column (m) "Dw"<ss>	3.000E+00
Depth of the upper benthic layer (m) "Db"<def>	3.000E-02
Bed sediment porosity (Lwater/L) "THETAbs"<def>	6.000E-01
Benthic solids concentration (g/cm**3) "BS"<def>	1.000E+00
---- Benthic Burial Rate Constant ----	
Benthic burial rate constant (yr**-1) "kb"<calculated>	1.328E-02
--- Total Water Column Concentration ---	
Depth of the upper benthic layer (m) "Db"<def>(copied from above)	3.000E-02
Depth of the water column (m) "Dw"<ss>(copied from above)	3.000E+00
--- Dissolved Water Concentration ---	
Total suspended solids (mg/L) "TSS"<def>	1.000E+01
--- Concentration Sorbed to Bed Sediment ---	
Total depth of water column (m) "Dw"<ss>	3.000E+00
Depth of the upper benthic layer (m) "Db"<def>	3.000E-02
Bed sediment porosity (Lwater/L) "THETAbs"<def>	6.000E-01
Bed sediment concentration (g/cm**3) "BS"<def>	1.000E+00

Appendix D-2

Concentration of Compounds in Media by Receptor

Table D-2-A
Concentrations of Compounds in Media by Receptor
Child Resident - North Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	As	Sb	Ba	Be	Cd	Total Cr	Cr VI
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	3.53E-07	3.57E-08	9.43E-09	1.23E-08	5.39E-09	4.05E-07	7.91E-08
Concentration in milk (mg/kg)	1.92E-08	6.41E-09	3.96E-08	1.79E-11	5.22E-10	1.74E-07	3.93E-08
Concentration in fish (mg/kg)	1.18E-06	4.79E-07	1.33E-05	2.19E-07	3.50E-06	1.18E-08	1.43E-08
Concentration in soil (mg/kg)	1.09E-04	3.32E-05	5.36E-05	6.31E-05	6.08E-05	4.47E-04	5.92E-06
Concentration in above-ground vegetables (mg/kg)	4.36E-06	1.71E-06	2.92E-06	2.70E-07	7.00E-06	1.89E-06	3.32E-07
Concentration in below-ground vegetables (mg/kg)	8.63E-07	9.34E-07	7.66E-07	3.66E-08	3.18E-06	6.70E-07	2.66E-08
Concentration in drinking water (mg/L)	6.91E-09	1.08E-09	1.92E-09	2.83E-10	1.21E-09	7.61E-11	4.52E-10
Air Concentration (ug/m$^{3)}$	1.58E-04	3.09E-05	5.48E-05	8.88E-06	3.42E-05	5.00E-05	1.30E-05
For carcinogenic effects:							
Concentration in beef (mg/kg)	3.53E-07	3.57E-08	9.43E-09	1.22E-08	5.39E-09	4.01E-07	7.91E-08
Concentration in milk (mg/kg)	1.92E-08	6.41E-09	3.96E-08	1.78E-11	5.21E-10	1.73E-07	3.93E-08
Concentration in fish (mg/kg)	1.18E-06	4.79E-07	1.33E-05	2.14E-07	3.49E-06	1.14E-08	1.43E-08
Concentration in soil (mg/kg)	1.09E-04	3.32E-05	5.36E-05	6.10E-05	6.07E-05	4.28E-04	5.92E-06
Concentration in above-ground vegetables (mg/kg)	4.36E-06	1.71E-06	2.91E-06	2.67E-07	6.90E-06	1.86E-06	3.32E-07
Concentration in below-ground vegetables (mg/kg)	8.61E-07	9.26E-07	7.61E-07	3.52E-08	3.12E-06	6.42E-07	2.66E-08
Concentration in drinking water (mg/L)	6.91E-09	1.08E-09	1.92E-09	2.81E-10	1.21E-09	7.56E-11	4.52E-10
Air Concentration (ug/m$^{3)}$	1.58E-04	3.09E-05	5.48E-05	8.88E-06	3.42E-05	5.00E-05	1.30E-05

Notes:

As	Arsenic
Sb	Antimony
Ba	Barium
Be	Beryllium
Cd	Cadmium
Total Cr	Total Chromium
Cr VI	Chromium VI

Table D-2-A
Concentrations of Compounds in Media by Receptor
Child Resident - North Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	Pb	Ni	Se	Ag	Tl	Zn	TCDD-TEQ
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	1.82E-08	4.42E-06	2.21E-08	3.90E-07	2.37E-06	1.69E-07	6.65E-09
Concentration in milk (mg/kg)	2.46E-08	1.31E-06	1.04E-07	4.76E-06	2.10E-07	1.09E-07	2.31E-09
Concentration in fish (mg/kg)	1.32E-07	1.99E-05	4.06E-07	8.50E-06	2.08E-08	1.26E-03	1.15E-08
Concentration in soil (mg/kg)	3.07E-04	9.82E-04	1.09E-06	2.34E-05	8.64E-05	2.26E-03	4.21E-07
Concentration in above-ground vegetables (mg/kg)	2.56E-06	2.26E-05	2.29E-07	5.95E-06	1.26E-06	1.77E-04	4.04E-09
Concentration in below-ground vegetables (mg/kg)	1.05E-06	6.72E-06	2.39E-08	2.34E-06	2.88E-08	8.65E-05	2.02E-07
Concentration in drinking water (mg/L)	1.70E-09	2.24E-08	3.08E-10	4.04E-09	1.81E-09	5.40E-08	2.02E-13
Air Concentration (ug/m$^{3)}$	4.20E-05	6.36E-04	8.90E-06	1.17E-04	5.13E-05	1.54E-03	1.06E-08
For carcinogenic effects:							
Concentration in beef (mg/kg)	1.81E-08	4.42E-06	2.21E-08	3.90E-07	2.37E-06	1.69E-07	6.63E-09
Concentration in milk (mg/kg)	2.45E-08	1.31E-06	1.04E-07	4.76E-06	2.10E-07	1.09E-07	2.07E-09
Concentration in fish (mg/kg)	1.29E-07	1.99E-05	4.06E-07	8.50E-06	2.08E-08	1.26E-03	1.12E-08
Concentration in soil (mg/kg)	2.96E-04	9.81E-04	1.09E-06	2.34E-05	8.63E-05	2.26E-03	4.10E-07
Concentration in above-ground vegetables (mg/kg)	2.50E-06	2.25E-05	2.29E-07	5.95E-06	1.26E-06	1.75E-04	4.00E-09
Concentration in below-ground vegetables (mg/kg)	1.01E-06	6.63E-06	2.39E-08	2.34E-06	2.83E-08	8.53E-05	1.94E-07
Concentration in drinking water (mg/L)	1.69E-09	2.24E-08	3.08E-10	4.04E-09	1.81E-09	5.40E-08	2.01E-13
Air Concentration (ug/m$^{3)}$	4.20E-05	6.36E-04	8.90E-06	1.17E-04	5.13E-05	1.54E-03	1.06E-08

Notes:

Pb	Lead
Ni	Nickel
Se	Selenium
Ag	Silver
Tl	Thallium
Zn	Zinc
TCDD-TEQ	2,3,7,8-TCDD Toxicity Equivalents

Table D-2-A
Concentrations of Compounds in Media by Receptor
Child Resident - North Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	BAA	BAP	BBF	BKF	CHRYS	DBAHA	INDENO
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	7.44E-09	9.78E-08	4.77E-07	1.29E-07	1.69E-07	1.25E-06	1.47E-05
Concentration in milk (mg/kg)	3.47E-09	5.29E-08	2.28E-07	7.04E-08	8.32E-08	7.04E-07	8.26E-06
Concentration in fish (mg/kg)	6.41E-07	9.40E-07	1.09E-05	5.86E-07	9.72E-06	1.20E-07	1.25E-07
Concentration in soil (mg/kg)	8.36E-06	1.33E-05	1.45E-04	7.61E-06	1.18E-04	1.57E-06	2.02E-06
Concentration in above-ground vegetables (mg/kg)	1.24E-07	1.21E-07	9.71E-07	1.10E-07	1.23E-06	3.93E-07	1.97E-06
Concentration in below-ground vegetables (mg/kg)	1.19E-05	5.99E-06	1.23E-04	4.42E-06	1.09E-04	7.52E-07	8.02E-07
Concentration in drinking water (mg/L)	6.77E-12	6.15E-12	6.23E-11	4.70E-12	7.03E-11	1.65E-12	1.29E-12
Air Concentration (ug/m^{3})	7.93E-08	1.31E-07	8.85E-07	1.18E-07	6.29E-07	8.94E-08	1.25E-07
For carcinogenic effects:							
Concentration in beef (mg/kg)	7.42E-09	9.74E-08	4.74E-07	1.29E-07	1.67E-07	1.25E-06	1.47E-05
Concentration in milk (mg/kg)	3.46E-09	5.28E-08	2.27E-07	7.03E-08	8.28E-08	7.04E-07	8.26E-06
Concentration in fish (mg/kg)	6.38E-07	9.12E-07	1.08E-05	5.68E-07	9.53E-06	1.16E-07	1.21E-07
Concentration in soil (mg/kg)	8.31E-06	1.28E-05	1.42E-04	7.32E-06	1.16E-04	1.50E-06	1.93E-06
Concentration in above-ground vegetables (mg/kg)	1.21E-07	1.19E-07	9.46E-07	1.09E-07	1.20E-06	3.93E-07	1.97E-06
Concentration in below-ground vegetables (mg/kg)	1.16E-05	5.75E-06	1.19E-04	4.24E-06	1.05E-04	7.21E-07	7.69E-07
Concentration in drinking water (mg/L)	6.75E-12	6.04E-12	6.17E-11	4.62E-12	6.93E-11	1.63E-12	1.28E-12
Air Concentration (ug/m^{3})	7.93E-08	1.31E-07	8.85E-07	1.18E-07	6.29E-07	8.94E-08	1.25E-07

Notes:

BAA	Benzo(a)anthracene
BAP	Benzo(a)pyrene
BBF	Benzo(b)fluoranthene
BKF	Benzo(k)fluoranthene
CHRYS	Chrysene
DBAHA	Dibenz(a,h)anthracene
INDENO	Indeno(1,2,3-c,d)pyrene

Table D-2-A
Concentrations of Compounds in Media by Receptor
Child Resident - North Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	BEHP	HCBZ	BZ	BM	CCl4	DCDFM	T13DCP
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	3.79E-06	6.38E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in milk (mg/kg)	1.67E-06	3.08E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in fish (mg/kg)	1.35E-04	5.99E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in soil (mg/kg)	1.61E-02	9.01E-05	6.69E-09	4.62E-10	1.88E-09	1.84E-11	2.46E-09
Concentration in above-ground vegetables (mg/kg)	6.04E-04	2.45E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in below-ground vegetables (mg/kg)	3.33E-02	4.52E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in drinking water (mg/L)	3.10E-08	3.19E-09	1.21E-08	7.71E-09	2.48E-09	8.35E-09	2.90E-09
Air Concentration (ug/m^{3})	4.81E-04	2.27E-04	1.19E-03	8.19E-04	2.48E-04	8.19E-04	2.74E-04
For carcinogenic effects:							
Concentration in beef (mg/kg)	3.79E-06	6.38E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in milk (mg/kg)	1.67E-06	3.08E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in fish (mg/kg)	1.35E-04	5.99E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in soil (mg/kg)	1.61E-02	9.01E-05	6.69E-09	4.62E-10	1.88E-09	1.84E-11	2.46E-09
Concentration in above-ground vegetables (mg/kg)	6.02E-04	2.45E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in below-ground vegetables (mg/kg)	3.32E-02	4.52E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in drinking water (mg/L)	3.10E-08	3.19E-09	1.21E-08	7.71E-09	2.48E-09	8.35E-09	2.90E-09
Air Concentration (ug/m^{3})	4.81E-04	2.27E-04	1.19E-03	8.19E-04	2.48E-04	8.19E-04	2.74E-04

Notes:

BEHP	Bis(2-ethylhexyl)phthalate
HCBZ	Hexachlorobenzene
BZ	Benzene
BM	Bromomethane
CCl4	Carbon tetrachloride
DCDFM	Dichlorodifluoromethane
T13DCP	Trans-1,3-Dichloropropene

Table D-2-A
Concentrations of Compounds in Media by Receptor
Child Resident - North Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	TCFM	VCL	HCP	2-NA	2,4-DNT	2,6-DNT	CLMTHN
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	0.00E+00	0.00E+00	3.25E-10	3.29E-11	1.53E-10	2.30E-10	0.00E+00
Concentration in milk (mg/kg)	0.00E+00	0.00E+00	1.62E-10	1.84E-11	8.59E-11	1.29E-10	0.00E+00
Concentration in fish (mg/kg)	0.00E+00	0.00E+00	2.63E-06	4.74E-06	5.15E-06	1.08E-05	0.00E+00
Concentration in soil (mg/kg)	1.01E-09	1.52E-11	9.70E-07	1.42E-05	5.35E-05	9.63E-05	4.68E-11
Concentration in above-ground vegetables (mg/kg)	0.00E+00	0.00E+00	5.81E-08	4.81E-05	1.53E-04	3.10E-04	0.00E+00
Concentration in below-ground vegetables (mg/kg)	0.00E+00	0.00E+00	1.43E-05	4.51E-04	1.50E-03	2.97E-03	0.00E+00
Concentration in drinking water (mg/L)	8.08E-09	7.63E-09	7.95E-09	2.78E-08	3.22E-08	6.64E-08	7.28E-09
Air Concentration (ug/m^{3})	8.19E-04	8.19E-04	7.22E-04	3.61E-04	1.80E-04	3.61E-04	8.19E-04
For carcinogenic effects:							
Concentration in beef (mg/kg)	0.00E+00	0.00E+00	3.25E-10	3.29E-11	1.53E-10	2.30E-10	0.00E+00
Concentration in milk (mg/kg)	0.00E+00	0.00E+00	1.62E-10	1.84E-11	8.59E-11	1.29E-10	0.00E+00
Concentration in fish (mg/kg)	0.00E+00	0.00E+00	2.63E-06	4.74E-06	5.15E-06	1.08E-05	0.00E+00
Concentration in soil (mg/kg)	1.01E-09	1.52E-11	9.70E-07	1.42E-05	5.35E-05	9.63E-05	4.68E-11
Concentration in above-ground vegetables (mg/kg)	0.00E+00	0.00E+00	5.81E-08	4.81E-05	1.53E-04	3.10E-04	0.00E+00
Concentration in below-ground vegetables (mg/kg)	0.00E+00	0.00E+00	1.43E-05	4.51E-04	1.50E-03	2.97E-03	0.00E+00
Concentration in drinking water (mg/L)	8.08E-09	7.63E-09	7.95E-09	2.78E-08	3.22E-08	6.64E-08	7.28E-09
Air Concentration (ug/m^{3})	8.19E-04	8.19E-04	7.22E-04	3.61E-04	1.80E-04	3.61E-04	8.19E-04

Notes:

TCFM	Trichlorofluoromethane
VCL	Vinyl Chloride
HCP	Hexachlorocyclopentadiene
2-NA	2-Nitroaniline
2,4-DNT	2,4-Dinitrotoluene
2,6-DNT	2,6-Dinitrotoluene
CLMTHN	Chloromethane

Table D-2-A
Concentrations of Compounds in Media by Receptor
Child Resident - North Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	PCP	1,1-DCE	1,1,2,2-TCA	CLFM	1,3-BUT	HCBU
For non-carcinogenic effects:						
Concentration in beef (mg/kg)	6.76E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.32E-12
Concentration in milk (mg/kg)	3.79E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.77E-12
Concentration in fish (mg/kg)	4.77E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.77E-07
Concentration in soil (mg/kg)	6.31E-05	6.05E-10	9.01E-08	1.20E-08	3.32E-10	2.43E-08
Concentration in above-ground vegetables (mg/kg)	8.96E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.81E-09
Concentration in below-ground vegetables (mg/kg)	2.38E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.59E-07
Concentration in drinking water (mg/L)	3.68E-08	2.65E-09	4.19E-09	8.29E-09	7.02E-09	3.94E-10
Air Concentration (ug/m$^{3)}$	7.22E-04	2.74E-04	2.74E-04	8.19E-04	8.19E-04	3.61E-05
For carcinogenic effects:						
Concentration in beef (mg/kg)	6.76E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.32E-12
Concentration in milk (mg/kg)	3.79E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.77E-12
Concentration in fish (mg/kg)	4.77E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.77E-07
Concentration in soil (mg/kg)	6.31E-05	6.05E-10	9.01E-08	1.20E-08	3.32E-10	2.43E-08
Concentration in above-ground vegetables (mg/kg)	8.96E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.81E-09
Concentration in below-ground vegetables (mg/kg)	2.38E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.59E-07
Concentration in drinking water (mg/L)	3.68E-08	2.65E-09	4.19E-09	8.29E-09	7.02E-09	3.94E-10
Air Concentration (ug/m$^{3)}$	7.22E-04	2.74E-04	2.74E-04	8.19E-04	8.19E-04	3.61E-05

Notes:

PCP	Pentachlorophenol
1,1-DCE	1,1-Dichloroethylene
1,1,2,2-TCA	1,1,2,2-Tetrachloroethane
CLFM	Chloroform
1,3-BUT	1,3-Butadiene
HCBU	Hexachlorobutadiene

Table D-2-A
Concentrations of Compounds in Media by Receptor
Child Resident - North Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	Hg	HgCl	MeHg
For non-carcinogenic effects:			
Concentration in beef (mg/kg)	0.00E+00	2.75E-06	5.46E-08
Concentration in milk (mg/kg)	0.00E+00	1.44E-06	4.05E-08
Concentration in fish (mg/kg)	0.00E+00	0.00E+00	9.40E-02
Concentration in soil (mg/kg)	0.00E+00	7.53E-03	1.34E-04
Concentration in above-ground vegetables (mg/kg)	0.00E+00	4.61E-04	1.21E-04
Concentration in below-ground vegetables (mg/kg)	0.00E+00	9.05E-05	4.85E-06
Concentration in drinking water (mg/L)	0.00E+00	4.51E-08	7.72E-09
Air Concentration (ug/m$^{3)}$	3.27E-06	4.25E-04	0.00E+00
For carcinogenic effects:			
Concentration in beef (mg/kg)	0.00E+00	2.72E-06	5.05E-08
Concentration in milk (mg/kg)	0.00E+00	1.43E-06	3.91E-08
Concentration in fish (mg/kg)	0.00E+00	0.00E+00	9.22E-02
Concentration in soil (mg/kg)	0.00E+00	7.36E-03	0.00E+00
Concentration in above-ground vegetables (mg/kg)	0.00E+00	4.60E-04	1.20E-04
Concentration in below-ground vegetables (mg/kg)	0.00E+00	8.85E-05	0.00E+00
Concentration in drinking water (mg/L)	0.00E+00	4.51E-08	7.71E-09
Air Concentration (ug/m$^{3)}$	3.27E-06	4.25E-04	0.00E+00

Notes:

Hg	Elemental Mercury
HgCl	Mercuric Chlorid
MeHg	Methyl Mercury

Table D-2-B
Concentrations of Compounds in Media by Receptor
Adult Resident - North Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	As	Sb	Ba	Be	Cd	Total Cr	Cr VI
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	3.53E-07	3.57E-08	9.43E-09	1.23E-08	5.39E-09	4.05E-07	7.91E-08
Concentration in milk (mg/kg)	1.92E-08	6.41E-09	3.96E-08	1.79E-11	5.22E-10	1.74E-07	3.93E-08
Concentration in fish (mg/kg)	1.18E-06	4.79E-07	1.33E-05	2.19E-07	3.50E-06	1.18E-08	1.43E-08
Concentration in soil (mg/kg)	1.09E-04	3.32E-05	5.36E-05	6.31E-05	6.08E-05	4.47E-04	5.92E-06
Concentration in above-ground vegetables (mg/kg)	4.36E-06	1.71E-06	2.92E-06	2.70E-07	7.00E-06	1.89E-06	3.32E-07
Concentration in below-ground vegetables (mg/kg)	8.63E-07	9.34E-07	7.66E-07	3.66E-08	3.18E-06	6.70E-07	2.66E-08
Concentration in drinking water (mg/L)	6.91E-09	1.08E-09	1.92E-09	2.83E-10	1.21E-09	7.61E-11	4.52E-10
Air Concentration (ug/m^{3})	1.58E-04	3.09E-05	5.48E-05	8.88E-06	3.42E-05	5.00E-05	1.30E-05
For carcinogenic effects:							
Concentration in beef (mg/kg)	3.52E-07	3.54E-08	9.38E-09	1.11E-08	5.21E-09	3.52E-07	7.91E-08
Concentration in milk (mg/kg)	1.91E-08	6.38E-09	3.95E-08	1.70E-11	5.07E-10	1.62E-07	3.92E-08
Concentration in fish (mg/kg)	1.10E-06	4.29E-07	1.21E-05	1.33E-07	2.92E-06	6.75E-09	1.36E-08
Concentration in soil (mg/kg)	1.09E-04	3.32E-05	5.36E-05	6.10E-05	6.07E-05	4.28E-04	5.92E-06
Concentration in above-ground vegetables (mg/kg)	4.21E-06	1.42E-06	2.46E-06	2.39E-07	4.72E-06	1.53E-06	3.27E-07
Concentration in below-ground vegetables (mg/kg)	6.74E-07	6.59E-07	5.52E-07	1.88E-08	2.01E-06	3.35E-07	2.26E-08
Concentration in drinking water (mg/L)	6.78E-09	1.04E-09	1.85E-09	2.50E-10	1.13E-09	6.95E-11	4.45E-10
Air Concentration (ug/m^{3})	1.58E-04	3.09E-05	5.48E-05	8.88E-06	3.42E-05	5.00E-05	1.30E-05

Notes:

As	Arsenic
Sb	Antimony
Ba	Barium
Be	Beryllium
Cd	Cadmium
Total Cr	Total Chromium
Cr VI	Chromium VI

Table D-2-B
Concentrations of Compounds in Media by Receptor
Adult Resident - North Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	Pb	Ni	Se	Ag	Tl	Zn	TCDD-TEQ
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	1.82E-08	4.42E-06	2.21E-08	3.90E-07	2.37E-06	1.69E-07	6.65E-09
Concentration in milk (mg/kg)	2.46E-08	1.31E-06	1.04E-07	4.76E-06	2.10E-07	1.09E-07	2.07E-09
Concentration in fish (mg/kg)	1.32E-07	1.99E-05	4.06E-07	8.50E-06	2.08E-08	1.26E-03	1.15E-08
Concentration in soil (mg/kg)	3.07E-04	9.82E-04	1.09E-06	2.34E-05	8.64E-05	2.26E-03	4.21E-07
Concentration in above-ground vegetables (mg/kg)	2.56E-06	2.26E-05	2.29E-07	5.95E-06	1.26E-06	1.77E-04	4.04E-09
Concentration in below-ground vegetables (mg/kg)	1.05E-06	6.72E-06	2.39E-08	2.34E-06	2.88E-08	8.65E-05	2.02E-07
Concentration in drinking water (mg/L)	1.70E-09	2.24E-08	3.08E-10	4.04E-09	1.81E-09	5.40E-08	2.02E-13
Air Concentration ($ug/m^{3)}$)	4.20E-05	6.36E-04	8.90E-06	1.17E-04	5.13E-05	1.54E-03	1.06E-08
For carcinogenic effects:							
Concentration in beef (mg/kg)	1.61E-08	4.37E-06	2.21E-08	3.90E-07	2.35E-06	1.66E-07	6.37E-09
Concentration in milk (mg/kg)	2.29E-08	1.30E-06	1.04E-07	4.76E-06	2.09E-07	1.07E-07	2.03E-09
Concentration in fish (mg/kg)	7.95E-08	1.70E-05	4.06E-07	8.33E-06	1.75E-08	1.09E-03	7.09E-09
Concentration in soil (mg/kg)	2.96E-04	9.81E-04	1.09E-06	2.34E-05	8.63E-05	2.26E-03	4.10E-07
Concentration in above-ground vegetables (mg/kg)	1.79E-06	1.99E-05	2.28E-07	5.74E-06	1.24E-06	1.29E-04	3.56E-09
Concentration in below-ground vegetables (mg/kg)	5.37E-07	4.38E-06	2.29E-08	2.19E-06	1.84E-08	5.69E-05	1.05E-07
Concentration in drinking water (mg/L)	1.55E-09	2.12E-08	3.08E-10	4.01E-09	1.70E-09	5.12E-08	1.78E-13
Air Concentration ($ug/m^{3)}$)	4.20E-05	6.36E-04	8.90E-06	1.17E-04	5.13E-05	1.54E-03	1.06E-08

Notes:

Pb	Lead
Ni	Nickel
Se	Selenium
Ag	Silver
Tl	Thallium
Zn	Zinc
TCDD-TEQ	2,3,7,8-TCDD Toxicity Equivalents

Table D-2-B
Concentrations of Compounds in Media by Receptor
Adult Resident - North Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	BAA	BAP	BBF	BKF	CHRYS	DBAHA	INDENO
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	7.44E-09	9.78E-08	4.77E-07	1.29E-07	1.69E-07	1.25E-06	1.47E-05
Concentration in milk (mg/kg)	3.47E-09	5.29E-08	2.28E-07	7.04E-08	8.32E-08	7.04E-07	8.26E-06
Concentration in fish (mg/kg)	6.41E-07	9.40E-07	1.09E-05	5.86E-07	9.72E-06	1.20E-07	1.25E-07
Concentration in soil (mg/kg)	8.36E-06	1.33E-05	1.45E-04	7.61E-06	1.18E-04	1.57E-06	2.02E-06
Concentration in above-ground vegetables (mg/kg)	1.24E-07	1.21E-07	9.71E-07	1.10E-07	1.23E-06	3.93E-07	1.97E-06
Concentration in below-ground vegetables (mg/kg)	1.19E-05	5.99E-06	1.23E-04	4.42E-06	1.09E-04	7.52E-07	8.02E-07
Concentration in drinking water (mg/L)	6.77E-12	6.15E-12	6.23E-11	4.70E-12	7.03E-11	1.65E-12	1.29E-12
Air Concentration (ug/m^{3})	7.93E-08	1.31E-07	8.85E-07	1.18E-07	6.29E-07	8.94E-08	1.25E-07
For carcinogenic effects:							
Concentration in beef (mg/kg)	6.63E-09	9.19E-08	4.21E-07	1.25E-07	1.49E-07	1.25E-06	1.47E-05
Concentration in milk (mg/kg)	3.21E-09	5.12E-08	2.12E-07	6.93E-08	7.70E-08	7.03E-07	8.26E-06
Concentration in fish (mg/kg)	4.83E-07	5.28E-07	7.20E-06	3.28E-07	6.04E-06	6.78E-08	7.09E-08
Concentration in soil (mg/kg)	8.31E-06	1.28E-05	1.42E-04	7.32E-06	1.16E-04	1.50E-06	1.93E-06
Concentration in above-ground vegetables (mg/kg)	7.68E-08	9.55E-08	6.30E-07	9.68E-08	7.65E-07	3.91E-07	1.97E-06
Concentration in below-ground vegetables (mg/kg)	6.94E-06	3.03E-06	6.64E-05	2.23E-06	5.73E-05	3.76E-07	4.01E-07
Concentration in drinking water (mg/L)	5.90E-12	4.69E-12	4.95E-11	3.75E-12	5.26E-11	1.48E-12	1.17E-12
Air Concentration (ug/m^{3})	7.93E-08	1.31E-07	8.85E-07	1.18E-07	6.29E-07	8.94E-08	1.25E-07

Notes:

BAA	Benzo(a)anthracene
BAP	Benzo(a)pyrene
BBF	Benzo(b)fluoranthene
BKF	Benzo(k)fluoranthene
CHRYS	Chrysene
DBAHA	Dibenz(a,h)anthracene
INDENO	Indeno(1,2,3-c,d)pyrene

Table D-2-B
Concentrations of Compounds in Media by Receptor
Adult Resident - North Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	BEHP	HCBZ	BZ	BM	CCl4	DCDFM	T13DCP
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	3.79E-06	6.38E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in milk (mg/kg)	1.67E-06	3.08E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in fish (mg/kg)	1.35E-04	5.99E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in soil (mg/kg)	1.61E-02	9.01E-05	6.69E-09	4.62E-10	1.88E-09	1.84E-11	2.46E-09
Concentration in above-ground vegetables (mg/kg)	6.04E-04	2.45E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in below-ground vegetables (mg/kg)	3.33E-02	4.52E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in drinking water (mg/L)	3.10E-08	3.19E-09	1.21E-08	7.71E-09	2.48E-09	8.35E-09	2.90E-09
Air Concentration ($ug/m^{3)}$	4.81E-04	2.27E-04	1.19E-03	8.19E-04	2.48E-04	8.19E-04	2.74E-04
For carcinogenic effects:							
Concentration in beef (mg/kg)	3.58E-06	6.38E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in milk (mg/kg)	1.59E-06	3.08E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in fish (mg/kg)	1.24E-04	5.99E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in soil (mg/kg)	1.61E-02	9.01E-05	6.69E-09	4.62E-10	1.88E-09	1.84E-11	2.46E-09
Concentration in above-ground vegetables (mg/kg)	4.56E-04	2.45E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in below-ground vegetables (mg/kg)	2.50E-02	4.52E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in drinking water (mg/L)	3.02E-08	3.19E-09	1.21E-08	7.71E-09	2.48E-09	8.35E-09	2.90E-09
Air Concentration ($ug/m^{3)}$	4.81E-04	2.27E-04	1.19E-03	8.19E-04	2.48E-04	8.19E-04	2.74E-04

Notes:

BEHP Bis(2-ethylhexyl)phthalate
HCBZ Hexachlorobenzene
BZ Benzene
BM Bromomethane
CCl4 Carbon tetrachloride
DCDFM Dichlorodifluoromethane
T13DCP Trans-1,3-Dichloropropene

Table D-2-B
Concentrations of Compounds in Media by Receptor
Adult Resident - North Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	TCFM	VCL	HCP	2-NA	2,4-DNT	2,6-DNT	CLMTHN
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	0.00E+00	0.00E+00	3.25E-10	3.29E-11	1.53E-10	2.30E-10	0.00E+00
Concentration in milk (mg/kg)	0.00E+00	0.00E+00	1.62E-10	1.84E-11	8.59E-11	1.29E-10	0.00E+00
Concentration in fish (mg/kg)	0.00E+00	0.00E+00	2.63E-06	4.74E-06	5.15E-06	1.08E-05	0.00E+00
Concentration in soil (mg/kg)	1.01E-09	1.52E-11	9.70E-07	1.42E-05	5.35E-05	9.63E-05	4.68E-11
Concentration in above-ground vegetables (mg/kg)	0.00E+00	0.00E+00	5.81E-08	4.81E-05	1.53E-04	3.10E-04	0.00E+00
Concentration in below-ground vegetables (mg/kg)	0.00E+00	0.00E+00	1.43E-05	4.51E-04	1.50E-03	2.97E-03	0.00E+00
Concentration in drinking water (mg/L)	8.08E-09	7.63E-09	7.95E-09	2.78E-08	3.22E-08	6.64E-08	7.28E-09
Air Concentration (ug/m$^{3)}$	8.19E-04	8.19E-04	7.22E-04	3.61E-04	1.80E-04	3.61E-04	8.19E-04
For carcinogenic effects:							
Concentration in beef (mg/kg)	0.00E+00	0.00E+00	3.25E-10	3.29E-11	1.53E-10	2.30E-10	0.00E+00
Concentration in milk (mg/kg)	0.00E+00	0.00E+00	1.62E-10	1.84E-11	8.59E-11	1.29E-10	0.00E+00
Concentration in fish (mg/kg)	0.00E+00	0.00E+00	2.63E-06	4.74E-06	5.15E-06	1.08E-05	0.00E+00
Concentration in soil (mg/kg)	1.01E-09	1.52E-11	9.70E-07	1.42E-05	5.35E-05	9.63E-05	4.68E-11
Concentration in above-ground vegetables (mg/kg)	0.00E+00	0.00E+00	5.81E-08	4.81E-05	1.53E-04	3.10E-04	0.00E+00
Concentration in below-ground vegetables (mg/kg)	0.00E+00	0.00E+00	1.43E-05	4.51E-04	1.50E-03	2.97E-03	0.00E+00
Concentration in drinking water (mg/L)	8.08E-09	7.63E-09	7.95E-09	2.78E-08	3.22E-08	6.64E-08	7.28E-09
Air Concentration (ug/m$^{3)}$	8.19E-04	8.19E-04	7.22E-04	3.61E-04	1.80E-04	3.61E-04	8.19E-04

Notes:

TCFM	Trichlorofluoromethane
VCL	Vinyl Chloride
HCP	Hexachlorocyclopentadiene
2-NA	2-Nitroaniline
2,4-DNT	2,4-Dinitrotoluene
2,6-DNT	2,6-Dinitrotoluene
CLMTHN	Chloromethane

Table D-2-B
Concentrations of Compounds in Media by Receptor
Adult Resident - North Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	PCP	1,1-DCE	1,1,2,2-TCA	CLFM	1,3-BUT	HCBU
For non-carcinogenic effects:						
Concentration in beef (mg/kg)	6.76E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.32E-12
Concentration in milk (mg/kg)	3.79E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.77E-12
Concentration in fish (mg/kg)	4.77E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.77E-07
Concentration in soil (mg/kg)	6.31E-05	6.05E-10	9.01E-08	1.20E-08	3.32E-10	2.43E-08
Concentration in above-ground vegetables (mg/kg)	8.96E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.81E-09
Concentration in below-ground vegetables (mg/kg)	2.38E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.59E-07
Concentration in drinking water (mg/L)	3.68E-08	2.65E-09	4.19E-09	8.29E-09	7.02E-09	3.94E-10
Air Concentration (ug/m$^{3)}$	7.22E-04	2.74E-04	2.74E-04	8.19E-04	8.19E-04	3.61E-05
For carcinogenic effects:						
Concentration in beef (mg/kg)	6.76E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.32E-12
Concentration in milk (mg/kg)	3.79E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.77E-12
Concentration in fish (mg/kg)	4.77E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.77E-07
Concentration in soil (mg/kg)	6.31E-05	6.05E-10	9.01E-08	1.20E-08	3.32E-10	2.43E-08
Concentration in above-ground vegetables (mg/kg)	8.96E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.81E-09
Concentration in below-ground vegetables (mg/kg)	2.38E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.59E-07
Concentration in drinking water (mg/L)	3.68E-08	2.65E-09	4.19E-09	8.29E-09	7.02E-09	3.94E-10
Air Concentration (ug/m$^{3)}$	7.22E-04	2.74E-04	2.74E-04	8.19E-04	8.19E-04	3.61E-05

Notes:

PCP	Pentachlorophenol
1,1-DCE	1,1-Dichloroethylene
1,1,2,2-TCA	1,1,2,2-Tetrachloroethane
CLFM	Chloroform
1,3-BUT	1,3-Butadiene
HCBU	Hexachlorobutadiene

Table D-2-B
Concentrations of Compounds in Media by Receptor
Adult Resident - North Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	Hg	HgCl	MeHg
For non-carcinogenic effects:			
Concentration in beef (mg/kg)	0.00E+00	2.75E-06	5.46E-08
Concentration in milk (mg/kg)	0.00E+00	1.44E-06	4.05E-08
Concentration in fish (mg/kg)	0.00E+00	0.00E+00	9.40E-02
Concentration in soil (mg/kg)	0.00E+00	7.53E-03	1.34E-04
Concentration in above-ground vegetables (mg/kg)	0.00E+00	4.61E-04	1.21E-04
Concentration in below-ground vegetables (mg/kg)	0.00E+00	9.05E-05	4.85E-06
Concentration in drinking water (mg/L)	0.00E+00	4.51E-08	7.72E-09
Air Concentration (ug/m$^{3)}$	3.27E-06	4.25E-04	0.00E+00
For carcinogenic effects:			
Concentration in beef (mg/kg)	0.00E+00	1.99E-06	5.05E-08
Concentration in milk (mg/kg)	0.00E+00	1.19E-06	3.91E-08
Concentration in fish (mg/kg)	0.00E+00	0.00E+00	6.96E-02
Concentration in soil (mg/kg)	0.00E+00	7.36E-03	0.00E+00
Concentration in above-ground vegetables (mg/kg)	0.00E+00	4.43E-04	1.20E-04
Concentration in below-ground vegetables (mg/kg)	0.00E+00	4.62E-05	0.00E+00
Concentration in drinking water (mg/L)	0.00E+00	4.48E-08	7.64E-09
Air Concentration (ug/m$^{3)}$	3.27E-06	4.25E-04	0.00E+00

Notes:

Hg	Elemental Mercury
HgCl	Mercuric Chlorid
MeHg	Methyl Mercury

Table D-2-C
Concentrations of Compounds in Media by Receptor
Subsistence Farmer - Beef Farm Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	As	Sb	Ba	Be	Cd	Total Cr	Cr VI
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	3.53E-07	3.57E-08	9.43E-09	1.23E-08	5.39E-09	4.05E-07	7.91E-08
Concentration in milk (mg/kg)	2.07E-08	6.94E-09	4.29E-08	1.93E-11	5.62E-10	1.88E-07	4.25E-08
Concentration in fish (mg/kg)	1.18E-06	4.79E-07	1.33E-05	2.19E-07	3.50E-06	1.18E-08	1.43E-08
Concentration in soil (mg/kg)	8.69E-06	2.64E-06	4.26E-06	5.01E-06	4.83E-06	3.55E-05	4.70E-07
Concentration in above-ground vegetables (mg/kg)	2.89E-07	1.25E-07	2.12E-07	1.82E-08	5.44E-07	1.32E-07	2.16E-08
Concentration in below-ground vegetables (mg/kg)	6.86E-08	7.42E-08	6.08E-08	2.91E-09	2.52E-07	5.32E-08	2.11E-09
Concentration in drinking water (mg/L)	6.91E-09	1.08E-09	1.92E-09	2.83E-10	1.21E-09	7.61E-11	4.52E-10
Air Concentration (ug/m^3)	6.44E-06	1.26E-06	2.23E-06	3.62E-07	1.40E-06	2.04E-06	5.30E-07
For carcinogenic effects:							
Concentration in beef (mg/kg)	3.50E-07	3.52E-08	9.31E-09	1.13E-08	5.14E-09	3.65E-07	7.88E-08
Concentration in milk (mg/kg)	2.07E-08	6.87E-09	4.25E-08	1.85E-11	5.40E-10	1.78E-07	4.24E-08
Concentration in fish (mg/kg)	9.13E-07	3.68E-07	1.03E-05	1.47E-07	2.63E-06	7.82E-09	1.10E-08
Concentration in soil (mg/kg)	6.51E-06	1.96E-06	3.18E-06	3.19E-06	3.51E-06	2.22E-05	3.53E-07
Concentration in above-ground vegetables (mg/kg)	2.74E-07	1.01E-07	1.73E-07	1.64E-08	3.79E-07	1.11E-07	2.10E-08
Concentration in below-ground vegetables (mg/kg)	4.93E-08	5.14E-08	4.25E-08	1.83E-09	1.68E-07	3.33E-08	1.56E-09
Concentration in drinking water (mg/L)	6.48E-09	9.95E-10	1.76E-09	2.57E-10	1.10E-09	7.10E-11	4.16E-10
Air Concentration (ug/m^3)	6.44E-06	1.26E-06	2.23E-06	3.62E-07	1.40E-06	2.04E-06	5.30E-07

Notes:

As	Arsenic
Sb	Antimony
Ba	Barium
Be	Beryllium
Cd	Cadmium
Total Cr	Total Chromium
Cr VI	Chromium VI

Table D-2-C
Concentrations of Compounds in Media by Receptor
Subsistence Farmer - Beef Farm Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	Pb	Ni	Se	Ag	Tl	Zn	TCDD-TEQ
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	1.82E-08	4.42E-06	2.21E-08	3.90E-07	2.37E-06	1.69E-07	6.65E-09
Concentration in milk (mg/kg)	2.66E-08	1.42E-06	1.13E-07	5.15E-06	2.28E-07	1.18E-07	2.31E-09
Concentration in fish (mg/kg)	1.32E-07	1.99E-05	4.06E-07	8.50E-06	2.08E-08	1.26E-03	1.15E-08
Concentration in soil (mg/kg)	2.44E-05	7.80E-05	8.64E-08	1.86E-06	6.86E-06	1.80E-04	2.15E-08
Concentration in above-ground vegetables (mg/kg)	1.89E-07	1.57E-06	1.49E-08	4.31E-07	8.13E-08	1.35E-05	1.79E-10
Concentration in below-ground vegetables (mg/kg)	8.34E-08	5.34E-07	1.90E-09	1.86E-07	2.28E-09	6.87E-06	1.03E-08
Concentration in drinking water (mg/L)	1.70E-09	2.24E-08	3.08E-10	4.04E-09	1.81E-09	5.40E-08	2.02E-13
Air Concentration (ug/m^3)	1.71E-06	2.59E-05	3.63E-07	4.76E-06	2.09E-06	6.26E-05	4.30E-10
For carcinogenic effects:							
Concentration in beef (mg/kg)	1.66E-08	4.35E-06	2.21E-08	3.88E-07	2.33E-06	1.64E-07	6.42E-09
Concentration in milk (mg/kg)	2.52E-08	1.41E-06	1.13E-07	5.13E-06	2.26E-07	1.15E-07	2.27E-09
Concentration in fish (mg/kg)	8.87E-08	1.51E-05	3.15E-07	6.58E-06	1.57E-08	9.61E-04	7.69E-09
Concentration in soil (mg/kg)	1.54E-05	5.72E-05	6.48E-08	1.40E-06	5.01E-06	1.32E-04	1.38E-08
Concentration in above-ground vegetables (mg/kg)	1.42E-07	1.36E-06	1.45E-08	3.66E-07	7.97E-08	9.88E-06	1.60E-10
Concentration in below-ground vegetables (mg/kg)	5.24E-08	3.59E-07	1.42E-09	1.40E-07	1.53E-09	4.64E-06	6.48E-09
Concentration in drinking water (mg/L)	1.58E-09	2.05E-08	2.84E-10	3.73E-09	1.65E-09	4.94E-08	1.82E-13
Air Concentration (ug/m^3)	1.71E-06	2.59E-05	3.63E-07	4.76E-06	2.09E-06	6.26E-05	4.30E-10

Notes:

Pb	Lead
Ni	Nickel
Se	Selenium
Ag	Silver
Tl	Thallium
Zn	Zinc
TCDD-TEQ	2,3,7,8-TCDD Toxicity Equivalents

Table D-2-C
Concentrations of Compounds in Media by Receptor
Subsistence Farmer - Beef Farm Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	BAA	BAP	BBF	BKF	CHRYS	DBAHA	INDENO
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	7.44E-09	9.78E-08	4.77E-07	1.29E-07	1.69E-07	1.25E-06	1.47E-05
Concentration in milk (mg/kg)	3.86E-09	5.90E-08	2.54E-07	7.86E-08	9.28E-08	7.86E-07	9.22E-06
Concentration in fish (mg/kg)	6.41E-07	9.40E-07	1.09E-05	5.86E-07	9.72E-06	1.20E-07	1.25E-07
Concentration in soil (mg/kg)	3.60E-07	6.08E-07	6.26E-06	3.64E-07	5.13E-06	1.02E-07	1.36E-07
Concentration in above-ground vegetables (mg/kg)	5.33E-09	5.28E-09	4.15E-08	4.77E-09	5.29E-08	1.63E-08	8.09E-08
Concentration in below-ground vegetables (mg/kg)	5.11E-07	2.73E-07	5.29E-06	2.11E-07	4.70E-06	4.90E-08	5.41E-08
Concentration in drinking water (mg/L)	6.77E-12	6.15E-12	6.23E-11	4.70E-12	7.03E-11	1.65E-12	1.29E-12
Air Concentration (ug/m^3)	3.25E-09	5.34E-09	3.62E-08	4.79E-09	2.57E-08	3.63E-09	5.07E-09
For carcinogenic effects:							
Concentration in beef (mg/kg)	6.56E-09	9.33E-08	4.27E-07	1.26E-07	1.52E-07	1.25E-06	1.47E-05
Concentration in milk (mg/kg)	3.55E-09	5.75E-08	2.38E-07	7.76E-08	8.71E-08	7.86E-07	9.22E-06
Concentration in fish (mg/kg)	4.59E-07	6.08E-07	7.42E-06	3.79E-07	6.48E-06	7.88E-08	8.24E-08
Concentration in soil (mg/kg)	2.52E-07	3.82E-07	4.15E-06	2.29E-07	3.33E-06	6.39E-08	8.50E-08
Concentration in above-ground vegetables (mg/kg)	3.61E-09	4.39E-09	2.98E-08	4.28E-09	3.71E-08	1.62E-08	8.08E-08
Concentration in below-ground vegetables (mg/kg)	3.32E-07	1.71E-07	3.37E-06	1.32E-07	2.97E-06	3.07E-08	3.38E-08
Concentration in drinking water (mg/L)	5.80E-12	5.01E-12	5.07E-11	3.96E-12	5.52E-11	1.52E-12	1.20E-12
Air Concentration (ug/m^3)	3.25E-09	5.34E-09	3.62E-08	4.79E-09	2.57E-08	3.63E-09	5.07E-09

Notes:

BAA	Benzo(a)anthracene
BAP	Benzo(a)pyrene
BBF	Benzo(b)fluoranthene
BKF	Benzo(k)fluoranthene
CHRYS	Chrysene
DBAHA	Dibenz(a,h)anthracene
INDENO	Indeno(1,2,3-c,d)pyrene

Table D-2-C
Concentrations of Compounds in Media by Receptor
Subsistence Farmer - Beef Farm Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	BEHP	HCBZ	BZ	BM	CCl4	DCDFM	T13DCP
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	3.79E-06	6.38E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in milk (mg/kg)	1.85E-06	3.43E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in fish (mg/kg)	1.35E-04	5.99E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in soil (mg/kg)	6.92E-04	3.87E-06	2.87E-10	1.99E-11	8.05E-11	7.90E-13	1.06E-10
Concentration in above-ground vegetables (mg/kg)	2.60E-05	1.05E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in below-ground vegetables (mg/kg)	1.43E-03	1.94E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in drinking water (mg/L)	3.10E-08	3.19E-09	1.21E-08	7.71E-09	2.48E-09	8.35E-09	2.90E-09
Air Concentration (ug/m^3)	1.97E-05	9.31E-06	4.87E-05	3.36E-05	1.02E-05	3.36E-05	1.12E-05
For carcinogenic effects:							
Concentration in beef (mg/kg)	3.21E-06	5.82E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in milk (mg/kg)	1.62E-06	3.22E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in fish (mg/kg)	1.03E-04	5.26E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in soil (mg/kg)	5.18E-04	2.90E-06	2.16E-10	1.49E-11	6.04E-11	5.93E-13	7.92E-11
Concentration in above-ground vegetables (mg/kg)	1.85E-05	8.02E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in below-ground vegetables (mg/kg)	1.02E-03	1.46E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in drinking water (mg/L)	2.87E-08	3.17E-09	1.21E-08	7.71E-09	2.48E-09	8.35E-09	2.90E-09
Air Concentration (ug/m^3)	1.97E-05	9.31E-06	4.87E-05	3.36E-05	1.02E-05	3.36E-05	1.12E-05

Notes:

BEHP	Bis(2-ethylhexyl)phthalate
HCBZ	Hexachlorobenzene
BZ	Benzene
BM	Bromomethane
CCl4	Carbon tetrachloride
DCDFM	Dichlorodifluoromethane
T13DCP	Trans-1,3-Dichloropropene

Table D-2-C
Concentrations of Compounds in Media by Receptor
Subsistence Farmer - Beef Farm Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	TCFM	VCL	HCP	2-NA	2,4-DNT	2,6-DNT	CLMTHN
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	0.00E+00	0.00E+00	3.25E-10	3.29E-11	1.53E-10	2.30E-10	0.00E+00
Concentration in milk (mg/kg)	0.00E+00	0.00E+00	1.81E-10	2.04E-11	9.53E-11	1.43E-10	0.00E+00
Concentration in fish (mg/kg)	0.00E+00	0.00E+00	2.63E-06	4.74E-06	5.15E-06	1.08E-05	0.00E+00
Concentration in soil (mg/kg)	4.35E-11	6.52E-13	4.16E-08	6.08E-07	2.30E-06	4.13E-06	2.01E-12
Concentration in above-ground vegetables (mg/kg)	0.00E+00	0.00E+00	2.49E-09	2.06E-06	6.56E-06	1.33E-05	0.00E+00
Concentration in below-ground vegetables (mg/kg)	0.00E+00	0.00E+00	6.12E-07	1.93E-05	6.43E-05	1.27E-04	0.00E+00
Concentration in drinking water (mg/L)	8.08E-09	7.63E-09	7.95E-09	2.78E-08	3.22E-08	6.64E-08	7.28E-09
Air Concentration (ug/m^3)	3.36E-05	3.36E-05	2.96E-05	1.48E-05	7.39E-06	1.48E-05	3.36E-05
For carcinogenic effects:							
Concentration in beef (mg/kg)	0.00E+00	0.00E+00	3.04E-10	2.49E-11	1.19E-10	1.73E-10	0.00E+00
Concentration in milk (mg/kg)	0.00E+00	0.00E+00	1.72E-10	1.55E-11	7.36E-11	1.08E-10	0.00E+00
Concentration in fish (mg/kg)	0.00E+00	0.00E+00	2.62E-06	3.85E-06	3.92E-06	8.22E-06	0.00E+00
Concentration in soil (mg/kg)	3.26E-11	4.89E-13	3.12E-08	4.56E-07	1.72E-06	3.10E-06	1.51E-12
Concentration in above-ground vegetables (mg/kg)	0.00E+00	0.00E+00	1.90E-09	1.56E-06	5.00E-06	1.00E-05	0.00E+00
Concentration in below-ground vegetables (mg/kg)	0.00E+00	0.00E+00	4.59E-07	1.45E-05	4.82E-05	9.55E-05	0.00E+00
Concentration in drinking water (mg/L)	8.08E-09	7.63E-09	7.95E-09	2.61E-08	2.68E-08	5.50E-08	7.28E-09
Air Concentration (ug/m^3)	3.36E-05	3.36E-05	2.96E-05	1.48E-05	7.39E-06	1.48E-05	3.36E-05

Notes:

TCFM	Trichlorofluoromethane
VCL	Vinyl Chloride
HCP	Hexachlorocyclopentadiene
2-NA	2-Nitroaniline
2,4-DNT	2,4-Dinitrotoluene
2,6-DNT	2,6-Dinitrotoluene
CLMTHN	Chloromethane

Table D-2-C
Concentrations of Compounds in Media by Receptor
Subsistence Farmer - Beef Farm Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	PCP	1,1-DCE	1,1,2,2-TCA	CLFM	1,3-BUT	HCBU
For non-carcinogenic effects:						
Concentration in beef (mg/kg)	6.76E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.32E-12
Concentration in milk (mg/kg)	4.24E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.09E-12
Concentration in fish (mg/kg)	4.77E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.77E-07
Concentration in soil (mg/kg)	2.71E-06	2.60E-11	3.87E-09	5.14E-10	1.43E-11	1.04E-09
Concentration in above-ground vegetables (mg/kg)	3.73E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.75E-11
Concentration in below-ground vegetables (mg/kg)	1.02E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.54E-08
Concentration in drinking water (mg/L)	3.68E-08	2.65E-09	4.19E-09	8.29E-09	7.02E-09	3.94E-10
Air Concentration (ug/m^3)	2.96E-05	1.13E-05	1.13E-05	3.36E-05	3.36E-05	1.48E-06
For carcinogenic effects:						
Concentration in beef (mg/kg)	6.74E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.92E-12
Concentration in milk (mg/kg)	4.23E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.91E-12
Concentration in fish (mg/kg)	4.01E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.77E-07
Concentration in soil (mg/kg)	2.03E-06	1.95E-11	2.90E-09	3.86E-10	1.07E-11	7.81E-10
Concentration in above-ground vegetables (mg/kg)	3.43E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.89E-11
Concentration in below-ground vegetables (mg/kg)	7.66E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.16E-08
Concentration in drinking water (mg/L)	3.61E-08	2.65E-09	4.18E-09	8.29E-09	7.02E-09	3.94E-10
Air Concentration (ug/m^3)	2.96E-05	1.13E-05	1.13E-05	3.36E-05	3.36E-05	1.48E-06

Notes:

PCP Pentachlorophenol
1,1-DCE 1,1-Dichloroethylene
1,1,2,2-TCA 1,1,2,2-Tetrachloroethane
CLFM Chloroform
1,3-BUT 1,3-Butadiene
HCBU Hexachlorobutadiene

Table D-2-C
Concentrations of Compounds in Media by Receptor
Subsistence Farmer - Beef Farm Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	Hg	HgCl	MeHg
For non-carcinogenic effects:			
Concentration in beef (mg/kg)	0.00E+00	2.75E-06	5.46E-08
Concentration in milk (mg/kg)	0.00E+00	1.57E-06	4.49E-08
Concentration in fish (mg/kg)	0.00E+00	0.00E+00	9.40E-02
Concentration in soil (mg/kg)	0.00E+00	5.96E-04	1.06E-05
Concentration in above-ground vegetables (mg/kg)	0.00E+00	2.03E-05	5.04E-06
Concentration in below-ground vegetables (mg/kg)	0.00E+00	7.17E-06	3.84E-07
Concentration in drinking water (mg/L)	0.00E+00	4.51E-08	7.72E-09
Air Concentration (ug/m^3)	1.34E-07	1.74E-05	0.00E+00
For carcinogenic effects:			
Concentration in beef (mg/kg)	0.00E+00	2.18E-06	5.14E-08
Concentration in milk (mg/kg)	0.00E+00	1.37E-06	4.38E-08
Concentration in fish (mg/kg)	0.00E+00	0.00E+00	7.22E-02
Concentration in soil (mg/kg)	0.00E+00	3.77E-04	2.53E-06
Concentration in above-ground vegetables (mg/kg)	0.00E+00	1.93E-05	4.95E-06
Concentration in below-ground vegetables (mg/kg)	0.00E+00	4.54E-06	9.45E-08
Concentration in drinking water (mg/L)	0.00E+00	4.48E-08	7.65E-09
Air Concentration (ug/m^3)	1.34E-07	1.74E-05	0.00E+00

Notes:

Hg	Elemental Mercury
HgCl	Mercuric Chlorid
MeHg	Methyl Mercury

Table D-2-D
Concentrations of Compounds in Media by Receptor
Subsistence Fisher
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	As	Sb	Ba	Be	Cd	Total Cr	Cr VI
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	3.53E-07	3.57E-08	9.43E-09	1.23E-08	5.39E-09	4.05E-07	7.91E-08
Concentration in milk (mg/kg)	1.92E-08	6.41E-09	3.96E-08	1.79E-11	5.22E-10	1.74E-07	3.93E-08
Concentration in fish (mg/kg)	2.23E-07	8.48E-08	2.36E-06	3.79E-08	6.14E-07	1.16E-08	2.55E-09
Concentration in soil (mg/kg)	1.09E-04	3.32E-05	5.36E-05	6.31E-05	6.08E-05	4.47E-04	5.92E-06
Concentration in above-ground vegetables (mg/kg)	4.36E-06	1.71E-06	2.92E-06	2.70E-07	7.00E-06	1.89E-06	3.32E-07
Concentration in below-ground vegetables (mg/kg)	8.63E-07	9.34E-07	7.66E-07	3.66E-08	3.18E-06	6.70E-07	2.66E-08
Concentration in drinking water (mg/L)	6.91E-09	1.08E-09	1.92E-09	2.83E-10	1.21E-09	7.61E-11	4.52E-10
Air Concentration (ug/m^3)	1.58E-04	3.09E-05	5.48E-05	8.88E-06	3.42E-05	5.00E-05	1.30E-05
For carcinogenic effects:							
Concentration in beef (mg/kg)	3.52E-07	3.54E-08	9.38E-09	1.11E-08	5.21E-09	3.52E-07	7.91E-08
Concentration in milk (mg/kg)	1.91E-08	6.38E-09	3.95E-08	1.70E-11	5.07E-10	1.62E-07	3.92E-08
Concentration in fish (mg/kg)	2.07E-07	7.55E-08	2.12E-06	2.22E-08	5.07E-07	6.62E-09	2.43E-09
Concentration in soil (mg/kg)	1.01E-04	2.92E-05	4.77E-05	3.40E-05	4.90E-05	2.23E-04	5.62E-06
Concentration in above-ground vegetables (mg/kg)	4.21E-06	1.42E-06	2.46E-06	2.39E-07	4.72E-06	1.53E-06	3.27E-07
Concentration in below-ground vegetables (mg/kg)	6.74E-07	6.59E-07	5.52E-07	1.88E-08	2.01E-06	3.35E-07	2.26E-08
Concentration in drinking water (mg/L)	6.78E-09	1.04E-09	1.85E-09	2.50E-10	1.13E-09	6.95E-11	4.45E-10
Air Concentration (ug/m^3)	1.58E-04	3.09E-05	5.48E-05	8.88E-06	3.42E-05	5.00E-05	1.30E-05

Notes:

As	Arsenic
Sb	Antimony
Ba	Barium
Be	Beryllium
Cd	Cadmium
Total Cr	Total Chromium
Cr VI	Chromium VI

Table D-2-D
Concentrations of Compounds in Media by Receptor
Subsistence Fisher
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	Pb	Ni	Se	Ag	Tl	Zn	TCDD-TEQ
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	1.82E-08	4.42E-06	2.21E-08	3.90E-07	2.37E-06	1.69E-07	6.65E-09
Concentration in milk (mg/kg)	2.46E-08	1.31E-06	1.04E-07	4.76E-06	2.10E-07	1.09E-07	2.07E-09
Concentration in fish (mg/kg)	2.41E-08	3.51E-06	7.29E-08	1.52E-06	3.66E-09	2.23E-04	8.84E-09
Concentration in soil (mg/kg)	3.07E-04	9.82E-04	1.09E-06	2.34E-05	8.64E-05	2.26E-03	4.21E-07
Concentration in above-ground vegetables (mg/kg)	2.56E-06	2.26E-05	2.29E-07	5.95E-06	1.26E-06	1.77E-04	4.04E-09
Concentration in below-ground vegetables (mg/kg)	1.05E-06	6.72E-06	2.39E-08	2.34E-06	2.88E-08	8.65E-05	2.02E-07
Concentration in drinking water (mg/L)	1.70E-09	2.24E-08	3.08E-10	4.04E-09	1.81E-09	5.40E-08	2.02E-13
Air Concentration (ug/m^3)	4.20E-05	6.36E-04	8.90E-06	1.17E-04	5.13E-05	1.54E-03	1.06E-08
For carcinogenic effects:							
Concentration in beef (mg/kg)	1.61E-08	4.37E-06	2.21E-08	3.90E-07	2.35E-06	1.66E-07	6.37E-09
Concentration in milk (mg/kg)	2.29E-08	1.30E-06	1.04E-07	4.76E-06	2.09E-07	1.07E-07	2.03E-09
Concentration in fish (mg/kg)	1.41E-08	2.97E-06	7.29E-08	1.49E-06	3.05E-09	1.90E-04	5.38E-09
Concentration in soil (mg/kg)	1.64E-04	8.15E-04	1.09E-06	2.29E-05	7.05E-05	1.89E-03	2.39E-07
Concentration in above-ground vegetables (mg/kg)	1.79E-06	1.99E-05	2.28E-07	5.74E-06	1.24E-06	1.29E-04	3.56E-09
Concentration in below-ground vegetables (mg/kg)	5.37E-07	4.38E-06	2.29E-08	2.19E-06	1.84E-08	5.69E-05	1.05E-07
Concentration in drinking water (mg/L)	1.55E-09	2.12E-08	3.08E-10	4.01E-09	1.70E-09	5.12E-08	1.78E-13
Air Concentration (ug/m^3)	4.20E-05	6.36E-04	8.90E-06	1.17E-04	5.13E-05	1.54E-03	1.06E-08

Notes:

Pb	Lead
Ni	Nickel
Se	Selenium
Ag	Silver
Tl	Thallium
Zn	Zinc
TCDD-TEQ	2,3,7,8-TCDD Toxicity Equivalents

Table D-2-D
Concentrations of Compounds in Media by Receptor
Subsistence Fisher
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	BAA	BAP	BBF	BKF	CHRYS	DBAHA	INDENO
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	7.44E-09	9.78E-08	4.77E-07	1.29E-07	1.69E-07	1.25E-06	1.47E-05
Concentration in milk (mg/kg)	3.47E-09	5.29E-08	2.28E-07	7.04E-08	8.32E-08	7.04E-07	8.26E-06
Concentration in fish (mg/kg)	2.67E-07	5.76E-07	6.58E-06	3.42E-07	4.14E-06	8.08E-08	9.53E-08
Concentration in soil (mg/kg)	8.36E-06	1.33E-05	1.45E-04	7.61E-06	1.18E-04	1.57E-06	2.02E-06
Concentration in above-ground vegetables (mg/kg)	1.24E-07	1.21E-07	9.71E-07	1.10E-07	1.23E-06	3.93E-07	1.97E-06
Concentration in below-ground vegetables (mg/kg)	1.19E-05	5.99E-06	1.23E-04	4.42E-06	1.09E-04	7.52E-07	8.02E-07
Concentration in drinking water (mg/L)	6.77E-12	6.15E-12	6.23E-11	4.70E-12	7.03E-11	1.65E-12	1.29E-12
Air Concentration (ug/m^3)	7.93E-08	1.31E-07	8.85E-07	1.18E-07	6.29E-07	8.94E-08	1.25E-07
For carcinogenic effects:							
Concentration in beef (mg/kg)	6.63E-09	9.19E-08	4.21E-07	1.25E-07	1.49E-07	1.25E-06	1.47E-05
Concentration in milk (mg/kg)	3.21E-09	5.12E-08	2.12E-07	6.93E-08	7.70E-08	7.03E-07	8.26E-06
Concentration in fish (mg/kg)	2.00E-07	3.18E-07	4.28E-06	1.87E-07	2.53E-06	4.48E-08	5.31E-08
Concentration in soil (mg/kg)	6.05E-06	6.90E-06	9.02E-05	3.90E-06	6.88E-05	7.86E-07	1.01E-06
Concentration in above-ground vegetables (mg/kg)	7.68E-08	9.55E-08	6.30E-07	9.68E-08	7.65E-07	3.91E-07	1.97E-06
Concentration in below-ground vegetables (mg/kg)	6.94E-06	3.03E-06	6.64E-05	2.23E-06	5.73E-05	3.76E-07	4.01E-07
Concentration in drinking water (mg/L)	5.90E-12	4.69E-12	4.95E-11	3.75E-12	5.26E-11	1.48E-12	1.17E-12
Air Concentration (ug/m^3)	7.93E-08	1.31E-07	8.85E-07	1.18E-07	6.29E-07	8.94E-08	1.25E-07

Notes:

BAA	Benzo(a)anthracene
BAP	Benzo(a)pyrene
BBF	Benzo(b)fluoranthene
BKF	Benzo(k)fluoranthene
CHRYS	Chrysene
DBAHA	Dibenz(a,h)anthracene
INDENO	Indeno(1,2,3-c,d)pyrene

Table D-2-D
Concentrations of Compounds in Media by Receptor
Subsistence Fisher
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	BEHP	HCBZ	BZ	BM	CCl4	DCDFM	T13DCP
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	3.79E-06	6.38E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in milk (mg/kg)	1.67E-06	3.08E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in fish (mg/kg)	4.53E-05	2.68E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in soil (mg/kg)	1.61E-02	9.01E-05	6.69E-09	4.62E-10	1.88E-09	1.84E-11	2.46E-09
Concentration in above-ground vegetables (mg/kg)	6.04E-04	2.45E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in below-ground vegetables (mg/kg)	3.33E-02	4.52E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in drinking water (mg/L)	3.10E-08	3.19E-09	1.21E-08	7.71E-09	2.48E-09	8.35E-09	2.90E-09
Air Concentration (ug/m^3)	4.81E-04	2.27E-04	1.19E-03	8.19E-04	2.48E-04	8.19E-04	2.74E-04
For carcinogenic effects:							
Concentration in beef (mg/kg)	3.58E-06	6.38E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in milk (mg/kg)	1.59E-06	3.08E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in fish (mg/kg)	4.14E-05	2.68E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in soil (mg/kg)	1.46E-02	9.01E-05	6.69E-09	4.62E-10	1.88E-09	1.84E-11	2.46E-09
Concentration in above-ground vegetables (mg/kg)	4.56E-04	2.45E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in below-ground vegetables (mg/kg)	2.50E-02	4.52E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in drinking water (mg/L)	3.02E-08	3.19E-09	1.21E-08	7.71E-09	2.48E-09	8.35E-09	2.90E-09
Air Concentration (ug/m^3)	4.81E-04	2.27E-04	1.19E-03	8.19E-04	2.48E-04	8.19E-04	2.74E-04

Notes:

BEHP	Bis(2-ethylhexyl)phthalate
HCBZ	Hexachlorobenzene
BZ	Benzene
BM	Bromomethane
CCl4	Carbon tetrachloride
DCDFM	Dichlorodifluoromethane
T13DCP	Trans-1,3-Dichloropropene

Table D-2-D
Concentrations of Compounds in Media by Receptor
Subsistence Fisher
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	TCFM	VCL	HCP	2-NA	2,4-DNT	2,6-DNT	CLMTHN
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	0.00E+00	0.00E+00	3.25E-10	3.29E-11	1.53E-10	2.30E-10	0.00E+00
Concentration in milk (mg/kg)	0.00E+00	0.00E+00	1.62E-10	1.84E-11	8.59E-11	1.29E-10	0.00E+00
Concentration in fish (mg/kg)	0.00E+00	0.00E+00	1.07E-06	1.06E-06	1.15E-06	2.41E-06	0.00E+00
Concentration in soil (mg/kg)	1.01E-09	1.52E-11	9.70E-07	1.42E-05	5.35E-05	9.63E-05	4.68E-11
Concentration in above-ground vegetables (mg/kg)	0.00E+00	0.00E+00	5.81E-08	4.81E-05	1.53E-04	3.10E-04	0.00E+00
Concentration in below-ground vegetables (mg/kg)	0.00E+00	0.00E+00	1.43E-05	4.51E-04	1.50E-03	2.97E-03	0.00E+00
Concentration in drinking water (mg/L)	8.08E-09	7.63E-09	7.95E-09	2.78E-08	3.22E-08	6.64E-08	7.28E-09
Air Concentration (ug/m^3)	8.19E-04	8.19E-04	7.22E-04	3.61E-04	1.80E-04	3.61E-04	8.19E-04
For carcinogenic effects:							
Concentration in beef (mg/kg)	0.00E+00	0.00E+00	3.25E-10	3.29E-11	1.53E-10	2.30E-10	0.00E+00
Concentration in milk (mg/kg)	0.00E+00	0.00E+00	1.62E-10	1.84E-11	8.59E-11	1.29E-10	0.00E+00
Concentration in fish (mg/kg)	0.00E+00	0.00E+00	1.07E-06	1.06E-06	1.15E-06	2.41E-06	0.00E+00
Concentration in soil (mg/kg)	1.01E-09	1.52E-11	9.70E-07	1.42E-05	5.35E-05	9.63E-05	4.68E-11
Concentration in above-ground vegetables (mg/kg)	0.00E+00	0.00E+00	5.81E-08	4.81E-05	1.53E-04	3.10E-04	0.00E+00
Concentration in below-ground vegetables (mg/kg)	0.00E+00	0.00E+00	1.43E-05	4.51E-04	1.50E-03	2.97E-03	0.00E+00
Concentration in drinking water (mg/L)	8.08E-09	7.63E-09	7.95E-09	2.78E-08	3.22E-08	6.64E-08	7.28E-09
Air Concentration (ug/m^3)	8.19E-04	8.19E-04	7.22E-04	3.61E-04	1.80E-04	3.61E-04	8.19E-04

Notes:

TCFM	Trichlorofluoromethane
VCL	Vinyl Chloride
HCP	Hexachlorocyclopentadiene
2-NA	2-Nitroaniline
2,4-DNT	2,4-Dinitrotoluene
2,6-DNT	2,6-Dinitrotoluene
CLMTHN	Chloromethane

Table D-2-D
Concentrations of Compounds in Media by Receptor
Subsistence Fisher
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	PCP	1,1-DCE	1,1,2,2-TCA	CLFM	1,3-BUT	HCBU
For non-carcinogenic effects:						
Concentration in beef (mg/kg)	6.76E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.32E-12
Concentration in milk (mg/kg)	3.79E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.77E-12
Concentration in fish (mg/kg)	1.39E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.94E-07
Concentration in soil (mg/kg)	6.31E-05	6.05E-10	9.01E-08	1.20E-08	3.32E-10	2.43E-08
Concentration in above-ground vegetables (mg/kg)	8.96E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.81E-09
Concentration in below-ground vegetables (mg/kg)	2.38E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.59E-07
Concentration in drinking water (mg/L)	3.68E-08	2.65E-09	4.19E-09	8.29E-09	7.02E-09	3.94E-10
Air Concentration (ug/m^3)	7.22E-04	2.74E-04	2.74E-04	8.19E-04	8.19E-04	3.61E-05
For carcinogenic effects:						
Concentration in beef (mg/kg)	6.76E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.32E-12
Concentration in milk (mg/kg)	3.79E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.77E-12
Concentration in fish (mg/kg)	1.39E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.94E-07
Concentration in soil (mg/kg)	6.31E-05	6.05E-10	9.01E-08	1.20E-08	3.32E-10	2.43E-08
Concentration in above-ground vegetables (mg/kg)	8.96E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.81E-09
Concentration in below-ground vegetables (mg/kg)	2.38E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.59E-07
Concentration in drinking water (mg/L)	3.68E-08	2.65E-09	4.19E-09	8.29E-09	7.02E-09	3.94E-10
Air Concentration (ug/m^3)	7.22E-04	2.74E-04	2.74E-04	8.19E-04	8.19E-04	3.61E-05

Notes:

PCP	Pentachlorophenol
1,1-DCE	1,1-Dichloroethylene
1,1,2,2-TCA	1,1,2,2-Tetrachloroethane
CLFM	Chloroform
1,3-BUT	1,3-Butadiene
HCBU	Hexachlorobutadiene

Table D-2-D
Concentrations of Compounds in Media by Receptor
Subsistence Fisher
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	Hg	HgCl	MeHg
For non-carcinogenic effects:			
Concentration in beef (mg/kg)	0.00E+00	2.75E-06	5.46E-08
Concentration in milk (mg/kg)	0.00E+00	1.44E-06	4.05E-08
Concentration in fish (mg/kg)	0.00E+00	0.00E+00	1.88E-02
Concentration in soil (mg/kg)	0.00E+00	5.96E-04	1.06E-05
Concentration in above-ground vegetables (mg/kg)	0.00E+00	2.03E-05	5.04E-06
Concentration in below-ground vegetables (mg/kg)	0.00E+00	7.17E-06	3.84E-07
Concentration in drinking water (mg/L)	0.00E+00	4.51E-08	7.72E-09
Air Concentration (ug/m^3)	3.27E-06	4.25E-04	0.00E+00
For carcinogenic effects:			
Concentration in beef (mg/kg)	0.00E+00	1.99E-06	5.05E-08
Concentration in milk (mg/kg)	0.00E+00	1.19E-06	3.91E-08
Concentration in fish (mg/kg)	0.00E+00	0.00E+00	1.26E-02
Concentration in soil (mg/kg)	0.00E+00	3.84E-03	0.00E+00
Concentration in above-ground vegetables (mg/kg)	0.00E+00	4.43E-04	1.20E-04
Concentration in below-ground vegetables (mg/kg)	0.00E+00	4.62E-05	0.00E+00
Concentration in drinking water (mg/L)	0.00E+00	4.48E-08	7.64E-09
Air Concentration (ug/m^3)	3.27E-06	4.25E-04	0.00E+00

Notes:

Hg	Elemental Mercury
HgCl	Mercuric Chlorid
MeHg	Methyl Mercury

Table D-2-E
Concentrations of Compounds in Media by Receptor
Child Resident - South Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	As	Sb	Ba	Be	Cd	Total Cr	Cr VI
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	3.53E-07	3.57E-08	9.43E-09	1.23E-08	5.39E-09	4.05E-07	7.91E-08
Concentration in milk (mg/kg)	1.92E-08	6.41E-09	3.96E-08	1.79E-11	5.22E-10	1.74E-07	3.93E-08
Concentration in fish (mg/kg)	1.18E-06	4.79E-07	1.33E-05	2.19E-07	3.50E-06	1.18E-08	1.43E-08
Concentration in soil (mg/kg)	2.73E-04	8.29E-05	1.34E-04	1.57E-04	1.52E-04	1.11E-03	1.48E-05
Concentration in above-ground vegetables (mg/kg)	8.22E-06	3.76E-06	6.37E-06	5.24E-07	1.69E-05	3.88E-06	6.09E-07
Concentration in below-ground vegetables (mg/kg)	2.16E-06	2.33E-06	1.91E-06	9.15E-08	7.93E-06	1.67E-06	6.64E-08
Concentration in drinking water (mg/L)	5.50E-09	1.08E-09	1.92E-09	2.83E-10	1.21E-09	7.61E-11	4.52E-10
Air Concentration (ug/m^3)	4.74E-07	9.29E-08	1.65E-07	2.67E-08	1.03E-07	1.50E-07	3.91E-08
For carcinogenic effects:							
Concentration in beef (mg/kg)	3.53E-07	3.57E-08	9.43E-09	1.22E-08	5.39E-09	4.01E-07	7.91E-08
Concentration in milk (mg/kg)	1.92E-08	6.41E-09	3.96E-08	1.78E-11	5.21E-10	1.73E-07	3.93E-08
Concentration in fish (mg/kg)	1.18E-06	4.79E-07	1.33E-05	2.14E-07	3.49E-06	1.14E-08	1.43E-08
Concentration in soil (mg/kg)	2.73E-04	8.29E-05	1.34E-04	1.52E-04	1.52E-04	1.07E-03	1.48E-05
Concentration in above-ground vegetables (mg/kg)	8.21E-06	3.74E-06	6.34E-06	5.17E-07	1.66E-05	3.80E-06	6.09E-07
Concentration in below-ground vegetables (mg/kg)	2.15E-06	2.31E-06	1.90E-06	8.79E-08	7.80E-06	1.60E-06	6.64E-08
Concentration in drinking water (mg/L)	5.50E-09	1.08E-09	1.92E-09	2.81E-10	1.21E-09	7.56E-11	4.52E-10
Air Concentration (ug/m^3)	4.74E-07	9.29E-08	1.65E-07	2.67E-08	1.03E-07	1.50E-07	3.91E-08

Notes:

As	Arsenic
Sb	Antimony
Ba	Barium
Be	Beryllium
Cd	Cadmium
Total Cr	Total Chromium
Cr VI	Chromium VI

Table D-2-E
Concentrations of Compounds in Media by Receptor
Child Resident - South Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	Pb	Ni	Se	Ag	Tl	Zn	TCDD-TEQ
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	1.82E-08	4.42E-06	2.21E-08	3.90E-07	2.37E-06	1.69E-07	6.65E-09
Concentration in milk (mg/kg)	2.46E-08	1.31E-06	1.04E-07	4.76E-06	2.10E-07	1.09E-07	2.07E-09
Concentration in fish (mg/kg)	1.32E-07	1.99E-05	4.06E-07	8.50E-06	2.08E-08	1.26E-03	1.15E-08
Concentration in soil (mg/kg)	7.65E-04	2.45E-03	2.71E-06	5.85E-05	2.16E-04	5.65E-03	2.58E-07
Concentration in above-ground vegetables (mg/kg)	5.69E-06	4.58E-05	4.20E-07	1.29E-05	2.27E-06	4.17E-04	9.21E-10
Concentration in below-ground vegetables (mg/kg)	2.62E-06	1.68E-05	5.97E-08	5.85E-06	7.18E-08	2.16E-04	1.23E-07
Concentration in drinking water (mg/L)	1.33E-09	2.24E-08	3.08E-10	4.04E-09	1.81E-09	5.40E-08	2.02E-13
Air Concentration (ug/m^3)	1.26E-07	1.91E-06	2.67E-08	3.51E-07	1.54E-07	4.61E-06	3.17E-11
For carcinogenic effects:							
Concentration in beef (mg/kg)	1.81E-08	4.42E-06	2.21E-08	3.90E-07	2.37E-06	1.69E-07	6.63E-09
Concentration in milk (mg/kg)	2.45E-08	1.31E-06	1.04E-07	4.76E-06	2.10E-07	1.09E-07	2.07E-09
Concentration in fish (mg/kg)	1.29E-07	1.99E-05	4.06E-07	8.50E-06	2.08E-08	1.26E-03	1.12E-08
Concentration in soil (mg/kg)	7.39E-04	2.45E-03	2.71E-06	5.85E-05	2.15E-04	5.65E-03	2.50E-07
Concentration in above-ground vegetables (mg/kg)	5.54E-06	4.55E-05	4.20E-07	1.29E-05	2.27E-06	4.12E-04	8.98E-10
Concentration in below-ground vegetables (mg/kg)	2.52E-06	1.65E-05	5.97E-08	5.85E-06	7.06E-08	2.13E-04	1.19E-07
Concentration in drinking water (mg/L)	1.32E-09	2.24E-08	3.08E-10	4.04E-09	1.81E-09	5.40E-08	2.01E-13
Air Concentration (ug/m^3)	1.26E-07	1.91E-06	2.67E-08	3.51E-07	1.54E-07	4.61E-06	3.17E-11

Notes:

Pb	Lead
Ni	Nickel
Se	Selenium
Ag	Silver
Tl	Thallium
Zn	Zinc
TCDD-TEQ	2,3,7,8-TCDD Toxicity Equivalents

Table D-2-E
Concentrations of Compounds in Media by Receptor
Child Resident - South Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	BAA	BAP	BBF	BKF	CHRYS	DBAHA	INDENO
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	7.44E-09	9.78E-08	4.77E-07	1.29E-07	1.69E-07	1.25E-06	1.47E-05
Concentration in milk (mg/kg)	3.47E-09	5.29E-08	2.28E-07	7.04E-08	8.32E-08	7.04E-07	8.26E-06
Concentration in fish (mg/kg)	6.41E-07	9.40E-07	1.09E-05	5.86E-07	9.72E-06	1.20E-07	1.25E-07
Concentration in soil (mg/kg)	1.01E-06	3.93E-06	1.84E-05	3.47E-06	1.59E-05	2.63E-06	3.70E-06
Concentration in above-ground vegetables (mg/kg)	1.43E-08	2.09E-08	1.04E-07	1.80E-08	1.41E-07	1.16E-08	1.75E-08
Concentration in below-ground vegetables (mg/kg)	1.44E-06	1.77E-06	1.55E-05	2.01E-06	1.45E-05	1.26E-06	1.47E-06
Concentration in drinking water (mg/L)	6.77E-12	6.15E-12	6.23E-11	4.70E-12	7.03E-11	1.65E-12	1.29E-12
Air Concentration (ug/m^3)	2.38E-10	3.95E-10	2.65E-09	3.55E-10	1.89E-09	2.69E-10	3.76E-10
For carcinogenic effects:							
Concentration in beef (mg/kg)	7.42E-09	9.74E-08	4.74E-07	1.29E-07	1.67E-07	1.25E-06	1.47E-05
Concentration in milk (mg/kg)	3.46E-09	5.28E-08	2.27E-07	7.03E-08	8.28E-08	7.04E-07	8.26E-06
Concentration in fish (mg/kg)	6.38E-07	9.12E-07	1.08E-05	5.68E-07	9.53E-06	1.16E-07	1.21E-07
Concentration in soil (mg/kg)	1.01E-06	3.78E-06	1.81E-05	3.34E-06	1.55E-05	2.52E-06	3.54E-06
Concentration in above-ground vegetables (mg/kg)	1.40E-08	2.03E-08	1.01E-07	1.75E-08	1.36E-07	1.14E-08	1.73E-08
Concentration in below-ground vegetables (mg/kg)	1.40E-06	1.70E-06	1.50E-05	1.93E-06	1.40E-05	1.21E-06	1.41E-06
Concentration in drinking water (mg/L)	6.75E-12	6.04E-12	6.17E-11	4.62E-12	6.93E-11	1.63E-12	1.28E-12
Air Concentration (ug/m^3)	2.38E-10	3.95E-10	2.65E-09	3.55E-10	1.89E-09	2.69E-10	3.76E-10

Notes:

BAA	Benzo(a)anthracene
BAP	Benzo(a)pyrene
BBF	Benzo(b)fluoranthene
BKF	Benzo(k)fluoranthene
CHRYS	Chrysene
DBAHA	Dibenz(a,h)anthracene
INDENO	Indeno(1,2,3-c,d)pyrene

Table D-2-E
Concentrations of Compounds in Media by Receptor
Child Resident - South Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	BEHP	HCBZ	BZ	BM	CCl4	DCDFM	T13DCP
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	3.79E-06	6.38E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in milk (mg/kg)	1.67E-06	3.08E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in fish (mg/kg)	1.35E-04	5.99E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in soil (mg/kg)	1.87E-03	1.00E-05	7.45E-10	5.15E-11	2.09E-10	2.05E-12	2.74E-10
Concentration in above-ground vegetables (mg/kg)	7.09E-05	2.57E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in below-ground vegetables (mg/kg)	3.88E-03	5.04E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in drinking water (mg/L)	3.10E-08	3.19E-09	1.21E-08	7.71E-09	2.48E-09	8.35E-09	2.90E-09
Air Concentration (ug/m^3)	1.44E-06	6.80E-07	3.56E-06	2.45E-06	7.43E-07	2.45E-06	8.21E-07
For carcinogenic effects:							
Concentration in beef (mg/kg)	3.79E-06	6.38E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in milk (mg/kg)	1.67E-06	3.08E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in fish (mg/kg)	1.35E-04	5.99E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in soil (mg/kg)	1.87E-03	1.00E-05	7.45E-10	5.15E-11	2.09E-10	2.05E-12	2.74E-10
Concentration in above-ground vegetables (mg/kg)	7.06E-05	2.57E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in below-ground vegetables (mg/kg)	3.86E-03	5.04E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in drinking water (mg/L)	3.10E-08	3.19E-09	1.21E-08	7.71E-09	2.48E-09	8.35E-09	2.90E-09
Air Concentration (ug/m^3)	1.44E-06	6.80E-07	3.56E-06	2.45E-06	7.43E-07	2.45E-06	8.21E-07

Notes:

BEHP Bis(2-ethylhexyl)phthalate
HCBZ Hexachlorobenzene
BZ Benzene
BM Bromomethane
CCl4 Carbon tetrachloride
DCDFM Dichlorodifluoromethane
T13DCP Trans-1,3-Dichloropropene

Table D-2-E
Concentrations of Compounds in Media by Receptor
Child Resident - South Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	TCFM	VCL	HCP	2-NA	2,4-DNT	2,6-DNT	CLMTHN
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	0.00E+00	0.00E+00	3.25E-10	3.29E-11	1.53E-10	2.30E-10	0.00E+00
Concentration in milk (mg/kg)	0.00E+00	0.00E+00	1.62E-10	1.84E-11	8.59E-11	1.29E-10	0.00E+00
Concentration in fish (mg/kg)	0.00E+00	0.00E+00	2.63E-06	4.74E-06	5.15E-06	1.08E-05	0.00E+00
Concentration in soil (mg/kg)	1.13E-10	1.69E-12	1.08E-07	1.58E-06	5.99E-06	1.07E-05	5.21E-12
Concentration in above-ground vegetables (mg/kg)	0.00E+00	0.00E+00	6.11E-09	5.21E-06	1.64E-05	3.38E-05	0.00E+00
Concentration in below-ground vegetables (mg/kg)	0.00E+00	0.00E+00	1.59E-06	5.02E-05	1.68E-04	3.30E-04	0.00E+00
Concentration in drinking water (mg/L)	8.08E-09	7.63E-09	7.95E-09	2.78E-08	3.22E-08	6.64E-08	7.28E-09
Air Concentration (ug/m^3)	2.45E-06	2.45E-06	2.16E-06	1.08E-06	5.40E-07	1.08E-06	2.45E-06
For carcinogenic effects:							
Concentration in beef (mg/kg)	0.00E+00	0.00E+00	3.25E-10	3.29E-11	1.53E-10	2.30E-10	0.00E+00
Concentration in milk (mg/kg)	0.00E+00	0.00E+00	1.62E-10	1.84E-11	8.59E-11	1.29E-10	0.00E+00
Concentration in fish (mg/kg)	0.00E+00	0.00E+00	2.63E-06	4.74E-06	5.15E-06	1.08E-05	0.00E+00
Concentration in soil (mg/kg)	1.13E-10	1.69E-12	1.08E-07	1.58E-06	5.99E-06	1.07E-05	5.21E-12
Concentration in above-ground vegetables (mg/kg)	0.00E+00	0.00E+00	6.11E-09	5.21E-06	1.64E-05	3.38E-05	0.00E+00
Concentration in below-ground vegetables (mg/kg)	0.00E+00	0.00E+00	1.59E-06	5.02E-05	1.68E-04	3.30E-04	0.00E+00
Concentration in drinking water (mg/L)	8.08E-09	7.63E-09	7.95E-09	2.78E-08	3.22E-08	6.64E-08	7.28E-09
Air Concentration (ug/m^3)	2.45E-06	2.45E-06	2.16E-06	1.08E-06	5.40E-07	1.08E-06	2.45E-06

Notes:

TCFM	Trichlorofluoromethane
VCL	Vinyl Chloride
HCP	Hexachlorocyclopentadiene
2-NA	2-Nitroaniline
2,4-DNT	2,4-Dinitrotoluene
2,6-DNT	2,6-Dinitrotoluene
CLMTHN	Chloromethane

Table D-2-E
Concentrations of Compounds in Media by Receptor
Child Resident - South Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	PCP	1,1-DCE	1,1,2,2-TCA	CLFM	1,3-BUT	HCBU
For non-carcinogenic effects:						
Concentration in beef (mg/kg)	6.76E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.32E-12
Concentration in milk (mg/kg)	3.79E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.77E-12
Concentration in fish (mg/kg)	4.77E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.77E-07
Concentration in soil (mg/kg)	7.03E-06	6.73E-11	1.00E-08	1.33E-09	3.69E-11	2.70E-09
Concentration in above-ground vegetables (mg/kg)	3.33E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.93E-10
Concentration in below-ground vegetables (mg/kg)	2.65E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.00E-08
Concentration in drinking water (mg/L)	3.68E-08	2.65E-09	4.19E-09	8.29E-09	7.02E-09	3.94E-10
Air Concentration (ug/m^3)	2.16E-06	8.22E-07	8.22E-07	2.45E-06	2.45E-06	1.08E-07
For carcinogenic effects:						
Concentration in beef (mg/kg)	6.76E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.32E-12
Concentration in milk (mg/kg)	3.79E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.77E-12
Concentration in fish (mg/kg)	4.77E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.77E-07
Concentration in soil (mg/kg)	7.03E-06	6.73E-11	1.00E-08	1.33E-09	3.69E-11	2.70E-09
Concentration in above-ground vegetables (mg/kg)	3.33E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.93E-10
Concentration in below-ground vegetables (mg/kg)	2.65E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.00E-08
Concentration in drinking water (mg/L)	3.68E-08	2.65E-09	4.19E-09	8.29E-09	7.02E-09	3.94E-10
Air Concentration (ug/m^3)	2.16E-06	8.22E-07	8.22E-07	2.45E-06	2.45E-06	1.08E-07

Notes:

PCP	Pentachlorophenol
1,1-DCE	1,1-Dichloroethylene
1,1,2,2-TCA	1,1,2,2-Tetrachloroethane
CLFM	Chloroform
1,3-BUT	1,3-Butadiene
HCBU	Hexachlorobutadiene

Table D-2-E
Concentrations of Compounds in Media by Receptor
Child Resident - South Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	Hg	HgCl	MeHg
For non-carcinogenic effects:			
Concentration in beef (mg/kg)	0.00E+00	2.75E-06	5.46E-08
Concentration in milk (mg/kg)	0.00E+00	1.44E-06	4.05E-08
Concentration in fish (mg/kg)	0.00E+00	0.00E+00	9.40E-02
Concentration in soil (mg/kg)	0.00E+00	1.66E-02	2.95E-04
Concentration in above-ground vegetables (mg/kg)	0.00E+00	8.43E-05	4.29E-06
Concentration in below-ground vegetables (mg/kg)	0.00E+00	1.99E-04	1.07E-05
Concentration in drinking water (mg/L)	0.00E+00	4.51E-08	7.72E-09
Air Concentration (ug/m^3)	9.80E-09	1.27E-06	0.00E+00
For carcinogenic effects:			
Concentration in beef (mg/kg)	0.00E+00	2.72E-06	5.05E-08
Concentration in milk (mg/kg)	0.00E+00	1.43E-06	3.91E-08
Concentration in fish (mg/kg)	0.00E+00	0.00E+00	9.22E-02
Concentration in soil (mg/kg)	0.00E+00	1.62E-02	0.00E+00
Concentration in above-ground vegetables (mg/kg)	0.00E+00	8.25E-05	1.12E-06
Concentration in below-ground vegetables (mg/kg)	0.00E+00	1.95E-04	0.00E+00
Concentration in drinking water (mg/L)	0.00E+00	4.51E-08	7.71E-09
Air Concentration (ug/m^3)	9.80E-09	1.27E-06	0.00E+00

Notes:

Hg	Elemental Mercury
HgCl	Mercuric Chlorid
MeHg	Methyl Mercury

Table D-2-F
Concentrations of Compounds in Media by Receptor
Adult Resident - South Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	As	Sb	Ba	Be	Cd	Total Cr	Cr VI
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	3.53E-07	3.57E-08	9.43E-09	1.23E-08	5.39E-09	4.05E-07	7.91E-08
Concentration in milk (mg/kg)	1.92E-08	6.41E-09	3.96E-08	1.79E-11	5.22E-10	1.74E-07	3.93E-08
Concentration in fish (mg/kg)	1.18E-06	4.79E-07	1.33E-05	2.19E-07	3.50E-06	1.18E-08	1.43E-08
Concentration in soil (mg/kg)	2.73E-04	8.29E-05	1.34E-04	1.57E-04	1.52E-04	1.11E-03	1.48E-05
Concentration in above-ground vegetables (mg/kg)	8.22E-06	3.76E-06	6.37E-06	5.24E-07	1.69E-05	3.88E-06	6.09E-07
Concentration in below-ground vegetables (mg/kg)	2.16E-06	2.33E-06	1.91E-06	9.15E-08	7.93E-06	1.67E-06	6.64E-08
Concentration in drinking water (mg/L)	5.50E-09	1.08E-09	1.92E-09	2.83E-10	1.21E-09	7.61E-11	4.52E-10
Air Concentration (ug/m^3)	4.74E-07	9.29E-08	1.65E-07	2.67E-08	1.03E-07	1.50E-07	3.91E-08
For carcinogenic effects:							
Concentration in beef (mg/kg)	3.52E-07	3.54E-08	9.38E-09	1.11E-08	5.21E-09	3.52E-07	7.91E-08
Concentration in milk (mg/kg)	1.91E-08	6.38E-09	3.95E-08	1.70E-11	5.07E-10	1.62E-07	3.92E-08
Concentration in fish (mg/kg)	1.10E-06	4.29E-07	1.21E-05	1.33E-07	2.92E-06	6.75E-09	1.36E-08
Concentration in soil (mg/kg)	2.73E-04	8.29E-05	1.34E-04	1.52E-04	1.52E-04	1.07E-03	1.48E-05
Concentration in above-ground vegetables (mg/kg)	7.84E-06	3.03E-06	5.22E-06	4.47E-07	1.12E-05	2.97E-06	5.98E-07
Concentration in below-ground vegetables (mg/kg)	1.68E-06	1.65E-06	1.38E-06	4.69E-08	5.02E-06	8.36E-07	5.63E-08
Concentration in drinking water (mg/L)	5.37E-09	1.04E-09	1.85E-09	2.50E-10	1.13E-09	6.95E-11	4.45E-10
Air Concentration (ug/m^3)	4.74E-07	9.29E-08	1.65E-07	2.67E-08	1.03E-07	1.50E-07	3.91E-08

Notes:

As	Arsenic
Sb	Antimony
Ba	Barium
Be	Beryllium
Cd	Cadmium
Total Cr	Total Chromium
Cr VI	Chromium VI

Table D-2-F
Concentrations of Compounds In Media by Receptor
Adult Resident - South Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	Pb	Ni	Se	Ag	Tl	Zn	TCDD-TEQ
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	1.82E-08	4.42E-06	2.21E-08	3.90E-07	2.37E-06	1.69E-07	6.65E-09
Concentration in milk (mg/kg)	2.46E-08	1.31E-06	1.04E-07	4.76E-06	2.10E-07	1.09E-07	2.07E-09
Concentration in fish (mg/kg)	1.32E-07	1.99E-05	4.06E-07	8.50E-06	2.08E-08	1.26E-03	1.15E-08
Concentration in soil (mg/kg)	7.65E-04	2.45E-03	2.71E-06	5.85E-05	2.16E-04	5.65E-03	2.58E-07
Concentration in above-ground vegetables (mg/kg)	5.69E-06	4.58E-05	4.20E-07	1.29E-05	2.27E-06	4.17E-04	9.21E-10
Concentration in below-ground vegetables (mg/kg)	2.62E-06	1.68E-05	5.97E-08	5.85E-06	7.18E-08	2.16E-04	1.23E-07
Concentration in drinking water (mg/L)	1.33E-09	2.24E-08	3.08E-10	4.04E-09	1.81E-09	5.40E-08	2.02E-13
Air Concentration (ug/m^3)	1.26E-07	1.91E-06	2.67E-08	3.51E-07	1.54E-07	4.61E-06	3.17E-11
For carcinogenic effects:							
Concentration in beef (mg/kg)	1.61E-08	4.37E-06	2.21E-08	3.90E-07	2.35E-06	1.66E-07	6.37E-09
Concentration in milk (mg/kg)	2.29E-08	1.30E-06	1.04E-07	4.76E-06	2.09E-07	1.07E-07	2.03E-09
Concentration in fish (mg/kg)	7.95E-08	1.70E-05	4.06E-07	8.33E-06	1.75E-08	1.09E-03	7.09E-09
Concentration in soil (mg/kg)	7.39E-04	2.45E-03	2.71E-06	5.85E-05	2.15E-04	5.65E-03	2.50E-07
Concentration in above-ground vegetables (mg/kg)	3.76E-06	3.89E-05	4.18E-07	1.23E-05	2.22E-06	2.96E-04	6.26E-10
Concentration in below-ground vegetables (mg/kg)	1.34E-06	1.09E-05	5.73E-08	5.46E-06	4.59E-08	1.42E-04	6.44E-08
Concentration in drinking water (mg/L)	1.18E-09	2.12E-08	3.08E-10	4.01E-09	1.70E-09	5.12E-08	1.78E-13
Air Concentration (ug/m^3)	1.26E-07	1.91E-06	2.67E-08	3.51E-07	1.54E-07	4.61E-06	3.17E-11

Notes:

Pb	Lead
Ni	Nickel
Se	Selenium
Ag	Silver
Tl	Thallium
Zn	Zinc
TCDD-TFQ	2,3,7,8-TCDD Toxicity Equivalents

Table D-2-F
Concentrations of Compounds in Media by Receptor
Adult Resident - South Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	BAA	BAP	BBF	BKF	CHRYS	DBAHA	INDENO
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	7.44E-09	9.78E-08	4.77E-07	1.29E-07	1.69E-07	1.25E-06	1.47E-05
Concentration in milk (mg/kg)	3.47E-09	5.29E-08	2.28E-07	7.04E-08	8.32E-08	7.04E-07	8.26E-06
Concentration in fish (mg/kg)	6.41E-07	9.40E-07	1.09E-05	5.86E-07	9.72E-06	1.20E-07	1.25E-07
Concentration in soil (mg/kg)	1.01E-06	3.93E-06	1.84E-05	3.47E-06	1.59E-05	2.63E-06	3.70E-06
Concentration in above-ground vegetables (mg/kg)	1.43E-08	2.09E-08	1.04E-07	1.80E-08	1.41E-07	1.16E-08	1.75E-08
Concentration in below-ground vegetables (mg/kg)	1.44E-06	1.77E-06	1.55E-05	2.01E-06	1.45E-05	1.26E-06	1.47E-06
Concentration in drinking water (mg/L)	6.77E-12	6.15E-12	6.23E-11	4.70E-12	7.03E-11	1.65E-12	1.29E-12
Air Concentration (ug/m^3)	2.38E-10	3.95E-10	2.65E-09	3.55E-10	1.89E-09	2.69E-10	3.76E-10
For carcinogenic effects:							
Concentration in beef (mg/kg)	6.63E-09	9.19E-08	4.21E-07	1.25E-07	1.49E-07	1.25E-06	1.47E-05
Concentration in milk (mg/kg)	3.21E-09	5.12E-08	2.12E-07	6.93E-08	7.70E-08	7.03E-07	8.26E-06
Concentration in fish (mg/kg)	4.83E-07	5.28E-07	7.20E-06	3.28E-07	6.04E-06	6.78E-08	7.09E-08
Concentration in soil (mg/kg)	1.01E-06	3.78E-06	1.81E-05	3.34E-06	1.55E-05	2.52E-06	3.54E-06
Concentration in above-ground vegetables (mg/kg)	8.59E-09	1.33E-08	6.04E-08	1.19E-08	7.87E-08	8.83E-09	1.51E-08
Concentration in below-ground vegetables (mg/kg)	8.40E-07	8.94E-07	8.43E-06	1.02E-06	7.66E-06	6.33E-07	7.36E-07
Concentration in drinking water (mg/L)	5.90E-12	4.69E-12	4.95E-11	3.75E-12	5.26E-11	1.48E-12	1.17E-12
Air Concentration (ug/m^3)	2.38E-10	3.95E-10	2.65E-09	3.55E-10	1.89E-09	2.69E-10	3.76E-10

Notes:

BAA	Benzo(a)anthracene
BAP	Benzo(a)pyrene
BBF	Benzo(b)fluoranthene
BKF	Benzo(k)fluoranthene
CHRYS	Chrysene
DBAHA	Dibenz(a,h)anthracene
INDENO	Indeno(1,2,3-c,d)pyrene

Table D-2-F
Concentrations of Compounds in Media by Receptor
Adult Resident - South Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	BEHP	HCBZ	BZ	BM	CCl4	DCDFM	T13DCP
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	3.79E-06	6.38E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in milk (mg/kg)	1.67E-06	3.08E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in fish (mg/kg)	1.35E-04	5.99E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in soil (mg/kg)	1.87E-03	1.00E-05	7.45E-10	5.15E-11	2.09E-10	2.05E-12	2.74E-10
Concentration in above-ground vegetables (mg/kg)	7.09E-05	2.57E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in below-ground vegetables (mg/kg)	3.88E-03	5.04E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in drinking water (mg/L)	3.10E-08	3.19E-09	1.21E-08	7.71E-09	2.48E-09	8.35E-09	2.90E-09
Air Concentration (ug/m^3)	1.44E-06	6.80E-07	3.56E-06	2.45E-06	7.43E-07	2.45E-06	8.21E-07
For carcinogenic effects:							
Concentration in beef (mg/kg)	3.58E-06	6.38E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in milk (mg/kg)	1.59E-06	3.08E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in fish (mg/kg)	1.24E-04	5.99E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in soil (mg/kg)	1.87E-03	1.00E-05	7.45E-10	5.15E-11	2.09E-10	2.05E-12	2.74E-10
Concentration in above-ground vegetables (mg/kg)	5.36E-05	2.57E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in below-ground vegetables (mg/kg)	2.91E-03	5.04E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in drinking water (mg/L)	3.02E-08	3.19E-09	1.21E-08	7.71E-09	2.48E-09	8.35E-09	2.90E-09
Air Concentration (ug/m^3)	1.44E-06	6.80E-07	3.56E-06	2.45E-06	7.43E-07	2.45E-06	8.21E-07

Notes:

BEHP	Bis(2-ethylhexyl)phthalate
HCBZ	Hexachlorobenzene
BZ	Benzene
BM	Bromomethane
CCl4	Carbon tetrachloride
DCDFM	Dichlorodifluoromethane
T13DCP	Trans-1,3-Dichloropropene

Table D-2-F
Concentrations of Compounds in Media by Receptor
Adult Resident - South Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	TCFM	VCL	HCP	2-NA	2,4-DNT	2,6-DNT	CLMTHN
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	0.00E+00	0.00E+00	3.25E-10	3.29E-11	1.53E-10	2.30E-10	0.00E+00
Concentration in milk (mg/kg)	0.00E+00	0.00E+00	1.62E-10	1.84E-11	8.59E-11	1.29E-10	0.00E+00
Concentration in fish (mg/kg)	0.00E+00	0.00E+00	2.63E-06	4.74E-06	5.15E-06	1.08E-05	0.00E+00
Concentration in soil (mg/kg)	1.13E-10	1.69E-12	1.08E-07	1.58E-06	5.99E-06	1.07E-05	5.21E-12
Concentration in above-ground vegetables (mg/kg)	0.00E+00	0.00E+00	6.11E-09	5.21E-06	1.64E-05	3.38E-05	0.00E+00
Concentration in below-ground vegetables (mg/kg)	0.00E+00	0.00E+00	1.59E-06	5.02E-05	1.68E-04	3.30E-04	0.00E+00
Concentration in drinking water (mg/L)	8.08E-09	7.63E-09	7.95E-09	2.78E-08	3.22E-08	6.64E-08	7.28E-09
Air Concentration (ug/m^3)	2.45E-06	2.45E-06	2.16E-06	1.08E-06	5.40E-07	1.08E-06	2.45E-06
For carcinogenic effects:							
Concentration in beef (mg/kg)	0.00E+00	0.00E+00	3.25E-10	3.29E-11	1.53E-10	2.30E-10	0.00E+00
Concentration in milk (mg/kg)	0.00E+00	0.00E+00	1.62E-10	1.84E-11	8.59E-11	1.29E-10	0.00E+00
Concentration in fish (mg/kg)	0.00E+00	0.00E+00	2.63E-06	4.74E-06	5.15E-06	1.08E-05	0.00E+00
Concentration in soil (mg/kg)	1.13E-10	1.69E-12	1.08E-07	1.58E-06	5.99E-06	1.07E-05	5.21E-12
Concentration in above-ground vegetables (mg/kg)	0.00E+00	0.00E+00	6.11E-09	5.21E-06	1.64E-05	3.38E-05	0.00E+00
Concentration in below-ground vegetables (mg/kg)	0.00E+00	0.00E+00	1.59E-06	5.02E-05	1.68E-04	3.30E-04	0.00E+00
Concentration in drinking water (mg/L)	8.08E-09	7.63E-09	7.95E-09	2.78E-08	3.22E-08	6.64E-08	7.28E-09
Air Concentration (ug/m^3)	2.45E-06	2.45E-06	2.16E-06	1.08E-06	5.40E-07	1.08E-06	2.45E-06

Notes:

TCFM	Trichlorofluoromethane
VCL	Vinyl Chloride
HCP	Hexachlorocyclopentadiene
2-NA	2-Nitroaniline
2,4-DNT	2,4-Dinitrotoluene
2,6-DNT	2,6-Dinitrotoluene
CLMTHN	Chloromethane

Table D-2-F
Concentrations of Compounds In Media by Receptor
Adult Resident - South Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	PCP	1,1-DCE	1,1,2,2-TCA	CLFM	1,3-BUT	HCBU
For non-carcinogenic effects:						
Concentration in beef (mg/kg)	6.76E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.32E-12
Concentration in milk (mg/kg)	3.79E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.77E-12
Concentration in fish (mg/kg)	4.77E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.77E-07
Concentration in soil (mg/kg)	7.03E-06	6.73E-11	1.00E-08	1.33E-09	3.69E-11	2.70E-09
Concentration in above-ground vegetables (mg/kg)	3.33E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.93E-10
Concentration in below-ground vegetables (mg/kg)	2.65E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.00E-08
Concentration in drinking water (mg/L)	3.68E-08	2.65E-09	4.19E-09	8.29E-09	7.02E-09	3.94E-10
Air Concentration (ug/m^3)	2.16E-06	8.22E-07	8.22E-07	2.45E-06	2.45E-06	1.08E-07
For carcinogenic effects:						
Concentration in beef (mg/kg)	6.76E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.32E-12
Concentration in milk (mg/kg)	3.79E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.77E-12
Concentration in fish (mg/kg)	4.77E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.77E-07
Concentration in soil (mg/kg)	7.03E-06	6.73E-11	1.00E-08	1.33E-09	3.69E-11	2.70E-09
Concentration in above-ground vegetables (mg/kg)	3.33E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.93E-10
Concentration in below-ground vegetables (mg/kg)	2.65E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.00E-08
Concentration in drinking water (mg/L)	3.68E-08	2.65E-09	4.19E-09	8.29E-09	7.02E-09	3.94E-10
Air Concentration (ug/m^3)	2.16E-06	8.22E-07	8.22E-07	2.45E-06	2.45E-06	1.08E-07

Notes:

PCP	Pentachlorophenol
1,1-DCE	1,1-Dichloroethylene
1,1,2,2-TCA	1,1,2,2-Tetrachloroethane
CLFM	Chloroform
1,3-BUT	1,3-Butadiene
HCBU	Hexachlorobutadiene

Table D-2-F
Concentrations of Compounds in Media by Receptor
Adult Resident - South Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	Hg	HgCl	MeHg
For non-carcinogenic effects:			
Concentration in beef (mg/kg)	0.00E+00	2.75E-06	5.46E-08
Concentration in milk (mg/kg)	0.00E+00	1.44E-06	4.05E-08
Concentration in fish (mg/kg)	0.00E+00	0.00E+00	9.40E-02
Concentration in soil (mg/kg)	0.00E+00	1.66E-02	2.95E-04
Concentration in above-ground vegetables (mg/kg)	0.00E+00	8.43E-05	4.29E-06
Concentration in below-ground vegetables (mg/kg)	0.00E+00	1.99E-04	1.07E-05
Concentration in drinking water (mg/L)	0.00E+00	4.51E-08	7.72E-09
Air Concentration (ug/m^3)	9.80E-09	1.27E-06	0.00E+00
For carcinogenic effects:			
Concentration in beef (mg/kg)	0.00E+00	1.99E-06	5.05E-08
Concentration in milk (mg/kg)	0.00E+00	1.19E-06	3.91E-08
Concentration in fish (mg/kg)	0.00E+00	0.00E+00	6.96E-02
Concentration in soil (mg/kg)	0.00E+00	1.62E-02	0.00E+00
Concentration in above-ground vegetables (mg/kg)	0.00E+00	4.50E-05	1.12E-06
Concentration in below-ground vegetables (mg/kg)	0.00E+00	1.02E-04	0.00E+00
Concentration in drinking water (mg/L)	0.00E+00	4.48E-08	7.64E-09
Air Concentration (ug/m^3)	9.80E-09	1.27E-06	0.00E+00

Notes:

Hg Elemental Mercury
HgCl Mercuric Chlorid
MeHg Methyl Mercury

Table D-2-G
Concentrations of Compounds in Media by Receptor
Subsistence Farmer - Dairy Farm location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	As	Sb	Ba	Be	Cd	Total Cr	Cr VI
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	3.26E-07	3.30E-08	8.73E-09	1.14E-08	5.01E-09	3.77E-07	7.31E-08
Concentration in milk (mg/kg)	1.92E-08	6.41E-09	3.96E-08	1.79E-11	5.22E-10	1.74E-07	3.93E-08
Concentration in fish (mg/kg)	1.18E-06	4.79E-07	1.33E-05	2.19E-07	3.50E-06	1.18E-08	1.43E-08
Concentration in soil (mg/kg)	8.27E-06	2.51E-06	4.05E-06	4.77E-06	4.59E-06	3.37E-05	4.47E-07
Concentration in above-ground vegetables (mg/kg)	2.69E-07	1.18E-07	2.00E-07	1.70E-08	5.16E-07	1.24E-07	2.01E-08
Concentration in below-ground vegetables (mg/kg)	6.52E-08	7.06E-08	5.79E-08	2.77E-09	2.40E-07	5.06E-08	2.01E-09
Concentration in drinking water (mg/L)	5.50E-09	1.08E-09	1.92E-09	2.83E-10	1.21E-09	7.61E-11	4.52E-10
Air Concentration (ug/m^3)	5.74E-06	1.12E-06	1.99E-06	3.23E-07	1.24E-06	1.82E-06	4.73E-07
For carcinogenic effects:							
Concentration in beef (mg/kg)	3.24E-07	3.25E-08	8.60E-09	1.05E-08	4.77E-09	3.39E-07	7.28E-08
Concentration in milk (mg/kg)	1.91E-08	6.35E-09	3.93E-08	1.72E-11	5.00E-10	1.65E-07	3.92E-08
Concentration in fish (mg/kg)	9.13E-07	3.68E-07	1.03E-05	1.47E-07	2.63E-06	7.82E-09	1.10E-08
Concentration in soil (mg/kg)	6.19E-06	1.87E-06	3.02E-06	3.03E-06	3.34E-06	2.11E-05	3.35E-07
Concentration in above-ground vegetables (mg/kg)	2.54E-07	9.45E-08	1.62E-07	1.52E-08	3.59E-07	1.03E-07	1.95E-08
Concentration in below-ground vegetables (mg/kg)	4.69E-08	4.89E-08	4.04E-08	1.74E-09	1.60E-07	3.16E-08	1.48E-09
Concentration in drinking water (mg/L)	5.06E-09	9.95E-10	1.76E-09	2.57E-10	1.10E-09	7.10E-11	4.16E-10
Air Concentration (ug/m^3)	5.74E-06	1.12E-06	1.99E-06	3.23E-07	1.24E-06	1.82E-06	4.73E-07

Notes:

As	Arsenic
Sb	Antimony
Ba	Barium
Be	Beryllium
Cd	Cadmium
Total Cr	Total Chromium
Cr VI	Chromium VI

Table D-2-G
Concentrations of Compounds in Media by Receptor
Subsistence Farmer - Dairy Farm location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	Pb	Ni	Se	Ag	Tl	Zn	TCDD-TEQ
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	1.70E-08	4.09E-06	2.04E-08	3.61E-07	2.19E-06	1.56E-07	5.97E-09
Concentration in milk (mg/kg)	2.46E-08	1.31E-06	1.04E-07	4.76E-06	2.10E-07	1.09E-07	2.07E-09
Concentration in fish (mg/kg)	1.32E-07	1.99E-05	4.06E-07	8.50E-06	2.08E-08	1.26E-03	1.15E-08
Concentration in soil (mg/kg)	2.32E-05	7.42E-05	8.22E-08	1.77E-06	6.53E-06	1.71E-04	1.97E-08
Concentration in above-ground vegetables (mg/kg)	1.78E-07	1.46E-06	1.38E-08	4.05E-07	7.52E-08	1.28E-05	1.62E-10
Concentration in below-ground vegetables (mg/kg)	7.93E-08	5.08E-07	1.81E-09	1.77E-07	2.17E-09	6.54E-06	9.44E-09
Concentration in drinking water (mg/L)	1.33E-09	2.24E-08	3.08E-10	4.04E-09	1.81E-09	5.40E-08	2.02E-13
Air Concentration (ug/m^3)	1.53E-06	2.31E-05	3.24E-07	4.25E-06	1.87E-06	5.58E-05	3.85E-10
For carcinogenic effects:							
Concentration in beef (mg/kg)	1.54E-08	4.02E-06	2.04E-08	3.58E-07	2.16E-06	1.51E-07	5.76E-09
Concentration in milk (mg/kg)	2.33E-08	1.30E-06	1.04E-07	4.74E-06	2.09E-07	1.06E-07	2.04E-09
Concentration in fish (mg/kg)	8.87E-08	1.51E-05	3.15E-07	6.58E-06	1.57E-08	9.61E-04	7.69E-09
Concentration in soil (mg/kg)	1.47E-05	5.44E-05	6.16E-08	1.33E-06	4.76E-06	1.26E-04	1.27E-08
Concentration in above-ground vegetables (mg/kg)	1.33E-07	1.27E-06	1.34E-08	3.44E-07	7.37E-08	9.33E-06	1.44E-10
Concentration in below-ground vegetables (mg/kg)	4.98E-08	3.42E-07	1.36E-09	1.33E-07	1.45E-09	4.41E-06	5.96E-09
Concentration in drinking water (mg/L)	1.21E-09	2.05E-08	2.84E-10	3.73E-09	1.65E-09	4.94E-08	1.82E-13
Air Concentration (ug/m^3)	1.53E-06	2.31E-05	3.24E-07	4.25E-06	1.87E-06	5.58E-05	3.85E-10

Notes:

Pb	Lead
Ni	Nickel
Se	Selenium
Ag	Silver
Tl	Thallium
Zn	Zinc
TCDD-TEQ	2,3,7,8-TCDD Toxicity Equivalents

Table D-2-G
Concentrations of Compounds in Media by Receptor
Subsistence Farmer - Dairy Farm location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	BAA	BAP	BBF	BKF	CHRYS	DBAHA	INDENO
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	6.68E-09	8.78E-08	4.28E-07	1.16E-07	1.51E-07	1.12E-06	1.32E-05
Concentration in milk (mg/kg)	3.47E-09	5.29E-08	2.28E-07	7.04E-08	8.32E-08	7.04E-07	8.26E-06
Concentration in fish (mg/kg)	6.41E-07	9.40E-07	1.09E-05	5.86E-07	9.72E-06	1.20E-07	1.25E-07
Concentration in soil (mg/kg)	3.25E-07	5.51E-07	5.64E-06	3.32E-07	4.62E-06	9.52E-08	1.27E-07
Concentration in above-ground vegetables (mg/kg)	4.80E-09	4.75E-09	3.74E-08	4.29E-09	4.76E-08	1.46E-08	7.24E-08
Concentration in below-ground vegetables (mg/kg)	4.61E-07	2.47E-07	4.77E-06	1.92E-07	4.24E-06	4.57E-08	5.05E-08
Concentration in drinking water (mg/L)	6.77E-12	6.15E-12	6.23E-11	4.70E-12	7.03E-11	1.65E-12	1.29E-12
Air Concentration (ug/m^3)	2.91E-09	4.77E-09	3.24E-08	4.28E-09	2.30E-08	3.24E-09	4.53E-09
For carcinogenic effects:							
Concentration in beef (mg/kg)	5.89E-09	8.37E-08	3.83E-07	1.13E-07	1.36E-07	1.12E-06	1.32E-05
Concentration in milk (mg/kg)	3.19E-09	5.16E-08	2.14E-07	6.95E-08	7.80E-08	7.03E-07	8.26E-06
Concentration in fish (mg/kg)	4.59E-07	6.08E-07	7.42E-06	3.79E-07	6.48E-06	7.88E-08	8.24E-08
Concentration in soil (mg/kg)	2.27E-07	3.47E-07	3.74E-06	2.08E-07	3.00E-06	5.95E-08	7.93E-08
Concentration in above-ground vegetables (mg/kg)	3.25E-09	3.95E-09	2.69E-08	3.85E-09	3.34E-08	1.45E-08	7.24E-08
Concentration in below-ground vegetables (mg/kg)	3.00E-07	1.55E-07	3.04E-06	1.20E-07	2.68E-06	2.86E-08	3.16E-08
Concentration in drinking water (mg/L)	5.80E-12	5.01E-12	5.07E-11	3.96E-12	5.52E-11	1.52E-12	1.20E-12
Air Concentration (ug/m^3)	2.91E-09	4.77E-09	3.24E-08	4.28E-09	2.30E-08	3.24E-09	4.53E-09

Notes:

BAA	Benzo(a)anthracene
BAP	Benzo(a)pyrene
BBF	Benzo(b)fluoranthene
BKF	Benzo(k)fluoranthene
CHRYS	Chrysene
DBAHA	Dibenz(a,h)anthracene
INDENO	Indeno(1,2,3-c,d)pyrene

Table D-2-G
Concentrations of Compounds in Media by Receptor
Subsistence Farmer - Dairy Farm location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	BEHP	HCBZ	BZ	BM	CCl4	DCDFM	T13DCP
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	3.41E-06	5.73E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in milk (mg/kg)	1.67E-06	3.08E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in fish (mg/kg)	1.35E-04	5.99E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in soil (mg/kg)	6.24E-04	3.49E-06	2.59E-10	1.79E-11	7.26E-11	7.13E-13	9.52E-11
Concentration in above-ground vegetables (mg/kg)	2.34E-05	9.46E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in below-ground vegetables (mg/kg)	1.29E-03	1.75E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in drinking water (mg/L)	3.10E-08	3.19E-09	1.21E-08	7.71E-09	2.48E-09	8.35E-09	2.90E-09
Air Concentration (ug/m^3)	1.76E-05	8.34E-06	4.36E-05	3.01E-05	9.11E-06	3.01E-05	1.01E-05
For carcinogenic effects:							
Concentration in beef (mg/kg)	2.88E-06	5.22E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in milk (mg/kg)	1.45E-06	2.89E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in fish (mg/kg)	1.03E-04	5.26E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in soil (mg/kg)	4.67E-04	2.62E-06	1.94E-10	1.34E-11	5.45E-11	5.34E-13	7.14E-11
Concentration in above-ground vegetables (mg/kg)	1.67E-05	7.22E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in below-ground vegetables (mg/kg)	9.15E-04	1.31E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concentration in drinking water (mg/L)	2.88E-08	3.17E-09	1.21E-08	7.71E-09	2.48E-09	8.35E-09	2.90E-09
Air Concentration (ug/m^3)	1.76E-05	8.34E-06	4.36E-05	3.01E-05	9.11E-06	3.01E-05	1.01E-05

Notes:

BEHP	Bis(2-ethylhexyl)phthalate
HCBZ	Hexachlorobenzene
BZ	Benzene
BM	Bromomethane
CCl4	Carbon tetrachloride
DCDFM	Dichlorodifluoromethane
T13DCP	Trans-1,3-Dichloropropene

Table D-2-G
Concentrations of Compounds in Media by Receptor
Subsistence Farmer - Dairy Farm location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	TCFM	VCL	HCP	2-NA	2,4-DNT	2,6-DNT	CLMTHN
For non-carcinogenic effects:							
Concentration in beef (mg/kg)	0.00E+00	0.00E+00	2.92E-10	2.96E-11	1.38E-10	2.07E-10	0.00E+00
Concentration in milk (mg/kg)	0.00E+00	0.00E+00	1.62E-10	1.84E-11	8.59E-11	1.29E-10	0.00E+00
Concentration in fish (mg/kg)	0.00E+00	0.00E+00	2.63E-06	4.74E-06	5.15E-06	1.08E-05	0.00E+00
Concentration in soil (mg/kg)	3.92E-11	5.88E-13	3.75E-08	5.48E-07	2.07E-06	3.73E-06	1.81E-12
Concentration in above-ground vegetables (mg/kg)	0.00E+00	0.00E+00	2.24E-09	1.86E-06	5.91E-06	1.20E-05	0.00E+00
Concentration in below-ground vegetables (mg/kg)	0.00E+00	0.00E+00	5.52E-07	1.74E-05	5.80E-05	1.15E-04	0.00E+00
Concentration in drinking water (mg/L)	8.08E-09	7.63E-09	7.95E-09	2.78E-08	3.22E-08	6.64E-08	7.28E-09
Air Concentration (ug/m^3)	3.01E-05	3.01E-05	2.65E-05	1.33E-05	6.62E-06	1.33E-05	3.01E-05
For carcinogenic effects:							
Concentration in beef (mg/kg)	0.00E+00	0.00E+00	2.73E-10	2.24E-11	1.07E-10	1.56E-10	0.00E+00
Concentration in milk (mg/kg)	0.00E+00	0.00E+00	1.54E-10	1.39E-11	6.63E-11	9.76E-11	0.00E+00
Concentration in fish (mg/kg)	0.00E+00	0.00E+00	2.62E-06	3.85E-06	3.92E-06	8.22E-06	0.00E+00
Concentration in soil (mg/kg)	2.94E-11	4.41E-13	2.82E-08	4.11E-07	1.55E-06	2.79E-06	1.36E-12
Concentration in above-ground vegetables (mg/kg)	0.00E+00	0.00E+00	1.71E-09	1.41E-06	4.50E-06	9.05E-06	0.00E+00
Concentration in below-ground vegetables (mg/kg)	0.00E+00	0.00E+00	4.14E-07	1.31E-05	4.35E-05	8.61E-05	0.00E+00
Concentration in drinking water (mg/L)	8.08E-09	7.63E-09	7.95E-09	2.61E-08	2.68E-08	5.50E-08	7.28E-09
Air Concentration (ug/m^3)	3.01E-05	3.01E-05	2.65E 05	1.33E-05	6.62E-06	1.33E-05	3.01E-05

Notes:

TCFM	Trichlorofluoromethane
VCL	Vinyl Chloride
HCP	Hexachlorocyclopentadiene
2-NA	2-Nitroaniline
2,4-DNT	2,4-Dinitrotoluene
2,6-DNT	2,6-Dinitrotoluene
CLMTHN	Chloromethane

Table D-2-G
Concentrations of Compounds in Media by Receptor
Subsistence Farmer - Dairy Farm location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	PCP	1,1-DCE	1,1,2,2-TCA	CLFM	1,3-BUT	HCBU
For non-carcinogenic effects:						
Concentration in beef (mg/kg)	6.05E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.77E-12
Concentration in milk (mg/kg)	3.79E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.77E-12
Concentration in fish (mg/kg)	4.77E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.77E-07
Concentration in soil (mg/kg)	2.44E-06	2.34E-11	3.49E-09	4.64E-10	1.28E-11	9.39E-10
Concentration in above-ground vegetables (mg/kg)	3.35E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.98E-11
Concentration in below-ground vegetables (mg/kg)	9.21E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.39E-08
Concentration in drinking water (mg/L)	3.68E-08	2.65E-09	4.19E-09	8.29E-09	7.02E-09	3.94E-10
Air Concentration (ug/m^3)	2.65E-05	1.01E-05	1.01E-05	3.01E-05	3.01E-05	1.32E-06
For carcinogenic effects:						
Concentration in beef (mg/kg)	6.04E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.42E-12
Concentration in milk (mg/kg)	3.79E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.61E-12
Concentration in fish (mg/kg)	4.01E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.77E-07
Concentration in soil (mg/kg)	1.83E-06	1.76E-11	2.62E-09	3.48E-10	9.63E-12	7.04E-10
Concentration in above-ground vegetables (mg/kg)	3.07E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.31E-11
Concentration in below-ground vegetables (mg/kg)	6.91E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.04E-08
Concentration in drinking water (mg/L)	3.61E-08	2.65E-09	4.18E-09	8.29E-09	7.02E-09	3.94E-10
Air Concentration (ug/m^3)	2.65E-05	1.01E-05	1.01E-05	3.01E-05	3.01E-05	1.32E-06

Notes:

PCP	Pentachlorophenol
1,1-DCE	1,1-Dichloroethylene
1,1,2,2-TCA	1,1,2,2-Tetrachloroethane
CLFM	Chloroform
1,3-BUT	1,3-Butadiene
HCBU	Hexachlorobutadiene

Table D-2-G
Concentrations of Compounds in Media by Receptor
Subsistence Farmer - Dairy Farm location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	Hg	HgCl	MeHg
For non-carcinogenic effects:			
Concentration in beef (mg/kg)	0.00E+00	2.57E-06	4.94E-08
Concentration in milk (mg/kg)	0.00E+00	1.44E-06	4.05E-08
Concentration in fish (mg/kg)	0.00E+00	0.00E+00	9.40E-02
Concentration in soil (mg/kg)	0.00E+00	5.72E-04	1.02E-05
Concentration in above-ground vegetables (mg/kg)	0.00E+00	1.84E-05	4.52E-06
Concentration in below-ground vegetables (mg/kg)	0.00E+00	6.88E-06	3.69E-07
Concentration in drinking water (mg/L)	0.00E+00	4.51E-08	7.72E-09
Air Concentration (ug/m^3)	1.20E-07	1.56E-05	0.00E+00
For carcinogenic effects:			
Concentration in beef (mg/kg)	0.00E+00	2.02E-06	4.63E-08
Concentration in milk (mg/kg)	0.00E+00	1.25E-06	3.94E-08
Concentration in fish (mg/kg)	0.00E+00	0.00E+00	7.22E-02
Concentration in soil (mg/kg)	0.00E+00	3.62E-04	2.42E-06
Concentration in above-ground vegetables (mg/kg)	0.00E+00	1.74E-05	4.43E-06
Concentration in below-ground vegetables (mg/kg)	0.00E+00	4.35E-06	9.07E-08
Concentration in drinking water (mg/L)	0.00E+00	4.48E-08	7.65E-09
Air Concentration (ug/m^3)	1.20E-07	1.56E-05	0.00E+00

Notes:

Hg Elemental Mercury
HgCl Mercuric Chlorid
MeHg Methyl Mercury

Appendix E

Assumptions Utilized for SLERA Model Parameters

TABLE E 1-1
ASSUMPTIONS FOR DEER MOUSE RISK ASSESSMENT
SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT
NORLITE FACILITY
COHOES, NY

Parameters	Value	Units
Soil Ingestion Rate	0.00144	(kg_{dw}/kg_{bw}-day)
Sediment Ingestion Rate	--	(kg_{dw}/kg_{bw}-day)
Water Consumption Rate	0.3400	(kg/kg_{bw}-day)
Fish TL3 Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Aquatic Invertebrate Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Fish TL4 Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Wetland Plant Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Terrestrial Invertebrate Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Small Mammal (Herbivore) Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Small Mammal (Omnivore) Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Terrestrial Plant Consumption Rate	0.4500	(kg_{ww}/kg_{bw}-day)
Exclusive Diet Prey Consumption Rate	0.4500	(kg_{ww}/kg_{bw}-day)
Body Weight	0.0153	(kg)
Exposure Duration	1	(unitless)
Area Use Factor	1	(unitless)

Exposure parameters are reference in Table 8-12 of the main report.
kg_{dw}/kg_{bw}-day = kilograms dry weight per kilograms body weight per day
kg_{ww}/kg_{bw}-day = kilograms wet weight per kilograms body weight per day

TABLE E 1-2
ASSUMPTIONS FOR MUSKRAT RISK ASSESSMENT
SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT
NORLITE FACILITY
COHOES, NY

Parameters	Value	Units
Soil Ingestion Rate	--	(kg_{dw}/kg_{bw}-day)
Sediment Ingestion Rate	0.00064	(kg_{dw}/kg_{bw}-day)
Water Consumption Rate	0.1004	(kg/kg_{bw}-day)
Fish TL3 Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Aquatic Invertebrate Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Fish TL4 Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Wetland Plant Consumption Rate	0.3400	(kg_{ww}/kg_{bw}-day)
Terrestrial Invertebrate Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Small Mammal (Herbivore) Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Small Mammal (Omnivore) Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Terrestrial Plant Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Exclusive Diet Prey Consumption Rate	0.3400	(kg_{ww}/kg_{bw}-day)
Body Weight	0.87	(kg)
Exposure Duration	1	(unitless)
Area Use Factor	1	(unitless)

Exposure parameters are reference in Table 8-12 of the main report.
kg_{dw}/kg_{bw}-day = kilograms dry weight per kilograms body weight per day
kg_{ww}/kg_{bw}-day = kilograms wet weight per kilograms body weight per day

TABLE E 1-3
ASSUMPTIONS FOR AMERICAN ROBIN RISK ASSESSMENT
SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT
NORLITE FACILITY
COHOES, NY

Parameters	Value	Units
Soil Ingestion Rate	0.0143	(kg_{dw}/kg_{bw}-day)
Sediment Ingestion Rate	--	(kg_{dw}/kg_{bw}-day)
Water Consumption Rate	0.1373	(kg/kg_{bw}-day)
Fish TL3 Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Wetland Invertebrate Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Fish TL4 Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Wetland Plant Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Terrestrial Invertebrate Consumption Rate	0.7600	(kg_{ww}/kg_{bw}-day)
Small Mammal (Herbivore) Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Small Mammal (Omnivore) Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Terrestrial Plant Consumption Rate	0.7600	(kg_{ww}/kg_{bw}-day)
Exclusive Diet Prey Consumption Rate	1.5200	(kg_{ww}/kg_{bw}-day)
Body Weight	0.08	(kg)
Exposure Duration	1	(unitless)
Area Use Factor	1	(unitless)

Exposure parameters are reference in Table 8-12 of the main report.
kg_{dw}/kg_{bw}-day = kilograms dry weight per kilograms body weight per day
kg_{ww}/kg_{bw}-day = kilograms wet weight per kilograms body weight per day

TABLE E 1-4
ASSUMPTIONS FOR SHORT-TAILED SHREW RISK ASSESSMENT
SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT
NORLITE FACILITY
COHOES, NY

Parameters	Value	Units
Soil Ingestion Rate	0.0068	(kg_{dw}/kg_{bw}-day)
Sediment Ingestion Rate	0.0068	(kg_{dw}/kg_{bw}-day)
Water Consumption Rate	0.2230	(kg/kg_{bw}-day)
Fish TL3 Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Wetland Invertebrate Consumption Rate	0.2790	(kg_{ww}/kg_{bw}-day)
Fish TL4 Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Wetland Plant Consumption Rate	0.0310	(kg_{ww}/kg_{bw}-day)
Terrestrial Invertebrate Consumption Rate	0.2790	(kg_{ww}/kg_{bw}-day)
Small Mammal (Herbivore) Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Small Mammal (Omnivore) Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Terrestrial Plant Consumption Rate	0.0310	(kg_{ww}/kg_{bw}-day)
Exclusive Diet Prey Consumption Rate	0.6200	(kg_{ww}/kg_{bw}-day)
Body Weight	0.015	(kg)
Exposure Duration	1	(unitless)
Area Use Factor	1	(unitless)

Exposure parameters are reference in Table 8-12 of the main report.
kg_{dw}/kg_{bw}-day = kilograms dry weight per kilograms body weight per day
kg_{ww}/kg_{bw}-day = kilograms wet weight per kilograms body weight per day

TABLE E 1-5
ASSUMPTIONS FOR RACCOON RISK ASSESSMENT
SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT
NORLITE FACILITY
COHOES, NY

Parameters	Value	Units
Soil Ingestion Rate	0.0133	(kg_{dw}/kg_{bw}-day)
Sediment Ingestion Rate	0.0133	(kg_{dw}/kg_{bw}-day)
Water Consumption Rate	0.0976	(kg/kg_{bw}-day)
Fish TL3 Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Aquatic Invertebrate Consumption Rate	0.0448	(kg_{ww}/kg_{bw}-day)
Fish TL4 Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Wetland Plant Consumption Rate	0.0716	(kg_{ww}/kg_{bw}-day)
Terrestrial Invertebrate Consumption Rate	0.0671	(kg_{ww}/kg_{bw}-day)
Small Mammal (Herbivore) Consumption Rate	0.0168	(kg_{ww}/kg_{bw}-day)
Small Mammal (Omnivore) Consumption Rate	0.0168	(kg_{ww}/kg_{bw}-day)
Terrestrial Plant Consumption Rate	0.0467	(kg_{ww}/kg_{bw}-day)
Exclusive Diet Prey Consumption Rate	0.2637	(kg_{ww}/kg_{bw}-day)
Body Weight	4.0	(kg)
Exposure Duration	1	(unitless)
Area Use Factor	1	(unitless)

Exposure parameters are reference in Table 8-12 of the main report.
kg_{dw}/kg_{bw}-day = kilograms dry weight per kilograms body weight per day
kg_{ww}/kg_{bw}-day = kilograms wet weight per kilograms body weight per day

TABLE E 1-6
ASSUMPTIONS FOR RED-TAILED HAWK RISK ASSESSMENT
SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT
NORLITE FACILITY
COHOES, NY

Parameters	Value	Units
Soil Ingestion Rate	0.00995	(kg_{dw}/kg_{bw}-day)
Sediment Ingestion Rate	--	(kg_{dw}/kg_{bw}-day)
Water Consumption Rate	0.0580	(kg/kg_{bw}-day)
Fish TL3 Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Wetland Invertebrate Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Fish TL4 Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Wetland Plant Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Terrestrial Invertebrate Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Small Mammal (Herbivore) Consumption Rate	0.0605	(kg_{ww}/kg_{bw}-day)
Small Mammal (Omnivore) Consumption Rate	0.0495	(kg_{ww}/kg_{bw}-day)
Terrestrial Plant Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Exclusive Diet Prey Consumption Rate	0.1100	(kg_{ww}/kg_{bw}-day)
Body Weight	1.06	(kg)
Exposure Duration	1	(unitless)
Area Use Factor	1	(unitless)

Exposure parameters are reference in Table 8-12 of the main report.
kg_{dw}/kg_{bw}-day = kilograms dry weight per kilograms body weight per day
kg_{ww}/kg_{bw}-day = kilograms wet weight per kilograms body weight per day

TABLE E 1-7
ASSUMPTIONS FOR MINK RISK ASSESSMENT
SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT
NORLITE FACILITY
COEHOES, NY

Parameters	Value	Units
Soil Ingestion Rate	--	(kg_{dw}/kg_{bw}-day)
Sediment Ingestion Rate	0.0019	(kg_{dw}/kg_{bw}-day)
Water Consumption Rate	0.0987	(kg/kg_{bw}-day)
Fish TL3 Consumption Rate	0.1432	(kg_{ww}/kg_{bw}-day)
Wetland Invertebrate Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Fish TL4 Consumption Rate	0.1172	(kg_{ww}/kg_{bw}-day)
Wetland Plant Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Terrestrial Invertebrate Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Small Mammal (Herbivore) Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Small Mammal (Omnivore) Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Terrestrial Plant Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Exclusive Diet Prey Consumption Rate	0.2604	(kg_{ww}/kg_{bw}-day)
Body Weight	1.354	(kg)
Exposure Duration	1	(unitless)
Area Use Factor	1	(unitless)

Exposure parameters are reference in Table 8-12 of the main report.
kg_{dw}/kg_{bw}-day = kilograms dry weight per kilograms body weight per day
kg_{ww}/kg_{bw}-day = kilograms wet weight per kilograms body weight per day

TABLE E 1-8
ASSUMPTIONS FOR OSPREY RISK ASSESSMENT
SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT
NORLITE FACILITY
COHOES, NY

Parameters	**Value**	**Units**
Soil Ingestion Rate	--	(kg_{dw}/kg_{bw}-day)
Sediment Ingestion Rate	0.0005	(kg_{dw}/kg_{bw}-day)
Water Consumption Rate	0.0518	(kg/kg_{bw}-day)
Fish TL3 Consumption Rate	0.1050	(kg_{ww}/kg_{bw}-day)
Wetland Invertebrate Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Fish TL4 Consumption Rate	0.1050	(kg_{ww}/kg_{bw}-day)
Wetland Plant Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Terrestrial Invertebrate Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Small Mammal (Herbivore) Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Small Mammal (Omnivore) Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Terrestrial Plant Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Exclusive Diet Prey Consumption Rate	0.2100	(kg_{ww}/kg_{bw}-day)
Body Weight	1.49	(kg)
Exposure Duration	1	(unitless)
Area Use Factor	1	(unitless)

Exposure parameters are reference in Table 8-12 of the main report.
kg_{dw}/kg_{bw}-day = kilograms dry weight per kilograms body weight per day
kg_{ww}/kg_{bw}-day = kilograms wet weight per kilograms body weight per day

TABLE E 1-9
ASSUMPTIONS FOR GREAT BLUE HERON RISK ASSESSMENT: WRIGHT/BRADLEY LAKE
SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT
NORLITE FACILITY
COHOES, NY

Parameters	Value	Units
Soil Ingestion Rate	--	(kg_{dw}/kg_{bw}-day)
Sediment Ingestion Rate	0.0045	(kg_{dw}/kg_{bw}-day)
Water Consumption Rate	0.0453	(kg/kg_{bw}-day)
Fish TL3 Consumption Rate	0.1260	(kg_{ww}/kg_{bw}-day)
Wetland Invertebrate Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Fish TL4 Consumption Rate	0.0540	(kg_{ww}/kg_{bw}-day)
Wetland Plant Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Terrestrial Invertebrate Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Small Mammal (Herbivore) Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Small Mammal (Omnivore) Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Terrestrial Plant Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Body Weight	2.23	(kg)
Exposure Duration	1	(unitless)
Area Use Factor	1	(unitless)

Exposure parameters are reference in Table 8-12 of the main report.

kg_{dw}/kg_{bw}-day = kilograms dry weight per kilograms body weight per day

kg_{ww}/kg_{bw}-day = kilograms wet weight per kilograms body weight per day

TABLE E 1-10
ASSUMPTIONS FOR GREAT BLUE HERON RISK ASSESSMENT: GREEN ISLAND
SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT
NORLITE FACILITY
COHOES, NY

Parameters	Value	Units
Soil Ingestion Rate	--	(kg_{dw}/kg_{bw}-day)
Sediment Ingestion Rate	0.0045	(kg_{dw}/kg_{bw}-day)
Water Consumption Rate	0.0453	(kg/kg_{bw}-day)
Fish TL3 Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Wetland Invertebrate Consumption Rate	0.1800	(kg_{ww}/kg_{bw}-day)
Fish TL4 Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Wetland Plant Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Terrestrial Invertebrate Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Small Mammal (Herbivore) Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Small Mammal (Omnivore) Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Terrestrial Plant Consumption Rate	--	(kg_{ww}/kg_{bw}-day)
Exclusive Diet Prey Consumption Rate	0.1800	(kg_{ww}/kg_{bw}-day)
Body Weight	2.23	(kg)
Exposure Duration	1	(unitless)
Area Use Factor	1	(unitless)

Exposure parameters are reference in Table 8-12 of the main report.
kg_{dw}/kg_{bw}-day = kilograms dry weight per kilograms body weight per day
kg_{ww}/kg_{bw}-day = kilograms wet weight per kilograms body weight per day

TABLE E.2-1
POTENTIAL RISKS TO THE MINK
SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT
HUDSON RIVER
NORLITE FACILITY
COHOES, NY

CPEC	Site Concentrations				Potential Daily Dose (mg/kg-day)					TRV (mg/kg-day)	HQ
	Sediment (mg/kg)	Surface Water (mg/L)	Fish TL3 (mg/kg)	Fish TL4 (mg/kg)	Sediment	Surface Water	Fish TL3	Fish TL4	Total		
INORGANICS											
ANTIMONY	2.20E-08	7.58E-10	3.03E-08	3.03E-08	4.24E-11	7.48E-11	4.34E-09	3.55E-09	8.01E-09	4.88E-02	1.64E-07
ARSENIC	6.77E-09	1.51E-10	1.72E-08	1.72E-08	1.31E-11	1.49E-11	2.46E-09	2.01E-09	4.49E-09	4.91E-02	9.15E-08
BARIUM	1.09E-08	2.66E-10	1.68E-07	1.68E-07	2.10E-11	2.62E-11	2.41E-08	1.97E-08	4.38E-08	3.85E+00	1.14E-08
BERYLLIUM	2.58E-08	3.29E-11	2.02E-09	2.02E-09	4.97E-11	3.24E-12	2.89E-10	2.37E-10	5.79E-10	4.69E-01	1.24E-09
CADMIUM	1.27E-08	1.70E-10	1.54E-07	1.54E-07	2.46E-11	1.68E-11	2.21E-08	1.81E-08	4.02E-08	6.90E-01	5.82E-08
CHROMIUM	1.27E-05	1.34E-10	1.34E-10	1.34E-10	2.44E-08	1.32E-11	1.91E-11	1.57E-11	2.45E-08	1.94E+03	1.26E-11
CHROMIUM VI	1.18E-09	6.19E-11	1.18E-09	1.18E-09	2.27E-12	6.11E-12	1.68E-10	1.38E-10	3.14E-10	2.33E+00	1.35E-10
LEAD	1.35E-07	1.51E-10	1.35E-11	1.35E-11	2.61E-10	1.49E-11	1.93E-12	1.58E-12	2.79E-10	5.68E+00	4.91E-11
INORGANIC MERCURY	2.66E-05	1.06E-09	4.73E-06	2.37E-05	5.13E-08	1.05E-10	6.78E-07	2.77E-06	3.50E-06	5.15E+00	6.80E-07
METHYL MERCURY	3.31E-07	2.20E-10	3.10E-06	1.55E-05	6.38E-10	2.17E-11	4.44E-07	1.82E-06	2.26E-06	2.27E-02	9.95E-05
NICKEL	2.04E-07	3.14E-09	2.45E-07	2.45E-07	3.94E-10	3.10E-10	3.51E-08	2.87E-08	6.44E-08	2.84E+01	2.27E-09
SELENIUM	2.09E-10	4.18E-11	5.39E-09	5.39E-09	4.03E-13	4.13E-12	7.72E-10	6.32E-10	1.41E-09	1.42E-01	9.92E-09
SILVER	4.57E-09	5.50E-10	4.82E-08	4.82E-08	8.81E-12	5.43E-11	6.91E-09	5.65E-09	1.26E-08	1.29E+01	9.82E-10
THALLIUM	1.81E-08	2.54E-10	2.54E-06	2.54E-06	3.48E-11	2.51E-11	3.64E-07	2.98E-07	6.62E-07	9.30E-03	7.12E-05
ZINC	4.69E-07	7.57E-09	1.56E-05	1.56E-05	9.05E-10	7.47E-10	2.23E-06	1.82E-06	4.06E-06	1.14E+02	3.57E-08
ORGANICS											
Semivolatiles											
HEXACHLOROCYCLOPENTAD	1.70E-07	4.50E-10	2.07E-07	1.62E-07	3.28E-10	4.44E-11	2.96E-08	1.90E-08	4.90E-08	2.70E+00	1.81E-08
HEXACHLOROBUTADIENE	6.19E-09	2.25E-11	1.24E-08	9.04E-09	1.19E-11	2.22E-12	1.78E-09	1.06E-09	2.85E-09	1.42E-01	2.01E-08
2,4-DINITROTOLUENE	1.75E-08	8.60E-09	1.81E-07	1.81E-07	3.39E-11	8.49E-10	2.59E-08	2.12E-08	4.80E-08	1.23E+00	3.92E-08
2,6-DINITROTOLUENE	3.01E-08	1.79E-08	3.77E-07	3.77E-07	5.81E-11	1.77E-09	5.40E-08	4.42E-08	1.00E-07	7.00E-01	1.43E-07
HEXACHLOROBENZENE	5.10E-07	1.69E-10	2.54E-07	2.86E-07	9.85E-10	1.67E-11	3.64E-08	3.36E-08	7.10E-08	1.14E+00	6.25E-08
2-NITROANILINE	4.72E-09	3.01E-09	7.42E-09	7.42E-09	9.11E-12	2.97E-10	1.06E-09	8.70E-10	2.24E-09	–	NC
PENTACHLOROPHENOL	3.56E-08	1.76E-09	6.91E-07	6.14E-07	6.87E-11	1.74E-10	9.90E-08	7.20E-08	1.71E-07	2.13E-01	8.04E-07
BIS(2-ETHYLHEXYL)PHTHALA	1.71E-05	4.17E-09	1.13E-06	1.05E-06	3.30E-08	4.12E-10	1.62E-07	1.23E-07	3.19E-07	7.14E+00	4.47E-08
BENZO(A)PYRENE	4.87E-08	2.17E-12	6.92E-09	1.13E-08	9.40E-11	2.14E-13	9.91E-10	1.33E-09	2.41E-09	3.90E-02	6.18E-08
BENZO(A)ANTHRACENE	1.37E-08	1.58E-12	5.27E-09	6.59E-09	2.65E-11	1.55E-13	7.55E-10	7.72E-10	1.55E-09	6.51E-02	2.39E-08
BENZO(B)FLUORANTHENE	4.70E-07	2.29E-11	8.44E-08	1.41E-07	9.07E-10	2.26E-12	1.21E-08	1.65E-08	2.95E-08	3.90E-02	7.56E-07
BENZO(K)FLUORANTHENE	2.72E-08	1.33E-12	4.91E-09	8.18E-09	5.26E-11	1.31E-13	7.03E-10	9.58E-10	1.71E-09	3.90E-02	4.39E-08
CHRYSENE	2.05E-07	2.10E-11	6.88E-08	8.60E-08	3.95E-10	2.08E-12	9.86E-09	1.01E-08	2.03E-08	3.90E-02	5.21E-07
DIBENZ(A,H)ANTHRACENE	1.16E-08	3.78E-13	1.13E-09	2.02E-09	2.23E-11	3.73E-14	1.62E-10	2.36E-10	4.20E-10	1.42E-03	2.96E-07
INDENO(1,2,3-CD)PYRENE	1.99E-08	4.96E-13	8.50E-10	1.64E-09	3.85E-11	4.89E-14	1.22E-10	1.92E-10	3.52E-10	3.90E-02	9.04E-09
TOTAL PAH	3.77E-08	1.68E-12	5.36E-09	8.78E-09	7.28E-11	1.66E-13	7.68E-10	1.03E-09	1.87E-09	3.90E-01	4.79E-09
Volatiles											
BENZENE	1.83E-09	7.39E-10	2.02E-09	2.02E-09	3.54E-12	7.29E-11	2.89E-10	2.36E-10	6.01E-10	1.03E+01	5.85E-11
BROMOMETHANE	1.83E-10	5.07E-10	9.13E-10	9.13E-10	3.52E-13	5.00E-11	1.31E-10	1.07E-10	2.88E-10	–	NC
1,3-BUTADIENE	1.02E-09	5.05E-10	1.31E-09	1.31E-09	1.97E-12	4.98E-11	1.88E-10	1.54E-10	3.93E-10	–	NC
CARBON TETRACHLORIDE	9.35E-10	1.54E-10	4.62E-09	4.62E-09	1.81E-12	1.52E-11	6.61E-10	5.41E-10	1.22E-09	1.14E+01	1.07E-10
CHLOROFORM	1.08E-09	5.11E-10	1.83E-09	1.83E-09	2.09E-12	5.04E-11	2.63E-10	2.15E-10	5.30E-10	1.07E+01	4.98E-11
CHLOROMETHANE	1.21E-10	5.05E-10	8.14E-10	8.14E-10	2.34E-13	4.99E-11	1.17E-10	9.53E-11	2.62E-10	–	NC
1,1-DICHLOROETHYLENE	4.42E-10	1.70E-10	4.62E-10	4.62E-10	8.53E-13	1.68E-11	6.62E-11	5.42E-11	1.38E-10	2.13E+01	6.48E-12
DICHLOROFLUOROMETHANE	1.39E-09	5.08E-10	1.12E-09	1.12E-09	2.69E-12	5.01E-11	1.60E-10	1.31E-10	3.44E-10	–	NC
TRANS-1,3-DICHLOROPROPE	1.85E-10	1.71E-10	3.54E-10	3.54E-10	3.57E-13	1.69E-11	5.07E-11	4.15E-11	1.10E-10	–	NC
1,1,2,2-TETRACHLOROETHAN	5.87E-10	1.86E-10	1.85E-09	1.39E-09	1.13E-12	1.83E-11	2.66E-10	1.63E-10	4.48E-10	5.46E-01	8.21E-10
TRICHLOROFLUOROMETHAN	2.71E-09	5.07E-10	1.57E-09	1.57E-09	5.23E-12	5.01E-11	2.25E-10	1.84E-10	4.64E-10	–	NC
VINYL CHLORIDE	2.25E-10	5.06E-10	9.16E-10	9.16E-10	4.34E-13	5.00E-11	1.31E-10	1.07E-10	2.89E-10	1.21E-01	2.39E-09
Dioxins											
2,3,7,8-TCDD TE											
2,3,7,8-TCDD (MAMMAL)	2.71E-09	7.58E-14	1.49E-09	2.76E-09	5.23E-12	7.48E-15	2.13E-10	3.24E-10	5.42E-10	7.10E-07	7.63E-04

– TRV not available.
The hazard quotient (HQ) is the TRV divided by the sum of potential daily dose due to all ingested media and prey items.
NC = Not calculated

TABLE E.2-2
POTENTIAL RISKS TO THE OSPREY
SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT
HUDSON RIVER
NORLITE FACILITY
COHOES, NY

CPEC	Site Concentrations				Potential Daily Dose (mg/kg$_{bw}$-day)					TRV	HQ
	Sediment (mg/kg$_{dw}$)	Surface Water (mg/L)	Fish TL3 (mg/kg$_{ww}$)	Fish TL4 (mg/kg$_{ww}$)	Sediment	Surface Water	Fish TL3	Fish TL4	Total	(mg/kg$_{bw}$-day)	
INORGANICS											
ANTIMONY	2.20E-08	7.58E-10	3.03E-08	3.03E-08	1.10E-11	3.92E-11	3.18E-09	3.18E-09	6.41E-09	–	NC
ARSENIC	6.77E-09	1.51E-10	1.72E-08	1.72E-08	3.39E-12	7.79E-12	1.80E-09	1.80E-09	3.61E-09	5.14E+00	7.03E-10
BARIUM	1.09E-08	2.66E-10	1.68E-07	1.68E-07	5.45E-12	1.38E-11	1.77E-08	1.77E-08	3.53E-08	2.08E+01	1.70E-09
BERYLLIUM	2.58E-08	3.29E-11	2.02E-09	2.02E-09	1.29E-11	1.70E-12	2.12E-10	2.12E-10	4.39E-10	–	NC
CADMIUM	1.27E-08	1.70E-10	1.54E-07	1.54E-07	6.37E-12	8.81E-12	1.62E-08	1.62E-08	3.24E-08	1.45E+00	2.23E-08
CHROMIUM	1.27E-05	1.34E-10	1.34E-10	1.34E-10	6.33E-09	6.92E-12	1.40E-11	1.40E-11	6.37E-09	1.00E+00	6.37E-09
CHROMIUM VI	1.18E-09	6.19E-11	1.18E-09	1.18E-09	5.88E-13	3.20E-12	1.23E-10	1.23E-10	2.51E-10	1.00E+00	2.51E-10
LEAD	1.35E-07	1.51E-10	1.35E-11	1.35E-11	6.75E-11	7.84E-12	1.42E-12	1.42E-12	7.82E-11	1.13E+00	6.92E-11
INORGANIC MERCURY	2.66E-05	1.06E-09	4.73E-06	2.37E-05	1.33E-08	5.51E-11	4.97E-07	2.48E-06	2.99E-06	4.50E-01	6.65E-06
METHYL MERCURY	3.31E-07	2.20E-10	3.10E-06	1.55E-05	1.65E-10	1.14E-11	3.26E-07	1.63E-06	1.95E-06	6.40E-03	3.05E-04
NICKEL	2.04E-07	3.14E-09	2.45E-07	2.45E-07	1.02E-10	1.63E-10	2.57E-08	2.57E-08	5.17E-08	7.74E+01	6.68E-10
SELENIUM	2.09E-10	4.18E-11	5.39E-09	5.39E-09	1.04E-13	2.16E-12	5.66E-10	5.66E-10	1.13E-09	5.00E-01	2.27E-09
SILVER	4.57E-09	5.50E-10	4.82E-08	4.82E-08	2.28E-12	2.85E-11	5.07E-09	5.07E-09	1.02E-08	2.29E+00	4.44E-09
THALLIUM	1.81E-08	2.54E-10	2.54E-06	2.54E-06	9.03E-12	1.32E-11	2.67E-07	2.67E-07	5.34E-07	3.50E-01	1.53E-06
ZINC	4.69E-07	7.57E-09	1.56E-05	1.56E-05	2.34E-10	3.92E-10	1.64E-06	1.64E-06	3.27E-06	1.45E+01	2.26E-07
ORGANICS											
Semivolatiles											
HEXACHLOROCYCLOPENTA	1.70E-07	4.50E-10	2.07E-07	1.62E-07	8.49E-11	2.33E-11	2.17E-08	1.70E-08	3.88E-08	–	NC
HEXACHLOROBUTADIENE	6.19E-09	2.25E-11	1.24E-08	9.04E-09	3.09E-12	1.16E-12	1.31E-09	9.49E-10	2.26E-09	3.19E+00	7.09E-10
2,4-DINITROTOLUENE	1.75E-08	8.60E-09	1.81E-07	1.81E-07	8.77E-12	4.45E-10	1.90E-08	1.90E-08	3.85E-08	–	NC
2,6-DINITROTOLUENE	3.01E-08	1.79E-08	3.77E-07	3.77E-07	1.51E-11	9.28E-10	3.96E-08	3.96E-08	8.01E-08	–	NC
HEXACHLOROBENZENE	5.10E-07	1.69E-10	2.54E-07	2.86E-07	2.55E-10	8.75E-12	2.67E-08	3.01E-08	5.70E-08	2.25E-01	2.53E-07
2-NITROANILINE	4.72E-09	3.01E-09	7.42E-09	7.42E-09	2.36E-12	1.56E-10	7.79E-10	7.79E-10	1.72E-09	–	NC
PENTACHLOROPHENOL	3.56E-08	1.76E-09	6.91E-07	6.14E-07	1.78E-11	9.13E-11	7.26E-08	6.45E-08	1.37E-07	4.03E+00	3.40E-08
BIS(2-ETHYLHEXYL)PHTHALA	1.71E-05	4.17E-09	1.13E-06	1.05E-06	8.55E-09	2.16E-10	1.19E-07	1.10E-07	2.38E-07	1.11E+00	2.14E-07
BENZO(A)PYRENE	4.87E-08	2.17E-12	6.92E-09	1.13E-08	2.43E-11	1.13E-13	7.27E-10	1.19E-09	1.94E-09	1.00E-03	1.94E-06
BENZO(A)ANTHRACENE	1.37E-08	1.58E-12	5.27E-09	6.59E-09	6.85E-12	8.16E-14	5.54E-10	6.92E-10	1.25E-09	7.90E-04	1.59E-06
BENZO(B)FLUORANTHENE	4.70E-07	2.29E-11	8.44E-08	1.41E-07	2.35E-10	1.18E-12	8.86E-09	1.48E-08	2.39E-08	1.40E-04	1.70E-04
BENZO(K)FLUORANTHENE	2.72E-08	1.33E-12	4.91E-09	8.18E-09	1.36E-11	6.88E-14	5.15E-10	8.59E-10	1.39E-09	1.40E-04	9.91E-06
CHRYSENE	2.05E-07	2.10E-11	6.88E-08	8.60E-08	1.02E-10	1.09E-12	7.23E-09	9.03E-09	1.64E-08	1.00E-03	1.64E-05
DIBENZ(A,H)ANTHRACENE	1.16E-08	3.78E-13	1.13E-09	2.02E-09	5.78E-12	1.96E-14	1.19E-10	2.12E-10	3.36E-10	3.90E-04	8.62E-07
INDENO(1,2,3-CD)PYRENE	1.99E-08	4.96E-13	8.50E-10	1.64E-09	9.96E-12	2.57E-14	8.93E-11	1.72E-10	2.71E-10	1.00E-03	2.71E-07
TOTAL PAH	3.77E-08	1.68E-12	5.36E-09	8.78E-09	1.89E-11	8.72E-14	5.63E-10	9.22E-10	1.50E-09	4.00E+01	3.76E-11
Volatiles											
BENZENE	1.83E-09	7.39E-10	2.02E-09	2.02E-09	9.16E-13	3.82E-11	2.12E-10	2.12E-10	4.63E-10	–	NC
BROMOMETHANE	1.83E-10	5.07E-10	9.13E-10	9.13E-10	9.13E-14	2.63E-11	9.58E-11	9.58E-11	2.18E-10	–	NC
1,3-BUTADIENE	1.02E-09	5.05E-10	1.31E-09	1.31E-09	5.10E-13	2.61E-11	1.38E-10	1.38E-10	3.02E-10	–	NC
CARBON TETRACHLORIDE	9.35E-10	1.54E-10	4.62E-09	4.62E-09	4.68E-13	7.97E-12	4.85E-10	4.85E-10	9.78E-10	–	NC
CHLOROFORM	1.08E-09	5.11E-10	1.83E-09	1.83E-09	5.41E-13	2.64E-11	1.93E-10	1.93E-10	4.12E-10	–	NC
CHLOROMETHANE	1.21E-10	5.05E-10	8.14E-10	8.14E-10	6.07E-14	2.62E-11	8.54E-11	8.54E-11	1.97E-10	–	NC
1,1-DICHLOROETHYLENE	4.42E-10	1.70E-10	4.62E-10	4.62E-10	2.21E-13	8.80E-12	4.85E-11	4.85E-11	1.06E-10	1.72E+01	6.17E-12
DICHLOROFLUOROMETHAN	1.39E-09	5.08E-10	1.12E-09	1.12E-09	6.96E-13	2.63E-11	1.17E-10	1.17E-10	2.62E-10	–	NC
TRANS-1,3-DICHLOROPROP	1.85E-10	1.71E-10	3.54E-10	3.54E-10	9.24E-14	8.86E-12	3.72E-11	3.72E-11	8.34E-11	–	NC
1,1,2,2-TETRACHLOROETHA	5.87E-10	1.86E-10	1.85E-09	1.39E-09	2.94E-13	9.62E-12	1.95E-10	1.46E-10	3.51E-10	3.97E+00	8.84E-11
TRICHLOROFLUOROMETHA	2.71E-09	5.07E-10	1.57E-09	1.57E-09	1.35E-12	2.63E-11	1.65E-10	1.65E-10	3.57E-10	–	NC
VINYL CHLORIDE	2.25E-10	5.06E-10	9.16E-10	9.16E-10	1.12E-13	2.62E-11	9.62E-11	9.62E-11	2.19E-10	–	NC
Dioxins											
2,3,7,8-TCDD TE											
2,3,7,8-TCDD (BIRD)	1.35E-08	3.78E-13	7.42E-09	1.38E-08	6.76E-12	1.96E-14	7.79E-10	1.45E-09	2.23E-09	1.40E-05	1.59E-04

– TRV not available.
The hazard quotient (HQ) is the TRV divided by the sum of potential daily dose due to all ingested media and prey items.
NC = Not calculated

TABLE E.2-3
POTENTIAL RISKS TO THE GREAT BLUE HERON
SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT
HUDSON RIVER
NORLITE FACILITY
COHOES, NY

CPEC	Site Concentrations				Potential Daily Dose (mg/kg$_{bw}$-day)					TRV	HQ
	Sediment (mg/kg$_{dw}$)	Surface Water (mg/L)	Fish TL3 (mg/kg$_{ww}$)	Fish TL4 (mg/kg$_{ww}$)	Sediment	Surface Water	Fish TL3	Fish TL4	Total	mg/kg$_{bw}$-day)	
INORGANICS											
ANTIMONY	2.20E-08	7.58E-10	3.03E-08	3.03E-08	9.88E-11	3.43E-11	3.82E-09	1.64E-09	5.59E-09	–	NC
ARSENIC	6.77E-09	1.51E-10	1.72E-08	1.72E-08	3.05E-11	6.82E-12	2.16E-09	9.26E-10	3.13E-09	5.14E+00	6.08E-10
BARIUM	1.09E-08	2.66E-10	1.68E-07	1.68E-07	4.90E-11	1.20E-11	2.12E-08	9.08E-09	3.03E-08	2.08E+01	1.46E-09
BERYLLIUM	2.58E-08	3.29E-11	2.02E-09	2.02E-09	1.16E-10	1.49E-12	2.55E-10	1.09E-10	4.81E-10	–	NC
CADMIUM	1.27E-08	1.70E-10	1.54E-07	1.54E-07	5.74E-11	7.70E-12	1.94E-08	8.33E-09	2.78E-08	1.45E+00	1.92E-08
CHROMIUM	1.27E-05	1.34E-10	1.34E-10	1.34E-10	5.70E-08	6.06E-12	1.68E-11	7.22E-12	5.70E-08	1.00E+00	5.70E-08
CHROMIUM VI	1.18E-09	6.19E-11	1.18E-09	1.18E-09	5.29E-12	2.80E-12	1.48E-10	6.35E-11	2.20E-10	1.00E+00	2.20E-10
LEAD	1.35E-07	1.51E-10	1.35E-11	1.35E-11	6.07E-10	6.85E-12	1.70E-12	7.29E-13	6.17E-10	1.13E+00	5.46E-10
INORGANIC MERCURY	2.66E-05	1.06E-09	4.73E-06	2.37E-05	1.20E-07	4.82E-11	5.96E-07	1.28E-06	1.99E-06	4.50E-01	4.43E-06
METHYL MERCURY	3.31E-07	2.20E-10	3.10E-06	1.55E-05	1.49E-09	9.98E-12	3.91E-07	8.37E-07	1.23E-06	6.40E-03	1.92E-04
NICKEL	2.04E-07	3.14E-09	2.45E-07	2.45E-07	9.18E-10	1.42E-10	3.08E-08	1.32E-08	4.51E-08	7.74E+01	5.83E-10
SELENIUM	2.09E-10	4.18E-11	5.39E-09	5.39E-09	9.40E-13	1.89E-12	6.79E-10	2.91E-10	9.73E-10	5.00E-01	1.95E-09
SILVER	4.57E-09	5.50E-10	4.82E-08	4.82E-08	2.05E-11	2.49E-11	6.08E-09	2.61E-09	8.73E-09	2.29E+00	3.81E-09
THALLIUM	1.81E-08	2.54E-10	2.54E-06	2.54E-06	8.12E-11	1.15E-11	3.20E-07	1.37E-07	4.58E-07	3.50E-01	1.31E-06
ZINC	4.69E-07	7.57E-09	1.56E-05	1.56E-05	2.11E-09	3.43E-10	1.96E-06	8.41E-07	2.81E-06	1.45E+01	1.94E-07
ORGANICS											
Semivolatiles											
HEXACHLOROCYCLOPENTA	1.70E-07	4.50E-10	2.07E-07	1.62E-07	7.64E-10	2.04E-11	2.60E-08	8.76E-09	3.56E-08	–	NC
HEXACHLOROBUTADIENE	6.19E-09	2.25E-11	1.24E-08	9.04E-09	2.78E-11	1.02E-12	1.57E-09	4.88E-10	2.08E-09	3.19E+00	6.54E-10
2,4-DINITROTOLUENE	1.75E-08	8.60E-09	1.81E-07	1.81E-07	7.89E-11	3.89E-10	2.28E-08	9.77E-09	3.30E-08	–	NC
2,6-DINITROTOLUENE	3.01E-08	1.79E-08	3.77E-07	3.77E-07	1.36E-10	8.12E-10	4.75E-08	2.04E-08	6.88E-08	–	NC
HEXACHLOROBENZENE	5.10E-07	1.69E-10	2.54E-07	2.86E-07	2.30E-09	7.66E-12	3.20E-08	1.55E-08	4.98E-08	2.25E-01	2.21E-07
2-NITROANILINE	4.72E-09	3.01E-09	7.42E-09	7.42E-09	2.12E-11	1.36E-10	9.35E-10	4.01E-10	1.49E-09	–	NC
PENTACHLOROPHENOL	3.56E-08	1.76E-09	6.91E-07	6.14E-07	1.60E-10	7.98E-11	8.71E-08	3.32E-08	1.21E-07	4.03E+00	2.99E-08
BIS(2-ETHYLHEXYL)PHTHAL	1.71E-05	4.17E-09	1.13E-06	1.05E-06	7.70E-08	1.89E-10	1.43E-07	5.68E-08	2.77E-07	1.11E+00	2.49E-07
BENZO(A)PYRENE	4.87E-08	2.17E-12	6.92E-09	1.13E-08	2.19E-10	9.84E-14	8.72E-10	6.11E-10	1.70E-09	1.00E-03	1.70E-06
BENZO(A)ANTHRACENE	1.37E-08	1.58E-12	5.27E-09	6.59E-09	6.17E-11	7.13E-14	6.64E-10	3.56E-10	1.08E-09	7.90E-04	1.37E-06
BENZO(B)FLUORANTHENE	4.70E-07	2.29E-11	8.44E-08	1.41E-07	2.11E-09	1.04E-12	1.06E-08	7.60E-09	2.03E-08	1.40E-04	1.45E-04
BENZO(K)FLUORANTHENE	2.72E-08	1.33E-12	4.91E-09	8.18E-09	1.23E-10	6.02E-14	6.18E-10	4.42E-10	1.18E-09	1.40E-04	8.45E-06
CHRYSENE	2.05E-07	2.10E-11	6.88E-08	8.60E-08	9.21E-10	9.53E-13	8.67E-09	4.65E-09	1.42E-08	1.00E-03	1.42E-05
DIBENZ(A,H)ANTHRACENE	1.16E-08	3.78E-13	1.13E-09	2.02E-09	5.20E-11	1.71E-14	1.42E-10	1.09E-10	3.03E-10	3.90E-04	7.78E-07
INDENO(1,2,3-CD)PYRENE	1.99E-08	4.96E-13	8.50E-10	1.64E-09	8.97E-11	2.24E-14	1.07E-10	8.86E-11	2.85E-10	1.00E-03	2.85E-07
TOTAL PAH	3.77E-08	1.68E-12	5.36E-09	8.78E-09	1.70E-10	7.63E-14	6.76E-10	4.74E-10	1.32E-09	4.00E+01	3.30E-11
Volatiles											
BENZENE	1.83E-09	7.39E-10	2.02E-09	2.02E-09	8.24E-12	3.34E-11	2.54E-10	1.09E-10	4.05E-10	–	NC
BROMOMETHANE	1.83E-10	5.07E-10	9.13E-10	9.13E-10	8.21E-13	2.30E-11	1.15E-10	4.93E-11	1.88E-10	–	NC
1,3-BUTADIENE	1.02E-09	5.05E-10	1.31E-09	1.31E-09	4.59E-12	2.29E-11	1.65E-10	7.09E-11	2.64E-10	–	NC
CARBON TETRACHLORIDE	9.35E-10	1.54E-10	4.62E-09	4.62E-09	4.21E-12	6.97E-12	5.82E-10	2.49E-10	8.42E-10	–	NC
CHLOROFORM	1.08E-09	5.11E-10	1.83E-09	1.83E-09	4.87E-12	2.31E-11	2.31E-10	9.90E-11	3.58E-10	–	NC
CHLOROMETHANE	1.21E-10	5.05E-10	8.14E-10	8.14E-10	5.46E-13	2.29E-11	1.03E-10	4.39E-11	1.70E-10	–	NC
1,1-DICHLOROETHYLENE	4.42E-10	1.70E-10	4.62E-10	4.62E-10	1.99E-12	7.70E-12	5.83E-11	2.50E-11	9.29E-11	1.72E+01	5.40E-12
DICHLOROFLUOROMETHAN	1.39E-09	5.08E-10	1.12E-09	1.12E-09	6.26E-12	2.30E-11	1.41E-10	6.03E-11	2.30E-10	–	NC
TRANS-1,3-DICHLOROPROP	1.85E-10	1.71E-10	3.54E-10	3.54E-10	8.32E-13	7.75E-12	4.46E-11	1.91E-11	7.24E-11	–	NC
1,1,2,2-TETRACHLOROETHA	5.87E-10	1.86E-10	1.85E-09	1.39E-09	2.64E-12	8.42E-12	2.34E-10	7.51E-11	3.20E-10	3.97E+00	8.06E-11
TRICHLOROFLUOROMETHA	2.71E-09	5.07E-10	1.57E-09	1.57E-09	1.22E-11	2.30E-11	1.98E-10	8.47E-11	3.17E-10	–	NC
VINYL CHLORIDE	2.25E-10	5.06E-10	9.16E-10	9.16E-10	1.01E-12	2.29E-11	1.15E-10	4.95E-11	1.89E-10	–	NC
Dioxins											
2,3,7,8-TCDD TE											
2,3,7,8-TCDD (BIRD)	1.35E-08	3.78E-13	7.42E-09	1.38E-08	6.08E-11	1.71E-14	9.35E-10	7.44E-10	1.74E-09	1.40E-05	1.24E-04

– TRV not available.
The hazard quotient (HQ) is the TRV divided by the sum of potential daily dose due to all ingested media and prey items.
NC = Not calculated

TABLE E.3-1
POTENTIAL RISKS TO THE MINK
SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT
ERIE CANAL
NORLITE FACILITY
COHOES, NY

CPEC	Site Concentrations				Potential Daily Dose (mg/kg_{bw}-day)					TRV	HQ
	Sediment (mg/kg_{dw})	Surface Water (mg/L)	Fish TL3 (mg/kg_{ww})	Fish TL4 (mg/kg_{ww})	Sediment	Surface Water	Fish TL3	Fish TL4	Total	(mg/kg_{bw}-day)	
INORGANICS											
ANTIMONY	3.05E-07	1.05E-08	1.27E-14	1.27E-14	5.88E-10	1.04E-09	1.82E-15	1.49E-15	1.62E-09	4.88E-02	3.33E-08
ARSENIC	9.54E-08	2.12E-09	4.14E-15	4.14E-15	1.84E-10	2.09E-10	5.93E-16	4.86E-16	3.93E-10	4.91E-02	8.00E-09
BARIUM	1.53E-07	3.73E-09	3.97E-13	3.97E-13	2.95E-10	3.68E-10	5.68E-14	4.65E-14	6.63E-10	3.85E+00	1.72E-10
BERYLLIUM	4.82E-07	6.15E-10	7.65E-17	7.65E-17	9.31E-10	6.07E-11	1.10E-17	8.97E-18	9.92E-10	4.69E-01	2.12E-09
CADMIUM	1.84E-07	2.46E-09	3.44E-13	3.44E-13	3.56E-10	2.43E-10	4.92E-14	4.03E-14	5.99E-10	6.90E-01	8.67E-10
CHROMIUM	1.10E-04	1.16E-09	1.55E-19	1.55E-19	2.12E-07	1.15E-10	2.22E-20	1.82E-20	2.13E-07	1.94E+03	1.09E-10
CHROMIUM VI	1.61E-08	8.49E-10	1.90E-17	1.90E-17	3.11E-11	8.38E-11	2.71E-18	2.22E-18	1.15E-10	2.33E+00	4.94E-11
LEAD	2.56E-06	2.88E-09	3.46E-21	3.46E-21	4.95E-09	2.84E-10	4.96E-22	4.06E-22	5.23E-09	5.68E+00	9.21E-10
INORGANIC MERCURY	4.39E-04	1.76E-08	1.47E-10	7.34E-10	8.48E-07	1.73E-09	2.10E-11	8.60E-11	8.50E-07	5.15E+00	1.65E-07
METHYL MERCURY	8.27E-06	5.52E-09	9.55E-11	4.77E-10	1.60E-08	5.44E-10	1.37E-11	5.59E-11	1.66E-08	2.27E-02	7.30E-07
NICKEL	2.92E-06	4.50E-08	8.59E-13	8.59E-13	5.64E-09	4.44E-09	1.23E-13	1.01E-13	1.01E-08	2.84E+01	3.55E-10
SELENIUM	2.82E-09	5.65E-10	3.93E-16	3.93E-16	5.45E-12	5.58E-11	5.63E-17	4.60E-17	6.12E-11	1.42E-01	4.31E-10
SILVER	6.19E-08	7.46E-09	3.16E-14	3.16E-14	1.20E-10	7.37E-10	4.52E-15	3.70E-15	8.56E-10	1.29E+01	6.66E-11
THALLIUM	2.60E-07	3.67E-09	9.32E-11	9.32E-11	5.02E-10	3.62E-10	1.33E-11	1.09E-11	8.88E-10	9.30E-03	9.55E-08
ZINC	6.71E-06	1.08E-07	3.47E-09	3.47E-09	1.29E-08	1.07E-08	4.97E-10	4.06E-10	2.45E-08	1.14E+02	2.16E-10
ORGANICS											
Semivolatiles											
HEXACHLOROCYCLOPENTADIE	7.69E-07	2.04E-09	6.89E-14	5.42E-14	1.48E-09	2.01E-10	9.87E-15	6.35E-15	1.68E-09	2.70E+00	6.24E-10
HEXACHLOROBUTADIENE	2.78E-08	1.01E-10	3.16E-16	2.30E-16	5.37E-11	9.96E-12	4.52E-17	2.69E-17	6.36E-11	1.42E-01	4.48E-10
2,4-DINITROTOLUENE	3.97E-07	1.95E-07	7.41E-13	7.41E-13	7.66E-10	1.92E-08	1.06E-13	8.68E-14	2.00E-08	1.23E+00	1.63E-08
2,6-DINITROTOLUENE	6.85E-07	4.08E-07	3.24E-12	3.24E-12	1.32E-09	4.03E-08	4.63E-13	3.79E-13	4.16E-08	7.00E-01	5.94E-08
HEXACHLOROBENZENE	4.53E-06	1.50E-09	9.10E-14	1.03E-13	8.74E-09	1.48E-10	1.30E-14	1.20E-14	8.89E-09	1.14E+00	7.82E-09
2-NITROANILINE	1.11E-07	7.08E-08	1.30E-15	1.30E-15	2.15E-10	6.99E-09	1.86E-16	1.52E-16	7.20E-09	–	NC
PENTACHLOROPHENOL	7.07E-07	3.50E-08	2.64E-12	2.34E-12	1.36E-09	3.46E-09	3.78E-13	2.75E-13	4.82E-09	2.13E-01	2.26E-08
BIS(2-ETHYLHEXYL)PHTHALATE	5.53E-04	1.35E-07	9.88E-12	9.17E-12	1.07E-06	1.33E-08	1.41E-12	1.07E-12	1.08E-06	7.14E+00	1.51E-07
BENZO(A)PYRENE	1.30E-06	5.79E-11	1.16E-16	1.90E-16	2.50E-09	5.71E-12	1.66E-17	2.22E-17	2.51E-09	3.90E-02	6.43E-08
BENZO(A)ANTHRACENE	4.56E-07	5.24E-11	1.16E-16	1.45E-16	8.80E-10	5.17E-12	1.66E-17	1.69E-17	8.86E-10	6.51E-02	1.36E-08
BENZO(B)FLUORANTHENE	1.36E-05	6.61E-10	1.72E-14	2.86E-14	2.62E-08	6.53E-11	2.46E-15	3.35E-15	2.63E-08	3.90E-02	6.74E-07
BENZO(K)FLUORANTHENE	7.04E-07	3.43E-11	5.19E-17	8.65E-17	1.36E-09	3.39E-12	7.43E-18	1.01E-17	1.36E-09	3.90E-02	3.49E-08
CHRYSENE	6.71E-06	6.89E-10	1.94E-14	2.42E-14	1.29E-08	6.80E-11	2.78E-15	2.84E-15	1.30E-08	3.90E-02	3.34E-07
DIBENZ(A,H)ANTHRACENE	1.93E-07	6.32E-12	1.52E-18	2.72E-18	3.73E-10	6.23E-13	2.18E-19	3.19E-19	3.74E-10	1.42E-03	2.63E-07
INDENO(1,2,3-CD)PYRENE	2.93E-07	7.28E-12	7.58E-19	1.46E-18	5.65E-10	7.18E-13	1.09E-19	1.71E-19	5.65E-10	3.90E-02	1.45E-08
TOTAL PAH	1.01E-06	4.49E-11	6.97E-17	1.14E-16	1.94E-09	4.43E-12	9.98E-18	1.34E-17	1.94E-09	3.90E-01	4.99E-09
Volatiles											
BENZENE	8.09E-09	3.26E-09	1.79E-17	1.79E-17	1.56E-11	3.22E-10	2.57E-18	2.10E-18	3.37E-10	1.03E+01	3.28E-11
BROMOMETHANE	7.74E-10	2.15E-09	3.53E-18	3.53E-18	1.49E-12	2.12E-10	5.06E-19	4.14E-19	2.14E-10	–	NC
1,3-BUTADIENE	4.13E-09	2.05E-09	6.98E-18	6.98E-18	7.97E-12	2.02E-10	9.99E-19	8.18E-19	2.10E-10	–	NC
CARBON TETRACHLORIDE	4.06E-09	6.67E-10	9.24E-17	9.24E-17	7.83E-12	6.59E-11	1.32E-17	1.08E-17	7.37E-11	1.14E+01	6.49E-12
CHLOROFORM	4.83E-09	2.28E-09	1.50E-17	1.50E-17	9.32E-12	2.25E-10	2.15E-18	1.76E-18	2.34E-10	1.07E+01	2.20E-11
CHLOROMETHANE	5.00E-10	2.08E-09	2.73E-18	2.73E-18	9.65E-13	2.06E-10	3.91E-19	3.20E-19	2.07E-10	–	NC
1,1-DICHLOROETHYLENE	1.89E-09	7.27E-10	9.14E-19	9.14E-19	3.65E-12	7.17E-11	1.31E-19	1.07E-19	7.54E-11	2.13E+01	3.54E-12
DICHLOROFLUOROMETHANE	6.05E-09	2.21E-09	5.43E-18	5.43E-18	1.17E-11	2.18E-10	7.77E-19	6.36E-19	2.30E-10	–	NC
TRANS-1,3-DICHLOROPROPENE	8.42E-10	7.80E-10	5.72E-19	5.72E-19	1.63E-12	7.70E-11	8.19E-20	6.70E-20	7.86E-11	–	NC
1,1,2,2-TETRACHLOROETHANE	3.82E-09	1.21E-09	1.12E-17	8.38E-18	7.37E-12	1.19E-10	1.60E-18	9.82E-19	1.27E-10	5.46E-01	2.32E-10
TRICHLOROFLUOROMETHANE	1.16E-08	2.18E-09	1.06E-17	1.06E-17	2.25E-11	2.15E-10	1.51E-18	1.24E-18	2.38E-10	–	NC
VINYL CHLORIDE	9.43E-10	2.12E-09	3.52E-18	3.52E-18	1.82E-12	2.10E-10	5.05E-19	4.13E-19	2.12E-10	1.21E-01	1.75E-09
Dioxins											
2,3,7,8-TCDD TE											
2,3,7,8-TCDD (MAMMAL)	5.61E-08	1.57E-12	3.27E-18	6.08E-18	1.08E-10	1.55E-13	4.69E-19	7.13E-19	1.09E-10	7.10E-07	1.53E-04

– TRV not available.

The hazard quotient (HQ) is the TRV divided by the sum of potential daily dose due to all ingested media and prey items.

NC = Not calculated

TABLE E.3-2
POTENTIAL RISKS TO THE OSPREY
SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT
ERIE CANAL
NORLITE FACILITY
COHOES, NY

CPEC	Site Concentrations				Potential Daily Dose (mg/kg$_{bw}$-day)					TRV	HQ
	Sediment (mg/kg$_{dw}$)	Surface Water (mg/L)	Fish TL3 (mg/kg$_{ww}$)	Fish TL4 (mg/kgww)	Sediment	Surface Water	Fish TL3	Fish TL4	Total	mg/kg$_{bw}$-day)	
INORGANICS											
ANTIMONY	3.05E-07	1.05E-08	1.27E-14	1.27E-14	1.52E-10	5.44E-10	1.34E-15	1.34E-15	6.96E-10	–	NC
ARSENIC	9.54E-08	2.12E-09	4.14E-15	4.14E-15	4.77E-11	1.10E-10	4.35E-16	4.35E-16	1.57E-10	5.14E+00	3.06E-11
BARIUM	1.53E-07	3.73E-09	3.97E-13	3.97E-13	7.64E-11	1.93E-10	4.17E-14	4.17E-14	2.70E-10	2.08E+01	1.30E-11
BERYLLIUM	4.82E-07	6.15E-10	7.65E-17	7.65E-17	2.41E-10	3.19E-11	8.04E-18	8.04E-18	2.73E-10	–	NC
CADMIUM	1.84E-07	2.46E-09	3.44E-13	3.44E-13	9.22E-11	1.27E-10	3.61E-14	3.61E-14	2.20E-10	1.45E+00	1.51E-10
CHROMIUM	1.10E-04	1.16E-09	1.55E-19	1.55E-19	5.50E-08	6.02E-11	1.63E-20	1.63E-20	5.51E-08	1.00E+00	5.51E-08
CHROMIUM VI	1.61E-08	8.49E-10	1.90E-17	1.90E-17	8.06E-12	4.40E-11	1.99E-18	1.99E-18	5.20E-11	1.00E+00	5.20E-11
LEAD	2.56E-06	2.88E-09	3.46E-21	3.46E-21	1.28E-09	1.49E-10	3.64E-22	3.64E-22	1.43E-09	1.13E+00	1.27E-09
INORGANIC MERCURY	4.39E-04	1.76E-08	1.47E-10	7.34E-10	2.20E-07	9.10E-10	1.54E-11	7.70E-11	2.21E-07	4.50E-01	4.90E-07
METHYL MERCURY	8.27E-06	5.52E-09	9.55E-11	4.77E-10	4.14E-09	2.86E-10	1.00E-11	5.01E-11	4.48E-09	6.40E-03	7.00E-07
NICKEL	2.92E-06	4.50E-08	8.59E-13	8.59E-13	1.46E-09	2.33E-09	9.02E-14	9.02E-14	3.79E-09	7.74E+01	4.90E-11
SELENIUM	2.82E-09	5.65E-10	3.93E-16	3.93E-16	1.41E-12	2.92E-11	4.13E-17	4.13E-17	3.07E-11	5.00E-01	6.13E-11
SILVER	6.19E-08	7.46E-09	3.16E-14	3.16E-14	3.10E-11	3.86E-10	3.32E-15	3.32E-15	4.17E-10	2.29E+00	1.82E-10
THALLIUM	2.60E-07	3.67E-09	9.32E-11	9.32E-11	1.30E-10	1.90E-10	9.78E-12	9.78E-12	3.39E-10	3.50E-01	9.70E-10
ZINC	6.71E-06	1.08E-07	3.47E-09	3.47E-09	3.35E-09	5.60E-09	3.64E-10	3.64E-10	9.68E-09	1.45E+01	6.68E-10
ORGANICS											
Semivolatiles											
HEXACHLOROCYCLOPENTADI	7.69E-07	2.04E-09	6.89E-14	5.42E-14	3.84E-10	1.05E-10	7.24E-15	5.69E-15	4.90E-10	–	NC
HEXACHLOROBUTADIENE	2.78E-08	1.01E-10	3.16E-16	2.30E-16	1.39E-11	5.23E-12	3.32E-17	2.41E-17	1.91E-11	3.19E+00	6.01E-12
2,4-DINITROTOLUENE	3.97E-07	1.95E-07	7.41E-13	7.41E-13	1.99E-10	1.01E-08	7.78E-14	7.78E-14	1.03E-08	–	NC
2,6-DINITROTOLUENE	6.85E-07	4.08E-07	3.24E-12	3.24E-12	3.43E-10	2.11E-08	3.40E-13	3.40E-13	2.15E-08	–	NC
HEXACHLOROBENZENE	4.53E-06	1.50E-09	9.10E-14	1.03E-13	2.26E-09	7.77E-11	9.55E-15	1.08E-14	2.34E-09	2.25E-01	1.04E-08
2-NITROANILINE	1.11E-07	7.08E-08	1.30E-15	1.30E-15	5.56E-11	3.67E-09	1.36E-16	1.36E-16	3.72E-09	–	NC
PENTACHLOROPHENOL	7.07E-07	3.50E-08	2.64E-12	2.34E-12	3.54E-10	1.81E-09	2.77E-13	2.46E-13	2.17E-09	4.03E+00	5.38E-10
BIS(2-ETHYLHEXYL)PHTHALAT	5.53E-04	1.35E-07	9.88E-12	9.17E-12	2.77E-07	6.99E-09	1.04E-12	9.63E-13	2.84E-07	1.11E+00	2.56E-07
BENZO(A)PYRENE	1.30E-06	5.79E-11	1.16E-16	1.90E-16	6.49E-10	3.00E-12	1.22E-17	1.99E-17	6.52E-10	1.00E-03	6.52E-07
BENZO(A)ANTHRACENE	4.56E-07	5.24E-11	1.16E-16	1.45E-16	2.28E-10	2.71E-12	1.21E-17	1.52E-17	2.31E-10	7.90E-04	2.92E-07
BENZO(B)FLUORANTHENE	1.36E-05	6.61E-10	1.72E-14	2.86E-14	6.79E-09	3.42E-11	1.80E-15	3.00E-15	6.82E-09	1.40E-04	4.87E-05
BENZO(K)FLUORANTHENE	7.04E-07	3.43E-11	5.19E-17	8.65E-17	3.52E-10	1.78E-12	5.45E-18	9.08E-18	3.54E-10	1.40E-04	2.53E-06
CHRYSENE	6.71E-06	6.89E-10	1.94E-14	2.42E-14	3.35E-09	3.57E-11	2.04E-15	2.55E-15	3.39E-09	1.00E-03	3.39E-06
DIBENZ(A,H)ANTHRACENE	1.93E-07	6.32E-12	1.52E-18	2.72E-18	9.66E-11	3.27E-13	1.60E-19	2.86E-19	9.70E-11	3.90E-04	2.49E-07
INDENO(1,2,3-CD)PYRENE	2.93E-07	7.28E-12	7.58E-19	1.46E-18	1.46E-10	3.77E-13	7.96E-20	1.54E-19	1.47E-10	1.00E-03	1.47E-07
TOTAL PAH	1.01E-06	4.49E-11	6.97E-17	1.14E-16	5.03E-10	2.32E-12	7.32E-18	1.20E-17	5.05E-10	4.00E+01	1.26E-11
Volatiles											
BENZENE	8.09E-09	3.26E-09	1.79E-17	1.79E-17	4.04E-12	1.69E-10	1.88E-18	1.88E-18	1.73E-10	–	NC
BROMOMETHANE	7.74E-10	2.15E-09	3.53E-18	3.53E-18	3.87E-13	1.11E-10	3.71E-19	3.71E-19	1.12E-10	–	NC
1,3-BUTADIENE	4.13E-09	2.05E-09	6.98E-18	6.98E-18	2.07E-12	1.06E-10	7.33E-19	7.33E-19	1.08E-10	–	NC
CARBON TETRACHLORIDE	4.06E-09	6.67E-10	9.24E-17	9.24E-17	2.03E-12	3.45E-11	9.70E-18	9.70E-18	3.66E-11	–	NC
CHLOROFORM	4.83E-09	2.28E-09	1.50E-17	1.50E-17	2.41E-12	1.18E-10	1.57E-18	1.57E-18	1.20E-10	–	NC
CHLOROMETHANE	5.00E-10	2.08E-09	2.73E-18	2.73E-18	2.50E-13	1.08E-10	2.87E-19	2.87E-19	1.08E-10	–	NC
1,1-DICHLOROETHYLENE	1.89E-09	7.27E-10	9.14E-19	9.14E-19	9.45E-13	3.76E-11	9.60E-20	9.60E-20	3.86E-11	1.72E+01	2.24E-12
DICHLOROFLUOROMETHANE	6.05E-09	2.21E-09	5.43E-18	5.43E-18	3.03E-12	1.14E-10	5.70E-19	5.70E-19	1.17E-10	–	NC
TRANS-1,3-DICHLOROPROPEN	8.42E-10	7.80E-10	5.72E-19	5.72E-19	4.21E-13	4.04E-11	6.01E-20	6.01E-20	4.08E-11	–	NC
1,1,2,2-TETRACHLOROETHANE	3.82E-09	1.21E-09	1.12E-17	8.38E-18	1.91E-12	6.25E-11	1.17E-18	8.80E-19	6.44E-11	3.97E+00	1.62E-11
TRICHLOROFLUOROMETHANE	1.16E-08	2.18E-09	1.06E-17	1.06E-17	5.82E-12	1.13E-10	1.11E-18	1.11E-18	1.19E-10	–	NC
VINYL CHLORIDE	9.43E-10	2.12E-09	3.52E-18	3.52E-18	4.72E-13	1.10E-10	3.70E-19	3.70E-19	1.10E-10	–	NC
Dioxins											
2,3,7,8-TCDD TE											
2,3,7,8-TCDD (BIRD)	3.03E-07	8.47E-12	8.81E-17	1.64E-16	1.51E-10	4.39E-13	9.25E-18	1.72E-17	1.52E-10	1.40E-05	1.08E-05

– TRV not available.

The hazard quotient (HQ) is the TRV divided by the sum of potential daily dose due to all ingested media and prey items.

NC = Not calculated

TABLE E3-3
POTENTIAL RISKS TO THE GREAT BLUE HERON
SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT
ERIE CANAL
NORLITE FACILITY
COHOES, NY

CPEC	Site Concentrations: Sediment (mg/kg$_{dw}$)	Site Concentrations: Surface Water (mg/L)	Site Concentrations: Fish TL3 (mg/kg$_{ww}$)	Site Concentrations: Fish TL4 (mg/kg$_{ww}$)	Potential Daily Dose (mg/kg$_{bw}$-day): Sediment	Potential Daily Dose: Surface Water	Potential Daily Dose: Fish TL3	Potential Daily Dose: Fish TL4	Potential Daily Dose: Total	TRV mg/kg$_{bw}$-day)	HQ
INORGANICS											
ANTIMONY	3.05E-07	1.05E-08	1.27E-14	1.27E-14	1.37E-09	4.76E-10	1.60E-15	6.87E-16	1.85E-09	–	NC
ARSENIC	9.54E-08	2.12E-09	4.14E-15	4.14E-15	4.29E-10	9.60E-11	5.22E-16	2.24E-16	5.25E-10	5.14E+00	1.02E-10
BARIUM	1.53E-07	3.73E-09	3.97E-13	3.97E-13	6.88E-10	1.69E-10	5.00E-14	2.14E-14	8.57E-10	2.08E+01	4.12E-11
BERYLLIUM	4.82E-07	6.15E-10	7.65E-17	7.65E-17	2.17E-09	2.79E-11	9.64E-18	4.13E-18	2.20E-09	–	NC
CADMIUM	1.84E-07	2.46E-09	3.44E-13	3.44E-13	8.29E-10	1.11E-10	4.33E-14	1.86E-14	9.41E-10	1.45E+00	6.49E-10
CHROMIUM	1.10E-04	1.16E-09	1.55E-19	1.55E-19	4.95E-07	5.26E-11	1.96E-20	8.39E-21	4.95E-07	1.00E+00	4.95E-07
CHROMIUM VI	1.61E-08	8.49E-10	1.90E-17	1.90E-17	7.26E-11	3.85E-11	2.39E-18	1.02E-18	1.11E-10	1.00E+00	1.11E-10
LEAD	2.56E-06	2.88E-09	3.46E-21	7.34E-10	1.15E-08	1.30E-10	4.36E-22	1.87E-22	1.17E-08	1.13E+00	1.03E-08
INORGANIC MERCURY	4.39E-04	1.76E-08	1.47E-10	7.34E-10	1.98E-06	7.96E-10	1.85E-11	3.96E-11	1.98E-06	4.50E-01	4.39E-06
METHYL MERCURY	8.27E-06	5.52E-09	9.55E-11	4.77E-10	3.72E-08	2.50E-10	1.20E-11	2.58E-11	3.75E-08	6.40E-03	5.86E-06
NICKEL	2.92E-06	4.50E-08	8.59E-13	8.59E-13	1.32E-08	2.04E-09	1.08E-13	4.64E-14	1.52E-08	7.74E+01	1.96E-10
SELENIUM	2.82E-09	5.65E-10	3.93E-16	3.93E-16	1.27E-11	2.56E-11	4.95E-17	2.12E-17	3.83E-11	5.00E-01	7.66E-11
SILVER	6.19E-08	7.46E-09	3.16E-14	3.16E-14	2.79E-10	3.38E-10	3.98E-15	1.70E-15	6.17E-10	2.29E+00	2.69E-10
THALLIUM	2.60E-07	3.67E-09	9.32E-11	9.32E-11	1.17E-09	1.66E-10	1.17E-11	5.03E-12	1.35E-09	3.50E-01	3.87E-09
ZINC	6.71E-06	1.08E-07	3.47E-09	3.47E-09	3.02E-08	4.90E-09	4.37E-10	1.87E-10	3.57E-08	1.45E+01	2.46E-09
ORGANICS											
Semivolatiles											
HEXACHLOROCYCLOPENTADI	7.69E-07	2.04E-09	6.89E-14	5.42E-14	3.46E-09	9.23E-11	8.69E-15	2.93E-15	3.55E-09	–	NC
HEXACHLOROBUTADIENE	2.78E-08	1.01E-10	3.16E-16	2.30E-16	1.25E-10	4.57E-12	3.98E-17	1.24E-17	1.30E-10	3.19E+00	4.07E-11
2,4-DINITROTOLUENE	3.97E-07	1.95E-07	7.41E-13	7.41E-13	1.79E-09	8.82E-09	9.34E-14	4.00E-14	1.06E-08	–	NC
2,6-DINITROTOLUENE	6.85E-07	4.08E-07	3.24E-12	3.24E-12	3.08E-09	1.85E-08	4.08E-13	1.75E-13	2.16E-08	–	NC
HEXACHLOROBENZENE	4.53E-06	1.50E-09	9.10E-14	1.03E-13	2.04E-08	6.79E-11	1.15E-14	5.54E-15	2.04E-08	2.25E-01	9.09E-08
2-NITROANILINE	1.11E-07	7.08E-08	1.30E-15	1.30E-15	5.00E-10	3.21E-09	1.64E-16	7.01E-17	3.71E-09	–	NC
PENTACHLOROPHENOL	7.07E-07	3.50E-08	2.64E-12	2.34E-12	3.18E-09	1.59E-09	3.32E-13	1.27E-13	4.77E-09	4.03E+00	1.18E-09
BIS(2-ETHYLHEXYL)PHTHALAT	5.53E-04	1.35E-07	9.88E-12	9.17E-12	2.49E-06	6.11E-09	1.24E-12	4.95E-13	2.50E-06	1.11E+00	2.25E-06
BENZO(A)PYRENE	1.30E-06	5.79E-11	1.16E-16	1.90E-16	5.84E-09	2.62E-12	1.46E-17	1.02E-17	5.84E-09	1.00E-03	5.84E-06
BENZO(A)ANTHRACENE	4.56E-07	5.24E-11	1.16E-16	1.45E-16	2.05E-09	2.37E-12	1.46E-17	7.80E-18	2.05E-09	7.90E-04	2.60E-06
BENZO(B)FLUORANTHENE	1.36E-05	6.61E-10	1.72E-14	2.86E-14	6.11E-08	2.99E-11	2.16E-15	1.54E-15	6.11E-08	1.40E-04	4.37E-04
BENZO(K)FLUORANTHENE	7.04E-07	3.43E-11	5.19E-17	8.65E-17	3.17E-09	1.56E-12	6.54E-18	4.67E-18	3.17E-09	1.40E-04	2.27E-05
CHRYSENE	6.71E-06	6.89E-10	1.94E-14	2.42E-14	3.02E-08	3.12E-11	2.44E-15	1.31E-15	3.02E-08	1.00E-03	.3.02E-05
DIBENZ(A,H)ANTHRACENE	1.93E-07	6.32E-12	1.52E-18	2.72E-18	8.70E-10	2.86E-13	1.92E-19	1.47E-19	8.70E-10	3.90E-04	2.23E-06
INDENO(1,2,3-CD)PYRENE	2.93E-07	7.28E-12	7.58E-19	1.46E-18	1.32E-09	3.30E-13	9.56E-20	7.90E-20	1.32E-09	1.00E-03	1.32E-06
TOTAL PAH	1.01E-06	4.49E-11	6.97E-17	1.14E-16	4.52E-09	2.03E-12	8.78E-18	6.16E-18	4.53E-09	4.00E+01	1.13E-10
Volatiles											
BENZENE	8.09E-09	3.26E-09	1.79E-17	1.79E-17	3.64E-11	1.48E-10	2.26E-18	9.69E-19	1.84E-10	–	NC
BROMOMETHANE	7.74E-10	2.15E-09	3.53E-18	3.53E-18	3.48E-12	9.74E-11	4.45E-19	1.91E-19	1.01E-10	–	NC
1,3-BUTADIENE	4.13E-09	2.05E-09	6.98E-18	6.98E-18	1.86E-11	9.26E-11	8.79E-19	3.77E-19	1.11E-10	–	NC
CARBON TETRACHLORIDE	4.06E-09	6.67E-10	9.24E-17	9.24E-17	1.83E-11	3.02E-11	1.16E-17	4.99E-18	4.85E-11	–	NC
CHLOROFORM	4.83E-09	2.28E-09	1.50E-17	1.50E-17	2.17E-11	1.03E-10	1.89E-18	8.09E-19	1.25E-10	–	NC
CHLOROMETHANE	5.00E-10	2.08E-09	2.73E-18	2.73E-18	2.25E-12	9.43E-11	3.44E-19	1.47E-19	9.66E-11	–	NC
1,1-DICHLOROETHYLENE	1.89E-09	7.27E-10	9.14E-19	9.14E-19	8.50E-12	3.29E-11	1.15E-19	4.94E-20	4.14E-11	1.72E+01	2.41E-12
DICHLOROFLUOROMETHANE	6.05E-09	2.21E-09	5.43E-18	5.43E-18	2.72E-11	1.00E-10	6.84E-19	2.93E-19	1.27E-10	–	NC
TRANS-1,3-DICHLOROPROPEN	8.42E-10	7.80E-10	5.72E-19	5.72E-19	3.79E-12	3.53E-11	7.21E-20	3.09E-20	3.91E-11	–	NC
1,1,2,2-TETRACHLOROETHANE	3.82E-09	1.21E-09	1.12E-17	8.38E-18	1.72E-11	5.47E-11	1.41E-18	4.53E-19	7.19E-11	3.97E+00	1.81E-11
TRICHLOROFLUOROMETHANE	1.16E-08	2.18E-09	1.06E-17	1.06E-17	5.24E-11	9.88E-11	1.33E-18	5.70E-19	1.51E-10	–	NC
VINYL CHLORIDE	9.43E-10	2.12E-09	3.52E-18	3.52E-18	4.24E-12	9.62E-11	4.44E-19	1.90E-19	1.00E-10	–	NC
Dioxins											
2,3,7,8-TCDD TE											
2,3,7,8-TCDD (BIRD)	3.03E-07	8.47E-12	8.81E-17	1.64E-16	1.36E-09	3.84E-13	1.11E-17	8.84E-18	1.36E-09	1.40E-05	9.74E-05

– TRV not available.
The hazard quotient (HQ) is the TRV divided by the sum of potential daily dose due to all ingested media and prey items.
NC = Not calculated

TA

POTENTIAL RISKS TO THE MIK
PROPORTIONED DIET
WRIGHT-BRADLEY LAKE
NORLITE FACILITY
COHOES, NY

CPEC	Site Concentrations				Potential Daily Dose (mg/kg$_{bw}$-day)					TRV	HQ
	Sediment (mg/kg$_{dw}$)	Surface Water (mg/L)	Fish TL3 (mg/kg$_{ww}$)	Fish TL4 (mg/kg$_{ww}$)	Sediment	Surface Water	Fish TL3	Fish TL4	Total	mg/kg$_{bw}$-day)	
INORGANICS											
ANTIMONY	1.71E-06	5.91E-08	2.36E-06	2.36E-06	3.31E-09	5.83E-09	3.38E-07	2.77E-07	6.25E-07	4.88E-02	1.28E-05
ARSENIC	5.39E-07	1.20E-08	1.37E-06	1.37E-06	1.04E-09	1.18E-09	1.96E-07	1.60E-07	3.58E-07	4.91E-02	7.28E-06
BARIUM	8.63E-07	2.11E-08	1.33E-05	1.33E-05	1.67E-09	2.08E-09	1.91E-06	1.56E-06	3.47E-06	3.85E+00	9.03E-07
BERYLLIUM	2.79E-06	3.56E-09	2.19E-07	2.19E-07	5.39E-09	3.51E-10	3.14E-08	2.57E-08	6.28E-08	4.69E-01	1.34E-07
CADMIUM	1.05E-06	1.40E-08	1.27E-05	1.27E-05	2.02E-09	1.38E-09	1.82E-06	1.49E-06	3.31E-06	6.90E-01	4.79E-06
CHROMIUM	1.12E-04	1.18E-09	1.18E-09	1.18E-09	2.16E-07	1.16E-10	1.69E-10	1.38E-10	2.16E-07	1.94E+03	1.11E-10
CHROMIUM VI	9.04E-08	4.76E-09	9.04E-08	9.04E-08	1.75E-10	4.70E-10	1.30E-08	1.06E-08	2.42E-08	2.33E+00	1.04E-08
LEAD	1.47E-05	1.65E-08	1.47E-09	1.47E-09	2.84E-08	1.63E-09	2.11E-10	1.72E-10	3.04E-08	5.68E+00	5.35E-09
INORGANIC MERCURY	7.93E-04	3.17E-08	1.41E-04	7.05E-04	1.53E-06	3.13E-09	2.02E-05	8.26E-05	1.04E-04	5.15E+00	2.03E-05
METHYL MERCURY	4.15E-05	2.77E-08	3.89E-04	1.95E-03	8.00E-08	2.73E-09	5.57E-05	2.28E-04	2.84E-04	2.27E-02	1.25E-02
NICKEL	1.66E-05	2.56E-07	1.99E-05	1.99E-05	3.20E-08	2.52E-08	2.85E-06	2.33E-06	5.24E-06	2.84E+01	1.85E-07
SELENIUM	1.58E-08	3.15E-09	4.06E-07	4.06E-07	3.04E-11	3.11E-10	5.82E-08	4.76E-08	1.06E-07	1.42E-01	7.46E-07
SILVER	3.46E-07	4.17E-08	3.65E-06	3.65E-06	6.67E-10	4.11E-09	5.23E-07	4.28E-07	9.56E-07	1.29E+01	7.44E-08
THALLIUM	1.48E-06	2.08E-08	2.08E-04	2.08E-04	2.85E-09	2.06E-09	2.98E-05	2.44E-05	5.42E-05	9.30E-03	5.83E-03
ZINC	3.80E-05	6.14E-07	1.26E-03	1.26E-03	7.34E-08	6.06E-08	1.81E-04	1.48E-04	3.29E-04	1.14E+02	2.90E-06
ORGANICS											
Semivolatiles											
HEXACHLOROCYCLOPENTADIE	1.89E-06	5.01E-09	2.30E-06	1.81E-06	3.65E-09	4.95E-10	3.29E-07	2.12E-07	5.45E-07	2.70E+00	2.02E-07
HEXACHLOROBUTADIENE	6.85E-08	2.48E-10	1.38E-07	1.00E-07	1.32E-10	2.45E-11	1.97E-08	1.17E-08	3.16E-08	1.42E-01	2.22E-07
2,4-DINITROTOLUENE	1.78E-06	8.71E-07	1.83E-05	1.83E-05	3.43E-09	8.59E-08	2.62E-06	2.15E-06	4.86E-06	1.23E+00	3.97E-06
2,6-DINITROTOLUENE	3.07E-06	1.82E-06	3.84E-05	3.84E-05	5.92E-09	1.80E-07	5.50E-06	4.50E-06	1.02E-05	7.00E-01	1.45E-05
HEXACHLOROBENZENE	1.01E-05	3.35E-09	5.03E-06	5.67E-06	1.95E-08	3.30E-10	7.21E-07	6.65E-07	1.41E-06	1.14E+00	1.24E-06
2-NITROANILINE	4.96E-07	3.16E-07	7.81E-07	7.81E-07	9.58E-10	3.12E-08	1.12E-07	9.15E-08	2.36E-07	--	NC
PENTACHLOROPHENOL	2.43E-06	1.20E-07	4.71E-05	4.19E-05	4.68E-09	1.19E-08	6.75E-06	4.91E-06	1.17E-05	2.13E-01	5.48E-05
BIS(2-ETHYLHEXYL)PHTHALATE	1.65E-03	4.03E-07	1.09E-04	1.02E-04	3.19E-06	3.98E-08	1.57E-05	1.19E-05	3.08E-05	7.14E+00	4.31E-06
BENZO(A)PYRENE	2.12E-06	9.44E-11	3.01E-07	4.92E-07	4.08E-09	9.32E-12	4.31E-08	5.77E-08	1.05E-07	3.90E-02	2.69E-06
BENZO(A)ANTHRACENE	1.09E-06	1.26E-10	4.21E-07	5.26E-07	2.11E-09	1.24E-11	6.02E-08	6.16E-08	1.24E-07	6.51E-02	1.90E-06
BENZO(B)FLUORANTHENE	2.25E-05	1.10E-09	4.05E-06	6.75E-06	4.35E-08	1.08E-10	5.80E-07	7.90E-07	1.41E-06	3.90E-02	3.62E-05
BENZO(K)FLUORANTHENE	1.21E-06	5.89E-11	2.17E-07	3.62E-07	2.33E-09	5.81E-12	3.11E-08	4.25E-08	7.59E-08	3.90E-02	1.95E-06
CHRYSENE	1.58E-05	1.62E-09	5.30E-06	6.62E-06	3.04E-08	1.60E-10	7.58E-07	7.76E-07	1.56E-06	3.90E-02	4.01E-05
DIBENZ(A,H)ANTHRACENE	2.86E-07	9.35E-12	2.80E-08	4.99E-08	5.52E-10	9.22E-13	4.00E-09	5.85E-09	1.04E-08	1.42E-03	7.33E-06
INDENO(1,2,3-CD)PYRENE	3.83E-07	9.53E-12	1.63E-08	3.15E-08	7.39E-10	9.40E-13	2.34E-09	3.69E-09	6.77E-09	3.90E-02	1.74E-07
TOTAL PAH	1.64E-06	7.32E-11	2.33E-07	3.81E-07	3.17E-09	7.22E-12	3.34E-08	4.47E-08	8.12E-08	3.90E-01	2.08E-07
Volatiles											
BENZENE	1.84E-08	7.42E-09	2.02E-08	2.02E-08	3.55E-11	7.32E-10	2.90E-09	2.37E-09	6.04E-09	1.03E+01	5.87E-10
BROMOMETHANE	1.67E-09	4.63E-09	8.33E-09	8.33E-09	3.22E-12	4.57E-10	1.19E-09	9.76E-10	2.63E-09	--	NC
1,3-BUTADIENE	8.23E-09	4.07E-09	1.06E-08	1.06E-08	1.59E-11	4.02E-10	1.52E-09	1.24E-09	3.18E-09	--	NC
CARBON TETRACHLORIDE	9.31E-09	1.53E-09	4.59E-08	4.59E-08	1.80E-11	1.51E-10	6.58E-09	5.38E-09	1.21E-08	1.14E+01	1.07E-09
CHLOROFORM	1.08E-08	5.08E-09	1.82E-08	1.82E-08	2.08E-11	5.02E-10	2.61E-09	2.14E-09	5.27E-09	1.07E+01	4.95E-10
CHLOROMETHANE	1.03E-09	4.29E-09	6.90E-09	6.90E-09	1.99E-12	4.23E-10	9.88E-10	8.09E-10	2.22E-09	--	NC
1,1-DICHLOROETHYLENE	4.20E-09	1.61E-09	4.39E-09	4.39E-09	8.10E-12	1.59E-10	6.29E-10	5.14E-10	1.31E-09	2.13E+01	6.15E-11
DICHLOROFLUOROMETHANE	1.42E-08	5.19E-09	1.14E-08	1.14E-08	2.75E-11	5.12E-10	1.64E-09	1.34E-09	3.51E-09	--	NC
TRANS-1,3-DICHLOROPROPENE	1.94E-09	1.79E-09	3.71E-09	3.71E-09	3.73E-12	1.77E-10	5.31E-10	4.35E-10	1.15E-09	--	NC
1,1,2,2-TETRACHLOROETHANE	9.36E-09	2.96E-09	2.95E-08	2.22E-08	1.81E-11	2.92E-10	4.23E-09	2.60E-09	7.14E-09	5.46E-01	1.31E-08
TRICHLOROFLUOROMETHANE	2.65E-08	4.97E-09	1.53E-08	1.53E-08	5.12E-11	4.90E-10	2.20E-09	1.80E-09	4.54E-09	--	NC
VINYL CHLORIDE	2.04E-09	4.59E-09	8.30E-09	8.30E-09	3.93E-12	4.53E-10	1.19E-09	9.73E-10	2.62E-09	1.21E-01	2.17E-08
Dioxins											
2,3,7,8-TCDD TE											
2,3,7,8-TCDD (MAMMAL)	7.28E-08	2.04E-12	4.00E-08	7.42E-08	1.41E-10	2.01E-13	5.72E-09	8.70E-09	1.46E-08	7.10E-07	2.05E-02

-- TRV not available.
The hazard quotient (HQ) is the TRV divided by the sum of potential daily dose due to all ingested media and prey items.
NC = Not calculated

Table E 4-2
POTENTIAL RISKS TO THE OSPREY
PROPORTIONED DIET
WRIGHT-BRADLEY LAKE
NORLITE FACILITY
COHOES, NY

CPEC	Site Concentrations				Potential Daily Dose (mg/kg$_{bw}$-day)					TRV	HQ
	Sediment (mg/kg$_{dw}$)	Surface Water (mg/L)	Fish TL3 (mg/kgww)	Fish TL4 (mg/kgww)	Sediment	Surface Water	Fish TL3	Fish TL4	Total	mg/kg$_{bw}$-day)	
INORGANICS											
ANTIMONY	1.71E-06	5.91E-08	2.36E-06	2.36E-06	8.57E-10	3.06E-09	2.48E-07	2.48E-07	5.00E-07	--	NC
ARSENIC	5.39E-07	1.20E-08	1.37E-06	1.37E-06	2.69E-10	6.20E-10	1.43E-07	1.43E-07	2.88E-07	5.14E+00	5.60E-08
BARIUM	8.63E-07	2.11E-08	1.33E-05	1.33E-05	4.31E-10	1.09E-09	1.40E-06	1.40E-06	2.80E-06	2.08E+01	1.35E-07
BERYLLIUM	2.79E-06	3.56E-09	2.19E-07	2.19E-07	1.40E-09	1.84E-10	2.30E-08	2.30E-08	4.76E-08	--	NC
CADMIUM	1.05E-06	1.40E-08	1.27E-05	1.27E-05	5.24E-10	7.24E-10	1.33E-06	1.33E-06	2.66E-06	1.45E+00	1.84E-06
CHROMIUM	1.12E-04	1.18E-09	1.18E-09	1.18E-09	5.59E-08	6.11E-11	1.24E-10	1.24E-10	5.62E-08	1.00E+00	5.62E-08
CHROMIUM VI	9.04E-08	4.76E-09	9.04E-08	9.04E-08	4.52E-11	2.46E-10	9.50E-09	9.50E-09	1.93E-08	1.00E+00	1.93E-08
LEAD	1.47E-05	1.65E-08	1.47E-09	1.47E-09	7.36E-09	8.54E-10	1.55E-10	1.55E-10	8.52E-09	1.13E+00	7.54E-09
INORGANIC MERCURY	7.93E-04	3.17E-08	1.41E-04	7.05E-04	3.96E-07	1.64E-09	1.48E-05	7.40E-05	8.92E-05	4.50E-01	1.98E-04
METHYL MERCURY	4.15E-05	2.77E-08	3.89E-04	1.95E-03	2.07E-08	1.43E-09	4.08E-05	2.04E-04	2.45E-04	6.40E-03	3.83E-02
NICKEL	1.66E-05	2.56E-07	1.99E-05	1.99E-05	8.30E-09	1.32E-08	2.09E-06	2.09E-06	4.21E-06	7.74E+01	5.43E-08
SELENIUM	1.58E-08	3.15E-09	4.06E-07	4.06E-07	7.88E-12	1.63E-10	4.27E-08	4.27E-08	8.55E-08	5.00E-01	1.71E-07
SILVER	3.46E-07	4.17E-08	3.65E-06	3.65E-06	1.73E-10	2.16E-09	3.84E-07	3.84E-07	7.70E-07	2.29E+00	3.36E-07
THALLIUM	1.48E-06	2.08E-08	2.08E-04	2.08E-04	7.39E-10	1.08E-09	2.19E-05	2.19E-05	4.37E-05	3.50E-01	1.25E-04
ZINC	3.80E-05	6.14E-07	1.26E-03	1.26E-03	1.90E-08	3.18E-08	1.33E-04	1.33E-04	2.65E-04	1.45E+01	1.83E-05
ORGANICS											
Semivolatiles											
HEXACHLOROCYCLOPENTAD	1.89E-06	5.01E-09	2.30E-06	1.81E-06	9.46E-10	2.60E-10	2.41E-07	1.90E-07	4.32E-07	--	NC
HEXACHLOROBUTADIENE	6.85E-08	2.48E-10	1.38E-07	1.00E-07	3.42E-11	1.29E-11	1.44E-08	1.05E-08	2.50E-08	3.19E+00	7.85E-09
2,4-DINITROTOLUENE	1.78E-06	8.71E-07	1.83E-05	1.83E-05	8.88E-10	4.51E-08	1.92E-06	1.92E-06	3.89E-06	--	NC
2,6-DINITROTOLUENE	3.07E-06	1.82E-06	3.84E-05	3.84E-05	1.53E-09	9.45E-08	4.03E-06	4.03E-06	8.16E-06	--	NC
HEXACHLOROBENZENE	1.01E-05	3.35E-09	5.03E-06	5.67E-06	5.05E-09	1.73E-10	5.29E-07	5.96E-07	1.13E-06	2.25E-01	5.02E-06
2-NITROANILINE	4.96E-07	3.16E-07	7.81E-07	7.81E-07	2.48E-10	1.64E-08	8.20E-08	8.20E-08	1.81E-07	--	NC
PENTACHLOROPHENOL	2.43E-06	1.20E-07	4.71E-05	4.19E-05	1.21E-09	6.22E-09	4.95E-06	4.40E-06	9.35E-06	4.03E+00	2.32E-06
BIS(2-ETHYLHEXYL)PHTHALAT	1.65E-03	4.03E-07	1.09E-04	1.02E-04	8.26E-07	2.09E-08	1.15E-05	1.07E-05	2.30E-05	1.11E+00	2.07E-05
BENZO(A)PYRENE	2.12E-06	9.44E-11	3.01E-07	4.92E-07	1.06E-09	4.89E-12	3.16E-08	5.17E-08	8.43E-08	1.00E-03	8.43E-05
BENZO(A)ANTHRACENE	1.09E-06	1.26E-10	4.21E-07	5.26E-07	5.47E-10	6.51E-12	4.42E-08	5.52E-08	9.99E-08	7.90E-04	1.27E-04
BENZO(B)FLUORANTHENE	2.25E-05	1.10E-09	4.05E-06	6.75E-06	1.13E-08	5.68E-11	4.25E-07	7.08E-07	1.14E-06	1.40E-04	8.18E-03
BENZO(K)FLUORANTHENE	1.21E-06	5.89E-11	2.17E-07	3.62E-07	6.03E-10	3.05E-12	2.28E-08	3.81E-08	6.15E-08	1.40E-04	4.39E-04
CHRYSENE	1.58E-05	1.62E-09	5.30E-06	6.62E-06	7.88E-09	8.38E-11	5.56E-07	6.95E-07	1.26E-06	1.00E-03	1.26E-03
DIBENZ(A,H)ANTHRACENE	2.86E-07	9.35E-12	2.80E-08	4.99E-08	1.43E-10	4.84E-13	2.94E-09	5.24E-09	8.32E-09	3.90E-04	2.13E-05
INDENO(1,2,3-CD)PYRENE	3.83E-07	9.53E-12	1.63E-08	3.15E-08	1.91E-10	4.93E-13	1.72E-09	3.31E-09	5.22E-09	1.00E-03	5.22E-06
TOTAL PAH	1.64E-06	7.32E-11	2.33E-07	3.81E-07	8.20E-10	3.79E-12	2.45E-08	4.01E-08	6.54E-08	4.00E+01	1.63E-09
Volatiles											
BENZENE	1.84E-08	7.42E-09	2.02E-08	2.02E-08	9.19E-12	3.84E-10	2.13E-09	2.13E-09	4.64E-09	--	NC
BROMOMETHANE	1.67E-09	4.63E-09	8.33E-09	8.33E-09	8.33E-13	2.40E-10	8.75E-10	8.75E-10	1.99E-09	--	NC
1,3-BUTADIENE	8.23E-09	4.07E-09	1.06E-08	1.06E-08	4.11E-12	2.11E-10	1.11E-09	1.11E-09	2.44E-09	--	NC
CARBON TETRACHLORIDE	9.31E-09	1.53E-09	4.59E-08	4.59E-08	4.65E-12	7.93E-11	4.82E-09	4.82E-09	9.73E-09	--	NC
CHLOROFORM	1.08E-08	5.08E-09	1.82E-08	1.82E-08	5.39E-12	2.63E-10	1.92E-09	1.92E-09	4.10E-09	--	NC
CHLOROMETHANE	1.03E-09	4.29E-09	6.90E-09	6.90E-09	5.14E-13	2.22E-10	7.25E-10	7.25E-10	1.67E-09	--	NC
1,1-DICHLOROETHYLENE	4.20E-09	1.61E-09	4.39E-09	4.39E-09	2.10E-12	8.36E-11	4.61E-10	4.61E-10	1.01E-09	1.72E+01	5.86E-11
DICHLOROFLUOROMETHANE	1.42E-08	5.19E-09	1.14E-08	1.14E-08	7.11E-12	2.69E-10	1.20E-09	1.20E-09	2.67E-09	--	NC
TRANS-1,3-DICHLOROPROPEN	1.94E-09	1.79E-09	3.71E-09	3.71E-09	9.68E-13	9.28E-11	3.89E-10	3.89E-10	8.73E-10	--	NC
1,1,2,2-TETRACHLOROETHANE	9.36E-09	2.96E-09	2.95E-08	2.22E-08	4.68E-12	1.53E-10	3.10E-09	2.33E-09	5.59E-09	3.97E+00	1.41E-09
TRICHLOROFLUOROMETHANE	2.65E-08	4.97E-09	1.53E-08	1.53E-08	1.33E-11	2.57E-10	1.61E-09	1.61E-09	3.49E-09	--	NC
VINYL CHLORIDE	2.04E-09	4.59E-09	8.30E-09	8.30E-09	1.02E-12	2.37E-10	8.72E-10	8.72E-10	1.98E-09	--	NC
Dioxins											
2,3,7,8-TCDD TE											
2,3,7,8-TCDD (BIRD)	4.13E-07	1.16E-11	2.27E-07	4.21E-07	2.07E-10	5.98E-13	2.38E-08	4.42E-08	6.83E-08	1.40E-05	4.88E-03

-- TRV not available.
The hazard quotient (HQ) is the TRV divided by the sum of potential daily dose due to all ingested media and prey items.

TABLE E 4-3
POTENTIAL RISKS TO THE GREAT BLUE HERON
PROPORTIONED DIET
WRIGHT-BRADLEY LAKE
NORLITE FACILITY
COHOES, NY

CPEC	Site Concentrations				Potential Daily Dose (mg/kg$_{bw}$-day)					TRV (mg/kg$_{bw}$-day)	HQ
	Sediment (mg/kg$_{dw}$)	Surface Water (mg/L)	Fish TL3 (mg/kg$_{ww}$)	Fish TL4 (mg/kg$_{ww}$)	Sediment	Surface Water	Fish TL3	Fish TL4	Total		
INORGANICS											
ANTIMONY	1.71E-06	5.91E-08	2.36E-06	2.36E-06	7.71E-09	2.68E-09	2.98E-07	1.28E-07	4.36E-07	–	NC
ARSENIC	5.39E-07	1.20E-08	1.37E-06	1.37E-06	2.43E-09	5.43E-10	1.72E-07	7.37E-08	2.49E-07	5.14E+00	4.84E-08
BARIUM	8.63E-07	2.11E-08	1.33E-05	1.33E-05	3.88E-09	9.53E-10	1.68E-06	7.19E-07	2.40E-06	2.08E+01	1.16E-07
BERYLLIUM	2.79E-06	3.56E-09	2.19E-07	2.19E-07	1.26E-08	1.61E-10	2.76E-08	1.18E-08	5.21E-08	–	NC
CADMIUM	1.05E-06	1.40E-08	1.27E-05	1.27E-05	4.72E-09	6.34E-10	1.60E-06	6.85E-07	2.29E-06	1.45E+00	1.58E-06
CHROMIUM	1.12E-04	1.18E-09	1.18E-09	1.18E-09	5.03E-07	5.34E-11	1.49E-10	6.37E-11	5.03E-07	1.00E+00	5.03E-07
CHROMIUM VI	9.04E-08	4.76E-09	9.04E-08	9.04E-08	4.07E-10	2.16E-10	1.14E-08	4.88E-09	1.69E-08	1.00E+00	1.69E-08
LEAD	1.47E-05	1.65E-08	1.47E-09	1.47E-09	6.62E-08	7.47E-10	1.85E-10	7.95E-11	6.72E-08	1.13E+00	5.95E-08
INORGANIC MERCURY	7.93E-04	3.17E-08	1.41E-04	7.05E-04	3.57E-06	1.44E-09	1.78E-05	3.81E-05	5.94E-05	4.50E-01	1.32E-04
METHYL MERCURY	4.15E-05	2.77E-08	3.89E-04	1.95E-03	1.87E-07	1.25E-09	4.90E-05	1.05E-04	1.54E-04	6.40E-03	2.41E-02
NICKEL	1.66E-05	2.56E-07	1.99E-05	1.99E-05	7.47E-08	1.16E-08	2.51E-06	1.08E-06	3.67E-06	7.74E+01	4.74E-08
SELENIUM	1.58E-08	3.15E-09	4.06E-07	4.06E-07	7.09E-11	1.43E-10	5.12E-08	2.19E-08	7.34E-08	5.00E-01	1.47E-07
SILVER	3.46E-07	4.17E-08	3.65E-06	3.65E-06	1.56E-09	1.89E-09	4.60E-07	1.97E-07	6.61E-07	2.29E+00	2.89E-07
THALLIUM	1.48E-06	2.08E-08	2.08E-04	2.08E-04	6.65E-09	9.44E-10	2.62E-05	1.12E-05	3.75E-05	3.50E-01	1.07E-04
ZINC	3.80E-05	6.14E-07	1.26E-03	1.26E-03	1.71E-07	2.78E-08	1.59E-04	6.82E-05	2.28E-04	1.45E+01	1.57E-05
ORGANICS											
Semivolatiles											
HEXACHLOROCYCLOPENTADIE	1.89E-06	5.01E-09	2.30E-06	1.81E-06	8.51E-09	2.27E-10	2.90E-07	9.76E-08	3.96E-07	–	NC
HEXACHLOROBUTADIENE	6.85E-08	2.48E-10	1.38E-07	1.00E-07	3.08E-10	1.13E-11	1.73E-08	5.40E-09	2.31E-08	3.19E+00	7.24E-09
2,4-DINITROTOLUENE	1.78E-06	8.71E-07	1.83E-05	1.83E-05	7.99E-09	3.94E-08	2.31E-06	9.89E-07	3.34E-06	–	NC
2,6-DINITROTOLUENE	3.07E-06	1.82E-06	3.84E-05	3.84E-05	1.38E-08	8.26E-08	4.84E-06	2.07E-06	7.01E-06	–	NC
HEXACHLOROBENZENE	1.01E-05	3.35E-09	5.03E-06	5.67E-06	4.55E-08	1.52E-10	6.34E-07	3.06E-07	9.86E-07	2.25E-01	4.38E-06
2-NITROANILINE	4.96E-07	3.16E-07	7.81E-07	7.81E-07	2.23E-09	1.43E-08	9.84E-08	4.22E-08	1.57E-07	–	NC
PENTACHLOROPHENOL	2.43E-06	1.20E-07	4.71E-05	4.19E-05	1.09E-08	5.44E-09	5.94E-06	2.26E-06	8.22E-06	4.03E+00	2.04E-06
BIS(2-ETHYLHEXYL)PHTHALATE	1.65E-03	4.03E-07	1.09E-04	1.02E-04	7.43E-06	1.82E-08	1.38E-05	5.48E-06	2.67E-05	1.11E+00	2.41E-05
BENZO(A)PYRENE	2.12E-06	9.44E-11	3.01E-07	4.92E-07	9.52E-09	4.28E-12	3.79E-08	2.66E-08	7.40E-08	1.00E-03	7.40E-05
BENZO(A)ANTHRACENE	1.09E-06	1.26E-10	4.21E-07	5.26E-07	4.92E-09	5.69E-12	5.30E-08	2.84E-08	8.63E-08	7.90E-04	1.09E-04
BENZO(B)FLUORANTHENE	2.25E-05	1.10E-09	4.05E-06	6.75E-06	1.01E-07	4.97E-11	5.10E-07	3.64E-07	9.76E-07	1.40E-04	6.97E-03
BENZO(K)FLUORANTHENE	1.21E-06	5.89E-11	2.17E-07	3.62E-07	5.43E-09	2.67E-12	2.74E-08	1.96E-08	5.24E-08	1.40E-04	3.74E-04
CHRYSENE	1.58E-05	1.62E-09	5.30E-06	6.62E-06	7.09E-08	7.33E-11	6.67E-07	3.57E-07	1.10E-06	1.00E-03	1.10E-03
DIBENZ(A,H)ANTHRACENE	2.86E-07	9.35E-12	2.80E-08	4.99E-08	1.29E-09	4.23E-13	3.52E-09	2.70E-09	7.51E-09	3.90E-04	1.92E-05
INDENO(1,2,3-CD)PYRENE	3.83E-07	9.53E-12	1.63E-08	3.15E-08	1.72E-09	4.31E-13	2.06E-09	1.70E-09	5.48E-09	1.00E-03	5.48E-06
TOTAL PAH	1.64E-06	7.32E-11	2.33E-07	3.81E-07	7.38E-09	3.31E-12	2.94E-08	2.06E-08	5.74E-08	4.00E+01	1.43E-09
Volatiles											
BENZENE	1.84E-08	7.42E-09	2.02E-08	2.02E-08	8.27E-11	3.36E-10	2.55E-09	1.09E-09	4.06E-09	–	NC
BROMOMETHANE	1.67E-09	4.63E-09	8.33E-09	8.33E-09	7.50E-12	2.10E-10	1.05E-09	4.50E-10	1.72E-09	–	NC
1,3-BUTADIENE	8.23E-09	4.07E-09	1.06E-08	1.06E-08	3.70E-11	1.84E-10	1.33E-09	5.72E-10	2.13E-09	–	NC
CARBON TETRACHLORIDE	9.31E-09	1.53E-09	4.59E-08	4.59E-08	4.19E-11	6.93E-11	5.79E-09	2.48E-09	8.38E-09	–	NC
CHLOROFORM	1.08E-08	5.08E-09	1.82E-08	1.82E-08	4.85E-11	2.30E-10	2.30E-09	9.85E-10	3.56E-09	–	NC
CHLOROMETHANE	1.03E-09	4.29E-09	6.90E-09	6.90E-09	4.63E-12	1.94E-10	8.69E-10	3.73E-10	1.44E-09	–	NC
1,1-DICHLOROETHYLENE	4.20E-09	1.61E-09	4.39E-09	4.39E-09	1.89E-11	7.31E-11	5.53E-10	2.37E-10	8.82E-10	1.72E+01	5.13E-11
DICHLOROFLUOROMETHANE	1.42E-08	5.19E-09	1.14E-08	1.14E-08	6.40E-11	2.35E-10	1.44E-09	6.17E-10	2.35E-09	–	NC
TRANS-1,3-DICHLOROPROPENE	1.94E-09	1.79E-09	3.71E-09	3.71E-09	8.71E-12	8.12E-11	4.67E-10	2.00E-10	7.58E-10	–	NC
1,1,2,2-TETRACHLOROETHANE	9.36E-09	2.96E-09	2.95E-08	2.22E-08	4.21E-11	1.34E-10	3.72E-09	1.20E-09	5.10E-09	3.97E+00	1.28E-09
TRICHLOROFLUOROMETHANE	2.65E-08	4.97E-09	1.53E-08	1.53E-08	1.19E-10	2.25E-10	1.93E-09	8.29E-10	3.11E-09	–	NC
VINYL CHLORIDE	2.04E-09	4.59E-09	8.30E-09	8.30E-09	9.16E-12	2.08E-10	1.05E-09	4.48E-10	1.71E-09	–	NC
Dioxins											
2,3,7,8-TCDD TE											
2,3,7,8-TCDD (BIRD)	4.13E-07	1.16E-11	2.27E-07	4.21E-07	1.86E-09	5.23E-13	2.86E-08	2.27E-08	5.32E-08	1.40E-05	3.80E-03

– TRV not available.
The hazard quotient (HQ) is the TRV divided by the sum of potential daily dose due to all ingested media and prey items.
NC = Not calculated

TABLE E.5-1
POTENTIAL RISKS TO THE DEER MOUSE
SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT
GREEN ISLAND
NORLITE FACILITY
COHOES, NY

CPEC	Site Concentrations			Potential Daily Dose (mg/kg_{bw}-day)				TRV	HQ
	Surface Soil (mg/kg_{dw})	Surface Water (mg/L)	Terrestrial Plant (mg/kg_{ww})	Surface Soil	Surface Water	Terrestrial Plant	Total	TRV (mg/kg_{bw}-day)	HQ
INORGANICS									
ANTIMONY	7.92E-06	8.57E-07	2.84E-07	1.14E-08	2.91E-07	1.28E-07	4.31E-07	1.48E-01	2.92E-06
ARSENIC	2.40E-06	1.71E-07	1.18E-07	3.46E-09	5.82E-08	5.31E-08	1.15E-07	1.49E-01	7.72E-07
BARIUM	3.88E-06	3.02E-07	2.01E-07	5.59E-09	1.03E-07	9.03E-08	1.99E-07	1.17E+01	1.69E-08
BERYLLIUM	4.57E-06	3.78E-08	1.78E-08	6.58E-09	1.28E-08	8.00E-09	2.74E-08	1.45E+00	1.90E-08
CADMIUM	4.40E-06	1.95E-07	5.00E-07	6.34E-09	6.63E-08	2.25E-07	2.98E-07	2.11E+00	1.41E-07
CHROMIUM	3.23E-05	4.46E-09	1.27E-07	4.66E-08	1.52E-09	5.72E-08	1.05E-07	5.99E+03	1.76E-11
CHROMIUM VI	4.29E-07	6.97E-08	2.14E-08	6.17E-10	2.37E-08	9.65E-09	3.40E-08	7.18E+00	4.73E-09
LEAD	2.22E-05	1.70E-07	1.77E-07	3.20E-08	5.77E-08	7.98E-08	1.69E-07	1.75E+01	9.67E-09
INORGANIC MERCURY	4.77E-04	1.61E-03	1.70E-07	6.87E-07	5.77E-08	8.10E-06	8.85E-06	1.56E+01	5.68E-07
METHYL MERCURY	8.48E-06	2.48E-04	4.54E-07	1.22E-08	1.54E-07	2.03E-06	2.20E-06	7.01E-02	3.14E-05
NICKEL	7.11E-05	3.59E-06	1.51E-06	1.02E-07	1.22E-06	6.81E-07	2.00E-06	8.76E+01	2.29E-08
SELENIUM	7.87E-08	4.67E-08	1.48E-08	1.13E-10	1.59E-08	6.65E-09	2.27E-08	4.38E-01	5.17E-08
SILVER	1.70E-06	6.16E-07	4.08E-07	2.44E-09	2.10E-07	1.84E-07	3.96E-07	3.96E+01	9.98E-09
THALLIUM	6.26E-06	2.91E-07	8.09E-08	9.01E-09	9.90E-08	3.64E-08	1.44E-07	2.87E-02	5.03E-06
ZINC	1.64E-04	8.64E-06	1.25E-05	2.36E-07	2.94E-06	5.64E-06	8.82E-06	3.50E+02	2.52E-08
ORGANICS									
Semivolatiles									
HEXACHLOROCYCLOPENTADIENE	3.70E-08	8.36E-08	2.21E-09	5.33E-11	2.84E-08	9.96E-10	2.95E-08	8.32E+00	3.54E-09
HEXACHLOROBUTADIENE	9.25E-10	4.14E-09	6.89E-11	1.33E-12	1.41E-09	3.10E-11	1.44E-09	4.38E-01	3.28E-09
2,4-DINITROTOLUENE	2.04E-06	3.03E-06	5.84E-06	2.94E-09	1.03E-06	2.63E-06	3.66E-06	3.76E+00	9.73E-07
2,6-DINITROTOLUENE	3.67E-06	6.29E-06	1.18E-05	5.29E-09	2.14E-06	5.32E-06	7.46E-06	2.15E+00	3.47E-06
HEXACHLOROBENZENE	3.44E-06	2.63E-08	9.33E-08	4.95E-09	8.94E-09	4.20E-08	5.59E-08	3.50E+00	1.60E-08
2-NITROANILINE	5.41E-07	8.71E-07	1.83E-06	7.79E-10	2.96E-07	8.25E-07	1.12E-06	–	NC
PENTACHLOROPHENOL	2.41E-06	2.95E-07	3.34E-07	3.47E-09	1.00E-07	1.50E-07	2.54E-07	6.57E-01	3.87E-07
BIS(2-ETHYLHEXYL)PHTHALATE	6.15E-04	5.31E-07	2.31E-05	8.86E-07	1.81E-07	1.04E-05	1.15E-05	2.16E+01	5.31E-07
BENZO(A)PYRENE	5.42E-07	1.38E-10	4.74E-09	7.80E-10	4.71E-11	2.13E-09	2.96E-09	1.18E-01	2.51E-08
BENZO(A)ANTHRACENE	3.20E-07	1.50E-10	4.74E-09	4.61E-10	5.10E-11	2.13E-09	2.65E-09	1.97E-01	1.34E-08
BENZO(B)FLUORANTHENE	5.56E-06	1.21E-09	3.70E-08	8.01E-09	4.12E-10	1.67E-08	2.51E-08	1.18E-01	2.13E-07
BENZO(K)FLUORANTHENE	3.25E-07	1.05E-10	4.30E-09	4.68E-10	3.56E-11	1.93E-09	2.44E-09	1.18E-01	2.07E-08
CHRYSENE	4.56E-06	2.10E-09	4.71E-08	6.56E-09	7.12E-10	2.12E-08	2.85E-08	1.18E-01	2.41E-07
DIBENZ(A,H)ANTHRACENE	9.24E-08	3.34E-11	1.46E-08	1.33E-10	1.14E-11	6.59E-09	6.73E-09	4.38E-03	1.54E-06
INDENO(1,2,3-CD)PYRENE	1.23E-07	3.51E-11	7.28E-08	1.77E-10	1.19E-11	3.27E-08	3.29E-08	1.18E-01	2.79E-07
TOTAL PAH	4.20E-07	1.07E-10	3.68E-09	6.04E-10	3.65E-11	1.65E-09	2.30E-09	1.18E+00	1.95E-09
Volatiles									
BENZENE	2.55E-10	1.11E-07	–	3.68E-13	3.77E-08	NC	3.77E-08	3.11E+01	1.21E-09
BROMOMETHANE	1.76E-11	6.83E-08	–	2.54E-14	2.32E-08	NC	2.32E-08	–	NC
1,3-BUTADIENE	1.27E-11	5.82E-08	–	1.82E-14	1.98E-08	NC	1.98E-08	–	NC
CARBON TETRACHLORIDE	7.16E-11	2.37E-08	–	1.03E-13	8.07E-09	NC	8.07E-09	3.50E+01	2.30E-10
CHLOROFORM	4.57E-10	7.34E-08	–	6.58E-13	2.50E-08	NC	2.50E-08	3.29E+01	7.60E-10
CHLOROMETHANE	1.79E-12	6.23E-08	–	2.57E-15	2.12E-08	NC	2.12E-08	–	NC
1,1-DICHLOROETHYLENE	2.31E-11	2.45E-08	–	3.32E-14	8.31E-09	NC	8.31E-09	6.57E+01	1.27E-10
DICHLOROFLUOROMETHANE	7.03E-13	8.26E-08	–	1.01E-15	2.81E-08	NC	2.81E-08	–	NC
TRANS-1,3-DICHLOROPROPENE	9.39E-11	2.60E-08	–	1.35E-13	8.84E-09	NC	8.84E-09	–	NC
1,1,2,2-TETRACHLOROETHANE	3.44E-09	2.93E-08	–	4.95E-12	9.97E-09	NC	9.97E-09	1.65E+00	6.04E-09
TRICHLOROFLUOROMETHANE	3.87E-11	7.71E-08	–	5.57E-14	2.62E-08	NC	2.62E-08	–	NC
VINYL CHLORIDE	5.80E-13	6.89E-08	–	8.35E-16	2.34E-08	NC	2.34E-08	3.72E-01	6.29E-08
Dioxins									
2,3,7,8-TCDD TE									
2,3,7,8-TCDD (MAMMAL)	1.87E-08	3.92E-12	1.61E-10	2.70E-11	1.33E-12	7.23E-11	1.01E-10	2.19E-06	4.59E-05

– TRV not available.
The hazard quotient (HQ) is the TRV divided by the sum of potential daily dose due to all ingested media and prey items.
NC = Not calculated

TABLE E.5-2
POTENTIAL RISKS TO THE MUSKRAT
SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT
GREEN ISLAND
NORLITE FACILITY
COHOES, NY

CPEC	Hydric Soil (mg/kg$_{dw}$)	Surface Water (mg/L)	Wetland Plant (mg/kg$_{ww}$)	Potential Daily Dose (mg/kg$_{bw}$-day) Hydric Soil	Surface Water	Wetland Plant	Total	TRV (mg/kg$_{bw}$-day)	HQ
INORGANICS									
ANTIMONY	3.08E-05	8.57E-07	8.57E-07	1.97E-08	8.60E-08	2.91E-07	3.97E-07	5.38E-02	7.39E-06
ARSENIC	9.15E-06	1.71E-07	1.71E-07	5.86E-09	1.72E-08	5.82E-08	8.12E-08	5.42E-02	1.50E-06
BARIUM	1.49E-05	3.02E-07	3.02E-07	9.51E-09	3.03E-08	1.03E-07	1.42E-07	4.25E+00	3.35E-08
BERYLLIUM	1.47E-05	3.78E-08	3.78E-08	9.39E-09	3.79E-09	1.28E-08	2.60E-08	5.28E-01	4.93E-08
CADMIUM	1.62E-05	1.95E-07	1.95E-07	1.03E-08	1.96E-08	6.63E-08	9.62E-08	7.70E-01	1.25E-07
CHROMIUM	1.02E-04	4.46E-09	4.46E-09	6.52E-08	4.48E-10	1.52E-09	6.71E-08	2.19E+03	3.07E-11
CHROMIUM VI	1.69E-06	6.97E-08	6.97E-08	1.08E-09	6.99E-09	2.37E-08	3.18E-08	2.62E+00	1.21E-08
LEAD	7.12E-05	1.70E-07	1.70E-07	4.55E-08	1.70E-08	5.77E-08	1.20E-07	6.40E+00	1.88E-08
INORGANIC MERCURY	1.61E-03	1.70E-07	1.70E-07	1.03E-06	1.70E-08	5.77E-08	1.11E-06	5.68E+00	1.95E-07
METHYL MERCURY	2.48E-04	4.54E-07	4.54E-07	1.59E-07	4.55E-08	1.54E-07	3.59E-07	2.56E-02	1.40E-05
NICKEL	2.64E-04	3.59E-06	3.59E-06	1.69E-07	3.60E-07	1.22E-06	1.75E-06	3.20E+01	5.47E-08
SELENIUM	3.16E-07	4.67E-08	4.67E-08	2.02E-10	4.69E-09	1.59E-08	2.08E-08	1.60E-01	1.30E-07
SILVER	6.79E-06	6.16E-07	6.16E-07	4.34E-09	6.18E-08	2.10E-07	2.76E-07	1.45E+01	1.90E-08
THALLIUM	2.31E-05	2.91E-07	2.91E-07	1.48E-08	2.92E-08	9.90E-08	1.43E-07	1.05E-02	1.36E-05
ZINC	6.11E-04	8.64E-06	8.64E-06	3.91E-07	8.68E-07	2.94E-06	4.20E-06	1.28E+02	3.28E-08
ORGANICS									
Semivolatiles									
HEXACHLOROCYCLOPENTADIENE	1.03E-06	8.36E-08	8.36E-08	6.62E-10	8.39E-09	2.84E-08	3.75E-08	3.04E+00	1.23E-08
HEXACHLOROBUTADIENE	6.58E-06	4.14E-09	4.14E-09	4.21E-09	4.15E-10	1.41E-09	6.03E-09	1.60E-01	3.77E-08
2,4-DINITROTOLUENE	7.03E-06	3.03E-06	3.03E-06	4.50E-09	3.04E-07	1.03E-06	1.34E-06	1.37E+00	9.81E-07
2,6-DINITROTOLUENE	3.42E-12	6.29E-06	6.29E-06	2.19E-15	6.31E-07	2.14E-06	2.77E-06	7.80E-01	3.55E-06
HEXACHLOROBENZENE	4.89E-10	2.63E-08	2.63E-08	3.13E-13	2.64E-09	8.94E-09	1.16E-08	1.28E+00	9.05E-09
2-NITROANILINE	3.91E-06	8.71E-07	8.71E-07	2.50E-09	8.74E-08	2.96E-07	3.86E-07	–	NC
PENTACHLOROPHENOL	4.42E-11	2.95E-07	2.95E-07	2.83E-14	2.96E-08	1.00E-07	1.30E-07	2.40E-01	5.41E-07
BIS(2-ETHYLHEXYL)PHTHALATE	1.77E-09	5.31E-07	5.31E-07	1.13E-12	5.33E-08	1.81E-07	2.34E-07	7.87E+00	2.97E-08
BENZO(A)PYRENE	9.32E-07	1.38E-10	1.38E-10	5.97E-10	1.39E-11	4.71E-11	6.58E-10	4.30E-02	1.53E-08
BENZO(A)ANTHRACENE	5.38E-07	1.50E-10	1.50E-10	3.45E-10	1.51E-11	5.10E-11	4.11E-10	7.18E-02	5.72E-09
BENZO(B)FLUORANTHENE	8.94E-06	1.21E-09	1.21E-09	5.72E-09	1.22E-10	4.12E-10	6.25E-09	4.30E-02	1.45E-07
BENZO(K)FLUORANTHENE	6.14E-07	1.05E-10	1.05E-10	3.93E-10	1.05E-11	3.56E-11	4.39E-10	4.30E-02	1.02E-08
CHRYSENE	7.21E-06	2.10E-09	2.10E-09	4.61E-09	2.10E-10	7.12E-10	5.54E-09	4.30E-02	1.29E-07
DIBENZ(A,H)ANTHRACENE	2.56E-07	3.34E-11	3.34E-11	1.64E-10	3.35E-12	1.14E-11	1.78E-10	1.60E-03	1.12E-07
INDENO(1,2,3-CD)PYRENE	3.50E-07	3.51E-11	3.51E-11	2.24E-10	3.52E-12	1.19E-11	2.39E-10	4.30E-02	5.57E-09
TOTAL PAH	1.13E-03	1.07E-10	1.07E-10	7.21E-07	1.08E-11	3.65E-11	7.21E-07	4.30E-01	1.68E-06
Volatiles									
BENZENE	3.38E-11	1.11E-07	1.11E-07	2.16E-14	1.11E-08	3.77E-08	4.88E-08	1.13E+01	4.30E-09
BROMOMETHANE	1.37E-10	6.83E-08	6.83E-08	8.77E-14	6.85E-09	2.32E-08	3.01E-08	–	NC
1,3-BUTADIENE	7.23E-07	5.82E-08	5.82E-08	4.63E-10	5.84E-09	1.98E-08	2.61E-08	–	NC
CARBON TETRACHLORIDE	1.34E-12	2.37E-08	2.37E-08	8.61E-16	2.38E-09	8.07E-09	1.04E-08	1.28E+01	8.16E-10
CHLOROFORM	2.42E-11	7.34E-08	7.34E-08	1.55E-14	7.37E-09	2.50E-08	3.23E-08	1.20E+01	2.69E-09
CHLOROMETHANE	4.61E-06	6.23E-08	6.23E-08	2.95E-09	6.25E-09	2.12E-08	3.04E-08	–	NC
1,1-DICHLOROETHYLENE	6.58E-09	2.45E-08	2.45E-08	4.21E-12	2.45E-09	8.31E-09	1.08E-08	2.40E+01	4.49E-10
DICHLOROFLUOROMETHANE	1.80E-10	8.26E-08	8.26E-08	1.15E-13	8.28E-09	2.81E-08	3.64E-08	–	NC
TRANS-1,3-DICHLOROPROPENE	7.40E-11	2.60E-08	2.60E-08	4.73E-14	2.61E-09	8.84E-09	1.14E-08	–	NC
1,1,2,2-TETRACHLOROETHANE	8.75E-10	2.93E-08	2.93E-08	5.60E-13	2.94E-09	9.97E-09	1.29E-08	6.02E-01	2.14E-08
TRICHLOROFLUOROMETHANE	1.11E-12	7.71E-08	7.71E-08	7.10E-16	7.74E-09	2.62E-08	3.40E-08	–	NC
VINYL CHLORIDE	7.08E-08	6.89E-08	6.89E-08	4.53E-11	6.91E-09	2.34E-08	3.04E-08	1.36E-01	2.23E-07
Dioxins									
2,3,7,8-TCDD TE									
2,3,7,8-TCDD (MAMMAL)	3.92E-08	3.92E-12	3.92E-12	2.51E-11	3.93E-13	1.33E-12	2.68E-11	8.00E-07	3.35E-05

– TRV not available.
The hazard quotient (HQ) is the TRV divided by the sum of potential daily dose due to all ingested media and prey items.
NC = Not calculated

TABLE E.5-3
POTENTIAL RISKS TO THE AMERICAN ROBIN
SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT
GREEN ISLAND
NORLITE FACILITY
COHOES, NY

CPEC	Site Concentrations				Potential Daily Dose (mg/kg$_{bw}$-day)					TRV	HQ
	Surface Soil (mg/kg$_{dw}$)	Surface Water (mg/L)	Terrestrial Invertebrate (mg/kg$_{ww}$)	Terrestrial Plant (mg/kg$_{ww}$)	Surface Soil	Surface Water	Terrestrial Invertebrates	Terrestrial Plant	Total	(mg/kg$_{bw}$-day)	
INORGANICS											
ANTIMONY	7.92E-06	8.57E-07	1.74E-06	2.84E-07	1.13E-07	1.18E-07	1.32E-06	2.16E-07	1.77E-06	--	NC
ARSENIC	2.40E-06	1.71E-07	2.64E-07	1.18E-07	3.44E-08	2.35E-08	2.01E-07	8.96E-08	3.49E-07	5.14E+00	6.78E-08
BARIUM	3.88E-06	3.02E-07	8.54E-07	2.01E-07	5.55E-08	4.15E-08	6.49E-07	1.52E-07	8.99E-07	2.08E+01	4.32E-08
BERYLLIUM	4.57E-06	3.78E-08	1.00E-06	1.78E-08	6.53E-08	5.19E-09	7.64E-07	1.35E-08	8.48E-07	--	NC
CADMIUM	4.40E-06	1.95E-07	4.23E-06	5.00E-07	6.29E-08	2.68E-08	3.21E-06	3.80E-07	3.68E-06	1.45E+00	2.54E-06
CHROMIUM	3.23E-05	4.46E-09	3.23E-07	1.27E-07	4.62E-07	6.13E-10	2.46E-07	9.66E-08	8.05E-07	1.00E+00	8.05E-07
CHROMIUM VI	4.29E-07	6.97E-08	4.29E-09	2.14E-08	6.13E-09	9.57E-09	3.26E-09	1.63E-08	3.53E-08	1.00E+00	3.53E-08
LEAD	2.22E-05	1.70E-07	6.66E-07	1.77E-07	3.17E-07	2.33E-08	5.06E-07	1.35E-07	9.82E-07	1.13E+00	8.69E-07
INORGANIC MERCURY	4.77E-04	1.70E-07	1.91E-05	1.80E-05	6.82E-06	2.33E-08	1.45E-05	1.37E-05	3.50E-05	4.50E-01	7.78E-05
METHYL MERCURY	8.48E-06	4.54E-07	7.21E-05	4.52E-06	1.21E-07	6.23E-08	5.48E-05	3.43E-06	5.84E-05	6.40E-03	9.13E-03
NICKEL	7.11E-05	3.59E-06	1.42E-06	1.51E-06	1.02E-06	4.93E-07	1.08E-06	1.15E-06	3.74E-06	7.74E+01	4.83E-08
SELENIUM	7.87E-08	4.67E-08	1.73E-08	1.48E-08	1.13E-09	6.42E-09	1.32E-08	1.12E-08	3.19E-08	5.00E-01	6.39E-08
SILVER	1.70E-06	6.16E-07	3.73E-07	4.08E-07	2.43E-08	8.46E-08	2.84E-07	3.10E-07	7.03E-07	2.29E+00	3.07E-07
THALLIUM	6.26E-06	2.91E-07	1.38E-06	8.09E-08	8.95E-08	4.00E-08	1.05E-06	6.15E-08	1.24E-06	3.50E-01	3.53E-06
ZINC	1.64E-04	8.64E-06	9.18E-05	1.25E-05	2.34E-06	1.19E-06	6.98E-05	9.53E-06	8.28E-05	1.45E+01	5.71E-06
ORGANICS											
Semivolatiles											
HEXACHLOROCYCLOPENTADIENE	3.70E-08	8.36E-08	2.76E-05	2.21E-09	5.29E-10	1.15E-08	2.10E-05	1.68E-09	2.10E-05	--	NC
HEXACHLOROBUTADIENE	9.25E-10	4.14E-09	4.95E-07	6.89E-11	1.32E-11	5.68E-10	3.76E-07	5.23E-11	3.77E-07	3.19E+00	1.18E-07
2,4-DINITROTOLUENE	2.04E-06	3.03E-06	6.29E-06	5.84E-06	2.92E-08	4.16E-07	4.78E-06	4.43E-06	9.66E-06	--	NC
2,6-DINITROTOLUENE	3.67E-06	6.29E-06	9.20E-06	1.18E-05	5.25E-08	8.64E-07	6.99E-06	8.98E-06	1.69E-05	--	NC
HEXACHLOROBENZENE	3.44E-06	2.63E-08	7.88E-03	9.33E-08	4.92E-08	3.61E-09	5.99E-03	7.09E-08	5.99E-03	2.25E-01	2.66[illegible]
2-NITROANILINE	5.41E-07	8.71E-07	1.27E-06	1.83E-06	7.73E-09	1.20E-07	9.62E-07	1.39E-06	2.48E-06	--	N[illegible]
PENTACHLOROPHENOL	2.41E-06	2.95E-07	2.49E-03	3.34E-07	3.44E-08	4.05E-08	1.89E-03	2.54E-07	1.89E-03	4.03E+00	4.[illegible]
BIS(2-ETHYLHEXYL)PHTHALATE	6.15E-04	5.31E-07	8.03E-01	2.31E-05	8.79E-06	7.29E-08	6.11E-01	1.76E-05	6.11E-01	1.11E+00	5.[illegible]
BENZO(A)PYRENE	5.42E-07	1.38E-10	3.79E-08	4.74E-09	7.74E-09	1.90E-11	2.88E-08	3.60E-09	4.02E-08	1.00E-03	4.02E-[illegible]
BENZO(A)ANTHRACENE	3.20E-07	1.50E-10	9.61E-09	4.74E-09	4.58E-09	2.06E-11	7.30E-09	3.60E-09	1.55E-08	7.90E-04	1.96E-05
BENZO(B)FLUORANTHENE	5.56E-06	1.21E-09	3.89E-07	3.70E-08	7.96E-08	1.66E-10	2.96E-07	2.81E-08	4.04E-07	1.40E-04	2.88E-03
BENZO(K)FLUORANTHENE	3.25E-07	1.05E-10	2.60E-08	4.30E-09	4.65E-09	1.44E-11	1.98E-08	3.26E-09	2.77E-08	1.40E-04	1.98E-04
CHRYSENE	4.56E-06	2.10E-09	1.82E-07	4.71E-08	6.52E-08	2.88E-10	1.39E-07	3.58E-08	2.40E-07	1.00E-03	2.40E-04
DIBENZ(A,H)ANTHRACENE	9.24E-08	3.34E-11	6.47E-09	1.46E-08	1.32E-09	4.58E-12	4.91E-09	1.11E-08	1.74E-08	3.90E-04	4.45E-05
INDENO(1,2,3-CD)PYRENE	1.23E-07	3.51E-11	9.84E-09	7.28E-08	1.76E-09	4.82E-12	7.48E-09	5.53E-08	6.45E-08	1.00E-03	6.45E-05
TOTAL PAH	4.20E-07	1.07E-10	3.15E-08	3.68E-09	6.00E-09	1.47E-11	2.39E-08	2.79E-09	3.27E-08	4.00E+01	8.18E-10
Volatiles											
BENZENE	2.55E-10	1.11E-07	1.03E-09	--	3.65E-12	1.52E-08	7.80E-10	NC	1.60E-08	--	NC
BROMOMETHANE	1.76E-11	6.83E-08	1.03E-11	--	2.52E-13	9.37E-09	7.83E-12	NC	9.38E-09	--	NC
1,3-BUTADIENE	1.27E-11	5.82E-08	3.86E-11	--	1.81E-13	8.00E-09	2.93E-11	NC	8.03E-09	--	NC
CARBON TETRACHLORIDE	7.16E-11	2.37E-08	8.59E-10	--	1.02E-12	3.26E-09	6.53E-10	NC	3.91E-09	--	NC
CHLOROFORM	4.57E-10	7.34E-08	1.29E-09	--	6.54E-12	1.01E-08	9.80E-10	NC	1.11E-08	--	NC
CHLOROMETHANE	1.79E-12	6.23E-08	7.01E-13	--	2.56E-14	8.55E-09	5.33E-13	NC	8.55E-09	--	NC
1,1-DICHLOROETHYLENE	2.31E-11	2.45E-08	9.00E-11	--	3.30E-13	3.36E-09	6.84E-11	NC	3.43E-09	1.72E+01	1.99E-10
DICHLOROFLUOROMETHANE	7.03E-13	8.26E-08	9.34E-13	--	1.00E-14	1.13E-08	7.10E-13	NC	1.13E-08	--	NC
TRANS-1,3-DICHLOROPROPENE	9.39E-11	2.60E-08	9.58E-11	--	1.34E-12	3.57E-09	7.28E-11	NC	3.64E-09	--	NC
1,1,2,2-TETRACHLOROETHANE	3.44E-09	2.93E-08	1.56E-06	--	4.92E-11	4.03E-09	1.19E-06	NC	1.19E-06	3.97E+00	3.00E-07
TRICHLOROFLUOROMETHANE	3.87E-11	7.71E-08	3.27E-10	--	5.53E-13	1.06E-08	2.48E-10	NC	1.08E-08	--	NC
VINYL CHLORIDE	5.80E-13	6.89E-08	3.59E-13	--	8.29E-15	9.46E-09	2.73E-13	NC	9.46E-09	--	NC
Dioxins											
2,3,7,8-TCDD TE											
2,3,7,8-TCDD (BIRD)	9.57E-08	1.71E-11	1.52E-07	8.31E-10	1.37E-09	2.35E-12	1.16E-07	6.31E-10	1.18E-07	1.40E-05	8.40E-03

-- TRV not available.

The hazard quotient (HQ) is the TRV divided by the sum of potential daily dose due to all ingested media and prey items.

NC = Not calculated

TABLE E.5-4
POTENTIAL RISKS TO THE SHORT-TAIL SHREW
SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT
GREEN ISLAND
NORLITE FACILITY
COHOES, NY

CPEC	Site Concentrations							Potential Daily Dose (mg/kg$_{bw}$-day)								TRV (mg/kg$_{bw}$-day)	HQ
	Surface Soil (mg/kg$_{dw}$)	Hydric Soil (mg/kg$_{dw}$)	Surface Water (mg/L)	Wetland Invertebrate (mg/kg$_{ww}$)	Wetland Plant (mg/kg$_{ww}$)	Terrestrial Invertebrate (mg/kg$_{ww}$)	Terrestrial Plant (mg/kg$_{ww}$)	Surface Soil	Hydric Soil	Surface Water	Wetland Invertebrates	Wetland Plant	Terrestrial Invertebrates	Terrestrial Plant	Total		
INORGANICS																	
ANTIMONY	7.92E-06	3.08E-05	8.57E-07	6.78E-06	7.39E-07	1.74E-06	2.84E-07	5.39E-08	2.09E-07	1.91E-07	1.69E-06	2.29E-08	4.86E-07	8.82E-09	2.86E-06	1.49E-01	1.92E-05
ARSENIC	2.40E-06	9.15E-06	1.71E-07	1.01E-06	3.95E-08	2.64E-07	1.18E-07	1.63E-08	6.22E-08	3.82E-08	2.81E-07	1.23E-09	7.38E-08	3.66E-09	4.76E-07	1.50E-01	3.18E-06
BARIUM	3.88E-06	1.49E-05	3.02E-07	3.27E-06	2.67E-07	8.54E-07	2.01E-07	2.64E-08	1.01E-07	6.73E-08	9.12E-07	8.29E-09	2.38E-07	6.22E-09	1.36E-06	1.18E+01	1.15E-07
BERYLLIUM	4.57E-06	1.47E-05	3.78E-08	3.23E-06	1.76E-08	1.00E-06	1.78E-08	3.11E-08	9.98E-08	8.43E-09	9.01E-07	5.46E-10	2.80E-07	5.51E-10	1.32E-06	1.45E+00	9.10E-07
CADMIUM	4.40E-06	1.62E-05	1.95E-07	1.55E-05	7.06E-07	4.23E-06	5.00E-07	2.99E-08	1.10E-07	4.35E-08	4.33E-06	2.19E-08	1.18E-06	1.55E-08	5.73E-06	2.12E+00	2.70E-06
CHROMIUM	3.23E-05	1.02E-04	4.46E-09	1.02E-06	9.16E-08	3.23E-07	1.27E-07	2.20E-07	6.92E-07	9.96E-10	2.84E-07	2.84E-09	9.02E-08	3.94E-09	1.29E-06	6.02E+03	2.15E-10
CHROMIUM VI	4.29E-07	1.69E-06	6.97E-08	1.69E-08	1.52E-09	4.29E-09	2.14E-08	2.91E-09	1.15E-08	1.55E-08	4.71E-09	4.71E-11	1.20E-09	6.65E-10	3.66E-08	7.22E+00	5.07E-09
LEAD	2.22E-05	7.12E-05	1.70E-07	2.13E-06	3.84E-07	6.66E-07	1.77E-07	1.51E-07	4.84E-07	3.79E-08	5.96E-07	1.19E-08	1.86E-07	5.50E-09	1.47E-06	1.76E+01	8.36E-08
INORGANIC MERCURY	4.77E-04	1.61E-03	1.70E-07	6.46E-05	7.26E-06	1.91E-05	1.80E-05	3.24E-06	1.10E-05	3.76E-08	1.80E-05	2.25E-07	5.32E-06	5.58E-07	3.84E-05	1.57E+01	2.44E-06
METHYL MERCURY	8.48E-06	2.48E-04	4.54E-07	2.11E-03	4.08E-06	7.21E-05	4.52E-06	5.77E-08	1.69E-06	1.01E-07	5.88E-04	1.26E-07	2.01E-05	1.40E-07	6.11E-04	7.04E-02	8.67E-03
NICKEL	7.11E-05	2.64E-04	3.59E-06	5.28E-06	1.01E-06	1.42E-06	1.51E-06	4.83E-07	1.80E-06	8.00E-07	1.47E-06	3.14E-08	3.97E-07	4.69E-08	5.03E-06	8.80E+01	5.71E-08
SELENIUM	7.87E-08	3.16E-07	4.67E-08	6.96E-08	6.07E-10	1.73E-08	1.48E-08	5.35E-10	2.15E-09	1.04E-08	1.94E-08	1.88E-11	4.83E-09	4.58E-10	3.78E-08	4.40E-01	8.60E-08
SILVER	1.70E-06	6.79E-06	6.16E-07	1.49E-06	3.26E-07	3.73E-07	4.08E-07	1.15E-08	4.61E-08	1.37E-07	4.17E-07	1.01E-08	1.04E-07	1.26E-08	7.38E-07	3.98E+01	1.85E-08
THALLIUM	6.26E-06	2.31E-05	2.91E-07	5.08E-06	1.11E-08	1.38E-06	8.09E-08	4.25E-08	1.57E-07	6.50E-08	1.42E-06	3.43E-10	3.84E-07	2.51E-09	2.07E-06	2.88E-02	7.18E-05
ZINC	1.64E-04	6.11E-04	8.64E-06	3.42E-04	8.80E-17	9.18E-05	1.25E-05	1.11E-06	4.15E-06	1.93E-06	9.54E-05	2.73E-18	2.56E-05	3.89E-07	1.29E-04	3.52E+02	3.65E-07
ORGANICS																	
Semivolatiles																	
HEXACHLOROCYCLOPENTADIENE	3.70E-08	1.03E-06	8.36E-08	7.71E-04	8.36E-08	2.76E-05	2.21E-09	2.52E-10	7.04E-09	1.87E-08	2.15E-04	2.59E-09	7.69E-06	6.66E-11	2.23E-04	8.36E+00	2.67E-05
HEXACHLOROBUTADIENE	9.25E-10	6.58E-06	4.14E-09	3.52E-03	4.14E-09	4.95E-07	6.89E-11	6.29E-12	4.47E-08	9.22E-10	9.83E-04	1.28E-10	1.38E-07	2.14E-12	9.83E-04	4.40E-01	2.23E-03
2,4-DINITROTOLUENE	2.04E-06	7.03E-06	3.03E-06	2.17E-05	3.03E-06	6.29E-06	5.84E-06	1.39E-08	4.78E-08	6.76E-07	6.04E-06	9.39E-08	1.75E-06	1.81E-07	8.81E-06	3.77E+00	2.34E-06
2,6-DINITROTOLUENE	3.67E-06	3.42E-12	6.29E-06	8.57E-12	6.29E-06	9.20E-06	1.18E-05	2.50E-08	2.33E-14	1.40E-06	2.39E-12	1.95E-07	2.57E-06	3.66E-07	4.56E-06	2.16E+00	2.11E-06
HEXACHLOROBENZENE	3.44E-06	4.89E-10	2.63E-08	1.12E-06	2.63E-08	7.88E-03	9.33E-08	2.34E-08	3.32E-12	5.87E-09	3.13E-07	8.16E-10	2.20E-03	2.89E-09	2.20E-03	3.52E+00	6.25E-04
2-NITROANILINE	5.41E-07	3.91E-06	8.71E-07	9.14E-06	8.71E-07	1.27E-06	1.83E-06	3.68E-09	2.66E-08	1.94E-07	2.55E-06	2.70E-08	3.53E-07	5.69E-08	3.21E-06	--	NC
PENTACHLOROPHENOL	2.41E-06	4.42E-11	2.95E-07	4.57E-08	2.95E-07	2.49E-03	3.34E-07	1.64E-08	3.00E-13	6.58E-08	1.27E-08	9.14E-09	6.95E-04	1.04E-08	6.95E-04	6.60E-01	1.05E-03
BIS(2-ETHYLHEXYL)PHTHALATE	6.15E-04	1.77E-09	5.31E-07	2.31E-06	5.31E-07	8.03E-01	2.31E-05	4.18E-06	1.20E-11	1.18E-07	6.45E-07	1.65E-08	2.24E-01	7.17E-07	2.24E-01	2.18E+01	1.03E-02
BENZO(A)PYRENE	5.42E-07	9.32E-07	1.38E-10	6.53E-08	1.38E-10	3.79E-08	4.74E-09	3.68E-09	6.34E-09	3.09E-11	1.82E-08	4.29E-12	1.06E-08	1.47E-10	3.90E-08	1.19E-01	3.28E-07
BENZO(A)ANTHRACENE	3.20E-07	5.38E-07	1.50E-10	1.62E-08	1.50E-10	9.61E-09	4.74E-09	2.18E-09	3.66E-09	3.35E-11	4.51E-09	4.65E-12	2.68E-09	1.47E-10	1.32E-08	1.99E-01	6.65E-08
BENZO(B)FLUORANTHENE	5.56E-06	8.94E-06	1.21E-09	6.26E-07	1.21E-09	3.69E-07	3.70E-08	3.78E-08	6.08E-08	2.70E-10	1.75E-07	3.76E-11	1.09E-07	1.16E-09	3.83E-07	1.19E-01	3.22E-06
BENZO(K)FLUORANTHENE	3.25E-07	6.14E-07	1.05E-10	4.91E-08	1.05E-10	2.60E-08	4.30E-09	2.21E-09	4.18E-09	2.33E-11	1.37E-08	3.24E-12	7.26E-09	1.33E-10	2.75E-08	1.19E-01	2.31E-07
CHRYSENE	4.56E-06	7.21E-06	2.10E-09	2.88E-07	2.10E-09	1.82E-07	4.71E-08	3.10E-08	4.90E-08	4.67E-10	8.05E-08	6.50E-11	5.09E-08	1.46E-09	2.13E-07	1.19E-01	1.79E-06
DIBENZ(A,H)ANTHRACENE	9.24E-08	2.56E-07	3.34E-11	1.79E-08	3.34E-11	6.47E-09	1.46E-08	6.28E-10	1.74E-09	7.44E-12	5.00E-09	1.03E-12	1.80E-09	4.54E-10	9.63E-09	4.40E-03	2.19E-06
INDENO(1,2,3-CD)PYRENE	1.23E-07	3.50E-07	3.51E-11	2.80E-08	3.51E-11	9.84E-09	7.26E-08	8.36E-10	2.38E-09	7.83E-12	7.81E-09	1.09E-12	2.75E-09	2.26E-09	1.60E-08	1.19E-01	1.35E-07
TOTAL PAH	4.20E-07	1.13E-03	1.07E-10	8.45E-05	1.07E-10	3.15E-08	3.68E-09	2.85E-09	7.66E-06	2.39E-11	2.36E-05	3.33E-12	8.76E-09	1.14E-10	3.13E-05	1.19E+00	2.63E-05
Volatiles																	
BENZENE	2.55E-10	3.38E-11	1.11E-07	1.36E-10	1.11E-07	1.03E-09	--	1.74E-12	2.30E-13	2.47E-08	3.79E-11	3.43E-09	2.87E-10	NC	2.85E-08	3.14E+01	9.07E-10
BROMOMETHANE	1.76E-11	1.37E-10	6.83E-08	8.00E-11	6.83E-08	1.03E-11	--	1.20E-13	9.32E-13	1.52E-08	2.23E-11	2.12E-09	2.87E-12	NC	1.74E-08	--	NC
1,3-BUTADIENE	1.27E-11	7.23E-07	5.82E-08	2.20E-06	5.82E-08	3.86E-11	--	8.61E-14	4.91E-09	1.30E-08	6.14E-07	1.81E-09	1.08E-11	NC	6.34E-07	--	NC
CARBON TETRACHLORIDE	7.16E-11	1.34E-12	2.37E-08	1.61E-11	2.37E-08	8.59E-10	--	4.87E-13	9.14E-15	5.29E-09	4.50E-12	7.36E-10	2.40E-10	NC	6.27E-09	3.52E+01	1.78E-10
CHLOROFORM	4.57E-10	2.42E-11	7.34E-08	6.84E-11	7.34E-08	1.29E-09	--	3.11E-12	1.65E-13	1.64E-08	1.91E-11	2.28E-09	3.60E-10	NC	1.90E-08	3.30E+01	5.77E-10
CHLOROMETHANE	1.79E-12	4.61E-06	6.23E-08	1.81E-06	6.23E-08	7.01E-13	--	1.22E-14	3.13E-08	1.39E-08	5.04E-07	1.93E-09	1.96E-13	NC	5.52E-07	--	NC
1,1-DICHLOROETHYLENE	2.31E-11	6.58E-09	2.45E-08	2.57E-08	2.45E-08	9.00E-11	--	1.57E-13	4.48E-11	5.45E-09	7.16E-09	7.58E-10	2.51E-11	NC	1.34E-08	6.60E+01	2.04E-10
DICHLOROFLUOROMETHANE	7.03E-13	1.80E-10	8.26E-08	2.39E-10	8.26E-08	9.34E-13	--	4.78E-15	1.22E-12	1.84E-08	6.66E-11	2.56E-09	2.60E-13	NC	2.10E-08	--	NC
TRANS-1,3-DICHLOROPROPENE	9.39E-11	7.40E-11	2.60E-08	7.55E-11	2.60E-08	9.58E-11	--	6.39E-13	5.03E-13	5.80E-09	2.11E-11	8.06E-10	2.67E-11	NC	6.65E-09	--	NC
1,1,2,2-TETRACHLOROETHANE	3.44E-09	8.75E-10	2.93E-08	3.97E-07	2.93E-08	1.56E-06	--	2.34E-11	5.95E-12	6.54E-09	1.11E-07	9.09E-10	4.35E-07	NC	5.53E-07	1.67E+00	3.32E-07
TRICHLOROFLUOROMETHANE	3.87E-11	1.11E-12	7.71E-08	9.37E-12	7.71E-08	3.27E-10	--	2.63E-13	7.54E-15	1.72E-08	2.62E-12	2.39E-09	9.11E-11	NC	1.97E-08	--	NC
VINYL CHLORIDE	5.80E-13	7.08E-08	6.89E-08	4.39E-08	6.89E-08	3.59E-13	--	3.94E-15	4.82E-10	1.54E-08	1.23E-08	2.14E-09	1.00E-13	NC	3.02E-08	3.74E-01	8.08E-08
Dioxins																	
2,3,7,8-TCDD TE																	
2,3,7,8-TCDD (MAMMAL)	1.87E-08	3.92E-08	3.92E-12	6.23E-08	3.92E-12	2.98E-08	1.61E-10	1.27E-10	2.67E-10	8.74E-13	1.74E-08	1.21E-13	8.31E-09	4.98E-12	2.61E-08	2.20E-06	1.19E-02

-- TRV not available.
The hazard quotient (HQ) is the TRV divided by the sum of potential daily dose due to all ingested media and prey items.
NC = Not calculated

TABLE E.5-5
POTENTIAL RISKS TO THE RACCOON
SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT
GREEN ISLAND
NORLITE FACILITY
COHOES, NY

CPEC	Site Concentrations									Potential Daily Dose (mg/kg$_{bw}$-day)										TRV	HQ
	Surface Soil (mg/kg$_{dw}$)	Hydric Soil (mg/kg$_{dw}$)	Surface Water (mg/L)	Aquatic Invertebrate (mg/kg$_{ww}$)	Wetland Plant (mg/kg$_{ww}$)	Terrestrial Invertebrate (mg/kg$_{ww}$)	Herbivorous Mammal (mg/kg$_{ww}$)	Omnivorous Mammal (mg/kg$_{ww}$)	Terrestrial Plant (mg/kg$_{ww}$)	Surface Soil	Hydric Soil	Surface Water	Aquatic Invertebrates	Wetland Plant	Terrestrial Invertebrates	Herbivorous Mammal	Omnivorous Mammal	Terrestrial Plant	Total	(mg/kg$_{bw}$-day)	
INORGANICS																					
ANTIMONY	7.92E-06	3.08E-05	8.57E-07	6.78E-06	7.39E-07	1.74E-06	3.34E-10	2.13E-06	2.64E-07	1.06E-07	4.11E-07	8.37E-08	3.03E-07	5.29E-08	1.17E-07	5.61E-12	3.57E-08	1.33E-08	1.12E-06	4.86E-02	2.30E-05
ARSENIC	2.40E-06	9.15E-06	1.71E-07	1.01E-06	3.95E-08	2.64E-07	1.11E-10	3.18E-07	1.16E-07	3.21E-08	1.22E-07	1.67E-08	4.51E-08	2.83E-09	1.78E-08	1.86E-12	5.34E-09	5.51E-09	2.47E-07	4.91E-02	5.03E-06
BARIUM	3.88E-06	1.49E-05	3.02E-07	3.27E-06	2.67E-07	8.54E-07	2.31E-11	1.03E-06	2.01E-07	5.18E-08	1.98E-07	2.95E-08	1.46E-07	1.91E-08	5.73E-08	3.87E-13	1.73E-08	9.37E-09	5.29E-07	3.85E+00	1.38E-07
BERYLLIUM	4.57E-06	1.47E-05	3.78E-08	3.23E-06	1.76E-08	1.00E-06	2.45E-11	1.06E-06	1.78E-08	6.09E-08	1.96E-07	3.69E-09	1.45E-07	1.26E-09	6.74E-08	4.10E-13	1.78E-08	8.30E-10	4.92E-07	4.69E-01	1.05E-06
CADMIUM	4.40E-06	1.62E-05	1.95E-07	1.55E-05	7.06E-07	4.23E-06	4.51E-11	4.94E-06	5.00E-07	5.67E-08	2.16E-07	1.90E-06	6.95E-07	5.06E-08	2.84E-07	7.56E-13	8.28E-08	2.34E-08	1.43E-06	6.90E-01	2.07E-06
CHROMIUM	3.23E-05	1.02E-04	4.46E-09	1.02E-06	9.16E-08	3.23E-07	8.91E-10	3.41E-07	1.27E-07	4.31E-07	1.36E-06	4.36E-10	4.56E-08	6.56E-09	2.17E-08	1.50E-11	5.72E-09	5.93E-09	1.88E-06	1.94E+03	9.65E-10
CHROMIUM VI	4.29E-07	1.69E-06	6.97E-08	1.69E-08	1.52E-09	4.29E-09	4.63E-11	5.39E-09	2.14E-08	5.72E-09	2.25E-08	6.80E-09	7.56E-10	1.09E-10	2.88E-10	7.76E-13	9.05E-11	1.00E-09	3.73E-08	2.33E+00	1.60E-08
LEAD	2.22E-05	7.12E-05	1.70E-07	2.13E-06	3.84E-07	6.66E-07	7.07E-11	7.00E-07	1.77E-07	2.96E-07	9.49E-07	1.66E-08	9.55E-08	2.75E-08	4.47E-08	1.19E-12	1.18E-08	8.28E-09	1.45E-06	5.68E+00	2.55E-07
INORGANIC MERCURY	4.77E-04	1.61E-03	1.70E-07	6.46E-05	7.26E-06	1.91E-05	4.74E-08	5.28E-05	1.80E-05	6.36E-06	2.15E-05	1.66E-08	2.89E-06	5.20E-07	1.28E-06	7.96E-10	8.86E-07	8.41E-07	3.43E-05	5.15E+00	6.67E-06
METHYL MERCURY	8.48E-06	2.48E-04	4.54E-07	2.11E-03	4.08E-06	7.21E-05	2.16E-09	1.37E-03	4.52E-06	1.13E-07	3.31E-06	4.43E-08	9.44E-05	2.92E-07	4.84E-06	3.62E-11	2.31E-05	2.11E-07	1.26E-04	2.27E-02	5.56E-03
NICKEL	7.11E-05	2.64E-04	3.59E-06	5.28E-06	1.01E-06	1.42E-06	5.99E-09	1.69E-06	1.51E-06	9.48E-07	3.52E-06	3.50E-07	2.36E-07	7.26E-08	9.54E-08	1.01E-10	2.84E-08	7.06E-08	5.32E-06	2.84E+01	1.87E-07
SELENIUM	7.87E-08	3.16E-07	4.67E-08	6.96E-08	6.07E-10	1.73E-08	1.11E-11	2.17E-08	1.48E-08	1.05E-09	4.22E-09	4.56E-09	3.11E-09	4.35E-11	1.16E-09	1.86E-13	3.65E-10	6.90E-10	1.52E-08	1.42E-01	1.07E-07
SILVER	1.70E-06	6.79E-06	6.16E-07	1.49E-06	3.26E-07	3.73E-07	6.79E-10	4.67E-07	4.08E-07	2.26E-08	9.05E-08	6.02E-08	6.68E-08	2.33E-08	2.51E-08	1.14E-11	7.84E-09	1.90E-08	3.15E-07	1.29E+01	2.45E-08
THALLIUM	6.26E-06	2.31E-05	2.91E-07	5.08E-06	1.11E-08	1.38E-06	1.95E-09	1.62E-06	8.09E-08	8.35E-08	3.08E-07	2.84E-08	2.27E-07	7.93E-10	9.24E-08	3.27E-11	2.72E-08	3.78E-09	7.71E-07	9.30E-03	8.29E-05
ZINC	1.64E-04	6.11E-04	8.64E-06	3.42E-04	8.80E-17	9.18E-05	3.88E-10	1.08E-04	1.25E-05	2.19E-06	8.15E-06	8.44E-07	1.53E-05	6.30E-16	6.16E-06	6.51E-12	1.82E-06	5.85E-07	3.61E-05	1.14E+02	3.09E-07
ORGANICS																					
Semivolatiles																					
HEXACHLOROCYCLOPENTADIENE	3.70E-08	1.03E-06	8.36E-08	7.71E-04	7.02E-09	2.76E-05	7.19E-12	5.59E-04	2.21E-09	4.94E-10	1.38E-08	8.17E-09	3.45E-05	5.02E-10	1.85E-06	1.21E-13	9.38E-06	1.03E-10	4.58E-05	2.70E+00	1.70E-05
HEXACHLOROBUTADIENE	9.25E-10	6.58E-06	4.14E-09	3.52E-03	5.61E-08	4.95E-07	2.91E-11	1.94E-03	6.89E-11	1.23E-11	8.76E-08	4.04E-10	1.56E-04	4.01E-09	3.32E-08	4.88E-13	3.25E-05	3.22E-12	1.90E-04	1.42E-01	1.34E-03
2,4-DINITROTOLUENE	2.04E-06	7.03E-06	3.03E-06	2.17E-05	2.29E-06	6.29E-06	6.07E-12	6.99E-06	5.84E-06	2.72E-08	9.38E-08	2.96E-07	9.69E-07	1.64E-07	4.22E-07	1.02E-13	1.17E-07	2.72E-07	2.36E-06	1.23E+00	1.93E-06
2,6-DINITROTOLUENE	3.67E-06	3.42E-12	6.29E-06	8.57E-12	1.29E-12	9.20E-06	6.86E-12	2.30E-06	1.18E-05	4.90E-08	4.56E-14	6.14E-07	3.83E-13	9.25E-14	6.18E-07	1.15E-13	3.86E-08	5.52E-07	1.87E-06	7.00E-01	2.67E-06
HEXACHLOROBENZENE	3.44E-06	4.89E-10	2.63E-08	1.12E-06	1.53E-12	7.88E-03	2.43E-10	1.24E-02	9.33E-08	4.59E-08	6.52E-12	2.57E-09	5.01E-08	1.09E-13	5.29E-04	4.08E-12	2.08E-04	4.36E-09	7.38E-04	1.14E+00	6.49E-04
2-NITROANILINE	5.41E-07	3.91E-06	8.71E-07	9.14E-06	1.55E-06	1.27E-06	2.53E-12	2.60E-06	1.63E-06	7.21E-09	5.21E-08	8.50E-08	4.09E-07	1.11E-07	8.49E-08	4.24E-14	4.37E-08	8.56E-08	8.76E-07	--	NC
PENTACHLOROPHENOL	2.41E-06	4.42E-11	2.95E-07	4.57E-08	2.38E-13	2.49E-03	3.08E-10	2.24E-03	3.34E-07	3.21E-08	5.89E-13	2.88E-08	2.04E-09	1.70E-14	1.67E-04	5.16E-12	3.76E-05	1.56E-08	2.05E-04	2.13E-01	9.62E-04
BIS(2-ETHYLHEXYL)PHTHALATE	6.15E-04	1.77E-09	5.31E-07	2.31E-06	8.07E-12	8.03E-01	2.98E-08	8.44E-01	2.31E-05	8.20E-06	2.36E-11	5.19E-08	1.03E-07	5.76E-13	5.39E-02	4.99E-10	1.42E-02	1.08E-06	6.81E-02	7.14E+00	9.54E-03
BENZO(A)PYRENE	5.42E-07	9.32E-07	1.38E-10	6.53E-08	1.23E-09	3.79E-08	9.64E-11	2.64E-07	4.74E-09	7.22E-09	1.24E-08	1.35E-11	2.92E-09	8.81E-11	2.54E-09	1.62E-12	4.77E-09	2.21E-10	3.02E-08	3.90E-02	7.75E-07
BENZO(A)ANTHRACENE	3.20E-07	5.38E-07	1.50E-10	1.62E-08	1.31E-09	9.61E-09	2.92E-11	5.16E-08	4.74E-09	4.27E-09	7.18E-09	1.47E-11	7.23E-10	9.34E-11	6.45E-10	4.89E-13	8.66E-10	2.21E-10	1.40E-08	6.51E-02	2.15E-07
BENZO(B)FLUORANTHENE	5.56E-06	8.94E-06	1.21E-09	6.26E-07	1.08E-08	3.89E-07	9.91E-10	3.05E-06	3.70E-08	7.42E-08	1.19E-07	1.18E-10	2.80E-08	7.76E-10	2.61E-08	1.66E-11	5.12E-08	1.73E-09	3.01E-07	3.90E-02	7.73E-06
BENZO(K)FLUORANTHENE	3.25E-07	6.14E-07	1.05E-10	4.91E-08	7.45E-10	2.60E-08	8.71E-11	2.26E-07	4.30E-09	4.34E-09	8.19E-09	1.02E-11	2.20E-09	5.33E-11	1.75E-09	1.46E-12	3.79E-09	2.01E-10	2.05E-08	3.90E-02	5.27E-07
CHRYSENE	4.56E-06	7.21E-06	2.10E-09	2.88E-07	1.62E-08	1.82E-07	3.79E-10	9.43E-07	4.71E-08	6.08E-08	9.62E-08	2.05E-10	1.29E-08	1.16E-09	1.22E-08	6.36E-12	1.58E-08	2.20E-09	2.01E-07	3.90E-02	5.17E-06
DIBENZ(A,H)ANTHRACENE	9.24E-08	2.56E-07	3.34E-11	1.79E-08	1.96E-10	6.47E-09	4.16E-10	8.57E-08	1.46E-08	1.23E-09	3.41E-09	3.26E-12	8.01E-10	1.41E-11	4.34E-10	6.98E-12	1.44E-09	6.84E-10	8.03E-09	1.42E-03	5.65E-06
INDENO(1,2,3-CD)PYRENE	1.23E-07	3.50E-07	3.51E-11	2.80E-08	1.64E-10	9.64E-09	4.59E-09	1.35E-07	7.28E-08	1.64E-09	4.67E-09	3.43E-12	1.25E-09	1.17E-11	6.60E-10	7.71E-11	2.27E-09	3.40E-09	1.40E-08	3.90E-02	3.59E-07
TOTAL PAH	4.20E-07	1.13E-03	1.07E-10	8.45E-05	2.73E-06	3.15E-08	5.52E-08	2.33E-04	3.68E-09	5.60E-09	1.50E-05	1.05E-11	3.78E-06	1.96E-07	2.11E-09	9.26E-10	3.91E-06	1.72E-10	2.29E-05	3.90E-01	5.88E-05
Volatiles																					
BENZENE	2.55E-10	3.38E-11	1.11E-07	1.36E-10	1.01E-10	1.03E-09	2.10E-16	2.91E-10	--	3.41E-12	4.50E-13	1.08E-08	6.07E-12	7.24E-12	6.89E-11	3.52E-18	4.88E-12	NC	1.09E-08	1.03E+01	1.06E-09
BROMOMETHANE	1.76E-11	1.37E-10	6.83E-08	8.00E-11	5.98E-10	1.03E-11	1.17E-16	2.26E-11	--	2.35E-13	1.83E-12	6.67E-09	3.58E-12	4.28E-11	6.92E-13	1.97E-18	3.79E-13	NC	6.71E-09	--	NC
1,3-BUTADIENE	1.27E-11	7.23E-07	5.82E-08	2.20E-06	2.26E-06	3.86E-11	3.32E-12	5.50E-07	--	1.69E-13	9.64E-09	5.69E-09	9.85E-08	1.62E-07	2.59E-12	5.58E-14	9.24E-09	NC	2.85E-07	--	NC
CARBON TETRACHLORIDE	7.16E-11	1.34E-12	2.37E-08	1.61E-11	1.68E-13	8.59E-10	2.00E-18	2.19E-10	--	9.55E-13	1.79E-14	2.32E-09	7.22E-13	1.20E-14	5.77E-11	3.36E-20	3.67E-12	NC	2.38E-09	1.14E+01	2.09E-10
CHLOROFORM	4.57E-10	2.42E-11	7.34E-08	6.64E-11	8.44E-12	1.29E-09	1.21E-17	3.39E-10	--	6.10E-12	3.23E-13	7.17E-09	3.06E-12	6.04E-13	8.66E-11	2.03E-19	5.70E-12	NC	7.27E-09	1.07E+01	6.83E-10
CHLOROMETHANE	1.79E-12	4.61E-06	6.23E-08	1.81E-06	2.27E-05	7.01E-13	2.74E-12	4.52E-07	--	2.38E-14	6.15E-08	6.08E-09	8.09E-08	1.63E-06	4.71E-14	4.59E-14	7.59E-09	NC	1.78E-06	--	NC
1,1-DICHLOROETHYLENE	2.31E-11	6.58E-09	2.45E-08	2.57E-08	1.98E-08	9.00E-11	3.94E-14	6.44E-09	--	3.08E-13	8.78E-11	2.39E-09	1.15E-09	1.42E-09	6.04E-12	6.62E-16	1.08E-10	NC	5.16E-09	2.13E+01	2.42E-10
DICHLOROFLUOROMETHANE	7.03E-13	1.80E-10	8.26E-08	2.39E-10	6.48E-10	9.34E-13	3.47E-16	5.99E-11	--	9.37E-15	2.40E-12	8.06E-09	1.07E-11	4.64E-11	6.27E-14	5.82E-18	1.01E-12	NC	8.12E-09	--	NC
TRANS-1,3-DICHLOROPROPENE	9.39E-11	7.40E-11	2.60E-08	7.55E-11	2.82E-10	9.58E-11	1.09E-16	4.28E-11	--	1.25E-12	9.87E-13	2.54E-09	3.38E-12	2.02E-11	6.43E-12	1.83E-18	7.19E-13	NC	2.57E-09	--	NC
1,1,2,2-TETRACHLOROETHANE	3.44E-09	8.75E-10	2.93E-08	3.97E-07	8.40E-12	1.56E-06	8.98E-15	9.78E-07	--	4.59E-11	1.17E-11	2.86E-09	1.78E-08	6.01E-13	1.05E-07	1.51E-16	1.64E-08	NC	1.42E-07	5.46E-01	2.60E-07
TRICHLOROFLUOROMETHANE	3.87E-11	1.11E-12	7.71E-08	9.37E-12	3.01E-12	3.27E-10	1.57E-17	8.40E-11	--	5.16E-13	1.48E-14	7.53E-09	4.18E-13	2.16E-13	2.19E-11	2.63E-19	1.41E-12	NC	7.56E-09	--	NC
VINYL CHLORIDE	5.80E-13	7.08E-08	6.89E-08	4.39E-08	7.17E-08	3.59E-13	1.51E-14	1.10E-08	--	7.73E-15	9.45E-10	6.73E-09	1.97E-09	5.13E-09	2.41E-14	2.54E-16	1.84E-10	NC	1.50E-08	1.21E-01	1.24E-07
Dioxins																					
2,3,7,8-TCDD TE																					
2,3,7,8-TCDD (MAMMAL)	1.87E-08	3.92E-08	3.92E-12	6.23E-08	2.64E-11	2.98E-08	5.30E-12	3.22E-07	1.61E-10	2.50E-10	5.23E-10	3.63E-13	2.79E-09	1.89E-12	2.00E-09	8.90E-14	5.41E-09	7.50E-12	1.10E-08	7.10E-07	1.55E-02

-- TRV not available.
The hazard quotient (HQ) is the TRV divided by the sum of potential daily dose due to all ingested media and prey items.
NC = Not calculated

TABLE E.5-6
POTENTIAL RISKS TO THE RED-TAILED HAWK
SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT
GREEN ISLAND
NORLITE FACILITY
COHOES, NY

CPEC	Site Concentrations				Potential Daily Dose (mg/kg_{bw}-day)					TRV	HQ
	Surface Soil (mg/kg_{dw})	Surface Water (mg/L)	Herbivorous Mammal (mg/kg_{ww})	Omnivorous Mammal (mg/kg_{ww})	Surface Soil	Surface Water	Herbivorous Mammal	Omnivorous Mammal	Total	(mg/kg_{bw}-day)	
INORGANICS											
ANTIMONY	7.92E-06	8.57E-07	2.84E-07	7.39E-07	7.88E-08	4.97E-08	1.72E-08	3.66E-08	1.82E-07	--	NC
ARSENIC	2.40E-06	1.71E-07	1.18E-07	3.95E-08	2.39E-08	9.92E-09	7.14E-09	1.96E-09	4.29E-08	5.14E+00	8.35E-09
BARIUM	3.88E-06	3.02E-07	2.01E-07	2.67E-07	3.86E-08	1.75E-08	1.21E-08	1.32E-08	8.15E-08	2.08E+01	3.92E-09
BERYLLIUM	4.57E-06	3.78E-08	1.78E-08	1.76E-08	4.54E-08	2.19E-09	1.08E-09	8.72E-10	4.96E-08	--	NC
CADMIUM	4.40E-06	1.95E-07	5.00E-07	7.06E-07	4.38E-08	1.13E-08	3.03E-08	3.50E-08	1.20E-07	1.45E+00	8.30E-08
CHROMIUM	3.23E-05	4.46E-09	1.27E-07	9.16E-08	3.22E-07	2.59E-10	7.69E-09	4.54E-09	3.34E-07	1.00E+00	3.34E-07
CHROMIUM VI	4.29E-07	6.97E-08	2.14E-08	1.52E-09	4.26E-09	4.04E-09	1.30E-09	7.53E-11	9.68E-09	1.00E+00	9.68E-09
LEAD	2.22E-05	1.70E-07	1.77E-07	3.84E-07	2.21E-07	9.84E-09	1.07E-08	1.90E-08	2.60E-07	1.13E+00	2.30E-07
INORGANIC MERCURY	4.77E-04	1.70E-07	1.80E-05	7.26E-06	4.75E-06	9.84E-09	1.09E-06	3.59E-07	6.21E-06	4.50E-01	1.38E-05
METHYL MERCURY	8.48E-06	4.54E-07	4.52E-06	4.08E-06	8.44E-08	2.63E-08	2.73E-07	2.02E-07	5.86E-07	6.40E-03	9.16E-05
NICKEL	7.11E-05	3.59E-06	1.51E-06	1.01E-06	7.07E-07	2.08E-07	9.15E-08	5.02E-08	1.06E-06	7.74E+01	1.37E-08
SELENIUM	7.87E-08	4.67E-08	1.48E-08	6.07E-10	7.83E-10	2.71E-09	8.94E-10	3.01E-11	4.42E-09	5.00E-01	8.83E-09
SILVER	1.70E-06	6.16E-07	4.08E-07	3.26E-07	1.69E-08	3.57E-08	2.47E-08	1.61E-08	9.34E-08	2.29E+00	4.08E-08
THALLIUM	6.26E-06	2.91E-07	8.09E-08	1.11E-08	6.23E-08	1.69E-08	4.89E-09	5.48E-10	8.46E-08	3.50E-01	2.42E-07
ZINC	1.64E-04	8.64E-06	1.25E-05	8.80E-17	1.63E-06	5.01E-07	7.58E-07	4.35E-18	2.89E-06	1.45E+01	1.99E-07
ORGANICS											
Semivolatiles											
HEXACHLOROCYCLOPENTADIENE	3.70E-08	8.36E-08	2.21E-09	7.02E-09	3.68E-10	4.85E-09	1.34E-10	3.47E-10	5.70E-09	--	NC
HEXACHLOROBUTADIENE	9.25E-10	4.14E-09	6.89E-11	5.61E-08	9.20E-12	2.40E-10	4.17E-12	2.77E-09	3.03E-09	3.19E+00	9.51E-10
2,4-DINITROTOLUENE	2.04E-06	3.03E-06	5.84E-06	2.29E-06	2.03E-08	1.76E-07	3.53E-07	1.13E-07	6.62E-07	--	NC
2,6-DINITROTOLUENE	3.67E-06	6.29E-06	1.18E-05	1.29E-12	3.66E-08	3.64E-07	7.15E-07	6.39E-14	1.12E-06	--	NC
HEXACHLOROBENZENE	3.44E-06	2.63E-08	9.33E-08	1.53E-12	3.42E-08	1.52E-09	5.65E-09	7.55E-14	4.14E-08	2.25E-01	1.84E-07
2-NITROANILINE	5.41E-07	8.71E-07	1.83E-06	1.55E-06	5.38E-09	5.05E-08	1.11E-07	7.66E-08	2.43E-07	--	NC
PENTACHLOROPHENOL	2.41E-06	2.95E-07	3.34E-07	2.38E-13	2.40E-08	1.71E-08	2.02E-08	1.18E-14	6.13E-08	4.03E+00	1.52E-08
BIS(2-ETHYLHEXYL)PHTHALATE	6.15E-04	5.31E-07	2.31E-05	8.07E-12	6.12E-06	3.08E-08	1.40E-06	4.00E-13	7.55E-06	1.11E+00	6.80E-06
BENZO(A)PYRENE	5.42E-07	1.38E-10	4.74E-09	1.23E-09	5.39E-09	8.02E-12	2.87E-10	6.09E-11	5.74E-09	1.00E-03	5.74E-06
BENZO(A)ANTHRACENE	3.20E-07	1.50E-10	4.74E-09	1.31E-09	3.19E-09	8.70E-12	2.87E-10	6.46E-11	3.55E-09	7.90E-04	4.49E-06
BENZO(B)FLUORANTHENE	5.56E-06	1.21E-09	3.70E-08	1.08E-08	5.54E-08	7.02E-11	2.24E-09	5.36E-10	5.82E-08	1.40E-04	4.16E-04
BENZO(K)FLUORANTHENE	3.25E-07	1.05E-10	4.30E-09	7.45E-10	3.24E-09	6.06E-12	2.60E-10	3.69E-11	3.54E-09	1.40E-04	2.53E-05
CHRYSENE	4.56E-06	2.10E-09	4.71E-08	1.62E-08	4.53E-08	1.21E-10	2.85E-09	8.01E-10	4.91E-08	1.00E-03	4.91E-05
DIBENZ(A,H)ANTHRACENE	9.24E-08	3.34E-11	1.46E-08	1.96E-10	9.19E-10	1.93E-12	8.86E-10	9.72E-12	1.82E-09	3.90E-04	4.66E-06
INDENO(1,2,3-CD)PYRENE	1.23E-07	3.51E-11	7.28E-08	1.64E-10	1.22E-09	2.04E-12	4.40E-09	8.11E-12	5.64E-09	1.00E-03	5.64E-06
TOTAL PAH	4.20E-07	1.07E-10	3.68E-09	2.73E-06	4.18E-09	6.22E-12	2.22E-10	1.35E-07	1.40E-07	4.00E+01	3.49E-09
Volatiles	0.00E+00	0.00E+00	0.00E+00	0.00E+00							
BENZENE	2.55E-10	1.11E-07	--	1.01E-10	2.54E-12	6.42E-09	NC	5.01E-12	6.43E-09	--	NC
BROMOMETHANE	1.76E-11	6.83E-08	--	5.98E-10	1.76E-13	3.96E-09	NC	2.96E-11	3.99E-09	--	NC
1,3-BUTADIENE	1.27E-11	5.82E-08	--	2.26E-06	1.26E-13	3.38E-09	NC	1.12E-07	1.15E-07	--	NC
CARBON TETRACHLORIDE	7.16E-11	2.37E-08	--	1.68E-13	7.12E-13	1.38E-09	NC	8.31E-15	1.38E-09	--	NC
CHLOROFORM	4.57E-10	7.34E-08	--	8.44E-12	4.55E-12	4.26E-09	NC	4.18E-13	4.26E-09	--	NC
CHLOROMETHANE	1.79E-12	6.23E-08	--	2.27E-05	1.78E-14	3.61E-09	NC	1.12E-06	1.13E-06	--	NC
1,1-DICHLOROETHYLENE	2.31E-11	2.45E-08	--	1.98E-08	2.30E-13	1.42E-09	NC	9.80E-10	2.40E-09	1.72E+01	1.39E-10
DICHLOROFLUOROMETHANE	7.03E-13	8.26E-08	--	6.48E-10	6.99E-15	4.78E-09	NC	3.21E-11	4.82E-09	--	NC
TRANS-1,3-DICHLOROPROPENE	9.39E-11	2.60E-08	--	2.82E-10	9.35E-13	1.51E-09	NC	1.40E-11	1.52E-09	--	NC
1,1,2,2-TETRACHLOROETHANE	3.44E-09	2.93E-08	--	8.40E-12	3.42E-11	1.70E-09	NC	4.16E-13	1.73E-09	3.97E+00	4.37E-10
TRICHLOROFLUOROMETHANE	3.87E-11	7.71E-08	--	3.01E-12	3.85E-13	4.47E-09	NC	1.49E-13	4.47E-09	--	NC
VINYL CHLORIDE	5.80E-13	6.89E-08	--	7.17E-08	5.77E-15	3.99E-09	NC	3.55E-09	7.54E-09	--	NC
Dioxins											
2,3,7,8-TCDD TE											
2,3,7,8-TCDD (BIRD)	9.57E-08	1.71E-11	8.31E-10	1.21E-10	9.52E-10	9.92E-13	5.03E-11	6.00E-12	1.01E-09	1.40E-05	7.21E-05

-- TRV not available.

The hazard quotient (HQ) is the TRV divided by the sum of potential daily dose due to all ingested media and prey items.

NC = Not calculated

TABLE E.5-7
POTENTIAL RISKS TO THE GREAT BLUE HERON
SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT
GREEN ISLAND
NORLITE FACILITY
COHOES, NY

CPEC	Site Concentrations			Potential Daily Dose (mg/kg_{bw}-day)				TRV (mg/kg_{bw}-day)	HQ
	Hydric Soil (mg/kg_{dw})	Surface Water (mg/L)	Aquatic Invertebrate (mg/kg_{ww})	Hydric Soil	Surface Water	Aquatic Invertebrates	Total		
INORGANICS									
ANTIMONY	3.08E-05	8.57E-07	6.78E-06	1.39E-07	3.88E-08	1.22E-06	1.40E-06	--	NC
ARSENIC	9.15E-06	1.71E-07	1.01E-06	4.12E-08	7.75E-09	1.81E-07	2.30E-07	5.14E+00	4.48E-08
BARIUM	1.49E-05	3.02E-07	3.27E-06	6.69E-08	1.37E-08	5.88E-07	6.69E-07	2.08E+01	3.22E-08
BERYLLIUM	1.47E-05	3.78E-08	3.23E-06	6.61E-08	1.71E-09	5.81E-07	6.49E-07	--	NC
CADMIUM	1.62E-05	1.95E-07	1.55E-05	7.27E-08	8.83E-09	2.79E-06	2.88E-06	1.45E+00	1.98E-06
CHROMIUM	1.02E-04	4.46E-09	1.02E-06	4.58E-07	2.02E-10	1.83E-07	6.42E-07	1.00E+00	6.42E-07
CHROMIUM VI	1.69E-06	6.97E-08	1.69E-08	7.60E-09	3.16E-09	3.04E-09	1.38E-08	1.00E+00	1.38E-08
LEAD	7.12E-05	1.70E-07	2.13E-06	3.20E-07	7.69E-09	3.84E-07	7.12E-07	1.13E+00	6.30E-07
INORGANIC MERCURY	1.61E-03	1.70E-07	6.46E-05	7.26E-06	7.69E-09	1.16E-05	1.89E-05	4.50E-01	4.20E-05
METHYL MERCURY	2.48E-04	4.54E-07	2.11E-03	1.12E-06	2.06E-08	3.80E-04	3.81E-04	6.40E-03	5.95E-02
NICKEL	2.64E-04	3.59E-06	5.28E-06	1.19E-06	1.63E-07	9.51E-07	2.30E-06	7.74E+01	2.97E-08
SELENIUM	3.16E-07	4.67E-08	6.96E-08	1.42E-09	2.12E-09	1.25E-08	1.61E-08	5.00E-01	3.21E-08
SILVER	6.79E-06	6.16E-07	1.49E-06	3.05E-08	2.79E-08	2.69E-07	3.27E-07	2.29E+00	1.43E-07
THALLIUM	2.31E-05	2.91E-07	5.08E-06	1.04E-07	1.32E-08	9.14E-07	1.03E-06	3.50E-01	2.95E-06
ZINC	6.11E-04	8.64E-06	3.42E-04	2.75E-06	3.91E-07	6.16E-05	6.47E-05	1.45E+01	4.46E-06
ORGANICS									
Semivolatiles									
HEXACHLOROCYCLOPENTADIENE	1.03E-06	8.36E-08	7.71E-04	4.66E-09	3.79E-09	1.39E-04	1.39E-04	--	NC
HEXACHLOROBUTADIENE	6.58E-06	4.14E-09	3.52E-03	2.96E-08	1.87E-10	6.34E-04	6.34E-04	3.19E+00	1.99E-04
2,4-DINITROTOLUENE	7.03E-06	3.03E-06	2.17E-05	3.16E-08	1.37E-07	3.90E-06	4.07E-06	--	NC
2,6-DINITROTOLUENE	3.42E-12	6.29E-06	8.57E-12	1.54E-14	2.85E-07	1.54E-12	2.85E-07	--	NC
HEXACHLOROBENZENE	4.89E-10	2.63E-08	1.12E-06	2.20E-12	1.19E-09	2.02E-07	2.03E-07	2.25E-01	9.02E-07
2-NITROANILINE	3.91E-06	8.71E-07	9.14E-06	1.76E-08	3.94E-08	1.65E-06	1.70E-06	--	NC
PENTACHLOROPHENOL	4.42E-11	2.95E-07	4.57E-08	1.99E-13	1.34E-08	8.22E-09	2.16E-08	4.03E+00	5.35E-09
BIS(2-ETHYLHEXYL)PHTHALATE	1.77E-09	5.31E-07	2.31E-06	7.97E-12	2.41E-08	4.16E-07	4.40E-07	1.11E+00	3.97E-07
BENZO(A)PYRENE	9.32E-07	1.38E-10	6.53E-08	4.20E-09	6.27E-12	1.17E-08	1.59E-08	1.00E-03	1.59E-05
BENZO(A)ANTHRACENE	5.38E-07	1.50E-10	1.62E-08	2.42E-09	6.80E-12	2.91E-09	5.34E-09	7.90E-04	6.76E-06
BENZO(B)FLUORANTHENE	8.94E-06	1.21E-09	6.26E-07	4.02E-08	5.49E-11	1.13E-07	1.53E-07	1.40E-04	1.09E-03
BENZO(K)FLUORANTHENE	6.14E-07	1.05E-10	4.91E-08	2.76E-09	4.74E-12	8.85E-09	1.16E-08	1.40E-04	8.30E-05
CHRYSENE	7.21E-06	2.10E-09	2.88E-07	3.24E-08	9.49E-11	5.19E-08	8.45E-08	1.00E-03	8.45E-05
DIBENZ(A,H)ANTHRACENE	2.56E-07	3.34E-11	1.79E-08	1.15E-09	1.51E-12	3.22E-09	4.38E-09	3.90E-04	1.12E-05
INDENO(1,2,3-CD)PYRENE	3.50E-07	3.51E-11	2.80E-08	1.57E-09	1.59E-12	5.04E-09	6.62E-09	1.00E-03	6.62E-06
TOTAL PAH	1.13E-03	1.07E-10	8.45E-05	5.07E-06	4.86E-12	1.52E-05	2.03E-05	4.00E+01	5.07E-07
Volatiles									
BENZENE	3.38E-11	1.11E-07	1.36E-10	1.52E-13	5.02E-09	2.44E-11	5.04E-09	--	NC
BROMOMETHANE	1.37E-10	6.83E-08	8.00E-11	6.17E-13	3.09E-09	1.44E-11	3.11E-09	--	NC
1,3-BUTADIENE	7.23E-07	5.82E-08	2.20E-06	3.25E-09	2.64E-09	3.96E-07	4.02E-07	--	NC
CARBON TETRACHLORIDE	1.34E-12	2.37E-08	1.61E-11	6.05E-15	1.07E-09	2.90E-12	1.08E-09	--	NC
CHLOROFORM	2.42E-11	7.34E-08	6.84E-11	1.09E-13	3.32E-09	1.23E-11	3.34E-09	--	NC
CHLOROMETHANE	4.61E-06	6.23E-08	1.81E-06	2.07E-08	2.82E-09	3.25E-07	3.49E-07	--	NC
1,1-DICHLOROETHYLENE	6.58E-09	2.45E-08	2.57E-08	2.96E-11	1.11E-09	4.62E-09	5.76E-09	1.72E+01	3.35E-10
DICHLOROFLUOROMETHANE	1.80E-10	8.26E-08	2.39E-10	8.09E-13	3.74E-09	4.30E-11	3.78E-09	--	NC
TRANS-1,3-DICHLOROPROPENE	7.40E-11	2.60E-08	7.55E-11	3.33E-13	1.18E-09	1.36E-11	1.19E-09	--	NC
1,1,2,2-TETRACHLOROETHANE	8.75E-10	2.93E-08	3.97E-07	3.94E-12	1.33E-09	7.14E-08	7.28E-08	3.97E+00	1.83E-08
TRICHLOROFLUOROMETHANE	1.11E-12	7.71E-08	9.37E-12	4.99E-15	3.49E-09	1.69E-12	3.49E-09	--	NC
VINYL CHLORIDE	7.08E-08	6.89E-08	4.39E-08	3.19E-10	3.12E-09	7.91E-09	1.13E-08	--	NC
Dioxins									
2,3,7,8-TCDD TE									
2,3,7,8-TCDD (BIRD)	1.80E-07	1.71E-11	2.87E-07	8.12E-10	7.75E-13	5.16E-08	5.24E-08	1.40E-05	3.75E-03

-- TRV not available.
The hazard quotient (HQ) is the TRV divided by the sum of potential daily dose due to all ingested media and prey items.
NC = Not calculated

Table E.6-1
Potential Risks to the Raccoon
Exclusive Diet Risk Calculations: Terrestrial Invertebrates, Herbivore, Omnivores, Terrestrial Plants, Wetland Invertebrates, Wetland Plants
Green Island
Norlite Facility
Cohoes, NY

CPEC	Site Concentrations								
	Surface Soil (mg/kg$_{dw}$)	Sediment (mg/kg$_{dw}$)	Surface Water (mg/L)	Wetland Invertebrate (mg/kg$_{ww}$)	Wetland Plant (mg/kg$_{ww}$)	Terrestrial Invertebrate (mg/kg$_{ww}$)	Herbivorous Mammal (mg/kg$_{ww}$)	Omnivorous Mammal (mg/kg$_{ww}$)	Terrestrial Plant (mg/kg$_{ww}$)
INORGANICS									
ANTIMONY	7.92E-06	3.08E-05	8.57E-07	6.78E-06	7.39E-07	1.74E-06	3.34E-10	2.13E-06	2.84E-07
ARSENIC	2.40E-06	9.15E-06	1.71E-07	1.01E-06	3.95E-08	2.64E-07	1.11E-10	3.18E-07	1.18E-07
BARIUM	3.88E-06	1.49E-05	3.02E-07	3.27E-06	2.67E-07	8.54E-07	2.31E-11	1.03E-06	2.01E-07
BERYLLIUM	4.57E-06	1.47E-05	3.78E-08	3.23E-06	1.76E-08	1.00E-06	2.45E-11	1.06E-06	1.78E-08
CADMIUM	4.40E-06	1.62E-05	1.95E-07	1.55E-05	7.06E-07	4.23E-06	4.51E-11	4.94E-06	5.00E-07
CHROMIUM	3.23E-05	1.02E-04	4.46E-09	1.02E-06	9.16E-08	3.23E-07	8.91E-10	3.41E-07	1.27E-07
CHROMIUM VI	4.29E-07	1.69E-06	6.97E-08	1.69E-08	1.52E-09	4.29E-09	4.63E-11	5.39E-09	2.14E-08
LEAD	2.22E-05	7.12E-05	1.70E-07	2.13E-06	3.84E-07	6.66E-07	7.07E-11	7.00E-07	1.77E-07
INORGANIC MERCURY	4.77E-04	1.61E-03	1.70E-07	6.46E-05	7.26E-06	1.91E-05	4.74E-08	5.28E-05	1.80E-05
METHYL MERCURY	8.48E-06	2.48E-04	4.54E-07	2.11E-03	4.08E-06	7.21E-05	2.16E-09	1.37E-03	4.52E-06
NICKEL	7.11E-05	2.64E-04	3.59E-06	5.28E-06	1.01E-06	1.42E-06	5.99E-09	1.69E-06	1.51E-06
SELENIUM	7.87E-08	3.16E-07	4.67E-08	6.96E-08	6.07E-10	1.73E-08	1.11E-11	2.17E-08	1.48E-08
SILVER	1.70E-06	6.79E-06	6.16E-07	1.49E-06	3.26E-07	3.73E-07	6.79E-10	4.67E-07	4.08E-07
THALLIUM	6.26E-06	2.31E-05	2.91E-07	5.08E-06	1.11E-08	1.38E-06	1.95E-09	1.62E-06	8.09E-08
ZINC	1.64E-04	6.11E-04	8.64E-06	3.42E-04	8.80E-17	9.18E-05	3.88E-10	1.08E-04	1.25E-05
ORGANICS									
Semivolatiles									
HEXACHLOROCYCLOPENTADIENE	3.70E-08	1.03E-06	8.36E-08	7.71E-04	7.02E-09	2.76E-05	7.19E-12	5.59E-04	2.21E-09
HEXACHLOROBUTADIENE	9.25E-10	6.58E-06	4.14E-09	3.52E-03	5.61E-08	4.95E-07	2.91E-11	1.94E-03	6.89E-11
2,4-DINITROTOLUENE	2.04E-06	7.03E-06	3.03E-06	2.17E-05	2.29E-06	6.29E-06	6.07E-12	6.99E-06	5.84E-06
2,6-DINITROTOLUENE	3.67E-06	3.42E-12	6.29E-06	8.57E-12	1.29E-12	9.20E-06	6.86E-12	2.30E-06	1.18E-05
HEXACHLOROBENZENE	3.44E-06	4.89E-10	2.63E-08	1.12E-06	1.53E-12	7.88E-03	2.43E-10	1.24E-02	9.33E-08
2-NITROANILINE	5.41E-07	3.91E-06	8.71E-07	9.14E-06	1.55E-06	1.27E-06	2.53E-12	2.60E-06	1.83E-06
PENTACHLOROPHENOL	2.41E-06	4.42E-11	2.95E-07	4.57E-08	2.38E-13	2.49E-03	3.08E-10	2.24E-03	3.34E-07
BIS(2-ETHYLHEXYL)PHTHALATE	6.15E-04	1.77E-09	5.31E-07	2.31E-06	8.07E-12	8.03E-01	2.98E-08	8.44E-01	2.31E-05
BENZO(A)PYRENE	5.42E-07	9.32E-07	1.38E-10	6.53E-08	1.23E-09	3.79E-08	9.64E-11	2.84E-07	4.74E-09
BENZO(A)ANTHRACENE	3.20E-07	5.38E-07	1.50E-10	1.62E-08	1.31E-09	9.61E-09	2.92E-11	5.16E-08	4.74E-09
BENZO(B)FLUORANTHENE	5.56E-06	8.94E-06	1.21E-09	6.26E-07	1.08E-08	3.89E-07	9.91E-10	3.05E-06	3.70E-08
BENZO(K)FLUORANTHENE	3.25E-07	6.14E-07	1.05E-10	4.91E-08	7.45E-10	2.60E-08	8.71E-11	2.26E-07	4.30E-09
CHRYSENE	4.56E-06	7.21E-06	2.10E-09	2.88E-07	1.62E-08	1.82E-07	3.79E-10	9.43E-07	4.71E-08
DIBENZ(A,H)ANTHRACENE	9.24E-08	2.56E-07	3.34E-11	1.79E-08	1.96E-10	6.47E-09	4.16E-10	8.57E-08	1.46E-08
INDENO(1,2,3-CD)PYRENE	1.23E-07	3.50E-07	3.51E-11	2.80E-08	1.64E-10	9.84E-09	4.59E-09	1.35E-07	7.28E-08
TOTAL PAH	4.20E-07	1.13E-03	1.07E-10	8.45E-05	2.73E-06	3.15E-08	5.52E-08	2.33E-04	3.68E-09
Volatiles									
BENZENE	2.55E-10	3.38E-11	1.11E-07	1.36E-10	1.01E-10	1.03E-09	2.10E-16	2.91E-10	--
BROMOMETHANE	1.76E-11	1.37E-10	6.83E-08	8.00E-11	5.98E-10	1.03E-11	1.17E-16	2.26E-11	--
1,3-BUTADIENE	1.27E-11	7.23E-07	5.82E-08	2.20E-06	2.26E-06	3.86E-11	3.32E-12	5.50E-07	--
CARBON TETRACHLORIDE	7.16E-11	1.34E-12	2.37E-08	1.61E-11	1.68E-13	8.59E-10	2.00E-18	2.19E-10	--
CHLOROFORM	4.57E-10	2.42E-11	7.34E-08	6.84E-11	8.44E-12	1.29E-09	1.21E-17	3.39E-10	--
CHLOROMETHANE	1.79E-12	4.61E-06	6.23E-08	1.81E-06	2.27E-05	7.01E-13	2.74E-12	4.52E-07	--
1,1-DICHLOROETHYLENE	2.31E-11	6.58E-09	2.45E-08	2.57E-08	1.98E-08	9.00E-11	3.94E-14	6.44E-09	--
DICHLOROFLUOROMETHANE	7.03E-13	1.80E-10	8.26E-08	2.39E-10	6.48E-10	9.34E-13	3.47E-16	5.99E-11	--
TRANS-1,3-DICHLOROPROPENE	9.39E-11	7.40E-11	2.60E-08	7.55E-11	2.82E-10	9.58E-11	1.09E-16	4.28E-11	--
1,1,2,2-TETRACHLOROETHANE	3.44E-09	8.75E-10	2.93E-08	3.97E-07	8.40E-12	1.56E-06	8.98E-15	9.78E-07	--
TRICHLOROFLUOROMETHANE	3.87E-11	1.11E-12	7.71E-08	9.37E-12	3.01E-12	3.27E-10	1.57E-17	8.40E-11	--
VINYL CHLORIDE	5.80E-13	7.08E-08	6.89E-08	4.39E-08	7.17E-08	3.59E-13	1.51E-14	1.10E-08	--
Dioxins									
2,3,7,8-TCDD TE									
2,3,7,8-TCDD (MAMMAL)	1.87E-08	3.92E-08	3.92E-12	6.23E-08	2.64E-11	2.98E-08	5.30E-12	3.22E-07	1.61E-10

-- TRV not available.
The hazard quotient (HQ) is the TRV divided by the sum of potential daily dose from abiotic media and exclusive prey item.
NC = Not calculated

Table E.6-1
Potential Risks to the Raccoon
Exclusive Diet Risk Calculations: Terrestrial Invertebrates, Herbivore, Omnivores, Terrestrial Plants, Wetland Invertebrates, Wetland Plant
Green Island
Norlite Facility
Cohoes, NY

CPEC	Potential Daily Dose (mg/kg-day)								
	Surface Soil	Sediment	Surface Water	Wetland Invertebrates	Wetland Plant	Terrestrial Invertebrates	Herbivorous Mammal	Omnivorous Mammal	Terrestrial Plant
INORGANICS									
ANTIMONY	1.06E-07	4.11E-07	8.37E-08	1.79E-06	1.95E-07	4.60E-07	8.82E-11	5.62E-07	7.50E-08
ARSENIC	3.21E-08	1.22E-07	1.67E-08	2.66E-07	1.04E-08	6.97E-08	2.93E-11	8.39E-08	3.11E-08
BARIUM	5.18E-08	1.98E-07	2.95E-08	8.62E-07	7.05E-08	2.25E-07	6.08E-12	2.72E-07	5.29E-08
BERYLLIUM	6.09E-08	1.96E-07	3.69E-09	8.52E-07	4.65E-09	2.65E-07	6.45E-12	2.79E-07	4.69E-09
CADMIUM	5.87E-08	2.16E-07	1.90E-08	4.09E-06	1.86E-07	1.11E-06	1.19E-11	1.30E-06	1.32E-07
CHROMIUM	4.31E-07	1.36E-06	4.36E-10	2.69E-07	2.42E-08	8.53E-08	2.35E-10	8.98E-08	3.35E-08
CHROMIUM VI	5.72E-09	2.25E-08	6.80E-09	4.46E-09	4.01E-10	1.13E-09	1.22E-11	1.42E-09	5.66E-09
LEAD	2.96E-07	9.49E-07	1.66E-08	5.63E-07	1.01E-07	1.76E-07	1.87E-11	1.85E-07	4.68E-08
INORGANIC MERCURY	6.36E-06	2.15E-05	1.66E-08	1.70E-05	1.92E-06	5.03E-06	1.25E-08	1.39E-05	4.75E-06
METHYL MERCURY	1.13E-07	3.31E-06	4.43E-08	5.56E-04	1.08E-06	1.90E-05	5.68E-10	3.62E-04	1.19E-06
NICKEL	9.48E-07	3.52E-06	3.50E-07	1.39E-06	2.67E-07	3.75E-07	1.58E-09	4.46E-07	3.99E-07
SELENIUM	1.05E-09	4.22E-09	4.56E-09	1.84E-08	1.60E-10	4.57E-09	2.93E-12	5.73E-09	3.90E-09
SILVER	2.26E-08	9.05E-08	6.02E-08	3.94E-07	8.59E-08	9.84E-08	1.79E-10	1.23E-07	1.08E-07
THALLIUM	8.35E-08	3.08E-07	2.84E-08	1.34E-06	2.92E-09	3.63E-07	5.13E-10	4.28E-07	2.13E-08
ZINC	2.19E-06	8.15E-06	8.44E-07	9.02E-05	2.32E-17	2.42E-05	1.02E-10	2.86E-05	3.31E-06
ORGANICS									
Semivolatiles									
HEXACHLOROCYCLOPENTADIENE	4.94E-10	1.38E-08	8.17E-09	2.03E-04	1.85E-09	7.27E-06	1.90E-12	1.47E-04	5.84E-10
HEXACHLOROBUTADIENE	1.23E-11	8.78E-08	4.04E-10	9.29E-04	1.48E-08	1.31E-07	7.67E-12	5.11E-04	1.82E-11
2,4-DINITROTOLUENE	2.72E-08	9.38E-08	2.96E-07	5.71E-06	6.05E-07	1.66E-06	1.60E-12	1.84E-06	1.54E-06
2,6-DINITROTOLUENE	4.90E-08	4.56E-14	6.14E-07	2.26E-12	3.41E-13	2.43E-06	1.81E-12	6.07E-07	3.12E-06
HEXACHLOROBENZENE	4.59E-08	6.52E-12	2.57E-09	2.95E-07	4.02E-13	2.08E-03	6.42E-11	3.28E-03	2.46E-08
2-NITROANILINE	7.21E-09	5.21E-08	8.50E-08	2.41E-06	4.08E-07	3.34E-07	6.67E-13	6.86E-07	4.84E-07
PENTACHLOROPHENOL	3.21E-08	5.89E-13	2.88E-08	1.20E-08	6.28E-14	6.57E-04	8.11E-11	5.91E-04	8.81E-08
BIS(2-ETHYLHEXYL)PHTHALATE	8.20E-06	2.36E-11	5.19E-08	6.10E-07	2.13E-12	2.12E-01	7.85E-09	2.22E-01	6.10E-06
BENZO(A)PYRENE	7.22E-09	1.24E-08	1.35E-11	1.72E-08	3.25E-10	1.00E-08	2.54E-11	7.49E-08	1.25E-09
BENZO(A)ANTHRACENE	4.27E-09	7.18E-09	1.47E-11	4.26E-09	3.44E-10	2.53E-09	7.69E-12	1.36E-08	1.25E-09
BENZO(B)FLUORANTHENE	7.42E-08	1.19E-07	1.18E-10	1.65E-07	2.86E-09	1.03E-07	2.61E-10	8.04E-07	9.76E-09
BENZO(K)FLUORANTHENE	4.34E-09	8.19E-09	1.02E-11	1.30E-08	1.96E-10	6.86E-09	2.30E-11	5.96E-08	1.13E-09
CHRYSENE	6.08E-08	9.62E-08	2.05E-10	7.61E-08	4.27E-09	4.81E-08	9.99E-11	2.49E-07	1.24E-08
DIBENZ(A,H)ANTHRACENE	1.23E-09	3.41E-09	3.26E-12	4.72E-09	5.18E-11	1.71E-09	1.10E-10	2.26E-08	3.86E-09
INDENO(1,2,3-CD)PYRENE	1.64E-09	4.67E-09	3.43E-12	7.38E-09	4.32E-11	2.59E-09	1.21E-09	3.57E-08	1.92E-08
TOTAL PAH	5.60E-09	1.50E-05	1.05E-11	2.23E-05	7.21E-07	8.30E-09	1.46E-08	6.14E-05	9.70E-10
Volatiles									
BENZENE	3.41E-12	4.50E-13	1.08E-08	3.58E-11	2.67E-11	2.71E-10	5.53E-17	7.67E-11	NC
BROMOMETHANE	2.35E-13	1.83E-12	6.67E-09	2.11E-11	1.58E-10	2.72E-12	3.09E-17	5.95E-12	NC
1,3-BUTADIENE	1.69E-13	9.64E-09	5.69E-09	5.81E-07	5.95E-07	1.02E-11	8.76E-13	1.45E-07	NC
CARBON TETRACHLORIDE	9.55E-13	1.79E-14	2.32E-09	4.26E-12	4.43E-14	2.27E-10	5.28E-19	5.77E-11	NC
CHLOROFORM	6.10E-12	3.23E-13	7.17E-09	1.80E-11	2.22E-12	3.40E-10	3.18E-18	8.95E-11	NC
CHLOROMETHANE	2.38E-14	6.15E-08	6.08E-09	4.77E-07	5.99E-06	1.85E-13	7.22E-13	1.19E-07	NC
1,1-DICHLOROETHYLENE	3.08E-13	8.78E-11	2.39E-09	6.77E-09	5.22E-09	2.37E-11	1.04E-14	1.70E-09	NC
DICHLOROFLUOROMETHANE	9.37E-15	2.40E-12	8.06E-09	6.30E-11	1.71E-10	2.46E-13	9.14E-17	1.58E-11	NC
TRANS-1,3-DICHLOROPROPENE	1.25E-12	9.87E-13	2.54E-09	1.99E-11	7.43E-11	2.53E-11	2.88E-17	1.13E-11	NC
1,1,2,2-TETRACHLOROETHANE	4.59E-11	1.17E-11	2.86E-09	1.05E-07	2.22E-12	4.11E-07	2.37E-15	2.58E-07	NC
TRICHLOROFLUOROMETHANE	5.16E-13	1.48E-14	7.53E-09	2.47E-12	7.95E-13	8.62E-11	4.13E-18	2.22E-11	NC
VINYL CHLORIDE	7.73E-15	9.45E-10	6.73E-09	1.16E-08	1.89E-08	9.48E-14	3.99E-15	2.90E-09	NC
Dioxins									
2,3,7,8-TCDD TE									
2,3,7,8-TCDD (MAMMAL)	2.50E-10	5.23E-10	3.83E-13	1.64E-08	6.95E-12	7.86E-09	1.40E-12	8.51E-08	4.24E-11

Table E.6-1
Potential Risks to the Raccoon
Exclusive Diet Risk Calculations: Terrestrial Invertebrates, Herbivore, Omnivores, Terrestrial Plants, Wetland Invertebrates, Wetland Plants
Green Island
Norlite Facility
Cohoes, NY

CPEC	TRV (mg/kg_bw-day)	Potential Risk (HQ) for Exclusive Diets					
		Aquatic Invertebrates	Wetland Plant	Terrestrial Invertebrates	Herbivorous Mammal	Omnivorous Mammal	Terrestrial Plant
INORGANICS							
ANTIMONY	3.63E-02	6.59E-05	2.19E-05	2.92E-05	1.66E-05	3.21E-05	1.86E-05
ARSENIC	3.65E-02	1.19E-05	4.96E-06	6.58E-06	4.68E-06	6.97E-06	5.53E-06
BARIUM	2.93E+00	3.89E-07	1.19E-07	1.72E-07	9.52E-08	1.88E-07	1.13E-07
BERYLLIUM	3.56E-01	3.12E-06	7.44E-07	1.47E-06	7.31E-07	1.51E-06	7.44E-07
CADMIUM	5.20E-01	8.44E-06	9.22E-07	2.71E-06	5.64E-07	3.07E-06	8.18E-07
CHROMIUM	1.48E+03	1.39E-09	1.23E-09	1.27E-09	1.21E-09	1.27E-09	1.23E-09
CHROMIUM VI	1.77E+00	2.23E-08	2.00E-08	2.04E-08	1.98E-08	2.06E-08	2.30E-08
LEAD	4.32E+00	4.22E-07	3.16E-07	3.33E-07	2.92E-07	3.35E-07	3.03E-07
INORGANIC MERCURY	3.83E+00	1.17E-05	7.79E-06	8.60E-06	7.29E-06	1.09E-05	8.53E-06
METHYL MERCURY	1.73E-02	3.24E-02	2.63E-04	1.30E-03	2.01E-04	2.12E-02	2.70E-04
NICKEL	2.16E+01	2.88E-07	2.36E-07	2.41E-07	2.23E-07	2.44E-07	2.42E-07
SELENIUM	1.08E-01	2.61E-07	9.25E-08	1.33E-07	9.11E-08	1.44E-07	1.27E-07
SILVER	9.77E+00	5.80E-08	2.65E-08	2.78E-08	1.77E-08	3.03E-08	2.87E-08
THALLIUM	7.07E-03	2.49E-04	5.98E-05	1.11E-04	5.94E-05	1.20E-04	6.24E-05
ZINC	8.64E+01	1.17E-06	1.29E-07	4.10E-07	1.29E-07	4.60E-07	1.68E-07
ORGANICS							
Semivolatiles							
HEXACHLOROCYCLOPENTADIENE	2.05E+00	9.91E-05	1.18E-08	3.56E-06	1.09E-08	7.19E-05	1.12E-08
HEXACHLOROBUTADIENE	1.08E-01	8.60E-03	9.53E-07	2.03E-06	8.16E-07	4.73E-03	8.17E-07
2,4-DINITROTOLUENE	9.38E-01	6.53E-06	1.09E-06	2.21E-06	4.44E-07	2.41E-06	2.09E-06
2,6-DINITROTOLUENE	5.36E-01	1.24E-06	1.24E-06	5.76E-06	1.24E-06	2.37E-06	7.05E-06
HEXACHLOROBENZENE	8.64E-01	3.98E-07	5.61E-08	2.41E-03	5.62E-08	3.79E-03	8.46E-08
2-NITROANILINE	–	NC	NC	NC	NC	NC	NC
PENTACHLOROPHENOL	1.62E-01	4.50E-07	3.76E-07	4.06E-03	3.77E-07	3.65E-03	9.20E-07
BIS(2-ETHYLHEXYL)PHTHALATE	5.31E+00	1.67E-06	1.56E-06	3.99E-02	1.56E-06	4.19E-02	2.70E-06
BENZO(A)PYRENE	2.90E-02	1.27E-06	6.90E-07	1.02E-06	6.79E-07	3.26E-06	7.21E-07
BENZO(A)ANTHRACENE	4.84E-02	3.25E-07	2.44E-07	2.89E-07	2.37E-07	5.18E-07	2.63E-07
BENZO(B)FLUORANTHENE	2.90E-02	1.24E-05	6.77E-06	1.02E-05	6.68E-06	3.44E-05	7.01E-06
BENZO(K)FLUORANTHENE	2.90E-02	8.80E-07	4.39E-07	6.69E-07	4.33E-07	2.49E-06	4.72E-07
CHRYSENE	2.90E-02	8.04E-06	5.57E-06	7.08E-06	5.42E-06	1.40E-05	5.85E-06
DIBENZ(A,H)ANTHRACENE	1.08E-03	8.68E-06	4.35E-06	5.88E-06	4.40E-06	2.52E-05	7.88E-06
INDENO(1,2,3-CD)PYRENE	2.90E-02	4.72E-07	2.19E-07	3.07E-07	2.59E-07	1.45E-06	8.79E-07
TOTAL PAH	2.90E-01	1.29E-04	5.43E-05	5.19E-05	5.19E-05	2.64E-04	5.19E-05
Volatiles							
BENZENE	7.64E+00	1.42E-09	1.42E-09	1.45E-09	1.42E-09	1.43E-09	NC
BROMOMETHANE	–	NC	NC	NC	NC	NC	NC
1,3-BUTADIENE	–	NC	NC	NC	NC	NC	NC
CARBON TETRACHLORIDE	8.64E+00	2.69E-10	2.68E-10	2.94E-10	2.68E-10	2.75E-10	NC
CHLOROFORM	8.10E+00	8.88E-10	8.86E-10	9.28E-10	8.86E-10	8.97E-10	NC
CHLOROMETHANE	–	NC	NC	NC	NC	NC	NC
1,1-DICHLOROETHYLENE	1.62E+01	5.71E-10	4.75E-10	1.54E-10	1.53E-10	2.58E-10	NC
DICHLOROFLUOROMETHANE	–	NC	NC	NC	NC	NC	NC
TRANS-1,3-DICHLOROPROPENE	–	NC	NC	NC	NC	NC	NC
1,1,2,2-TETRACHLOROETHANE	4.06E-01	2.65E-07	7.20E-09	1.02E-06	7.19E-09	6.43E-07	NC
TRICHLOROFLUOROMETHANE	–	NC	NC	NC	NC	NC	NC
VINYL CHLORIDE	9.18E-02	2.10E-07	2.89E-07	8.36E-08	8.36E-08	1.15E-07	NC
Dioxins							
2,3,7,8-TCDD TE							
2,3,7,8-TCDD (MAMMAL)	5.40E-07	3.19E-02	1.44E-03	1.60E-02	1.43E-03	1.59E-01	1.51E-03

Table E.6-2
Potential Risks to the Short-Tailed Shrew
Exclusive Diet Risk Calculations: Terrestrial Invertebrates, Terrestrial Plants, Wetland Invertebrates, Wetland Plants
Green Island
Norlite Facility
Cohoes, NY

CPEC	Site Concentrations						
	Surface Soil (mg/kg$_{dw}$)	Sediment (mg/kg$_{dw}$)	Surface Water (mg/L)	Wetland Invertebrate (mg/kg$_{ww}$)	Wetland Plant (mg/kg$_{ww}$)	Terrestrial Invertebrate (mg/kg$_{ww}$)	Terrestrial Plant (mg/kg$_{ww}$)
INORGANICS							
ANTIMONY	7.92E-06	3.08E-05	8.57E-07	6.78E-06	7.39E-07	1.74E-06	2.84E-07
ARSENIC	2.40E-06	9.15E-06	1.71E-07	1.01E-06	3.95E-08	2.64E-07	1.18E-07
BARIUM	3.88E-06	1.49E-05	3.02E-07	3.27E-06	2.67E-07	8.54E-07	2.01E-07
BERYLLIUM	4.57E-06	1.47E-05	3.78E-08	3.23E-06	1.76E-08	1.00E-06	1.78E-08
CADMIUM	4.40E-06	1.62E-05	1.95E-07	1.55E-05	7.06E-07	4.23E-06	5.00E-07
CHROMIUM	3.23E-05	1.02E-04	4.46E-09	1.02E-06	9.16E-08	3.23E-07	1.27E-07
CHROMIUM VI	4.29E-07	1.69E-06	6.97E-08	1.69E-08	1.52E-09	4.29E-09	2.14E-08
LEAD	2.22E-05	7.12E-05	1.70E-07	2.13E-06	3.84E-07	6.66E-07	1.77E-07
INORGANIC MERCURY	4.77E-04	1.61E-03	1.70E-07	6.46E-05	7.26E-06	1.91E-05	1.80E-05
METHYL MERCURY	8.48E-06	2.48E-04	4.54E-07	2.11E-03	4.08E-06	7.21E-05	4.52E-06
NICKEL	7.11E-05	2.64E-04	3.59E-06	5.28E-06	1.01E-06	1.42E-06	1.51E-06
SELENIUM	7.87E-08	3.16E-07	4.67E-08	6.96E-08	6.07E-10	1.73E-08	1.48E-08
SILVER	1.70E-06	6.79E-06	6.16E-07	1.49E-06	3.26E-07	3.73E-07	4.08E-07
THALLIUM	6.26E-06	2.31E-05	2.91E-07	5.08E-06	1.11E-08	1.38E-06	8.09E-08
ZINC	1.64E-04	6.11E-04	8.64E-06	3.42E-04	8.80E-17	9.18E-05	1.25E-05
ORGANICS							
Semivolatiles							
HEXACHLOROCYCLOPENTADIENE	3.70E-08	1.03E-06	8.36E-08	7.71E-04	7.02E-09	2.76E-05	2.21E-09
HEXACHLOROBUTADIENE	9.25E-10	6.58E-06	4.14E-09	3.52E-03	5.61E-08	4.95E-07	6.89E-11
2,4-DINITROTOLUENE	2.04E-06	7.03E-06	3.03E-06	2.17E-05	2.29E-06	6.29E-06	5.84E-06
2,6-DINITROTOLUENE	3.67E-06	3.42E-12	6.29E-06	8.57E-12	1.29E-12	9.20E-06	1.18E-05
HEXACHLOROBENZENE	3.44E-06	4.89E-10	2.63E-08	1.12E-06	1.53E-12	7.88E-03	9.33E-08
2-NITROANILINE	5.41E-07	3.91E-06	8.71E-07	9.14E-06	1.55E-06	1.27E-06	1.83E-06
PENTACHLOROPHENOL	2.41E-06	4.42E-11	2.95E-07	4.57E-08	2.38E-13	2.49E-03	3.34E-07
BIS(2-ETHYLHEXYL)PHTHALATE	6.15E-04	1.77E-09	5.31E-07	2.31E-06	8.07E-12	8.03E-01	2.31E-05
BENZO(A)PYRENE	5.42E-07	9.32E-07	1.38E-10	6.53E-08	1.23E-09	3.79E-08	4.74E-09
BENZO(A)ANTHRACENE	3.20E-07	5.38E-07	1.50E-10	1.62E-08	1.31E-09	9.61E-09	4.74E-09
BENZO(B)FLUORANTHENE	5.56E-06	8.94E-06	1.21E-09	6.26E-07	1.08E-08	3.89E-07	3.70E-08
BENZO(K)FLUORANTHENE	3.25E-07	6.14E-07	1.05E-10	4.91E-08	7.45E-10	2.60E-08	4.30E-09
CHRYSENE	4.56E-06	7.21E-06	2.10E-09	2.88E-07	1.62E-08	1.82E-07	4.71E-08
DIBENZ(A,H)ANTHRACENE	9.24E-08	2.56E-07	3.34E-11	1.79E-08	1.96E-10	6.47E-09	1.46E-08
INDENO(1,2,3-CD)PYRENE	1.23E-07	3.50E-07	3.51E-11	2.80E-08	1.64E-10	9.84E-09	7.28E-08
TOTAL PAH	4.20E-07	1.13E-03	1.07E-10	8.45E-05	2.73E-06	3.15E-08	3.68E-09
Volatiles							
BENZENE	2.55E-10	3.38E-11	1.11E-07	1.36E-10	1.01E-10	1.03E-09	–
BROMOMETHANE	1.76E-11	1.37E-10	6.83E-08	8.00E-11	5.98E-10	1.03E-11	–
1,3-BUTADIENE	1.27E-11	7.23E-07	5.82E-08	2.20E-06	2.26E-06	3.86E-11	–
CARBON TETRACHLORIDE	7.16E-11	1.34E-12	2.37E-08	1.61E-11	1.68E-13	8.59E-10	–
CHLOROFORM	4.57E-10	2.42E-11	7.34E-08	6.84E-11	8.44E-12	1.29E-09	–
CHLOROMETHANE	1.79E-12	4.61E-06	6.23E-08	1.81E-06	2.27E-05	7.01E-13	–
1,1-DICHLOROETHYLENE	2.31E-11	6.58E-09	2.45E-08	2.57E-08	1.98E-08	9.00E-11	–
DICHLOROFLUOROMETHANE	7.03E-13	1.80E-10	8.26E-08	2.39E-10	6.48E-10	9.34E-13	–
TRANS-1,3-DICHLOROPROPENE	9.39E-11	7.40E-11	2.60E-08	7.55E-11	2.82E-10	9.58E-11	–
1,1,2,2-TETRACHLOROETHANE	3.44E-09	8.75E-10	2.93E-08	3.97E-07	8.40E-12	1.56E-06	–
TRICHLOROFLUOROMETHANE	3.87E-11	1.11E-12	7.71E-08	9.37E-12	3.01E-12	3.27E-10	–
VINYL CHLORIDE	5.80E-13	7.08E-08	6.89E-08	4.39E-08	7.17E-08	3.59E-13	–
Dioxins							
2,3,7,8-TCDD TE							
2,3,7,8-TCDD (MAMMAL)	1.87E-08	3.92E-08	3.92E-12	6.23E-08	2.64E-11	2.98E-08	1.61E-10

– TRV not available.
The hazard quotient (HQ) is the TRV divided by the sum of potential daily dose from abiotic media and prey item.
NC = Not calculated

Table E.6-2
Potential Risks to the Short-Tailed Shrew
Exclusive Diet Risk Calculations: Terrestrial Invertebrates, Terrestrial Plants, Wetland Invertebrates, Wetland Plants
Green Island
Norlite Facility
Cohoes, NY

CPEC	Potential Daily Dose (mg/kg-day)						
	Surface Soil	Sediment	Surface Water	Wetland Invertebrates	Wetland Plant	Terrestrial Invertebrates	Terrestrial Plant
INORGANICS							
ANTIMONY	5.39E-08	2.09E-07	1.91E-07	4.20E-06	4.58E-07	1.08E-06	1.76E-07
ARSENIC	1.63E-08	6.22E-08	3.82E-08	6.24E-07	2.45E-08	1.64E-07	7.31E-08
BARIUM	2.64E-08	1.01E-07	6.73E-08	2.03E-06	1.66E-07	5.30E-07	1.24E-07
BERYLLIUM	3.11E-08	9.98E-08	8.43E-09	2.00E-06	1.09E-08	6.23E-07	1.10E-08
CADMIUM	2.99E-08	1.10E-07	4.35E-08	9.62E-06	4.38E-07	2.62E-06	3.10E-07
CHROMIUM	2.20E-07	6.92E-07	9.95E-10	6.31E-07	5.68E-08	2.00E-07	7.88E-08
CHROMIUM VI	2.91E-09	1.15E-08	1.55E-08	1.05E-08	9.43E-10	2.66E-09	1.33E-08
LEAD	1.51E-07	4.84E-07	3.79E-08	1.32E-06	2.38E-07	4.13E-07	1.10E-07
INORGANIC MERCURY	3.24E-06	1.10E-05	3.78E-08	4.00E-05	4.50E-06	1.18E-05	1.12E-05
METHYL MERCURY	5.77E-08	1.69E-06	1.01E-07	1.31E-03	2.53E-06	4.47E-05	2.80E-06
NICKEL	4.83E-07	1.80E-06	8.00E-07	3.27E-06	6.29E-07	8.82E-07	9.38E-07
SELENIUM	5.35E-10	2.15E-09	1.04E-08	4.31E-08	3.76E-10	1.07E-08	9.17E-09
SILVER	1.15E-08	4.61E-08	1.37E-07	9.26E-07	2.02E-07	2.31E-07	2.53E-07
THALLIUM	4.25E-08	1.57E-07	6.50E-08	3.15E-06	6.87E-09	8.53E-07	5.01E-08
ZINC	1.11E-06	4.15E-06	1.93E-06	2.12E-04	5.45E-17	5.69E-05	7.77E-06
ORGANICS							
Semivolatiles							
HEXACHLOROCYCLOPENTADIENE	2.52E-10	7.04E-09	1.87E-08	4.78E-04	4.35E-09	1.71E-05	1.37E-09
HEXACHLOROBUTADIENE	6.29E-12	4.47E-08	9.22E-10	2.18E-03	3.48E-08	3.07E-07	4.27E-11
2,4-DINITROTOLUENE	1.39E-08	4.78E-08	6.76E-07	1.34E-05	1.42E-06	3.90E-06	3.62E-06
2,6-DINITROTOLUENE	2.50E-08	2.33E-14	1.40E-06	5.31E-12	8.01E-13	5.70E-06	7.33E-06
HEXACHLOROBENZENE	2.34E-08	3.32E-12	5.87E-09	6.95E-07	9.46E-13	4.89E-03	5.79E-08
2-NITROANILINE	3.68E-09	2.66E-08	1.94E-07	5.67E-06	9.60E-07	7.84E-07	1.14E-06
PENTACHLOROPHENOL	1.64E-08	3.00E-13	6.58E-08	2.83E-08	1.48E-13	1.54E-03	2.07E-07
BIS(2-ETHYLHEXYL)PHTHALATE	4.18E-06	1.20E-11	1.18E-07	1.43E-06	5.00E-12	4.98E-01	1.43E-05
BENZO(A)PYRENE	3.68E-09	6.34E-09	3.09E-11	4.05E-08	7.63E-10	2.35E-08	2.94E-09
BENZO(A)ANTHRACENE	2.18E-09	3.66E-09	3.35E-11	1.00E-08	8.09E-10	5.96E-09	2.94E-09
BENZO(B)FLUORANTHENE	3.78E-08	6.08E-08	2.70E-10	3.88E-07	6.72E-09	2.41E-07	2.30E-08
BENZO(K)FLUORANTHENE	2.21E-09	4.18E-09	2.33E-11	3.05E-08	4.62E-10	1.61E-08	2.66E-09
CHRYSENE	3.10E-08	4.90E-08	4.67E-10	1.79E-07	1.00E-08	1.13E-07	2.92E-08
DIBENZ(A,H)ANTHRACENE	6.28E-10	1.74E-09	7.44E-12	1.11E-08	1.22E-10	4.01E-09	9.08E-09
INDENO(1,2,3-CD)PYRENE	8.36E-10	2.38E-09	7.83E-12	1.74E-08	1.02E-10	6.10E-09	4.51E-08
TOTAL PAH	2.85E-09	7.66E-06	2.39E-11	5.24E-05	1.69E-06	1.95E-08	2.28E-09
Volatiles							
BENZENE	1.74E-12	2.30E-13	2.47E-08	8.42E-11	6.27E-11	6.37E-10	NC
BROMOMETHANE	1.20E-13	9.32E-13	1.52E-08	4.96E-11	3.71E-10	6.39E-12	NC
1,3-BUTADIENE	8.61E-14	4.91E-09	1.30E-08	1.37E-06	1.40E-06	2.39E-11	NC
CARBON TETRACHLORIDE	4.87E-13	9.14E-15	5.29E-09	1.00E-11	1.04E-13	5.33E-10	NC
CHLOROFORM	3.11E-12	1.65E-13	1.64E-08	4.24E-11	5.23E-12	7.99E-10	NC
CHLOROMETHANE	1.22E-14	3.13E-08	1.39E-08	1.12E-06	1.41E-05	4.35E-13	NC
1,1-DICHLOROETHYLENE	1.57E-13	4.48E-11	5.45E-09	1.59E-08	1.23E-08	5.58E-11	NC
DICHLOROFLUOROMETHANE	4.78E-15	1.22E-12	1.84E-08	1.48E-10	4.02E-10	5.79E-13	NC
TRANS-1,3-DICHLOROPROPENE	6.39E-13	5.03E-13	5.80E-09	4.68E-11	1.75E-10	5.94E-11	NC
1,1,2,2-TETRACHLOROETHANE	2.34E-11	5.95E-12	6.54E-09	2.46E-07	5.21E-12	9.67E-07	NC
TRICHLOROFLUOROMETHANE	2.63E-13	7.54E-15	1.72E-08	5.81E-12	1.87E-12	2.03E-10	NC
VINYL CHLORIDE	3.94E-15	4.82E-10	1.54E-08	2.72E-08	4.44E-08	2.23E-13	NC
Dioxins							
2,3,7,8-TCDD TE							
2,3,7,8-TCDD (MAMMAL)	1.27E-10	2.67E-10	8.74E-13	3.87E-08	1.63E-11	1.85E-08	9.96E-11

Table E.6-2
Potential Risks to the Short-Tailed Shrew
Exclusive Diet Risk Calculations: Terrestrial Invertebrates, Terrestrial Plants, Wetland Invertebrates, Wetland Plants
Green Island
Norlite Facility
Cohoes, NY

CPEC	TRV (mg/kg$_{bw}$-day)	Potential Risk (HQ) for Exclusive Diets			
		Aquatic Invertebrates	Wetland Plant	Terrestrial Invertebrates	Terrestrial Plant
INORGANICS					
ANTIMONY	1.49E-01	3.13E-05	6.14E-06	1.03E-05	4.24E-06
ARSENIC	5.42E-02	1.37E-05	2.61E-06	5.18E-06	3.50E-06
BARIUM	4.25E+00	5.23E-07	8.48E-08	1.70E-07	7.51E-08
BERYLLIUM	5.28E-01	4.06E-06	2.84E-07	1.44E-06	2.85E-07
CADMIUM	7.70E-01	1.27E-05	8.07E-07	3.64E-06	6.41E-07
CHROMIUM	2.19E+03	7.05E-10	4.43E-10	5.09E-10	4.53E-10
CHROMIUM VI	2.62E+00	1.54E-08	1.18E-08	1.24E-08	1.65E-08
LEAD	6.40E+00	3.12E-07	1.42E-07	1.70E-07	1.22E-07
INORGANIC MERCURY	5.68E+00	9.56E-06	3.30E-06	4.60E-06	4.48E-06
METHYL MERCURY	2.56E-02	5.11E-02	1.71E-04	1.82E-03	1.82E-04
NICKEL	3.20E+01	1.99E-07	1.16E-07	1.24E-07	1.26E-07
SELENIUM	1.60E-01	3.52E-07	8.43E-08	1.49E-07	1.39E-07
SILVER	1.45E+01	7.74E-08	2.74E-08	2.95E-08	3.09E-08
THALLIUM	1.05E-02	3.26E-04	2.59E-05	1.07E-04	3.00E-05
ZINC	1.28E+02	1.71E-06	5.62E-08	5.01E-07	1.17E-07
ORGANICS					
Semivolatiles					
HEXACHLOROCYCLOPENTADIENE	3.04E+00	1.57E-04	9.96E-09	5.63E-06	8.98E-09
HEXACHLOROBUTADIENE	1.60E-01	1.37E-02	5.03E-07	2.20E-06	2.86E-07
2,4-DINITROTOLUENE	1.37E+00	1.04E-05	1.58E-06	3.40E-06	3.19E-06
2,6-DINITROTOLUENE	7.80E-01	1.83E-06	1.83E-06	9.14E-06	1.12E-05
HEXACHLOROBENZENE	1.28E+00	5.65E-07	2.29E-08	3.82E-03	6.81E-08
2-NITROANILINE	--	NC	NC	NC	NC
PENTACHLOROPHENOL	2.40E-01	4.60E-07	3.42E-07	6.43E-03	1.21E-06
BIS(2-ETHYLHEXYL)PHTHALATE	7.87E+00	7.29E-07	5.46E-07	6.33E-02	2.37E-06
BENZO(A)PYRENE	4.30E-02	1.17E-06	2.52E-07	7.80E-07	3.02E-07
BENZO(A)ANTHRACENE	7.18E-02	2.21E-07	9.30E-08	1.65E-07	1.23E-07
BENZO(B)FLUORANTHENE	4.30E-02	1.13E-05	2.46E-06	7.91E-06	2.83E-06
BENZO(K)FLUORANTHENE	4.30E-02	8.58E-07	1.60E-07	5.24E-07	2.11E-07
CHRYSENE	4.30E-02	6.03E-06	2.11E-06	4.50E-06	2.55E-06
DIBENZ(A,H)ANTHRACENE	1.60E-03	8.42E-06	1.56E-06	3.99E-06	7.16E-06
INDENO(1,2,3-CD)PYRENE	4.30E-02	4.79E-07	7.73E-08	2.17E-07	1.12E-06
TOTAL PAH	4.30E-01	1.40E-04	2.18E-05	1.79E-05	1.78E-05
Volatiles					
BENZENE	1.13E+01	2.19E-09	2.19E-09	2.24E-09	NC
BROMOMETHANE	--	NC	NC	NC	NC
1,3-BUTADIENE	--	NC	NC	NC	NC
CARBON TETRACHLORIDE	1.28E+01	4.14E-10	4.13E-10	4.55E-10	NC
CHLOROFORM	1.20E+01	1.37E-09	1.37E-09	1.43E-09	NC
CHLOROMETHANE	--	NC	NC	NC	NC
1,1-DICHLOROETHYLENE	2.40E+01	8.92E-10	7.41E-10	2.31E-10	NC
DICHLOROFLUOROMETHANE	--	NC	NC	NC	NC
TRANS-1,3-DICHLOROPROPENE	--	NC	NC	NC	NC
1,1,2,2-TETRACHLOROETHANE	6.02E-01	4.20E-07	1.09E-08	1.62E-06	NC
TRICHLOROFLUOROMETHANE	--	NC	NC	NC	NC
VINYL CHLORIDE	1.36E-01	3.17E-07	4.43E-07	1.16E-07	NC
Dioxins					
2,3,7,8-TCDD TE					
2,3,7,8-TCDD (MAMMAL)	8.00E-07	4.88E-02	5.14E-04	2.36E-02	6.18E-04

Appendix F

Correspondence Regarding Threatened and Endangered Species for SLERA

ENSR
Consulting • Engineering • Remediation

35 Nagog Park
Acton, MA 01720
(508) 635-9500
FAX (508) 635-9180

October 15, 1999

Paul Nickerson
U.S. Fish and Wildlife Service
Division of Endangered Species, Region 5
300 Westgate Center Drive
Hadley, MA 01035

RE: Endangered, Threatened, Proposed, and Candidate Species in the Vicinity of the Norlite Corporation Manufacturing Facility, Cohoes, NY

Dear Mr. Nickerson:

On behalf of Norlite Corporation Manufacturing Facility (Norlite), ENSR hereby requests information regarding the occurrence and distribution of federally-listed and proposed, endangered or threatened floral and faunal species in the vicinity of the Norlite site located at 628 S. Saratoga St., Cohoes, New York. This information is sought in support of site investigation activities. A copy of the USGS topographic quadrangle with the site location has been provided for your use.

If you have any questions, please do not hesitate to contact me at (978) 635-9500 x3418. Thank you for your attention to this request.

Very truly yours,
ENSR

Stephanie Kelly
Biologist

Attachment

ENSR.

Consulting • Engineering • Remediation

35 Nagog Park
Acton, MA 01720
(508) 635-9500
FAX (508) 635-9180
http://www.ensr.com

October 15, 1999

Steven Schassler
Office of Fish, Wildlife and Marine Resources
Region 4
1150 North Westcott Road
Schenectady, NY 12306-2014

RE: State-Listed Rare Species in the Vicinity of the Norlite Corporation Manufacturing Facility, Cohoes, NY

Dear Mr. Schassler:

On behalf of Norlite Corporation Manufacturing Facility (Norlite), ENSR hereby requests information regarding the occurrence and distribution of state-listed rare floral and faunal species in the vicinity of the Norlite site located at 628 S. Saratoga St., Cohoes, New York. This information is sought in support of site investigation activities. A copy of the USGS topographic quadrangle with the site location has been provided for your use.

If you have any questions, please do not hesitate to contact me at (978) 635-9500 x3418. Thank you for your attention to this request.

Very truly yours,
ENSR

Stephanie Kelly
Biologist

Attachment

New York State Department of Environmental Conservation
eedom of Information Office, Region 4
50 North Westcott Road, Schenectady, New York 12306-2014
none: (518) 357-2046 • **FAX:** (518) 357-2291
Website: www.dec.state.ny.us

John P. Cahill
Commissioner

October 25, 1999

Ms. Stephanie Kelly
ENSR
35 Nagog Park
Acton Latham MA 01720

Dear Ms. Kelly:

I am in receipt of your Freedom of Information request No. **99-232** regarding **Norlite Corporation Manufacturing Facility.**

D.E.C. staff are searching the files for the records and anticipate, but do not guarantee, providing you with all or some of the records on or about November 27, 1999.

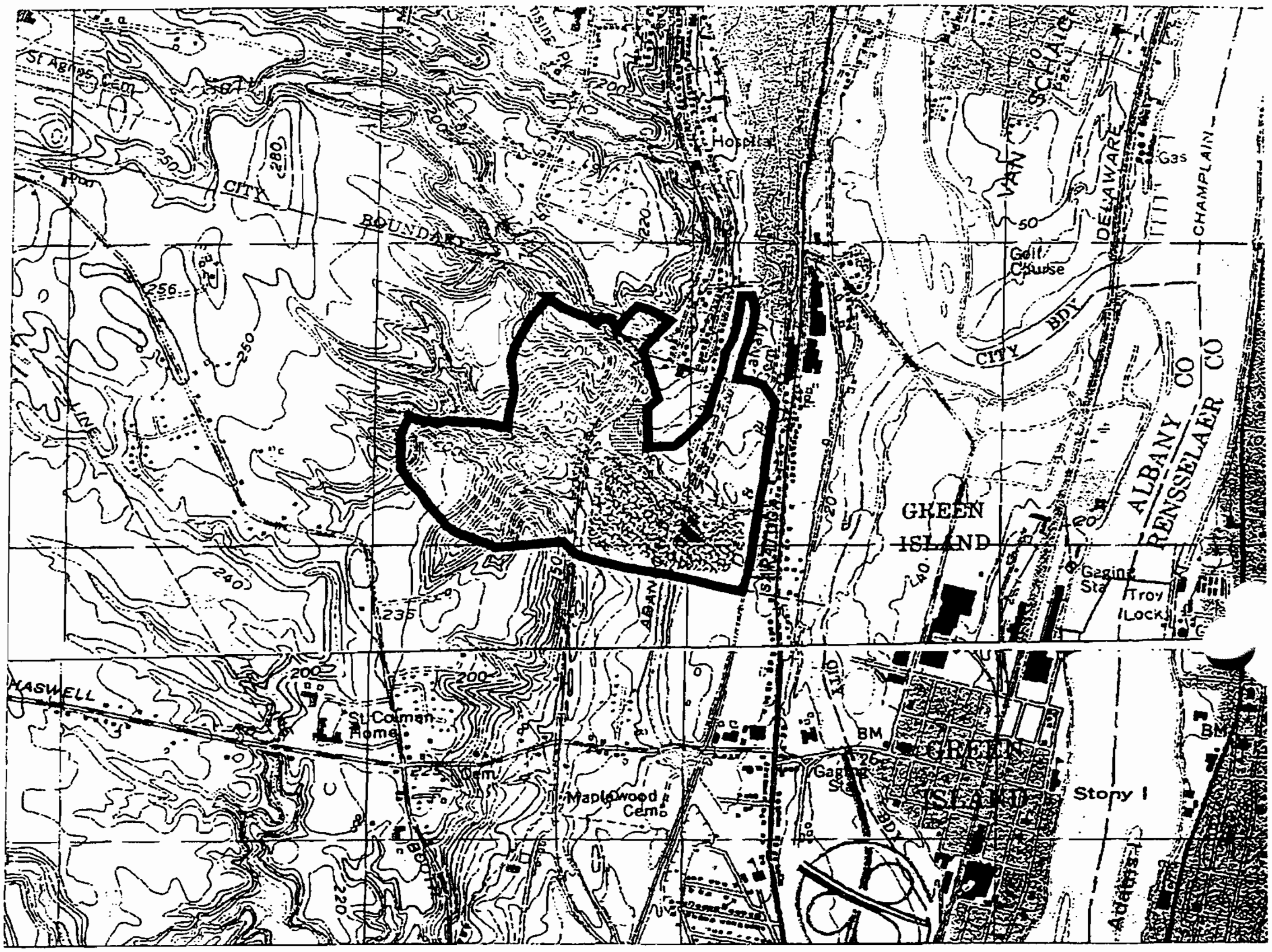
Please call Toni Mauceri at the number above on that date to determine whether the files are ready for your review. Upon completion of our search, you may schedule an appointment to review information provided within the availabilty period of 30 days. Files are then generally returned to the respective DEC programs at the end of the 30-day period.

Sincerely,

Tamara Donlon / TM

Tamara A. Donlon
F.O.I.L. Coordinator

□



Troy North and Troy South Quadrangl

0 0.3 0.6 0.9 **Kilometers**

Scale: 1:24,000

Site

Norlite Stacks

N

Figure 2-2

Norlite Facility Location

United States Department of the Interior

FISH AND WILDLIFE SERVICE
3817 Luker Road
Cortland, NY 13045

November 3, 1999

Ms. Stephanie Kelly
Biologist
ENSR
35 Nagog Park
Acton, MA 01720

Dear Ms. Kelly:

This responds to your letter of October 15, 1999, requesting information on the presence of Federally listed or proposed endangered or threatened species in the vicinity of the Norlite Corporation Manufacturing Facility in the Town of Cohoes, Albany County, New York.

Except for occasional transient individuals, no Federally listed or proposed endangered or threatened species under our jurisdiction are known to exist in the project impact area. Therefore, no Biological Assessment or further Section 7 consultation under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) is required with the U.S. Fish and Wildlife Service (Service). Should project plans change, or if additional information on listed or proposed species becomes available, this determination may be reconsidered. A compilation of Federally listed and proposed endangered and threatened species in New York is enclosed for your information.

The above comments pertaining to endangered species under our jurisdiction are provided pursuant to the Endangered Species Act. This response does not preclude additional Service comments under the Fish and Wildlife Coordination Act or other legislation.

For additional information on fish and wildlife resources or State-listed species, we suggest you contact:

New York State Department of
Environmental Conservation
Region 4
1150 N. Westcott Road
Schenectady, NY 12306
(518) 357-2066

New York State Department of
Environmental Conservation
Wildlife Resources Center - Information Services
New York Natural Heritage Program
700 Troy-Schenectady Road
Latham, NY 12110-2400
(518) 783-3932

National Wetlands Inventory (NWI) maps may or may not be available for the project area. However, while the NWI maps are reasonably accurate, they should not be used in lieu of field surveys for determining the presence of wetlands or delineating wetland boundaries for Federal regulatory purposes. Copies of specific NWI maps can be obtained from:

Cornell Institute for Resource Information Systems
302 Rice Hall
Cornell University
Ithaca, NY 14853
(607) 255-4864

Work in certain waters and wetlands of the United States may require a permit from the U.S. Army Corps of Engineers (Corps). If a permit is required, in reviewing the application pursuant to the Fish and Wildlife Coordination Act, the Service may concur, with or without stipulations, or recommend denial of the permit depending upon the potential adverse impacts on fish and wildlife resources associated with project implementation. The need for a Corps permit may be determined by contacting Mr. Joseph Seebode, Chief, Regulatory Branch, U.S. Army Corps of Engineers, 26 Federal Plaza, New York, NY 10278 (telephone: [212] 264-3996).

If you require additional information please contact Michael Stoll at (607) 753-9334.

Sincerely,
Mark W. Clough
ACTING FOR

David A. Stilwell
Field Supervisor

Enclosure

cc: NYSDEC, Schenectady, NY (Environmental Permits)
NYSDEC, Latham, NY
COE, New York, NY

FEDERALLY LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES IN NEW YORK

Common Name	Scientific Name	Status	Distribution
FISHES			
Sturgeon, shortnose*	*Acipenser brevirostrum*	E	Hudson River & other Atlantic coastal rivers
REPTILES			
Turtle, bog	*Clemmys muhlenbergii*	T	Albany, Columbia, Dutchess, Genesee, Orange, Oswego, Putnam, Seneca, Ulster, Wayne, and Westchester Counties
Turtle, green*	*Chelonia mydas*	T	Oceanic summer visitor coastal waters
Turtle, hawksbill*	*Eretmochelys imbricata*	E	Oceanic summer visitor coastal waters
Turtle, leatherback*	*Dermochelys coriacea*	E	Oceanic summer resident coastal waters
Turtle, loggerhead*	*Caretta caretta*	T	Oceanic summer resident coastal waters
Turtle, Atlantic ridley*	*Lepidochelys kempii*	E	Oceanic summer resident coastal waters
BIRDS			
Eagle, bald	*Haliaeetus leucocephalus*	T	Entire state
Plover, piping	*Charadrius melodus*	E	Great Lakes Watershed
		T	Remainder of coastal New York
Tern, roseate	*Sterna dougallii dougallii*	E	Southeastern coastal portions of state
MAMMALS			
Bat, Indiana	*Myotis sodalis*	E	Entire state
Cougar, eastern	*Felis concolor couguar*	E	Entire state - probably extinct
Whale, blue*	*Balaenoptera musculus*	E	Oceanic
Whale, finback*	*Balaenoptera physalus*	E	Oceanic
Whale, humpback*	*Megaptera novaeangliae*	E	Oceanic
Whale, right*	*Eubalaena glacialis*	E	Oceanic
Whale, sei*	*Balaenoptera borealis*	E	Oceanic
Whale, sperm*	*Physeter catodon*	E	Oceanic
MOLLUSKS			
Snail, Chittenango ovate amber	*Succinea chittenangoensis*	T	Madison County
Mussel, dwarf wedge	*Alasmidonta heterodon*	E	Orange County - lower Neversink River
BUTTERFLIES			
Butterfly, Karner blue	*Lycaeides melissa samuelis*	E	Albany, Saratoga, Warren, and Schenectady Counties

Except for sea turtle nesting habitat, principal responsibility for these species is vested with the National Marine Fisheries Service.

FEDERALLY LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES IN NEW YORK (Cont'd)

Common Name	Scientific Name	Status	Distribution
PLANTS			
Monkshood, northern wild	*Aconitum noveboracense*	T	Ulster, Sullivan, and Delaware Counties
Pogonia, small whorled	*Isotria medeoloides*	T	Entire state
Swamp pink	*Helonias bullata*	T	Staten Island - presumed extirpated
Gerardia, sandplain	*Agalinis acuta*	E	Nassau and Suffolk Counties
Fern, American hart's-tongue	*Asplenium scolopendrium* var. *americana*	T	Onondaga and Madison Counties
Orchid, eastern prairie fringed	*Platanthera leucophea*	T	Not relocated in New York
Bulrush, northeastern	*Scirpus ancistrochaetus*	E	Not relocated in New York
Roseroot, Leedy's	*Sedum integrifolium* ssp. *Leedyi*	T	West shore of Seneca Lake
Amaranth, seabeach	*Amaranthus pumilus*	T	Atlantic coastal plain beaches
Goldenrod, Houghton's	*Solidago houghtonii*	T	Genesee County

E=endangered T=threatened P=proposed

New York State Department of Environmental Conservation
Freedom of Information Office, Region 4
150 North Westcott Road, Schenectady, New York 12306-2014
Phone: (518) 357-2046 • FAX: (518) 357-2291
Website: www.dec.state.ny.us

John P. Cahill
Commissioner

October 25, 1999

Ms. Stephanie Kelly
ENSR
35 Nagog Park
Acton Latham MA 01720

Dear Ms. Kelly:

I am in receipt of your Freedom of Information request No. **99-232** regarding **Norlite Corporation Manufacturing Facility**.

D.E.C. staff are searching the files for the records and anticipate, but do not guarantee, providing you with all or some of the records on or about November 27, 1999.

Please call Toni Mauceri at the number above on that date to determine whether the files are ready for your review. Upon completion of our search, you may schedule an appointment to review information provided within the availabilty period of 30 days. Files are then generally returned to the respective DEC programs at the end of the 30-day period.

Sincerely,

Tamara Donlon /TM

Tamara A. Donlon
F.O.I.L. Coordinator

Natural Heritage Report on Rare Species and Ecological Communities

Prepared 27 March 2001 by NY Natural Heritage Program, NYS DEC, Latham, New York

This report contains SENSITIVE information that should be treated in a sensitive manner -- Please see cover letter. Refer to the Users' Guide for explanations of codes, ranks, and fields. We do not always provide maps of locations of species most vulnerable to disturbance, nor of some records whose locations and/or extents are not precisely known or are too large to display.

* County
** Town

Scientific Name, COMMON NAME, & Group Name	NY Legal Status, Heritage Ranks, & Federal Status	EO Rank, Last Seen, & Acreage	Detailed Location	General Habitat and Quality	Office Use
* ALBANY					
** BETHLEHEM, NEW SCOTLAND					
Ammodramus henslowii HENSLOW'S SPARROW Bird	THREATENED G4; S3B,SAN	E 1980 0.00	BETHLEHEM (BETHLEHEM).		4207357 ESU

1 Records Processed

USERS GUIDE TO NY NATURAL HERITAGE DATA

New York Natural Heritage Program, 700 Troy-Schenectady Road, Latham NY 12110-2400 phone: (518) 783-3932

TURAL HERITAGE PROGRAM: The Natural Heritage Program is an ongoing, systematic, scientific inventory whose goal is to compile and maintain a on the rare plants and animals native to New York State, and significant ecological communities. The data provided in the report facilitate sound nning, conservation, and natural resource management and help to conserve the plants, animals and ecological communities that represent New York's natural heritage.

DATA SENSITIVITY: The data provided in the report are ecologically sensitive and should be treated in a sensitive manner. The report is for your in-house use and should not be released, distributed or incorporated in a public document without prior permission from the Natural Heritage Program.

NATURAL HERITAGE REPORTS (may contain any of the following types of data):

COUNTY NAME: County where the occurrence of a rare species or significant ecological community is located.

TOWN NAME: Town where the occurrence of a rare species or significant ecological community is located.

USGS 7 ½' TOPOGRAPHIC MAP: Name of 7.5 minute US Geological Survey (USGS) quadrangle map (scale 1:24,000).

LAT: Centrum latitude coordinate of the location of the occurrence. Caution: latitude & longitude must be used with PRECISION (e.g. the location of an occurrence with M (minute) precision is not precisely known & is thought to occur within a 1.5 mile radius of the latitude/longitude coordinates).

LONG: Centrum longitude coordinate of the location of the occurrence. See also LAT above.

PRECISION: S - seconds: location known precisely. (within a 300' or 1-second radius of the latitude and longitude given.
M - minutes: location known only to within a 1.5 mile (1 minute) radius of the latitude and longitude given.
G - general: location known to within a 5 mile radius of the latitude and longitude given.

SIZE (acres): Approximate acres occupied by the rare species or significant ecological community at this location. A blank indicates unknown size.

SCIENTIFIC NAME: Scientific name of the occurrence of a rare species or significant ecological community.

COMMON NAME: Common name of the occurrence of a rare species or significant ecological community.

ELEMENT TYPE: Type of element (i.e. plant, animal, significant ecological community, other, etc.)

LAST SEEN: Year rare species or significant ecological community last observed extant at this location.

EO RANK: Comparative evaluation summarizing the quality, condition, viability and defensibility of this occurrence. Use with LAST SEEN and PRECISION.

- A-E = Extant: A=excellent, B=good, C=marginal, D=poor, E=extant but with insufficient data to assign a rank of A - D.
- F = Failed to find. Did not locate species, but habitat is still there and further field work is justified.
- H = Historical. Historical occurrence without any recent field information.
- X = Extirpated. Field/other data indicates element/habitat is destroyed and the element no longer exists at this location.
- ? = Unknown.
- Blank = Not assigned.

NEW YORK STATE STATUS (animals): Categories of Endangered and Threatened species are defined in New York State Environmental Conservation Law section 11-0535. Endangered, Threatened, and Special Concern species are listed in regulation 6NYCRR 182.5.

E = Endangered Species: any species which meet one of the following criteria:
1) Any native species in imminent danger of extirpation or extinction in New York.
2) Any species listed as endangered by the United States Department of the Interior, as enumerated in the Code of Federal Regulations 50 CFR 17.11.

T = Threatened Species: any species which meet one of the following criteria:
1) Any native species likely to become an endangered species within the foreseeable future in NY.
2) Any species listed as threatened by the U.S. Department of the Interior, as enumerated in the Code of the Federal Regulations 50 CFR 17.11

SC = Special Concern Species: those species which are not yet recognized as endangered or threatened, but for which documented concern exists for their continued welfare in New York. Unlike the first two categories, species of special concern receive no additional legal protection under Environmental Conservation Law section 11-0535 (Endangered and Threatened Species).

P = Protected Wildlife (defined in Environmental Conservation Law section 11-0103): wild game, protected wild birds, and endangered species of wildlife.

U = Unprotected (defined in Environmental Conservation Law section 11-0103): the species may be taken at any time without limit; however a license to take may be required.

G = Game (defined in Environmental Conservation Law section 11-0103): any of a variety of big game or small game species as stated in the Environmental Conservation Law; many normally have an open season for at least part of the year, and are protected at other times.

NEW YORK STATE STATUS (plants): The following categories are defined in regulation 6NYCRR part 193.3 and apply to NYS Environmental Conservation Law section 9-1503.

E = Endangered Species: listed species are those with:
1) 5 or fewer extant sites, or
2) fewer than 1,000 individuals, or
3) restricted to fewer than 4 U.S.G.S. 7 ½ minute topographical maps, or
4) species listed as endangered by U.S. Department of Interior, as enumerated in Code of Federal Regulations 50 CFR 17.11.

T = Threatened: listed species are those with:
1) 6 to fewer than 20 extant sites, or
2) 1,000 to fewer than 3,000 individuals, or
3) restricted to not less than 4 or more than 7 U.S.G.S. 7 and ½ minute topographical maps, or
4) listed as threatened by U.S. Department of Interior, as enumerated in Code of Federal Regulations 50 CFR 17.11.

. = Rare: listed species have:
1) 20 to 35 extant sites, or
2) 3,000 to 5,000 individuals statewide.

continued on next page

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DIVISION OF ENVIRONMENTAL PERMITS REGIONAL OFFICES

REGION	COUNTIES	NAME	ADDRESS AND PHONE NO.
Region 1	Nassau Suffolk	John Pavacic Permit Administrator	Loop Road, Bldg. 40 SUNY Stony Brook, NY 11790-2356 (516) 444-0365
Region 2	New York City	John Cryan (Act) Permit Administrator	Hunters Point Plaza 4740 21st Street Long Island City, NY 11101-5407 (718) 482-4997
Region 3	Dutchess Orange Putnam Rockland, Sullivan Ulster, Westchester	Margaret Duke Permit Administrator	21 South Putt Corners Road New Paltz, NY 12561-1696 (914) 256-3059
Region 4	Albany Columbia Delaware Greene, Montgomery, Otsego Rensselaer, Schenectady, Schoharie	William J. Clarke Permit Administrator	1150 N. Westcott Road Schenectady, NY 12306-2014 (518) 357-2234
Region 5	Clinton Essex Franklin Fulton, Hamilton Saratoga, Warren, Washington	Richard Wild Permit Administrator	Route 86 Ray Brook, NY 12977 (518) 897-1234
Region 6	Herkimer Jefferson Lewis Oneida, St. Lawrence	Brian Fenlon (Act) Permit Administrator	State Office Building 317 Washington Street Watertown, NY 13601 (315) 785-2246
Region 7	Broome Cayuga Chenango Cortland, Madison, Onondaga Oswego, Tioga, Tompkins	Ralph Manna, Jr. Permit Administrator	615 Erie Blvd. West Syracuse, NY 13204-2400 (315) 426-7439
Region 8	Chemung Genesee Livingston Monroe, Ontario, Orleans Schuyler, Seneca, Steuben Wayne, Yates	Peter Lent (Act) Permit Administrator	6274 East Avon-Lima Road Avon, NY 14414 (716) 226-2466
Region 9	Allegany Cattaraugus Chautauqua Erie, Niagara, Wyoming	Steven Doleski Permit Administrator	270 Michigan Avenue Buffalo, NY 14203-2999 (716) 851-7165

Appendix G

Dioxin Reference Dose (RfD) Uncertainty Factors

APPENDIX G

Dioxin Reference Dose (RfD) Uncertainty Factors

By Lucy Fraiser, PhD, DABT

Selection of Critical Effect

A LOAEL of 0.13 mg/kg-day was used as the equivalent of an oral RfD for evaluating non-cancer health effects of dioxins. This value is based on reported increases in the incidence of endometriosis in adult female monkeys and developmental effects (reduced growth during nursing and post-weaning behavioral/learning effects) in offspring at 2,3,7,8-TCDD maternal dose levels of 0.13 ng/kg-day.

Selection of Appropriate Animal Model

Numerous effects reported in Ysho and Yu-Cheng exposed infants resemble those observed following TCDD exposure in adult monkeys, including subcutaneous edema of the face and eyelids (EPA, 2000a). There are also similarities in neurobehavioral effects of TCDD in monkeys and humans. Perinatal exposure of monkeys has been shown to produce a specific replicable deficit in cognitive function (Schantz and Bowman, 1989 as cited in EPA, 2000b). The intellectual and behavioral development of Yu-Cheng children transplacentally exposed to PCBs and furans was studied through 1985 by Rogan et al. (1988). Except for verbal IQ, Yu-Cheng children scored lower than control children on three developmental and cognitive tests (Rogan et al, 1988 as cited in EPA, 2000b).

Reports indicate that woman with endometriosis in Germany are more likely to have elevated concentrations of PCBs in their blood. It has also been noted that Belgium has a high incidence of endometriosis and that TCDD concentrations of TCDD in breast milk in Belgian women is amongst the highest in the world. Similarly, a larger number of women in Israel with endometriosis were found to have measurable blood levels of TCDD when compared with age-matched control women that had tubal infertility but no endometriosis (Mayani et al., 1997 as cited in EPA, 2000b).

The association between TCDD exposure and endometriosis has found some experimental support in studies using the rhesus monkey. In the Rier et al. (1993) study, there was a dose-related increase in both the incidence and severity of endometriosis in exposed monkeys compared to controls. In this study, it took seven years before the first endometriosis was noted. Data on the relationship of dioxins to endometriosis in people is preliminary but animal results lend biological plausibility to the epidemiological findings.

However, according to *Exposure and Human health Reassessment of 2,3,7,8-Tetrachlorodibenzo-p-Dioxin (TCDD) and Related Compounds: Part III: Integrated Summary and Risk Characterization for 2,3,7,8-Tetrachlorodibenzo-p-Dioxin (TCDD) and Related Compounds* (EPA,2000a), further studies are clearly needed to provide additional support to this association of endometriosis and dioxins, as well as to demonstrate causality.

Development of a "Safe" Level for Humans

The process of developing oral RfDs generally involves identifying a NOAEL or LOAEL in animals and applying uncertainty factors (Ufs) to account for extrapolation from animals to humans and/or from an average human to a sensitive human. In cases where a LOAEL is used as the basis of the RfD, a UF is used to account for the higher health risk potentially associated with a LOAEL compared with a NOAEL. Historically, UFs have usually represented multiples of 10, with each representing a specific area of uncertainty (i.e., inter- and intraspecies extrapolation and extrapolation from a LOAEL to NOAEL).

Following an extensive literature review, Calabrese (1985) concluded that the commonly used UF of 10 seemed to provide protection for 80-95% of the human population. However, combining UFs can lead to overestimation of the actual hazard. For example, if two factors of 10 are multiplied and each factor encompasses an extrapolation at the 95% level, the product will result in an estimate that is more conservative than the 95% level (i.e., 99% level or greater) (Pohl and Abdin, 1995). Public agencies have begun to consider using data-derived approaches, where each area of uncertainty is divided into sub-factors to allow for separate evaluations of toxicokinetics and toxicodynamics. This approach uses available toxicokinetic and toxicodynamic data in the determination of UFs rather than simply relying on standard default values (Zhao, Unrine, and Dourson, 1999).

The International Programme on Chemical Safety (IPCS) recommends subdividing the UF for interspecies extrapolation into 4-fold (toxicokinetics) and 2.5-fold (toxicodynamics) sub-factors and dividing the intraspecies UF into evenly split (3.16-fold for both toxicokinetics and toxicodynamics) sub-factors.

Uncertainty Factor for Extrapolating from Animals to Humans: There is a wealth of data showing that species differ markedly in anatomic, physiologic, and metabolic characteristics, and can vary greatly in terms of susceptibility to adverse effects from exposure to chemicals. To account for this area of uncertainty, a default factor of 10 has historically been incorporated for extrapolation from animals to humans based on an assumption that that an average human is likely to be, at <u>most</u>, 10-fold more susceptible to the effects of the substance than experimental animals. This 10-fold estimate is based on the potential for greater sensitivity of humans and the larger surface area of humans, suggesting a 2- to 100-fold uncertainty factor (OEHHA, 1999). However, according to *Exposure and Human Health Reassessment of 2,3,7,8-Tetrachlorodibenzo-p-Dioxin (TCDD) and Related Compounds* (EPA, 2000a), humans do not appear to be particularly sensitive or insensitive to the effects of dioxins by comparison to other animals. Therefore, it is reasonable to assume that human responsiveness would lie across the middle ranges of observed responses, which argues for something less than a full order of magnitude uncertainty factor to account for interspecies extrapolation.

Toxicokinetic considerations for the interspecies UF include absorption, distribution, metabolism, and excretion. Because they are similar in size (which affects metabolic rate), body fat content (which affects dioxin tissue distribution), and because they walk upright (which affects the way in which particle-bound dioxins deposit in the lungs), primates are more likely to respond to dioxin exposure in a similar manner to human than are other laboratory animals. For example, the amount of airborne particles deposited in the lungs is proportional to the surface area of the lungs of a given species. Liver and adipose tissue consistently have the highest concentrations of dioxins in both humans and primates. In fact, there do not appear to be major species or strain differences in tissue distribution of dioxins (EPA, 2000b). The existing database, which is limited, also indicates that there are no major interspecies differences in the gastrointestinal absorption of dioxins (EPA, 2000b). Therefore, behavioral, genetic, morphological, and toxicokinetic similarities between humans and primates provide additional support for a smaller uncertainty factor. It is recommended that a sub-factor of 2.5 be included to account for toxicodynamic differences between species. Given the similarities between humans and primates in terms of toxicokinetics, no additional UFs are believed to be necessary to account for interspecies extrapolation.

Uncertainty Factor for Extrapolating from Average to Sensitive Humans: RfDs are intended to protect identifiable sensitive individuals from harm due to chemical exposure. Susceptibility may vary among individuals due to genetic heterogeneity within the population, resulting from lower levels of protective biological mechanisms or increased metabolic activation. Sensitive individuals may include children, pregnant women and their fetuses, the elderly, individuals with existing diseases, and persons engaging in physical activity. A 10-fold uncertainty factor has typically been used to account for variability in the human population. Based on an analysis conducted by Gillis et al. (1997 as cited in OEHHA, 1999), an uncertainty factor of 10 is protective of approximately 85% of the population. However, when data are available on sensitive individuals, sub-threshold doses can be estimated directly (i.e., without the need for an UF).

The subjects in the studies from which the LOAEL of 0.13 ng/kg-day was derived were pregnant adult female monkeys and their fetuses/newborn infants. Therefore, it could be argued that the critical effect has been observed in a sensitive subpopulation and that no additional UFs need to be added to account for the hypersensitivity of some members of the population. Certainly, the UF for intraspecies extrapolation should be less than 10. Since the test subjects were comprised of a sensitive primate subpopulation rather than a sensitive human subpopulation, a sub-factor of 3.16 is recommended to account for intraspecies variability in toxicokinetics.

Uncertainty Factor for Extrapolating from a LOAEL to a NOAEL: The relationship between LOAELs and NOAELs has been examined for chronic exposures. Kadry et al. (1995) showed that among a small data set (four chemicals) LOAEL to NOAEL ratios were less than five. An analysis by Alexeef et al. (1997) of LOAEL to NOAEL ratios for over 100 datasets indicated that the 95th percentile of that ratio is 6.2. Based on the analysis by Alexeef et al. (1997), the California EPA's Office of Environmental Health Hazard Assessment (OEHHA) uses an uncertainty factor of 6 when extrapolating from a LOAEL to a NOAEL. An uncertainty factor of 6 is recommended for use in developing an oral RfD from the LOAEL of 0.13 ng/kg-d provided by the NYSDOH.

Based on readily available toxicokinetic and toxicodynamic data for dioxins, it is recommended that a UF of 50 (47.4) be applied to the LOAEL of 0.13 ng/kg-d to develop a RfD for use in estimating non-cancer hazards associated with dioxin exposure.

References

Alexeef, GV, Fowles, JR, Hill, M, Dodge, D. (Alexeef et al., 1997). Stochastic Evaluation of Acute Inhalation Thresholds from Reported LOAELs [Abstract #85]. *Toxicologist* **36:**167.

Calabrese, EJ. (Calabrese, 1985). Uncertainty Factors and Interindividual Variation. *Regul. Toxicol. Pharmacol.***5:**190-196.

Gillis, CA, Keenan, RE, Carlson-Lynch, HL, Price, PS. Characterization of the Interindividual (UFH) Factor: Alternative Models and Approaches [Abstract #1053]. *Toxicologist* **36:**207.

Kadry, AM, Skowronski, GA, Abdel-Rahman, MS. (Kadry et al., 1995). Evaluation of the Use of Uncertainty Factors in Deriving RfDs for Some Chlorinated Compounds. *J. Toxicol. Environ. Health* **45:**83-95.

Mayani, A, Barel, S,Soback, S, et al. (Mayani, et al., 1997). Dioxin Concentrations in Women with Endometriosis. *Hum. Reprod.***12(2):**373-375.

Office of Environmental Health Hazard Assessment (OEHHA, 1999). Air Toxics Hot Spots Program Risk Assessment Guidelines, Part I: The Determination of Acute Reference Exposure Levels for Airborne Toxicants. California Environmental Protection Agency.

Pohl, HR, and Abdin, HG. (Pohl and Abdin, 1995). Utilizing Uncertainty Factors in Minimal Risk Levels Derivation. *Regul. Toxicol. Pharmacol.***22:**180-188.

U.S. Environmental Protection Agency (EPA, 2000a). *Exposure and Human Health Reassessment of 2,3,7,8-Tetrachlorodibenzo-p-Dioxin and Related Compounds, Part III: Integrated Summary and Risk Characterizations for 2,3,7,8-Tetrachlorodibenzo-p-Dioxin (TCDD) and Related Compounds.* National Center for Environmental Assessment, Office of Research and Development, Washington, D.C. September. EPA/600/P-00/001Bg.

U.S. Environmental Protection Agency (EPA, 2000b). *Health Assessment of 2,3,7,8-Tetrachlorodibenzo-p-Dioxin and Related Compounds, Part III: Integrated Summary and Risk Characterizations for 2,3,7,8-Tetrachlorodibenzo-p-Dioxin (TCDD) and Related Compounds.* National Center for Environmental Assessment, Office of Research and Development, Washington, D.C. September. EPA/600/P-00/001Be.

Rier, SE, Martin, DC, Bowman, RE, et al. (Rier et al, 1993). Endometriosis in Rhesus Monkeys (*Macaca mulatta*) following Chronic Exposure to 2,3,7,8-Tetrachlorodibenzo-p-Dioxin. *Fundam. A;;l.Toxicol.***21(4):**433-441.

Rogan, WJ. (Rogan, 1989). Yu-Cheng In: Halogenated Biphenyls, Terphenyls, Napthalenes, Dibenzodioxins and Related Products, 2nd ed. Kimbrough, RD, Jensen, AA, eds. Amsterdam: Elsevier Science Publishers, pp.401-415.

Schantz, SL, and Bowman, RE. (Schantz and Bowman, 1989). Learning in Monkeys Exposed Perinatally to 2,3,7,8-Tetrachlorodibenzo-p-Dioxin (TCDD). *Neurotox. Teratol.***11:**13-19.

Zhao, Q, Unrine, J., and Dourson, M. (Zhao et al., 1999). Replacing the Default Values of 10 with Data Derived Values: A Comparison of Two Different Data-Derived Uncertainty Factors for Boron. *Human Ecol. Risk Assessment* **5(5):**973-983.

Appendix H

Two Papers on Mercury Modeling:

Risk Modeling Implications of Mercury MACT Limits and Detection Sensitivity for RCRA Regulated Combustion Facilities I and II

Risk Modeling Implications of Mercury MACT Limits and Detection Sensitivity for RCRA-Regulated Combustion Facilities

Paper # 681

Douglas Smith and Marcus Garcia
ENSR Corporation, 2 Technology Park Drive, Westford, MA 01886

KEYWORDS

Mercury, Dry Deposition, MACT Limits, RCRA Combustion, Incinerators, Risk Modeling

ABSTRACT

The newest U.S. EPA[1] regulatory guidance for evaluating risk to human health from exposure to mercury emissions at combustion facilities has changed substantially from previous generations. The updated modeling methods have been adapted from the EPA's Mercury Study Report to Congress (1997)[2]. The new model attempts to balance the need for a simplified regulatory model with the desire to have a technically realistic representation of the major features of the more complex multi-pathway fate and transport models that have been used for research studies. The recommended model assumes that hazardous waste combustion facilities normally emit 80% vapor and 20% particulate. Mercury emissions in the vapor form are assumed to consist of both elemental mercury (Hg°) and oxidized mercury (Hg^{++}, evaluated in the risk model as mercuric chloride ($HgCl_2$)). Particulate mercury emissions are assumed to consist of oxidized mercury (i.e., $HgCl_2$). No emission of methyl mercury (MeHg) is assumed. Considering the global mercury cycle, the U.S. EPA[1] assumes only 48% of total mercury emitted from the stack is deposited locally (in the vicinity of the combustion unit) and 52% of total mercury emitted leaves the study area to join the global mercury cycle. Features and limitations of this model are reviewed with respect to "conservation-of-mass" and inherent uncertainties with its application in site-specific studies. In particular, the paper includes an example case of the potential impact of meeting MACT, but using an insufficiently sensitive emission measurement method. It is highly possible with the current model to generate risk predictions that would fail EPA risk screening because the calculated residual risk is above acceptability criteria. This paper suggests how to avoid either dilemma.

INTRODUCTION

The newest U.S. EPA [1] regulatory guidance for evaluating risk to human health from exposure to mercury emissions at combustion facilities has changed substantially from previous generations. The latest guidance, as amended in 1999, has been adapted from models used by U.S. EPA to support its EPA's Mercury Study Report to Congress[2]. For the application to RCRA permitting, the new model attempts to balance the need for a simplicity for regulatory use with sufficient technical realism to represent the major features of the more complex multi-pathway fate and transport research models. Unfortunately, sometimes the efforts to maintain a health protective margin of conservatism, introduces the potential for "double counting of mass", or at least overestimating of the rate of buildup in the environment, and subsequently overestimating risks. The discussion below outlines the features of the multipathway fate and transport model that can create these problems. Included is a case study to identify how the current model can easily lead to risk estimates (hazard index values) in a questionable range, even when the emission rates are well within new MACT Standards.

MERCURY EMISSIONS MODELING

The model recommended by the U.S. EPA guidance for simulating the complex mixture of the various phases and chemical forms of mercury is illustrated in Figure 1 (reproduced from Figure 2-4 of the original guidance). As is readily apparent the percentages of each form of mercury are dependent upon whether the user of the model is attempting to evaluate the total mercury released into the environment, or just the fraction that is expected to interact with the portion of the environment that is within a 10-20 km distance from the source. The latter region is the area in which the largest and most significant effects from that particular source are expected to be observed. For sources other than power plants, there are very few measurements available to determine whether or not the fractions identified are reasonable. Until more data are available, however, the distribution given appears the most reasonable choice to use for predictive modeling.

OVERVIEW OF EPA'S MERCURY FATE AND TRANSPORT MODEL

The mercury fate and transport model is relatively complex, as is indicated by Figure 2. This figure is adopted from a recent poster paper presented by a colleague, Mr. John Bleiler[4], concerning a lake site under investigation for mercury contamination. U.S. EPA[1] guidance is based on a very similar conceptual model, which the agency has translated into a quantitative model. As will be noted below there are still many uncertainties in calculating the rate of atmospheric deposition contributions to the mercury loading of the soil. The uncertainties grow as the model attempts to address the many processes involved in transport of this loading to adjacent bodies of water.

As shown in Figure 1 above, two forms of mercury are assumed to be emitted from hazardous waste combustion facilities: vapor and particulate:

- Mercury emissions in the vapor form are assumed to consist of both elemental mercury (Hg°) and oxidized mercury (Hg^{+2}, generally evaluated in the risk assessment process as mercuric chloride ($HgCl_2$)).
- Particulate mercury emissions are assumed to consist of oxidized mercury (i.e., HgCl).

Based on the vast majority of stack testing done to date almost all of the mercury exiting the stack is in inorganic elemental, Hg°, and Hg^{+2} (or $HGCl_2$). Therefore, it is assumed that there is no significant emission of methyl mercury (MeHg) from the stack. The U.S. EPA assumes that total mercury emissions from hazardous waste combustion consist of 80% vapor phase mercury and 20% particle bound mercury. This assumption is derived from much data drawn from testing of coal combustion facilities, rather than hazardous waste facilities. Presumably, when more test data becomes available from the latter, the agency will consider revising these default percentages.

Considering the global mercury cycle, the U.S. EPA[1] assumes only 48.2% of total mercury emitted from the stack is deposited locally (in the vicinity of the combustion unit). 40.8% of total mercury is assumed to be deposited locally as HgCl vapor, 7.2% is assumed to be deposited locally as particle-bound HgCl, and 0.2% is deposited locally as vapor phase Hg°. 52% of total mercury emitted is assumed to leave the study area and join the global mercury cycle.

It is assumed that deposition of mercury to the various environmental media is entirely as HgCl in either vapor or particle bound form. 1% of Hg° is assumed to deposit in the vapor phase. The approach to modeling wet deposition is conventional and utilizes wet deposition parameters for vapor that are effectively equal to those utilized for the smallest of particles. For the particulate fraction of emissions the wet deposition rates are matched to the size distribution for the particles to which the Hg^{+2} is likely to attach (as it leaves the stack). For dry deposition, however the agency guidance has adopted the position that all mercury vapors will deposit with an effective 'deposition velocity' of 3 cm/sec.

ALTERNATIVE DRY DEPOSITION VELOCITIES

This rate is exceptionally high according to the results of recent research. Precipitation samples collected for incident rainfall and the subsequent 'throughfall' of rain in a forest allow differences to be used to estimate deposition rates specific to mercury vapor and particles. This type of data has been carefully studied by Lindberg[5], at the Oak Ridge Walker Branch facility, and compared with analogous studies performed by Iverfeldt[6] in Sweden. Table 1 shows the Walker Branch project results for the estimated deposition rates for mercury from measurements of throughfall at this site. The Hg vapor dry deposition rates range from 0.009 to 0.094 cm/sec according to the cited modeling. For the current case study we have chosen 0.076 as a middle value. For the fine pariculates simultaneously collected experimentally Lindberg, et al.[5] reported a modeled value 0.11 cm/sec for three of the four measurement periods. That was comparable to the average value that could be back-calculated from the annual deposition rates determined in our case study.

Lindberg,[5] specifically includes a statement that the quantity of Hg found in the throughfall could not be explained entirely by the fine particles, unless mean daily dry deposition velocities for these particles were in the range of 0.5 to 3 cm/sec. However, he immediately discounts that possibility by saying that it would contradict the results of several field, wind tunnel, and modeling studies. Then he presents an argument for the expectation that. deposition of Hg^{+2} vapor, combined with the predominant Hg° vapor, would be necessary to explain the magnitude of the predicted throughfall. That is because the observed throughfall rates fell in between the values that would have occurred (see "modeled dry deposition rates" in Table 2) had the researchers exclusively used either the measured concentrations of particles (with their modeled deposition rates); or the measured vapor concentrations (with their much lower deposition rates, but higher total deposition quantities) for the calculations.

Comparison of other recent articles that attempt to characterize the long term deposition rates suggest that longer term averages of the transfer rate for Hg^{+2} to plants and soil. The transfer rate, commonly described as a 'deposition velocity" ranges from the values identified above, which are all less than 0.1 cm/s, to regional and global average estimates that have been given by various researchers as ranging upward to 0.3 cm/s for nightime[2,] or daytime[8] to peak daytime rates that range from 0.4 cm/s for pasture[9] to 1.5 to as high as 5[2,9] for forests. The latest of these references utilizes new measurement methods that are set up to look at short-term events, and caution must be exercised when extending the findings to longer term average situations, when the atmospheric exchange rates and processes are quite different. A hypothetical average value of 0.78 cm/s was previously calculated by one of the present authors[10] for passive transport of organic vapor species at trace levels, but the active role of plant surfaces remains a complicating factor for chemicals species that are as soluble and reactive as Hg^{+2} .

METHYLATION OF MERCURY IN SOIL

Mercury is assumed to deposit to soil in the HgCl form. A small of fraction of deposited mercury is then converted to be MeHg. 98% of the total mercury concentration predicted in soil is assumed to be in the HgCl form. 2% of the total mecury in soil is assumed to be MeHg. Although the latest Errata[1] to the U.S. EPA guidance now allows that volatilization from soil, as well as the water body surface, is a potentially important pathway for loss of mercury into the atmosphere, the recommendation for erosion losses is still zero. A zero value is also recommended for all but dioxin-like compounds for biotic and abiotic degradation. Due to the inherent uncertainties in this last type of removal, it is probably best to stay with the agency's recommendation in this case. The prior issue of "erosion loss corrections", although not addressed in the case study in this report, is one worthy of continuing investigation.

METHYLATION OF MERCURY IN A SURFACE WATER ENVIRONMENT

Watershed erosion and direct deposition are important sources of Hg that eventually reach nearby bodies of water. Some Hg entering each water body is methylated through biotic processes. For simplicity, rather than modeling site-specific water body properties and biotic conditions the U.S. EPA[i] recommends (consistent with the mercury report to congress) assuming 85% of total Hg in surface water is divalent (as HgCl) and that 15% is methylated mercury (MeHg). Experimental data gathered to date indicates that, due to the wide range of chemical and physical properties that influence the methylation process, there is high variability in the rates of methylation of mercury among water bodies. Correspondingly, our knowledge is limited by the degree to which we can characterize the properties of local water bodies when they are evaluated in a typical combustion risk assessment. Thus although there is also a high level of uncertainty in predicting MeHg levels in surface water bodies using the U.S. EPA recommended assumptions, there are few alternatives unless a site-specific measurements program is undertaken. Frequently this is impractical, and thus the default recommendations must be taken at face value.

RISK ANALYSIS FOR MERCURY

After the issues of emission rates and fate and transport are addressed, the final step in risk assessment is to combine the exposure assessments for each chemical (and form) with the respective dose response factors for each species to characterize the risk. In the case of mercury, the reference doses for each of the species are used to determine the hazard quotients that are summed with other chemicals to derive the total hazard index value. It should be noted that the U.S. EPA guidance recommends for risk calculations:

- Exposure to Hg° is assumed to occur only via inhalation of vapor phase Hg°.
- Exposure to divalent Hg occurs through both indirect exposure (i.e., consumption of locally produced agricultural products or locally caught fish) to and inhalation of vapor and particle-bound $HgCl_2$, but
- Although Hg° and HgCl (Hg^{+2}) exposures may be the primary concerns for residents or farmers, for fishermen both of these sources of exposure are often small compared to the amplified risk of ingestion of methylated mercury found in fish, as discussed above.

When mercury levels are high enough to cause any concern, it is generally the fishing exposure scenario that dominates the results of the mercury risk assessment. That is why the case study presented below is simplified to report only on the resulting methyl mercury exposures from fish consumption. The ingestion rate of 30 g/day of freshwater fish is assumed as a rate appropriate for the recreational fisher, since an ingestion rate equal to or close to this rate has been adopted as a basis for developing fish consumption safety advisories in many states.

EXAMPLE CASE STUDY

The case study presented below was set up to utilize the latest EPA guidance and recommendations as the base case. (The Environmental IRAP Program[ii], developed with U.S. EPA cooperation, was utilized to ensure conformance with agency calculation methods). Table 2 presents the basic air modeling data utilized for the case study. Because this case study is intended as a generic example to show "order-of-magnitude" results, site specific details are omitted. The stack and flow data are in a typical range for medium-sized incineration units dedicated to burning hazardous waste streams at chemical manufacturing facilities. The combination of parameters is intended to represent a general facility class, which may have stacks between 70 and 100 ft., exit velocities of 30-45 ft/sec and exit temperatures between 100 and 150 deg. F. Although the wind data utilized to determine the annual dilution and deposition rates was selected from Louisiana. experience of the authors has shown that, except to enhanced wet deposition due to higher rain rates in the Gulf Region, the specified dilution factors could apply to a wide variety of locations. Therefore, the concerns raised by the results presented here are not necessarily limited to a particular site or geographic region. The basic emission rate for total mercury is assumed to be 13 ug/m3, or 1/10 of the allowable MACT limit. Under typical stack testing conditions, e.g., a 21,000 dscfm stack flow (or about 10dscm/s), would suggest a case study emission rate of 130 ug/s. The present paper examined two additional cases. One assumed an emission rate of 1% of the MACT limit (13 ug/s) and the last used 0.1% (1.3 ug/s).

MODELING RESULTS

The hazard index calculation results presented in Table 3 represent a downwind quiescent lake location at about 5 km from the source. (At this distance, the sensitivity to small changes in stack height and exit velocity are somewhat diminished). For this example case, the specific dilution factor for the air concentration is approximately 0.06 ug/m3 per g/sec. The total depositional flux rate is about 0.003 for vapor and/or very fine area-weighted particles. Four variations of the each of the three emission cases are presented: They differ only in the deposition velocity assumed for Hg^{+2} vapor. These deposition velocities covered a wide range, i.e., from 3.0 cm/s to 0.1 cm/sec. The lowest stack concentration would require about 100-300 liters of stack air sample to be drawn to produce a detectable quantity of mercury in the collected sample (depending upon the efficiency of the collection medium and the sensitivity quoted by the analysis laboratory). This situation suggests that careful attention be paid to planning trial burns or other performance testing that will serve as the basis for risk assessment calculations. Otherwise a high detection limit can itself yield risk assessment results that may be unacceptable, even when it is suspected that the quantity of mercury fed to the source is extremely small.

The results shown in Table 3 show the risk calculated for recreational fishermen catching and consuming an average of 60 g/day after the facility had operated for a long enough period for soil and water concentrations to be near equilibrium levels. Figure 3, which is a regression plot of hazard quotient against the varying dry deposition rates assumed for the various cases, illustrates that the fate and transport models and risk models used here are essentially linear. The intercept value in this situation represents the portion of the risk being contributed by the wet deposition of mercury due to precipitation. For this exercise that is assumed to be constant. That is, however, an oversimplification of the currently recommended modeling method for dry deposition of Hg^{+2}. The EPA assumes, by using a simple deposition velocity value applied to an undiminished plume of vapor, that the removal is insignificant at every important receptor location. Aside from the question of violating the conservation of mass principle, it can be shown that use of deposition velocities as high as 3 cm/s could significantly reduce the residual plume available for deposition at on large watersheds surrounding lakes or ponds--especially at distances equal to or greater than the 5-km pond distance examined here. This is definitely an area for future improvement in the modeling of airborne mercury transport and deposition.

As shown in this table, the maximum hazard quotient is 24. (The hazard quotient is essentially equal to the hazard index, when all other chemicals make negligible additions to the risk). This maximum value is calculated with the 10% MACT emission rate and with the 3-cm/sec-deposition rate recommended as a default value by the EPA guidance[1]. The value reduces to 1.6, if based on a vapor dry deposition velocity of 0.1 cm/sec, which corresponds to a minimal long-term average value that several authors have previously recommended for use in calculating yearlong averages. Even the latter of these two values is more than a factor of 6 above the recommended benchmark of 0.25 for the total hazard index from mercury (including MeHg) and all other chemicals of concern to be evaluated.

The lowest emission rate equal to 0.1% of the MACT limit yields a hazard index of 0.24, just below the recommended EPA benchmark, when the EPA-recommended 3 cm/sec deposition rate is assumed to be representative. In this case the amount of mercury that would be measurable in the stack gas would be approaching the usual detection limit. If, however, a lower value of deposition velocity can realistically be assumed, such as values between 0.1 cm/s and 0.78 cm/s, the hazard index contribution due to methyl mercury would fall to 0.016 to 0.068, well below the 0.25 hazard index benchmark level. Review of the remaining cases reveals that unless other aspects of the mercury risk model are demonstrated to be overly conservative, only the lowest deposition velocity case would allow an emission rate for this example facility to be as high as 1% of the published MACT limit. Otherwise emission limits would have to be set a factor of two to ten lower to maintain the 0.25 guideline due to the hazard index contributions of mercury present in fish as methyl mercury.

CONCLUSIONS:

Overall, these example case results suggest that there is an important discrepancy between the requirements for MACT emissions and the recommendations for the use of a risk assessment model to demonstrate that site-specific risks will normally also be acceptable. The breadth of the discrepancy strongly suggests the need for more field validation of the subject mercury fate and transport model. However, a careful re-examination of the assumptions made about transfer rates between the various environmental media, as demonstrated in the example case presented here, may be the best place to start.

ACKNOWLEDGEMENT

The authors wish to thank Ms. Angela Lin for assisting with the modeling analysis and Mr. Mark Gerath, Mr John Bleiler, and Dr. Ken Heim for the helpful insights they provided during the development of this paper.

REFERENCES:

1. U.S. EPA. 1998. Human Health Risk Assessment Protocol for Hazardous Waste Facilities (Peer Review Draft). Office of Solid Waste and Emergency Response. July 1998. EPA530-D-98-001A.

2. 2. U.S. EPA, 1997. Mercury Study Report to Congress, Vol. I-VIII. OAQPS and ORD, EPA/452/R-97-001. Dec.

3. U. S. EPA, 1999. Human Health Risk Assessment Protocol for Hazardous Waste Facilities. (Peer Review Draft), Errata—August 2, 1999.

4. Bleiler, J., Gerath, M., Heim, K., Worthy, M., Wandland, K., Tracey, J., Evans, M. "Mercury Dynamics in a New England Kettle Hole Pond". Society of Environmental Toxicology and Chemistry. 20th Annual Meeting, November 1999.

5. Lindberg, S.E., J.G. Owens, and W.J. Stratton. 1994. Application of Throughfall Methods to Estimate Dry Deposition of Mercury. Lewis Publishers.

6. Iverfeldt, A. 1991. Mercury in Forest Canopy Throughfall Water and Its Relation to Atmospheric Deposition, Water Air and Soil Pollut. 56, 553.

7. Lindberg, S.E. 1995. Forests and Global Biogeochemical Cycle of Mercury: The Importance of Understanding Air/Vegetation Exchange Processes. In Regional and Global mercury Cycles, Ebinghaus, et al. (Ed.) NATO ASI Series, Novosibersk, Siberia, July

Bergan, T. [illegible] Gallardo, and H.Rodhe. 1999. Mercury in the Global Troposphere: A Three-dimensional Model Study. Atmos. Environ. Vol. 33, 1575-1585.

Lindberg, S.E. and W.J. Stratton. 1998. Atmospheric Mercury Speciation: Concentrations and Behavior of Reactive Gaseous Mercury in Ambient Air. Environ. Sci. Technol. Vol. 32. 49-57.

[illegible]. Smith, D.G. and D. Heinold, 1995. Deposition Modeling for Dioxins/Furans: Realistic Alternatives to the 1993 Addendum Approach for Plant Uptake of Vapors and Particles, 88th Annual Meeting of the AWMA, San Antonio.

[illegible]1. IRAP-h View. 1999. Integrated Risk Assessment Program. Product of Lakes Environmental Software Waterloo, Ontario.

Table 1

Comparison of Measurements and Deposition Model Rates at Walker Branch Site, Oak Ridge, TN*

Event Date	Representative mean air concentrations		Modeled mean Vd		Modeled dry deposition rates		Est. Dry Dep. rates from:
	Hg vapor (ng/m^3)	Particulate Hg (ng/m^3)	Hg vapor (cm/s)	Hg-p (cm/s)	Hg vapor (ng/m^2h)	Hg-p (ng/m^2h)	throughfall ($mg/m^2/h$)
8/9/91	5-6	0.02-0.03	0.094	0.11	17-20	0.08-0.12	0.53
9/7/91	4-6	0.02-0.03	0.078	0.11	11-17	0.08-0.12	1.1
9/24-25/91	3-4	0.02-0.03	0.076	0.11	8-11	0.08-0.12	2.9
2/14-15/92	2-3	0.04-0.06	0.009	0.003	0.06-1.0	0.004-0.006	0.11

[1]Measured at or near the throughfall collection sites; Hg vapor includes all gas phases, but consists primarily of Hg^0.
[2]Particulate Hg (Hg-p) consists of total Hg associated with aerosols collected by 1.0 µm pore size Teflon® filter.
* Mean air concentrations, modeled dry deposition velocities (Vd), and dry deposition rates for Hg, and dry deposition estimates from throughfall beneath a pine canopy at Walker Branch Watershed.

Table 2
Case Study Emissions, Concentrations and Deposition Modeling Data

Parameter	*Value*
Source Emissions:	
Stack Height (m)	20
Stack Diameter (m)	1.0
Volume Flow (dscm/s)	10
Exit Velocity (m/s)	10
Exit Temp. (deg. K)	300
Emission Rates (g/sec)	1.3 to 130 x 10-6
Air Conc. and Depos. Rates (all per g/s):	
Air Vapor Conc. (ug/m3)	6.2 x 10-2
Hg^{+2} Particle-bound Wet Depos. (g/m^2-yr)	2.0 x 10-3
Hg^{+2} Particle-bound Dry Depos. (g/m^2-yr)	1.0 x 10-3
Hg^{+2} Vapor Wet Depos. (g/m^2-yr)	1.5 x 10-3
Hg^{+2} Vapor Dry Depos. (g/m^2-yr)	1.5 x 10-3 to 6.0 x 10-2
Water Body and Watershed Sizes	
Water Body Area (m^2 / acres)	2.0 x 10+5 / 50
Watershed Area (m^2/acres)	8.5 x 10+6 / 2,000

Table 3

Hazard Index Modeling Results for Recreational Fisher Ingesting Mercury *

HAZARD INDEX Emission Rate (ug/s)	% of MACT Limit	Vapor Deposition Velocity Assumed			
		3 cm/s[a]	0.78 cm/s[b]	0.3 cm/s[c]	0.10 cm/s[d]
130	10	24	6.8	3.1	1.6
13	1	2.4	0.68	0.31	0.16
1.3	**0.1**	**0.24**	**0.068**	**0.031**	**0.016**

- **Principally methyl mercury**

[a] EPA guidance default value, derived from higher values estimated as appropriate for daytime HNO_3 deposition in U.S. EPA Mercury Study Report to Congress[2];

[b] Previously calculated as maximum long-term average for dry deposition to pasture by authors[10], approximately double the short-term deposition velocity recently measured by Lindberg and Stratton[9] for pasture..

[c]Nighttime average used by U.S. EPA in Mercury Study Report to Congress[2]

[d] A rounded average deposition rate for total mercury vapor modeled by Lindberg, et al.[4] from throughfall experiments.

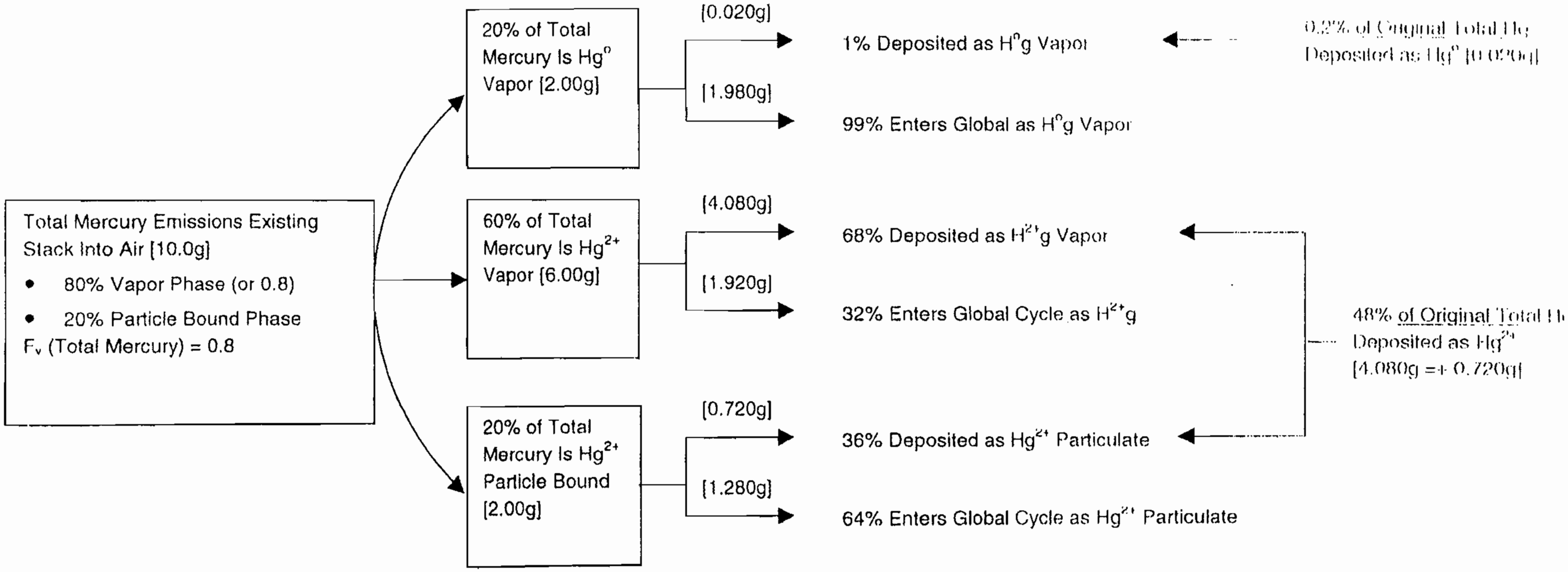
TEXT PAGE = Landscape

Figure 1

EPA Model Default Phase Allocation and Speciation of Mercury in Air

Figure 1

EPA Model Default Phase Allocation and Speciation of Mercury in Air



LEGEND
Hg° – Elemental Mercury
Hg^{2+} - Divalent Mercury
[ ] – Example Mass Allocation

THUS:
Without Consideration of Global Cycle

- 80% of Total Mercury Emitted is Deposited as H^{2+}g [(6g+2g)/10g]
- 20% of Total Mercury Emitted is Deposited as H°g [2g/10g]

Calculated Fv

- Fv (Hg^{2+}) = [6g/(6g+2g)] = 0.75
- Fv (Hg°) = [2g/2g] = 1.0

BUT: With Consideration of Global Cycle

- 48% of Total Mercury Emitted is Deposited as H^{2+}g [(4.08g + 0.72g)/10g]
- 0.2% of Total Mercury Emitted is Deposited as H°g [0.02g/10g]

Calculated Fv

- Fv (Hg^{2+}) = [4.08g/(4.08g + 0.72g)] = 0.85
- Fv (Hg°) = [0.02g/(0.02g + 0g)] = 1.0

Compound Specific Emission Rate Q

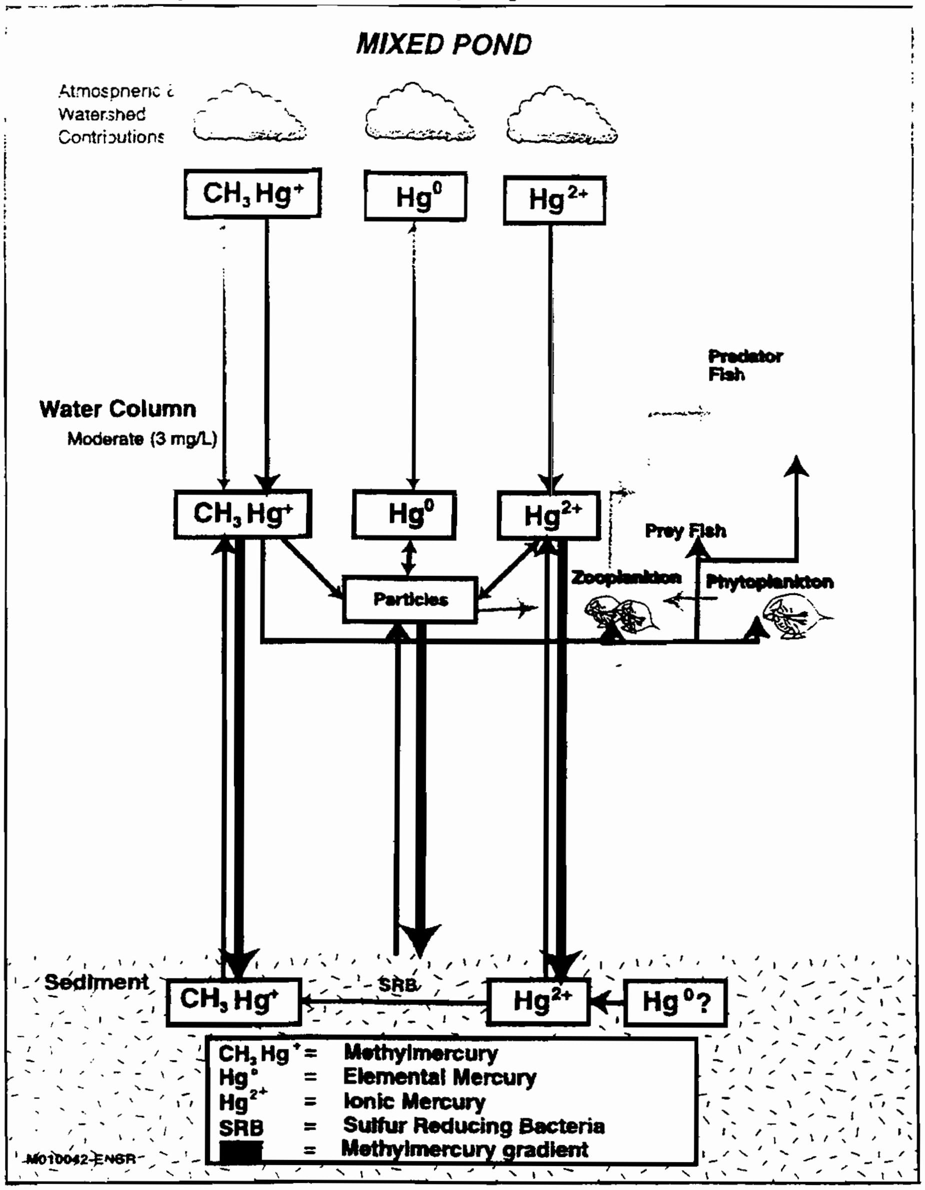
- Actual Q (Hg^{2+}) = 48% * Q (Total Mercury)
- Actual Q (H°g) = 0.2% * Q (Total Mercury)

EXIT PAGE = *Portrait*

Figure 2
Conceptual Model of Mercury Disposition in Lake or Pond

Figure 2

Conceptual Model of Mercury Deposition in Lake or Pond



ALL PAGES = *Landscape*

Figure 3

Dependence of Methyl Mercury Hazard Quotient on Assumed Dry Deposition Velocity for Hg^{+2} Vapor

RISK MODELING IMPLICATIONS OF MERCURY MACT LIMITS AND DETECTION SENSITIVITY FOR RCRA REGULATED COMBUSTION FACILITIES - II

Douglas Smith and Marcus Garcia
ENSR Corporation
2 Technology Park Drive
Westford, MA 01886

ABSTRACT

The newest U.S. EPA (1998 and 1999) regulatory guidance [1,2], for evaluating risk to human health from exposure to mercury emissions at combustion facilities, updated by its Errata [3], has changed substantially from previous generations. The currently recommended modeling methods have been adapted from the EPA's 1997 Mercury Study Report to Congress [4]. The new model attempts to balance the need for a simplified regulatory model with the desire to have a technically realistic representation of the major features of the more complex multi-pathway fate and transport models that have been used for research studies. The recommended model assumes that hazardous waste combustion facilities normally emit 80% vapor and 20% particulate. Mercury emissions in the vapor form are assumed to consist of both elemental mercury (Hg°) and oxidized mercury (Hg^{+2}) evaluated in the risk model as mercuric chloride ($HgCl_2$)). Particulate mercury emissions are assumed to consist of oxidized mercury (i.e., $HgCl_2$). No emission of methyl mercury (MeHg) is assumed. Considering the global mercury cycle, the U.S. EPA [1] assumes that 48% of total mercury emitted from the stack is deposited locally (in the vicinity of the combustion unit) and 52% of total mercury emitted leaves the study area to join the global mercury cycle. Features and limitations of this model are reviewed with respect to "conservation-of-mass" and inherent uncertainties with its application in site-specific studies. Example cases illustrate that just meeting MACT emission limits for mercury is likely to be inadequate. The same results indicate the importance using sufficiently sensitive emission measurement methods. Otherwise the current model will generate risk predictions that fail to meet EPA risk screening criteria. This paper suggests potential approaches to this dilemma.

INTRODUCTION

This paper reports upon the progress of an ongoing study of the U.S. EPA's Mercury Fate and Transport Model, as applied to hazardous waste combustor risk assessments under the U.S, EPA's Combustion Initiative program. The model under discussion is that recommended by the U.S. EPA in its Human Health Risk Assessment Protocol (HHRAP)[1], and similarly in its 1999 Screening Level Ecological Risk Assessment Protocol (SLERAP)[2]. As stated by the authors of these guidance documents, it is based primarily upon a model the agency previously applied in its Mercury Study Report to Congress [4]. For the application to RCRA permitting, the new model attempts to balance the need for simplicity for regulatory use with sufficient technical realism to represent the major features of the more complex multi-pathway fate and transport research models. Unfortunately, the efforts to maintain a health protective margin of conservatism often introduces the potential for "double counting of mass", or at least overestimating of the rate of buildup in the environment, and consequently exaggerating projected risks. The discussion below outlines the features of the current multipathway fate and transport model that can create these problems. Included is are case studies that illustrate how use of the current model can easily lead to risk estimates (hazard quotient values for mercury) in a questionable range, even when the emission rates are well within new MACT Standards

The agency assumed that the current model version would be adequately conservative for initial screening level assessments. They were not entirely prepared for a model so conservative that it would cause virtually every facility with detectable mercury emissions to fail the initial health benchmark comparison, as reported last year at this conference [5]. Many private companies have mirrored EPA's experience in their initial attempts to apply the same risk modeling guidance. In that sense, the current model fails as a risk-screening tool.

At the May 23 and May 24, 2000 External Scientific Peer Review Meeting on the HHRAP guidance held in Dallas, there was much discussion and testimony concerning the apparent problems with the current model. The authors of this report worked with a technical team to develop and present testimony on basic concerns about uncertainties in the structure and recommended model input parameter data. This testimony included a description of the basic underlying model components and noted the several submodel features that most probably contributed to the overall conservatism. Preliminary evidence that the model violated principles of mass conservation was also cited. Additional testimony by U.S. EPA Region 6 technical staff indicated that application of the model to 11 out of 12 facilities had failed to produce non-cancer risk projections for a recreational fisher that remained within the recommended health benchmark, that is a total hazard index of 0.25. In fact, the hazard quotient for just methyl mercury was often higher than that benchmark.

The present study has included an initial review of the recommended methods for application of the model and several sensitivity analyses to determine the relative significance of the several weaknesses identified in the scientific peer-review process in May 2000. The present report represents a progress report on this investigation and includes recommendations for applications of its preliminary findings.

OVERVIEW OF EPA MERCURY MODEL FEATURES

The referenced 1998 EPA HHRAP [1] and SLERAP [2] documents both present relatively detailed information about the modeling context for the mercury model, but leave to the Errata [3] and the cited Mercury Study Report to Congress [4] the task of providing documentation of their latest assumptions. The paper presented C. Kaleri of EPA Region 6 at the May 2000 International Conference on Incineration and Thermal Treatment Technologies (IT3) presented a concise and practical overview of the principal functions of the model [5]. That paper also included two preliminary example cases that portrayed ominous results. The paper concluded with a warning that facilities meeting the new MACT emission standard might still have risk levels which would not compare favorably with regulatory agency benchmarks for acceptable risks. Independent calculations for a number of other facilities, including several by the present authors below have confirmed this fact.

Those results led to further investigation of the features and behavior of the mercury fate and transport model, and the many assumptions associated with its use. A primary goal of the present study is to try to better understand why the new predictions appear to be so much more adverse than those of previous models, and to determine whether there are problems of model design or recommendations for use that can be readily fixed.

Basically, any discussion of the mercury fate and transport model has to also include some description of the source speciation model and the atmospheric dispersion models used for the initial stages of a risk analysis. All of these models interact to produce the predicted airborne concentrations and deposition fluxes. These in turn produce the concentrations in the soils and plants of the watersheds--as well as those that are due to direct deposition onto water bodies. As explained in the guidance, it is the concentrations of soluble mercury and its principal organic form, methyl mercury, which are the primary mercury-related concerns in risk assessments. Therefore, when considering the potential portions of the overall model that could individually or "in concert" lead to exaggeration of risks, all of the following modules must be examined:

- Source speciation model (measurements) – both physical and chemical forms;
- Atmospheric transport model
- Atmospheric deposition: dry and wet processes
- Plant, soil and soil uptake/loss and transport
- Water accumulation and transport
- Fish uptake/bioaccumulation
- Human consumption model
- Human dose/response factor

Although separate studies could be performed on all of these modules separately and the relative uncertainty evaluated, that is beyond the scope of the current inquiry. Many of the relevant issues have been reviewed in the 1997 EPA Mercury Study Report to Congress. Instead, the present study is limited to consideration of the first five portions of the model listed above. Even then the current studies are rather selective in their focus, concentrating on the few factors that seemingly offer an opportunity for significant improvement in matching predicted levels with those measured in water bodies and fish, based on use of more representative--often site-specific--model input data. The current study concentrated its attention on the first five of the eight modules listed above.

Source Speciation

Figure 1 illustrates the EPA's current mercury source emissions speciation model, assumed as a default if site-specific data are not available. Conclusions on the representativeness of this generic speciation model must await the collection of a much larger body of measurement data specifically designed for this task. Each facility will have to determine whether a site-specific set of measurements would be beneficial.

Figure 2 shows an alternate version of this speciation model developed from data collected at one facility. In this latter case the fractions portrayed for each valence state are based upon a set of state-of-the-art mercury speciation measurements using a sampling and analysis method referred to by the Electric power research institute as the Ontario Protocol, due to its development by Ontario Hydro Corporation. The subject source in this case is a light-weight aggregate kiln that burns supplementary hazardous-waste-derived fuel. The results shown in Figure 2 indicate a modest change in the reactive mercury (Hg^{+2}) deposited onto soils and water bodies: 39% vs. 48% assumed by the U.S. EPA guidance. The ultimate effect of the calculated risk was about 30 to 35% reduction. For some risk assessments, even this modest change could prove significant when the acceptability of the total hazard index value is reviewed, but given the potential scale of the problem indicated below, there are other factors which appear to be more generally important.

Atmospheric Transport Model

The atmospheric transport models have been--and will continue to be--the subject of long- term government and private industrial research efforts, because they are fundamental to all air permitting under the Clean Air Act. The widely used ISCST3 model will eventually be upgraded/expanded to include the features now unique to ISCPRIME and AERMOD. ISCPRIME has improved "downwash" modeling algorithms for facilities with relatively short stacks, but that is more likely to be an issue for air contaminants which are more acutely toxic, and don't require the long term buildup in the environment that is of concern for mercury.

Deposition Modeling

The deposition models are often considered an integral part of the atmospheric transport and diffusion models, but are segregated in the above listing due to the way they are being applied to mercury deposition modeling. The current draft version of AERMOD does not yet have an adequate vapor deposition and depletion sub-model, and thus may not represent any substantial improvement for modeling mercury species until this feature is fully functional. Vapor dry deposition for mercury (Hg^{+2} and Hg^0) is calculated as an "adjunct " process, rather than an integrated one like that used for dry and wet deposition used for mercury that may be attached to particles (also primarily Hg^{+2}), or wet deposition for mercury vapor. This 'segregation' of the dry deposition of mercury vapor is one of the most important assumptions, and has significant consequences for risk calculations. It requires the assumption of a virtually "constant" value for the rate of vapor transfer to the surface. As noted below, there is a wide range of possible values for this choice, and the selection of a "maximal" value for all circumstances can lead to significant overprediction over the long term.

Plant and Soil Uptake/Loss and Transport

Plant and soil uptake and soil transport are perhaps the other most controversial modeling area, and it is expected will continue to be the subject of much additional research before their significant contributions to uncertainty can be diminished. The toxicity of inorganic mercury forms stored in plants and soils is lower than that of methylated mercury, which is maximized in its concentrations in water bodies and fish. Thus, the accuracy of plant uptake models has often been relegated secondary importance. That is also the case in this study, but recently commenced research studies on the important buffering role of plant life may soon alter that situation [6].

Water Transport, Fish Bioaccumulation, and Human Consumption
The behavior of mercury and methyl mercury in water bodies and in fish has also been the continuing subject of much attention, including many state-directed measurement programs designed to determine the need for health advisories. It is the results of the water and fish bioaccumulation model calculations, when combined with the assumptions typically made in the subsequent fish consumption model, which finally determine the risk prediction. However the EPA, through its "Great Lakes Initiative" studies, has already used much of the available quality measurement data to determine a recommended approach for selecting appropriate bioaccumulation factors for various species and trophic levels of fish. And, although there is currently a major re-evaluation of human toxicity (reference dose) parameters underway, this process is long, involves many agencies and scientific groups, and is not generally subject to short-term repair. Therefore the present study has made no attempt to address these three subject areas; other than to conclude below that more attention may need to be paid to identification of the appropriate species and trophic levels of fish for a site-specific risk analysis.

Coincidentally, just before the presentation of the IT3 paper by EPA, ENSR was invited to field a technical team to review the 1998 combustor risk assessment guidance. There was relatively little preparatory time allowed for that activity, given the complexity of the many models that have been integrated by the guidance. Therefore our team utilized much of its past modeling experience, as well as the limited experience possible for application of the newest version of the set of risk assessment models, including the mercury fate and transport model, to compile a set of comments. Most concerns raised in our testimony remain relevant, since no official changes or further explanatory updates of the "guidances"[1,2] for application of the mercury model have yet been published. However, the EPA Dallas Scientific Peer Review Meeting testimony now appears on the Agency's Web Site: [http://www.epa.gov/epaoswer/hazwaste/combust/riskassess.htm].

EPA MODEL FEATURES NEEDING IMPROVEMENT

Figure 3 is a listing of the set of equations used in the EPA model to compute the various components of the load of mercury that is predicted to reach each subject water body. The water bodies of primary interest here are those which contain fish that may be caught and eaten by the hypothetical fisherman. As discussed in the cited Dallas Meeting, the shaded terms in these equations are all terms which are believed by the authors to include important uncertainties. These terms affect the overall uncertainty in the final mercury and methyl mercury concentrations in water that are predicted to bioaccumulate in the fish ingested by both human and non-human fishers. (The nomenclature used is exactly that in the guidance and is not elaborated here).

The primary purpose of Figure 3 is to show the linear accumulation of the several quantities that each carry along a significant uncertainty factor. In most cases, a major portion of this uncertainty can be traced back to that in the total deposition rate from the airborne mercury reaching the location at a concentration determined by the atmospheric transport and deposition models. As was brought out in the Dallas testimony, and hinted at above, the assumption that all dry deposition of airborne mercury vapor is governed by a "constant deposition velocity" assumed to equal 3 cm/sec is highly suspect. Several members of the panel cited references that supported other calculation methods or other values for this "constant" if the current model continues to be used. . Another comment by the EPA staff indicated that they had heard reports that the current model might violate the principle of "mass conservation". They challenged attendees to present a documented case. That discussion, and the past experience of the authors in evaluating deposition processes, made the "dry deposition velocity" a prime 'suspect' for further investigation

Several risk assessments, performed by EPA and others, have been predicting mercury concentrations in water bodies and in fish that are higher than any existing measurements (in those few cases where comparable measurements are available). This raised questions about not only the deposition to water and soil surfaces, but also the migration of soil-borne mercury into the water body of interest. In the drafts of the risk assessment guidance preceding that issued in 1998, it was recommended that several of the soil loss factors acknowledged to be part of the process be set to <u>zero</u> due to a lack of reliable site-specific or chemical-specific data. The two factors that appeared to be most important for mercury were the volatilization loss coefficient (k_v) and the erosion loss coefficient (k_e). Review of research literature (such as that reported by Watras, et al 1995 [7], and Lindberg, et al. 1995 [8], 1991 [9]) indicates that the two loss processes represented by these coefficients are extremely important in explaining the mass balance of mercury in not only the soil, but the atmosphere and water bodies. Therefore, our sensitivity testing also focused on these processes.

In addition, we examined several other parameters that seemed to be potentially important. One was the relationship of watershed size to water body size. In cases where the ratio was small, we would expect the influence of parameters that reflected the quantity of mercury deposited on soils to be less important, and vice versa. Therefore, the largest rates of dry deposition might be most important when the watershed was very large. Similarly, if soil losses by erosion processes were ignored, it might not be very important for a relatively small watershed, if the water body were large enough to obtain the majority of its mercury load from direct deposition. In this latter case, volatilization from soil might also not be very important, but volatilization from the water surface could be exceptionally so. Consideration of these factors led to the sensitivity tests and results reported below.

A Case to Illustrate a "Mass Balance" Problem

In response to the U.S. EPA request, an example from current practice is presented in Table 1. These results clearly demonstrate the mass conservation problem that occurred when calculations were performed according to when the U.S. EPA modeling guidance.

Tables 1 shows the results of a modeling exercise performed for a site (in the Northeast) surrounded by several small ponds as well as several streams and rivers. The table lists the predicted mass distribution of both inorganic (as mercuric chloride) and organic (as methyl mercury) forms. Table 1 presents the results obtained for a single pond, although the values for two neighboring ponds that differ somewhat in size and watershed exposure all yielded similar results. In the first pair of columns of data the results obtained with the EPA default recommendations are given, with the exception that a lower deposition velocity (0.1 cm/sec) is assumed. The second pair of columns shows the comparable results when the erosion coefficient is calculated by the equations presented in the HHRAP guidance, when the value for k_{se} is not set to 0 [1].

At the top line of each pair of columns total direct deposition of airborne vapor onto the watershed area in g/yr is listed. The second line tabulates the mass of eroded material and the runoff load from the pervious surrounding surfaces. (No significant impervious surfaces were present). These added in the third line and compared as a ratio (and percentage) in the fourth line to the total deposition load calculated for the entire watershed. It is apparent from Table 1 that the modeled pond is predicted to receive approximately 200% of the deposited mass—a clear example of a "mass balance problem".

From the data in Table 1 the model also projected the concentrations in the water body. Ultimately, the transformed concentration of methyl mercury (MeHg) is used to calculate the fish concentration based on the EPA-published BAF. For the pond shown, the predicted concentrations in the trophic level 4 fish were close to 5 ppm. One of the neighboring ponds had a predicted fish concentration of 10 ppm (wt.). These levels are higher than has ever been found in fish in that state. Unfortunately, there are no measurement data available for these particular water bodies. But a review of the EPA's latest database information suggests that these levels would be quite rare, even if they are not impossible.

The last two columns of Table 1 lists results with the model changed to allow the calculation of loss due to erosion to be subtracted from the residual mass of mercury containing soils. The results are dramatically different, although the finally calculated fish concentration is still suspiciously high. In this case, at least, the percentage of the total mass deposited to the watershed that finds its way to the water body is 86%, and the subsequent calculation of fish tissue concentration was about 2 ppm (wt). These values are still very high, but at least conceptually possible.

For rivers and streams, ignoring the erosion loss term in the modeling appears to be less important. With the EPA default recommendations, the predictions that 30 to 48% of the total watershed load washes into the nearest stream still appears to be exaggerated, but it is within the realm of possibility.

Other tests were conducted to show that this magnitude couldn't be explained by the transport of soils over distances greater than a few miles, because the soil delivery ratio value effectively prevents that for watersheds unless slopes are very steep. Furthermore this impossible prediction was not just due to an exceptionally high deposition velocity, since the results presented in Table 1 were produced with a selected value of 0.1 cm/sec. This lower value was believed to be a more realistic as a 30-year average value than the default 3 cm/sec for this site, based on the comparability of the area with the Walker Branch Tennessee research project area [8], [9]. These lower deposition rates are comparable to the longer-term measurements reported in the Walker Branch research studies. That is, long-term average values of V_d were based on long term air concentrations and total mercury measured in leaves and soil, rather than short-term episodic flux measurements [10]. (To clarify the statement that EPA's default modeling assumptions were adopted, that included: calculation of the loss due to volatilization, k_v, from the equations given in the guidance, as recommended by the 1999 Errata [5]; and the erosion loss constant, k_{se} was set equal to 0; it excluded the use of V_d = 3 cm/sec).

The results given in Table 1, inspired a further comparison of the hazard quotient values that would be expected for a hypothetical source that met the new MACT standard for mercury emissions with varying 'safety' margins. Tables 2 and 3 show the results for such a comparison for a different hypothetical source (specified in Table 2) from another paper about to be presented [11]. The three emission rates chosen are equal to 10%, 1% and 0.1% of the MACT standard for an existing hazardous waste incinerator source. Table 2 identifies the hypothetical source parameters assumed. These parameters are in a typical range for a number of older dedicated incinerators. Many newer incinerators have a 30+ m stack height.

The results are listed in Table 3. They show that attaining an acceptable hazard quotient is highly dependent upon the assumption of a deposition velocity. With 3 cm/sec selected, the source would be limited to 0.1 % of the MACT limit to produce acceptable results, if the current model is relied upon. At 10 % of the MACT emission rate, the hazard Quotient would be 24, about 100 times higher than the recommended EPA benchmark for the sum of potential non-carcinogenic risks for **all** chemicals emitted. From Table 3 it can be deduced that the only case that is likely to yield an acceptable hazard quotient for a risk assessment, is that with a deposition velocity of 3 cm/sec assumed. It further assumes an emission rate that is only 0.1% of the MACT standard for existing sources. Since this case assumes an emission rate that is barely above the typical detection limits for stack testing, these results raise concerns for many facilities that have low, but readily detectable concentrations.

Analysis of Effect of Watershed to Water Body Size Ratio and Erosion Loss Correction

The final sensitivity testing performed for the current study examined two hypothetical case situations for a range of watershed and water body sizes. The first case was the same hypothetical case just examined for its relationship to MACT limit compliance. The second was based on the same case initially examined for the "mass balance" problem. Since each case had a different water body and watershed nearby, and also had differing stack geometries and emission rates. This comparison relied only on normalized data to identify the relative importance of the ratio of the watershed area to the water body area as deposition velocity and erosion loss factors were varied. Figure 4 presents the results of the first hypothetical case study for a variety of watershed to water body size ratios. The data for this Figure are presented in Table 4. Figure 4 plots the ratio of the hazard quotient (HQ) calculated for a deposition velocity of 3 cm/sec to that calculated for 0.1 cm/sec, all cases with the erosion loss parameter set to zero (but with volatilization loss allowed) in accord with the EPA 1999 Errata guidance.

Figure 4 shows that the ratio of the hazard quotient calculated for the 3 cm/sec case is close to 15 times that for the $V_d = 0.1$ cm/sec case. Similar results are obtained, almost regardless of the ratio of the watershed and water body size, as long as the ratio of the watershed/water body area exceeds a value of 15. Only when that size ratio is less than 2 (i.e., half of the water shed is equal to the area of the water body) does the HQ ratio drop to about 8. In the particular case examined here, the water body of concern is approximately 50 acres.

Summary of the Relative Effects of the Variables Investigated

Table 5 presents a summary comparison of the resultant general ranges of variation (expressed as rounded factors) derived from this preliminary series of analysis of methyl mercury concentrations and related hazard quotients. The first line indicates that the anticipated change in risk (hazard quotient) levels may be expected to range upward or downward from that calculated with the EPA's'default speciation scheme--by perhaps +/- 50% for the types of hazardous waste incinerators or cement or light-weight aggregate kiln facilities targeted by the "Combustion Initiative". (The presently examined case study resulted in a reduction of its hazard quotient for the recreational fisher at a nearby small lake by approximately 30%).

The EPA-recommended [1,3] equations for the total load of constituents deposited on the soils of the watersheds surrounding each subject water body were evaluated in a separate sensitivity analysis. These tests (see Table 1) illustrated the effect of including the calculated erosion loss factor, rather than setting it to zero, as suggested by the concluding recommendation presently published in the EPA guidance for this portion of the fate and transport model. Several variations of the specific case identified above were analyzed, and all produced reductions in the range of 1/2 to 1/4 times the values for hazard quotient obtained with $k_{se} = 0$.

The sensitivity tests comparing different watershed to water body size ratios all showed modest variations compared to the effect of making alternative choices of the parameter representing the dry deposition rte for reactive mercury vapor (Hg^{+2}). That is why the results given in Table 4 and Figure 4 are illustrated as a modifying factor for the HQ changes expected from those obtained with lower deposition velocity values, because there is a combined effect. However, tests to date indicate the even for cases modeled with large deposition velocity values, a two-order-of-magnitude increase in the WS/WB ratio would not further increase the calculated risk by more than a factor of two. Since the ratio of WS/WB is not readily controlled, it is good to see that it has less impact on the final results than several other factors.

The deposition velocity for reactive mercury vapor, on the other hand is a relatively important variable, as shown in Table 5 by the magnitude of its potential effect on the calculated HQ. Unfortunately, this is another variable that is not really controllable, other than by the attempt to select a value for modeling purposes that is thought to reliably represent the long-term behavior of Hg^{+2} form in the environment. Historical data has many limitations, but tends to support values for V_d in the range of 0.07 to 0.4 cm/sec for most agricultural surfaces, except forests, in which most measurements range from 0.1-

0.2 cm/sec seasonal average to as high as 6 cm/sec for a maximum hour. For each of the ranges just mentioned, the maximum values were measured during a 1-3-hr fumigation event [10]; while the daily average for the forest (on a summer day) was 2 cm/sec. Since nocturnal rates are often close to 1/3 the daytime rates [8, 9, 10], it is expected that proper computation of an annual average, or modeling of individual hourly rates over the observed range, would lead to annual averages far below those calculated by the currently recommended method [1.3]. That method multiplies the annual average airborne vapor concentration by an "apparent worst case" deposition velocity of 3 cm/sec. As more field data become available it will become easier to critically test the alternative hypotheses behind the range of choices available.

CONCLUSIONS

The results of the sensitivity studies presented show how important is can be to include corrections for erosion loss, when it is appropriate to the environmental setting. It was demonstrated that accounting for this loss term could avert the apparent violation of the "mass balance" principle. It is recommended that each of the algorithms containing loss correction terms be carefully reviewed to ensure that the potential for exaggeration of predicted concentrations is adequately controlled.

The current analyses did not specifically address the type of mass balance problem that occurs when a deposition velocity is applied to an air concentration "externally" to the rest of the air concentration calculations. However, the mass of vapor that is dry-deposited at each downwind distance should be subtracted from the mass in the airborne plume, as is done for particulate concentrations modeled with ISCST3. This would also provide a needed correction for the downwind deposition rates, which is more important for water bodies and watersheds that are farther than the 1 1/2 to 3 km at which the maximum ground level air concentrations typically occur. The EPA Dallas Meeting included a long discussion of the reasons for modifying the air modeling approach to accomplish this. EPA indicated that it is in the "active planning" stage, but no specific schedule was identified.

Although this paper did not examine the complex role of plants in the modeling, outside of recognizing that the high value of deposition velocity recommended by the U.S. EPA in the HHRAP and SLERAP guidance is inherently related to measurements made in plant life. As noted above, this topic will continue to develop new information rapidly, and should be closely followed to gain better insights into the entire fate and transport cycle for the various mercury species of importance to risk assessment.

ACKNOWLEDGEMENTS

The authors would like to acknowledge the applied research support received from the Louisiana Chemical Association and the Norlite Corporation of Cohoes, NY that was of substantial benefit to the present investigation. With the exception of Norlite measurement results presented in Figure 2, case study results should not be taken to directly represent any of the facilities associated with either organization. The example case presented here are intended to represent typical cases that might approximate expected results for similar situations for these or other facilities that incinerate or use as fuels materials containing hazardous waste constituents.

The authors would also like to especially thank Ms. Angela Lin and Mr. Brian Stormwind for their assistance with several of the modeling calculations. We would also like to thank Mr. Mark Gerath, Dr. Kenneth Heim, and Dr. Michael Mills for their early counsel on the behavior of fate and transport models and the simulation of erosion processes.

REFERENCES

1. U.S. EPA, 1998. Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities (Peer Review Draft). Office of Solid Waste and Emergency Response. EPA530-D-98-001A, B, C. July.

2. U. S. EPA, 1999. Screening Level Ecological Risk Assessment for Hazardous Waste Combustion Facilities (Peer Review Draft). Office of Solid Waste and Emergency Response. August 2.

3. U.S. EPA, 1999. Human Health Risk Assessment Protocol for Hazardous Waste Facilities. (Peer Review Draft), Errata—August 2.

4. U.S. EPA, 1997. Mercury Study Report to Congress, Vol. I-VIII. OAQPS and ORD, EPA/452/R-97-001. December.

5. Kaleri, Cynthia J, 2000. Implementation Issues: Mercury Transport & Fate, Combustion Risk Assessments in Region 6. Proceeding of the 12th International Conference on Incineration and Thermal Treatment Technologies, May 14-18

6. Gustin, M.S. et al., 2001. Assessing the Role of Plants in the Biogeochemical Cycle of Mercury. Dept. of Environmental and Resource Sciences, Univ. of Nev. MS 370,

Reno, NV, (in cooperation with Environmental Sciences Div. ORNL and Desert Research Institute, Reno, NV) May.

7. Watras, C., and J. Huckabee, eds. 1994. Mercury as a Global Pollutant. Lewis Publishers, Boca Raton, FL.

8. Lindberg, S., et al., 1995. Micrometeorological Gradient Approach for Quantifying Air/Surface Exchange of Mercury Vapor: Tests over Contaminated Soils. Environ. Sci. and Technol. V. 29, 126-135.

9. Lindberg, S., et al. 1992. J. Geophysical Research, V. 97, 2519-2528.

10. Lindberg, S., W.J. Stratton, 1998. Atmospheric Mercury Speciation: Concentrations and Behavior of Reactive Gaseous Mercury in Ambient Air. Environ. Sci. and Technol. V. 32, 49-57.

11. Smith, D. G., M. Garcia, 2001. Risk Modeling Implications of Mercury MACT Limits and Detection Sensitivity for RCRA-Regulated Combustion Facilities – I, Paper presentation at 94th Annual Conference & Exhibition of the Air and Waste Management Assoc. Orlando, FL. June 25-27.

Table 1
Comparison of Predicted Water Body Loading Rates with Total Deposition Load to Watershed

Quantity Predicted	EPA Default Assumptions (Erosion Loss, kse = 0)		Modified EPA Assumptions (Erosion Loss, kse = Calculated)	
Chemical Species	$HgCl_2$	MeHg	$HgCl_2$	MeHg
Total Deposition to Watershed (g/yr)	**1.18**	**0.00**	**1.18**	**0.00**
Erosion & Pervious Surface Runoff Load Predicted (g/yr)	**1.96**	**0.47**	**0.85**	**0.17**
Total Mercury (sum of species, g/yr)	**2.43**		**1.02**	
Ratio of Total to Total Deposition from Source to Watershed	**2.05 (205 %)**		**0.86 (86 %)**	

Table 2
Case Study Emissions, Concentrations and Deposition Modeling Data

Parameter	*Value*
Source Emissions:	
Stack Height (m)	20
Stack Diameter (m)	1.0
Volume Flow (dscm/sec)	10
Exit Velocity (m/sec)	10
Exit Temp. (deg. K)	300
Emission Rates (g/sec)	1.3 to 130 x 10-6
Air Conc. and Depos. Rates (all per g/s):	
Air Vapor Conc. (ug/m3)	6.2 x 10-2
Hg^{+2} Particle-bound Wet Depos. (g/m^2-yr)	2.0 x 10-3
Hg^{+2} Particle-bound Dry Depos. (g/m^2-yr)	1.0 x 10-3
Hg^{+2} Vapor Wet Depos. (g/m^2-yr)	1.5 x 10-3
Hg^{+2} Vapor Dry Depos. (g/m^2-yr)	1.5 x 10-3 to 6.0 x 10-2
Water Body and Watershed Sizes	
Water Body Area (m^2 / acres)	2.0 x 10+5 / 50
Watershed Area (m^2/acres)	8.5 x 10+6 / 2,000

Table 3
Hazard Index Modeling Results for Recreational Fisher Ingesting Mercury *

Emission Rates		HAZARD INDEX[+]			
		Vapor Deposition Velocity Assumed			
Rate (ug/sec)	% of MACT Limit	3 cm/sec[a]	0.78 cm/sec[b]	0.3 cm/sec[c]	0.10 cm/sec[d]
130	10	24	6.8	3.1	1.6
13	1	2.4	0.68	0.31	0.16
1.3	0.1	0.24	0.068	0.031	0.016

[+] **Principally due to methyl mercury**

[a] EPA guidance default value, derived from higher values estimated as appropriate for daytime HNO_3 deposition in U.S. EPA Mercury Study Report to Congress[2];

[b] Previously calculated as maximum long-term average for dry deposition to pasture by authors [10], approximately double the short-term deposition velocity recently measured by Lindberg and Stratton [9] for pasture.

[c] Nighttime average used by U.S. EPA in Mercury Study Report to Congress [5]

[d] A rounded average deposition rate for total mercury vapor modeled by Lindberg, et al.[4] from throughfall experiments.

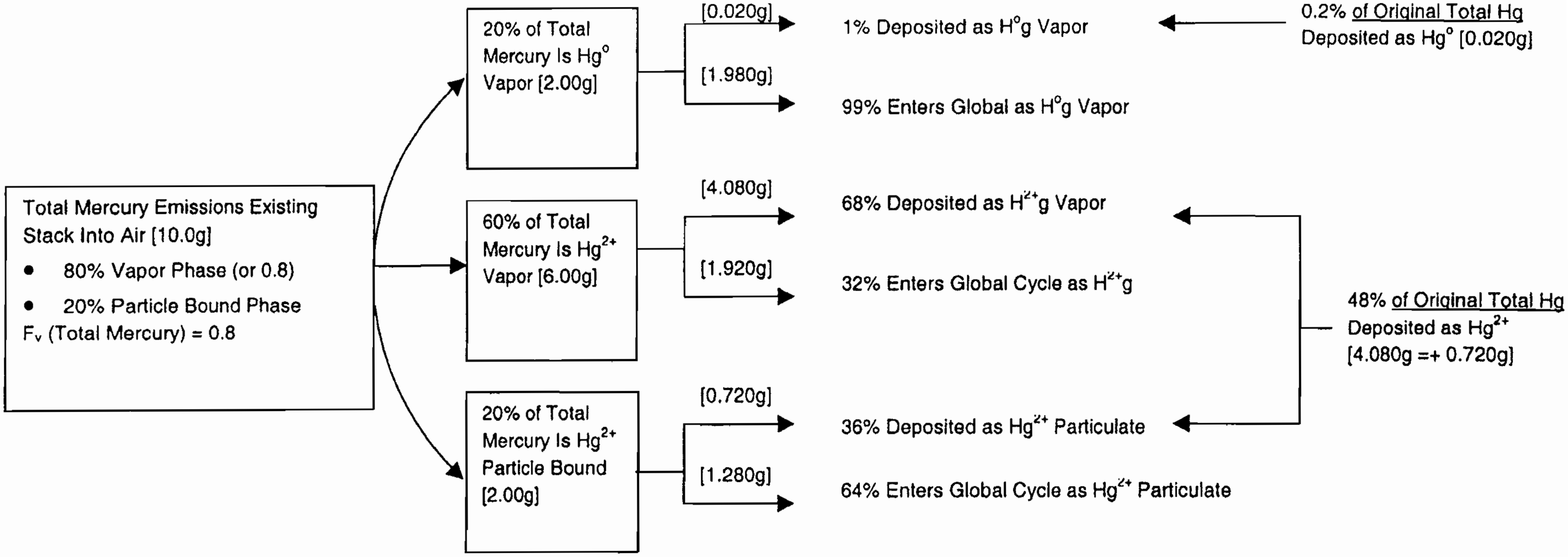
Table 4
Comparison of Hazard Quotient (Ratios) for High and Low Deposition Rates for Different Watershed:Water Body Size Ratios

	AREAS			HQ (MeHg)		HQ (MeHg)
	Water body (WB)	Watershed (WS)	Ratio	vdv=0.1	vdv=3	Ratio
Case	(m^2)	(m^2)	WS:WB	(cm/sec)	(cm/sec)	(for vdv=3 : vdv=0.1)
A	8.15E+05	1.18E+06	1.45E+00	4.58E-02	3.65E-01	7.97E+00
B	8.15E+05	7.19E+06	8.82E+00	3.87E-02	4.49E-01	1.16E+01
C	8.15E+05	8.45E+06	1.04E+01	3.83E-02	4.70E-01	1.23E+01
D	2.02E+05	3.40E+06	1.69E+01	1.75E-01	2.46E+00	1.41E+01
E	2.02E+05	8.45E+06	4.18E+01	1.60E-01	2.40E+00	1.50E+01
F	2.02E+05	3.47E+07	1.72E+02	1.74E-01	2.74E+00	1.57E+01

TABLE 5
Uncertainty Factors Identified by Hg Risk Model Sensitivity Tests

FACTOR	MARGIN OF UNCERTAINTY
Emissions (Valence) Speciation	+/- 50%
Erosion Loss Rate Constant, k_{se}	- 2x to 4x
Watershed/Water body Area Ratio	< 2x
Dry Deposition of Vapor Rate, V_d	+/- 4x to 16x

Figure 1
EPA Model Default Phase Allocation and Speciation of Mercury in Air



LEGEND
Hg^o – Elemental Mercury
Hg^{2+} - Divalent Mercury
[ ] – Example Mass Allocation

THUS: Without Consideration of Global Cycle

- 80% of Total Mercury Emitted is Deposited as $H^{2+}g$ [(6g+2g)/10g]
- 20% of Total Mercury Emitted is Deposited as H^og [2g/10g]

Calculated Fv

- Fv (Hg^{2+}) = [6g/(6g+2g)] = 0.75
- Fv (Hg^o) = [2g/2g] = 1.0

BUT: With Consideration of Global Cycle

- 48% of Total Mercury Emitted is Deposited as $H^{2+}g$ [(4.08g + 0.72g)/10g]
- 0.2% of Total Mercury Emitted is Deposited as H^og [0.02g/10g]

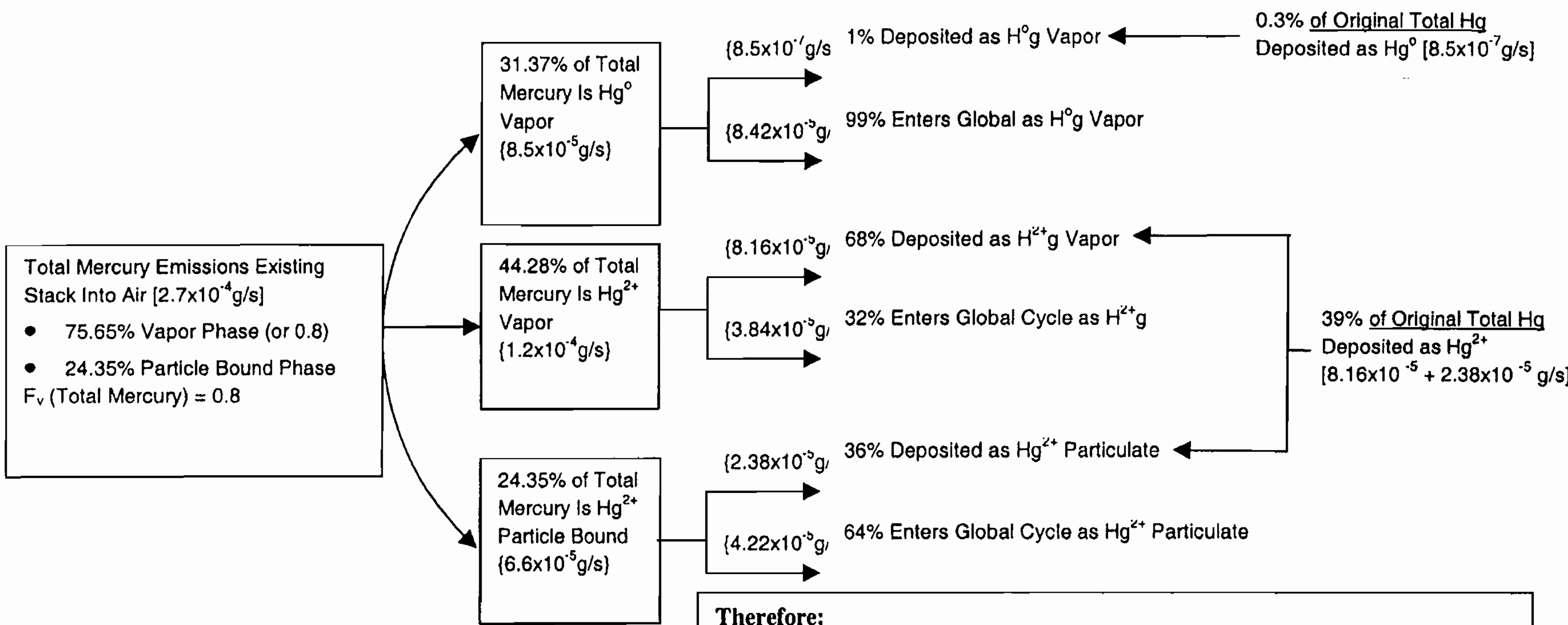
Calculated Fv:

- Fv (Hg^{2+}) = [4.08g/(4.08g + 0.72g)] = 0.85
- Fv (Hg^o) = [0.02g/(0.02g + 0g)] = 1.0

Compound Specific Emission Rate Q:

- Actual Q (Hg^{2+}) = 48% * Q (Total Mercury)
- Actual Q (H^og) = 0.2% * Q (Total Mercury)

Figure 2
Site Specific Measurement-based Phase Allocation and Speciation of Mercury in Air



LEGEND
Hg^{o} – Elemental Mercury
Hg^{2+} - Divalent Mercury
{ } – New Norlite-specific Emission Rates Allocation

<u>Therefore</u>:
With Consideration of Global Cycle, the Compound-Specific Emission Rate, Q:

- 39% of Total Mercury Emitted is Deposited as H^{2+}g {8.16x10^{-5} + 2.38x10^{-5} g/s)]
- 0.3% of Total Mercury Emitted is Deposited as H^{o}g {8.5x10^{-7} g/s}

Calculated Fv:

- Fv (Hg^{2+}) = 0.77 = {8.16x10^{-5}g/s)/(8.16x10^{-5} +2.38x10^{-5} g/s}
- Fv (Hg^{o}) = 1.0

Figure 3
Equations from EPA Fate and Transport Model Illustrating Buildup of Uncertainty as Material Deposits and Migrates to Body of Water

The first set of equations are presented to show the appropriate form for Equation B-4-27 in the 1998 U.S. EPA Guidance:

(The 1999 Errata effectively made this correction for soil loads that are modeled as transferring to the water bodies, with subsequent calculations of methyl mercury concentrations in water and fish).

Correction of Equation B-4-27:

$$C_{fishMHg} = C_{dwMHg+Hg2+} \times BAF_{MHg} \quad \text{to} \quad C_{fishMHg} = C_{dwMHg} \times BAF_{MHg}$$

The following presents the set of linear equations used to compute the concentration and total mass loadings of the various portions of the transport of Hg2 (e.g. HgCl2) and MHg (methyl mercury) which pass into the water body:

If: $RO \times (A_L \times A_I) \times [(Cs_{Hg2+} \times BD)/(\theta_{sw} \times Kd_s \times BD)] \times 0.01 = LR_{Hg2+}$ Eq 5-32 (p 5-67)

and $LR_{Hg2+} \times 0.15) + LR_{MHg(Initial)} = L_{RMHg(final)}$ Errata (p 19)

and [redacted] $= X_e \times (A_L - A_I) \times SD \times ER \times [(Cs_{Hg2+} \times 0.02 \times Kd_s \times BD)/(\theta_{sw} \times Kd_s \times BD)] \times 0.01$ Eq 5-33 (p 5-68)

Then:

[redacted] $+ L_{RMHg} + L_{IMHg} + L_{RIMHg} + L_{difMHg} + L_{DEPMHg} = LT_{MHg}$ Eq 5-28 (p 5-64)

Thus the total load of methyl mercury to the water body includes the sum of the uncertainties of the four terms highlighted as having the greatest uncertainty in their values.

Figure 3 (concluded)

Furthermore, the resulting concentrations calculated for the fish will include both these uncertainties and those of the highlighted media concentrations which affect the uptake of the fish from the water body:

The total water body concentration reflects the distribution of the total transferred load into the water column and the bed sediment:

$$C_{wtotMHg} = L_{TMHg}/[Vf_x \times f_{wc} \times K_{wt} \times A_W \times (d_{wc} + d_{bs})]$$ Eq 5-35 (p 5-71)

From that total, the concentration in the water column is calculated from the distribution coefficients:

$$C_{wctotMHg} = f_{wc} \times C_{wtotMHg} \times [(d_{wc} + d_{bs})/ d_{wc}]$$ Eq 5-45 (p 5-83)

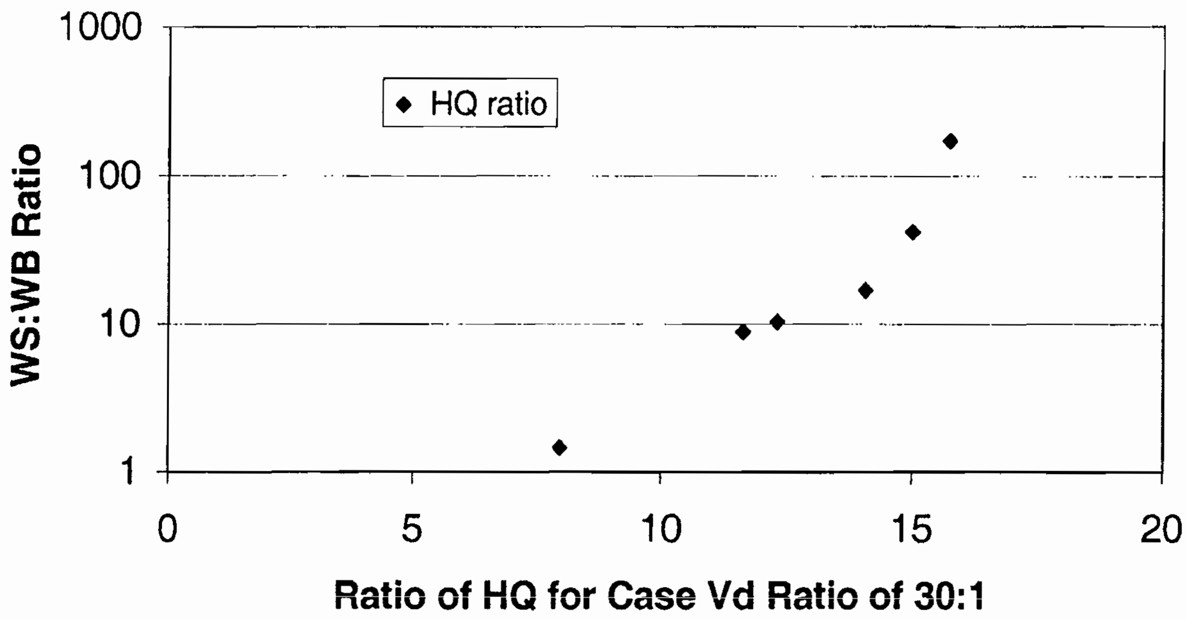
Then the dissolved water concentration of methyl mercury is subsequently calculated:

$$C_{dwMHg} = (C_{wctotMHg})/(1 + Kd_{sw} \times TSS \times 1 \times 10^{-6})$$ Eq 5-46 (p 5-84)

And finally, the methyl mercury concentration in fish is estimated, based upon the site-specific assumptions made about the species caught for human consumption and its published BAF values for similar circumstances:

$$C_{fishMHg} = C_{dwMHg} \times BAF_{fishMHg}$$ Eq 5-49 (p 5-88)

Figure 4. Ratio of MeHg HQ for 30:1 Ratio of Vd as a Function of WS:WB Ratio



Appendix I

Detailed Risk and hazard Index Modeling results for "EPA Alternative Case" (Tables I-1 through I-8)

Table I-1a
Noncarcinogenic Hazard Index - Child Resident
North Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	As	Sb	Ba	Be	Cd	Total Cr	Cr VI
Total Noncarcinogenic Hazard Index - Child Resident							
Total HI = 6.12E-01							
Hazard Index for consumption of beef	1.50E-07	1.14E-08	1.72E-11	1.02E-09	1.38E-09	7.04E-11	3.36E-09
Hazard Index for consumption of milk	2.96E-07	7.44E-08	2.63E-09	4.76E-11	4.85E-09	8.44E-10	6.07E-08
Hazard Index for consumption of fish	7.48E-07	2.28E-07	3.62E-08	3.36E-08	1.33E-06	3.61E-12	9.04E-10
Hazard Index for consumption of soil	4.86E-06	1.11E-06	1.02E-08	1.01E-06	1.63E-06	1.98E-08	2.63E-08
Hazard Index for consumption of above-ground vegetables	3.74E-06	1.06E-06	1.04E-08	3.29E-08	3.23E-06	2.95E-10	2.86E-08
Hazard Index for consumption of below-ground vegetables	1.18E-06	9.19E-07	4.35E-09	5.91E-09	2.36E-06	1.41E-10	3.72E-09
Hazard Index for consumption of drinking water	1.03E-06	1.21E-07	1.22E-09	8.02E-09	1.08E-07	3.40E-12	6.72E-09
Hazard Index for inhalation	1.50E-04	2.16E-05	1.10E-04	4.44E-04	1.72E-04	5.00E-04	1.24E-04
Total Hazard Index - All Potential Exposure Pathways	1.62E-04	2.52E-05	1.10E-04	4.45E-04	1.80E-04	5.00E-04	1.24E-04
Fraction of 0.25 Benchmark	0.001	0.000	0.000	0.002	0.001	0.002	0.000
Total Cancer Risk - Child Resident							
Total Risk = 1.24E-06							
Cancer Risk for consumption of beef	5.55E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of milk	1.10E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of fish	2.77E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of soil	1.80E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of above-ground vegetables	1.38E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of below-ground vegetables	4.29E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of drinking water	3.81E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for inhalation	9.34E-08	0.00E+00	0.00E+00	2.94E-09	8.51E-09	0.00E+00	1.49E-07
Total Cancer Risk - All Potential Exposure Pathways	9.39E-08	0.00E+00	0.00E+00	2.94E-09	8.51E-09	0.00E+00	1.49E-07
Fraction of 1E-05 Benchmark	0.009	0.000	0.000	0.000	0.001	0.000	0.015

Notes:

As	Arsenic
Sb	Antimony
Ba	Barium
Be	Beryllium
Cd	Cadmium
Total Cr	Total Chromium
Cr VI	Chromium VI

Table I-1a
Noncarcinogenic Hazard Index - Child Resident
North Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	Pb	Ni	Se	Ag	Tl	Zn	TCDD-TEQ
Total Noncarcinogenic Hazard Index - Child Resident							
Total HI = 6.12E-01							
Hazard Index for consumption of beef	0.00E+00	2.82E-08	5.63E-10	9.96E-09	3.78E-06	7.16E-11	6.35E-06
Hazard Index for consumption of milk	0.00E+00	3.04E-07	9.70E-08	4.42E-06	1.22E-05	1.68E-09	5.93E-05
Hazard Index for consumption of fish	0.00E+00	1.90E-07	1.54E-08	3.23E-07	4.96E-08	8.02E-07	9.36E-05
Hazard Index for consumption of soil	0.00E+00	6.57E-07	2.90E-09	6.25E-08	1.45E-05	1.01E-07	2.88E-04
Hazard Index for consumption of above-ground vegetables	0.00E+00	2.82E-07	1.18E-08	3.08E-07	4.04E-06	1.40E-07	9.04E-08
Hazard Index for consumption of below-ground vegetables	0.00E+00	1.27E-07	2.02E-09	1.98E-07	1.34E-07	1.09E-07	6.04E-06
Hazard Index for consumption of drinking water	0.00E+00	5.00E-08	2.75E-09	3.61E-08	1.01E-06	8.05E-09	8.13E-08
Hazard Index for inhalation	0.00E+00	3.18E-02	4.95E-07	6.49E-06	1.83E-04	1.46E-06	3.76E-05
Total Hazard Index - All Potential Exposure Pathways	0.00E+00	3.18E-02	6.27E-07	1.18E-05	2.19E-04	2.62E-06	4.91E-04
Fraction of 0.25 Benchmark	0.000	0.127	0.000	0.000	0.001	0.000	0.002
Total Cancer Risk - Child Resident							
Total Risk = 1.24E-06							
Cancer Risk for consumption of beef	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.21E-09
Cancer Risk for consumption of milk	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.15E-08
Cancer Risk for consumption of fish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.05E-07
Cancer Risk for consumption of soil	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.21E-07
Cancer Risk for consumption of above-ground vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.42E-10
Cancer Risk for consumption of below-ground vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.83E-09
Cancer Risk for consumption of drinking water	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.30E-10
Cancer Risk for inhalation	0.00E+00	2.11E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.28E-08
Total Cancer Risk - All Potential Exposure Pathways	0.00E+00	2.11E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.99E-07
Fraction of 1E-05 Benchmark	0.000	0.002	0.000	0.000	0.000	0.000	0.060

Notes:

Pb	Lead
Ni	Nickel
Se	Selenium
Ag	Silver
Tl	Thallium
Zn	Zinc
TCDD-TEQ	2,3,7,8-TCDD Toxicity Equivalents

Table I-1a
Noncarcinogenic Hazard Index - Child Resident
North Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	BAA	BAP	BBF	BKF	CHRYS	DBAHA	INDENO
Total Noncarcinogenic Hazard Index - Child Resident							
Total HI = 6.12E-01							
Hazard Index for consumption of beef	3.22E-11	5.44E-10	2.20E-09	6.51E-10	8.32E-10	5.41E-09	6.28E-08
Hazard Index for consumption of milk	5.43E-10	9.54E-09	3.70E-08	1.20E-08	1.42E-08	1.10E-07	1.28E-06
Hazard Index for consumption of fish	4.18E-09	1.20E-08	8.04E-08	7.92E-09	8.08E-08	1.80E-09	1.90E-09
Hazard Index for consumption of soil	3.89E-09	2.04E-08	8.23E-08	1.29E-08	8.33E-08	3.33E-09	4.40E-09
Hazard Index for consumption of above-ground vegetables	9.08E-10	9.35E-10	7.05E-09	8.92E-10	8.74E-09	3.38E-09	1.69E-08
Hazard Index for consumption of below-ground vegetables	1.40E-07	6.37E-08	1.37E-06	4.68E-08	1.19E-06	7.93E-09	8.46E-09
Hazard Index for consumption of drinking water	1.03E-11	1.73E-11	1.05E-10	1.29E-11	1.35E-10	3.82E-12	2.97E-12
Hazard Index for inhalation	7.55E-10	1.25E-09	8.42E-09	1.12E-09	5.99E-09	8.52E-10	1.19E-09
Total Hazard Index - All Potential Exposure Pathways	1.50E-07	1.08E-07	1.59E-06	8.23E-08	1.38E-06	1.32E-07	1.38E-06
Fraction of 0.25 Benchmark	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cancer Risk - Child Resident							
Total Risk = 1.24E-06							
Cancer Risk for consumption of beef	5.80E-14	9.60E-12	3.96E-12	1.15E-13	1.50E-14	9.72E-11	1.13E-10
Cancer Risk for consumption of milk	9.78E-13	1.70E-10	6.66E-11	2.13E-12	2.55E-13	1.97E-09	2.30E-09
Cancer Risk for consumption of fish	7.53E-12	2.13E-10	1.45E-10	1.40E-12	1.45E-12	3.15E-11	3.32E-12
Cancer Risk for consumption of soil	7.01E-12	3.45E-10	1.48E-10	2.16E-12	1.49E-12	5.43E-11	7.14E-12
Cancer Risk for consumption of above-ground vegetables	1.53E-12	1.62E-11	1.19E-11	1.57E-13	1.47E-13	6.08E-11	3.05E-11
Cancer Risk for consumption of below-ground vegetables	2.34E-10	1.03E-09	2.26E-09	7.60E-12	1.95E-11	1.29E-10	1.37E-11
Cancer Risk for consumption of drinking water	1.85E-14	3.02E-13	1.89E-13	2.25E-15	2.42E-15	6.65E-14	5.16E-15
Cancer Risk for inhalation	6.57E-12	1.09E-11	7.33E-11	9.78E-12	5.21E-11	7.41E-12	1.04E-11
Total Cancer Risk - All Potential Exposure Pathways	2.57E-10	1.80E-09	2.71E-09	2.33E-11	7.50E-11	2.35E-09	2.48E-09
Fraction of 1E-05 Benchmark	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes:

BAA	Benzo(a)anthracene
BAP	Benzo(a)pyrene
BBF	Benzo(b)fluoranthene
BKF	Benzo(k)fluoranthene
CHRYS	Chrysene
DBAHA	Dibenz(a,h)anthracene
INDENO	Indeno(1,2,3-c,d)pyrene

Table I-1a
Noncarcinogenic Hazard Index - Child Resident
North Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	BEHP	HCBZ	BZ	BM	CCl4	DCDFM	T13DCP
Total Noncarcinogenic Hazard Index - Child Resident							
Total HI = 6.12E-01							
Hazard Index for consumption of beef	2.42E-08	1.02E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Index for consumption of milk	3.87E-07	1.79E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Index for consumption of fish	1.29E-06	1.42E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Index for consumption of soil	1.07E-05	1.50E-06	2.97E-11	4.40E-12	3.57E-11	1.23E-15	1.09E-12
Hazard Index for consumption of above-ground vegetables	7.49E-06	7.91E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Index for consumption of below-ground vegetables	6.74E-04	2.38E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Index for consumption of drinking water	6.92E-08	1.78E-07	1.80E-07	2.46E-07	1.58E-07	1.86E-09	4.31E-09
Hazard Index for inhalation	6.87E-06	8.11E-05	1.98E-04	1.64E-04	1.24E-04	4.10E-06	1.37E-05
Total Hazard Index - All Potential Exposure Pathways	7.01E-04	3.24E-04	1.98E-04	1.64E-04	1.24E-04	4.10E-06	1.37E-05
Fraction of 0.25 Benchmark	0.003	0.001	0.001	0.001	0.000	0.000	0.000
Total Cancer Risk - Child Resident							
Total Risk = 1.24E-06							
Cancer Risk for consumption of beef	5.56E-13	1.07E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of milk	8.91E-12	1.88E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of fish	2.96E-11	1.50E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of soil	2.47E-10	1.58E-10	4.03E-16	0.00E+00	2.67E-16	1.69E-18	2.70E-16
Cancer Risk for consumption of above-ground vegetables	1.68E-10	8.33E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of below-ground vegetables	1.51E-08	2.51E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of drinking water	1.59E-12	1.87E-11	2.44E-12	0.00E+00	1.18E-12	2.57E-12	1.06E-12
Cancer Risk for inhalation	2.66E-10	1.43E-08	1.36E-09	0.00E+00	5.19E-10	0.00E+00	1.51E-09
Total Cancer Risk - All Potential Exposure Pathways	1.59E-08	3.99E-08	1.36E-09	0.00E+00	5.20E-10	2.57E-12	1.51E-09
Fraction of 1E-05 Benchmark	0.002	0.004	0.000	0.000	0.000	0.000	0.000

Notes:

BEHP	Bis(2-ethylhexyl)phthalate
HCBZ	Hexachlorobenzene
BZ	Benzene
BM	Bromomethane
CCl4	Carbon tetrachloride
DCDFM	Dichlorodifluoromethane
T13DCP	Trans-1,3-Dichloropropene

Table I-1a
Noncarcinogenic Hazard Index - Child Resident
North Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	TCFM	VCL	HCP	2-NA	2,4-DNT	2,6-DNT	CLMTHN
Total Noncarcinogenic Hazard Index - Child Resident							
Total HI = 6.12E-01							
Hazard Index for consumption of beef	0.00E+00	0.00E+00	6.92E-12	6.98E-11	9.78E-12	2.93E-11	0.00E+00
Hazard Index for consumption of milk	0.00E+00	0.00E+00	1.25E-10	1.42E-09	1.99E-10	6.00E-10	0.00E+00
Hazard Index for consumption of fish	0.00E+00	0.00E+00	8.33E-08	1.50E-05	4.90E-07	2.05E-06	0.00E+00
Hazard Index for consumption of soil	4.50E-14	6.75E-14	2.16E-09	3.15E-06	3.56E-07	1.28E-06	1.56E-13
Hazard Index for consumption of above-ground vegetables	0.00E+00	0.00E+00	2.50E-09	2.07E-04	1.98E-05	8.01E-05	0.00E+00
Hazard Index for consumption of below-ground vegetables	0.00E+00	0.00E+00	1.00E-06	3.17E-03	3.16E-04	1.25E-03	0.00E+00
Hazard Index for consumption of drinking water	1.20E-09	1.14E-07	5.92E-08	2.07E-05	7.19E-07	2.96E-06	8.13E-08
Hazard Index for inhalation	1.17E-06	8.19E-06	3.61E-03	1.80E-03	2.57E-05	1.03E-04	9.10E-06
Total Hazard Index - All Potential Exposure Pathways	1.17E-06	8.31E-06	3.61E-03	5.22E-03	3.63E-04	1.44E-03	9.18E-06
Fraction of 0.25 Benchmark	0.000	0.000	0.014	0.021	0.001	0.006	0.000
Total Cancer Risk - Child Resident							
Total Risk = 1.24E-06							
Cancer Risk for consumption of beef	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.09E-15	1.64E-15	0.00E+00
Cancer Risk for consumption of milk	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.23E-14	3.35E-14	0.00E+00
Cancer Risk for consumption of fish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.47E-11	1.15E-10	0.00E+00
Cancer Risk for consumption of soil	0.00E+00	2.50E-17	0.00E+00	0.00E+00	3.98E-11	7.17E-11	6.67E-19
Cancer Risk for consumption of above-ground vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.21E-09	4.47E-09	0.00E+00
Cancer Risk for consumption of below-ground vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.53E-08	6.99E-08	0.00E+00
Cancer Risk for consumption of drinking water	0.00E+00	4.20E-11	0.00E+00	0.00E+00	8.04E-11	1.66E-10	3.47E-13
Cancer Risk for inhalation	0.00E+00	9.95E-10	0.00E+00	0.00E+00	4.83E-09	9.68E-09	2.04E-10
Total Cancer Risk - All Potential Exposure Pathways	0.00E+00	1.04E-09	0.00E+00	0.00E+00	4.25E-08	8.44E-08	2.04E-10
Fraction of 1E-05 Benchmark	0.000	0.000	0.000	0.000	0.004	0.008	0.000

Notes:

TCFM	Trichlorofluoromethane
VCL	Vinyl Chloride
HCP	Hexachlorocyclopentadiene
2-NA	2-Nitroaniline
2,4-DNT	2,4-Dinitrotoluene
2,6-DNT	2,6-Dinitrotoluene
CLMTHN	Chloromethane

Table I-1a
Noncarcinogenic Hazard Index - Child Resident
North Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	PCP	1,1-DCE	1,1,2,2-TCA	CLFM	1,3-BUT	HCBU
Total Noncarcinogenic Hazard Index - Child Resident						
Total HI = 6.12E-01						
Hazard Index for consumption of beef	2.87E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.39E-12
Hazard Index for consumption of milk	5.87E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.43E-11
Hazard Index for consumption of fish	3.02E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.54E-07
Hazard Index for consumption of soil	2.81E-08	8.96E-13	2.00E-11	1.60E-11	0.00E+00	1.62E-09
Hazard Index for consumption of above-ground vegetables	7.72E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.34E-09
Hazard Index for consumption of below-ground vegetables	3.34E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.57E-07
Hazard Index for consumption of drinking water	5.48E-08	1.32E-08	3.12E-09	3.70E-08	0.00E+00	8.80E-08
Hazard Index for inhalation	6.88E-06	8.58E-06	1.31E-06	2.73E-03	0.00E+00	5.15E-05
Total Hazard Index - All Potential Exposure Pathways	3.42E-04	8.59E-06	1.31E-06	2.73E-03	0.00E+00	5.28E-05
Fraction of 0.25 Benchmark	0.001	0.000	0.000	0.011	0.000	0.000
Total Cancer Risk - Child Resident						
Total Risk = 1.24E-06						
Cancer Risk for consumption of beef	8.50E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.35E-18
Cancer Risk for consumption of milk	1.74E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.25E-17
Cancer Risk for consumption of fish	8.94E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.82E-13
Cancer Risk for consumption of soil	8.30E-12	3.98E-16	1.97E-14	0.00E+00	0.00E+00	2.07E-15
Cancer Risk for consumption of above-ground vegetables	2.28E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.00E-15
Cancer Risk for consumption of below-ground vegetables	9.90E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.70E-13
Cancer Risk for consumption of drinking water	1.62E-11	5.84E-12	3.07E-12	0.00E+00	0.00E+00	1.13E-13
Cancer Risk for inhalation	3.42E-09	1.89E-09	2.17E-09	2.62E-09	5.82E-08	1.11E-10
Total Cancer Risk - All Potential Exposure Pathways	1.03E-07	1.90E-09	2.17E-09	2.62E-09	5.82E-08	1.13E-10
Fraction of 1E-05 Benchmark	0.010	0.000	0.000	0.000	0.006	0.000

Notes:

PCP	Pentachlorophenol
1,1-DCE	1,1-Dichloroethylene
1,1,2,2-TCA	1,1,2,2-Tetrachloroethane
CLFM	Chloroform
1,3-BUT	1,3-Butadiene
HCBU	Hexachlorobutadiene

Table I-1a
Noncarcinogenic Hazard Index - Child Resident
North Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	Hg	HgCl	MeHg	Total by Pathway
Total Noncarcinogenic Hazard Index - Child Resident				
Total HI = 6.12E-01				
Hazard Index for consumption of beef	0.00E+00	3.77E-06	8.04E-08	1.43E-05
Hazard Index for consumption of milk	0.00E+00	5.39E-05	2.01E-06	1.35E-04
Hazard Index for consumption of fish	0.00E+00	0.00E+00	5.60E-01	5.60E-01
Hazard Index for consumption of soil	0.00E+00	1.65E-03	5.43E-05	2.03E-03
Hazard Index for consumption of above-ground vegetables	0.00E+00	3.89E-04	3.12E-04	1.03E-03
Hazard Index for consumption of below-ground vegetables	0.00E+00	9.55E-05	1.55E-05	6.11E-03
Hazard Index for consumption of drinking water	0.00E+00	7.12E-06	3.71E-06	3.90E-05
Hazard Index for inhalation	1.09E-05	3.86E-04	0.00E+00	4.29E-02
Total Hazard Index - All Potential Exposure Pathways	1.09E-05	2.59E-03	5.60E-01	6.12E-01
Fraction of 0.25 Benchmark	0.000	0.010	2.240	2.448
Total Cancer Risk - Child Resident				
Total Risk = 1.24E-06				
Cancer Risk for consumption of beef	0.00E+00	0.00E+00	0.00E+00	9.44E-09
Cancer Risk for consumption of milk	0.00E+00	0.00E+00	0.00E+00	9.61E-08
Cancer Risk for consumption of fish	0.00E+00	0.00E+00	0.00E+00	1.06E-07
Cancer Risk for consumption of soil	0.00E+00	0.00E+00	0.00E+00	3.23E-07
Cancer Risk for consumption of above-ground vegetables	0.00E+00	0.00E+00	0.00E+00	7.36E-09
Cancer Risk for consumption of below-ground vegetables	0.00E+00	0.00E+00	0.00E+00	2.57E-07
Cancer Risk for consumption of drinking water	0.00E+00	0.00E+00	0.00E+00	5.10E-10
Cancer Risk for inhalation	0.00E+00	0.00E+00	0.00E+00	4.40E-07
Total Cancer Risk - All Potential Exposure Pathways	0.00E+00	0.00E+00	0.00E+00	1.24E-06
Fraction of 1E-05 Benchmark	0.000	0.000	0.000	0.124

Notes:

Hg Elemental Mercury
HgCl Mercuric Chlorid
MeHg Methyl Mercury

Table I-1b
Noncarcinogenic Hazard Index and Cancer Risk - Child Resident
South Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	As	Sb	Ba	Be	Cd	Total Cr	Cr VI
Total Noncarcinogenic Hazard Index - Child Resident							
Total HI = 5.65E-01							
Hazard Index for consumption of beef	1.50E-07	1.14E-08	1.72E-11	1.02E-09	1.38E-09	7.04E-11	3.36E-09
Hazard Index for consumption of milk	2.96E-07	7.44E-08	2.63E-09	4.76E-11	4.85E-09	8.44E-10	6.07E-08
Hazard Index for consumption of fish	7.48E-07	2.28E-07	3.62E-08	3.36E-08	1.33E-06	3.61E-12	9.04E-10
Hazard Index for consumption of soil	1.21E-05	2.76E-06	2.55E-08	2.52E-06	4.08E-06	4.95E-08	6.57E-08
Hazard Index for consumption of above-ground vegetables	7.04E-06	2.32E-06	2.26E-08	6.28E-08	7.77E-06	5.90E-10	5.24E-08
Hazard Index for consumption of below-ground vegetables	2.95E-06	2.29E-06	1.09E-08	1.47E-08	5.88E-06	3.53E-10	9.28E-09
Hazard Index for consumption of drinking water	8.19E-07	1.21E-07	1.22E-09	8.02E-09	1.08E-07	3.40E-12	6.72E-09
Hazard Index for inhalation	4.52E-07	6.50E-08	3.29E-07	1.33E-06	5.16E-07	1.50E-06	3.72E-07
Total Hazard Index - All Potential Exposure Pathways	2.46E-05	7.88E-06	4.28E-07	3.97E-06	1.97E-05	1.55E-06	5.71E-07
Fraction of 0.25 Benchmark	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cancer Risk - Child Resident							
Total Risk = 3.30E-07							
Cancer Risk for consumption of beef	5.55E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of milk	1.10E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of fish	2.77E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of soil	4.49E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of above-ground vegetables	2.59E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of below-ground vegetables	1.07E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of drinking water	3.03E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for inhalation	2.81E-10	0.00E+00	0.00E+00	8.84E-12	2.56E-11	0.00E+00	4.47E-10
Total Cancer Risk - All Potential Exposure Pathways	1.17E-09	0.00E+00	0.00E+00	8.84E-12	2.56E-11	0.00E+00	4.47E-10
Fraction of 1E-05 Benchmark	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes:

As	Arsenic
Sb	Antimony
Ba	Barium
Be	Beryllium
Cd	Cadmium
Total Cr	Total Chromium
Cr VI	Chromium VI

Table I-1b
Noncarcinogenic Hazard Index and Cancer Risk - Child Resident
South Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	Pb	Ni	Se	Ag	Tl	Zn	TCDD-TEQ
Total Noncarcinogenic Hazard Index - Child Resident							
Total HI = 5.65E-01							
Hazard Index for consumption of beef	0.00E+00	2.82E-08	5.63E-10	9.96E-09	3.78E-06	7.16E-11	6.35E-06
Hazard Index for consumption of milk	0.00E+00	3.04E-07	9.70E-08	4.42E-06	1.22E-05	1.68E-09	5.93E-05
Hazard Index for consumption of fish	0.00E+00	1.90E-07	1.54E-08	3.23E-07	4.96E-08	8.02E-07	9.36E-05
Hazard Index for consumption of soil	0.00E+00	1.64E-06	7.24E-09	1.56E-07	3.61E-05	2.52E-07	7.28E-05
Hazard Index for consumption of above-ground vegetables	0.00E+00	5.64E-07	2.17E-08	6.66E-07	7.28E-06	3.28E-07	1.79E-08
Hazard Index for consumption of below-ground vegetables	0.00E+00	3.17E-07	5.04E-09	4.93E-07	3.35E-07	2.73E-07	3.56E-06
Hazard Index for consumption of drinking water	0.00E+00	5.00E-08	2.75E-09	3.61E-08	1.01E-06	8.05E-09	8.13E-08
Hazard Index for inhalation	0.00E+00	9.56E-05	1.49E-09	1.95E-08	5.51E-07	4.39E-09	1.13E-07
Total Hazard Index - All Potential Exposure Pathways	0.00E+00	9.86E-05	1.51E-07	6.12E-06	6.14E-05	1.67E-06	2.36E-04
Fraction of 0.25 Benchmark	0.000	0.000	0.000	0.000	0.000	0.000	0.001
Total Cancer Risk - Child Resident							
Total Risk = 3.30E-07							
Cancer Risk for consumption of beef	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.21E-09
Cancer Risk for consumption of milk	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.15E-08
Cancer Risk for consumption of fish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.05E-07
Cancer Risk for consumption of soil	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.11E-08
Cancer Risk for consumption of above-ground vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.94E-11
Cancer Risk for consumption of below-ground vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.66E-09
Cancer Risk for consumption of drinking water	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.30E-10
Cancer Risk for inhalation	0.00E+00	6.33E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.89E-10
Total Cancer Risk - All Potential Exposure Pathways	0.00E+00	6.33E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.93E-07
Fraction of 1E-05 Benchmark	0.000	0.000	0.000	0.000	0.000	0.000	0.029

Notes:

Pb	Lead
Ni	Nickel
Se	Selenium
Ag	Silver
Tl	Thallium
Zn	Zinc
TCDD-TEQ	2,3,7,8-TCDD Toxicity Equivalents

Table I-1b
Noncarcinogenic Hazard Index and Cancer Risk - Child Resident
South Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	BAA	BAP	BBF	BKF	CHRYS	DBAHA	INDENO
Total Noncarcinogenic Hazard Index - Child Resident							
Total HI = 5.65E-01							
Hazard Index for consumption of beef	3.22E-11	5.44E-10	2.20E-09	6.51E-10	8.32E-10	5.41E-09	6.28E-08
Hazard Index for consumption of milk	5.43E-10	9.54E-09	3.70E-08	1.20E-08	1.42E-08	1.10E-07	1.28E-06
Hazard Index for consumption of fish	4.18E-09	1.20E-08	8.04E-08	7.92E-09	8.08E-08	1.80E-09	1.90E-09
Hazard Index for consumption of soil	4.72E-10	6.03E-09	1.04E-08	5.90E-09	1.11E-08	5.60E-09	8.07E-09
Hazard Index for consumption of above-ground vegetables	1.04E-10	1.48E-10	7.26E-10	1.29E-10	9.65E-10	8.81E-11	1.40E-10
Hazard Index for consumption of below-ground vegetables	1.69E-08	1.88E-08	1.74E-07	2.14E-08	1.59E-07	1.33E-08	1.55E-08
Hazard Index for consumption of drinking water	1.03E-11	1.73E-11	1.05E-10	1.29E-11	1.35E-10	3.82E-12	2.97E-12
Hazard Index for inhalation	2.26E-12	3.76E-12	2.53E-11	3.38E-12	1.80E-11	2.56E-12	3.58E-12
Total Hazard Index - All Potential Exposure Pathways	2.23E-08	4.71E-08	3.05E-07	4.79E-08	2.67E-07	1.36E-07	1.37E-06
Fraction of 0.25 Benchmark	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cancer Risk - Child Resident							
Total Risk = 3.30E-07							
Cancer Risk for consumption of beef	5.80E-14	9.60E-12	3.96E-12	1.15E-13	1.50E-14	9.72E-11	1.13E-10
Cancer Risk for consumption of milk	9.78E-13	1.70E-10	6.66E-11	2.13E-12	2.55E-13	1.97E-09	2.30E-09
Cancer Risk for consumption of fish	7.53E-12	2.13E-10	1.45E-10	1.40E-12	1.45E-12	3.15E-11	3.32E-12
Cancer Risk for consumption of soil	8.49E-13	1.02E-10	1.88E-11	9.86E-13	2.00E-13	9.12E-11	1.31E-11
Cancer Risk for consumption of above-ground vegetables	1.75E-13	2.48E-12	1.21E-12	2.18E-14	1.59E-14	1.52E-12	2.47E-13
Cancer Risk for consumption of below-ground vegetables	2.83E-11	3.05E-10	2.87E-10	3.47E-12	2.61E-12	2.16E-10	2.51E-11
Cancer Risk for consumption of drinking water	1.85E-14	3.02E-13	1.89E-13	2.25E-15	2.42E-15	6.65E-14	5.16E-15
Cancer Risk for inhalation	1.97E-14	3.27E-14	2.20E-13	2.94E-14	1.56E-13	2.23E-14	3.11E-14
Total Cancer Risk - All Potential Exposure Pathways	3.79E-11	8.02E-10	5.22E-10	8.15E-12	4.71E-12	2.41E-09	2.46E-09
Fraction of 1E-05 Benchmark	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes:

BAA	Benzo(a)anthracene
BAP	Benzo(a)pyrene
BBF	Benzo(b)fluoranthene
BKF	Benzo(k)fluoranthene
CHRYS	Chrysene
DBAHA	Dibenz(a,h)anthracene
INDENO	Indeno(1,2,3-c,d)pyrene

Table I-1b
Noncarcinogenic Hazard Index and Cancer Risk - Child Resident
South Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	BEHP	HCBZ	BZ	BM	CCl4	DCDFM
Total Noncarcinogenic Hazard Index - Child Resident						
Total HI = 5.65E-01						
Hazard Index for consumption of beef	2.42E-08	1.02E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Index for consumption of milk	3.87E-07	1.79E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Index for consumption of fish	1.29E-06	1.42E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Index for consumption of soil	1.25E-06	1.67E-07	3.31E-12	4.90E-13	3.98E-12	1.37E-16
Hazard Index for consumption of above-ground vegetables	8.79E-07	8.31E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Index for consumption of below-ground vegetables	7.84E-05	2.65E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Index for consumption of drinking water	6.93E-08	1.78E-07	1.80E-07	2.46E-07	1.58E-07	1.86E-09
Hazard Index for inhalation	2.06E-08	2.43E-07	5.93E-07	4.91E-07	3.72E-07	1.23E-08
Total Hazard Index - All Potential Exposure Pathways	8.23E-05	2.88E-05	7.73E-07	7.37E-07	5.30E-07	1.41E-08
Fraction of 0.25 Benchmark	0.000	0.000	0.000	0.000	0.000	0.000
Total Cancer Risk - Child Resident						
Total Risk = 3.30E-07						
Cancer Risk for consumption of beef	5.56E-13	1.07E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of milk	8.91E-12	1.88E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of fish	2.96E-11	1.50E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of soil	2.87E-11	1.76E-11	4.49E-17	0.00E+00	2.97E-17	1.89E-19
Cancer Risk for consumption of above-ground vegetables	1.98E-11	8.74E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of below-ground vegetables	1.76E-09	2.79E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of drinking water	1.59E-12	1.87E-11	2.44E-12	0.00E+00	1.18E-12	2.57E-12
Cancer Risk for inhalation	7.96E-13	4.29E-11	4.07E-12	0.00E+00	1.55E-12	0.00E+00
Total Cancer Risk - All Potential Exposure Pathways	1.85E-09	3.05E-09	6.51E-12	0.00E+00	2.74E-12	2.57E-12
Fraction of 1E-05 Benchmark	0.000	0.000	0.000	0.000	0.000	0.000

Notes:

BEHP	Bis(2-ethylhexyl)phthalate
HCBZ	Hexachlorobenzene
BZ	Benzene
BM	Bromomethane
CCl4	Carbon tetrachloride
DCDFM	Dichlorodifluoromethane

Table I-1b
Noncarcinogenic Hazard Index and Cancer Risk - Child Resident
South Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	T13DCP	TCFM	VCL	HCP	2-NA	2,4-DNT	2,6-DNT	CLMTHN
Total Noncarcinogenic Hazard Index - Child Resident								
Total HI = 5.65E-01								
Hazard Index for consumption of beef	0.00E+00	0.00E+00	0.00E+00	6.92E-12	6.98E-11	9.78E-12	2.93E-11	0.00E+00
Hazard Index for consumption of milk	0.00E+00	0.00E+00	0.00E+00	1.25E-10	1.42E-09	1.99E-10	6.00E-10	0.00E+00
Hazard Index for consumption of fish	0.00E+00	0.00E+00	0.00E+00	8.33E-08	1.50E-05	4.90E-07	2.05E-06	0.00E+00
Hazard Index for consumption of soil	1.22E-13	5.01E-15	7.51E-15	2.40E-10	3.50E-07	3.99E-08	1.43E-07	1.74E-14
Hazard Index for consumption of above-ground vegetables	0.00E+00	0.00E+00	0.00E+00	2.63E-10	2.24E-05	2.12E-06	8.73E-06	0.00E+00
Hazard Index for consumption of below-ground vegetables	0.00E+00	0.00E+00	0.00E+00	1.12E-07	3.52E-04	3.54E-05	1.39E-04	0.00E+00
Hazard Index for consumption of drinking water	4.31E-09	1.20E-09	1.14E-07	5.92E-08	2.07E-05	7.19E-07	2.96E-06	8.13E-08
Hazard Index for inhalation	4.10E-08	3.51E-09	2.45E-08	1.08E-05	5.41E-06	7.71E-08	3.09E-07	2.73E-08
Total Hazard Index - All Potential Exposure Pathways	4.53E-08	4.71E-09	1.38E-07	1.11E-05	4.16E-04	3.88E-05	1.53E-04	1.09E-07
Fraction of 0.25 Benchmark	0.000	0.000	0.000	0.000	0.002	0.000	0.001	0.000
Total Cancer Risk - Child Resident								
Total Risk = 3.30E-07								
Cancer Risk for consumption of beef	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.09E-15	1.64E-15	0.00E+00
Cancer Risk for consumption of milk	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.23E-14	3.35E-14	0.00E+00
Cancer Risk for consumption of fish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.47E-11	1.15E-10	0.00E+00
Cancer Risk for consumption of soil	3.00E-17	0.00E+00	2.78E-18	0.00E+00	0.00E+00	4.46E-12	7.99E-12	7.43E-20
Cancer Risk for consumption of above-ground vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.37E-10	4.88E-10	0.00E+00
Cancer Risk for consumption of below-ground vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.95E-09	7.78E-09	0.00E+00
Cancer Risk for consumption of drinking water	1.06E-12	0.00E+00	4.20E-11	0.00E+00	0.00E+00	8.04E-11	1.66E-10	3.47E-13
Cancer Risk for inhalation	4.53E-12	0.00E+00	2.98E-12	0.00E+00	0.00E+00	1.45E-11	2.90E-11	6.10E-13
Total Cancer Risk - All Potential Exposure Pathways	5.60E-12	0.00E+00	4.50E-11	0.00E+00	0.00E+00	4.34E-09	8.58E-09	9.57E-13
Fraction of 1E-05 Benchmark	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000

Notes:

T13DCP	Trans-1,3-Dichloropropene
TCFM	Trichlorofluoromethane
VCL	Vinyl Chloride
HCP	Hexachlorocyclopentadiene
2-NA	2-Nitroaniline
2,4-DNT	2,4-Dinitrotoluene
2,6-DNT	2,6-Dinitrotoluene
CLMTHN	Chloromethane

Table I-1b
Noncarcinogenic Hazard Index and Cancer Risk - Child Resident
South Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	PCP	1,1-DCE	1,1,2,2-TCA	CLFM	1,3-BUT	HCBU
Total Noncarcinogenic Hazard Index - Child Resident						
Total HI = 5.65E-01						
Hazard Index for consumption of beef	2.87E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.39E-12
Hazard Index for consumption of milk	5.87E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.43E-11
Hazard Index for consumption of fish	3.02E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.54E-07
Hazard Index for consumption of soil	3.12E-09	9.97E-14	2.23E-12	1.78E-12	0.00E+00	1.80E-10
Hazard Index for consumption of above-ground vegetables	2.87E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.49E-10
Hazard Index for consumption of below-ground vegetables	3.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.42E-08
Hazard Index for consumption of drinking water	5.48E-08	1.32E-08	3.12E-09	3.70E-08	0.00E+00	8.80E-08
Hazard Index for inhalation	2.06E-08	2.57E-08	3.92E-09	8.18E-06	0.00E+00	1.54E-07
Total Hazard Index - All Potential Exposure Pathways	3.77E-05	3.89E-08	7.04E-09	8.22E-06	0.00E+00	7.81E-07
Fraction of 0.25 Benchmark	0.000	0.000	0.000	0.000	0.000	0.000
Total Cancer Risk - Child Resident						
Total Risk = 3.30E-07						
Cancer Risk for consumption of beef	8.50E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.35E-18
Cancer Risk for consumption of milk	1.74E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.25E-17
Cancer Risk for consumption of fish	8.94E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.82E-13
Cancer Risk for consumption of soil	9.24E-13	4.43E-17	2.20E-15	0.00E+00	0.00E+00	2.31E-16
Cancer Risk for consumption of above-ground vegetables	8.49E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.20E-16
Cancer Risk for consumption of below-ground vegetables	1.10E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.08E-13
Cancer Risk for consumption of drinking water	1.62E-11	5.84E-12	3.07E-12	0.00E+00	0.00E+00	1.13E-13
Cancer Risk for inhalation	1.02E-11	5.68E-12	6.49E-12	7.84E-12	1.74E-10	3.33E-13
Total Cancer Risk - All Potential Exposure Pathways	1.12E-08	1.15E-11	9.56E-12	7.84E-12	1.74E-10	1.14E-12
Fraction of 1E-05 Benchmark	0.001	0.000	0.000	0.000	0.000	0.000

Notes:

PCP	Pentachlorophenol
1,1-DCE	1,1-Dichloroethylene
1,1,2,2-TCA	1,1,2,2-Tetrachloroethane
CLFM	Chloroform
1,3-BUT	1,3-Butadiene

Table I-1b
Noncarcinogenic Hazard Index and Cancer Risk - Child Resident
South Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	Hg	HgCl	MeHg	Total by Pathway
Total Noncarcinogenic Hazard Index - Child Resident				
Total HI = 5.65E-01				
Hazard Index for consumption of beef	0.00E+00	3.77E-06	8.04E-08	1.43E-05
Hazard Index for consumption of milk	0.00E+00	5.39E-05	2.01E-06	1.35E-04
Hazard Index for consumption of fish	0.00E+00	0.00E+00	5.60E-01	5.60E-01
Hazard Index for consumption of soil	0.00E+00	3.64E-03	1.20E-04	3.89E-03
Hazard Index for consumption of above-ground vegetables	0.00E+00	5.53E-05	9.11E-06	1.25E-04
Hazard Index for consumption of below-ground vegetables	0.00E+00	2.10E-04	3.42E-05	9.30E-04
Hazard Index for consumption of drinking water	0.00E+00	7.12E-06	3.71E-06	3.88E-05
Hazard Index for inhalation	3.27E-08	1.16E-06	0.00E+00	1.29E-04
Total Hazard Index - All Potential Exposure Pathways	3.27E-08	3.97E-03	5.60E-01	5.65E-01
Fraction of 0.25 Benchmark	0.000	0.016	2.239	2.260
Total Cancer Risk - Child Resident				
Total Risk = 3.30E-07				
Cancer Risk for consumption of beef	0.00E+00	0.00E+00	0.00E+00	9.44E-09
Cancer Risk for consumption of milk	0.00E+00	0.00E+00	0.00E+00	9.61E-08
Cancer Risk for consumption of fish	0.00E+00	0.00E+00	0.00E+00	1.06E-07
Cancer Risk for consumption of soil	0.00E+00	0.00E+00	0.00E+00	8.18E-08
Cancer Risk for consumption of above-ground vegetables	0.00E+00	0.00E+00	0.00E+00	1.05E-09
Cancer Risk for consumption of below-ground vegetables	0.00E+00	0.00E+00	0.00E+00	3.39E-08
Cancer Risk for consumption of drinking water	0.00E+00	0.00E+00	0.00E+00	5.02E-10
Cancer Risk for inhalation	0.00E+00	0.00E+00	0.00E+00	1.32E-09
Total Cancer Risk - All Potential Exposure Pathways	0.00E+00	0.00E+00	0.00E+00	3.30E-07
Fraction of 1E-05 Benchmark	0.000	0.000	0.000	0.033

Notes:

Hg	Mercury
HgCl	Mercuric Chloride
MeHg	Methyl Mercury

Table I-2a
Noncarcinogenic Hazard Index and Cancer Risk - Adult Resident
North Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	As	Sb	Ba	Be	Cd	Total Cr	Cr VI
Total Noncarcinogenic Hazard Index - Adult Resident							
Total HI = 9.10E-01							
Hazard Index for consumption of beef	3.35E-07	2.54E-08	3.84E-11	2.27E-09	3.08E-09	1.57E-10	7.52E-09
Hazard Index for consumption of milk	1.34E-07	3.38E-08	1.19E-09	2.16E-11	2.20E-09	3.82E-10	2.75E-08
Hazard Index for consumption of fish	1.15E-06	3.50E-07	5.57E-08	5.17E-08	2.05E-06	5.56E-12	1.39E-09
Hazard Index for consumption of soil	5.21E-07	1.19E-07	1.09E-09	1.08E-07	1.75E-07	2.13E-09	2.82E-09
Hazard Index for consumption of above-ground vegetables	2.73E-06	7.78E-07	7.63E-09	2.41E-08	2.36E-06	2.15E-10	2.09E-08
Hazard Index for consumption of below-ground vegetables	8.00E-07	6.23E-07	2.95E-09	4.00E-09	1.60E-06	9.57E-11	2.52E-09
Hazard Index for consumption of drinking water	6.58E-07	7.74E-08	7.82E-10	5.13E-09	6.92E-08	2.17E-12	4.30E-09
Hazard Index for inhalation	1.50E-04	2.16E-05	1.10E-04	4.44E-04	1.72E-04	5.00E-04	1.24E-04
Total Hazard Index - All Potential Exposure Pathways	1.57E-04	2.36E-05	1.10E-04	4.44E-04	1.78E-04	5.00E-04	1.24E-04
Fraction of 0.25 Benchmark	0.001	0.000	0.000	0.002	0.001	0.002	0.000
Total Cancer Risk - Adult Resident							
Total Risk = 3.45E-06							
Cancer Risk for consumption of beef	6.20E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of milk	2.49E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of fish	2.13E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of soil	9.63E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of above-ground vegetables	4.85E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of below-ground vegetables	1.08E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of drinking water	1.22E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for inhalation	2.78E-07	0.00E+00	0.00E+00	8.75E-09	2.53E-08	0.00E+00	4.43E-07
Total Cancer Risk - All Potential Exposure Pathways	2.79E-07	0.00E+00	0.00E+00	8.75E-09	2.53E-08	0.00E+00	4.43E-07
Fraction of 1E-05 Benchmark	0.028	0.000	0.000	0.001	0.003	0.000	0.044

Notes:

As	Arsenic
Sb	Antimony
Ba	Barium
Be	Beryllium
Cd	Cadmium
Total Cr	Total Chromium
Cr VI	Chromium VI

Table I-2a
Noncarcinogenic Hazard Index and Cancer Risk - Adult Resident
North Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	Pb	Ni	Se	Ag	Tl	Zn	TCDD-TEQ
Total Noncarcinogenic Hazard Index - Adult Resident							
Total HI = 9.10E-01							
Hazard Index for consumption of beef	0.00E+00	6.30E-08	1.26E-09	2.23E-08	8.45E-06	1.60E-10	1.42E-05
Hazard Index for consumption of milk	0.00E+00	1.38E-07	4.40E-08	2.00E-06	5.53E-06	7.64E-10	2.69E-05
Hazard Index for consumption of fish	0.00E+00	2.92E-07	2.38E-08	4.97E-07	7.64E-08	1.23E-06	1.44E-04
Hazard Index for consumption of soil	0.00E+00	7.04E-08	3.11E-10	6.69E-09	1.55E-06	1.08E-08	3.09E-05
Hazard Index for consumption of above-ground vegetables	0.00E+00	2.06E-07	8.64E-09	2.25E-07	2.95E-06	1.03E-07	6.40E-08
Hazard Index for consumption of below-ground vegetables	0.00E+00	8.59E-08	1.37E-09	1.34E-07	9.09E-08	7.41E-08	4.29E-06
Hazard Index for consumption of drinking water	0.00E+00	3.20E-08	1.76E-09	2.31E-08	6.47E-07	5.15E-09	5.20E-08
Hazard Index for inhalation	0.00E+00	3.18E-02	4.95E-07	6.49E-06	1.83E-04	1.46E-06	1.69E-05
Total Hazard Index - All Potential Exposure Pathways	0.00E+00	3.18E-02	5.76E-07	9.40E-06	2.03E-04	2.89E-06	2.38E-04
Fraction of 0.25 Benchmark	0.000	0.127	0.000	0.000	0.001	0.000	0.001
Total Cancer Risk - Adult Resident							
Total Risk = 3.45E-06							
Cancer Risk for consumption of beef	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.03E-07
Cancer Risk for consumption of milk	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.07E-07
Cancer Risk for consumption of fish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.09E-07
Cancer Risk for consumption of soil	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.72E-07
Cancer Risk for consumption of above-ground vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.76E-10
Cancer Risk for consumption of below-ground vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.11E-08
Cancer Risk for consumption of drinking water	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.85E-10
Cancer Risk for inhalation	0.00E+00	6.27E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.41E-07
Total Cancer Risk - All Potential Exposure Pathways	0.00E+00	6.27E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.46E-06
Fraction of 1E-05 Benchmark	0.000	0.006	0.000	0.000	0.000	0.000	0.146

Notes:

Pb	Lead
Ni	Nickel
Se	Selenium
Ag	Silver
Tl	Thallium
Zn	Zinc
TCDD-TEQ	2,3,7,8-TCDD Toxicity Equivalents

Table I-2a
Noncarcinogenic Hazard Index and Cancer Risk - Adult Resident
North Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	BAA	BAP	BBF	BKF	CHRYS	DBAHA	INDENO
Total Noncarcinogenic Hazard Index - Adult Resident							
Total HI = 9.10E-01							
Hazard Index for consumption of beef	7.20E-11	1.22E-09	4.92E-09	1.46E-09	1.86E-09	1.21E-08	1.40E-07
Hazard Index for consumption of milk	2.46E-10	4.33E-09	1.68E-08	5.42E-09	6.43E-09	4.97E-08	5.80E-07
Hazard Index for consumption of fish	6.44E-09	1.85E-08	1.24E-07	1.22E-08	1.24E-07	2.78E-09	2.93E-09
Hazard Index for consumption of soil	4.17E-10	2.19E-09	8.82E-09	1.39E-09	8.92E-09	3.57E-10	4.71E-10
Hazard Index for consumption of above-ground vegetables	6.64E-10	6.84E-10	5.15E-09	6.52E-10	6.39E-09	2.47E-09	1.24E-08
Hazard Index for consumption of below-ground vegetables	9.46E-08	4.32E-08	9.28E-07	3.17E-08	8.07E-07	5.38E-09	5.73E-09
Hazard Index for consumption of drinking water	6.58E-12	1.11E-11	6.70E-11	8.26E-12	8.62E-11	2.44E-12	1.90E-12
Hazard Index for inhalation	7.55E-10	1.25E-09	8.42E-09	1.12E-09	5.99E-09	8.52E-10	1.19E-09
Total Hazard Index - All Potential Exposure Pathways	1.03E-07	7.14E-08	1.10E-06	5.40E-08	9.61E-07	7.37E-08	7.44E-07
Fraction of 0.25 Benchmark	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cancer Risk - Adult Resident							
Total Risk = 3.45E-06							
Cancer Risk for consumption of beef	6.31E-13	9.44E-11	4.22E-11	1.19E-12	1.55E-13	1.08E-09	1.26E-09
Cancer Risk for consumption of milk	2.18E-12	3.57E-10	1.47E-10	4.62E-12	5.50E-13	4.46E-09	5.22E-09
Cancer Risk for consumption of fish	5.47E-11	1.22E-09	1.00E-09	7.84E-12	9.65E-12	1.70E-10	1.79E-11
Cancer Risk for consumption of soil	3.51E-12	1.15E-10	6.90E-11	6.98E-13	6.46E-13	1.64E-11	2.14E-12
Cancer Risk for consumption of above-ground vegetables	3.63E-12	5.04E-11	3.07E-11	5.30E-13	3.66E-13	2.22E-10	1.11E-10
Cancer Risk for consumption of below-ground vegetables	4.80E-10	1.96E-09	4.44E-09	1.44E-11	3.78E-11	2.42E-10	2.58E-11
Cancer Risk for consumption of drinking water	5.74E-14	7.33E-13	5.59E-13	5.49E-15	6.82E-15	1.73E-13	1.35E-14
Cancer Risk for inhalation	1.95E-11	3.24E-11	2.18E-10	2.91E-11	1.55E-10	2.20E-11	3.08E-11
Total Cancer Risk - All Potential Exposure Pathways	5.64E-10	3.83E-09	5.95E-09	5.83E-11	2.04E-10	6.21E-09	6.67E-09
Fraction of 1E-05 Benchmark	0.000	0.000	0.001	0.000	0.000	0.001	0.001

Notes:

BAA	Benzo(a)anthracene
BAP	Benzo(a)pyrene
BBF	Benzo(b)fluoranthene
BKF	Benzo(k)fluoranthene
CHRYS	Chrysene
DBAHA	Dibenz(a,h)anthracene
INDENO	Indeno(1,2,3-c,d)pyrene

Table I-2a
Noncarcinogenic Hazard Index and Cancer Risk - Adult Resident
North Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	BEHP	HCBZ	BZ	BM	CCl4	DCDFM	T13DCP
Total Noncarcinogenic Hazard Index - Adult Resident							
Total HI = 9.10E-01							
Hazard Index for consumption of beef	5.40E-08	2.27E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Index for consumption of milk	1.75E-07	8.10E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Index for consumption of fish	1.98E-06	2.19E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Index for consumption of soil	1.15E-06	1.61E-07	3.19E-12	4.72E-13	3.83E-12	1.32E-16	1.17E-13
Hazard Index for consumption of above-ground vegetables	5.48E-06	5.79E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Index for consumption of below-ground vegetables	4.57E-04	1.62E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Index for consumption of drinking water	4.43E-08	1.14E-07	1.15E-07	1.57E-07	1.01E-07	1.19E-09	2.76E-09
Hazard Index for inhalation	6.87E-06	8.11E-05	1.98E-04	1.64E-04	1.24E-04	4.10E-06	1.37E-05
Total Hazard Index - All Potential Exposure Pathways	4.72E-04	2.46E-04	1.98E-04	1.64E-04	1.24E-04	4.10E-06	1.37E-05
Fraction of 0.25 Benchmark	0.002	0.001	0.001	0.001	0.000	0.000	0.000
Total Cancer Risk - Adult Resident							
Total Risk = 3.45E-06							
Cancer Risk for consumption of beef	6.15E-12	1.20E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of milk	2.00E-11	4.26E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of fish	2.28E-10	1.15E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of soil	1.30E-10	8.47E-11	2.16E-16	0.00E+00	1.43E-16	9.08E-19	1.44E-16
Cancer Risk for consumption of above-ground vegetables	4.46E-10	3.04E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of below-ground vegetables	3.69E-08	8.50E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of drinking water	5.07E-12	5.98E-11	7.81E-12	0.00E+00	3.79E-12	8.23E-12	3.40E-12
Cancer Risk for inhalation	7.91E-10	4.27E-08	4.04E-09	0.00E+00	1.54E-09	0.00E+00	4.50E-09
Total Cancer Risk - All Potential Exposure Pathways	3.85E-08	1.29E-07	4.05E-09	0.00E+00	1.55E-09	8.23E-12	4.51E-09
Fraction of 1E-05 Benchmark	0.004	0.013	0.000	0.000	0.000	0.000	0.000

Notes:

BEHP	Bis(2-ethylhexyl)phthalate
HCBZ	Hexachlorobenzene
BZ	Benzene
BM	Bromomethane
CCl4	Carbon tetrachloride
DCDFM	Dichlorodifluoromethane
T13DCP	Trans-1,3-Dichloropropene

Table I-2a
Noncarcinogenic Hazard Index and Cancer Risk - Adult Resident
North Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	TCFM	VCL	HCP	2-NA	2,4-DNT	2,6-DNT	CLMTHN
Total Noncarcinogenic Hazard Index - Adult Resident							
Total HI = 9.10E-01							
Hazard Index for consumption of beef	0.00E+00	0.00E+00	1.55E-11	1.56E-10	2.19E-11	6.55E-11	0.00E+00
Hazard Index for consumption of milk	0.00E+00	0.00E+00	5.68E-11	6.46E-10	9.04E-11	2.72E-10	0.00E+00
Hazard Index for consumption of fish	0.00E+00	0.00E+00	1.28E-07	2.31E-05	7.54E-07	3.16E-06	0.00E+00
Hazard Index for consumption of soil	4.82E-15	7.23E-15	2.31E-10	3.37E-07	3.82E-08	1.38E-07	1.67E-14
Hazard Index for consumption of above-ground vegetables	0.00E+00	0.00E+00	1.83E-09	1.51E-04	1.45E-05	5.85E-05	0.00E+00
Hazard Index for consumption of below-ground vegetables	0.00E+00	0.00E+00	6.79E-07	2.15E-03	2.14E-04	8.47E-04	0.00E+00
Hazard Index for consumption of drinking water	7.70E-10	7.27E-08	3.78E-08	1.33E-05	4.60E-07	1.90E-06	5.20E-08
Hazard Index for inhalation	1.17E-06	8.19E-06	3.61E-03	1.80E-03	2.57E-05	1.03E-04	9.10E-06
Total Hazard Index - All Potential Exposure Pathways	1.17E-06	8.26E-06	3.61E-03	4.14E-03	2.55E-04	1.01E-03	9.15E-06
Fraction of 0.25 Benchmark	0.000	0.000	0.014	0.017	0.001	0.004	0.000
Total Cancer Risk - Adult Resident							
Total Risk = 3.45E-06							
Cancer Risk for consumption of beef	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.22E-14	1.83E-14	0.00E+00
Cancer Risk for consumption of milk	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.05E-14	7.60E-14	0.00E+00
Cancer Risk for consumption of fish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.21E-10	8.83E-10	0.00E+00
Cancer Risk for consumption of soil	0.00E+00	1.34E-17	0.00E+00	0.00E+00	2.13E-11	3.84E-11	3.57E-19
Cancer Risk for consumption of above-ground vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.08E-09	1.64E-08	0.00E+00
Cancer Risk for consumption of below-ground vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-07	2.37E-07	0.00E+00
Cancer Risk for consumption of drinking water	0.00E+00	1.34E-10	0.00E+00	0.00E+00	2.57E-10	5.30E-10	1.11E-12
Cancer Risk for inhalation	0.00E+00	2.96E-09	0.00E+00	0.00E+00	1.44E-08	2.88E-08	6.06E-10
Total Cancer Risk - All Potential Exposure Pathways	0.00E+00	3.10E-09	0.00E+00	0.00E+00	1.43E-07	2.83E-07	6.07E-10
Fraction of 1E-05 Benchmark	0.000	0.000	0.000	0.000	0.014	0.028	0.000

Notes:

TCFM	Trichlorofluoromethane
VCL	Vinyl Chloride
HCP	Hexachlorocyclopentadiene
2-NA	2-Nitroaniline
2,4-DNT	2,4-Dinitrotoluene
2,6-DNT	2,6-Dinitrotoluene
CLMTHN	Chloromethane

Table I-2a
Noncarcinogenic Hazard Index and Cancer Risk - Adult Resident
North Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	PCP	1,1-DCE	1,1,2,2-TCA	CLFM	1,3-BUT	HCBU	Hg	HgCl	MeHg	Total by Pathway
<u>Total Noncarcinogenic Hazard Index - Adult Resident</u>										
Total HI = 9.10E-01										
Hazard Index for consumption of beef	6.42E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.58E-12	0.00E+00	8.43E-06	1.80E-07	3.20E-05
Hazard Index for consumption of milk	2.66E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.92E-11	0.00E+00	2.44E-05	9.12E-07	6.11E-05
Hazard Index for consumption of fish	4.65E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.98E-07	0.00E+00	0.00E+00	8.61E-01	8.62E-01
Hazard Index for consumption of soil	3.01E-09	9.60E-14	2.15E-12	1.71E-12	0.00E+00	1.73E-10	0.00E+00	1.77E-04	5.82E-06	2.18E-04
Hazard Index for consumption of above-ground vegetables	5.65E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.71E-09	0.00E+00	2.85E-04	2.28E-04	7.53E-04
Hazard Index for consumption of below-ground vegetables	2.27E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.13E-07	0.00E+00	6.47E-05	1.05E-05	4.14E-03
Hazard Index for consumption of drinking water	3.51E-08	8.42E-09	1.99E-09	2.37E-08	0.00E+00	5.63E-08	0.00E+00	4.55E-06	2.37E-06	2.49E-05
Hazard Index for inhalation	6.88E-06	8.58E-06	1.31E-06	2.73E-03	0.00E+00	5.15E-05	1.09E-05	3.86E-04	0.00E+00	4.29E-02
Total Hazard Index - All Potential Exposure Pathways	2.34E-04	8.58E-06	1.31E-06	2.73E-03	0.00E+00	5.28E-05	1.09E-05	9.50E-04	8.62E-01	9.10E-01
Fraction of 0.25 Benchmark	0.001	0.000	0.000	0.011	0.000	0.000	0.000	0.004	3.447	3.639
<u>Total Cancer Risk - Adult Resident</u>										
Total Risk = 3.45E-06										
Cancer Risk for consumption of beef	9.50E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.86E-17	0.00E+00	0.00E+00	0.00E+00	1.05E-07
Cancer Risk for consumption of milk	3.94E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.87E-16	0.00E+00	0.00E+00	0.00E+00	2.18E-07
Cancer Risk for consumption of fish	6.88E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.48E-12	0.00E+00	0.00E+00	0.00E+00	8.15E-07
Cancer Risk for consumption of soil	4.45E-12	2.13E-16	1.06E-14	0.00E+00	0.00E+00	1.11E-15	0.00E+00	0.00E+00	0.00E+00	1.73E-07
Cancer Risk for consumption of above-ground vegetables	8.35E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.10E-14	0.00E+00	0.00E+00	0.00E+00	2.71E-08
Cancer Risk for consumption of below-ground vegetables	3.35E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.29E-12	0.00E+00	0.00E+00	0.00E+00	8.52E-07
Cancer Risk for consumption of drinking water	5.19E-11	1.87E-11	9.83E-12	0.00E+00	0.00E+00	3.61E-13	0.00E+00	0.00E+00	0.00E+00	1.60E-09
Cancer Risk for inhalation	1.02E-08	5.64E-09	6.44E-09	7.79E-09	1.73E-07	3.30E-10	0.00E+00	0.00E+00	0.00E+00	1.26E-06
Total Cancer Risk - All Potential Exposure Pathways	3.46E-07	5.66E-09	6.45E-09	7.79E-09	1.73E-07	3.38E-10	0.00E+00	0.00E+00	0.00E+00	3.45E-06
Fraction of 1E-05 Benchmark	0.035	0.001	0.001	0.001	0.017	0.000	0.000	0.000	0.000	0.345

Notes:

PCP	Pentachlorophenol
1,1-DCE	1,1-Dichloroethylene
1,1,2,2-TCA	1,1,2,2-Tetrachloroethane
CLFM	Chloroform
1,3-BUT	1,3-Butadiene
Hg	Elemental Mercury
HgCl	Mercuric Chlorid
MeHg	Methyl Mercury

Table I-2b
Noncarcinogenic Hazard Index and Cancer Risk - Adult Resident
South Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	As	Sb	Ba	Be	Cd	Total Cr	Cr VI
Total Noncarcinogenic Hazard Index - Adult Resident							
Total HI = 8.63E-01							
Hazard Index for consumption of beef	3.35E-07	2.54E-08	3.84E-11	2.27E-09	3.08E-09	1.57E-10	7.52E-09
Hazard Index for consumption of milk	1.34E-07	3.38E-08	1.19E-09	2.16E-11	2.20E-09	3.82E-10	2.75E-08
Hazard Index for consumption of fish	1.15E-06	3.50E-07	5.57E-08	5.17E-08	2.05E-06	5.56E-12	1.39E-09
Hazard Index for consumption of soil	1.30E-06	2.96E-07	2.73E-09	2.70E-07	4.37E-07	5.31E-09	7.04E-09
Hazard Index for consumption of above-ground vegetables	5.15E-06	1.70E-06	1.65E-08	4.60E-08	5.68E-06	4.31E-10	3.83E-08
Hazard Index for consumption of below-ground vegetables	2.00E-06	1.55E-06	7.36E-09	9.99E-09	3.99E-06	2.39E-10	6.29E-09
Hazard Index for consumption of drinking water	5.24E-07	7.74E-08	7.82E-10	5.13E-09	6.92E-08	2.17E-12	4.30E-09
Hazard Index for inhalation	4.52E-07	6.50E-08	3.29E-07	1.33E-06	5.16E-07	1.50E-06	3.72E-07
Total Hazard Index - All Potential Exposure Pathways	1.10E-05	4.10E-06	4.14E-07	1.72E-06	1.27E-05	1.51E-06	4.64E-07
Fraction of 0.25 Benchmark	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cancer Risk - Adult Resident							
Total Risk = 1.30E-06							
Cancer Risk for consumption of beef	6.20E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of milk	2.49E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of fish	2.13E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of soil	2.41E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of above-ground vegetables	9.00E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of below-ground vegetables	2.70E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of drinking water	9.69E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for inhalation	8.35E-10	0.00E+00	0.00E+00	2.63E-11	7.61E-11	0.00E+00	1.33E-09
Total Cancer Risk - All Potential Exposure Pathways	2.64E-09	0.00E+00	0.00E+00	2.63E-11	7.61E-11	0.00E+00	1.33E-09
Fraction of 1E-05 Benchmark	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes:

As	Arsenic
Sb	Antimony
Ba	Barium
Be	Beryllium
Cd	Cadmium
Total Cr	Total Chromium
Cr VI	Chromium VI

Table I-2b
Noncarcinogenic Hazard Index and Cancer Risk - Adult Resident
South Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	Pb	Ni	Se	Ag	Tl	Zn	TCDD-TEQ
Total Noncarcinogenic Hazard Index - Adult Resident							
Total HI = 8.63E-01							
Hazard Index for consumption of beef	0.00E+00	6.30E-08	1.26E-09	2.23E-08	8.45E-06	1.60E-10	1.42E-05
Hazard Index for consumption of milk	0.00E+00	1.38E-07	4.40E-08	2.00E-06	5.53E-06	7.64E-10	2.69E-05
Hazard Index for consumption of fish	0.00E+00	2.92E-07	2.38E-08	4.97E-07	7.64E-08	1.23E-06	1.44E-04
Hazard Index for consumption of soil	0.00E+00	1.76E-07	7.75E-10	1.67E-08	3.87E-06	2.70E-08	7.80E-06
Hazard Index for consumption of above-ground vegetables	0.00E+00	4.13E-07	1.59E-08	4.87E-07	5.32E-06	2.40E-07	1.38E-08
Hazard Index for consumption of below-ground vegetables	0.00E+00	2.14E-07	3.41E-09	3.34E-07	2.27E-07	1.85E-07	2.54E-06
Hazard Index for consumption of drinking water	0.00E+00	3.20E-08	1.76E-09	2.31E-08	6.47E-07	5.15E-09	5.20E-08
Hazard Index for inhalation	0.00E+00	9.56E-05	1.49E-09	1.95E-08	5.51E-07	4.39E-09	5.08E-08
Total Hazard Index - All Potential Exposure Pathways	0.00E+00	9.69E-05	9.23E-08	3.40E-06	2.47E-05	1.70E-06	1.96E-04
Fraction of 0.25 Benchmark	0.000	0.000	0.000	0.000	0.000	0.000	0.001
Total Cancer Risk - Adult Resident							
Total Risk = 1.30E-06							
Cancer Risk for consumption of beef	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.03E-07
Cancer Risk for consumption of milk	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.07E-07
Cancer Risk for consumption of fish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.09E-07
Cancer Risk for consumption of soil	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.35E-08
Cancer Risk for consumption of above-ground vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.48E-10
Cancer Risk for consumption of below-ground vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.01E-08
Cancer Risk for consumption of drinking water	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.85E-10
Cancer Risk for inhalation	0.00E+00	1.88E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.24E-10
Total Cancer Risk - All Potential Exposure Pathways	0.00E+00	1.88E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.18E-06
Fraction of 1E-05 Benchmark	0.000	0.000	0.000	0.000	0.000	0.000	0.118

Notes:

Pb	Lead
Ni	Nickel
Se	Selenium
Ag	Silver
Tl	Thallium
Zn	Zinc
TCDD-TEQ	2,3,7,8-TCDD Toxicity Equivalents

Table I-2b
Noncarcinogenic Hazard Index and Cancer Risk - Adult Resident
South Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	BAA	BAP	BBF	BKF	CHRYS	DBAHA	INDENO
Total Noncarcinogenic Hazard Index - Adult Resident							
Total HI = 8.63E-01							
Hazard Index for consumption of beef	7.20E-11	1.22E-09	4.92E-09	1.46E-09	1.86E-09	1.21E-08	1.40E-07
Hazard Index for consumption of milk	2.46E-10	4.33E-09	1.68E-08	5.42E-09	6.43E-09	4.97E-08	5.80E-07
Hazard Index for consumption of fish	6.44E-09	1.85E-08	1.24E-07	1.22E-08	1.24E-07	2.78E-09	2.93E-09
Hazard Index for consumption of soil	5.06E-11	6.46E-10	1.12E-09	6.32E-10	1.19E-09	6.00E-10	8.64E-10
Hazard Index for consumption of above-ground vegetables	7.60E-11	1.08E-10	5.31E-10	9.44E-11	7.06E-10	6.44E-11	1.03E-10
Hazard Index for consumption of below-ground vegetables	1.15E-08	1.27E-08	1.18E-07	1.45E-08	1.08E-07	9.04E-09	1.05E-08
Hazard Index for consumption of drinking water	6.58E-12	1.11E-11	6.70E-11	8.26E-12	8.62E-11	2.44E-12	1.90E-12
Hazard Index for Inhalation	2.26E-12	3.76E-12	2.53E-11	3.38E-12	1.80E-11	2.56E-12	3.58E-12
Total Hazard Index - All Potential Exposure Pathways	1.84E-08	3.76E-08	2.65E-07	3.43E-08	2.43E-07	7.43E-08	7.35E-07
Fraction of 0.25 Benchmark	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cancer Risk - Adult Resident							
Total Risk = 1.30E-06							
Cancer Risk for consumption of beef	6.31E-13	9.44E-11	4.22E-11	1.19E-12	1.55E-13	1.08E-09	1.26E-09
Cancer Risk for consumption of milk	2.18E-12	3.57E-10	1.47E-10	4.62E-12	5.50E-13	4.46E-09	5.22E-09
Cancer Risk for consumption of fish	5.47E-11	1.22E-09	1.00E-09	7.84E-12	9.65E-12	1.70E-10	1.79E-11
Cancer Risk for consumption of soil	4.25E-13	3.40E-11	8.76E-12	3.18E-13	8.65E-14	2.75E-11	3.92E-12
Cancer Risk for consumption of above-ground vegetables	3.99E-13	6.44E-12	2.78E-12	5.89E-14	3.55E-14	4.60E-12	8.22E-13
Cancer Risk for consumption of below-ground vegetables	5.81E-11	5.78E-10	5.64E-10	6.56E-12	5.06E-12	4.07E-10	4.73E-11
Cancer Risk for consumption of drinking water	5.74E-14	7.33E-13	5.59E-13	5.49E-15	6.82E-15	1.73E-13	1.35E-14
Cancer Risk for inhalation	5.86E-14	9.73E-14	6.54E-13	8.75E-14	4.65E-13	6.63E-14	9.27E-14
Total Cancer Risk - All Potential Exposure Pathways	1.17E-10	2.29E-09	1.77E-09	2.07E-11	1.60E-11	6.14E-09	6.55E-09
Fraction of 1E-05 Benchmark	0.000	0.000	0.000	0.000	0.000	0.001	0.001

Notes:

BAA	Benzo(a)anthracene
BAP	Benzo(a)pyrene
BBF	Benzo(b)fluoranthene
BKF	Benzo(k)fluoranthene
CHRYS	Chrysene
DBAHA	Dibenz(a,h)anthracene
INDENO	Indeno(1,2,3-c,d)pyrene

Table I-2b
Noncarcinogenic Hazard Index and Cancer Risk - Adult Resident
South Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	BEHP	HCBZ	BZ	BM	CCl4	DCDFM
Total Noncarcinogenic Hazard Index - Adult Resident						
Total HI = 8.63E-01						
Hazard Index for consumption of beef	5.40E-08	2.27E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Index for consumption of milk	1.75E-07	8.10E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Index for consumption of fish	1.98E-06	2.19E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Index for consumption of soil	1.34E-07	1.79E-08	3.55E-13	5.25E-14	4.26E-13	1.46E-17
Hazard Index for consumption of above-ground vegetables	6.43E-07	6.08E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Index for consumption of below-ground vegetables	5.31E-05	1.80E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Index for consumption of drinking water	4.43E-08	1.14E-07	1.15E-07	1.57E-07	1.01E-07	1.19E-09
Hazard Index for inhalation	2.06E-08	2.43E-07	5.93E-07	4.91E-07	3.72E-07	1.23E-08
Total Hazard Index - All Potential Exposure Pathways	5.62E-05	2.07E-05	7.08E-07	6.48E-07	4.73E-07	1.35E-08
Fraction of 0.25 Benchmark	0.000	0.000	0.000	0.000	0.000	0.000
Total Cancer Risk - Adult Resident						
Total Risk = 1.30E-06						
Cancer Risk for consumption of beef	6.15E-12	1.20E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of milk	2.00E-11	4.26E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of fish	2.28E-10	1.15E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of soil	1.51E-11	9.42E-12	2.41E-17	0.00E+00	1.59E-17	1.01E-19
Cancer Risk for consumption of above-ground vegetables	5.25E-11	3.20E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of below-ground vegetables	4.29E-09	9.46E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of drinking water	5.07E-12	5.98E-11	7.81E-12	0.00E+00	3.79E-12	8.23E-12
Cancer Risk for inhalation	2.37E-12	1.28E-10	1.21E-11	0.00E+00	4.63E-12	0.00E+00
Total Cancer Risk - All Potential Exposure Pathways	4.62E-09	1.09E-08	1.99E-11	0.00E+00	8.41E-12	8.23E-12
Fraction of 1E-05 Benchmark	0.000	0.001	0.000	0.000	0.000	0.000

Notes:

BEHP Bis(2-ethylhexyl)phthalate
HCBZ Hexachlorobenzene
BZ Benzene
BM Bromomethane
CCl4 Carbon tetrachloride
DCDFM Dichlorodifluoromethane

Table I-2b
Noncarcinogenic Hazard Index and Cancer Risk - Adult Resident
South Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	T13DCP	TCFM	VCL	HCP	2-NA	2,4-DNT	2,6-DNT	CLMTHN
Total Noncarcinogenic Hazard Index - Adult Resident								
Total HI = 8.63E-01								
Hazard Index for consumption of beef	0.00E+00	0.00E+00	0.00E+00	1.55E-11	1.56E-10	2.19E-11	6.55E-11	0.00E+00
Hazard Index for consumption of milk	0.00E+00	0.00E+00	0.00E+00	5.68E-11	6.46E-10	9.04E-11	2.72E-10	0.00E+00
Hazard Index for consumption of fish	0.00E+00	0.00E+00	0.00E+00	1.28E-07	2.31E-05	7.54E-07	3.16E-06	0.00E+00
Hazard Index for consumption of soil	1.30E-14	5.37E-16	8.05E-16	2.57E-11	3.75E-08	4.28E-09	1.53E-08	1.86E-15
Hazard Index for consumption of above-ground vegetables	0.00E+00	0.00E+00	0.00E+00	1.92E-10	1.64E-05	1.55E-06	6.38E-06	0.00E+00
Hazard Index for consumption of below-ground vegetables	0.00E+00	0.00E+00	0.00E+00	7.56E-08	2.39E-04	2.40E-05	9.43E-05	0.00E+00
Hazard Index for consumption of drinking water	2.76E-09	7.70E-10	7.27E-08	3.78E-08	1.33E-05	4.60E-07	1.90E-06	5.20E-08
Hazard Index for inhalation	4.10E-08	3.51E-09	2.45E-08	1.08E-05	5.41E-06	7.71E-08	3.09E-07	2.73E-08
Total Hazard Index - All Potential Exposure Pathways	4.38E-08	4.28E-09	9.72E-08	1.11E-05	2.97E-04	2.68E-05	1.06E-04	7.93E-08
Fraction of 0.25 Benchmark	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000
Total Cancer Risk - Adult Resident								
Total Risk = 1.30E-06								
Cancer Risk for consumption of beef	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.22E-14	1.83E-14	0.00E+00
Cancer Risk for consumption of milk	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.05E-14	7.60E-14	0.00E+00
Cancer Risk for consumption of fish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.21E-10	8.83E-10	0.00E+00
Cancer Risk for consumption of soil	1.61E-17	0.00E+00	1.49E-18	0.00E+00	0.00E+00	2.39E-12	4.28E-12	3.98E-20
Cancer Risk for consumption of above-ground vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.67E-10	1.78E-09	0.00E+00
Cancer Risk for consumption of below-ground vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.34E-08	2.64E-08	0.00E+00
Cancer Risk for consumption of drinking water	3.40E-12	0.00E+00	1.34E-10	0.00E+00	0.00E+00	2.57E-10	5.30E-10	1.11E-12
Cancer Risk for inhalation	1.35E-11	0.00E+00	8.88E-12	0.00E+00	0.00F+00	4.31E-11	8.63E-11	1.82E-12
Total Cancer Risk - All Potential Exposure Pathways	1.69E-11	0.00E+00	1.43E-10	0.00E+00	0.00E+00	1.50E-08	2.96E-08	2.93E-12
Fraction of 1E-05 Benchmark	0.000	0.000	0.000	0.000	0.000	0.001	0.003	0.000

Notes:

- T13DCP Trans-1,3-Dichloropropene
- TCFM Trichlorofluoromethane
- VCL Vinyl Chloride
- HCP Hexachlorocyclopentadiene
- 2-NA 2-Nitroaniline
- 2,4-DNT 2,4-Dinitrotoluene
- 2,6-DNT 2,6-Dinitrotoluene
- CLMTHN Chloromethane

Table I-2b
Noncarcinogenic Hazard Index and Cancer Risk - Adult Resident
South Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	PCP	1,1-DCE	1,1,2,2-TCA	CLFM	1,3-BUT	HCBU
Total Noncarcinogenic Hazard Index - Adult Resident						
Total HI = 8.63E-01						
Hazard Index for consumption of beef	6.42E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.58E-12
Hazard Index for consumption of milk	2.66E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.92E-11
Hazard Index for consumption of fish	4.65E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.98E-07
Hazard Index for consumption of soil	3.35E-10	1.07E-14	2.39E-13	1.91E-13	0.00E+00	1.93E-11
Hazard Index for consumption of above-ground vegetables	2.10E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.82E-10
Hazard Index for consumption of below-ground vegetables	2.52E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.71E-08
Hazard Index for consumption of drinking water	3.51E-08	8.42E-09	1.99E-09	2.37E-08	0.00E+00	5.63E-08
Hazard Index for inhalation	2.06E-08	2.57E-08	3.92E-09	8.18E-06	0.00E+00	1.54E-07
Total Hazard Index - All Potential Exposure Pathways	2.58E-05	3.41E-08	5.91E-09	8.21E-06	0.00E+00	9.66E-07
Fraction of 0.25 Benchmark	0.000	0.000	0.000	0.000	0.000	0.000
Total Cancer Risk - Adult Resident						
Total Risk = 1.30E-06						
Cancer Risk for consumption of beef	9.50E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.86E-17
Cancer Risk for consumption of milk	3.94E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.87E-16
Cancer Risk for consumption of fish	6.88E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.48E-12
Cancer Risk for consumption of soil	4.95E-13	2.37E-17	1.18E-15	0.00E+00	0.00E+00	1.24E-16
Cancer Risk for consumption of above-ground vegetables	3.10E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.17E-15
Cancer Risk for consumption of below-ground vegetables	3.73E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.66E-13
Cancer Risk for consumption of drinking water	5.19E-11	1.87E-11	9.83E-12	0.00E+00	0.00E+00	3.61E-13
Cancer Risk for inhalation	3.05E-11	1.69E-11	1.93E-11	2.33E-11	5.19E-10	9.90E-13
Total Cancer Risk - All Potential Exposure Pathways	3.81E-08	3.56E-11	2.91E-11	2.33E-11	5.19E-10	6.19E-12
Fraction of 1E-05 Benchmark	0.004	0.000	0.000	0.000	0.000	0.000

Notes:

PCP	Pentachlorophenol
1,1-DCE	1,1-Dichloroethylene
1,1,2,2-TCA	1,1,2,2-Tetrachloroethane
CLFM	Chloroform
1,3-BUT	1,3-Butadiene
HCBU	Hexachlorobutadiene

Table I-2b
Noncarcinogenic Hazard Index and Cancer Risk - Adult Resident
South Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	Hg	HgCl	MeHg	Total by Pathway
Total Noncarcinogenic Hazard Index - Adult Resident				
Total HI = 8.63E-01				
Hazard Index for consumption of beef	0.00E+00	8.43E-06	1.80E-07	3.20E-05
Hazard Index for consumption of milk	0.00E+00	2.44E-05	9.12E-07	6.11E-05
Hazard Index for consumption of fish	0.00E+00	0.00E+00	8.61E-01	8.62E-01
Hazard Index for consumption of soil	0.00E+00	3.90E-04	1.28E-05	4.17E-04
Hazard Index for consumption of above-ground vegetables	0.00E+00	4.04E-05	6.67E-06	9.13E-05
Hazard Index for consumption of below-ground vegetables	0.00E+00	1.42E-04	2.32E-05	6.30E-04
Hazard Index for consumption of drinking water	0.00E+00	4.55E-06	2.37E-06	2.48E-05
Hazard Index for inhalation	3.27E-08	1.16E-06	0.00E+00	1.29E-04
Total Hazard Index - All Potential Exposure Pathways	3.27E-08	6.11E-04	8.62E-01	8.63E-01
Fraction of 0.25 Benchmark	0.000	0.002	3.446	3.452
Total Cancer Risk - Adult Resident				
Total Risk = 1.30E-06				
Cancer Risk for consumption of beef	0.00E+00	0.00E+00	0.00E+00	1.05E-07
Cancer Risk for consumption of milk	0.00E+00	0.00E+00	0.00E+00	2.18E-07
Cancer Risk for consumption of fish	0.00E+00	0.00E+00	0.00E+00	8.15E-07
Cancer Risk for consumption of soil	0.00E+00	0.00E+00	0.00E+00	4.38E-08
Cancer Risk for consumption of above-ground vegetables	0.00E+00	0.00E+00	0.00E+00	3.80E-09
Cancer Risk for consumption of below-ground vegetables	0.00E+00	0.00E+00	0.00E+00	1.13E-07
Cancer Risk for consumption of drinking water	0.00E+00	0.00E+00	0.00E+00	1.57E-09
Cancer Risk for inhalation	0.00E+00	0.00E+00	0.00E+00	3.79E-09
Total Cancer Risk - All Potential Exposure Pathways	0.00E+00	0.00E+00	0.00E+00	1.30E-06
Fraction of 1E-05 Benchmark	0.000	0.000	0.000	0.130

Notes:

Hg	Mercury
HgCl	Mercuric Chloride
MeHg	Methyl Mercury

Table I-3a
Noncarcinogenic Hazard Index and Cancer Risk - Subsistence Farmer
Beef Farm Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	As	Sb	Ba	Be	Cd	Total Cr	Cr VI
Total Noncarcinogenic Hazard Index - Farmer							
Total HI = 8.66E-01							
Hazard Quotient for consumption of beef	1.34E-06	1.02E-07	1.54E-10	9.08E-09	1.23E-08	6.30E-10	3.01E-08
Hazard Quotient for consumption of milk	5.82E-07	1.46E-07	5.16E-09	9.30E-11	9.48E-09	1.64E-09	1.19E-07
Hazard Quotient for consumption of fish	1.15E-06	3.51E-07	5.57E-08	5.18E-08	2.08E-06	5.57E-12	1.39E-09
Hazard Quotient for consumption of soil	4.14E-08	9.42E-09	8.69E-11	8.59E-09	1.39E-08	1.69E-10	2.24E-10
Hazard Quotient for consumption of above-ground vegetables	7.25E-07	2.26E-07	2.21E-09	6.44E-09	7.32E-07	5.93E-11	5.45E-09
Hazard Quotient for consumption of below-ground vegetables	2.54E-07	1.98E-07	9.37E-10	1.27E-09	5.07E-07	3.04E-11	8.00E-10
Hazard Quotient for consumption of drinking water	4.61E-07	5.42E-08	5.48E-10	3.59E-09	4.84E-08	1.52E-12	3.01E-09
Hazard Quotient for inhalation	6.13E-06	8.82E-07	4.47E-06	1.81E-05	7.00E-06	2.04E-05	5.05E-06
Total Hazard Index - All Potential Exposure Pathways	1.07E-05	1.97E-06	4.53E-06	1.82E-05	1.04E-05	2.04E-05	5.21E-06
Fraction of 0.25 Benchmark	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cancer Risk - Farmer							
Total Risk = 3.19E-06							
Cancer Risk for consumption of beef	3.28E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of milk	1.43E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of fish	2.20E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of soil	7.65E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of above-ground vegetables	1.69E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of below-ground vegetables	4.40E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of drinking water	1.07E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for inhalation	1.14E-08	0.00E+00	0.00E+00	3.60E-10	1.04E-09	0.00E+00	1.82E-08
Total Cancer Risk - All Potential Exposure Pathways	1.24E-08	0.00E+00	0.00E+00	3.60E-10	1.04E-09	0.00E+00	1.82E-08
Fraction of 1E-05 Benchmark	0.001	0.000	0.000	0.000	0.000	0.000	0.002

Notes:

As	Arsenic
Sb	Antimony
Ba	Barium
Be	Beryllium
Cd	Cadmium
Total Cr	Total Chromium
Cr VI	Chromium VI

Table I-3a
Noncarcinogenic Hazard Index and Cancer Risk - Subsistence Farmer
Beef Farm Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	Pb	Ni	Se	Ag	Tl	Zn	TCDD-TEQ
Total Noncarcinogenic Hazard Index - Farmer							
Total HI = 8.66E-01							
Hazard Quotient for consumption of beef	0.00E+00	2.52E-07	5.04E-09	8.90E-08	3.38E-05	6.41E-10	5.66E-05
Hazard Quotient for consumption of milk	0.00E+00	5.97E-07	1.91E-07	8.68E-06	2.40E-05	3.30E-09	1.20E-04
Hazard Quotient for consumption of fish	0.00E+00	2.92E-07	2.38E-08	4.98E-07	7.65E-08	1.24E-06	1.44E-04
Hazard Quotient for consumption of soil	0.00E+00	5.59E-09	2.47E-11	5.32E-10	1.23E-07	8.58E-10	1.37E-06
Hazard Quotient for consumption of above-ground vegetables	0.00E+00	5.66E-08	2.26E-09	6.51E-08	7.63E-07	3.12E-08	1.14E-08
Hazard Quotient for consumption of below-ground vegetables	0.00E+00	2.73E-08	4.34E-10	4.25E-08	2.89E-08	2.35E-08	8.22E-07
Hazard Quotient for consumption of drinking water	0.00E+00	2.24E-08	1.23E-09	1.62E-08	4.53E-07	3.60E-09	3.64E-08
Hazard Quotient for inhalation	0.00E+00	1.30E-03	2.02E-08	2.65E-07	7.48E-06	5.96E-08	6.84E-07
Total Hazard Index - All Potential Exposure Pathways	0.00E+00	1.30E-03	2.43E-07	9.65E-06	6.67E-05	1.36E-06	3.24E-04
Fraction of 0.25 Benchmark	0.000	0.005	0.000	0.000	0.000	0.000	0.001
Total Cancer Risk - Farmer							
Total Risk = 3.19E-06							
Cancer Risk for consumption of beef	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.52E-07
Cancer Risk for consumption of milk	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.24E-06
Cancer Risk for consumption of fish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.10E-06
Cancer Risk for consumption of soil	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.04E-08
Cancer Risk for consumption of above-ground vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.63E-10
Cancer Risk for consumption of below-ground vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.11E-09
Cancer Risk for consumption of drinking water	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.47E-10
Cancer Risk for inhalation	0.00E+00	2.58E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.62E-09
Total Cancer Risk - All Potential Exposure Pathways	0.00E+00	2.58E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.91E-06
Fraction of 1E-05 Benchmark	0.000	0.000	0.000	0.000	0.000	0.000	0.291

Notes:

Cr VI	Chromium VI
Pb	Lead
Ni	Nickel
Se	Selenium
Ag	Silver
Tl	Thallium
Zn	Zinc

Table I-3a
Noncarcinogenic Hazard Index and Cancer Risk - Subsistence Farmer
Beef Farm Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	BAA	BAP	BBF	BKF	CHRYS	DBAHA	INDENO
Total Noncarcinogenic Hazard Index - Farmer							
Total HI = 8.66E-01							
Hazard Quotient for consumption of beef	2.88E-10	4.87E-09	1.97E-08	5.82E-09	7.44E-09	4.84E-08	5.61E-07
Hazard Quotient for consumption of milk	1.10E-09	1.93E-08	7.48E-08	2.42E-08	2.87E-08	2.22E-07	2.59E-06
Hazard Quotient for consumption of fish	6.44E-09	1.85E-08	1.24E-07	1.22E-08	1.25E-07	2.78E-09	2.93E-09
Hazard Quotient for consumption of soil	1.80E-11	9.98E-11	3.81E-10	6.63E-11	3.86E-10	2.33E-11	3.18E-11
Hazard Quotient for consumption of above-ground vegetables	1.14E-10	1.18E-10	8.80E-10	1.12E-10	1.09E-09	4.08E-10	2.04E-09
Hazard Quotient for consumption of below-ground vegetables	1.63E-08	7.87E-09	1.60E-07	6.07E-09	1.40E-07	1.40E-09	1.55E-09
Hazard Quotient for consumption of drinking water	4.60E-12	7.74E-12	4.69E-11	5.78E-12	6.03E-11	1.71E-12	1.33E-12
Hazard Quotient for inhalation	3.09E-11	5.09E-11	3.45E-10	4.56E-11	2.45E-10	3.45E-11	4.83E-11
Total Hazard Index - All Potential Exposure Pathways	2.43E-08	5.08E-08	3.80E-07	4.85E-08	3.02E-07	2.75E-07	3.16E-06
Fraction of 0.25 Benchmark	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cancer Risk - Farmer							
Total Risk = 3.19E-06							
Cancer Risk for consumption of beef	3.11E-12	5.16E-10	2.14E-10	6.45E-12	8.00E-13	5.76E-09	6.72E-09
Cancer Risk for consumption of milk	1.23E-11	2.15E-09	8.47E-10	2.78E-11	3.21E-12	2.66E-08	3.11E-08
Cancer Risk for consumption of fish	5.86E-11	1.56E-09	1.12E-09	1.02E-11	1.11E-11	2.30E-10	2.42E-11
Cancer Risk for consumption of soil	1.62E-13	7.78E-12	3.39E-12	5.10E-14	3.36E-14	1.75E-12	2.39E-13
Cancer Risk for consumption of above-ground vegetables	9.27E-13	1.22E-11	7.73E-12	1.24E-13	9.41E-14	4.88E-11	2.44E-11
Cancer Risk for consumption of below-ground vegetables	1.26E-10	5.91E-10	1.22E-09	4.56E-12	1.06E-11	1.05E-10	1.16E-11
Cancer Risk for consumption of drinking water	4.84E-14	7.03E-13	4.75E-13	5.32E-15	5.88E-15	1.69E-13	1.32E-14
Cancer Risk for inhalation	8.07E-13	1.33E-12	9.00E-12	1.19E-12	6.39E-12	9.01E-13	1.26E-12
Total Cancer Risk - All Potential Exposure Pathways	2.02E-10	4.85E-09	3.42E-09	5.04E-11	3.22E-11	3.27E-08	3.79E-08
Fraction of 1E-05 Benchmark	0.000	0.000	0.000	0.000	0.000	0.003	0.004

Notes:

TCDD-TEQ	2,3,7,8-TCDD Toxicity Equivalents
BAA	Benzo(a)anthracene
BAP	Benzo(a)pyrene
BBF	Benzo(b)fluoranthene
BKF	Benzo(k)fluoranthene
CHRYS	Chrysene
DBAHA	Dibenz(a,h)anthracene

Table I-3a
Noncarcinogenic Hazard Index and Cancer Risk - Subsistence Farmer
Beef Farm Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	BEHP	HCBZ	BZ	BM	CCl4	DCDFM	T13DCP
Total Noncarcinogenic Hazard Index - Farmer							
Total HI = 8.66E-01							
Hazard Quotient for consumption of beef	2.16E-07	9.09E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Quotient for consumption of milk	7.81E-07	3.61E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Quotient for consumption of fish	1.98E-06	2.19E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Quotient for consumption of soil	4.94E-08	6.91E-09	1.37E-13	2.03E-14	1.64E-13	5.65E-18	5.03E-15
Hazard Quotient for consumption of above-ground vegetables	9.43E-07	9.91E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Quotient for consumption of below-ground vegetables	7.85E-05	2.78E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Quotient for consumption of drinking water	3.10E-08	7.96E-08	8.06E-08	1.10E-07	7.09E-08	8.35E-10	1.93E-09
Hazard Quotient for inhalation	2.82E-07	3.33E-06	8.12E-06	6.72E-06	5.09E-06	1.68E-07	5.62E-07
Total Hazard Index - All Potential Exposure Pathways	8.28E-05	3.39E-05	8.20E-06	6.83E-06	5.16E-06	1.69E-07	5.64E-07
Fraction of 0.25 Benchmark	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cancer Risk - Farmer							
Total Risk = 3.19E-06							
Cancer Risk for consumption of beef	2.81E-11	5.82E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of milk	1.05E-10	2.38E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of fish	2.32E-10	1.35E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of soil	5.69E-12	3.64E-12	9.28E-18	0.00E+00	6.15E-18	3.90E-20	6.20E-18
Cancer Risk for consumption of above-ground vegetables	1.01E-10	5.31E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of below-ground vegetables	8.33E-09	1.46E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of drinking water	4.41E-12	5.57E-11	7.29E-12	0.00E+00	3.53E-12	7.68E-12	3.17E-12
Cancer Risk for inhalation	3.27E-11	1.76E-09	1.67E-10	0.00E+00	6.38E-11	0.00E+00	1.86E-10
Total Cancer Risk - All Potential Exposure Pathways	8.84E-09	1.81E-08	1.75E-10	0.00E+00	6.74E-11	7.68E-12	1.89E-10
Fraction of 1E-05 Benchmark	0.001	0.002	0.000	0.000	0.000	0.000	0.000

Notes:

INDENO	Indeno(1,2,3-c,d)pyrene
Not Used	Not Used
HCBZ	Hexachlorobenzene
BZ	Benzene
BM	Bromomethane
CCl4	Carbon tetrachloride
DCDFM	Dichlorodifluoromethane

Table I-3a
Noncarcinogenic Hazard Index and Cancer Risk - Subsistence Farmer
Beef Farm Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	TCFM	VCL	HCP	2-NA	2,4-DNT	2,6-DNT	CLMTHN
Total Noncarcinogenic Hazard Index - Farmer							
Total HI = 8.66E-01							
Hazard Quotient for consumption of beef	0.00E+00	0.00E+00	6.18E-11	6.24E-10	8.75E-11	2.62E-10	0.00E+00
Hazard Quotient for consumption of milk	0.00E+00	0.00E+00	2.53E-10	2.87E-09	4.01E-10	1.21E-09	0.00E+00
Hazard Quotient for consumption of fish	0.00E+00	0.00E+00	1.28E-07	2.32E-05	7.55E-07	3.16E-06	0.00E+00
Hazard Quotient for consumption of soil	2.07E-16	3.11E-16	9.92E-12	1.45E-08	1.64E-09	5.91E-09	7.18E-16
Hazard Quotient for consumption of above-ground vegetables	0.00E+00	0.00E+00	3.13E-10	2.60E-05	2.48E-06	1.00E-05	0.00E+00
Hazard Quotient for consumption of below-ground vegetables	0.00E+00	0.00E+00	1.17E-07	3.68E-04	3.67E-05	1.46E-04	0.00E+00
Hazard Quotient for consumption of drinking water	5.39E-10	5.09E-08	2.65E-08	9.28E-06	3.22E-07	1.33E-06	3.64E-08
Hazard Quotient for inhalation	4.80E-08	3.36E-07	1.48E-04	7.40E-05	1.06E-06	4.23E-06	3.73E-07
Total Hazard Index - All Potential Exposure Pathways	4.85E-08	3.87E-07	1.48E-04	5.01E-04	4.14E-05	1.64E-04	4.10E-07
Fraction of 0.25 Benchmark	0.000	0.000	0.001	0.002	0.000	0.001	0.000
Total Cancer Risk - Farmer							
Total Risk = 3.19E-06							
Cancer Risk for consumption of beef	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.03E-14	7.37E-14	0.00E+00
Cancer Risk for consumption of milk	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.31E-13	3.40E-13	0.00E+00
Cancer Risk for consumption of fish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.28E-10	8.97E-10	0.00E+00
Cancer Risk for consumption of soil	0.00E+00	5.74E-19	0.00E+00	0.00E+00	9.17E-13	1.65E-12	1.53E-20
Cancer Risk for consumption of above-ground vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.41E-09	2.83E-09	0.00E+00
Cancer Risk for consumption of below-ground vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.05E-08	4.07E-08	0.00E+00
Cancer Risk for consumption of drinking water	0.00E+00	1.25E-10	0.00E+00	0.00E+00	2.00E-10	4.10E-10	1.04E-12
Cancer Risk for inhalation	0.00E+00	1.22E-10	0.00E+00	0.00E+00	5.95E-10	1.19E-09	2.51E-11
Total Cancer Risk - All Potential Exposure Pathways	0.00E+00	2.48E-10	0.00E+00	0.00E+00	2.32E-08	4.60E-08	2.61E-11
Fraction of 1E-05 Benchmark	0.000	0.000	0.000	0.000	0.002	0.005	0.000

Notes:

T13DCP	Trans-1,3-Dichloropropene
TCFM	Trichlorofluoromethane
VCL	Vinyl Chloride
HCP	Hexachlorocyclopentadiene
2-NA	2-Nitroaniline
2,4-DNT	2,4-Dinitrotoluene
2,6-DNT	2,6-Dinitrotoluene

Table I-3a
Noncarcinogenic Hazard Index and Cancer Risk - Subsistence Farmer
Beef Farm Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	PCP	1,1-DCE	1,1,2,2-TCA	CLFM	1,3-BUT	HCBU	Hg	HgCl	MeHg	Total by Pathway
Total Noncarcinogenic Hazard Index - Farmer										
Total HI = 8.66E-01										
Hazard Quotient for consumption of beef	2.57E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.03E-11	0.00E+00	3.37E-05	7.19E-07	1.26E-04
Hazard Quotient for consumption of milk	1.19E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.30E-10	0.00E+00	1.04E-04	4.03E-06	2.66E-04
Hazard Quotient for consumption of fish	4.66E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.99E-07	0.00E+00	0.00E+00	8.63E-01	8.63E-01
Hazard Quotient for consumption of soil	1.29E-10	4.12E-15	9.21E-14	7.35E-14	0.00E+00	7.44E-12	0.00E+00	1.40E-05	4.61E-07	1.61E-05
Hazard Quotient for consumption of above-ground vegetables	9.40E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.93E-10	0.00E+00	4.94E-05	3.79E-05	1.29E-04
Hazard Quotient for consumption of below-ground vegetables	3.89E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.81E-08	0.00E+00	2.05E-05	3.33E-06	7.22E-04
Hazard Quotient for consumption of drinking water	2.46E-08	5.89E-09	1.40E-09	1.66E-08	0.00E+00	3.94E-08	0.00E+00	3.19E-06	1.66E-06	1.75E-05
Hazard Quotient for inhalation	2.82E-07	3.52E-07	5.36E-08	1.12E-04	0.00E+00	2.11E-06	4.47E-07	1.58E-05	0.00E+00	1.75E-03
Total Hazard Index - All Potential Exposure Pathways	3.98E-05	3.58E-07	5.50E-08	1.12E-04	0.00E+00	2.94E-06	4.47E-07	2.40E-04	8.63E-01	8.66E-01
Fraction of 0.25 Benchmark	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	3.450	3.463
Total Cancer Risk - Farmer										
Total Risk = 3.19E-06										
Cancer Risk for consumption of beef	5.05E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.40E-16	0.00E+00	0.00E+00	0.00E+00	5.66E-07
Cancer Risk for consumption of milk	2.34E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.05E-15	0.00E+00	0.00E+00	0.00E+00	1.30E-06
Cancer Risk for consumption of fish	7.71E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.97E-12	0.00E+00	0.00E+00	0.00E+00	1.10E-06
Cancer Risk for consumption of soil	1.91E-13	9.15E-18	4.54E-16	0.00E+00	0.00E+00	4.77E-17	0.00E+00	0.00E+00	0.00E+00	1.04E-08
Cancer Risk for consumption of above-ground vegetables	1.70E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.90E-15	0.00E+00	0.00E+00	0.00E+00	4.83E-09
Cancer Risk for consumption of below-ground vegetables	5.76E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.65E-13	0.00E+00	0.00E+00	0.00E+00	1.52E-07
Cancer Risk for consumption of drinking water	4.74E-11	1.74E-11	9.17E-12	0.00E+00	0.00E+00	3.37E-13	0.00E+00	0.00E+00	0.00E+00	1.35E-09
Cancer Risk for inhalation	4.21E-10	2.33E-10	2.66E-10	3.22E-10	7.16E-09	1.37E-11	0.00E+00	0.00E+00	0.00E+00	5.38E-08
Total Cancer Risk - All Potential Exposure Pathways	5.91E-08	2.51E-10	2.76E-10	3.22E-10	7.16E-09	2.05E-11	0.00E+00	0.00E+00	0.00E+00	3.19E-06
Fraction of 1E-05 Benchmark	0.006	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.319

Notes:

CLMTHN	Chloromethane
PCP	Pentachlorophenol
1,1-DCE	1,1-Dichloroethylene
1,1,2,2-TCA	1,1,2,2-Tetrachloroethane
CLFM	Chloroform
1,3-BUT	1,3-Butadiene
Hg	Elemental Mercury
HgCl	Mercuric Chlorid
MeHg	Methyl Mercury

Table I-3b
Noncarcinogenic Hazard Index and Cancer Risk - Subsistence Farmer
Dairy Farm Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	As	Sb	Ba	Be	Cd	Total Cr	Cr VI
Total Noncarcinogenic Hazard Index - Farmer							
Total HI = 8.65E-01							
Hazard Quotient for consumption of beef	1.24E-06	9.41E-08	1.42E-10	8.48E-09	1.14E-08	5.93E-10	2.78E-08
Hazard Quotient for consumption of milk	5.38E-07	1.35E-07	4.77E-09	8.64E-11	8.79E-09	1.53E-09	1.10E-07
Hazard Quotient for consumption of fish	1.15E-06	3.51E-07	5.57E-08	5.18E-08	2.06E-06	5.57E-12	1.39E-09
Hazard Quotient for consumption of soil	3.94E-08	8.96E-09	8.27E-11	8.17E-09	1.32E-08	1.61E-10	2.13E-10
Hazard Quotient for consumption of above-ground vegetables	6.73E-07	2.13E-07	2.08E-09	5.98E-09	6.94E-07	5.54E-11	5.05E-09
Hazard Quotient for consumption of below-ground vegetables	2.42E-07	1.88E-07	8.91E-10	1.21E-09	4.82E-07	2.89E-11	7.61E-10
Hazard Quotient for consumption of drinking water	3.67E-07	5.42E-08	5.48E-10	3.59E-09	4.84E-08	1.52E-12	3.01E-09
Hazard Quotient for inhalation	5.46E-06	7.86E-07	3.98E-06	1.61E-05	6.24E-06	1.82E-05	4.50E-06
Total Hazard Index - All Potential Exposure Pathways	9.72E-06	1.83E-06	4.05E-06	1.62E-05	9.55E-06	1.82E-05	4.65E-06
Fraction of 0.25 Benchmark	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cancer Risk - Farmer							
Total Risk = 2.98E-06							
Cancer Risk for consumption of beef	3.03E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of milk	1.32E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of fish	2.20E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of soil	7.28E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of above-ground vegetables	1.57E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of below-ground vegetables	4.18E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of drinking water	8.33E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for inhalation	1.02E-08	0.00E+00	0.00E+00	3.21E-10	9.28E-10	0.00E+00	1.62E-08
Total Cancer Risk - All Potential Exposure Pathways	1.11E-08	0.00E+00	0.00E+00	3.21E-10	9.28E-10	0.00E+00	1.62E-08
Fraction of 1E-05 Benchmark	0.001	0.000	0.000	0.000	0.000	0.000	0.002

Notes:

As	Arsenic
Sb	Antimony
Ba	Barium
Be	Beryllium
Cd	Cadmium
Total Cr	Total Chromium
Cr VI	Chromium VI

Table I-3b
Noncarcinogenic Hazard Index and Cancer Risk - Subsistence Farmer
Dairy Farm Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	Pb	Ni	Se	Ag	Tl	Zn	TCDD-TEQ
Total Noncarcinogenic Hazard Index - Farmer							
Total HI = 8.65E-01							
Hazard Quotient for consumption of beef	0.00E+00	2.33E-07	4.65E-09	8.22E-08	3.13E-05	5.93E-10	5.11E-05
Hazard Quotient for consumption of milk	0.00E+00	5.52E-07	1.76E-07	8.02E-06	2.21E-05	3.05E-09	1.08E-04
Hazard Quotient for consumption of fish	0.00E+00	2.92E-07	2.38E-08	4.98E-07	7.65E-08	1.24E-06	1.44E-04
Hazard Quotient for consumption of soil	0.00E+00	5.32E-09	2.35E-11	5.06E-10	1.17E-07	8.17E-10	1.24E-06
Hazard Quotient for consumption of above-ground vegetables	0.00E+00	5.30E-08	2.09E-09	6.12E-08	7.05E-07	2.95E-08	1.91E-08
Hazard Quotient for consumption of below-ground vegetables	0.00E+00	2.60E-08	4.13E-10	4.05E-08	2.75E-08	2.24E-08	7.99E-07
Hazard Quotient for consumption of drinking water	0.00E+00	2.24E-08	1.23E-09	1.62E-08	4.53E-07	3.60E-09	3.64E-08
Hazard Quotient for inhalation	0.00E+00	1.16E-03	1.80E-08	2.36E-07	6.66E-06	5.31E-08	6.12E-07
Total Hazard Index - All Potential Exposure Pathways	0.00E+00	1.16E-03	2.26E-07	8.95E-06	6.14E-05	1.35E-06	3.06E-04
Fraction of 0.25 Benchmark	0.000	0.005	0.000	0.000	0.000	0.000	0.001
Total Cancer Risk - Farmer							
Total Risk = 2.98E-06							
Cancer Risk for consumption of beef	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.96E-07
Cancer Risk for consumption of milk	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.11E-06
Cancer Risk for consumption of fish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.10E-06
Cancer Risk for consumption of soil	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.38E-09
Cancer Risk for consumption of above-ground vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.59E-10
Cancer Risk for consumption of below-ground vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.04E-09
Cancer Risk for consumption of drinking water	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.47E-10
Cancer Risk for inhalation	0.00E+00	2.30E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.81E-09
Total Cancer Risk - All Potential Exposure Pathways	0.00E+00	2.30E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.73E-06
Fraction of 1E-05 Benchmark	0.000	0.000	0.000	0.000	0.000	0.000	0.273

Notes:

Pb	Lead
Ni	Nickel
Se	Selenium
Ag	Silver
Tl	Thallium
Zn	Zinc
TCDD-TEQ	2,3,7,8-TCDD Toxicity Equivalents

Table I-3b
Noncarcinogenic Hazard Index and Cancer Risk - Subsistence Farmer
Dairy Farm Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	BAA	BAP	BBF	BKF	CHRYS	DBAHA	INDENO
Total Noncarcinogenic Hazard Index - Farmer							
Total HI = 8.65E-01							
Hazard Quotient for consumption of beef	2.59E-10	4.38E-09	1.77E-08	5.23E-09	6.68E-09	4.33E-08	5.03E-07
Hazard Quotient for consumption of milk	9.85E-10	1.73E-08	6.71E-08	2.17E-08	2.57E-08	1.99E-07	2.32E-06
Hazard Quotient for consumption of fish	6.44E-09	1.85E-08	1.24E-07	1.22E-08	1.25E-07	2.78E-09	2.93E-09
Hazard Quotient for consumption of soil	1.62E-11	9.04E-11	3.43E-10	6.03E-11	3.48E-10	2.17E-11	2.96E-11
Hazard Quotient for consumption of above-ground vegetables	1.03E-10	1.06E-10	7.92E-10	1.01E-10	9.86E-10	3.66E-10	1.82E-09
Hazard Quotient for consumption of below-ground vegetables	1.47E-08	7.13E-09	1.45E-07	5.53E-09	1.26E-07	1.31E-09	1.44E-09
Hazard Quotient for consumption of drinking water	4.60E-12	7.74E-12	4.69E-11	5.78E-12	6.03E-11	1.71E-12	1.33E-12
Hazard Quotient for inhalation	2.77E-11	4.55E-11	3.09E-10	4.08E-11	2.19E-10	3.08E-11	4.31E-11
Total Hazard Index - All Potential Exposure Pathways	2.25E-08	4.76E-08	3.55E-07	4.49E-08	2.85E-07	2.47E-07	2.83E-06
Fraction of 0.25 Benchmark	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cancer Risk - Farmer							
Total Risk = 2.98E-06							
Cancer Risk for consumption of beef	2.79E-12	4.64E-10	1.92E-10	5.80E-12	7.18E-13	5.16E-09	6.02E-09
Cancer Risk for consumption of milk	1.10E-11	1.93E-09	7.59E-10	2.49E-11	2.87E-12	2.38E-08	2.78E-08
Cancer Risk for consumption of fish	5.86E-11	1.56E-09	1.12E-09	1.02E-11	1.11E-11	2.30E-10	2.42E-11
Cancer Risk for consumption of soil	1.46E-13	7.05E-12	3.06E-12	4.65E-14	3.03E-14	1.63E-12	2.23E-13
Cancer Risk for consumption of above-ground vegetables	8.35E-13	1.09E-11	6.96E-12	1.11E-13	8.47E-14	4.37E-11	2.19E-11
Cancer Risk for consumption of below-ground vegetables	1.13E-10	5.36E-10	1.10E-09	4.15E-12	9.52E-12	9.80E-11	1.08E-11
Cancer Risk for consumption of drinking water	4.84E-14	7.03E-13	4.75E-13	5.32E-15	5.88E-15	1.69E-13	1.32E-14
Cancer Risk for inhalation	7.22E-13	1.19E-12	8.05E-12	1.06E-12	5.72E-12	8.05E-13	1.13E-12
Total Cancer Risk - All Potential Exposure Pathways	1.88E-10	4.52E-09	3.19E-09	4.63E-11	3.01E-11	2.93E-08	3.39E-08
Fraction of 1E-05 Benchmark	0.000	0.000	0.000	0.000	0.000	0.003	0.003

Notes:

BAA	Benzo(a)anthracene
BAP	Benzo(a)pyrene
BBF	Benzo(b)fluoranthene
BKF	Benzo(k)fluoranthene
CHRYS	Chrysene
DBAHA	Dibenz(a,h)anthracene
INDENO	Indeno(1,2,3-c,d)pyrene

Table I-3b
Noncarcinogenic Hazard Index and Cancer Risk - Subsistence Farmer
Dairy Farm Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	BEHP	HCBZ	BZ	BM	CCl4	DCDFM
Total Noncarcinogenic Hazard Index - Farmer						
Total HI = 8.65E-01						
Hazard Quotient for consumption of beef	1.94E-07	8.16E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Quotient for consumption of milk	7.02E-07	3.24E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Quotient for consumption of fish	1.98E-06	2.19E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Quotient for consumption of soil	4.45E-08	6.23E-09	1.23E-13	1.83E-14	1.48E-13	5.09E-18
Hazard Quotient for consumption of above-ground vegetables	8.50E-07	8.93E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Quotient for consumption of below-ground vegetables	7.08E-05	2.50E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Quotient for consumption of drinking water	3.10E-08	7.96E-08	8.06E-08	1.10E-07	7.09E-08	8.35E-10
Hazard Quotient for inhalation	2.52E-07	2.98E-06	7.27E-06	6.02E-06	4.56E-06	1.50E-07
Total Hazard Index - All Potential Exposure Pathways	7.49E-05	3.08E-05	7.35E-06	6.13E-06	4.63E-06	1.51E-07
Fraction of 0.25 Benchmark	0.000	0.000	0.000	0.000	0.000	0.000
Total Cancer Risk - Farmer						
Total Risk = 2.98E-06						
Cancer Risk for consumption of beef	2.52E-11	5.22E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of milk	9.41E-11	2.13E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of fish	2.32E-10	1.35E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of soil	5.13E-12	3.28E-12	8.36E-18	0.00E+00	5.54E-18	3.51E-20
Cancer Risk for consumption of above-ground vegetables	9.08E-11	4.79E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of below-ground vegetables	7.51E-09	1.32E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of drinking water	4.42E-12	5.57E-11	7.29E-12	0.00E+00	3.53E-12	7.68E-12
Cancer Risk for inhalation	2.92E-11	1.58E-09	1.50E-10	0.00E+00	5.71E-11	0.00E+00
Total Cancer Risk - All Potential Exposure Pathways	7.99E-09	1.65E-08	1.57E-10	0.00E+00	6.07E-11	7.68E-12
Fraction of 1E-05 Benchmark	0.001	0.002	0.000	0.000	0.000	0.000

Notes:

BEHP	Bis(2-ethylhexyl)phthalate
HCBZ	Hexachlorobenzene
BZ	Benzene
BM	Bromomethane
CCl4	Carbon tetrachloride
DCDFM	Dichlorodifluoromethane

Table I-3b
Noncarcinogenic Hazard Index and Cancer Risk - Subsistence Farmer
Dairy Farm Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	T13DCP	TCFM	VCL	HCP	2-NA	2,4-DNT	2,6-DNT	CLMTHN
Total Noncarcinogenic Hazard Index - Farmer								
Total HI = 8.65E-01								
Hazard Quotient for consumption of beef	0.00E+00	0.00E+00	0.00E+00	5.55E-11	5.63E-10	7.88E-11	2.36E-10	0.00E+00
Hazard Quotient for consumption of milk	0.00E+00	0.00E+00	0.00E+00	2.27E-10	2.58E-09	3.61E-10	1.09E-09	0.00E+00
Hazard Quotient for consumption of fish	0.00E+00	0.00E+00	0.00E+00	1.28E-07	2.32E-05	7.55E-07	3.16E-06	0.00E+00
Hazard Quotient for consumption of soil	4.54E-15	1.87E-16	2.80E-16	8.94E-12	1.31E-08	1.48E-09	5.32E-09	6.47E-16
Hazard Quotient for consumption of above-ground vegetables	0.00E+00	0.00E+00	0.00E+00	2.82E-10	2.34E-05	2.23E-06	9.05E-06	0.00E+00
Hazard Quotient for consumption of below-ground vegetables	0.00E+00	0.00E+00	0.00E+00	1.05E-07	3.32E-04	3.31E-05	1.31E-04	0.00E+00
Hazard Quotient for consumption of drinking water	1.93E-09	5.39E-10	5.09E-08	2.65E-08	9.28E-06	3.22E-07	1.33E-06	3.64E-08
Hazard Quotient for inhalation	5.03E-07	4.30E-08	3.01E-07	1.33E-04	6.63E-05	9.45E-07	3.79E-06	3.34E-07
Total Hazard Index - All Potential Exposure Pathways	5.05E-07	4.35E-08	3.52E-07	1.33E-04	4.54E-04	3.74E-05	1.48E-04	3.71E-07
Fraction of 0.25 Benchmark	0.000	0.000	0.000	0.001	0.002	0.000	0.001	0.000
Total Cancer Risk - Farmer								
Total Risk = 2.98E-06								
Cancer Risk for consumption of beef	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.54E-14	6.64E-14	0.00E+00
Cancer Risk for consumption of milk	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.08E-13	3.06E-13	0.00E+00
Cancer Risk for consumption of fish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.28E-10	8.97E-10	0.00E+00
Cancer Risk for consumption of soil	5.59E-18	0.00E+00	5.18E-19	0.00E+00	0.00E+00	8.26E-13	1.49E-12	1.38E-20
Cancer Risk for consumption of above-ground vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.27E-09	2.55E-09	0.00E+00
Cancer Risk for consumption of below-ground vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.85E-08	3.67E-08	0.00E+00
Cancer Risk for consumption of drinking water	3.17E-12	0.00E+00	1.25E-10	0.00E+00	0.00E+00	2.00E-10	4.10E-10	1.04E-12
Cancer Risk for inhalation	1.67E-10	0.00E+00	1.10E-10	0.00E+00	0.00E+00	5.32E-10	1.07E-09	2.24E-11
Total Cancer Risk - All Potential Exposure Pathways	1.70E-10	0.00E+00	2.35E-10	0.00E+00	0.00E+00	2.09E-08	4.16E-08	2.35E-11
Fraction of 1E-05 Benchmark	0.000	0.000	0.000	0.000	0.000	0.002	0.004	0.000

Notes:

T13DCP	Trans-1,3-Dichloropropene
TCFM	Trichlorofluoromethane
VCL	Vinyl Chloride
HCP	Hexachlorocyclopentadiene
2-NA	2-Nitroaniline
2,4-DNT	2,4-Dinitrotoluene
2,6-DNT	2,6-Dinitrotoluene
CLMTHN	Chloromethane

Table I-3b
Noncarcinogenic Hazard Index and Cancer Risk - Subsistence Farmer
Dairy Farm Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	PCP	1,1-DCE	1,1,2,2-TCA	CLFM	1,3-BUT	HCBU
Total Noncarcinogenic Hazard Index - Farmer						
Total HI = 8.65E-01						
Hazard Quotient for consumption of beef	2.30E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.72E-11
Hazard Quotient for consumption of milk	1.06E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.17E-10
Hazard Quotient for consumption of fish	4.66E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.99E-07
Hazard Quotient for consumption of soil	1.16E-10	3.71E-15	8.30E-14	6.62E-14	0.00E+00	6.70E-12
Hazard Quotient for consumption of above-ground vegetables	8.43E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.64E-10
Hazard Quotient for consumption of below-ground vegetables	3.51E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.94E-08
Hazard Quotient for consumption of drinking water	2.46E-08	5.89E-09	1.40E-09	1.66E-08	0.00E+00	3.94E-08
Hazard Quotient for inhalation	2.52E-07	3.15E-07	4.80E-08	1.00E-04	0.00E+00	1.89E-06
Total Hazard Index - All Potential Exposure Pathways	3.60E-05	3.21E-07	4.94E-08	1.00E-04	0.00E+00	2.71E-06
Fraction of 0.25 Benchmark	0.000	0.000	0.000	0.000	0.000	0.000
Total Cancer Risk - Farmer						
Total Risk = 2.98E-06						
Cancer Risk for consumption of beef	4.53E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.15E-16
Cancer Risk for consumption of milk	2.10E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.37E-16
Cancer Risk for consumption of fish	7.71E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.97E-12
Cancer Risk for consumption of soil	1.72E-13	8.24E-18	4.09E-16	0.00E+00	0.00E+00	4.30E-17
Cancer Risk for consumption of above-ground vegetables	1.53E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.71E-15
Cancer Risk for consumption of below-ground vegetables	5.19E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.09E-13
Cancer Risk for consumption of drinking water	4.74E-11	1.74E-11	9.17E-12	0.00E+00	0.00E+00	3.37E-13
Cancer Risk for inhalation	3.76E-10	2.09E-10	2.39E-10	2.88E-10	6.41E-09	1.22E-11
Total Cancer Risk - All Potential Exposure Pathways	5.34E-08	2.26E-10	2.48E-10	2.88E-10	6.41E-09	1.90E-11
Fraction of 1E-05 Benchmark	0.005	0.000	0.000	0.000	0.001	0.000

Notes:

PCP	Pentachlorophenol
1,1-DCE	1,1-Dichloroethylene
1,1,2,2-TCA	1,1,2,2-Tetrachloroethane
CLFM	Chloroform
1,3-BUT	1,3-Butadiene

Table I-3b
Noncarcinogenic Hazard Index and Cancer Risk - Subsistence Farmer
Dairy Farm Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	Hg	HgCl	MeHg	Total by Pathway
Total Noncarcinogenic Hazard Index - Farmer				
Total HI = 8.65E-01				
Hazard Quotient for consumption of beef	0.00E+00	3.21E-05	6.55E-07	1.18E-04
Hazard Quotient for consumption of milk	0.00E+00	9.77E-05	3.65E-06	2.44E-04
Hazard Quotient for consumption of fish	0.00E+00	0.00E+00	8.63E-01	8.63E-01
Hazard Quotient for consumption of soil	0.00E+00	1.34E-05	4.42E-07	1.54E-05
Hazard Quotient for consumption of above-ground vegetables	0.00E+00	4.46E-05	3.39E-05	1.17E-04
Hazard Quotient for consumption of below-ground vegetables	0.00E+00	1.97E-05	3.20E-06	6.53E-04
Hazard Quotient for consumption of drinking water	0.00E+00	3.19E-06	1.66E-06	1.74E-05
Hazard Quotient for inhalation	4.00E-07	1.42E-05	0.00E+00	1.56E-03
Total Hazard Index - All Potential Exposure Pathways	4.00E-07	2.25E-04	8.63E-01	8.65E-01
Fraction of 0.25 Benchmark	0.000	0.001	3.450	3.462
Total Cancer Risk - Farmer				
Total Risk = 2.98E-06				
Cancer Risk for consumption of beef	0.00E+00	0.00E+00	0.00E+00	5.08E-07
Cancer Risk for consumption of milk	0.00E+00	0.00E+00	0.00E+00	1.17E-06
Cancer Risk for consumption of fish	0.00E+00	0.00E+00	0.00E+00	1.10E-06
Cancer Risk for consumption of soil	0.00E+00	0.00E+00	0.00E+00	9.41E-09
Cancer Risk for consumption of above-ground vegetables	0.00E+00	0.00E+00	0.00E+00	4.37E-09
Cancer Risk for consumption of below-ground vegetables	0.00E+00	0.00E+00	0.00E+00	1.38E-07
Cancer Risk for consumption of drinking water	0.00E+00	0.00E+00	0.00E+00	1.32E-09
Cancer Risk for inhalation	0.00E+00	0.00E+00	0.00E+00	4.80E-08
Total Cancer Risk - All Potential Exposure Pathways	0.00E+00	0.00E+00	0.00E+00	2.98E-06
Fraction of 1E-05 Benchmark	0.000	0.000	0.000	0.298

Notes:

Hg Mercury
HgCl Mercuric Chloride
MeHg Methyl Mercury

Table I-4
Noncarcinogenic Hazard Index and Cancer Risk - Subsistence Fisher
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	As	Sb	Ba	Be	Cd	Total Cr	Cr VI
Total Noncarcinogenic Hazard Index - Subsistence Fisher							
Total HI = 8.33E-01							
Hazard Index for consumption of beef	3.35E-07	2.54E-08	3.84E-11	2.27E-09	3.08E-09	1.57E-10	7.52E-09
Hazard Index for consumption of milk	1.34E-07	3.38E-08	1.19E-09	2.16E-11	2.20E-09	3.82E-10	2.75E-08
Hazard Index for consumption of fish	8.70E-07	2.48E-07	3.94E-08	3.87E-08	1.44E-06	2.58E-11	9.93E-10
Hazard Index for consumption of soil	5.21E-07	1.19E-07	1.09E-09	1.08E-07	1.75E-07	2.13E-09	2.82E-09
Hazard Index for consumption of above-ground vegetables	2.73E-06	7.78E-07	7.63E-09	2.41E-08	2.36E-06	2.15E-10	2.09E-08
Hazard Index for consumption of below-ground vegetables	8.00E-07	6.23E-07	2.95E-09	4.00E-09	1.60E-06	9.57E-11	2.52E-09
Hazard Index for consumption of drinking water	4.61E-07	5.42E-08	5.48E-10	3.59E-09	4.84E-08	1.52E-12	3.01E-09
Hazard Index for inhalation	1.50E-04	2.16E-05	1.10E-04	4.44E-04	1.72E-04	5.00E-04	1.24E-04
Total Hazard Index - All Potential Exposure Pathways	1.56E-04	2.35E-05	1.10E-04	4.44E-04	1.77E-04	5.00E-04	1.24E-04
Fraction of 0.25 Benchmark	0.001	0.000	0.000	0.002	0.001	0.002	0.000
Total Cancer Risk - Subsistence Fisher							
Total Risk = 3.98E-06							
Cancer Risk for consumption of beef	6.20E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of milk	2.49E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of fish	1.61E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of soil	9.63E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of above-ground vegetables	4.85E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of below-ground vegetables	1.08E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of drinking water	8.52E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for inhalation	2.10E-07	0.00E+00	0.00E+00	6.62E-09	1.92E-08	0.00E+00	3.35E-07
Total Cancer Risk - All Potential Exposure Pathways	2.11E-07	0.00E+00	0.00E+00	6.62E-09	1.92E-08	0.00E+00	3.35E-07
Fraction of 1E-05 Benchmark	0.021	0.000	0.000	0.001	0.002	0.000	0.033

Notes:

As	Arsenic
Sb	Antimony
Ba	Barium
Be	Beryllium
Cd	Cadmium
Total Cr	Total Chromium
Cr VI	Chromium VI

Table I-4
Noncarcinogenic Hazard Index and Cancer Risk - Subsistence Fisher
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	Pb	Ni	Se	Ag	Tl	Zn	TCDD-TEQ
Total Noncarcinogenic Hazard Index - Subsistence Fisher							
Total HI = 8.33E-01							
Hazard Index for consumption of beef	0.00E+00	6.30E-08	1.26E-09	2.23E-08	8.45E-06	1.60E-10	1.42E-05
Hazard Index for consumption of milk	0.00E+00	1.38E-07	4.40E-08	2.00E-06	5.53E-06	7.64E-10	2.69E-05
Hazard Index for consumption of fish	0.00E+00	2.06E-07	1.71E-08	3.56E-07	5.38E-08	8.70E-07	2.58E-04
Hazard Index for consumption of soil	0.00E+00	7.04E-08	3.11E-10	6.69E-09	1.55E-06	1.08E-08	3.09E-05
Hazard Index for consumption of above-ground vegetables	0.00E+00	2.06E-07	8.64E-09	2.25E-07	2.95E-06	1.03E-07	6.40E-08
Hazard Index for consumption of below-ground vegetables	0.00E+00	8.59E-08	1.37E-09	1.34E-07	9.09E-08	7.41E-08	4.29E-06
Hazard Index for consumption of drinking water	0.00E+00	2.24E-08	1.23E-09	1.62E-08	4.53E-07	3.60E-09	5.20E-08
Hazard Index for inhalation	0.00E+00	3.18E-02	4.95E-07	6.49E-06	1.83E-04	1.46E-06	1.69E-05
Total Hazard Index - All Potential Exposure Pathways	0.00E+00	3.18E-02	5.68E-07	9.25E-06	2.02E-04	2.52E-06	3.51E-04
Fraction of 0.25 Benchmark	0.000	0.127	0.000	0.000	0.001	0.000	0.001
Total Cancer Risk - Subsistence Fisher							
Total Risk = 3.98E-06							
Cancer Risk for consumption of beef	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.03E-07
Cancer Risk for consumption of milk	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.07E-07
Cancer Risk for consumption of fish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.44E-06
Cancer Risk for consumption of soil	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.72E-07
Cancer Risk for consumption of above-ground vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.36E-09
Cancer Risk for consumption of below-ground vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.90E-07
Cancer Risk for consumption of drinking water	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.85E-10
Cancer Risk for inhalation	0.00E+00	4.74E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.41E-07
Total Cancer Risk - All Potential Exposure Pathways	0.00E+00	4.74E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.26E-06
Fraction of 1E-05 Benchmark	0.000	0.005	0.000	0.000	0.000	0.000	0.226

Notes:

Pb	Lead
Ni	Nickel
Se	Selenium
Ag	Silver
Tl	Thallium
Zn	Zinc
TCDD-TEQ	2,3,7,8-TCDD Toxicity Equivalents

Table I-4
Noncarcinogenic Hazard Index and Cancer Risk - Subsistence Fisher
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	BAA	BAP	BBF	BKF	CHRYS	DBAHA	INDENO
Total Noncarcinogenic Hazard Index - Subsistence Fisher							
Total HI = 8.33E-01							
Hazard Index for consumption of beef	7.20E-11	1.22E-09	4.92E-09	1.46E-09	1.86E-09	1.21E-08	1.40E-07
Hazard Index for consumption of milk	2.46E-10	4.33E-09	1.68E-08	5.42E-09	6.43E-09	4.97E-08	5.80E-07
Hazard Index for consumption of fish	1.08E-08	5.02E-08	3.04E-07	3.18E-08	2.19E-07	8.65E-09	1.04E-08
Hazard Index for consumption of soil	4.17E-10	2.19E-09	8.82E-09	1.39E-09	8.92E-09	3.57E-10	4.71E-10
Hazard Index for consumption of above-ground vegetables	6.64E-10	6.84E-10	5.15E-09	6.52E-10	6.39E-09	2.47E-09	1.24E-08
Hazard Index for consumption of below-ground vegetables	9.46E-08	4.32E-08	9.28E-07	3.17E-08	8.07E-07	5.38E-09	5.73E-09
Hazard Index for consumption of drinking water	4.60E-12	7.74E-12	4.69E-11	5.78E-12	6.03E-11	1.71E-12	1.33E-12
Hazard Index for inhalation	7.55E-10	1.25E-09	8.42E-09	1.12E-09	5.99E-09	8.52E-10	1.19E-09
Total Hazard Index - All Potential Exposure Pathways	1.08E-07	1.03E-07	1.28E-06	7.36E-08	1.06E-06	7.95E-08	7.51E-07
Fraction of 0.25 Benchmark	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cancer Risk - Subsistence Fisher							
Total Risk = 3.98E-06							
Cancer Risk for consumption of beef	6.31E-13	9.44E-11	4.22E-11	1.19E-12	1.55E-13	1.08E-09	1.26E-09
Cancer Risk for consumption of milk	2.18E-12	3.57E-10	1.47E-10	4.62E-12	5.50E-13	4.46E-09	5.22E-09
Cancer Risk for consumption of fish	9.14E-11	3.17E-09	2.44E-09	1.95E-11	1.68E-11	4.99E-10	5.94E-11
Cancer Risk for consumption of soil	3.51E-12	1.15E-10	6.90E-11	6.98E-13	6.46E-13	1.64E-11	2.14E-12
Cancer Risk for consumption of above-ground vegetables	3.63E-12	5.04E-11	3.07E-11	5.30E-13	3.66E-13	2.22E-10	1.11E-10
Cancer Risk for consumption of below-ground vegetables	4.80E-10	1.96E-09	4.44E-09	1.44E-11	3.78E-11	2.42E-10	2.58E-11
Cancer Risk for consumption of drinking water	4.02E-14	5.13E-13	3.91E-13	3.84E-15	4.77E-15	1.21E-13	9.47E-15
Cancer Risk for inhalation	1.48E-11	2.45E-11	1.65E-10	2.20E-11	1.17E-10	1.67E-11	2.33E-11
Total Cancer Risk - All Potential Exposure Pathways	5.96E-10	5.77E-09	7.34E-09	6.29E-11	1.73E-10	6.53E-09	6.70E-09
Fraction of 1E-05 Benchmark	0.000	0.001	0.001	0.000	0.000	0.001	0.001

Notes:

BAA	Benzo(a)anthracene
BAP	Benzo(a)pyrene
BBF	Benzo(b)fluoranthene
BKF	Benzo(k)fluoranthene
CHRYS	Chrysene
DBAHA	Dibenz(a,h)anthracene
INDENO	Indeno(1,2,3-c,d)pyrene

Table I-4
Noncarcinogenic Hazard Index and Cancer Risk - Subsistence Fisher
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	BEHP	HCBZ	BZ	BM	CCl4	DCDFM	T13DCP
Total Noncarcinogenic Hazard Index - Subsistence Fisher							
Total HI = 8.33E-01							
Hazard Index for consumption of beef	5.40E-08	2.27E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Index for consumption of milk	1.75E-07	8.10E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Index for consumption of fish	2.65E-06	3.93E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Index for consumption of soil	1.15E-06	1.61E-07	3.19E-12	4.72E-13	3.83E-12	1.32E-16	1.17E-13
Hazard Index for consumption of above-ground vegetables	5.48E-06	5.79E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Index for consumption of below-ground vegetables	4.57E-04	1.62E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazard Index for consumption of drinking water	3.10E-08	7.96E-08	8.06E-08	1.10E-07	7.09E-08	8.35E-10	1.93E-09
Hazard Index for inhalation	6.87E-06	8.11E-05	1.98E-04	1.64E-04	1.24E-04	4.10E-06	1.37E-05
Total Hazard Index - All Potential Exposure Pathways	4.73E-04	2.48E-04	1.98E-04	1.64E-04	1.24E-04	4.10E-06	1.37E-05
Fraction of 0.25 Benchmark	0.002	0.001	0.001	0.001	0.000	0.000	0.000
Total Cancer Risk - Subsistence Fisher							
Total Risk = 3.98E-06							
Cancer Risk for consumption of beef	6.15E-12	1.20E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of milk	2.00E-11	4.26E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of fish	3.05E-10	2.07E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of soil	1.30E-10	8.47E-11	2.16E-16	0.00E+00	1.43E-16	9.08E-19	1.44E-16
Cancer Risk for consumption of above-ground vegetables	4.46E-10	3.04E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of below-ground vegetables	3.69E-08	8.50E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cancer Risk for consumption of drinking water	3.55E-12	4.19E-11	5.47E-12	0.00E+00	2.65E-12	5.76E-12	2.38E-12
Cancer Risk for inhalation	5.98E-10	3.23E-08	3.06E-09	0.00E+00	1.17E-09	0.00E+00	3.40E-09
Total Cancer Risk - All Potential Exposure Pathways	3.84E-08	1.20E-07	3.06E-09	0.00E+00	1.17E-09	5.76E-12	3.41E-09
Fraction of 1E-05 Benchmark	0.004	0.012	0.000	0.000	0.000	0.000	0.000

Notes:

BEHP	Bis(2-ethylhexyl)phthalate
HCBZ	Hexachlorobenzene
BZ	Benzene
BM	Bromomethane
CCl4	Carbon tetrachloride
DCDFM	Dichlorodifluoromethane
T13DCP	Trans-1,3-Dichloropropene

Table I-4
Noncarcinogenic Hazard Index and Cancer Risk - Subsistence Fisher
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	TCFM	VCL	HCP	2-NA	2,4-DNT	2,6-DNT	CLMTHN
Total Noncarcinogenic Hazard Index - Subsistence Fisher							
Total HI = 8.33E-01							
Hazard Index for consumption of beef	0.00E+00	0.00E+00	1.55E-11	1.56E-10	2.19E-11	6.55E-11	0.00E+00
Hazard Index for consumption of milk	0.00E+00	0.00E+00	5.68E-11	6.46E-10	9.04E-11	2.72E-10	0.00E+00
Hazard Index for consumption of fish	0.00E+00	0.00E+00	2.09E-07	2.07E-05	6.74E-07	2.82E-06	0.00E+00
Hazard Index for consumption of soil	4.82E-15	7.23E-15	2.31E-10	3.37E-07	3.82E-08	1.38E-07	1.67E-14
Hazard Index for consumption of above-ground vegetables	0.00E+00	0.00E+00	1.83E-09	1.51E-04	1.45E-05	5.85E-05	0.00E+00
Hazard Index for consumption of below-ground vegetables	0.00E+00	0.00E+00	6.79E-07	2.15E-03	2.14E-04	8.47E-04	0.00E+00
Hazard Index for consumption of drinking water	5.39E-10	5.09E-08	2.65E-08	9.28E-06	3.22E-07	1.33E-06	3.64E-08
Hazard Index for inhalation	1.17E-06	8.19E-06	3.61E-03	1.80E-03	2.57E-05	1.03E-04	9.10E-06
Total Hazard Index - All Potential Exposure Pathways	1.17E-06	8.24E-06	3.61E-03	4.13E-03	2.55E-04	1.01E-03	9.14E-06
Fraction of 0.25 Benchmark	0.000	0.000	0.014	0.017	0.001	0.004	0.000
Total Cancer Risk - Subsistence Fisher							
Total Risk = 3.98E-06							
Cancer Risk for consumption of beef	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.22E-14	1.83E-14	0.00E+00
Cancer Risk for consumption of milk	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.05E-14	7.60E-14	0.00E+00
Cancer Risk for consumption of fish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.77E-10	7.89E-10	0.00E+00
Cancer Risk for consumption of soil	0.00E+00	1.34E-17	0.00E+00	0.00E+00	2.13E-11	3.84E-11	3.57E-19
Cancer Risk for consumption of above-ground vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.08E-09	1.64E-08	0.00E+00
Cancer Risk for consumption of below-ground vegetables	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-07	2.37E-07	0.00E+00
Cancer Risk for consumption of drinking water	0.00E+00	9.40E-11	0.00E+00	0.00E+00	1.80E-10	3.71E-10	7.78E-13
Cancer Risk for inhalation	0.00E+00	2.24E-09	0.00E+00	0.00E+00	1.09E-08	2.18E-08	4.58E-10
Total Cancer Risk - All Potential Exposure Pathways	0.00E+00	2.33E-09	0.00E+00	0.00E+00	1.39E-07	2.76E-07	4.59E-10
Fraction of 1E-05 Benchmark	0.000	0.000	0.000	0.000	0.014	0.028	0.000

Notes:

TCFM	Trichlorofluoromethane
VCL	Vinyl Chloride
HCP	Hexachlorocyclopentadiene
2-NA	2-Nitroaniline
2,4-DNT	2,4-Dinitrotoluene
2,6-DNT	2,6-Dinitrotoluene
CLMTHN	Chloromethane

Table I-4
Noncarcinogenic Hazard Index and Cancer Risk - Subsistence Fisher
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	PCP	1,1-DCE	1,1,2,2-TCA	CLFM	1,3-BUT	HCBU
Total Noncarcinogenic Hazard Index - Subsistence Fisher						
Total HI = 8.33E-01						
Hazard Index for consumption of beef	6.42E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.58E-12
Hazard Index for consumption of milk	2.66E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.92E-11
Hazard Index for consumption of fish	5.42E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.13E-06
Hazard Index for consumption of soil	3.01E-09	9.60E-14	2.15E-12	1.71E-12	0.00E+00	1.73E-10
Hazard Index for consumption of above-ground vegetables	5.65E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.71E-09
Hazard Index for consumption of below-ground vegetables	2.27E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.13E-07
Hazard Index for consumption of drinking water	2.46E-08	5.89E-09	1.40E-09	1.66E-08	0.00E+00	3.94E-08
Hazard Index for inhalation	6.88E-06	8.58E-06	1.31E-06	2.73E-03	0.00E+00	5.15E-05
Total Hazard Index - All Potential Exposure Pathways	2.34E-04	8.58E-06	1.31E-06	2.73E-03	0.00E+00	5.32E-05
Fraction of 0.25 Benchmark	0.001	0.000	0.000	0.011	0.000	0.000
Total Cancer Risk - Subsistence Fisher						
Total Risk = 3.98E-06						
Cancer Risk for consumption of beef	9.50E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.86E-17
Cancer Risk for consumption of milk	3.94E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.87E-16
Cancer Risk for consumption of fish	8.02E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.27E-12
Cancer Risk for consumption of soil	4.45E-12	2.13E-16	1.06E-14	0.00E+00	0.00E+00	1.11E-15
Cancer Risk for consumption of above-ground vegetables	8.35E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.10E-14
Cancer Risk for consumption of below-ground vegetables	3.35E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.29E-12
Cancer Risk for consumption of drinking water	3.63E-11	1.31E-11	6.88E-12	0.00E+00	0.00E+00	2.53E-13
Cancer Risk for inhalation	7.69E-09	4.26E-09	4.87E-09	5.89E-09	1.31E-07	2.50E-10
Total Cancer Risk - All Potential Exposure Pathways	3.44E-07	4.28E-09	4.88E-09	5.89E-09	1.31E-07	2.61E-10
Fraction of 1E-05 Benchmark	0.034	0.000	0.000	0.001	0.013	0.000

Notes:

PCP	Pentachlorophenol
1,1-DCE	1,1-Dichloroethylene
1,1,2,2-TCA	1,1,2,2-Tetrachloroethane
CLFM	Chloroform
1,3-BUT	1,3-Butadiene
HCBU	Hexachlorobutadiene

Table I-4
Noncarcinogenic Hazard Index and Cancer Risk - Subsistence Fisher
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	Hg	HgCl	MeHg	Total by Pathway
Total Noncarcinogenic Hazard Index - Subsistence Fisher				
Total HI = 8.33E-01				
Hazard Index for consumption of beef	0.00E+00	8.43E-06	1.80E-07	3.20E-05
Hazard Index for consumption of milk	0.00E+00	2.44E-05	9.12E-07	6.11E-05
Hazard Index for consumption of fish	0.00E+00	0.00E+00	7.85E-01	7.85E-01
Hazard Index for consumption of soil	0.00E+00	1.77E-04	5.82E-06	2.18E-04
Hazard Index for consumption of above-ground vegetables	0.00E+00	2.85E-04	2.28E-04	7.53E-04
Hazard Index for consumption of below-ground vegetables	0.00E+00	6.47E-05	1.05E-05	4.14E-03
Hazard Index for consumption of drinking water	0.00E+00	3.19E-06	1.66E-06	1.75E-05
Hazard Index for inhalation	1.09E-05	3.86E-04	0.00E+00	4.29E-02
Total Hazard Index - All Potential Exposure Pathways	1.09E-05	9.49E-04	7.85E-01	8.33E-01
Fraction of 0.25 Benchmark	0.000	0.004	3.140	3.332
Total Cancer Risk - Subsistence Fisher				
Total Risk = 3.98E-06				
Cancer Risk for consumption of beef	0.00E+00	0.00E+00	0.00E+00	1.05E-07
Cancer Risk for consumption of milk	0.00E+00	0.00E+00	0.00E+00	2.18E-07
Cancer Risk for consumption of fish	0.00E+00	0.00E+00	0.00E+00	1.45E-06
Cancer Risk for consumption of soil	0.00E+00	0.00E+00	0.00E+00	1.73E-07
Cancer Risk for consumption of above-ground vegetables	0.00E+00	0.00E+00	0.00E+00	3.15E-08
Cancer Risk for consumption of below-ground vegetables	0.00E+00	0.00E+00	0.00E+00	1.01E-06
Cancer Risk for consumption of drinking water	0.00E+00	0.00E+00	0.00E+00	1.23E-09
Cancer Risk for inhalation	0.00E+00	0.00E+00	0.00E+00	9.89E-07
Total Cancer Risk - All Potential Exposure Pathways	0.00E+00	0.00E+00	0.00E+00	3.98E-06
Fraction of 1E-05 Benchmark	0.000	0.000	0.000	0.398

Notes:

Hg Elemental Mercury
HgCl Mercuric Chlorid
MeHg Methyl Mercury

Table I-5a
Total Cancer Risk Summary - Primary Scenarios
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	North Resident Location: Child Resident Carcinogenic Risk	North Resident Location: Adult Resident Carcinogenic Risk	Subsistence Farmer Beef Farm Location Carcinogenic Risk	Subsistence Fisher Erie Canal Carcinogenic Risk
Cancer risk for consumption of beef	9.44E-09	1.05E-07	5.66E-07	1.05E-07
Cancer risk for consumption of milk	9.61E-08	2.18E-07	1.30E-06	2.18E-07
Cancer risk for consumption of fish	1.06E-07	8.15E-07	1.10E-06	1.45E-06
Cancer risk for ingestion of soil	3.23E-07	1.73E-07	1.04E-08	1.73E-07
Cancer risk for consumption of above-ground vegetables	7.36E-09	2.71E-08	4.83E-09	3.15E-08
Cancer risk for consumption of below-ground vegetables	2.57E-07	8.52E-07	1.52E-07	1.01E-06
Cancer risk for consumption of drinking water	5.10E-10	1.60E-09	1.35E-09	1.23E-09
Cancer risk for inhalation	4.40E-07	1.26E-06	5.38E-08	9.89E-07
Total Cancer Risk	1.24E-06	3.45E-06	3.19E-06	3.98E-06

Notes:

Source: ENSR, 1999 RN: 0

4/8/02

Table I-5b
Total Cancer Risk Summary - Alternative Scenarios
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	South Resident Location Child Resident Carcinogenic Risk	South Resident Location Adult Resident Carcinogenic Risk	Subsistence Farmer Dairy Farm Location Carcinogenic Risk
Cancer risk for consumption of beef	9.44E-09	1.05E-07	5.08E-07
Cancer risk for consumption of milk	9.61E-08	2.18E-07	1.17E-06
Cancer risk for consumption of fish	1.06E-07	8.15E-07	1.10E-06
Cancer risk for ingestion of soil	8.18E-08	4.38E-08	9.41E-09
Cancer risk for consumption of above-ground vegetables	1.05E-09	3.80E-09	4.37E-09
Cancer risk for consumption of below-ground vegetables	3.39E-08	1.13E-07	1.38E-07
Cancer risk for consumption of drinking water	5.02E-10	1.57E-09	1.32E-09
Cancer risk for inhalation	1.32E-09	3.79E-09	4.80E-08
Total Cancer Risk	3.30E-07	1.30E-06	2.98E-06

Notes:

Source: ENSR, 1999 RN: 0

4/8/02

Table I-6a
Total Noncarcinogenic Hazard Index - Summary
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Potential Exposure Pathway	North Resident Location: Child Resident Noncarcinogenic Hazard Index	North Resident Location: Adult Resident Noncarcinogenic Hazard Index	Subsistence Farmer Beef Farm Location Noncarcinogenic Hazard Index	Subsistence Fisher Erie Canal Noncarcinogenic Hazard Index
Hazard Index for consumption of beef	0.000014	0.000032	0.00013	0.000032
Hazard Index for consumption of milk	0.000135	0.000061	0.00027	0.000061
Hazard Index for consumption of fish	0.56	0.86	0.86	0.79
Hazard Index for ingestion of soil	0.002	0.0002	0.00002	0.0002
Hazard Index for consumption of above-ground vegetables	0.0010	0.0008	0.00013	0.0008
Hazard Index for consumption of below-ground vegetables	0.0061	0.0041	0.00072	0.0041
Hazard Index for consumption of drinking water	0.000039	0.00002	0.000017	0.000017
Hazard Index for inhalation	0.043	0.043	0.0018	0.043
Total Noncarcinogenic Hazard Index	0.61	0.91	0.87	0.83

Notes:

Source: ENSR, 1999 RN: 0

4/8/02

Table I-6b
Total Noncarcinogenic Hazard Index - Summary Alternative Scenarios
Norlite Corporation Light Aggregate Facility
Cohoes, NY

	South Resident Location		Subsistence Farmer
Potential Exposure Pathway	**Child Resident Noncarcinogenic Hazard Index**	**Adult Resident Noncarcinogenic Hazard Index**	**Dairy Farm Location Noncarcinogenic Hazard Index**
Hazard Index for consumption of beef	0.000014	0.000032	0.00012
Hazard Index for consumption of milk	0.00013	0.00006	0.00024
Hazard Index for consumption of fish	0.56	0.86	0.86
Hazard Index for ingestion of soil	0.0039	0.00042	0.00002
Hazard Index for consumption of above-ground vegetables	0.00012	0.000091	0.00012
Hazard Index for consumption of below-ground vegetables	0.00093	0.00063	0.00065
Hazard Index for consumption of drinking water	0.000039	0.00002	0.000017
Hazard Index for inhalation	0.00013	0.00013	0.0016
Total Noncarcinogenic Hazard Index	0.56	0.86	0.87
Notes:			

Source: ENSR, 1999 RN: 0

4/8/02

Table I-7a
Evaluation of Infant Exposure to Dioxin - Primary Locations
Norlite Corporation Light Agregate Facility
Cohoes, NY

	Average Daily Dose - Infant (pg/kg BW-day)
Beef Farm - Subsistence Farmer - Infant	1.396E+00
Subsistence Fisher - Infant	1.486E+00
North Resident Location - Infant	1.006E+00

Table I-7b
Evaluation of Infant Exposure to Dioxin - Alternative Locations
Norlite Corporation Light Aggregate Facility
Cohoes, NY

	Average Daily Dose - Infant (pg/kg BW-day)
Dairy Farm - Subsistence Farmer - Infant	1.32E+00
South Resident Location - Infant	8.90E-01

Table I-8a
Risk Evaluation for Lead - Child Resident North Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Medium	Predicted Site and Intake Concentration	Slope Factor	Reference	Predicted Blood Lead Level (ug/dL)
Air	0.000042 ug/m^3	1.97 ug/dL blood lead per ug/m^3 air lead	U. S. EPA, 1989c	8.27E-05
Drinking Water	2.0712E-06 ug/L	0.26 ug/dL blood lead per ug/L water lead (a)	U. S. EPA, 1991b	5.39E-07
Diet	1.6345E-05 ug/day	0.24 ug/dL blood lead per ug/day dietary lead (b)	U. S. EPA, 1989c	3.92E-06
Soil	0.00079 ug/g	0.0068 ug/dL blood lead per ug/g soil lead (c)	U. S. EPA, 1986b	5.35E-06
Total Predicted Blood Level =				0.000093

Notes:
(a) - Used value for children (0-6 months) at water concentrations below 15 ug/L.
(b) - Combined dietary intake from vegetables, fish, beef and dairy milk. Used value for children (0-8 months).
(c) - Used upper range value for children.

Source: ENSR, 2002 RN: 1
4/8/02

Table I-8b
Risk Evaluation for Lead - Child Resident South Resident Location
Norlite Corporation Light Aggregate Facility
Cohoes, NY

Medium	Predicted Site and Intake Concentration	Slope Factor	Reference	Predicted Blood Lead Level (ug/dL)
Air	0.00000013 ug/m^3	1.97 ug/dL blood lead per ug/m^3 air lead	U. S. EPA, 1989c	2.49E-07
Drinking Water	0.0000017 ug/L	0.26 ug/dL blood lead per ug/L water lead (a)	U. S. EPA, 1991b	4.42E-07
Diet	0.000034 ug/day	0.24 ug/dL blood lead per ug/day dietary lead (b)	U. S. EPA, 1989c	8.13E-06
Soil	0.0020 ug/g	0.0068 ug/dL blood lead per ug/g soil lead (c)	U. S. EPA, 1986b	1.34E-05
Total Predicted Blood Level =				0.0000222

Notes:
(a) - Used value for children (0-6 months) at water concentrations below 15 ug/L.
(b) - Combined dietary intake from vegetables, fish, beef and dairy milk. Used value for children (0-8 months).
(c) - Used upper range value for children.

Source: ENSR, 2002 RN: 1
4/11/02