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# Appendix F.10

## Area C

**RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**

**SITE NAME: AREA C, HOUSATONIC BOAT CLUB**
**LOCATION: FERRY CREEK, STRATFORD, CT**
**EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT RME**
**MEDIA: SURFACE SOIL**
**DATE: AUGUST 3, 2000**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = \frac{Cs \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$

| WHERE: | | | |
|---|---|---|---|
| | Cs = : | | Concentration in soil (mg/kg) |
| | IR = : | 100 | Soil Ingestion Rate (mg/day) |
| | CF = : | 1.0E-06 | Conversion Factor (kg/mg) |
| | FI = : | 1 | Fraction from contaminated source (unitless) |
| | EF = : | 20 | Exposure Frequency (days/year) |
| | ED = : | 24 | Exposure Duration (years) |
| | BW = : | 70 | Body Weight (kg) |
| | ATc = : | 25,550 | Averaging time for carcinogenic exposures (days) |
| | ATn = : | 8,760 | Averaging time for noncarcinogenic exposures (days) |

| Unit Dose | | |
|---|---|---|
| Lifetime Chronic Daily Int | 2.7E-08 | kg-soil/kg-wt/day |
| Chronic Daily Intake = : | 7.8E-08 | kg-soil/kg-wt/day |

**RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**

**SITE NAME:** AREA C, HOUSATONIC BOAT CLUB
**LOCATION:** FERRY CREEK, STRATFORD, CT
**EXPOSURE SCENARIO:** WETLAND/MARSH RECEPTOR - ADULT RME
**MEDIA:** SURFACE SOIL
**DATE:** AUGUST 3, 2000

| CHEMICAL | Cs (mg/kg) | Lifetime Chronic Daily Intake (mg/kg/day) | Chronic Daily Intake (mg/kg/day) | Cancer Slope Factor $(mg/kg/day)^{-1}$ | Reference Dose (mg/kg/day) | Lifetime Cancer Risk | Percent Cancer Risk | Hazard Quotient | Percent Hazard Quotient |
|---|---|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 1.7 | 4.6E-08 | 1.3E-07 | 7.30E-01 | NA | 3.3E-08 | 1.1% | NA | NA |
| Benzo(b) fluoranthene | 2.3 | 6.2E-08 | 1.8E-07 | 7.30E-01 | NA | 4.5E-08 | 1.5% | NA | NA |
| Benzo(a)pyrene | 1.7 | 4.6E-08 | 1.3E-07 | 7.30E+00 | NA | 3.3E-07 | 11.1% | NA | NA |
| Dibenzo(a,h)anthracene | 0.5 | 1.3E-08 | 3.9E-08 | 7.30E+00 | NA | 9.8E-08 | 3.3% | NA | NA |
| Indeno(1,2,3-cd)pyrene | 1.4 | 3.8E-08 | 1.1E-07 | 7.30E-01 | NA | 2.7E-08 | 0.9% | NA | NA |
| Aroclor, total | 11 | 3.0E-07 | 8.6E-07 | 2.00E+00 | 2.00E-05 | 5.9E-07 | 19.7% | 4.3E-02 | 66.9% |
| Antimony | 3.7 | 9.9E-08 | 2.9E-07 | NA | 4.00E-04 | NA | NA | 7.2E-04 | 1.1% |
| Arsenic | 9.5 | 2.5E-07 | 7.4E-07 | 1.50E+00 | 3.00E-04 | 3.8E-07 | 12.8% | 2.5E-03 | 3.9% |
| Barium | 1700 | 4.6E-05 | 1.3E-04 | NA | 7.00E-02 | NA | NA | 1.9E-03 | 3.0% |
| Chromium (total) | 516 | 1.4E-05 | 4.0E-05 | NA | 3.00E-03 | NA | NA | 1.3E-02 | 20.9% |
| Nickel | 62.1 | 1.7E-06 | 4.9E-06 | NA | 2.00E-02 | NA | NA | 2.4E-04 | 0.4% |
| Thallium | 2.1 | 5.6E-08 | 1.6E-07 | NA | 6.60E-05 | NA | NA | 2.5E-03 | 3.9% |
| TEQ-Dioxins/Furans | 0.00037 | 9.9E-12 | 2.9E-11 | 1.50E+05 | NA | 1.5E-06 | 49.7% | NA | NA |
| | | | | | **Total** | **3.0E-06** | **100%** | **6.4E-02** | **100%** |

**RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**

**SITE NAME: AREA C, HOUSATONIC BOAT CLUB**
**LOCATION: FERRY CREEK, STRATFORD, CT**
**EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT RME**
**MEDIA: SURFACE SOIL**
**DATE: AUGUST 3, 2000**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $$\text{Absorbed Dose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

| Where: | | | |
|---|---|---|---|
| | Cs = : | | Concentration in soil (mg/kg) |
| | CF = : | 1.0E-06 | Conversion factor (kg/mg) |
| | SA = : | 5,700 | Skin surface available for contact ($cm^2$/event) |
| | AF = : | 0.3 | Soil to skin adherence factor (mg/$cm^2$) |
| | ABS = : | | Absorption factor (unitless) |
| | EF = : | 20 | Exposure frequency (events/year) |
| | ED = : | 24 | Exposure duration (years) |
| | BW = : | 70 | Body weight (kg) |
| | ATc = : | 25,550 | Averaging time for carcinogenic exposures (days) |
| | ATn = : | 8,760 | Averaging time for noncarcinogenic exposures (days) |

Unit Dose
Lifetime Chronic Daily Intake 4.6E-07 kg-soil/kg-wt/day
Chronic Daily Intake = : 1.3E-06 kg-soil/kg-wt/day

**RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**

**SITE NAME:** AREA C, HOUSATONIC BOAT CLUB
**LOCATION:** FERRY CREEK, STRATFORD, CT
**EXPOSURE SCENARIO:** WETLAND/MARSH RECEPTOR - ADULT RME
**MEDIA:** SURFACE SOIL
**DATE:** AUGUST 3, 2000

| CHEMICAL | Cs (mg/kg) | ABS (unitless) | Lifetime Chronic Daily Intake (mg/kg/day) | Chronic Daily Intake (mg/kg/day) | Cancer Slope Factor $(mg/kg/day)^{-1}$ | Reference Dose (mg/kg/day) | Lifetime Cancer Risk | Percent Cancer Risk | Hazard Quotient | Percent Hazard Quotient |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 1.7 | 0.13 | 1.01E-07 | 2.96E-07 | 7.30E-01 | NA | 7.4E-08 | 2.1% | NA | NA |
| Benzo(b) fluoranthene | 2.3 | 0.13 | 1.37E-07 | 4.00E-07 | 7.30E-01 | NA | 1.0E-07 | 2.8% | NA | NA |
| Benzo(a)pyrene | 1.7 | 0.13 | 1.01E-07 | 2.96E-07 | 7.30E+00 | NA | 7.4E-07 | 20.8% | NA | NA |
| Dibenzo(a,h)anthracene | 0.5 | 0.13 | 2.98E-08 | 8.70E-08 | 7.30E+00 | NA | 2.2E-07 | 6.1% | NA | NA |
| Indeno(1,2,3-cd)pyrene | 1.4 | 0.13 | 8.35E-08 | 2.44E-07 | 7.30E-01 | NA | 6.1E-08 | 1.7% | NA | NA |
| Aroclor, total | 11 | 0.14 | 7.07E-07 | 2.06E-06 | 2.00E+00 | 2.00E-05 | 1.4E-06 | 39.6% | 1.0E-01 | 98.8% |
| Antimony | 3.7 | NA | NA | NA | NA | 6.00E-05 | NA | NA | NA | NA |
| Arsenic | 9.5 | 0.03 | 1.31E-07 | 3.81E-07 | 1.50E+00 | 3.00E-04 | 2.0E-07 | 5.5% | 1.3E-03 | 1.2% |
| Barium | 1700 | NA | NA | NA | NA | 4.90E-03 | NA | NA | NA | NA |
| Chromium (total) | 516 | NA | NA | NA | NA | 7.50E-05 | NA | NA | NA | NA |
| Nickel | 62.1 | NA | NA | NA | NA | 8.00E-04 | NA | NA | NA | NA |
| Thallium | 2.1 | NA | NA | NA | NA | 6.60E-05 | NA | NA | NA | NA |
| TEQ-Dioxins/Furans | 0.00037 | 0.03 | 5.09E-12 | 1.49E-11 | 1.50E+05 | NA | 7.6E-07 | 21.4% | NA | NA |
| | | | | | | **Total** | **3.6E-06** | **100%** | **1.0E-01** | **100%** |

**RISK ASSESSMENT SPREADSHEET - SUMMARY**

**SITE NAME:** AREA C, HOUSATONIC BOAT CLUB
**LOCATION:** FERRY CREEK, STRATFORD, CT
**EXPOSURE SCENARIO:** WETLAND/MARSH RECEPTOR - ADULT RME
**MEDIA:** SURFACE SOIL
**DATE:** AUGUST 3, 2000

| | Lifetime Cancer Risk | | | | | Hazard Index | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Chemical | Incidental Ingestion | Dermal Contact | Inhalation | Total Risk | Percent Risk | Incidental Ingestion | Dermal Contact | Inhalation | Total HI | Percent HI |
| Benzo(a)anthracene | 3.3E-08 | 7.4E-08 | NA | 1.1E-07 | 1.6% | NA | NA | NA | NA | NA |
| Benzo(b) fluoranthene | 4.5E-08 | 1.0E-07 | NA | 1.5E-07 | 2.2% | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 3.3E-07 | 7.4E-07 | NA | 1.1E-06 | 16.3% | NA | NA | NA | NA | NA |
| Dibenzo(a,h)anthracene | 9.8E-08 | 2.2E-07 | NA | 3.2E-07 | 4.8% | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 2.7E-08 | 6.1E-08 | NA | 8.8E-08 | 1.3% | NA | NA | NA | NA | NA |
| Aroclor, total | 5.9E-07 | 1.4E-06 | NA | 2.0E-06 | 30.5% | 4.3E-02 | 1.0E-01 | NA | 1.5E-01 | 86.6% |
| Antimony | NA | NA | NA | NA | NA | 7.2E-04 | NA | NA | 7.2E-04 | 0.4% |
| Arsenic | 3.8E-07 | 2.0E-07 | NA | 5.8E-07 | 8.8% | 2.5E-03 | 1.3E-03 | NA | 3.8E-03 | 2.2% |
| Barium | NA | NA | NA | NA | NA | 1.9E-03 | NA | NA | 1.9E-03 | 1.1% |
| Chromium (total) | NA | NA | NA | NA | NA | 1.3E-02 | NA | NA | 1.3E-02 | 8.0% |
| Nickel | NA | NA | NA | NA | NA | 2.4E-04 | NA | NA | 2.4E-04 | 0.1% |
| Thallium | NA | NA | NA | NA | NA | 2.5E-03 | NA | NA | 2.5E-03 | 1.5% |
| TEQ-Dioxins/Furans | 1.5E-06 | 7.6E-07 | NA | 2.3E-06 | 34.3% | NA | NA | NA | NA | NA |
| **Total** | **3.0E-06** | **3.6E-06** | **NA** | **6.6E-06** | **100.0%** | **6.4E-02** | **1.0E-01** | **NA** | **1.7E-01** | **100.0%** |

**RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**

**SITE NAME:** AREA C, HOUSATONIC BOAT CLUB
**LOCATION:** FERRY CREEK, STRATFORD, CT
**EXPOSURE SCENARIO:** WETLAND/MARSH RECEPTOR - ADULT CTE
**MEDIA:** SURFACE SOIL
**DATE:** AUGUST 3, 2000

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = \frac{Cs \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$

| WHERE: | | | |
|---|---|---|---|
| | Cs = : | | Concentration in soil (mg/kg) |
| | IR = : | 50 | Soil Ingestion Rate (mg/day) |
| | CF = : | 1.0E-06 | Conversion Factor (kg/mg) |
| | FI = : | 1 | Fraction from contaminated source (unitless) |
| | EF = : | 20 | Exposure Frequency (days/year) |
| | ED = : | 7 | Exposure Duration (years) |
| | BW = : | 70 | Body Weight (kg) |
| | ATc = : | 25,550 | Averaging time for carcinogenic exposures (days) |
| | ATn = : | 2,555 | Averaging time for noncarcinogenic exposures (days) |

| | | |
|---|---|---|
| Unit Dose | | |
| Lifetime Chronic Daily Int: | 3.9E-09 | kg-soil/kg-wt/day |
| Chronic Daily Intake = : | 3.9E-08 | kg-soil/kg-wt/day |

**RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**

**SITE NAME:** AREA C, HOUSATONIC BOAT CLUB
**LOCATION:** FERRY CREEK, STRATFORD, CT
**EXPOSURE SCENARIO:** WETLAND/MARSH RECEPTOR - ADULT CTE
**MEDIA:** SURFACE SOIL
**DATE:** AUGUST 3, 2000

| CHEMICAL | Cs (mg/kg) | Lifetime Chronic Daily Intake (mg/kg/day) | Chronic Daily Intake (mg/kg/day) | Cancer Slope Factor $(mg/kg/day)^{-1}$ | Reference Dose (mg/kg/day) | Lifetime Cancer Risk | Percent Cancer Risk | Hazard Quotient | Percent Hazard Quotient |
|---|---|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 1.7 | 6.7E-09 | 6.7E-08 | 7.30E-01 | NA | 4.9E-09 | 1.2% | NA | NA |
| Benzo(b) fluoranthene | 2.3 | 9.0E-09 | 9.0E-08 | 7.30E-01 | NA | 6.6E-09 | 1.7% | NA | NA |
| Benzo(a)pyrene | 1.7 | 6.7E-09 | 6.7E-08 | 7.30E+00 | NA | 4.9E-08 | 12.3% | NA | NA |
| Dibenzo(a,h)anthracene | 0.5 | 2.0E-09 | 2.0E-08 | 7.30E+00 | NA | 1.4E-08 | 3.6% | NA | NA |
| Indeno(1,2,3-cd)pyrene | 1.4 | 5.5E-09 | 5.5E-08 | 7.30E-01 | NA | 4.0E-09 | 1.0% | NA | NA |
| Aroclor, total | 11 | 4.3E-08 | 4.3E-07 | 1.00E+00 | 2.00E-05 | 4.3E-08 | 10.9% | 2.2E-02 | 66.9% |
| Antimony | 3.7 | 1.4E-08 | 1.4E-07 | NA | 4.00E-04 | NA | NA | 3.6E-04 | 1.1% |
| Arsenic | 9.5 | 3.7E-08 | 3.7E-07 | 1.50E+00 | 3.00E-04 | 5.6E-08 | 14.1% | 1.2E-03 | 3.9% |
| Barium | 1700 | 6.7E-06 | 6.7E-05 | NA | 7.00E-02 | NA | NA | 9.5E-04 | 3.0% |
| Chromium (total) | 516 | 2.0E-06 | 2.0E-05 | NA | 3.00E-03 | NA | NA | 6.7E-03 | 20.9% |
| Nickel | 62.1 | 2.4E-07 | 2.4E-06 | NA | 2.00E-02 | NA | NA | 1.2E-04 | 0.4% |
| Thallium | 2.1 | 8.2E-09 | 8.2E-08 | NA | 6.60E-05 | NA | NA | 1.2E-03 | 3.9% |
| TEQ-Dioxins/Furans | 0.00037 | 1.4E-12 | 1.4E-11 | 1.50E+05 | NA | 2.2E-07 | 55.1% | NA | NA |
| | | | | | **Total** | **3.9E-07** | **100%** | **3.2E-02** | **100%** |

**RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**

**SITE NAME:** **AREA C, HOUSATONIC BOAT CLUB**
**LOCATION:** **FERRY CREEK, STRATFORD, CT**
**EXPOSURE SCENARIO:** **WETLAND/MARSH RECEPTOR - ADULT CTE**
**MEDIA:** **SURFACE SOIL**
**DATE:** **AUGUST 3, 2000**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $$\text{Absorbed Dose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

| Where: | | | |
|---|---|---|---|
| | Cs = : | | Concentration in soil (mg/kg) |
| | CF = : | 1.0E-06 | Conversion factor (kg/mg) |
| | SA = : | 5,700 | Skin surface available for contact ($cm^2$/event) |
| | AF = : | 0.04 | Soil to skin adherence factor (mg/$cm^2$) |
| | ABS = : | | Absorption factor (unitless) |
| | EF = : | 20 | Exposure frequency (events/year) |
| | ED = : | 7 | Exposure duration (years) |
| | BW = : | 70 | Body weight (kg) |
| | ATc = : | 25,550 | Averaging time for carcinogenic exposures (days) |
| | ATn = : | 2,555 | Averaging time for noncarcinogenic exposures (days) |

Unit Dose
Lifetime Chronic Daily Intake 1.8E-08 kg-soil/kg-wt/day
Chronic Daily Intake = : 1.8E-07 kg-soil/kg-wt/day

**RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**

**SITE NAME:** AREA C, HOUSATONIC BOAT CLUB
**LOCATION:** FERRY CREEK, STRATFORD, CT
**EXPOSURE SCENARIO:** WETLAND/MARSH RECEPTOR - ADULT CTE
**MEDIA:** SURFACE SOIL
**DATE:** AUGUST 3, 2000

| CHEMICAL | Cs (mg/kg) | ABS (unitless) | Lifetime Chronic Daily Intake (mg/kg/day) | Chronic Daily Intake (mg/kg/day) | Cancer Slope Factor $(mg/kg/day)^{-1}$ | Reference Dose (mg/kg/day) | Lifetime Cancer Risk | Percent Cancer Risk | Hazard Quotient | Percent Hazard Quotient |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 1.7 | 0.13 | 3.94E-09 | 3.94E-08 | 7.30E-01 | NA | 2.9E-09 | 2.6% | NA | NA |
| Benzo(b) fluoranthene | 2.3 | 0.13 | 5.34E-09 | 5.34E-08 | 7.30E-01 | NA | 3.9E-09 | 3.5% | NA | NA |
| Benzo(a)pyrene | 1.7 | 0.13 | 3.94E-09 | 3.94E-08 | 7.30E+00 | NA | 2.9E-08 | 25.9% | NA | NA |
| Dibenzo(a,h)anthracene | 0.5 | 0.13 | 1.16E-09 | 1.16E-08 | 7.30E+00 | NA | 8.5E-09 | 7.6% | NA | NA |
| Indeno(1,2,3-cd)pyrene | 1.4 | 0.13 | 3.25E-09 | 3.25E-08 | 7.30E-01 | NA | 2.4E-09 | 2.1% | NA | NA |
| Aroclor, total | 11 | 0.14 | 2.75E-08 | 2.75E-07 | 1.00E+00 | 2.00E-05 | 2.7E-08 | 24.7% | 1.4E-02 | 98.8% |
| Antimony | 3.7 | NA | NA | NA | NA | 6.00E-05 | NA | NA | NA | NA |
| Arsenic | 9.5 | 0.03 | 5.09E-09 | 5.09E-08 | 1.50E+00 | 3.00E-04 | 7.6E-09 | 6.9% | 1.7E-04 | 1.2% |
| Barium | 1700 | NA | NA | NA | NA | 4.90E-03 | NA | NA | NA | NA |
| Chromium (total) | 516 | NA | NA | NA | NA | 7.50E-05 | NA | NA | NA | NA |
| Nickel | 62.1 | NA | NA | NA | NA | 8.00E-04 | NA | NA | NA | NA |
| Thallium | 2.1 | NA | NA | NA | NA | 6.60E-05 | NA | NA | NA | NA |
| TEQ-Dioxins/Furans | 0.00037 | 0.03 | 1.98E-13 | 1.98E-12 | 1.50E+05 | NA | 3.0E-08 | 26.7% | NA | NA |
| | | | | | | **Total** | **1.1E-07** | **100%** | **1.4E-02** | **100%** |

**RISK ASSESSMENT SPREADSHEET - SUMMARY**

**SITE NAME:** AREA C, HOUSATONIC BOAT CLUB
**LOCATION:** FERRY CREEK, STRATFORD, CT
**EXPOSURE SCENARIO:** WETLAND/MARSH RECEPTOR - ADULT CTE
**MEDIA:** SURFACE SOIL
**DATE:** AUGUST 3, 2000

| | Lifetime Cancer Risk | | | | | Hazard Index | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Chemical | Incidental Ingestion | Dermal Contact | Inhalation | Total Risk | Percent Risk | Incidental Ingestion | Dermal Contact | Inhalation | Total HI | Percent HI |
| Benzo(a)anthracene | 4.9E-09 | 2.9E-09 | NA | 7.7E-09 | 1.5% | NA | NA | NA | NA | NA |
| Benzo(b) fluoranthene | 6.6E-09 | 3.9E-09 | NA | 1.0E-08 | 2.1% | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 4.9E-08 | 2.9E-08 | NA | 7.7E-08 | 15.3% | NA | NA | NA | NA | NA |
| Dibenzo(a,h)anthracene | 1.4E-08 | 8.5E-09 | NA | 2.3E-08 | 4.5% | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 4.0E-09 | 2.4E-09 | NA | 6.4E-09 | 1.3% | NA | NA | NA | NA | NA |
| Aroclor, total | 4.3E-08 | 2.7E-08 | NA | 7.1E-08 | 14.0% | 2.2E-02 | 1.4E-02 | NA | 3.5E-02 | 76.5% |
| Antimony | NA | NA | NA | NA | NA | 3.6E-04 | NA | NA | 3.6E-04 | 0.8% |
| Arsenic | 5.6E-08 | 7.6E-09 | NA | 6.3E-08 | 12.5% | 1.2E-03 | 1.7E-04 | NA | 1.4E-03 | 3.1% |
| Barium | NA | NA | NA | NA | NA | 9.5E-04 | NA | NA | 9.5E-04 | 2.1% |
| Chromium (total) | NA | NA | NA | NA | NA | 6.7E-03 | NA | NA | 6.7E-03 | 14.6% |
| Nickel | NA | NA | NA | NA | NA | 1.2E-04 | NA | NA | 1.2E-04 | 0.3% |
| Thallium | NA | NA | NA | NA | NA | 1.2E-03 | NA | NA | 1.2E-03 | 2.7% |
| TEQ-Dioxins/Furans | 2.2E-07 | 3.0E-08 | NA | 2.5E-07 | 48.8% | NA | NA | NA | NA | NA |
| **Total** | **3.9E-07** | **1.1E-07** | **NA** | **5.1E-07** | **100.0%** | **3.2E-02** | **1.4E-02** | **NA** | **4.6E-02** | **100.0%** |

**RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**

**SITE NAME: AREA C, HOUSATONIC BOAT CLUB**
**LOCATION: FERRY CREEK, STRATFORD, CT**
**EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - PRE-ADOLESCENT RME**
**MEDIA: SURFACE SOIL**
**DATE: AUGUST 3, 2000**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = \frac{Cs \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$

| WHERE: | | | |
|---|---|---|---|
| | Cs = : | | Concentration in soil (mg/kg) |
| | IR = : | 100 | Soil Ingestion Rate (mg/day) |
| | CF = : | 1.0E-06 | Conversion Factor (kg/mg) |
| | FI = : | 1 | Fraction from contaminated source (unitless) |
| | EF = : | 20 | Exposure Frequency (days/year) |
| | ED = : | 6 | Exposure Duration (years) |
| | BW = : | 31 | Body Weight (kg) |
| | ATc = : | 25,550 | Averaging time for carcinogenic exposures (days) |
| | ATn = : | 2,190 | Averaging time for noncarcinogenic exposures (days) |

| | | |
|---|---|---|
| Unit Dose | | |
| Lifetime Chronic Daily Int: | 1.5E-08 | kg-soil/kg-wt/day |
| Chronic Daily Intake = : | 1.8E-07 | kg-soil/kg-wt/day |

**RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**

**SITE NAME:** AREA C, HOUSATONIC BOAT CLUB
**LOCATION:** FERRY CREEK, STRATFORD, CT
**EXPOSURE SCENARIO:** WETLAND/MARSH RECEPTOR - PRE-ADOLESCENT RME
**MEDIA:** SURFACE SOIL
**DATE:** AUGUST 3, 2000

| CHEMICAL | Cs (mg/kg) | Lifetime Chronic Daily Intake (mg/kg/day) | Chronic Daily Intake (mg/kg/day) | Cancer Slope Factor $(mg/kg/day)^{-1}$ | Reference Dose (mg/kg/day) | Lifetime Cancer Risk | Percent Cancer Risk | Hazard Quotient | Percent Hazard Quotient |
|---|---|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 1.7 | 2.6E-08 | 3.0E-07 | 7.30E-01 | NA | 1.9E-08 | 1.1% | NA | NA |
| Benzo(b)fluoranthene | 2.3 | 3.5E-08 | 4.1E-07 | 7.30E-01 | NA | 2.5E-08 | 1.5% | NA | NA |
| Benzo(a)pyrene | 1.7 | 2.6E-08 | 3.0E-07 | 7.30E+00 | NA | 1.9E-07 | 11.1% | NA | NA |
| Dibenzo(a,h)anthracene | 0.5 | 7.6E-09 | 8.8E-08 | 7.30E+00 | NA | 5.5E-08 | 3.3% | NA | NA |
| Indeno(1,2,3-cd)pyrene | 1.4 | 2.1E-08 | 2.5E-07 | 7.30E-01 | NA | 1.5E-08 | 0.9% | NA | NA |
| Aroclor, total | 11 | 1.7E-07 | 1.9E-06 | 2.00E+00 | 2.00E-05 | 3.3E-07 | 19.7% | 9.7E-02 | 85.0% |
| Antimony | 3.7 | 5.6E-08 | 6.5E-07 | NA | 4.00E-04 | NA | NA | 1.6E-03 | 1.4% |
| Arsenic | 9.5 | 1.4E-07 | 1.7E-06 | 1.50E+00 | 3.00E-04 | 2.2E-07 | 12.8% | 5.6E-03 | 4.9% |
| Barium | 1700 | 2.6E-05 | 3.0E-04 | NA | 7.00E-02 | NA | NA | 4.3E-03 | 3.8% |
| Chromium (total) | 516 | 7.8E-06 | 9.1E-05 | NA | 2.00E-02 | NA | NA | 4.6E-03 | 4.0% |
| Nickel | 62.1 | 9.4E-07 | 1.1E-05 | NA | 2.00E-02 | NA | NA | 5.5E-04 | 0.5% |
| Thallium | 2.1 | 3.2E-08 | 3.7E-07 | NA | 6.60E-04 | NA | NA | 5.6E-04 | 0.5% |
| TEQ-Dioxin/Furans | 0.00037 | 5.6E-12 | 6.5E-11 | 1.50E+05 | NA | 8.4E-07 | 49.7% | NA | NA |
| | | | | | **Total** | **1.7E-06** | **100%** | **1.1E-01** | **100%** |

**RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**

**SITE NAME: AREA C, HOUSATONIC BOAT CLUB**
**LOCATION: FERRY CREEK, STRATFORD, CT**
**EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - PRE-ADOLESCENT RME**
**MEDIA: SURFACE SOIL**
**DATE: AUGUST 3, 2000**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $$\text{AbsorbedDose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

| | | | |
|---|---|---|---|
| Where: | Cs = : | | Mean concentration in soil (mg/kg) |
| | CF = : | 1.0E-06 | Conversion factor (kg/mg) |
| | SA = : | 3,200 | Skin surface available for contact ($cm^2$/event) |
| | AF = : | 1.0 | Soil to skin adherence factor ($mg/cm^2$) |
| | ABS = : | | Absorption factor (unitless) |
| | EF = : | 20 | Exposure frequency (events/year) |
| | ED = : | 6 | Exposure duration (years) |
| | BW = : | 31 | Body weight (kg) |
| | ATc = : | 25,550 | Averaging time for carcinogenic exposures (days) |
| | ATn = : | 2,190 | Averaging time for noncarcinogenic exposures (days) |

Unit Dose
Lifetime Chronic Daily Intake 4.8E-07 kg-soil/kg-wt/day
Chronic Daily Intake = : 5.7E-06 kg-soil/kg-wt/day

**RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**

**SITE NAME:** AREA C, HOUSATONIC BOAT CLUB
**LOCATION:** FERRY CREEK, STRATFORD, CT
**EXPOSURE SCENARIO:** WETLAND/MARSH RECEPTOR - PRE-ADOLESCENT RME
**MEDIA:** SURFACE SOIL
**DATE:** AUGUST 3, 2000

| CHEMICAL | Cs (mg/kg) | ABS (unitless) | Lifetime Chronic Daily Intake (mg/kg/day) | Chronic Daily Intake (mg/kg/day) | Cancer Slope Factor $(mg/kg/day)^{-1}$ | Reference Dose (mg/kg/day) | Lifetime Cancer Risk | Percent Cancer Risk | Hazard Quotient | Percent Hazard Quotient |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 1.7 | 0.13 | 1.07E-07 | 1.25E-06 | 7.30E-01 | NA | 7.8E-08 | 2.1% | NA | NA |
| Benzo(b)fluoranthene | 2.3 | 0.13 | 1.45E-07 | 1.69E-06 | 7.30E-01 | NA | 1.1E-07 | 2.8% | NA | NA |
| Benzo(a)pyrene | 1.7 | 0.13 | 1.07E-07 | 1.25E-06 | 7.30E+00 | NA | 7.8E-07 | 20.8% | NA | NA |
| Dibenzo(a,h)anthracene | 0.5 | 0.13 | 3.15E-08 | 3.68E-07 | 7.30E+00 | NA | 2.3E-07 | 6.1% | NA | NA |
| Indeno(1,2,3-cd)pyrene | 1.4 | 0.13 | 8.82E-08 | 1.03E-06 | 7.30E-01 | NA | 6.4E-08 | 1.7% | NA | NA |
| Aroclor, total | 11 | 0.14 | 7.47E-07 | 8.71E-06 | 2.00E+00 | 2.00E-05 | 1.5E-06 | 39.6% | 4.4E-01 | 98.8% |
| Antimony | 3.7 | NA | NA | NA | NA | 6.00E-05 | NA | NA | NA | NA |
| Arsenic | 9.5 | 0.03 | 1.38E-07 | 1.61E-06 | 1.50E+00 | 3.00E-04 | 2.1E-07 | 5.5% | 5.4E-03 | 1.2% |
| Barium | 1700 | NA | NA | NA | NA | 4.90E-03 | NA | NA | NA | NA |
| Chromium (total) | 516 | NA | NA | NA | NA | 5.00E-04 | NA | NA | NA | NA |
| Nickel | 62.1 | NA | NA | NA | NA | 8.00E-04 | NA | NA | NA | NA |
| Thallium | 2.1 | NA | NA | NA | NA | 6.60E-04 | NA | NA | NA | NA |
| TEQ-Dioxin/Furans | 0.00037 | 0.03 | 5.38E-12 | 6.28E-11 | 1.50E+05 | NA | 8.1E-07 | 21.4% | NA | NA |
| | | | | | | **Total** | **3.8E-06** | **100%** | **4.4E-01** | **100%** |

**RISK ASSESSMENT SPREADSHEET - SUMMARY**

**SITE NAME:** AREA C, HOUSATONIC BOAT CLUB
**LOCATION:** FERRY CREEK, STRATFORD, CT
**EXPOSURE SCENARIO:** WETLAND/MARSH RECEPTOR - PRE-ADOLESCENT RME
**MEDIA:** SURFACE SOIL
**DATE:** AUGUST 3, 2000

| | Lifetime Cancer Risk | | | | | Hazard Index | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Chemical | Incidental Ingestion | Dermal Contact | Inhalation | Total Risk | Percent Risk | Incidental Ingestion | Dermal Contact | Inhalation | Total HI | Percent HI |
| Benzo(a)anthracene | 1.9E-08 | 7.8E-08 | NA | 9.7E-08 | 1.8% | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | 2.5E-08 | 1.1E-07 | NA | 1.3E-07 | 2.4% | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 1.9E-07 | 7.8E-07 | NA | 9.7E-07 | 17.8% | NA | NA | NA | NA | NA |
| Dibenzo(a,h)anthracene | 5.5E-08 | 2.3E-07 | NA | 2.9E-07 | 5.2% | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 1.5E-08 | 6.4E-08 | NA | 8.0E-08 | 1.5% | NA | NA | NA | NA | NA |
| Aroclor, total | 3.3E-07 | 1.5E-06 | NA | 1.8E-06 | 33.4% | 9.7E-02 | 4.4E-01 | NA | 5.3E-01 | 95.9% |
| Antimony | NA | NA | NA | NA | NA | 1.6E-03 | NA | NA | 1.6E-03 | 0.3% |
| Arsenic | 2.2E-07 | 2.1E-07 | NA | 4.2E-07 | 7.7% | 5.6E-03 | 5.4E-03 | NA | 1.1E-02 | 2.0% |
| Barium | NA | NA | NA | NA | NA | 4.3E-03 | NA | NA | 4.3E-03 | 0.8% |
| Chromium (total) | NA | NA | NA | NA | NA | 4.6E-03 | NA | NA | 4.6E-03 | 0.8% |
| Nickel | NA | NA | NA | NA | NA | 5.5E-04 | NA | NA | 5.5E-04 | 0.1% |
| Thallium | NA | NA | NA | NA | NA | 5.6E-04 | NA | NA | 5.6E-04 | 0.1% |
| TEQ-Dioxin/Furans | 8.4E-07 | 8.1E-07 | NA | 1.6E-06 | 30.2% | NA | NA | NA | NA | NA |
| **Total** | **1.7E-06** | **3.8E-06** | **NA** | **5.5E-06** | **100.0%** | **1.1E-01** | **4.4E-01** | **NA** | **5.6E-01** | **100.0%** |

**RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**

**SITE NAME:** **AREA C, HOUSATONIC BOAT CLUB**
**LOCATION:** **FERRY CREEK, STRATFORD, CT**
**EXPOSURE SCENARIO:** **WETLAND/MARSH RECEPTOR - PRE-ADOLESCENT CTE**
**MEDIA:** **SURFACE SOIL**
**DATE:** **AUGUST 3, 2000**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = \frac{Cs \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$

| WHERE: | | | |
|---|---|---|---|
| | Cs = : | | Concentration in soil (mg/kg) |
| | IR = : | 50 | Soil Ingestion Rate (mg/day) |
| | CF = : | 1.0E-06 | Conversion Factor (kg/mg) |
| | FI = : | 1 | Fraction from contaminated source (unitless) |
| | EF = : | 20 | Exposure Frequency (days/year) |
| | ED = : | 2 | Exposure Duration (years) |
| | BW = : | 31 | Body Weight (kg) |
| | ATc = : | 25,550 | Averaging time for carcinogenic exposures (days) |
| | ATn = : | 730 | Averaging time for noncarcinogenic exposures (days) |

Unit Dose
Lifetime Chronic Daily Int: 2.5E-09 kg-soil/kg-wt/day
Chronic Daily Intake = : 8.8E-08 kg-soil/kg-wt/day

**RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**

**SITE NAME:** AREA C, HOUSATONIC BOAT CLUB
**LOCATION:** FERRY CREEK, STRATFORD, CT
**EXPOSURE SCENARIO:** WETLAND/MARSH RECEPTOR - PRE-ADOLESCENT CTE
**MEDIA:** SURFACE SOIL
**DATE:** AUGUST 3, 2000

| CHEMICAL | Cs (mg/kg) | Lifetime Chronic Daily Intake (mg/kg/day) | Chronic Daily Intake (mg/kg/day) | Cancer Slope Factor $(mg/kg/day)^{-1}$ | Reference Dose (mg/kg/day) | Lifetime Cancer Risk | Percent Cancer Risk | Hazard Quotient | Percent Hazard Quotient |
|---|---|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 1.7 | 4.3E-09 | 1.5E-07 | 7.30E-01 | NA | 3.1E-09 | 1.2% | NA | NA |
| Benzo(b)fluoranthene | 2.3 | 5.8E-09 | 2.0E-07 | 7.30E-01 | NA | 4.2E-09 | 1.7% | NA | NA |
| Benzo(a)pyrene | 1.7 | 4.3E-09 | 1.5E-07 | 7.30E+00 | NA | 3.1E-08 | 12.3% | NA | NA |
| Dibenzo(a,h)anthracene | 0.5 | 1.3E-09 | 4.4E-08 | 7.30E+00 | NA | 9.2E-09 | 3.6% | NA | NA |
| Indeno(1,2,3-cd)pyrene | 1.4 | 3.5E-09 | 1.2E-07 | 7.30E-01 | NA | 2.6E-09 | 1.0% | NA | NA |
| Aroclor, total | 11 | 2.8E-08 | 9.7E-07 | 1.00E+00 | 2.00E-05 | 2.8E-08 | 10.9% | 4.9E-02 | 85.0% |
| Antimony | 3.7 | 9.3E-09 | 3.3E-07 | NA | 4.00E-04 | NA | NA | 8.2E-04 | 1.4% |
| Arsenic | 9.5 | 2.4E-08 | 8.4E-07 | 1.50E+00 | 3.00E-04 | 3.6E-08 | 14.1% | 2.8E-03 | 4.9% |
| Barium | 1700 | 4.3E-06 | 1.5E-04 | NA | 7.00E-02 | NA | NA | 2.1E-03 | 3.8% |
| Chromium (total) | 516 | 1.3E-06 | 4.6E-05 | NA | 2.00E-02 | NA | NA | 2.3E-03 | 4.0% |
| Nickel | 62.1 | 1.6E-07 | 5.5E-06 | NA | 2.00E-02 | NA | NA | 2.7E-04 | 0.5% |
| Thallium | 2.1 | 5.3E-09 | 1.9E-07 | NA | 6.60E-04 | NA | NA | 2.8E-04 | 0.5% |
| TEQ-Dioxin/Furans | 0.00037 | 9.3E-13 | 3.3E-11 | 1.50E+05 | NA | 1.4E-07 | 55.1% | NA | NA |
| | | | | | **Total** | **2.5E-07** | **100%** | **5.7E-02** | **100%** |

**RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**

**SITE NAME:** **AREA C, HOUSATONIC BOAT CLUB**
**LOCATION:** **FERRY CREEK, STRATFORD, CT**
**EXPOSURE SCENARIO:** **WETLAND/MARSH RECEPTOR - PRE-ADOLESCENT CTE**
**MEDIA:** **SURFACE SOIL**
**DATE:** **AUGUST 3, 2000**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:

$$\text{AbsorbedDose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

| Where: | | | |
|---|---|---|---|
| | Cs = : | | Mean concentration in soil (mg/kg) |
| | CF = : | 1.0E-06 | Conversion factor (kg/mg) |
| | SA = : | 3,200 | Skin surface available for contact ($cm^2$/event) |
| | AF = : | 0.2 | Soil to skin adherence factor (mg/$cm^2$) |
| | ABS = : | | Absorption factor (unitless) |
| | EF = : | 20 | Exposure frequency (events/year) |
| | ED = : | 2 | Exposure duration (years) |
| | BW = : | 31 | Body weight (kg) |
| | ATc = : | 25,550 | Averaging time for carcinogenic exposures (days) |
| | ATn = : | 730 | Averaging time for noncarcinogenic exposures (days) |

Unit Dose
Lifetime Chronic Daily Intake 3.2E-08 kg-soil/kg-wt/day
Chronic Daily Intake = : 1.1E-06 kg-soil/kg-wt/day

**RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)**

**SITE NAME:** AREA C, HOUSATONIC BOAT CLUB
**LOCATION:** FERRY CREEK, STRATFORD, CT
**EXPOSURE SCENARIO:** WETLAND/MARSH RECEPTOR - PRE-ADOLESCENT CTE
**MEDIA:** SURFACE SOIL
**DATE:** AUGUST 3, 2000

| CHEMICAL | Cs (mg/kg) | ABS (unitless) | Lifetime Chronic Daily Intake (mg/kg/day) | Chronic Daily Intake (mg/kg/day) | Cancer Slope Factor $(mg/kg/day)^{-1}$ | Reference Dose (mg/kg/day) | Lifetime Cancer Risk | Percent Cancer Risk | Hazard Quotient | Percent Hazard Quotient |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 1.7 | 0.13 | 7.14E-09 | 2.50E-07 | 7.30E-01 | NA | 5.2E-09 | 2.6% | NA | NA |
| Benzo(b)fluoranthene | 2.3 | 0.13 | 9.66E-09 | 3.38E-07 | 7.30E-01 | NA | 7.1E-09 | 3.5% | NA | NA |
| Benzo(a)pyrene | 1.7 | 0.13 | 7.14E-09 | 2.50E-07 | 7.30E+00 | NA | 5.2E-08 | 25.9% | NA | NA |
| Dibenzo(a,h)anthracene | 0.5 | 0.13 | 2.10E-09 | 7.35E-08 | 7.30E+00 | NA | 1.5E-08 | 7.6% | NA | NA |
| Indeno(1,2,3-cd)pyrene | 1.4 | 0.13 | 5.88E-09 | 2.06E-07 | 7.30E-01 | NA | 4.3E-09 | 2.1% | NA | NA |
| Aroclor, total | 11 | 0.14 | 4.98E-08 | 1.74E-06 | 1.00E+00 | 2.00E-05 | 5.0E-08 | 24.7% | 8.7E-02 | 98.8% |
| Antimony | 3.7 | NA | NA | NA | NA | 6.00E-05 | NA | NA | NA | NA |
| Arsenic | 9.5 | 0.03 | 9.21E-09 | 3.22E-07 | 1.50E+00 | 3.00E-04 | 1.4E-08 | 6.9% | 1.1E-03 | 1.2% |
| Barium | 1700 | NA | NA | NA | NA | 4.90E-03 | NA | NA | NA | NA |
| Chromium (total) | 516 | NA | NA | NA | NA | 5.00E-04 | NA | NA | NA | NA |
| Nickel | 62.1 | NA | NA | NA | NA | 8.00E-04 | NA | NA | NA | NA |
| Thallium | 2.1 | NA | NA | NA | NA | 6.60E-04 | NA | NA | NA | NA |
| TEQ-Dioxin/Furans | 0.00037 | 0.03 | 3.59E-13 | 1.26E-11 | 1.50E+05 | NA | 5.4E-08 | 26.7% | NA | NA |
| | | | | | | **Total** | **2.0E-07** | **100%** | **8.8E-02** | **100%** |

**RISK ASSESSMENT SPREADSHEET - SUMMARY**

**SITE NAME:** AREA C, HOUSATONIC BOAT CLUB
**LOCATION:** FERRY CREEK, STRATFORD, CT
**EXPOSURE SCENARIO:** WETLAND/MARSH RECEPTOR - PRE-ADOLESCENT CTE
**MEDIA:** SURFACE SOIL
**DATE:** AUGUST 3, 2000

| | Lifetime Cancer Risk | | | | | Hazard Index | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Chemical | Incidental Ingestion | Dermal Contact | Inhalation | Total Risk | Percent Risk | Incidental Ingestion | Dermal Contact | Inhalation | Total HI | Percent HI |
| Benzo(a)anthracene | 3.1E-09 | 5.2E-09 | NA | 8.3E-09 | 1.8% | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | 4.2E-09 | 7.1E-09 | NA | 1.1E-08 | 2.5% | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 3.1E-08 | 5.2E-08 | NA | 8.3E-08 | 18.3% | NA | NA | NA | NA | NA |
| Dibenzo(a,h)anthracene | 9.2E-09 | 1.5E-08 | NA | 2.5E-08 | 5.4% | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 2.6E-09 | 4.3E-09 | NA | 6.9E-09 | 1.5% | NA | NA | NA | NA | NA |
| Aroclor, total | 2.8E-08 | 5.0E-08 | NA | 7.8E-08 | 17.0% | 4.9E-02 | 8.7E-02 | NA | 1.4E-01 | 93.3% |
| Antimony | NA | NA | NA | NA | NA | 8.2E-04 | NA | NA | 8.2E-04 | 0.6% |
| Arsenic | 3.6E-08 | 1.4E-08 | NA | 5.0E-08 | 10.9% | 2.8E-03 | 1.1E-03 | NA | 3.9E-03 | 2.7% |
| Barium | NA | NA | NA | NA | NA | 2.1E-03 | NA | NA | 2.1E-03 | 1.5% |
| Chromium (total) | NA | NA | NA | NA | NA | 2.3E-03 | NA | NA | 2.3E-03 | 1.6% |
| Nickel | NA | NA | NA | NA | NA | 2.7E-04 | NA | NA | 2.7E-04 | 0.2% |
| Thallium | NA | NA | NA | NA | NA | 2.8E-04 | NA | NA | 2.8E-04 | 0.2% |
| TEQ-Dioxin/Furans | 1.4E-07 | 5.4E-08 | NA | 1.9E-07 | 42.5% | NA | NA | NA | NA | NA |
| **Total** | **2.5E-07** | **2.0E-07** | **NA** | **4.6E-07** | **100.0%** | **5.7E-02** | **8.8E-02** | **NA** | **1.5E-01** | **100.0%** |

**RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER**

**SITE NAME: AREA C, HOUSATONIC BOAT CLUB**
**LOCATION: FERRY CREEK, STRATFORD, CT**
**EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT -NON-SWIMMING - RME**
**MEDIA: SURFACE WATER**
**DATE: AUGUST 3, 2000**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH WATER ARE CONSIDERED. ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATIONS:

$$\text{Absorbed Dose} = \frac{DAevent \times EV \times EF \times ED \times SA}{BW \times AT}$$

For Inorganics DAevent = Kp x Cw x CF x tevent

For Organics If tevent $\leq t^*$, then : $DAevent = 2 \times Kp \times Cw \times CF \times \sqrt{\frac{6 \times tau \times tevent}{\pi}}$

If tevent $> t^*$, then : $DAevent = Kp \times Cw \times CF \times \left[\frac{tevent}{1+B} + 2 \times tau \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right]$

| | | | |
|---|---|---|---|
| Where: | SA = : | 4,500 | Skin surface available for contact ($cm^2$) |
| | DAevent = : | | Chemical specific absorbed dose per event ($mg/cm^2$-event) |
| | EV = : | 1 | Event frequency (events/days) |
| | EF = : | 20 | Exposure frequency (days/year) |
| | ED = : | 24 | Exposure duration (years) |
| | BW = : | 70 | Body weight (kg) |
| | ATc = : | 25,550 | Averaging time for carcinogenic exposures (days) |
| | ATn = : | 8,760 | Averaging time for noncarcinogenic exposures (days) |
| | CF = : | 0.001 | Conversion Factor ($L/m^3$) |
| | Kp =: | | Chemical specific permeability coefficient (cm/hr) |
| | Cw = : | | Concentration of chemical in water (mg/L) |
| | tevent = : | 1 | duration of event (hr/event) |
| | tau = : | | Chemical specific lag time (hr) |
| | t* = : | | Chemical specific time it takes to reach steady state (hr) |
| | B = : | | Chemical specific dimensionless constant |
| | Dsc = : | | Effective diffusivity for chemical transfer through skin ($cm^2/hr$) |
| | b, c = : | | chemical specific constants |

Unit Dose

| | | |
|---|---|---|
| Lifetime Chronic Daily Intake = | 1.2E+00 | $cm^2$-event/(kg-day) |
| Chronic Daily Intake = : | 3.5E+00 | $cm^2$-event/(kg-day) |

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER (PAGE TWO)

SITE NAME: AREA C, HOUSATONIC BOAT CLUB
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT -NON-SWIMMING - RME
MEDIA: SURFACE WATER
DATE: AUGUST 3, 2000

| CHEMICAL | Cw (mg/L) | Organic or Inorganic | Molecular Weight | Estimated Kp (cm/hr) | tau-event (hr) | B | b | c | Dsc ($cm^2$/hr) | t* (hr) | DAevent (mg/$cm^2$ - event) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dieldrin | 0.000027 | O | 381 | 1.60E-02 | 1.43E+01 | 1.20E-01 | 3.81E-01 | 4.18E-01 | 1.17E-08 | 3.43E+01 | 4.51E-09 |
| Aroclor, total | 0.002 | O | 292 | 9.00E-01 | 4.53E+00 | 5.92E+00 | 2.45E+01 | 5.96E+00 | 3.67E-08 | 2.01E+01 | 1.06E-05 |
| Antimony | 0.0136 | I | 121.78 | 1.00E-03 | 5.05E-01 | 4.24E-03 | 3.06E-01 | 3.36E-01 | 3.30E-07 | 1.21E+00 | 1.36E-08 |
| Arsenic | 0.0271 | I | 74.92 | 1.00E-03 | 2.76E-01 | 3.33E-03 | 3.05E-01 | 3.36E-01 | 6.03E-07 | 6.62E-01 | 2.71E-08 |
| Cadmium | 0.0013 | I | 112.41 | 1.00E-03 | 4.47E-01 | 4.08E-03 | 3.06E-01 | 3.36E-01 | 3.72E-07 | 1.07E+00 | 1.30E-09 |
| Chromium (total) | 0.0183 | I | 51.99 | 1.00E-03 | 2.05E-01 | 2.77E-03 | 3.05E-01 | 3.35E-01 | 8.11E-07 | 4.93E-01 | 1.83E-08 |
| Manganese | 0.4 | I | 54.94 | 1.00E-03 | 2.13E-01 | 2.85E-03 | 3.05E-01 | 3.35E-01 | 7.80E-07 | 5.12E-01 | 4.00E-07 |
| Mercury | 0.00062 | I | 200.59 | 1.00E-03 | 1.39E+00 | 5.45E-03 | 3.07E-01 | 3.37E-01 | 1.19E-07 | 3.35E+00 | 6.20E-10 |
| Thallium | 0.0041 | I | 204.38 | 1.00E-03 | 1.46E+00 | 5.50E-03 | 3.07E-01 | 3.37E-01 | 1.14E-07 | 3.52E+00 | 4.10E-09 |

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER (PAGE THREE)

SITE NAME: AREA C, HOUSATONIC BOAT CLUB
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT -NON-SWIMMING - RME
MEDIA: SURFACE WATER
DATE: AUGUST 3, 2000

| CHEMICAL | DAevent ($mg/cm^2$ - event) | Lifetime Chronic Daily Intake (mg/kg/day) | Chronic Daily Intake (mg/kg/day) | Cancer Slope Factor $(mg/kg/day)^{-1}$ | Reference Dose (mg/kg/day) | Lifetime Cancer Risk | Percent Cancer Risk | Hazard Quotient | Percent Hazard Quotient |
|---|---|---|---|---|---|---|---|---|---|
| Dieldrin | 4.51E-09 | 5.45E-09 | 1.59E-08 | 1.60E+01 | 5.00E-05 | 8.7E-08 | 0.3% | 3.2E-04 | 0.0% |
| Aroclor, total | 1.06E-05 | 1.28E-05 | 3.73E-05 | 2.00E+00 | 2.00E-05 | 2.6E-05 | 99.5% | 1.9E+00 | 99.8% |
| Antimony | 1.36E-08 | 1.64E-08 | 4.79E-08 | NA | 6.00E-05 | NA | NA | 8.0E-04 | 0.0% |
| Arsenic | 2.71E-08 | 3.27E-08 | 9.55E-08 | 1.50E+00 | 3.00E-04 | 4.9E-08 | 0.2% | 3.2E-04 | 0.0% |
| Cadmium | 1.30E-09 | 1.57E-09 | 4.58E-09 | NA | 2.50E-05 | NA | NA | 1.8E-04 | 0.0% |
| Chromium (total) | 1.83E-08 | 2.21E-08 | 6.45E-08 | NA | 7.50E-05 | NA | NA | 8.6E-04 | 0.0% |
| Manganese | 4.00E-07 | 4.83E-07 | 1.41E-06 | NA | 1.40E-03 | NA | NA | 1.0E-03 | 0.1% |
| Mercury | 6.20E-10 | 7.49E-10 | 2.18E-09 | NA | 2.10E-05 | NA | NA | 1.0E-04 | 0.0% |
| Thallium | 4.10E-09 | 4.95E-09 | 1.44E-08 | NA | 6.60E-05 | NA | NA | 2.2E-04 | 0.0% |
| | | | | | Total | 2.6E-05 | 100.0% | 1.9E+00 | 100.0% |

**RISK ASSESSMENT SPREADSHEET - SUMMARY OF CANCER RISKS AND HAZARD INDICES**

**SITE NAME:** AREA C, HOUSATONIC BOAT CLUB
**LOCATION:** FERRY CREEK, STRATFORD, CT
**EXPOSURE SCENARIO:** WETLAND/MARSH RECEPTOR - ADULT -NON-SWIMMING - RME
**MEDIA:** SURFACE WATER
**DATE:** AUGUST 3, 2000

| | Lifetime Cancer Risk | | | | | Hazard Index | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Chemical | Incidental Ingestion | Dermal Contact | Inhalation | Total Risk | Percent Risk | Incidental Ingestion | Dermal Contact | Inhalation | Total HI | Percent HI |
| Dieldrin | NA | 8.7E-08 | NA | 8.7E-08 | 0.3% | NA | 3.2E-04 | NA | 3.2E-04 | 0.0% |
| Aroclor, total | NA | 2.6E-05 | NA | 2.6E-05 | 99.5% | NA | 1.9E+00 | NA | 1.9E+00 | 99.8% |
| Antimony | NA | NA | NA | NA | NA | NA | 8.0E-04 | NA | 8.0E-04 | 0.0% |
| Arsenic | NA | 4.9E-08 | NA | 4.9E-08 | 0.2% | NA | 3.2E-04 | NA | 3.2E-04 | 0.0% |
| Cadmium | NA | NA | NA | NA | NA | NA | 1.8E-04 | NA | 1.8E-04 | 0.0% |
| Chromium (total) | NA | NA | NA | NA | NA | NA | 8.6E-04 | NA | 8.6E-04 | 0.0% |
| Manganese | NA | NA | NA | NA | NA | NA | 1.0E-03 | NA | 1.0E-03 | 0.1% |
| Mercury | NA | NA | NA | NA | NA | NA | 1.0E-04 | NA | 1.0E-04 | 0.0% |
| Thallium | NA | NA | NA | NA | NA | NA | 2.2E-04 | NA | 2.2E-04 | 0.0% |
| **Total** | **NA** | **2.6E-05** | **NA** | **2.6E-05** | **100.0%** | **NA** | **1.9E+00** | **NA** | **1.9E+00** | **100.0%** |

**RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER**

**SITE NAME: AREA C, HOUSATONIC BOAT CLUB**
**LOCATION: FERRY CREEK, STRATFORD, CT**
**EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT -NON-SWIMMING - CTE**
**MEDIA: SURFACE WATER**
**DATE: AUGUST 3, 2000**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH WATER ARE CONSIDERED. ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATIONS:

$$\text{Absorbed Dose} = \frac{DAevent \times EV \times EF \times ED \times SA}{BW \times AT}$$

For Inorganics $DAevent = Kp \times Cw \times CF \times tevent$

For Organics If $tevent \le t^*$, then : $DAevent = 2 \times Kp \times Cw \times CF \times \sqrt{\frac{6 \times tau \times tevent}{\pi}}$

If $tevent > t^*$, then : $DAevent = Kp \times Cw \times CF \times \left[\frac{tevent}{1+B} + 2 \times tau \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right]$

| | | | |
|---|---|---|---|
| Where: | SA = : | 4,500 | Skin surface available for contact ($cm^2$) |
| | DAevent = : | | Chemical specific absorbed dose per event ($mg/cm^2$-event) |
| | EV = : | 1 | Event frequency (events/days) |
| | EF = : | 20 | Exposure frequency (days/year) |
| | ED = : | 7 | Exposure duration (years) |
| | BW = : | 70 | Body weight (kg) |
| | ATc = : | 25,550 | Averaging time for carcinogenic exposures (days) |
| | ATn = : | 2,555 | Averaging time for noncarcinogenic exposures (days) |
| | CF = : | 0.001 | Conversion Factor ($L/m^3$) |
| | Kp =: | | Chemical specific permeability coefficient (cm/hr) |
| | Cw = : | | Concentration of chemical in water (mg/L) |
| | tevent = : | 1 | duration of event (hr/event) |
| | tau = : | | Chemical specific lag time (hr) |
| | t* = : | | Chemical specific time it takes to reach steady state (hr) |
| | B = : | | Chemical specific dimensionless constant |
| | Dsc = : | | Effective diffusivity for chemical transfer through skin ($cm^2/hr$) |
| | b, c = : | | chemical specific constants |

Unit Dose

| | | |
|---|---|---|
| Lifetime Chronic Daily Intake = | 3.5E-01 | $cm^2$-event/(kg-day) |
| Chronic Daily Intake = : | 3.5E+00 | $cm^2$-event/(kg-day) |

**RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER (PAGE TWO)**

SITE NAME: AREA C, HOUSATONIC BOAT CLUB
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT -NON-SWIMMING - CTE
MEDIA: SURFACE WATER
DATE: AUGUST 3, 2000

| CHEMICAL | Cw (mg/L) | Organic or Inorganic | Molecular Weight | Estimated Kp (cm/hr) | tau-event (hr) | B | b | c | Dsc ($cm^2$/hr) | t* (hr) | DAevent (mg/$cm^2$ - event) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dieldrin | 0.000027 | O | 381 | 1.60E-02 | 1.43E+01 | 1.20E-01 | 3.81E-01 | 4.18E-01 | 1.17E-08 | 3.43E+01 | 4.51E-09 |
| Aroclor, total | 0.002 | O | 292 | 9.00E-01 | 4.53E+00 | 5.92E+00 | 2.45E+01 | 5.96E+00 | 3.67E-08 | 2.01E+01 | 1.06E-05 |
| Antimony | 0.0136 | I | 121.78 | 1.00E-03 | 5.05E-01 | 4.24E-03 | 3.06E-01 | 3.36E-01 | 3.30E-07 | 1.21E+00 | 1.36E-08 |
| Arsenic | 0.0271 | I | 74.92 | 1.00E-03 | 2.76E-01 | 3.33E-03 | 3.05E-01 | 3.36E-01 | 6.03E-07 | 6.62E-01 | 2.71E-08 |
| Cadmium | 0.0013 | I | 112.41 | 1.00E-03 | 4.47E-01 | 4.08E-03 | 3.06E-01 | 3.36E-01 | 3.72E-07 | 1.07E+00 | 1.30E-09 |
| Chromium (total) | 0.0183 | I | 51.99 | 1.00E-03 | 2.05E-01 | 2.77E-03 | 3.05E-01 | 3.35E-01 | 8.11E-07 | 4.93E-01 | 1.83E-08 |
| Manganese | 0.4 | I | 54.94 | 1.00E-03 | 2.13E-01 | 2.85E-03 | 3.05E-01 | 3.35E-01 | 7.80E-07 | 5.12E-01 | 4.00E-07 |
| Mercury | 0.00062 | I | 200.59 | 1.00E-03 | 1.39E+00 | 5.45E-03 | 3.07E-01 | 3.37E-01 | 1.19E-07 | 3.35E+00 | 6.20E-10 |
| Thallium | 0.0041 | I | 204.38 | 1.00E-03 | 1.46E+00 | 5.50E-03 | 3.07E-01 | 3.37E-01 | 1.14E-07 | 3.52E+00 | 4.10E-09 |

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER (PAGE THREE)

SITE NAME: AREA C, HOUSATONIC BOAT CLUB
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT -NON-SWIMMING - CTE
MEDIA: SURFACE WATER
DATE: AUGUST 3, 2000

| CHEMICAL | DAevent ($mg/cm^2$ - event) | Lifetime Chronic Daily Intake (mg/kg/day) | Chronic Daily Intake (mg/kg/day) | Cancer Slope Factor $(mg/kg/day)^{-1}$ | Reference Dose (mg/kg/day) | Lifetime Cancer Risk | Percent Cancer Risk | Hazard Quotient | Percent Hazard Quotient |
|---|---|---|---|---|---|---|---|---|---|
| Dieldrin | 4.51E-09 | 1.59E-09 | 1.59E-08 | 1.60E+01 | 5.00E-05 | 2.5E-08 | 0.7% | 3.2E-04 | 0.0% |
| Aroclor, total | 1.06E-05 | 3.73E-06 | 3.73E-05 | 1.00E+00 | 2.00E-05 | 3.7E-06 | 98.9% | 1.9E+00 | 99.8% |
| Antimony | 1.36E-08 | 4.79E-09 | 4.79E-08 | NA | 6.00E-05 | NA | NA | 8.0E-04 | 0.0% |
| Arsenic | 2.71E-08 | 9.55E-09 | 9.55E-08 | 1.50E+00 | 3.00E-04 | 1.4E-08 | 0.4% | 3.2E-04 | 0.0% |
| Cadmium | 1.30E-09 | 4.58E-10 | 4.58E-09 | NA | 2.50E-05 | NA | NA | 1.8E-04 | 0.0% |
| Chromium (total) | 1.83E-08 | 6.45E-09 | 6.45E-08 | NA | 7.50E-05 | NA | NA | 8.6E-04 | 0.0% |
| Manganese | 4.00E-07 | 1.41E-07 | 1.41E-06 | NA | 1.40E-03 | NA | NA | 1.0E-03 | 0.1% |
| Mercury | 6.20E-10 | 2.18E-10 | 2.18E-09 | NA | 2.10E-05 | NA | NA | 1.0E-04 | 0.0% |
| Thallium | 4.10E-09 | 1.44E-09 | 1.44E-08 | NA | 6.60E-05 | NA | NA | 2.2E-04 | 0.0% |
| | | | | | Total | 3.8E-06 | 100.0% | 1.9E+00 | 100.0% |

**RISK ASSESSMENT SPREADSHEET - SUMMARY OF CANCER RISKS AND HAZARD INDICES**

SITE NAME: AREA C, HOUSATONIC BOAT CLUB
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT -NON-SWIMMING - CTE
MEDIA: SURFACE WATER
DATE: AUGUST 3, 2000

| | Lifetime Cancer Risk | | | | | Hazard Index | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Chemical | Incidental Ingestion | Dermal Contact | Inhalation | Total Risk | Percent Risk | Incidental Ingestion | Dermal Contact | Inhalation | Total HI | Percent HI |
| Dieldrin | NA | 2.5E-08 | NA | 2.5E-08 | 0.7% | NA | 3.2E-04 | NA | 3.2E-04 | 0.0% |
| Aroclor, total | NA | 3.7E-06 | NA | 3.7E-06 | 98.9% | NA | 1.9E+00 | NA | 1.9E+00 | 99.8% |
| Antimony | NA | NA | NA | NA | NA | NA | 8.0E-04 | NA | 8.0E-04 | 0.0% |
| Arsenic | NA | 1.4E-08 | NA | 1.4E-08 | 0.4% | NA | 3.2E-04 | NA | 3.2E-04 | 0.0% |
| Cadmium | NA | NA | NA | NA | NA | NA | 1.8E-04 | NA | 1.8E-04 | 0.0% |
| Chromium (total) | NA | NA | NA | NA | NA | NA | 8.6E-04 | NA | 8.6E-04 | 0.0% |
| Manganese | NA | NA | NA | NA | NA | NA | 1.0E-03 | NA | 1.0E-03 | 0.1% |
| Mercury | NA | NA | NA | NA | NA | NA | 1.0E-04 | NA | 1.0E-04 | 0.0% |
| Thallium | NA | NA | NA | NA | NA | NA | 2.2E-04 | NA | 2.2E-04 | 0.0% |
| **Total** | **NA** | **3.8E-06** | **NA** | **3.8E-06** | **100.0%** | **NA** | **1.9E+00** | **NA** | **1.9E+00** | **100.0%** |

**RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER**

**SITE NAME: AREA C, HOUSATONIC BOAT CLUB**
**LOCATION: FERRY CREEK, STRATFORD, CT**
**EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR -PRE-ADOLESCENT - NON-SWIMMING - RME**
**MEDIA: SURFACE WATER**
**DATE: AUGUST 3, 2000**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH WATER ARE CONSIDERED. ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATIONS:

$$\text{Absorbed Dose} = \frac{DAevent \times EV \times EF \times ED \times SA}{BW \times AT}$$

For Inorganics DAevent = Kp x Cw x CF x tevent

For Organics If tevent $\leq t^*$, then : $DAevent = 2 \times Kp \times Cw \times CF \times \sqrt{\frac{6 \times tau \times tevent}{\pi}}$

If tevent $> t^*$, then : $DAevent = Kp \times Cw \times CF \times \left[\frac{tevent}{1+B} + 2 \times tau \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right]$

| | | | |
|---|---|---|---|
| Where: | SA = : | 2,500 | Skin surface available for contact ($cm^2$) |
| | DAevent = : | | Chemical specific absorbed dose per event ($mg/cm^2$-event) |
| | EV = : | 1 | Event frequency (events/days) |
| | EF = : | 20 | Exposure frequency (days/year) |
| | ED = : | 6 | Exposure duration (years) |
| | BW = : | 31 | Body weight (kg) |
| | ATc = : | 25,550 | Averaging time for carcinogenic exposures (days) |
| | ATn = : | 2,190 | Averaging time for noncarcinogenic exposures (days) |
| | CF = : | 0.001 | Conversion Factor ($L/m^3$) |
| | Kp =: | | Chemical specific permeability coefficient (cm/hr) |
| | Cw = : | | Concentration of chemical in water (mg/L) |
| | tevent = : | 1 | duration of event (hr/event) |
| | tau = : | | Chemical specific lag time (hr) |
| | t* = : | | Chemical specific time it takes to reach steady state (hr) |
| | B = : | | Chemical specific dimensionless constant |
| | Dsc = : | | Effective diffusivity for chemical transfer through skin ($cm^2/hr$) |
| | b, c = : | | chemical specific constants |

Unit Dose

| | | |
|---|---|---|
| Lifetime Chronic Daily Intake = | 3.8E-01 | $cm^2$-event/(kg-day) |
| Chronic Daily Intake = : | 4.4E+00 | $cm^2$-event/(kg-day) |

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER (PAGE TWO)

SITE NAME: AREA C, HOUSATONIC BOAT CLUB
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR -PRE-ADOLESCENT - NON-SWIMMING - RME
MEDIA: SURFACE WATER
DATE: AUGUST 3, 2000

| CHEMICAL | Cw (mg/L) | Organic or Inorganic | Molecular Weight | Estimated Kp (cm/hr) | tau-event (hr) | B | b | c | Dsc ($cm^2$/hr) | t* (hr) | DAevent (mg/$cm^2$ - event) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dieldrin | 0.000027 | O | 381 | 1.60E-02 | 1.43E+01 | 1.20E-01 | 3.81E-01 | 4.18E-01 | 1.17E-08 | 3.43E+01 | 4.51E-09 |
| Aroclor, total | 0.002 | O | 292 | 9.00E-01 | 4.53E+00 | 5.92E+00 | 2.45E+01 | 5.96E+00 | 3.67E-08 | 2.01E+01 | 1.06E-05 |
| Antimony | 0.0136 | I | 121.78 | 1.00E-03 | 5.05E-01 | 4.24E-03 | 3.06E-01 | 3.36E-01 | 3.30E-07 | 1.21E+00 | 1.36E-08 |
| Arsenic | 0.0271 | I | 74.92 | 1.00E-03 | 2.76E-01 | 3.33E-03 | 3.05E-01 | 3.36E-01 | 6.03E-07 | 6.62E-01 | 2.71E-08 |
| Cadmium | 0.0013 | I | 112.41 | 1.00E-03 | 4.47E-01 | 4.08E-03 | 3.06E-01 | 3.36E-01 | 3.72E-07 | 1.07E+00 | 1.30E-09 |
| Chromium (total) | 0.0183 | I | 51.99 | 1.00E-03 | 2.05E-01 | 2.77E-03 | 3.05E-01 | 3.35E-01 | 8.11E-07 | 4.93E-01 | 1.83E-08 |
| Manganese | 0.4 | I | 54.94 | 1.00E-03 | 2.13E-01 | 2.85E-03 | 3.05E-01 | 3.35E-01 | 7.80E-07 | 5.12E-01 | 4.00E-07 |
| Mercury | 0.00062 | I | 200.59 | 1.00E-03 | 1.39E+00 | 5.45E-03 | 3.07E-01 | 3.37E-01 | 1.19E-07 | 3.35E+00 | 6.20E-10 |
| Thallium | 0.0041 | I | 204.38 | 1.00E-03 | 1.46E+00 | 5.50E-03 | 3.07E-01 | 3.37E-01 | 1.14E-07 | 3.52E+00 | 4.10E-09 |

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER (PAGE THREE)

SITE NAME: AREA C, HOUSATONIC BOAT CLUB
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR -PRE-ADOLESCENT - NON-SWIMMING - RME
MEDIA: SURFACE WATER
DATE: AUGUST 3, 2000

| CHEMICAL | DAevent ($mg/cm^2$ - event) | Lifetime Chronic Daily Intake (mg/kg/day) | Chronic Daily Intake (mg/kg/day) | Cancer Slope Factor $(mg/kg/day)^{-1}$ | Reference Dose (mg/kg/day) | Lifetime Cancer Risk | Percent Cancer Risk | Hazard Quotient | Percent Hazard Quotient |
|---|---|---|---|---|---|---|---|---|---|
| Dieldrin | 4.51E-09 | 1.71E-09 | 1.99E-08 | 1.60E+01 | 5.00E-05 | 2.7E-08 | 0.3% | 4.0E-04 | 0.0% |
| Aroclor, total | 1.06E-05 | 4.01E-06 | 4.68E-05 | 2.00E+00 | 2.00E-05 | 8.0E-06 | 99.5% | 2.3E+00 | 99.9% |
| Antimony | 1.36E-08 | 5.15E-09 | 6.01E-08 | NA | 6.00E-05 | NA | NA | 1.0E-03 | 0.0% |
| Arsenic | 2.71E-08 | 1.03E-08 | 1.20E-07 | 1.50E+00 | 3.00E-04 | 1.5E-08 | 0.2% | 4.0E-04 | 0.0% |
| Cadmium | 1.30E-09 | 4.92E-10 | 5.74E-09 | NA | 2.50E-05 | NA | NA | 2.3E-04 | 0.0% |
| Chromium (total) | 1.83E-08 | 6.93E-09 | 8.09E-08 | NA | 5.00E-04 | NA | NA | 1.6E-04 | 0.0% |
| Manganese | 4.00E-07 | 1.52E-07 | 1.77E-06 | NA | 1.40E-03 | NA | NA | 1.3E-03 | 0.1% |
| Mercury | 6.20E-10 | 2.35E-10 | 2.74E-09 | NA | 2.10E-04 | NA | NA | 1.3E-05 | 0.0% |
| Thallium | 4.10E-09 | 1.55E-09 | 1.81E-08 | NA | 6.60E-04 | NA | NA | 2.7E-05 | 0.0% |
| | | | | | Total | 8.1E-06 | 100.0% | 2.3E+00 | 100.0% |

**RISK ASSESSMENT SPREADSHEET - SUMMARY OF CANCER RISKS AND HAZARD INDICES**

**SITE NAME:** AREA C, HOUSATONIC BOAT CLUB
**LOCATION:** FERRY CREEK, STRATFORD, CT
**EXPOSURE SCENARIO:** WETLAND/MARSH RECEPTOR -PRE-ADOLESCENT - NON-SWIMMING - RME
**MEDIA:** SURFACE WATER
**DATE:** AUGUST 3, 2000

| | Lifetime Cancer Risk | | | | | Hazard Index | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Chemical | Incidental Ingestion | Dermal Contact | Inhalation | Total Risk | Percent Risk | Incidental Ingestion | Dermal Contact | Inhalation | Total HI | Percent HI |
| Dieldrin | NA | 2.7E-08 | NA | 2.7E-08 | 0.3% | NA | 4.0E-04 | NA | 4.0E-04 | 0.0% |
| Aroclor, total | NA | 8.0E-06 | NA | 8.0E-06 | 99.5% | NA | 2.3E+00 | NA | 2.3E+00 | 99.9% |
| Antimony | NA | NA | NA | NA | NA | NA | 1.0E-03 | NA | 1.0E-03 | 0.0% |
| Arsenic | NA | 1.5E-08 | NA | 1.5E-08 | 0.2% | NA | 4.0E-04 | NA | 4.0E-04 | 0.0% |
| Cadmium | NA | NA | NA | NA | NA | NA | 2.3E-04 | NA | 2.3E-04 | 0.0% |
| Chromium (total) | NA | NA | NA | NA | NA | NA | 1.6E-04 | NA | 1.6E-04 | 0.0% |
| Manganese | NA | NA | NA | NA | NA | NA | 1.3E-03 | NA | 1.3E-03 | 0.1% |
| Mercury | NA | NA | NA | NA | NA | NA | 1.3E-05 | NA | 1.3E-05 | 0.0% |
| Thallium | NA | NA | NA | NA | NA | NA | 2.7E-05 | NA | 2.7E-05 | 0.0% |
| **Total** | **NA** | **8.1E-06** | **NA** | **8.1E-06** | **100.0%** | **NA** | **2.3E+00** | **NA** | **2.3E+00** | **100.0%** |

**RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER**

**SITE NAME: AREA C, HOUSATONIC BOAT CLUB**
**LOCATION: FERRY CREEK, STRATFORD, CT**
**EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR -PRE-ADOLESCENT - NON-SWIMMING - CTE**
**MEDIA: SURFACE WATER**
**DATE: AUGUST 3, 2000**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH WATER ARE CONSIDERED. ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATIONS:

$$\text{Absorbed Dose} = \frac{DAevent \times EV \times EF \times ED \times SA}{BW \times AT}$$

For Inorganics $DAevent = Kp \times Cw \times CF \times tevent$

For Organics If $tevent \le t^*$, then : $DAevent = 2 \times Kp \times Cw \times CF \times \sqrt{\frac{6 \times tau \times tevent}{\pi}}$

If $tevent > t^*$, then : $DAevent = Kp \times Cw \times CF \times \left[\frac{tevent}{1+B} + 2 \times tau \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right]$

| | | | |
|---|---|---|---|
| Where: | SA = : | 2,500 | Skin surface available for contact ($cm^2$) |
| | DAevent = : | | Chemical specific absorbed dose per event ($mg/cm^2$-event) |
| | EV = : | 1 | Event frequency (events/days) |
| | EF = : | 20 | Exposure frequency (days/year) |
| | ED = : | 2 | Exposure duration (years) |
| | BW = : | 31 | Body weight (kg) |
| | ATc = : | 25,550 | Averaging time for carcinogenic exposures (days) |
| | ATn = : | 730 | Averaging time for noncarcinogenic exposures (days) |
| | CF = : | 0.001 | Conversion Factor ($L/m^3$) |
| | Kp =: | | Chemical specific permeability coefficient (cm/hr) |
| | Cw = : | | Concentration of chemical in water (mg/L) |
| | tevent = : | 1 | duration of event (hr/event) |
| | tau = : | | Chemical specific lag time (hr) |
| | t* = : | | Chemical specific time it takes to reach steady state (hr) |
| | B = : | | Chemical specific dimensionless constant |
| | Dsc = : | | Effective diffusivity for chemical transfer through skin ($cm^2/hr$) |
| | b, c = : | | chemical specific constants |

Unit Dose

| | | |
|---|---|---|
| Lifetime Chronic Daily Intake = | 1.3E-01 | $cm^2$-event/(kg-day) |
| Chronic Daily Intake = : | 4.4E+00 | $cm^2$-event/(kg-day) |

**RISK ASSESSMENT SPREADSHEET - SUMMARY OF CANCER RISKS AND HAZARD INDICES**

**SITE NAME:** AREA C, HOUSATONIC BOAT CLUB
**LOCATION:** FERRY CREEK, STRATFORD, CT
**EXPOSURE SCENARIO:** WETLAND/MARSH RECEPTOR -PRE-ADOLESCENT - NON-SWIMMING - CTE
**MEDIA:** SURFACE WATER
**DATE:** AUGUST 3, 2000

| | Lifetime Cancer Risk | | | | | Hazard Index | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Chemical | Incidental Ingestion | Dermal Contact | Inhalation | Total Risk | Percent Risk | Incidental Ingestion | Dermal Contact | Inhalation | Total HI | Percent HI |
| Dieldrin | NA | 9.1E-09 | NA | 9.1E-09 | 0.7% | NA | 4.0E-04 | NA | 4.0E-04 | 0.0% |
| Aroclor, total | NA | 1.3E-06 | NA | 1.3E-06 | 98.9% | NA | 2.3E+00 | NA | 2.3E+00 | 99.9% |
| Antimony | NA | NA | NA | NA | NA | NA | 1.0E-03 | NA | 1.0E-03 | 0.0% |
| Arsenic | NA | 5.1E-09 | NA | 5.1E-09 | 0.4% | NA | 4.0E-04 | NA | 4.0E-04 | 0.0% |
| Cadmium | NA | NA | NA | NA | NA | NA | 2.3E-04 | NA | 2.3E-04 | 0.0% |
| Chromium (total) | NA | NA | NA | NA | NA | NA | 1.6E-04 | NA | 1.6E-04 | 0.0% |
| Manganese | NA | NA | NA | NA | NA | NA | 1.3E-03 | NA | 1.3E-03 | 0.1% |
| Mercury | NA | NA | NA | NA | NA | NA | 1.3E-05 | NA | 1.3E-05 | 0.0% |
| Thallium | NA | NA | NA | NA | NA | NA | 2.7E-05 | NA | 2.7E-05 | 0.0% |
| **Total** | **NA** | **1.4E-06** | **NA** | **1.4E-06** | **100.0%** | **NA** | **2.3E+00** | **NA** | **2.3E+00** | **100.0%** |

# Appendix F.11

## Area F

**RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**

**SITE NAME: AREA F, SELBY POND**
**LOCATION: FERRY CREEK, STRATFORD, CT**
**EXPOSURE SCENARIO: FREQUENT RECREATIONAL USER - ADULT - RME**
**MEDIA: SEDIMENT/WETLAND MATERIAL**
**DATE: FEBRUARY 10, 2000** ✓

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = \frac{Cs \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$

| WHERE: | | | |
|---|---|---|---|
| | Cs = : | | Concentration in soil (mg/kg) |
| | IR = : | 100 | Soil Ingestion Rate (mg/day) |
| | CF = : | 1.0E-06 | Conversion Factor (kg/mg) |
| | FI = : | 1 | Fraction from contaminated source (unitless) |
| | EF = : | 90 | Exposure Frequency (days/year) ✓ |
| | ED = : | 24 | Exposure Duration (years) |
| | BW = : | 70 | Body Weight (kg) |
| | ATc = : | 25,550 | Averaging time for carcinogenic exposures (days) |
| | ATn = : | 8,760 | Averaging time for noncarcinogenic exposures (days) |

| | | |
|---|---|---|
| Unit Dose | | |
| Lifetime Chronic Daily Int | 1.2E-07 | kg-soil/kg-wt/day |
| Chronic Daily Intake = : | 3.5E-07 | kg-soil/kg-wt/day |

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: AREA F, SELBY POND
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: FREQUENT RECREATIONAL USER - ADULT - RME
MEDIA: SEDIMENT/WETLAND MATERIAL
DATE: FEBRUARY 10, 2000

| CHEMICAL | Cs (mg/kg) | Lifetime Chronic Daily Intake (mg/kg/day) | Chronic Daily Intake (mg/kg/day) | Cancer Slope Factor $(mg/kg/day)^{-1}$ | Reference Dose (mg/kg/day) | Lifetime Cancer Risk | Percent Cancer Risk | Hazard Quotient | Percent Hazard Quotient |
|---|---|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 1.9✓ | 2.3E-07 | 6.7E-07 | 7.30E-01 | NA | 1.7E-07 | 0.8% | NA | NA |
| Benzo(a)pyrene | 4.5✓ | 5.4E-07 | 1.6E-06 | 7.30E+00 | NA | 4.0E-06 | 19.1% | NA | NA |
| Benzo(b)fluoranthene | 2.8✓ | 3.4E-07 | 9.9E-07 | 7.30E-01 | NA | 2.5E-07 | 1.2% | NA | NA |
| Dibenzo(a,h)anthracene | 0.52✓ | 6.3E-08 | 1.8E-07 | 7.30E+00 | NA | 4.6E-07 | 2.2% | NA | NA |
| Indeno(1,2,3-cd)pyrene | 1.3✓ | 1.6E-07 | 4.6E-07 | 7.30E-01 | NA | 1.1E-07 | 0.6% | NA | NA |
| Arsenic | 23.3✓ | 2.8E-06 | 8.2E-06 | 1.50E+00 | 3.00E-04 | 4.2E-06 | 20.3% | 2.7E-02 | 30.9% |
| Barium | 154✓ | 1.9E-05 | 5.4E-05 | NA | 7.00E-02 | NA | NA | 7.7E-04 | 0.9% |
| Cadmium | 17.5✓ | 2.1E-06 | 6.2E-06 | NA | 1.00E-03✓ | NA | NA | 6.2E-03 | 7.0% |
| Chromium (total) | 374✓ | 4.5E-05 | 1.3E-04 | NA | 3.00E-03 | NA | NA | 4.4E-02 | 49.5% |
| Mercury | 2.2✓ | 2.7E-07 | 7.7E-07 | NA | 3.00E-04 | NA | NA | 2.6E-03 | 2.9% |
| Vanadium | 97.2✓ | 1.2E-05 | 3.4E-05 | NA | 7.00E-03 | NA | NA | 4.9E-03 | 5.5% |
| Zinc | 2550✓ | 3.1E-04 | 9.0E-04 | NA | 3.00E-01 | NA | NA | 3.0E-03 | 3.4% |
| TEQ-Dioxins/Furans | 0.00064✓ | 7.7E-11 | 2.3E-10 | 1.50E+05 | NA | 1.2E-05 | 55.8% | NA | NA |
| | | | | | **Total** | **2.1E-05** | **100%** | **8.9E-02** | **100%** |

**RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**

**SITE NAME: AREA F, SELBY POND**
**LOCATION: FERRY CREEK, STRATFORD, CT**
**EXPOSURE SCENARIO: FREQUENT RECREATIONAL USER - ADULT - RME**
**MEDIA: SEDIMENT/WETLAND MATERIAL**
**DATE: FEBRUARY 10, 2000**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:

$$\text{Absorbed Dose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

| Where: | | | |
|---|---|---|---|
| | Cs = : | | Concentration in soil (mg/kg) |
| | CF = : | 1.0E-06 | Conversion factor (kg/mg) |
| | SA = : | 5,700 | Skin surface available for contact ($cm^2$/event) ✓ |
| | AF = : | 0.3 | Soil to skin adherence factor (mg/$cm^2$) ✓ |
| | ABS = : | | Absorption factor (unitless) |
| | EF = : | 90 | Exposure frequency (events/year) ✓ |
| | ED = : | 24 | Exposure duration (years) |
| | BW = : | 70 | Body weight (kg) |
| | ATc = : | 25,550 | Averaging time for carcinogenic exposures (days) |
| | ATn = : | 8,760 | Averaging time for noncarcinogenic exposures (days) |

Unit Dose
Lifetime Chronic Daily Intake = 2.1E-06 kg-soil/kg-wt/day
Chronic Daily Intake = : 6.0E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: AREA F, SELBY POND
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: FREQUENT RECREATIONAL USER - ADULT - RME
MEDIA: SEDIMENT/WETLAND MATERIAL
DATE: FEBRUARY 10, 2000

| CHEMICAL | Cs (mg/kg) | ABS (unitless) | Lifetime Chronic Daily Intake (mg/kg/day) | Chronic Daily Intake (mg/kg/day) | Cancer Slope Factor $(mg/kg/day)^{-1}$ | Reference Dose (mg/kg/day) | Lifetime Cancer Risk | Percent Cancer Risk | Hazard Quotient | Percent Hazard Quotient |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 1.9 ✓ | 0.13 | 5.10E-07 | 1.49E-06 | 7.30E-01 | NA | 3.7E-07 | 1.9% | NA | NA |
| Benzo(a)pyrene | 4.5 ✓ | 0.13 | 1.21E-06 | 3.52E-06 | 7.30E+00 | NA | 8.8E-06 | 46.1% | NA | NA |
| Benzo(b)fluoranthene | 2.8 ✓ | 0.13 | 7.52E-07 | 2.19E-06 | 7.30E-01 | NA | 5.5E-07 | 2.9% | NA | NA |
| Dibenzo(a,h)anthracene | 0.52 ✓ | 0.13 | 1.40E-07 | 4.07E-07 | 7.30E+00 | NA | 1.0E-06 | 5.3% | NA | NA |
| Indeno(1,2,3-cd)pyrene | 1.3 ✓ | 0.13 | 3.49E-07 | 1.02E-06 | 7.30E-01 | NA | 2.5E-07 | 1.3% | NA | NA |
| Arsenic | 23.3 ✓ | 0.03 | 1.44E-06 | 4.21E-06 | 1.50E+00 | 3.00E-04 | 2.2E-06 | 11.3% | 1.4E-02 | 40.0% |
| Barium | 154 ✓ | NA | NA | NA | NA | 4.90E-03 | NA | NA | NA | NA |
| Cadmium | 17.5 ✓ | 0.01 | 3.61E-07 | 1.05E-06 | NA | 5.00E-05 | NA | NA | 2.1E-02 | 60.0% |
| Chromium (total) | 374 ✓ | NA | NA | NA | NA | 7.50E-05 | NA | NA | NA | NA |
| Mercury | 2.2 ✓ | NA | NA | NA | NA | 2.10E-05 | NA | NA | NA | NA |
| Vanadium | 97.2 ✓ | NA | NA | NA | NA | 1.80E-04 | NA | NA | NA | NA |
| Zinc | 2550 ✓ | NA | NA | NA | NA | 3.00E-01 | NA | NA | NA | NA |
| TEQ-Dioxins/Furans | 0.00064 ✓ | 0.03 | 3.97E-11 | 1.16E-10 | 1.50E+05 | NA | 5.9E-06 | 31.1% | NA | NA |
| | | | | | | **Total** | **1.9E-05** | **100.0%** | **3.5E-02** | **100.0%** |

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: AREA F, SELBY POND
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: FREQUENT RECREATIONAL USER - ADULT - RME
MEDIA: SEDIMENT/WETLAND MATERIAL
DATE: FEBRUARY 10, 2000

| | Lifetime Cancer Risk | | | | | Hazard Index | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Chemical | Incidental Ingestion | Dermal Contact | Inhalation | Total Risk | Percent Risk | Incidental Ingestion | Dermal Contact | Inhalation | Total HI | Percent HI |
| Benzo(a)anthracene | 1.7E-07 | 3.7E-07 | NA | 5.4E-07 | 1.4% | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 4.0E-06 | 8.8E-06 | NA | 1.3E-05 | 32.0% | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | 2.5E-07 | 5.5E-07 | NA | 8.0E-07 | 2.0% | NA | NA | NA | NA | NA |
| Dibenzo(a,h)anthracene | 4.6E-07 | 1.0E-06 | NA | 1.5E-06 | 3.7% | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 1.1E-07 | 2.5E-07 | NA | 3.7E-07 | 0.9% | NA | NA | NA | NA | NA |
| Arsenic | 4.2E-06 | 2.2E-06 | NA | 6.4E-06 | 16.0% | 2.7E-02 | 1.4E-02 | NA | 4.1E-02 | 33.4% |
| Barium | NA | NA | NA | NA | NA | 7.7E-04 | NA | NA | 7.7E-04 | 0.6% |
| Cadmium | NA | NA | NA | NA | NA | 6.2E-03 | 2.1E-02 | NA | 2.7E-02 | 22.0% |
| Chromium (total) | NA | NA | NA | NA | NA | 4.4E-02 | NA | NA | 4.4E-02 | 35.5% |
| Mercury | NA | NA | NA | NA | NA | 2.6E-03 | NA | NA | 2.6E-03 | 2.1% |
| Vanadium | NA | NA | NA | NA | NA | 4.9E-03 | NA | NA | 4.9E-03 | 4.0% |
| Zinc | NA | NA | NA | NA | NA | 3.0E-03 | NA | NA | 3.0E-03 | 2.4% |
| TEQ-Dioxins/Furans | 1.2E-05 | 5.9E-06 | NA | 1.8E-05 | 44.0% | NA | NA | NA | NA | NA |
| **Total** | **2.1E-05** | **1.9E-05** | **NA** | **4.0E-05** | **100%** | **8.9E-02** | **3.5E-02** | **NA** | **1.2E-01** | **100%** |

**RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**

**SITE NAME: AREA F, SELBY POND**
**LOCATION: FERRY CREEK, STRATFORD, CT**
**EXPOSURE SCENARIO: FREQUENT RECREATIONAL USER - ADULT - CTE**
**MEDIA: SEDIMENT/WETLAND MATERIAL**
**DATE: FEBRUARY 10, 2000**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = \frac{Cs \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$

| WHERE: | | | |
|---|---|---|---|
| | Cs = : | | Concentration in soil (mg/kg) |
| | IR = : | 50 | Soil Ingestion Rate (mg/day) |
| | CF = : | 1.0E-06 | Conversion Factor (kg/mg) |
| | FI = : | 1 | Fraction from contaminated source (unitless) |
| | EF = : | 90 | Exposure Frequency (days/year) |
| | ED = : | 7 | Exposure Duration (years) |
| | BW = : | 70 | Body Weight (kg) |
| | ATc = : | 25,550 | Averaging time for carcinogenic exposures (days) |
| | ATn = : | 2,555 | Averaging time for noncarcinogenic exposures (days) |

| | | |
|---|---|---|
| Unit Dose | | |
| Lifetime Chronic Daily Int: | 1.8E-08 | kg-soil/kg-wt/day |
| Chronic Daily Intake = : | 1.8E-07 | kg-soil/kg-wt/day |

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: AREA F, SELBY POND
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: FREQUENT RECREATIONAL USER - ADULT - CTE
MEDIA: SEDIMENT/WETLAND MATERIAL
DATE: FEBRUARY 10, 2000

| CHEMICAL | Cs (mg/kg) | Lifetime Chronic Daily Intake (mg/kg/day) | Chronic Daily Intake (mg/kg/day) | Cancer Slope Factor $(mg/kg/day)^{-1}$ | Reference Dose (mg/kg/day) | Lifetime Cancer Risk | Percent Cancer Risk | Hazard Quotient | Percent Hazard Quotient |
|---|---|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 0.84 | 1.5E-08 | 1.5E-07 | 7.30E-01 | NA | 1.1E-08 | 1.6% | NA | NA |
| Benzo(a)pyrene | 1.2 | 2.1E-08 | 2.1E-07 | 7.30E+00 | NA | 1.5E-07 | 22.3% | NA | NA |
| Benzo(b)fluoranthene | 1.1 | 1.9E-08 | 1.9E-07 | 7.30E-01 | NA | 1.4E-08 | 2.0% | NA | NA |
| Dibenzo(a,h)anthracene | 0.38 | 6.7E-09 | 6.7E-08 | 7.30E+00 | NA | 4.9E-08 | 7.1% | NA | NA |
| Indeno(1,2,3-cd)pyrene | 0.63 | 1.1E-08 | 1.1E-07 | 7.30E-01 | NA | 8.1E-09 | 1.2% | NA | NA |
| Arsenic | 7.8 | 1.4E-07 | 1.4E-06 | 1.50E+00 | 3.00E-04 | 2.1E-07 | 29.8% | 4.6E-03 | 37.4% |
| Barium | 39.6 | 7.0E-07 | 7.0E-06 | NA | 7.00E-02 | NA | NA | 1.0E-04 | 0.8% |
| Cadmium | 4.3 | 7.6E-08 | 7.6E-07 | NA | 1.00E-03 | NA | NA | 7.6E-04 | 6.2% |
| Chromium (total) | 90.4 | 1.6E-06 | 1.6E-05 | NA | 3.00E-03 | NA | NA | 5.3E-03 | 43.3% |
| Mercury | 0.77 | 1.4E-08 | 1.4E-07 | NA | 3.00E-03 | NA | NA | 4.5E-05 | 0.4% |
| Vanadium | 43.9 | 7.7E-07 | 7.7E-06 | NA | 7.00E-03 | NA | NA | 1.1E-03 | 9.0% |
| Zinc | 607 | 1.1E-05 | 1.1E-04 | NA | 3.00E-01 | NA | NA | 3.6E-04 | 2.9% |
| TEQ-Dioxins/Furans | 0.000094 | 1.7E-12 | 1.7E-11 | 1.50E+05 | NA | 2.5E-07 | 36.0% | NA | NA |
| | | | | | Total | 6.9E-07 | 100% | 1.2E-02 | 100% |

**RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**

**SITE NAME: AREA F, SELBY POND**
**LOCATION: FERRY CREEK, STRATFORD, CT**
**EXPOSURE SCENARIO: FREQUENT RECREATIONAL USER - ADULT - CTE**
**MEDIA: SEDIMENT/WETLAND MATERIAL**
**DATE: FEBRUARY 10, 2000**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:

$$\text{Absorbed Dose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

| Where: | | | |
|---|---|---|---|
| | Cs = : | | Concentration in soil (mg/kg) |
| | CF = : | 1.0E-06 | Conversion factor (kg/mg) |
| | SA = : | ✓5,700 | Skin surface available for contact ($cm^2$/event) |
| | AF = : | ✓0.04 | Soil to skin adherence factor (mg/$cm^2$) |
| | ABS = : | | Absorption factor (unitless) |
| | EF = : | ✓90 | Exposure frequency (events/year) |
| | ED = : | 7 | Exposure duration (years) |
| | BW = : | 70 | Body weight (kg) |
| | ATc = : | 25,550 | Averaging time for carcinogenic exposures (days) |
| | ATn = : | 2,555 | Averaging time for noncarcinogenic exposures (days) |

Unit Dose
Lifetime Chronic Daily Intake = 8.0E-08 kg-soil/kg-wt/day
Chronic Daily Intake = : 8.0E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: AREA F, SELBY POND
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: FREQUENT RECREATIONAL USER - ADULT - CTE
MEDIA: SEDIMENT/WETLAND MATERIAL
DATE: FEBRUARY 10, 2000

| CHEMICAL | Cs (mg/kg) | ABS (unitless) | Lifetime Chronic Daily Intake (mg/kg/day) | Chronic Daily Intake (mg/kg/day) | Cancer Slope Factor $(mg/kg/day)^{-1}$ | Reference Dose (mg/kg/day) | Lifetime Cancer Risk | Percent Cancer Risk | Hazard Quotient | Percent Hazard Quotient |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 0.84 ✓ | 0.13 | 8.77E-09 | 8.77E-08 | 7.30E-01 | NA | 6.4E-09 | 3.2% | NA | NA |
| Benzo(a)pyrene | 1.2 ✓ | 0.13 | 1.25E-08 | 1.25E-07 | 7.30E+00 | NA | 9.1E-08 | 45.2% | NA | NA |
| Benzo(b)fluoranthene | 1.1 ✓ | 0.13 | 1.15E-08 | 1.15E-07 | 7.30E-01 | NA | 8.4E-09 | 4.1% | NA | NA |
| Dibenzo(a,h)anthracene | 0.38 ✓ | 0.13 | 3.97E-09 | 3.97E-08 | 7.30E+00 | NA | 2.9E-08 | 14.3% | NA | NA |
| Indeno(1,2,3-cd)pyrene | 0.63 ✓ | 0.13 | 6.58E-09 | 6.58E-08 | 7.30E-01 | NA | 4.8E-09 | 2.4% | NA | NA |
| Arsenic | 7.8 ✓ | 0.03 | 1.88E-08 | 1.88E-07 | 1.50E+00 | 3.00E-04 | 2.8E-08 | 13.9% | 6.3E-04 | 47.6% |
| Barium | 39.6 ✓ | NA | NA | NA | NA | 4.90E-03 | NA | NA | NA | NA |
| Cadmium | 4.3 ✓ | 0.01 | 3.45E-09 | 3.45E-08 | NA | 5.00E-05 | NA | NA | 6.9E-04 | 52.4% |
| Chromium (total) | 90.4 ✓ | NA | NA | NA | NA | 7.50E-05 | NA | NA | NA | NA |
| Mercury | 0.77 ✓ | NA | NA | NA | NA | 2.10E-05 | NA | NA | NA | NA |
| Vanadium | 43.9 ✓ | NA | NA | NA | NA | 1.80E-04 | NA | NA | NA | NA |
| Zinc | 607 ✓ | NA | NA | NA | NA | 3.00E-01 | NA | NA | NA | NA |
| TEQ-Dioxins/Furans | 0.000094 ✓ | 0.03 | 2.26E-13 | 2.26E-12 | 1.50E+05 | NA | 3.4E-08 | 16.8% | NA | NA |
| | | | | | | Total | 2.0E-07 | 100.0% | 1.3E-03 | 100.0% |

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: AREA F, SELBY POND
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: FREQUENT RECREATIONAL USER - ADULT - CTE
MEDIA: SEDIMENT/WETLAND MATERIAL
DATE: FEBRUARY 10, 2000

| | Lifetime Cancer Risk | | | | | Hazard Index | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Chemical | Incidental Ingestion | Dermal Contact | Inhalation | Total Risk | Percent Risk | Incidental Ingestion | Dermal Contact | Inhalation | Total HI | Percent HI |
| Benzo(a)anthracene | 1.1E-08 | 2.2E-08 | NA | 3.3E-08 | 2.4% | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 1.5E-07 | 3.1E-07 | NA | 4.6E-07 | 33.7% | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | 1.4E-08 | 2.8E-08 | NA | 4.3E-08 | 3.1% | NA | NA | NA | NA | NA |
| Dibenzo(a,h)anthracene | 4.9E-08 | 9.8E-08 | NA | 1.5E-07 | 10.7% | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 8.1E-09 | 1.6E-08 | NA | 2.4E-08 | 1.8% | NA | NA | NA | NA | NA |
| Arsenic | 2.1E-07 | 9.6E-08 | NA | 3.0E-07 | 21.9% | 4.6E-03 | 7.4E-03 | NA | 1.2E-02 | 43.1% |
| Barium | NA | NA | NA | NA | NA | 1.0E-04 | NA | NA | 1.0E-04 | 0.4% |
| Cadmium | NA | NA | NA | NA | NA | 7.6E-04 | 8.2E-03 | NA | 9.0E-03 | 32.1% |
| Chromium (total) | NA | NA | NA | NA | NA | 5.3E-03 | NA | NA | 5.3E-03 | 19.0% |
| Mercury | NA | NA | NA | NA | NA | 4.5E-05 | NA | NA | 4.5E-05 | 0.2% |
| Vanadium | NA | NA | NA | NA | NA | 1.1E-03 | NA | NA | 1.1E-03 | 4.0% |
| Zinc | NA | NA | NA | NA | NA | 3.6E-04 | NA | NA | 3.6E-04 | 1.3% |
| TEQ-Dioxins/Furans | 2.5E-07 | 1.2E-07 | NA | 3.6E-07 | 26.4% | NA | NA | NA | NA | NA |
| **Total** | **6.9E-07** | **6.9E-07** | **NA** | **1.4E-06** | **100%** | **1.2E-02** | **1.6E-02** | **NA** | **2.8E-02** | **100%** |

**RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**

**SITE NAME: AREA F, SELBY POND**
**LOCATION: FERRY CREEK, STRATFORD, CT**
**EXPOSURE SCENARIO: FREQUENT RECREATIONAL USER - CHILD - RME**
**MEDIA: SEDIMENT/WETLAND MATERIAL**
**DATE: FEBRUARY 10, 2000**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = \frac{Cs \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$

| WHERE: | | | |
|---|---|---|---|
| | Cs = : | | Concentration in soil (mg/kg) |
| | IR = : | 200 | Soil Ingestion Rate (mg/day) |
| | CF = : | 1.0E-06 | Conversion Factor (kg/mg) |
| | FI = : | 1 | Fraction from contaminated source (unitless) |
| | EF = : | 90 | Exposure Frequency (days/year) |
| | ED = : | 6 | Exposure Duration (years) |
| | BW = : | 15 | Body Weight (kg) |
| | ATc = : | 25,550 | Averaging time for carcinogenic exposures (days) |
| | ATn = : | 2,190 | Averaging time for noncarcinogenic exposures (days) |

| | | |
|---|---|---|
| Unit Dose | | |
| Lifetime Chronic Daily Int | 2.8E-07 | kg-soil/kg-wt/day |
| Chronic Daily Intake = : | 3.3E-06 | kg-soil/kg-wt/day |

**RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)**

**SITE NAME:** AREA F, SELBY POND
**LOCATION:** FERRY CREEK, STRATFORD, CT
**EXPOSURE SCENARIO:** FREQUENT RECREATIONAL USER - CHILD - RME
**MEDIA:** SEDIMENT/WETLAND MATERIAL
**DATE:** FEBRUARY 10, 2000

| CHEMICAL | Cs (mg/kg) | Lifetime Chronic Daily Intake (mg/kg/day) | Chronic Daily Intake (mg/kg/day) | Cancer Slope Factor $(mg/kg/day)^{-1}$ | Reference Dose (mg/kg/day) | Lifetime Cancer Risk | Percent Cancer Risk | Hazard Quotient | Percent Hazard Quotient |
|---|---|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 1.9 | 5.4E-07 | 6.2E-06 | 7.30E-01 | NA | 3.9E-07 | 0.8% | NA | NA |
| Benzo(a)pyrene | 4.5 | 1.3E-06 | 1.5E-05 | 7.30E+00 | NA | 9.3E-06 | 19.1% | NA | NA |
| Benzo(b)fluoranthene | 2.8 | 7.9E-07 | 9.2E-06 | 7.30E-01 | NA | 5.8E-07 | 1.2% | NA | NA |
| Dibenzo(a,h)anthracene | 0.52 | 1.5E-07 | 1.7E-06 | 7.30E+00 | NA | 1.1E-06 | 2.2% | NA | NA |
| Indeno(1,2,3-cd)pyrene | 1.3 | 3.7E-07 | 4.3E-06 | 7.30E-01 | NA | 2.7E-07 | 0.6% | NA | NA |
| Arsenic | 23.3 | 6.6E-06 | 7.7E-05 | 1.50E+00 | 3.00E-04 | 9.8E-06 | 20.3% | 2.6E-01 | 55.8% |
| Barium | 154 | 4.3E-05 | 5.1E-04 | NA | 7.00E-02 | NA | NA | 7.2E-03 | 1.6% |
| Cadmium | 17.5 | 4.9E-06 | 5.8E-05 | NA | 1.00E-03 | NA | NA | 5.8E-02 | 12.6% |
| Chromium (total) | 374 | 1.1E-04 | 1.2E-03 | NA | 2.00E-02 | NA | NA | 6.1E-02 | 13.4% |
| Mercury | 2.2 | 6.2E-07 | 7.2E-06 | NA | 3.00E-03 | NA | NA | 2.4E-03 | 0.5% |
| Vanadium | 97.2 | 2.7E-05 | 3.2E-04 | NA | 7.00E-03 | NA | NA | 4.6E-02 | 10.0% |
| Zinc | 2550 | 7.2E-04 | 8.4E-03 | NA | 3.00E-01 | NA | NA | 2.8E-02 | 6.1% |
| TEQ-Dioxins/Furans | 0.00064 | 1.8E-10 | 2.1E-09 | 1.50E+05 | NA | 2.7E-05 | 55.8% | NA | NA |
| | | | | | **Total** | **4.8E-05** | **100%** | **4.6E-01** | **100%** |

**RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**

**SITE NAME: AREA F, SELBY POND**
**LOCATION: FERRY CREEK, STRATFORD, CT**
**EXPOSURE SCENARIO: FREQUENT RECREATIONAL USER - CHILD - RME**
**MEDIA: SEDIMENT/WETLAND MATERIAL**
**DATE: FEBRUARY 10, 2000**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:

$$\text{Absorbed Dose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

| Where: | | | |
|---|---|---|---|
| | Cs = : | | Concentration in soil (mg/kg) |
| | CF = : | 1.0E-06 | Conversion factor (kg/mg) |
| | SA = : | 2,900 | Skin surface available for contact ($cm^2$/event) |
| | AF = : | 1.0 | Soil to skin adherence factor ($mg/cm^2$) |
| | ABS = : | | Absorption factor (unitless) |
| | EF = : | 90 | Exposure frequency (events/year) |
| | ED = : | 6 | Exposure duration (years) |
| | BW = : | 15 | Body weight (kg) |
| | ATc = : | 25,550 | Averaging time for carcinogenic exposures (days) |
| | ATn = : | 2,190 | Averaging time for noncarcinogenic exposures (days) |

Unit Dose
Lifetime Chronic Daily Intake = 4.1E-06 kg-soil/kg-wt/day
Chronic Daily Intake = : 4.8E-05 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: AREA F, SELBY POND
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: FREQUENT RECREATIONAL USER - CHILD - RME
MEDIA: SEDIMENT/WETLAND MATERIAL
DATE: FEBRUARY 10, 2000

| CHEMICAL | Cs (mg/kg) | ABS (unitless) | Lifetime Chronic Daily Intake (mg/kg/day) | Chronic Daily Intake (mg/kg/day) | Cancer Slope Factor $(mg/kg/day)^{-1}$ | Reference Dose (mg/kg/day) | Lifetime Cancer Risk | Percent Cancer Risk | Hazard Quotient | Percent Hazard Quotient |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 1.9 | 0.13 | 1.01E-06 | 1.18E-05 | 7.30E-01 | NA | 7.4E-07 | 1.9% | NA | NA |
| Benzo(a)pyrene | 4.5 | 0.13 | 2.39E-06 | 2.79E-05 | 7.30E+00 | NA | 1.7E-05 | 46.1% | NA | NA |
| Benzo(b)fluoranthene | 2.8 | 0.13 | 1.49E-06 | 1.74E-05 | 7.30E-01 | NA | 1.1E-06 | 2.9% | NA | NA |
| Dibenzo(a,h)anthracene | 0.52 | 0.13 | 2.76E-07 | 3.22E-06 | 7.30E+00 | NA | 2.0E-06 | 5.3% | NA | NA |
| Indeno(1,2,3-cd)pyrene | 1.3 | 0.13 | 6.91E-07 | 8.06E-06 | 7.30E-01 | NA | 5.0E-07 | 1.3% | NA | NA |
| Arsenic | 23.3 | 0.03 | 2.86E-06 | 3.33E-05 | 1.50E+00 | 3.00E-04 | 4.3E-06 | 11.3% | 1.1E-01 | 40.0% |
| Barium | 154 | NA | NA | NA | NA | 4.90E-03 | NA | NA | NA | NA |
| Cadmium | 17.5 | 0.01 | 7.15E-07 | 8.34E-06 | NA | 5.00E-05 | NA | NA | 1.7E-01 | 60.0% |
| Chromium (total) | 374 | NA | NA | NA | NA | 5.00E-04 | NA | NA | NA | NA |
| Mercury | 2.2 | NA | NA | NA | NA | 2.10E-04 | NA | NA | NA | NA |
| Vanadium | 97.2 | NA | NA | NA | NA | 1.80E-04 | NA | NA | NA | NA |
| Zinc | 2550 | NA | NA | NA | NA | 3.00E-01 | NA | NA | NA | NA |
| TEQ-Dioxins/Furans | 0.00064 | 0.03 | 7.85E-11 | 9.15E-10 | 1.50E+05 | NA | 1.2E-05 | 31.1% | NA | NA |
| | | | | | | Total | 3.8E-05 | 100.0% | 2.8E-01 | 100.0% |

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: AREA F, SELBY POND
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: FREQUENT RECREATIONAL USER - CHILD - RME
MEDIA: SEDIMENT/WETLAND MATERIAL
DATE: FEBRUARY 10, 2000

| | Lifetime Cancer Risk | | | | | Hazard Index | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Chemical | Incidental Ingestion | Dermal Contact | Inhalation | Total Risk | Percent Risk | Incidental Ingestion | Dermal Contact | Inhalation | Total HI | Percent HI |
| Benzo(a)anthracene | 3.9E-07 | 7.4E-07 | NA | 1.1E-06 | 1.3% | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 9.3E-06 | 1.7E-05 | NA | 2.7E-05 | 30.9% | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | 5.8E-07 | 1.1E-06 | NA | 1.7E-06 | 1.9% | NA | NA | NA | NA | NA |
| Dibenzo(a,h)anthracene | 1.1E-06 | 2.0E-06 | NA | 3.1E-06 | 3.6% | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 2.7E-07 | 5.0E-07 | NA | 7.7E-07 | 0.9% | NA | NA | NA | NA | NA |
| Arsenic | 9.8E-06 | 4.3E-06 | NA | 1.4E-05 | 16.4% | 2.6E-01 | 1.1E-01 | NA | 3.7E-01 | 49.8% |
| Barium | NA | NA | NA | NA | NA | 7.2E-03 | NA | NA | 7.2E-03 | 1.0% |
| Cadmium | NA | NA | NA | NA | NA | 5.8E-02 | 1.7E-01 | NA | 2.2E-01 | 30.5% |
| Chromium (total) | NA | NA | NA | NA | NA | 6.1E-02 | NA | NA | 6.1E-02 | 8.4% |
| Mercury | NA | NA | NA | NA | NA | 2.4E-03 | NA | NA | 2.4E-03 | 0.3% |
| Vanadium | NA | NA | NA | NA | NA | 4.6E-02 | NA | NA | 4.6E-02 | 6.2% |
| Zinc | NA | NA | NA | NA | NA | 2.8E-02 | NA | NA | 2.8E-02 | 3.8% |
| TEQ-Dioxins/Furans | 2.7E-05 | 1.2E-05 | NA | 3.9E-05 | 45.0% | NA | NA | NA | NA | NA |
| **Total** | **4.8E-05** | **3.8E-05** | **NA** | **8.6E-05** | **100%** | **4.6E-01** | **2.8E-01** | **NA** | **7.4E-01** | **100%** |

**RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL**

**SITE NAME: AREA F, SELBY POND**
**LOCATION: FERRY CREEK, STRATFORD, CT**
**EXPOSURE SCENARIO: FREQUENT RECREATIONAL USER - CHILD - CTE**
**MEDIA: SEDIMENT/WETLAND MATERIAL**
**DATE: FEBRUARY 10, 2000**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $\text{Intake} = \frac{Cs \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$

| WHERE: | | | |
|---|---|---|---|
| | Cs = : | | Concentration in soil (mg/kg) |
| | IR = : | 100 | Soil Ingestion Rate (mg/day) |
| | CF = : | 1.0E-06 | Conversion Factor (kg/mg) |
| | FI = : | 1 | Fraction from contaminated source (unitless) |
| | EF = : | 90 | Exposure Frequency (days/year) |
| | ED = : | 2 | Exposure Duration (years) |
| | BW = : | 15 | Body Weight (kg) |
| | ATc = : | 25,550 | Averaging time for carcinogenic exposures (days) |
| | ATn = : | 730 | Averaging time for noncarcinogenic exposures (days) |

| | | |
|---|---|---|
| Unit Dose | | |
| Lifetime Chronic Daily Int | 4.7E-08 | kg-soil/kg-wt/day |
| Chronic Daily Intake = : | 1.6E-06 | kg-soil/kg-wt/day |

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: AREA F, SELBY POND
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: FREQUENT RECREATIONAL USER - CHILD - CTE
MEDIA: SEDIMENT/WETLAND MATERIAL
DATE: FEBRUARY 10, 2000

| CHEMICAL | Cs (mg/kg) | Lifetime Chronic Daily Intake (mg/kg/day) | Chronic Daily Intake (mg/kg/day) | Cancer Slope Factor $(mg/kg/day)^{-1}$ | Reference Dose (mg/kg/day) | Lifetime Cancer Risk | Percent Cancer Risk | Hazard Quotient | Percent Hazard Quotient |
|---|---|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 0.84 | 3.9E-08 | 1.4E-06 | 7.30E-01 | NA | 2.9E-08 | 1.6% | NA | NA |
| Benzo(a)pyrene | 1.2 | 5.6E-08 | 2.0E-06 | 7.30E+00 | NA | 4.1E-07 | 22.3% | NA | NA |
| Benzo(b)fluoranthene | 1.1 | 5.2E-08 | 1.8E-06 | 7.30E-01 | NA | 3.8E-08 | 2.0% | NA | NA |
| Dibenzo(a,h)anthracene | 0.38 | 1.8E-08 | 6.2E-07 | 7.30E+00 | NA | 1.3E-07 | 7.1% | NA | NA |
| Indeno(1,2,3-cd)pyrene | 0.63 | 3.0E-08 | 1.0E-06 | 7.30E-01 | NA | 2.2E-08 | 1.2% | NA | NA |
| Arsenic | 7.8 | 3.7E-07 | 1.3E-05 | 1.50E+00 | 3.00E-04 | 5.5E-07 | 29.8% | 4.3E-02 | 59.2% |
| Barium | 39.6 | 1.9E-06 | 6.5E-05 | NA | 7.00E-02 | NA | NA | 9.3E-04 | 1.3% |
| Cadmium | 4.3 | 2.0E-07 | 7.1E-06 | NA | 1.00E-03 | NA | NA | 7.1E-03 | 9.8% |
| Chromium (total) | 90.4 | 4.2E-06 | 1.5E-04 | NA | 2.00E-02 | NA | NA | 7.4E-03 | 10.3% |
| Mercury | 0.77 | 3.6E-08 | 1.3E-06 | NA | 3.00E-03 | NA | NA | 4.2E-04 | 0.6% |
| Vanadium | 43.9 | 2.1E-06 | 7.2E-05 | NA | 7.00E-03 | NA | NA | 1.0E-02 | 14.3% |
| Zinc | 607 | 2.9E-05 | 1.0E-03 | NA | 3.00E-01 | NA | NA | 3.3E-03 | 4.6% |
| TEQ-Dioxins/Furans | 0.000094 | 4.4E-12 | 1.5E-10 | 1.50E+05 | NA | 6.6E-07 | 36.0% | NA | NA |
| | | | | | **Total** | **1.8E-06** | **100%** | **7.2E-02** | **100%** |

**RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL**

**SITE NAME: AREA F, SELBY POND**
**LOCATION: FERRY CREEK, STRATFORD, CT**
**EXPOSURE SCENARIO: FREQUENT RECREATIONAL USER - CHILD - CTE**
**MEDIA: SEDIMENT/WETLAND MATERIAL**
**DATE: FEBRUARY 10, 2000**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:

$$\text{Absorbed Dose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

| Where: | | | |
|---|---|---|---|
| | Cs = : | | Concentration in soil (mg/kg) |
| | CF = : | 1.0E-06 | Conversion factor (kg/mg) |
| | SA = : | 2,900 | Skin surface available for contact ($cm^2$/event) |
| | AF = : | 0.20 | Soil to skin adherence factor ($mg/cm^2$) |
| | ABS = : | | Absorption factor (unitless) |
| | EF = : | 90 | Exposure frequency (events/year) |
| | ED = : | 2 | Exposure duration (years) |
| | BW = : | 15 | Body weight (kg) |
| | ATc = : | 25,550 | Averaging time for carcinogenic exposures (days) |
| | ATn = : | 730 | Averaging time for noncarcinogenic exposures (days) |

Unit Dose
Lifetime Chronic Daily Intake = 2.7E-07 kg-soil/kg-wt/day
Chronic Daily Intake = : 9.5E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: AREA F, SELBY POND
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: FREQUENT RECREATIONAL USER - CHILD - CTE
MEDIA: SEDIMENT/WETLAND MATERIAL
DATE: FEBRUARY 10, 2000

| CHEMICAL | Cs (mg/kg) | ABS (unitless) | Lifetime Chronic Daily Intake (mg/kg/day) | Chronic Daily Intake (mg/kg/day) | Cancer Slope Factor $(mg/kg/day)^{-1}$ | Reference Dose (mg/kg/day) | Lifetime Cancer Risk | Percent Cancer Risk | Hazard Quotient | Percent Hazard Quotient |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 0.84 | 0.13 | 2.97E-08 | 1.04E-06 | 7.30E-01 | NA | 2.2E-08 | 3.2% | NA | NA |
| Benzo(a)pyrene | 1.2 | 0.13 | 4.25E-08 | 1.49E-06 | 7.30E+00 | NA | 3.1E-07 | 45.2% | NA | NA |
| Benzo(b)fluoranthene | 1.1 | 0.13 | 3.90E-08 | 1.36E-06 | 7.30E-01 | NA | 2.8E-08 | 4.1% | NA | NA |
| Dibenzo(a,h)anthracene | 0.38 | 0.13 | 1.35E-08 | 4.71E-07 | 7.30E+00 | NA | 9.8E-08 | 14.3% | NA | NA |
| Indeno(1,2,3-cd)pyrene | 0.63 | 0.13 | 2.23E-08 | 7.81E-07 | 7.30E-01 | NA | 1.6E-08 | 2.4% | NA | NA |
| Arsenic | 7.8 | 0.03 | 6.37E-08 | 2.23E-06 | 1.50E+00 | 3.00E-04 | 9.6E-08 | 13.9% | 7.4E-03 | 47.6% |
| Barium | 39.6 | NA | NA | NA | NA | 4.90E-03 | NA | NA | NA | NA |
| Cadmium | 4.3 | 0.01 | 1.17E-08 | 4.10E-07 | NA | 5.00E-05 | NA | NA | 8.2E-03 | 52.4% |
| Chromium (total) | 90.4 | NA | NA | NA | NA | 5.00E-04 | NA | NA | NA | NA |
| Mercury | 0.77 | NA | NA | NA | NA | 2.10E-04 | NA | NA | NA | NA |
| Vanadium | 43.9 | NA | NA | NA | NA | 1.80E-04 | NA | NA | NA | NA |
| Zinc | 607 | NA | NA | NA | NA | 3.00E-01 | NA | NA | NA | NA |
| TEQ-Dioxins/Furans | 0.000094 | 0.03 | 7.68E-13 | 2.69E-11 | 1.50E+05 | NA | 1.2E-07 | 16.8% | NA | NA |
| | | | | | | Total | 6.9E-07 | 100.0% | 1.6E-02 | 100.0% |

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: AREA F, SELBY POND
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: FREQUENT RECREATIONAL USER - CHILD - CTE
MEDIA: SEDIMENT/WETLAND MATERIAL
DATE: FEBRUARY 10, 2000

| | Lifetime Cancer Risk | | | | | Hazard Index | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Chemical | Incidental Ingestion | Dermal Contact | Inhalation | Total Risk | Percent Risk | Incidental Ingestion | Dermal Contact | Inhalation | Total HI | Percent HI |
| Benzo(a)anthracene | 2.9E-08 | 2.2E-08 | NA | 5.1E-08 | 2.0% | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 4.1E-07 | 3.1E-07 | NA | 7.2E-07 | 28.6% | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | 3.8E-08 | 2.8E-08 | NA | 6.6E-08 | 2.6% | NA | NA | NA | NA | NA |
| Dibenzo(a,h)anthracene | 1.3E-07 | 9.8E-08 | NA | 2.3E-07 | 9.0% | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 2.2E-08 | 1.6E-08 | NA | 3.8E-08 | 1.5% | NA | NA | NA | NA | NA |
| Arsenic | 5.5E-07 | 9.6E-08 | NA | 6.5E-07 | 25.5% | 4.3E-02 | 7.4E-03 | NA | 5.0E-02 | 57.1% |
| Barium | NA | NA | NA | NA | NA | 9.3E-04 | NA | NA | 9.3E-04 | 1.1% |
| Cadmium | NA | NA | NA | NA | NA | 7.1E-03 | 8.2E-03 | NA | 1.5E-02 | 17.4% |
| Chromium (total) | NA | NA | NA | NA | NA | 7.4E-03 | NA | NA | 7.4E-03 | 8.5% |
| Mercury | NA | NA | NA | NA | NA | 4.2E-04 | NA | NA | 4.2E-04 | 0.5% |
| Vanadium | NA | NA | NA | NA | NA | 1.0E-02 | NA | NA | 1.0E-02 | 11.7% |
| Zinc | NA | NA | NA | NA | NA | 3.3E-03 | NA | NA | 3.3E-03 | 3.8% |
| TEQ-Dioxins/Furans | 6.6E-07 | 1.2E-07 | NA | 7.8E-07 | 30.8% | NA | NA | NA | NA | NA |
| **Total** | **1.8E-06** | **6.9E-07** | **NA** | **2.5E-06** | **100%** | **7.2E-02** | **1.6E-02** | **NA** | **8.8E-02** | **100%** |

**RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER**

**SITE NAME: AREA F, SELBY POND**
**LOCATION: FERRY CREEK, STRATFORD, CT**
**EXPOSURE SCENARIO: FREQUENT RECREATIONAL USER - ADULT - RME**
**MEDIA: SURFACE WATER**
**DATE: JULY 20, 2000**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH WATER ARE CONSIDERED. ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATIONS:

$$\text{Absorbed Dose} = \frac{DAevent \times EV \times EF \times ED \times SA}{BW \times AT}$$

For Inorganics $DAevent = Kp \times Cw \times CF \times tevent$

For Organics If $tevent \le t^*$, then : $DAevent = 2 \times Kp \times Cw \times CF \times \sqrt{\frac{6 \times tau \times tevent}{\pi}}$

If $tevent > t^*$, then : $DAevent = Kp \times Cw \times CF \times \left[\frac{tevent}{1+B} + 2 \times tau \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right]$

| | | | |
|---|---|---|---|
| Where: | SA = : | 4,500 | Skin surface available for contact ($cm^2$) |
| | DAevent = : | | Chemical specific absorbed dose per event ($mg/cm^2$-event) |
| | EV = : | 1 | Event frequency (events/days) |
| | EF = : | 90 | Exposure frequency (days/year) |
| | ED = : | 24 | Exposure duration (years) |
| | BW = : | 70 | Body weight (kg) |
| | ATc = : | 25,550 | Averaging time for carcinogenic exposures (days) |
| | ATn = : | 8,760 | Averaging time for noncarcinogenic exposures (days) |
| | CF = : | 0.001 | Conversion Factor ($L/m^3$) |
| | Kp =: | | Chemical specific permeability coefficient (cm/hr) |
| | Cw = : | | Concentration of chemical in water (mg/L) |
| | tevent = : | 1 | duration of event (hr/event) |
| | tau = : | | Chemical specific lag time (hr) |
| | t* = : | | Chemical specific time it takes to reach steady state (hr) |
| | B = : | | Chemical specific dimensionless constant |
| | Dsc = : | | Effective diffusivity for chemical transfer through skin ($cm^2/hr$) |
| | b, c = : | | chemical specific constants |

Unit Dose

| | | |
|---|---|---|
| Lifetime Chronic Daily Intake = | 5.4E+00 | $cm^2$-event/(kg-day) |
| Chronic Daily Intake = : | 1.6E+01 | $cm^2$-event/(kg-day) |

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER (PAGE TWO)

SITE NAME: AREA F, SELBY POND
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: FREQUENT RECREATIONAL USER - ADULT - RME
MEDIA: SURFACE WATER
DATE: JULY 20, 2000

| CHEMICAL | Cw (mg/L) | Organic or Inorganic | Molecular Weight | Estimated Kp (cm/hr) | tau-event (hr) | B | b | c | Dsc ($cm^2$/hr) | t* (hr) | DAevent (mg/$cm^2$ - event) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 0.0044 | I | 121.57 | 1.00E-03 | 5.03E-01 | 4.24E-03 | 3.06E-01 | 3.36E-01 | 3.31E-07 | 1.21E+00 | 4.40E-09 |
| Arsenic | 0.0046 | I | 74.9 | 1.00E-03 | 2.76E-01 | 3.33E-03 | 3.05E-01 | 3.36E-01 | 6.03E-07 | 6.62E-01 | 4.60E-09 |
| Manganese | 0.149 | I | 54.94 | 1.00E-03 | 2.13E-01 | 2.85E-03 | 3.05E-01 | 3.35E-01 | 7.80E-07 | 5.12E-01 | 1.49E-07 |
| Thallium | 0.005 | I | 204.38 | 1.00E-03 | 1.46E+00 | 5.50E-03 | 3.07E-01 | 3.37E-01 | 1.14E-07 | 3.52E+00 | 5.00E-09 |

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER (PAGE THREE)

SITE NAME: AREA F, SELBY POND
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: FREQUENT RECREATIONAL USER - ADULT - RME
MEDIA: SURFACE WATER
DATE: JULY 20, 2000

| CHEMICAL | DAevent ($mg/cm^2$ - event) | Lifetime Chronic Daily Intake (mg/kg/day) | Chronic Daily Intake (mg/kg/day) | Cancer Slope Factor $(mg/kg/day)^{-1}$ | Reference Dose (mg/kg/day) | Lifetime Cancer Risk | Percent Cancer Risk | Hazard Quotient | Percent Hazard Quotient |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | 4.40E-09 | 2.39E-08 | 6.97E-08 | NA | 6.00E-05 | NA | NA | 1.2E-03 | 27.1% |
| Arsenic | 4.60E-09 | 2.50E-08 | 7.29E-08 | 1.50E+00 | 3.00E-04 | 3.7E-08 | 100.0% | 2.4E-04 | 5.7% |
| Manganese | 1.49E-07 | 8.10E-07 | 2.36E-06 | NA | 1.40E-03 | NA | NA | 1.7E-03 | 39.3% |
| Thallium | 5.00E-09 | 2.72E-08 | 7.93E-08 | NA | 6.60E-05 | NA | NA | 1.2E-03 | 28.0% |
| | | | | | Total | 3.7E-08 | 100.0% | 4.3E-03 | 100.0% |

**RISK ASSESSMENT SPREADSHEET - SUMMARY OF CANCER RISKS AND HAZARD INDICES**

**SITE NAME:** AREA F, SELBY POND
**LOCATION:** FERRY CREEK, STRATFORD, CT
**EXPOSURE SCENARIO:** FREQUENT RECREATIONAL USER - ADULT - RME
**MEDIA:** SURFACE WATER
**DATE:** JULY 20, 2000

| | Lifetime Cancer Risk | | | | | Hazard Index | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Chemical | Incidental Ingestion | Dermal Contact | Inhalation | Total Risk | Percent Risk | Incidental Ingestion | Dermal Contact | Inhalation | Total HI | Percent HI |
| Antimony | NA | NA | NA | NA | NA | NA | 1.2E-03 | NA | 1.2E-03 | 27.1% |
| Arsenic | NA | 3.7E-08 | NA | 3.7E-08 | 100.0% | NA | 2.4E-04 | NA | 2.4E-04 | 5.7% |
| Manganese | NA | NA | NA | NA | NA | NA | 1.7E-03 | NA | 1.7E-03 | 39.3% |
| Thallium | NA | NA | NA | NA | NA | NA | 1.2E-03 | NA | 1.2E-03 | 28.0% |
| **Total** | **NA** | **3.7E-08** | **NA** | **3.7E-08** | **100.0%** | **NA** | **4.3E-03** | **NA** | **4.3E-03** | **100.0%** |

**RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER**

**SITE NAME: AREA F, SELBY POND**
**LOCATION: FERRY CREEK, STRATFORD, CT**
**EXPOSURE SCENARIO: FREQUENT RECREATIONAL USER - ADULT - CTE**
**MEDIA: SURFACE WATER**
**DATE: JULY 20, 2000**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH WATER ARE CONSIDERED. ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATIONS:

$$\text{Absorbed Dose} = \frac{DAevent \times EV \times EF \times ED \times SA}{BW \times AT}$$

For Inorganics DAevent = Kp x Cw x CF x tevent

For Organics If tevent $\leq t^*$, then : $DAevent = 2 \times Kp \times Cw \times CF \times \sqrt{\frac{6 \times tau \times tevent}{\pi}}$

If tevent $> t^*$, then : $DAevent = Kp \times Cw \times CF \times \left[\frac{tevent}{1+B} + 2 \times tau \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right]$

| | | | |
|---|---|---|---|
| Where: | SA = : | 4,500 | Skin surface available for contact ($cm^2$) |
| | DAevent = : | | Chemical specific absorbed dose per event ($mg/cm^2$-event) |
| | EV = : | 1 | Event frequency (events/days) |
| | EF = : | 90 | Exposure frequency (days/year) |
| | ED = : | 7 | Exposure duration (years) |
| | BW = : | 70 | Body weight (kg) |
| | ATc = : | 25,550 | Averaging time for carcinogenic exposures (days) |
| | ATn = : | 2,555 | Averaging time for noncarcinogenic exposures (days) |
| | CF = : | 0.001 | Conversion Factor ($L/m^3$) |
| | Kp =: | | Chemical specific permeability coefficient (cm/hr) |
| | Cw = : | | Concentration of chemical in water (mg/L) |
| | tevent = : | 1 | duration of event (hr/event) |
| | tau = : | | Chemical specific lag time (hr) |
| | $t^*$ = : | | Chemical specific time it takes to reach steady state (hr) |
| | B = : | | Chemical specific dimensionless constant |
| | Dsc = : | | Effective diffusivity for chemical transfer through skin ($cm^2/hr$) |
| | b, c = : | | chemical specific constants |

Unit Dose

| | | |
|---|---|---|
| Lifetime Chronic Daily Intake = | 1.6E+00 | $cm^2$-event/(kg-day) |
| Chronic Daily Intake = : | 1.6E+01 | $cm^2$-event/(kg-day) |

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER (PAGE TWO)

SITE NAME: AREA F, SELBY POND
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: FREQUENT RECREATIONAL USER - ADULT - CTE
MEDIA: SURFACE WATER
DATE: JULY 20, 2000

| CHEMICAL | Cw (mg/L) | Organic or Inorganic | Molecular Weight | Estimated Kp (cm/hr) | tau-event (hr) | B | b | c | Dsc ($cm^2$/hr) | t* (hr) | DAevent (mg/$cm^2$ - event) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 0.0037 | I | 121.57 | 1.00E-03 | 5.03E-01 | 4.24E-03 | 3.06E-01 | 3.36E-01 | 3.31E-07 | 1.21E+00 | 3.70E-09 |
| Arsenic | 0.0046 | I | 74.9 | 1.00E-03 | 2.76E-01 | 3.33E-03 | 3.05E-01 | 3.36E-01 | 6.03E-07 | 6.62E-01 | 4.60E-09 |
| Manganese | 0.0577 | I | 54.94 | 1.00E-03 | 2.13E-01 | 2.85E-03 | 3.05E-01 | 3.35E-01 | 7.80E-07 | 5.12E-01 | 5.77E-08 |
| Thallium | 0.005 | I | 204.38 | 1.00E-03 | 1.46E+00 | 5.50E-03 | 3.07E-01 | 3.37E-01 | 1.14E-07 | 3.52E+00 | 5.00E-09 |

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER (PAGE THREE)

SITE NAME: AREA F, SELBY POND
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: FREQUENT RECREATIONAL USER - ADULT - CTE
MEDIA: SURFACE WATER
DATE: JULY 20, 2000

| CHEMICAL | DAevent ($mg/cm^2$ - event) | Lifetime Chronic Daily Intake (mg/kg/day) | Chronic Daily Intake (mg/kg/day) | Cancer Slope Factor $(mg/kg/day)^{-1}$ | Reference Dose (mg/kg/day) | Lifetime Cancer Risk | Percent Cancer Risk | Hazard Quotient | Percent Hazard Quotient |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | 3.70E-09 | 5.86E-09 | 5.86E-08 | NA | 6.00E-05 | NA | NA | 9.8E-04 | 31.8% |
| Arsenic | 4.60E-09 | 7.29E-09 | 7.29E-08 | 1.50E+00 | 3.00E-04 | 1.1E-08 | 100.0% | 2.4E-04 | 7.9% |
| Manganese | 5.77E-08 | 9.15E-08 | 9.15E-07 | NA | 1.40E-03 | NA | NA | 6.5E-04 | 21.2% |
| Thallium | 5.00E-09 | 7.93E-09 | 7.93E-08 | NA | 6.60E-05 | NA | NA | 1.2E-03 | 39.1% |
| | | | | | Total | 1.1E-08 | 100.0% | 3.1E-03 | 100.0% |

**RISK ASSESSMENT SPREADSHEET - SUMMARY OF CANCER RISKS AND HAZARD INDICES**

**SITE NAME:** AREA F, SELBY POND
**LOCATION:** FERRY CREEK, STRATFORD, CT
**EXPOSURE SCENARIO:** FREQUENT RECREATIONAL USER - ADULT - CTE
**MEDIA:** SURFACE WATER
**DATE:** JULY 20, 2000

| | Lifetime Cancer Risk | | | | | Hazard Index | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Chemical | Incidental Ingestion | Dermal Contact | Inhalation | Total Risk | Percent Risk | Incidental Ingestion | Dermal Contact | Inhalation | Total HI | Percent HI |
| Antimony | NA | NA | NA | NA | NA | NA | 9.8E-04 | NA | 9.8E-04 | 31.8% |
| Arsenic | NA | 1.1E-08 | NA | 1.1E-08 | 100.0% | NA | 2.4E-04 | NA | 2.4E-04 | 7.9% |
| Manganese | NA | NA | NA | NA | NA | NA | 6.5E-04 | NA | 6.5E-04 | 21.2% |
| Thallium | NA | NA | NA | NA | NA | NA | 1.2E-03 | NA | 1.2E-03 | 39.1% |
| **Total** | **NA** | **1.1E-08** | **NA** | **1.1E-08** | **100.0%** | **NA** | **3.1E-03** | **NA** | **3.1E-03** | **100.0%** |

**RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER**

**SITE NAME: AREA F, SELBY POND**
**LOCATION: FERRY CREEK, STRATFORD, CT**
**EXPOSURE SCENARIO: FREQUENT RECREATIONAL USER - CHILD - RME**
**MEDIA: SURFACE WATER**
**DATE: JULY 20, 2000**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH WATER ARE CONSIDERED. ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATIONS:

$$\text{Absorbed Dose} = \frac{DAevent \times EV \times EF \times ED \times SA}{BW \times AT}$$

For Inorganics $DAevent = Kp \times Cw \times CF \times tevent$

For Organics If $tevent \le t^*$, then : $DAevent = 2 \times Kp \times Cw \times CF \times \sqrt{\frac{6 \times tau \times tevent}{\pi}}$

If $tevent > t^*$, then : $DAevent = Kp \times Cw \times CF \times \left[\frac{tevent}{1+B} + 2 \times tau \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right]$

| | | | |
|---|---|---|---|
| Where: | SA = : | 1,900 | Skin surface available for contact ($cm^2$) |
| | DAevent = : | | Chemical specific absorbed dose per event ($mg/cm^2$-event) |
| | EV = : | 1 | Event frequency (events/days) |
| | EF = : | 90 | Exposure frequency (days/year) |
| | ED = : | 6 | Exposure duration (years) |
| | BW = : | 15 | Body weight (kg) |
| | ATc = : | 25,550 | Averaging time for carcinogenic exposures (days) |
| | ATn = : | 2,190 | Averaging time for noncarcinogenic exposures (days) |
| | CF = : | 0.001 | Conversion Factor ($L/m^3$) |
| | Kp =: | | Chemical specific permeability coefficient (cm/hr) |
| | Cw = : | | Concentration of chemical in water (mg/L) |
| | tevent = : | 1 | duration of event (hr/event) |
| | tau = : | | Chemical specific lag time (hr) |
| | t* = : | | Chemical specific time it takes to reach steady state (hr) |
| | B = : | | Chemical specific dimensionless constant |
| | Dsc = : | | Effective diffusivity for chemical transfer through skin ($cm^2/hr$) |
| | b, c = : | | chemical specific constants |

Unit Dose

| | | |
|---|---|---|
| Lifetime Chronic Daily Intake = | 2.7E+00 | $cm^2$-event/(kg-day) |
| Chronic Daily Intake = : | 3.1E+01 | $cm^2$-event/(kg-day) |

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER (PAGE TWO)

SITE NAME: AREA F, SELBY POND
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: FREQUENT RECREATIONAL USER - CHILD - RME
MEDIA: SURFACE WATER
DATE: JULY 20, 2000

| CHEMICAL | Cw (mg/L) | Organic or Inorganic | Molecular Weight | Estimated Kp (cm/hr) | tau-event (hr) | B | b | c | Dsc ($cm^2$/hr) | t* (hr) | DAevent (mg/$cm^2$ - event) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 0.0044 | I | 121.57 | 1.00E-03 | 5.03E-01 | 4.24E-03 | 3.06E-01 | 3.36E-01 | 3.31E-07 | 1.21E+00 | 4.40E-09 |
| Arsenic | 0.0046 | I | 74.9 | 1.00E-03 | 2.76E-01 | 3.33E-03 | 3.05E-01 | 3.36E-01 | 6.03E-07 | 6.62E-01 | 4.60E-09 |
| Manganese | 0.149 | I | 54.94 | 1.00E-03 | 2.13E-01 | 2.85E-03 | 3.05E-01 | 3.35E-01 | 7.80E-07 | 5.12E-01 | 1.49E-07 |
| Thallium | 0.005 | I | 204.38 | 1.00E-03 | 1.46E+00 | 5.50E-03 | 3.07E-01 | 3.37E-01 | 1.14E-07 | 3.52E+00 | 5.00E-09 |

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER (PAGE THREE)

SITE NAME: AREA F, SELBY POND
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: FREQUENT RECREATIONAL USER - CHILD - RME
MEDIA: SURFACE WATER
DATE: JULY 20, 2000

| CHEMICAL | DAevent ($mg/cm^2$ - event) | Lifetime Chronic Daily Intake (mg/kg/day) | Chronic Daily Intake (mg/kg/day) | Cancer Slope Factor $(mg/kg/day)^{-1}$ | Reference Dose (mg/kg/day) | Lifetime Cancer Risk | Percent Cancer Risk | Hazard Quotient | Percent Hazard Quotient |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | 4.40E-09 | 1.18E-08 | 1.37E-07 | NA | 6.00E-05 | NA | NA | 2.3E-03 | 36.2% |
| Arsenic | 4.60E-09 | 1.23E-08 | 1.44E-07 | 1.50E+00 | 3.00E-04 | 1.8E-08 | 100.0% | 4.8E-04 | 7.6% |
| Manganese | 1.49E-07 | 3.99E-07 | 4.65E-06 | NA | 1.40E-03 | NA | NA | 3.3E-03 | 52.5% |
| Thallium | 5.00E-09 | 1.34E-08 | 1.56E-07 | NA | 6.60E-04 | NA | NA | 2.4E-04 | 3.7% |
| | | | | | Total | 1.8E-08 | 100.0% | 6.3E-03 | 100.0% |

**RISK ASSESSMENT SPREADSHEET - SUMMARY OF CANCER RISKS AND HAZARD INDICES**

**SITE NAME:** AREA F, SELBY POND
**LOCATION:** FERRY CREEK, STRATFORD, CT
**EXPOSURE SCENARIO:** FREQUENT RECREATIONAL USER - CHILD - RME
**MEDIA:** SURFACE WATER
**DATE:** JULY 20, 2000

| | Lifetime Cancer Risk | | | | | Hazard Index | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Chemical | Incidental Ingestion | Dermal Contact | Inhalation | Total Risk | Percent Risk | Incidental Ingestion | Dermal Contact | Inhalation | Total HI | Percent HI |
| Antimony | NA | NA | NA | NA | NA | NA | 2.3E-03 | NA | 2.3E-03 | 36.2% |
| Arsenic | NA | 1.8E-08 | NA | 1.8E-08 | 100.0% | NA | 4.8E-04 | NA | 4.8E-04 | 7.6% |
| Manganese | NA | NA | NA | NA | NA | NA | 3.3E-03 | NA | 3.3E-03 | 52.5% |
| Thallium | NA | NA | NA | NA | NA | NA | 2.4E-04 | NA | 2.4E-04 | 3.7% |
| **Total** | **NA** | **1.8E-08** | **NA** | **1.8E-08** | **100.0%** | **NA** | **6.3E-03** | **NA** | **6.3E-03** | **100.0%** |

**RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER**

**SITE NAME: AREA F, SELBY POND**
**LOCATION: FERRY CREEK, STRATFORD, CT**
**EXPOSURE SCENARIO: FREQUENT RECREATIONAL USER - CHILD - CTE**
**MEDIA: SURFACE WATER**
**DATE: JULY 20, 2000**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH WATER ARE CONSIDERED. ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATIONS:

$$\text{Absorbed Dose} = \frac{DAevent \times EV \times EF \times ED \times SA}{BW \times AT}$$

For Inorganics DAevent = Kp x Cw x CF x tevent

For Organics If tevent $\leq t^*$, then : $DAevent = 2 \times Kp \times Cw \times CF \times \sqrt{\frac{6 \times tau \times tevent}{\pi}}$

If tevent $> t^*$, then : $DAevent = Kp \times Cw \times CF \times \left[\frac{tevent}{1+B} + 2 \times tau \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right]$

| | | | |
|---|---|---|---|
| Where: | SA = : | 1,900 | Skin surface available for contact ($cm^2$) |
| | DAevent = : | | Chemical specific absorbed dose per event ($mg/cm^2$-event) |
| | EV = : | 1 | Event frequency (events/days) |
| | EF = : | 90 | Exposure frequency (days/year) |
| | ED = : | 2 | Exposure duration (years) |
| | BW = : | 15 | Body weight (kg) |
| | ATc = : | 25,550 | Averaging time for carcinogenic exposures (days) |
| | ATn = : | 730 | Averaging time for noncarcinogenic exposures (days) |
| | CF = : | 0.001 | Conversion Factor ($L/m^3$) |
| | Kp =: | | Chemical specific permeability coefficient (cm/hr) |
| | Cw = : | | Concentration of chemical in water (mg/L) |
| | tevent = : | 1 | duration of event (hr/event) |
| | tau = : | | Chemical specific lag time (hr) |
| | t* = : | | Chemical specific time it takes to reach steady state (hr) |
| | B = : | | Chemical specific dimensionless constant |
| | Dsc = : | | Effective diffusivity for chemical transfer through skin ($cm^2/hr$) |
| | b, c = : | | chemical specific constants |

Unit Dose

| | | |
|---|---|---|
| Lifetime Chronic Daily Intake = | 8.9E-01 | $cm^2$-event/(kg-day) |
| Chronic Daily Intake = : | 3.1E+01 | $cm^2$-event/(kg-day) |

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER (PAGE TWO)

SITE NAME: AREA F, SELBY POND
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: FREQUENT RECREATIONAL USER - CHILD - CTE
MEDIA: SURFACE WATER
DATE: JULY 20, 2000

| CHEMICAL | Cw (mg/L) | Organic or Inorganic | Molecular Weight | Estimated Kp (cm/hr) | tau-event (hr) | B | b | c | Dsc ($cm^2$/hr) | t* (hr) | DAevent (mg/$cm^2$ - event) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 0.0037 | I | 121.57 | 1.00E-03 | 5.03E-01 | 4.24E-03 | 3.06E-01 | 3.36E-01 | 3.31E-07 | 1.21E+00 | 3.70E-09 |
| Arsenic | 0.0046 | I | 74.9 | 1.00E-03 | 2.76E-01 | 3.33E-03 | 3.05E-01 | 3.36E-01 | 6.03E-07 | 6.62E-01 | 4.60E-09 |
| Manganese | 0.0577 | I | 54.94 | 1.00E-03 | 2.13E-01 | 2.85E-03 | 3.05E-01 | 3.35E-01 | 7.80E-07 | 5.12E-01 | 5.77E-08 |
| Thallium | 0.005 | I | 204.38 | 1.00E-03 | 1.46E+00 | 5.50E-03 | 3.07E-01 | 3.37E-01 | 1.14E-07 | 3.52E+00 | 5.00E-09 |

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER (PAGE THREE)

SITE NAME: AREA F, SELBY POND
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: FREQUENT RECREATIONAL USER - CHILD - CTE
MEDIA: SURFACE WATER
DATE: JULY 20, 2000

| CHEMICAL | DAevent ($mg/cm^2$ - event) | Lifetime Chronic Daily Intake (mg/kg/day) | Chronic Daily Intake (mg/kg/day) | Cancer Slope Factor $(mg/kg/day)^{-1}$ | Reference Dose (mg/kg/day) | Lifetime Cancer Risk | Percent Cancer Risk | Hazard Quotient | Percent Hazard Quotient |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | 3.70E-09 | 3.30E-09 | 1.16E-07 | NA | 6.00E-05 | NA | NA | 1.9E-03 | 49.0% |
| Arsenic | 4.60E-09 | 4.10E-09 | 1.44E-07 | 1.50E+00 | 3.00E-04 | 6.2E-09 | 100.0% | 4.8E-04 | 12.2% |
| Manganese | 5.77E-08 | 5.15E-08 | 1.80E-06 | NA | 1.40E-03 | NA | NA | 1.3E-03 | 32.8% |
| Thallium | 5.00E-09 | 4.46E-09 | 1.56E-07 | NA | 6.60E-04 | NA | NA | 2.4E-04 | 6.0% |
| | | | | | Total | 6.2E-09 | 100.0% | 3.9E-03 | 100.0% |

**RISK ASSESSMENT SPREADSHEET - SUMMARY OF CANCER RISKS AND HAZARD INDICES**

**SITE NAME:** AREA F, SELBY POND
**LOCATION:** FERRY CREEK, STRATFORD, CT
**EXPOSURE SCENARIO:** FREQUENT RECREATIONAL USER - CHILD - CTE
**MEDIA:** SURFACE WATER
**DATE:** JULY 20, 2000

| | Lifetime Cancer Risk | | | | | Hazard Index | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Chemical | Incidental Ingestion | Dermal Contact | Inhalation | Total Risk | Percent Risk | Incidental Ingestion | Dermal Contact | Inhalation | Total HI | Percent HI |
| Antimony | NA | NA | NA | NA | NA | NA | 1.9E-03 | NA | 1.9E-03 | 49.0% |
| Arsenic | NA | 6.2E-09 | NA | 6.2E-09 | 100.0% | NA | 4.8E-04 | NA | 4.8E-04 | 12.2% |
| Manganese | NA | NA | NA | NA | NA | NA | 1.3E-03 | NA | 1.3E-03 | 32.8% |
| Thallium | NA | NA | NA | NA | NA | NA | 2.4E-04 | NA | 2.4E-04 | 6.0% |
| **Total** | **NA** | **6.2E-09** | **NA** | **6.2E-09** | **100.0%** | **NA** | **3.9E-03** | **NA** | **3.9E-03** | **100.0%** |

**RISK ASSESSMENT SPREADSHEET - INGESTION OF FISH**

**SITE NAME: AREA F, SELBY POND**
**LOCATION: FERRY CREEK, STRATFORD, CT**
**XPOSURE SCENARIO: LOCAL FISHER - RME**
**MEDIA: AMERICAN EELS**
**DATE: AUGUST 3, 2000**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INGESTION OF FISH ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $Intake = \frac{Cf \times IR \times FI \times EF \times ED}{BW \times AT}$

| WHERE: | | | |
|---|---|---|---|
| | Cf = : | | Chemical concentration in fish (mg/kg) |
| | IR = : | 0.054 | Ingestion Rate (Kg/meal) |
| | FI = : | 1 | Fraction from contaminated source (unitless) |
| | EF = : | 365 | Exposure Frequency (meals/year) |
| | ED = : | 30 | Exposure Duration (years) |
| | BW = : | 70 | Body Weight (kg) |
| | ATc = : | 25,550 | Averaging time for carcinogenic exposures (days) |
| | ATn = : | 10,950 | Averaging time for noncarcinogenic exposures (days) |

Unit Dose
Lifetime Chronic Daily I: 3.31E-04 kg-fish/kg-wt/day
Chronic Daily Intake = : 7.71E-04 kg-fish/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INGESTION OF FISH (PAGE TWO)

SITE NAME: AREA F, SELBY POND
LOCATION: FERRY CREEK, STRATFORD, CT
XPOSURE SCENARIO: LOCAL FISHER - RME
MEDIA: AMERICAN EELS
DATE: AUGUST 3, 2000

| CHEMICAL | Cf (mg/kg) | Lifetime Chronic Daily Intake (mg/kg/day) | Chronic Daily Intake (mg/kg/day) | Cancer Slope Factor $(mg/kg/day)^{-1}$ | Reference Dose (mg/kg/day) | Lifetime Cancer Risk | Percent Cancer Risk | Hazard Quotient | Percent Hazard Quotient |
|---|---|---|---|---|---|---|---|---|---|
| 4,4'-DDD | 0.00032 | 1.1E-07 | 2.5E-07 | 2.40E-01 | NA | 2.5E-08 | 5.2% | NA | NA |
| 4,4'-DDE | 0.00039 | 1.3E-07 | 3.0E-07 | 3.40E-01 | NA | 4.4E-08 | 8.9% | NA | NA |
| 4,4'-DDT | 0.00007 | 2.3E-08 | 5.4E-08 | 3.40E-01 | 5.00E-04 | 7.9E-09 | 1.6% | 1.1E-04 | 0.5% |
| Aldrin | 0.0000016 | 5.3E-10 | 1.2E-09 | 1.70E+01 | 3.00E-05 | 9.0E-09 | 1.8% | 4.1E-05 | 0.2% |
| Aroclor, total | 0.00054 | 1.8E-07 | 4.2E-07 | 2.00E+00 | 2.00E-05 | 3.6E-07 | 72.5% | 2.1E-02 | 97.0% |
| Dieldrin | 0.000011 | 3.6E-09 | 8.5E-09 | 1.60E+01 | 5.00E-05 | 5.8E-08 | 11.8% | 1.7E-04 | 0.8% |
| Heptachlor epoxide | 0.0000054 | 1.8E-09 | 4.2E-09 | 9.10E+00 | 1.30E-05 | 1.6E-08 | 3.3% | 3.2E-04 | 1.5% |
| | | | | | Total | 4.9E-07 | 100.0% | 2.1E-02 | 100.0% |

**RISK ASSESSMENT SPREADSHEET - INGESTION OF FISH**

**SITE NAME: AREA F, SELBY POND**
**LOCATION: FERRY CREEK, STRATFORD, CT**
**XPOSURE SCENARIO: LOCAL FISHER - CTE**
**MEDIA: AMERICAN EELS**
**DATE: AUGUST 3, 2000**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INGESTION OF FISH ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $Intake = \frac{Cf \times IR \times FI \times EF \times ED}{BW \times AT}$

| | | | |
|---|---|---|---|
| WHERE: | Cf = : | | Chemical concentration in fish (mg/kg) |
| | IR = : | 0.0095 | Ingestion Rate (Kg/meal) |
| | FI = : | 1 | Fraction from contaminated source (unitless) |
| | EF = : | 365 | Exposure Frequency (meals/year) |
| | ED = : | 9 | Exposure Duration (years) |
| | BW = : | 70 | Body Weight (kg) |
| | ATc = : | 25,550 | Averaging time for carcinogenic exposures (days) |
| | ATn = : | 3,285 | Averaging time for noncarcinogenic exposures (days) |

| | | |
|---|---|---|
| Unit Dose | | |
| Lifetime Chronic Daily Ir | 1.74E-05 | kg-fish/kg-wt/day |
| Chronic Daily Intake = : | 1.36E-04 | kg-fish/kg-wt/day |

RISK ASSESSMENT SPREADSHEET - INGESTION OF FISH (PAGE TWO)

SITE NAME: AREA F, SELBY POND
LOCATION: FERRY CREEK, STRATFORD, CT
XPOSURE SCENARIO: LOCAL FISHER - CTE
MEDIA: AMERICAN EELS
DATE: AUGUST 3, 2000

| CHEMICAL | Cf (mg/kg) | Lifetime Chronic Daily Intake (mg/kg/day) | Chronic Daily Intake (mg/kg/day) | Cancer Slope Factor $(mg/kg/day)^{-1}$ | Reference Dose (mg/kg/day) | Lifetime Cancer Risk | Percent Cancer Risk | Hazard Quotient | Percent Hazard Quotient |
|---|---|---|---|---|---|---|---|---|---|
| 4,4'-DDD | 0.00017 | 3.0E-09 | 2.3E-08 | 2.40E-01 | NA | 7.1E-10 | 4.4% | NA | NA |
| 4,4'-DDE | 0.00027 | 4.7E-09 | 3.7E-08 | 3.40E-01 | NA | 1.6E-09 | 10.0% | NA | NA |
| 4,4'-DDT | 0.000049 | 8.6E-10 | 6.7E-09 | 3.40E-01 | 5.00E-04 | 2.9E-10 | 1.8% | 1.3E-05 | 0.6% |
| Aldrin | 0.0000011 | 1.9E-11 | 1.5E-10 | 1.70E+01 | 3.00E-05 | 3.3E-10 | 2.0% | 5.0E-06 | 0.2% |
| Aroclor, total | 0.00034 | 5.9E-09 | 4.6E-08 | 2.00E+00 | 2.00E-05 | 1.2E-08 | 73.9% | 2.3E-03 | 97.7% |
| Dieldrin | 0.000006 | 1.0E-10 | 8.1E-10 | 1.60E+01 | 5.00E-05 | 1.7E-09 | 10.4% | 1.6E-05 | 0.7% |
| Heptachlor epoxide | 0.0000019 | 3.3E-11 | 2.6E-10 | 9.10E+00 | 1.30E-05 | 3.0E-10 | 1.9% | 2.0E-05 | 0.8% |
| | | | | | **Total** | **1.6E-08** | **100.0%** | **2.4E-03** | **100.0%** |

**RISK ASSESSMENT SPREADSHEET - INGESTION OF FISH**

**SITE NAME: AREA F, SELBY POND**
**LOCATION: FERRY CREEK, STRATFORD, CT**
**XPOSURE SCENARIO: LOCAL FISHER - RME**
**MEDIA: WHITE PERCH**
**DATE: AUGUST 3, 2000**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INGESTION OF FISH ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $Intake = \frac{Cf \times IR \times FI \times EF \times ED}{BW \times AT}$

| | | | |
|---|---|---|---|
| WHERE: | Cf = : | | Chemical concentration in fish (mg/kg) |
| | IR = : | 0.054 | Ingestion Rate (Kg/meal) |
| | FI = : | 1 | Fraction from contaminated source (unitless) |
| | EF = : | 365 | Exposure Frequency (meals/year) |
| | ED = : | 30 | Exposure Duration (years) |
| | BW = : | 70 | Body Weight (kg) |
| | ATc = : | 25,550 | Averaging time for carcinogenic exposures (days) |
| | ATn = : | 10,950 | Averaging time for noncarcinogenic exposures (days) |

Unit Dose
Lifetime Chronic Daily I 3.31E-04 kg-fish/kg-wt/day
Chronic Daily Intake = : 7.71E-04 kg-fish/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INGESTION OF FISH (PAGE TWO)

SITE NAME: AREA F, SELBY POND
LOCATION: FERRY CREEK, STRATFORD, CT
XPOSURE SCENARIO: LOCAL FISHER - RME
MEDIA: WHITE PERCH
DATE: AUGUST 3, 2000

| CHEMICAL | Cf (mg/kg) | Lifetime Chronic Daily Intake (mg/kg/day) | Chronic Daily Intake (mg/kg/day) | Cancer Slope Factor $(mg/kg/day)^{-1}$ | Reference Dose (mg/kg/day) | Lifetime Cancer Risk | Percent Cancer Risk | Hazard Quotient | Percent Hazard Quotient |
|---|---|---|---|---|---|---|---|---|---|
| 4,4'-DDD | 0.00013 | 4.3E-08 | 1.0E-07 | 2.40E-01 | NA | 1.0E-08 | 6.4% | NA | NA |
| 4,4'-DDE | 0.00023 | 7.6E-08 | 1.8E-07 | 3.40E-01 | NA | 2.6E-08 | 16.0% | NA | NA |
| 4,4'-DDT | 0.000031 | 1.0E-08 | 2.4E-08 | 3.40E-01 | 5.00E-04 | 3.5E-09 | 2.2% | 4.8E-05 | 0.8% |
| Aroclor, total | 0.00015 | 5.0E-08 | 1.2E-07 | 2.00E+00 | 2.00E-05 | 9.9E-08 | 61.3% | 5.8E-03 | 97.6% |
| Dieldrin | 0.0000063 | 2.1E-09 | 4.9E-09 | 1.60E+01 | 5.00E-05 | 3.3E-08 | 20.6% | 9.7E-05 | 1.6% |
| | | | | | **Total** | **1.6E-07** | **100.0%** | **5.9E-03** | **100.0%** |

**RISK ASSESSMENT SPREADSHEET - INGESTION OF FISH**

**SITE NAME: AREA F, SELBY POND**
**LOCATION: FERRY CREEK, STRATFORD, CT**
**XPOSURE SCENARIO: LOCAL FISHER - CTE**
**MEDIA: WHITE PERCH**
**DATE: AUGUST 3, 2000**

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INGESTION OF FISH ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $Intake = \frac{Cf \times IR \times FI \times EF \times ED}{BW \times AT}$

| | | | |
|---|---|---|---|
| WHERE: | Cf = : | | Chemical concentration in fish (mg/kg) |
| | IR = : | 0.0095 | Ingestion Rate (Kg/meal) |
| | FI = : | 1 | Fraction from contaminated source (unitless) |
| | EF = : | 365 | Exposure Frequency (meals/year) |
| | ED = : | 9 | Exposure Duration (years) |
| | BW = : | 70 | Body Weight (kg) |
| | ATc = : | 25,550 | Averaging time for carcinogenic exposures (days) |
| | ATn = : | 3,285 | Averaging time for noncarcinogenic exposures (days) |

Unit Dose
Lifetime Chronic Daily Ir 1.74E-05 kg-fish/kg-wt/day
Chronic Daily Intake = : 1.36E-04 kg-fish/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INGESTION OF FISH (PAGE TWO)

SITE NAME: AREA F, SELBY POND
LOCATION: FERRY CREEK, STRATFORD, CT
XPOSURE SCENARIO: LOCAL FISHER - CTE
MEDIA: WHITE PERCH
DATE: AUGUST 3, 2000

| CHEMICAL | Cf (mg/kg) | Lifetime Chronic Daily Intake (mg/kg/day) | Chronic Daily Intake (mg/kg/day) | Cancer Slope Factor $(mg/kg/day)^{-1}$ | Reference Dose (mg/kg/day) | Lifetime Cancer Risk | Percent Cancer Risk | Hazard Quotient | Percent Hazard Quotient |
|---|---|---|---|---|---|---|---|---|---|
| 4,4'-DDD | 0.000059 | 1.0E-09 | 8.0E-09 | 2.40E-01 | NA | 2.5E-10 | 8.9% | NA | NA |
| 4,4'-DDE | 0.000093 | 1.6E-09 | 1.3E-08 | 3.40E-01 | NA | 5.5E-10 | 20.0% | NA | NA |
| 4,4'-DDT | 0.000011 | 1.9E-10 | 1.5E-09 | 3.40E-01 | 5.00E-04 | 6.5E-11 | 2.4% | 3.0E-06 | 0.6% |
| Aroclor, total | 0.000075 | 1.3E-09 | 1.0E-08 | 1.00E+00 | 2.00E-05 | 1.3E-09 | 47.4% | 5.1E-04 | 97.9% |
| Dieldrin | 0.000003 | 5.2E-11 | 4.1E-10 | 1.60E+01 | 5.00E-05 | 8.4E-10 | 30.3% | 8.1E-06 | 1.6% |
| | | | | | **Total** | **2.8E-09** | **100.0%** | **5.2E-04** | **100.0%** |

# Appendix F.12

## Results of IEUBK and Adult Models for Lead Exposures

**TETRA TECH NUS, INC.** **CALCULATION WORKSHEET** PAGE ____ OF ____

| | | | |
|---|---|---|---|
| CLIENT: EPA Region I | | JOB NUMBER: 7491 Area II | |
| SUBJECT: Evaluation of Frequent Recreational User - Via IEUBK | | | |
| BASED ON: | | DRAWING NUMBER: | |
| BY: L.A. Sinagoga | CHECKED BY: J.M. Malle | APPROVED BY: | DATE: 3/16/00 |

Objective: Develop Lead exposure point concentrations to be evaluated assuming a recreational Land use scenario and using the EPA IEUBK model.

Relevant Equation:

$PbS_w = EF_{site} \cdot [(F_{site} \cdot PbS_{site}) + (F_{yard} \cdot PbS_{yard})] + (EF_{yard} \cdot PbS_{yard})$

$PbS_w$ (mg/kg) = Time-weighted soil concentration

$EF_{site}$ ($\frac{days}{days\ of\ wk}$) = Fraction of days/week site is visited (Assume $\frac{3\ days}{7\ days}$)

$F_{site}$ (fraction) = Fraction of daily outdoor time spent at the site on days when the site is visited (dimensionless). (Assume 0.5)

$PbS_{site}$ (mg/kg) = Average soil lead concentration at an exposure unit on the site (mg/kg).

$F_{yard}$ ($\frac{days}{days\ per\ wk}$) = Fraction of daily outdoor time at local background soil lead level (usually near home) = 1 - $F_{site}$ (Assume 0.5)

$PbS_{yard}$ (mg/kg) = Average soil lead concentration near home.

$EF_{yard}$ ($\frac{days}{days/wk}$) = Fraction of the days/week child does not visit the site during the exposure period = 1 - $EF_{site}$ ($\frac{4\ days}{7\ days}$)

Assume $PbS_{site}$ = 256 mg/kg ; $PbS_{yard}$ = 200 mg/kg

$PbS_w = \frac{3d}{7d} \times [(0.5 \times 256\ mg/kg) + (0.5 \times 200\ mg/kg)] + (\frac{4}{7} \times 200\ mg/kg) = 212\ \frac{mg}{kg}$

IEUBK MODEL - EXPOSURE TO LEAD
SITE NAME: AREA F: SELBY POND
LOCATION: FERRY CREEK, STRATFORD, CONNECTICUT
RECEPTOR: FREQUENT RECREATIONAL USER
DATE: MARCH 16, 2000

LEAD MODEL Version 0.99d

AIR CONCENTRATION: 0.100 ug Pb/m3 DEFAULT
Indoor AIR Pb Conc: 30.0 percent of outdoor.
Other AIR Parameters:

| Age | Time Outdoors (hr) | Vent. Rate (m3/day) | Lung Abs. (%) |
|---|---|---|---|
| 0-1 | 1.0 | 2.0 | 32.0 |
| 1-2 | 2.0 | 3.0 | 32.0 |
| 2-3 | 3.0 | 5.0 | 32.0 |
| 3-4 | 4.0 | 5.0 | 32.0 |
| 4-5 | 4.0 | 5.0 | 32.0 |
| 5-6 | 4.0 | 7.0 | 32.0 |
| 6-7 | 4.0 | 7.0 | 32.0 |

DIET: DEFAULT

DRINKING WATER Conc: 4.00 ug Pb/L DEFAULT
WATER Consumption: DEFAULT

SOIL & DUST:
Soil: constant conc.
Dust: constant conc.

| Age | Soil (ug Pb/g) | House Dust (ug Pb/g) |
|---|---|---|
| 0-1 | 212.0 | 200.0 |
| 1-2 | 212.0 | 200.0 |
| 2-3 | 212.0 | 200.0 |
| 3-4 | 212.0 | 200.0 |
| 4-5 | 212.0 | 200.0 |
| 5-6 | 212.0 | 200.0 |
| 6-7 | 212.0 | 200.0 |

Additional Dust Sources: None DEFAULT

PAINT Intake: 0.00 ug Pb/day DEFAULT

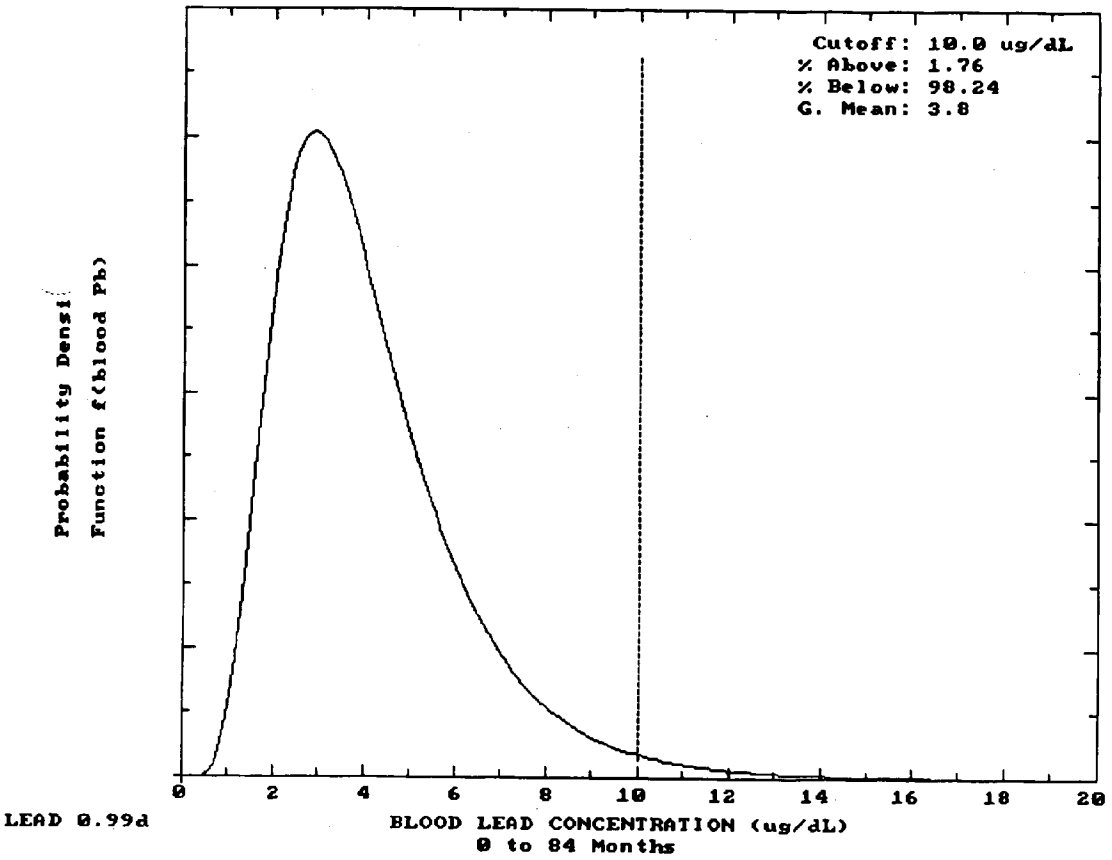
MATERNAL CONTRIBUTION: Infant Model
Maternal Blood Conc: 2.50 ug Pb/dL

CALCULATED BLOOD Pb and Pb UPTAKES:

| YEAR | Blood Level (ug/dL) | Total Uptake (ug/day) | Soil+Dust Uptake (ug/day) |
|---|---|---|---|
| 0.5-1: | 4.2 | 7.72 | 4.80 |
| 1-2: | 4.6 | 11.11 | 7.54 |
| 2-3: | 4.3 | 11.62 | 7.63 |
| 3-4: | 4.1 | 11.67 | 7.72 |
| 4-5: | 3.5 | 9.80 | 5.84 |
| 5-6: | 3.0 | 9.53 | 5.30 |
| 6-7: | 2.7 | 9.60 | 5.02 |

| YEAR | Diet Uptake (ug/day) | Water Uptake (ug/day) | Paint Uptake (ug/day) | Air Uptake (ug/day) |
|---|---|---|---|---|
| 0.5-1: | 2.53 | 0.37 | 0.00 | 0.02 |
| 1-2: | 2.62 | 0.91 | 0.00 | 0.03 |
| 2-3: | 2.98 | 0.95 | 0.00 | 0.06 |
| 3-4: | 2.90 | 0.98 | 0.00 | 0.07 |
| 4-5: | 2.85 | 1.04 | 0.00 | 0.07 |
| 5-6: | 3.03 | 1.11 | 0.00 | 0.09 |
| 6-7: | 3.35 | 1.13 | 0.00 | 0.09 |

IEUBK MODEL - EXPOSURE TO LEAD
SITE NAME: AREA F: SELBY POND
LOCATION: FERRY CREEK, STRATFORD, CONNECTICUT
RECEPTOR: FREQUENT RECREATIONAL USER
DATE: MARCH 16, 2000



SITE NAME: AREA B: LOWER FERRY CREEK - DELBUONO WETLANDS
LOCATION: FERRY CREEK, STRATFORD, CONNECTICUT
RECEPTOR: COMMERCIAL WORKER - SURFACE SOILS- REASONABLE MAXIMUM EXPOSURE
DATE: July 20, 2000

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and the blood lead concentration in the developing fetuses of adult women. (U.S. EPA, Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, December 1996). U.S. EPA, Use of the TRW Interim Adult Lead Methodology in Risk Assessment, April 7, 1999.

RELEVANT EQUATIONS: $PbB_{fetal,GM} = R_{fetal/maternal} \times [PbB_{adult,0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,0.95} = PbB_{fetal,GM} \times GSD_{i,adult}^{1.645}$

Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL = 1-NORMDIST ((ln(10)-ln(PbS))/ln($GSD_i$))

| Exposure Parameter | Description (units) | $GSD_i$ = 1.8 - 2.1; $PbB_{adult,0}$ = 1.7 - 2.2 | | | | |
|---|---|---|---|---|---|---|
| | | Adult 1 | Adult 2 | Adult 3 | Adult 4 | Adult 5 |
| $PbB_{adult,0}$ | Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL) | 1.7 | 1.7 | 2.2 | 2.2 | 2 |
| PbS | Site-specific soil lead concentration (mg/kg) [1] | 745 | 745 | 745 | 745 | 745 |
| BKSF | Biokinetic slope factor (ug/dL per ug/day)) | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| $IR_s$ | Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day) | 0.100 | 0.100 | 0.100 | 0.100 | 0.100 |
| $AF_s$ | Absolute gastrointestinal absorption fraction (unitless) | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |
| $EF_s$ | Exposure frequency (days/year) | 250 | 250 | 250 | 250 | 250 |
| AT | Averaging time (days/year) | 365 | 365 | 365 | 365 | 365 |
| $GSD_{i,adult}$ | Estimate of individual geometric standard deviation among adults (unitless) | 1.8 | 2.1 | 1.8 | 2.1 | 2 |
| $R_{fetal/maternal}$ | Constant of proportionality between fetal blood lead concentration at birth and maternal blood lead concentration (unitless) | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| **$PbB_{adult,central}$** | **Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)** | **4.15** | **4.15** | **4.65** | **4.65** | **4.45** |
| **$PbB_{fetal,GM}$** | **Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have site exposures to soil lead at concentration, PbS.** | **3.73** | **3.73** | **4.18** | **4.18** | **4.00** |
| | **Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL.** | **4.69%** | **9.22%** | **6.91%** | **12.01%** | **9.34%** |
| **$PbB_{fetal,0.95}$** | **Calculated 95th percentile blood lead concentrations among fetuses born to women having site exposures (ug/dL)** | **9.82** | **12.66** | **11.00** | **14.18** | **12.52** |
| **RBRG** | **Lead soil concentration corresponding to a 95th percentile 10 ug/dL lead blood level in a fetus (mg/kg).** | **768** | **480** | **616** | **328** | **472** |

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the $EF_s$ is less than 1 day/week.

[1] The arithmetic mean concentration is the exposure point concentration.

SITE NAME: AREA B: LOWER FERRY CREEK - DELBUONO WETLANDS
LOCATION: FERRY CREEK, STRATFORD, CONNECTICUT
RECEPTOR: COMMERCIAL WORKER - SURFACE SOILS- CENTRAL TENDENCY EXPOSURE
DATE: July 20, 2000

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and the blood lead concentration in the developing fetuses of adult women. (U.S. EPA, Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, December 1996). U.S. EPA, Use of the TRW Interim Adult Lead Methodology in Risk Assessment, April 7, 1999.

RELEVANT EQUATIONS: $PbB_{fetal,\,GM} = R_{fetal/maternal} \times [PbB_{adult,\,0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,\,0.95} = PbB_{fetal,\,GM} \times GSD_{i,\,adult}^{1.645}$

Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL = 1-NORMDIST ((ln(10)-ln(PbS))/ln($GSD_i$))

| Exposure Parameter | Description (units) | $GSD_i$ = 1.8 - 2.1; $PbB_{adult,\,0}$ = 1.7 - 2.2 | | | | |
|---|---|---|---|---|---|---|
| | | Adult 1 | Adult 2 | Adult 3 | Adult 4 | Adult 5 |
| $PbB_{adult,\,0}$ | Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL) | 1.7 | 1.7 | 2.2 | 2.2 | 2 |
| PbS | Site-specific soil lead concentration (mg/kg) [1] | 745 | 745 | 745 | 745 | 745 |
| BKSF | Biokinetic slope factor (ug/dL per ug/day) | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| $IR_s$ | Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day) | 0.050 | 0.050 | 0.050 | 0.050 | 0.050 |
| $AF_s$ | Absolute gastrointestinal absorption fraction (unitless) | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |
| $EF_s$ | Exposure frequency (days/year) | 250 | 250 | 250 | 250 | 250 |
| AT | Averaging time (days/year) | 365 | 365 | 365 | 365 | 365 |
| $GSD_{i,\,adult}$ | Estimate of individual geometric standard deviation among adults (unitless) | 1.8 | 2.1 | 1.8 | 2.1 | 2 |
| $R_{fetal/maternal}$ | Constant of proportionality between fetal blood lead concentration at birth and maternal blood lead concentration (unitless) | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| **$PbB_{adult,\,central}$** | **Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)** | **2.92** | **2.92** | **3.42** | **3.42** | **3.22** |
| **$PbB_{fetal,\,GM}$** | **Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have site exposures to soil lead at concentration, PbS.** | **2.63** | **2.63** | **3.08** | **3.08** | **2.90** |
| | **Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL.** | **1.16%** | **3.60%** | **2.26%** | **5.63%** | **3.71%** |
| **$PbB_{fetal,\,0.95}$** | **Calculated 95th percentile blood lead concentrations among fetuses born to women having site exposures (ug/dL)** | **6.92** | **8.92** | **8.11** | **10.45** | **9.08** |
| **RBRG** | **Lead soil concentration corresponding to a 95th percentile 10 ug/dL lead blood level in a fetus (mg/kg).** | **1536** | **960** | **1232** | **656** | **945** |

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the $EF_s$ is less than 1 day/week.

[1] The arithmetic mean concentration is the exposure point concentration.

SITE NAME: AREA B: LOWER FERRY CREEK - DELBUONO WETLANDS
LOCATION: FERRY CREEK, STRATFORD, CONNECTICUT
RECEPTOR: COMMERCIAL WORKER - AREA #1 - SOILS 0-15 FEET - REASONABLE MAXIMUM EXPOSURE
DATE: July 20, 2000

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and the blood lead concentration in the developing fetuses of adult women. (U.S. EPA, Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, December 1996). U.S. EPA, Use of the TRW Interim Adult Lead Methodology in Risk Assessment, April 7, 1999.

RELEVANT EQUATIONS: $PbB_{fetal,\,GM} = R_{fetal/maternal} \times [PbB_{adult,\,0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,\,0.95} = PbB_{fetal,\,GM} \times GSD_{i,\,adult}^{1.645}$

Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL = 1-NORMDIST ((ln(10)-ln(PbS))/ln($GSD_i$))

| Exposure Parameter | Description (units) | $GSD_i$ = 1.8 - 2.1; $PbB_{adult,\,0}$ = 1.7 - 2.2 | | | | |
|---|---|---|---|---|---|---|
| | | Adult 1 | Adult 2 | Adult 3 | Adult 4 | Adult 5 |
| $PbB_{adult,\,0}$ | Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL) | 1.7 | 1.7 | 2.2 | 2.2 | 2 |
| PbS | Site-specific soil lead concentration (mg/kg) [1] | 464 | 464 | 464 | 464 | 464 |
| BKSF | Biokinetic slope factor (ug/dL per ug/day) | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| $IR_s$ | Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day) | 0.100 | 0.100 | 0.100 | 0.100 | 0.100 |
| $AF_s$ | Absolute gastrointestinal absorption fraction (unitless) | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |
| $EF_s$ | Exposure frequency (days/year) | 250 | 250 | 250 | 250 | 250 |
| AT | Averaging time (days/year) | 365 | 365 | 365 | 365 | 365 |
| $GSD_{i,\,adult}$ | Estimate of individual geometric standard deviation among adults (unitless) | 1.8 | 2.1 | 1.8 | 2.1 | 2 |
| $R_{fetal/maternal}$ | Constant of proportionality between fetal blood lead concentration at birth and maternal blood lead concentration (unitless) | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| **$PbB_{adult,\,central}$** | **Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)** | **3.23** | **3.23** | **3.73** | **3.73** | **3.53** |
| **$PbB_{fetal,\,GM}$** | **Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have site exposures to soil lead at concentration, PbS.** | **2.90** | **2.90** | **3.35** | **3.35** | **3.17** |
| | **Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL.** | **1.77%** | **4.77%** | **3.15%** | **7.04%** | **4.88%** |
| **$PbB_{fetal,\,0.95}$** | **Calculated 95th percentile blood lead concentrations among fetuses born to women having site exposures (ug/dL)** | **7.63** | **9.84** | **8.82** | **11.36** | **9.92** |
| **RBRG** | **Lead soil concentration corresponding to a 95th percentile 10 ug/dL lead blood level in a fetus (mg/kg).** | **768** | **480** | **616** | **328** | **472** |

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the $EF_s$ is less than 1 day/week.

[1] The arithmetic mean concentration is the exposure point concentration.

**SITE NAME:** AREA B: LOWER FERRY CREEK - DELBUONO WETLANDS
**LOCATION:** FERRY CREEK, STRATFORD, CONNECTICUT
**RECEPTOR:** COMMERCIAL WORKER - AREA #1 - SOILS 0-15 FEET - CENTRAL TENDENCY EXPOSURE
**DATE:** July 20, 2000

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and the blood lead concentration in the developing fetuses of adult women. (U.S. EPA, Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, December 1996). U.S. EPA, Use of the TRW Interim Adult Lead Methodology in Risk Assessment, April 7, 1999.

RELEVANT EQUATIONS: $PbB_{fetal,\,GM} = R_{fetal/maternal} \times [PbB_{adult,\,0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,\,0.95} = PbB_{fetal,\,GM} \times GSD_{i,\,adult}^{1.645}$

Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL = 1-NORMDIST ((ln(10)-ln(PbS))/ln($GSD_i$))

| Exposure Parameter | Description (units) | $GSD_i$ = 1.8 - 2.1; $PbB_{adult,\,0}$ = 1.7 - 2.2 | | | | |
|---|---|---|---|---|---|---|
| | | Adult 1 | Adult 2 | Adult 3 | Adult 4 | Adult 5 |
| $PbB_{adult,\,0}$ | Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL) | 1.7 | 1.7 | 2.2 | 2.2 | 2 |
| PbS | Site-specific soil lead concentration (mg/kg) [1] | 464 | 464 | 464 | 464 | 464 |
| BKSF | Biokinetic slope factor (ug/dL per ug/day) | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| $IR_s$ | Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day) | 0.050 | 0.050 | 0.050 | 0.050 | 0.050 |
| $AF_s$ | Absolute gastrointestinal absorption fraction (unitless) | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |
| $EF_s$ | Exposure frequency (days/year) | 250 | 250 | 250 | 250 | 250 |
| AT | Averaging time (days/year) | 365 | 365 | 365 | 365 | 365 |
| $GSD_{i,\,adult}$ | Estimate of individual geometric standard deviation among adults (unitless) | 1.8 | 2.1 | 1.8 | 2.1 | 2 |
| $R_{fetal/maternal}$ | Constant of proportionality between fetal blood lead concentration at birth and maternal blood lead concentration (unitless) | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| **$PbB_{adult,\,central}$** | **Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)** | **2.46** | **2.46** | **2.96** | **2.96** | **2.76** |
| **$PbB_{fetal,\,GM}$** | **Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have site exposures to soil lead at concentration, PbS.** | **2.22** | **2.22** | **2.67** | **2.67** | **2.49** |
| | **Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL.** | **0.52%** | **2.11%** | **1.23%** | **3.74%** | **2.23%** |
| **$PbB_{fetal,\,0.95}$** | **Calculated 95th percentile blood lead concentrations among fetuses born to women having site exposures (ug/dL)** | **5.83** | **7.51** | **7.01** | **9.04** | **7.78** |
| **RBRG** | **Lead soil concentration corresponding to a 95th percentile 10 ug/dL lead blood level in a fetus (mg/kg).** | **1536** | **960** | **1232** | **656** | **945** |

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the $EF_s$ is less than 1 day/week.

[1] The arithmetic mean concentration is the exposure point concentration.

**SITE NAME:** AREA B: LOWER FERRY CREEK - DELBUONO WETLANDS
**LOCATION:** FERRY CREEK, STRATFORD, CONNECTICUT
**RECEPTOR:** COMMERCIAL WORKER - AREA #2 - SOILS 0-15 FEET - REASONABLE MAXIMUM EXPOSURE
**DATE:** July 20, 2000

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and the blood lead concentration in the developing fetuses of adult women. (U.S. EPA, Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, December 1996). U.S. EPA, Use of the TRW Interim Adult Lead Methodology in Risk Assessment, April 7, 1999.

RELEVANT EQUATIONS:

$$PbB_{fetal,\,GM} = R_{fetal/maternal} \times [PbB_{adult,\,0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$$

and

$$PbB_{fetal,\,0.95} = PbB_{fetal,\,GM} \times GSD_{i,\,adult}^{1.645}$$

Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL = 1-NORMDIST ((ln(10)-ln(PbS))/ln($GSD_i$))

| Exposure Parameter | Description (units) | $GSD_i$ = 1.8 - 2.1; $PbB_{adult,\,0}$ = 1.7 - 2.2 | | | | |
|---|---|---|---|---|---|---|
| | | Adult 1 | Adult 2 | Adult 3 | Adult 4 | Adult 5 |
| $PbB_{adult,\,0}$ | Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL) | 1.7 | 1.7 | 2.2 | 2.2 | 2 |
| PbS | Site-specific soil lead concentration (mg/kg) [1] | 474 | 474 | 474 | 474 | 474 |
| BKSF | Biokinetic slope factor (ug/dL per ug/day) | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| $IR_s$ | Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day) | 0.100 | 0.100 | 0.100 | 0.100 | 0.100 |
| $AF_s$ | Absolute gastrointestinal absorption fraction (unitless) | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |
| $EF_s$ | Exposure frequency (days/year) | 250 | 250 | 250 | 250 | 250 |
| AT | Averaging time (days/year) | 365 | 365 | 365 | 365 | 365 |
| $GSD_{i,\,adult}$ | Estimate of individual geometric standard deviation among adults (unitless) | 1.8 | 2.1 | 1.8 | 2.1 | 2 |
| $R_{fetal/maternal}$ | Constant of proportionality between fetal blood lead concentration at birth and maternal blood lead concentration (unitless) | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| **$PbB_{adult,\,central}$** | **Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)** | **3.26** | **3.26** | **3.76** | **3.76** | **3.56** |
| **$PbB_{fetal,\,GM}$** | **Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have site exposures to soil lead at concentration, PbS.** | **2.93** | **2.93** | **3.38** | **3.38** | **3.20** |
| | **Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL.** | **1.84%** | **4.91%** | **3.26%** | **7.20%** | **5.02%** |
| **$PbB_{fetal,\,0.95}$** | **Calculated 95th percentile blood lead concentrations among fetuses born to women having site exposures (ug/dL)** | **7.71** | **9.94** | **8.90** | **11.46** | **10.02** |
| **RBRG** | **Lead soil concentration corresponding to a 95th percentile 10 ug/dL lead blood level in a fetus (mg/kg).** | **768** | **480** | **616** | **328** | **472** |

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the $EF_s$ is less than 1 day/week.

[1] The arithmetic mean concentration is the exposure point concentration.

**SITE NAME:** AREA B: LOWER FERRY CREEK - DELBUONO WETLANDS
**LOCATION:** FERRY CREEK, STRATFORD, CONNECTICUT
**RECEPTOR:** COMMERCIAL WORKER - AREA #2 - SOILS 0-15 FEET - CENTRAL TENDENCY EXPOSURE
**DATE:** July 20, 2000

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and the blood lead concentration in the developing fetuses of adult women. (U.S. EPA, Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, December 1996). U.S. EPA, Use of the TRW Interim Adult Lead Methodology in Risk Assessment, April 7, 1999.

RELEVANT EQUATIONS: $PbB_{fetal,\,GM} = R_{fetal/maternal} \times [PbB_{adult,\,0} + (PbS \times BKSF \times IR_S \times AF_S \times EF_S)/AT]$

and

$PbB_{fetal,\,0.95} = PbB_{fetal,\,GM} \times GSD_{i,\,adult}^{1.645}$

Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL = 1-NORMDIST ((ln(10)-ln(PbS))/ln($GSD_i$))

| Exposure Parameter | Description (units) | $GSD_i$ = 1.8 - 2.1; $PbB_{adult,\,0}$ = 1.7 - 2.2 | | | | |
|---|---|---|---|---|---|---|
| | | Adult 1 | Adult 2 | Adult 3 | Adult 4 | Adult 5 |
| $PbB_{adult,\,0}$ | Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL) | 1.7 | 1.7 | 2.2 | 2.2 | 2 |
| PbS | Site-specific soil lead concentration (mg/kg) [1] | 474 | 474 | 474 | 474 | 474 |
| BKSF | Biokinetic slope factor (ug/dL per ug/day) | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| $IR_S$ | Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day) | 0.050 | 0.050 | 0.050 | 0.050 | 0.050 |
| $AF_S$ | Absolute gastrointestinal absorption fraction (unitless) | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |
| $EF_S$ | Exposure frequency (days/year) | 250 | 250 | 250 | 250 | 250 |
| AT | Averaging time (days/year) | 365 | 365 | 365 | 365 | 365 |
| $GSD_{i,\,adult}$ | Estimate of individual geometric standard deviation among adults (unitless) | 1.8 | 2.1 | 1.8 | 2.1 | 2 |
| $R_{fetal/maternal}$ | Constant of proportionality between fetal blood lead concentration at birth and maternal blood lead concentration (unitless) | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| **$PbB_{adult,\,central}$** | **Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)** | **2.48** | **2.48** | **2.98** | **2.98** | **2.78** |
| **$PbB_{fetal,\,GM}$** | **Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have site exposures to soil lead at concentration, PbS.** | **2.23** | **2.23** | **2.68** | **2.68** | **2.50** |
| | **Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL.** | **0.54%** | **2.16%** | **1.26%** | **3.80%** | **2.28%** |
| **$PbB_{fetal,\,0.95}$** | **Calculated 95th percentile blood lead concentrations among fetuses born to women having site exposures (ug/dL)** | **5.87** | **7.56** | **7.05** | **9.09** | **7.82** |
| **RBRG** | **Lead soil concentration corresponding to a 95th percentile 10 ug/dL lead blood level in a fetus (mg/kg).** | **1536** | **960** | **1232** | **656** | **945** |

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the $EF_S$ is less than 1 day/week.

[1] The arithmetic mean concentration is the exposure point concentration.

**SITE NAME:** AREA B: LOWER FERRY CREEK - DELBUO[illegible]TLANDS
**LOCATION:** FERRY CREEK, STRATFORD, CONNECTICU[illegible]
**RECEPTOR:** ADOLESCENT TRESPASSER - REASONABLE MAXIMUM EXPOSURE
**DATE:** July 20, 2000

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and the blood lead concentration in the developing fetuses of adult women. (U.S. EPA, Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, December 1996). U.S. EPA, Use of the TRW Interim Adult Lead Methodology in Risk Assessment, April 7, 1999.

RELEVANT EQUATIONS: $PbB_{fetal,\,GM} = R_{fetal/maternal} \times [PbB_{adult,\,0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,\,0.95} = PbB_{fetal,\,GM} \times GSD_{i,\,adult}^{1.645}$

Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL = 1-NORMDIST ((ln(10)-ln(PbS))/ln($GSD_i$))

| Exposure Parameter | Description (units) | $GSD_i$ = 1.8 - 2.1; $PbB_{adult,\,0}$ = 1.7 - 2.2 | | | | |
|---|---|---|---|---|---|---|
| | | Adult 1 | Adult 2 | Adult 3 | Adult 4 | Adult 5 |
| $PbB_{adult,\,0}$ | Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL) | 1.7 | 1.7 | 2.2 | 2.2 | 2 |
| PbS | Site-specific soil lead concentration (mg/kg) [1] | 582 | 582 | 582 | 582 | 582 |
| BKSF | Biokinetic slope factor (ug/dL per ug/day) | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| $IR_s$ | Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day) | 0.100 | 0.100 | 0.100 | 0.100 | 0.100 |
| $AF_s$ | Absolute gastrointestinal absorption fraction (unitless) | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |
| $EF_s$ | Exposure frequency (days/year) | 52 | 52 | 52 | 52 | 52 |
| AT | Averaging time (days/year) | 365 | 365 | 365 | 365 | 365 |
| $GSD_{i,\,adult}$ | Estimate of individual geometric standard deviation among adults (unitless) | 1.8 | 2.1 | 1.8 | 2.1 | 2 |
| $R_{fetal/maternal}$ | Constant of proportionality between fetal blood lead concentration at birth and maternal blood lead concentration (unitless) | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| **$PbB_{adult,\,central}$** | **Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)** | **2.10** | **2.10** | **2.60** | **2.60** | **2.40** |
| **$PbB_{fetal,\,GM}$** | **Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have site exposures to soil lead at concentration, PbS.** | **1.89** | **1.89** | **2.34** | **2.34** | **2.16** |
| | **Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL.** | **0.23%** | **1.23%** | **0.67%** | **2.51%** | **1.35%** |
| **$PbB_{fetal,\,0.95}$** | **Calculated 95th percentile blood lead concentrations among fetuses born to women having site exposures (ug/dL)** | **4.97** | **6.40** | **6.15** | **7.92** | **6.75** |
| **RBRG** | **Lead soil concentration corresponding to a 95th percentile 10 ug/dL lead blood level in a fetus (mg/kg).** | **3693** | **2309** | **2961** | **1577** | **2271** |

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the $EF_s$ is less than 1 day/week.

[1] The arithmetic mean concentration is the exposure point concentration.

**SITE NAME:** AREA B: LOWER FERRY CREEK - DELBUONO WETLANDS
**LOCATION:** FERRY CREEK, STRATFORD, CONNECTICUT
**RECEPTOR:** ADOLESCENT TRESPASSER - CENTRAL TENDENCY EXPOSURE
**DATE:** July 20, 2000

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and the blood lead concentration in the developing fetuses of adult women. (U.S. EPA, Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, December 1996). U.S. EPA, Use of the TRW Interim Adult Lead Methodology in Risk Assessment, April 7, 1999.

RELEVANT EQUATIONS: $PbB_{fetal,\,GM} = R_{fetal/maternal} \times [PbB_{adult,\,0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,\,0.95} = PbB_{fetal,\,GM} \times GSD_{i,\,adult}^{1.645}$

Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL = 1-NORMDIST ((ln(10)-ln(PbS))/ln($GSD_i$))

| Exposure Parameter | Description (units) | $GSD_i$ = 1.8 - 2.1; $PbB_{adult,\,0}$ = 1.7 - 2.2 | | | | |
|---|---|---|---|---|---|---|
| | | Adult 1 | Adult 2 | Adult 3 | Adult 4 | Adult 5 |
| $PbB_{adult,\,0}$ | Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL) | 1.7 | 1.7 | 2.2 | 2.2 | 2 |
| PbS | Site-specific soil lead concentration (mg/kg) [1] | 582 | 582 | 582 | 582 | 582 |
| BKSF | Biokinetic slope factor (ug/dL per ug/day) | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| $IR_s$ | Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day) | 0.050 | 0.050 | 0.050 | 0.050 | 0.050 |
| $AF_s$ | Absolute gastrointestinal absorption fraction (unitless) | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |
| $EF_s$ | Exposure frequency (days/year) | 52 | 52 | 52 | 52 | 52 |
| AT | Averaging time (days/year) | 365 | 365 | 365 | 365 | 365 |
| $GSD_{i,\,adult}$ | Estimate of individual geometric standard deviation among adults (unitless) | 1.8 | 2.1 | 1.8 | 2.1 | 2 |
| $R_{fetal/maternal}$ | Constant of proportionality between fetal blood lead concentration at birth and maternal blood lead concentration (unitless) | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| **$PbB_{adult,\,central}$** | **Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)** | **1.90** | **1.90** | **2.40** | **2.40** | **2.20** |
| **$PbB_{fetal,\,GM}$** | **Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have site exposures to soil lead at concentration, PbS.** | **1.71** | **1.71** | **2.16** | **2.16** | **1.98** |
| | **Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL.** | **0.13%** | **0.86%** | **0.46%** | **1.94%** | **0.97%** |
| **$PbB_{fetal,\,0.95}$** | **Calculated 95th percentile blood lead concentrations among fetuses born to women having site exposures (ug/dL)** | **4.49** | **5.79** | **5.68** | **7.32** | **6.19** |
| **RBRG** | **Lead soil concentration corresponding to a 95th percentile 10 ug/dL lead blood level in a fetus (mg/kg).** | **7385** | **4617** | **5923** | **3155** | **4541** |

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the $EF_s$ is less than 1 day/week.

[1] The arithmetic mean concentration is the exposure point concentration.

SITE NAME: AREA B: LOWER FERRY CREEK - DELBUONO WETLANDS
LOCATION: FERRY CREEK, STRATFORD, CONNECTICUT
RECEPTOR: COMMERCIAL WORKER - HOT SPOT - SURFACE SOILS- CENTRAL TENDENCY EXPOSURE
DATE: July 20, 2000

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and the blood lead concentration in the developing fetuses of adult women. (U.S. EPA, Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, December 1996). U.S. EPA, Use of the TRW Interim Adult Lead Methodology in Risk Assessment, April 7, 1999.

RELEVANT EQUATIONS: $PbB_{fetal,\,GM} = R_{fetal/maternal} \times [PbB_{adult,\,0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,\,0.95} = PbB_{fetal,\,GM} \times GSD_{i,\,adult}^{1.645}$

Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL = 1-NORMDIST ((ln(10)-ln(PbS))/ln($GSD_i$))

| Exposure Parameter | Description (units) | $GSD_i$ = 1.8 - 2.1; $PbB_{adult,\,0}$ = 1.7 - 2.2 | | | | |
|---|---|---|---|---|---|---|
| | | Adult 1 | Adult 2 | Adult 3 | Adult 4 | Adult 5 |
| $PbB_{adult,\,0}$ | Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL) | 1.7 | 1.7 | 2.2 | 2.2 | 2 |
| PbS | Site-specific soil lead concentration (mg/kg) [1] | 1070 | 1070 | 1070 | 1070 | 1070 |
| BKSF | Biokinetic slope factor (ug/dL per ug/day) | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| $IR_s$ | Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day) | 0.050 | 0.050 | 0.050 | 0.050 | 0.050 |
| $AF_s$ | Absolute gastrointestinal absorption fraction (unitless) | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |
| $EF_s$ | Exposure frequency (days/year) | 250 | 250 | 250 | 250 | 250 |
| AT | Averaging time (days/year) | 365 | 365 | 365 | 365 | 365 |
| $GSD_{i,\,adult}$ | Estimate of individual geometric standard deviation among adults (unitless) | 1.8 | 2.1 | 1.8 | 2.1 | 2 |
| $R_{fetal/maternal}$ | Constant of proportionality between fetal blood lead concentration at birth and maternal blood lead concentration (unitless) | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| **$PbB_{adult,\,central}$** | **Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)** | **3.46** | **3.46** | **3.96** | **3.96** | **3.76** |
| **$PbB_{fetal,\,GM}$** | **Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have site exposures to soil lead at concentration, PbS.** | **3.11** | **3.11** | **3.56** | **3.56** | **3.38** |
| | **Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL.** | **2.35%** | **5.79%** | **3.96%** | **8.21%** | **5.90%** |
| **$PbB_{fetal,\,0.95}$** | **Calculated 95th percentile blood lead concentrations among fetuses born to women having site exposures (ug/dL)** | **8.19** | **10.55** | **9.37** | **12.07** | **10.58** |
| **RBRG** | **Lead soil concentration corresponding to a 95th percentile 10 ug/dL lead blood level in a fetus (mg/kg).** | **1536** | **960** | **1232** | **656** | **945** |

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the $EF_s$ is less than 1 day/week.

[1] The arithmetic mean concentration is the exposure point concentration.

SITE NAME: AREA B: LOWER FERRY CREEK - BUONO WETLANDS
LOCATION: FERRY CREEK, STRATFORD, CONNECTICUT
RECEPTOR: COMMERCIAL WORKER - HOTSPOT - SOILS 0-15 FEET - REASONABLE MAXIMUM EXPOSURE
DATE: July 20, 2000

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and the blood lead concentration in the developing fetuses of adult women. (U.S. EPA, Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, December 1996). U.S. EPA, Use of the TRW Interim Adult Lead Methodology in Risk Assessment, April 7, 1999.

RELEVANT EQUATIONS: $PbB_{fetal,GM} = R_{fetal/maternal} \times [PbB_{adult,0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,0.95} = PbB_{fetal,GM} \times GSD_{i,adult}^{1.645}$

Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL = 1-NORMDIST ((ln(10)-ln(PbS))/ln($GSD_i$))

| Exposure Parameter | Description (units) | $GSD_i$ = 1.8 - 2.1; $PbB_{adult,0}$ = 1.7 - 2.2 | | | | |
|---|---|---|---|---|---|---|
| | | Adult 1 | Adult 2 | Adult 3 | Adult 4 | Adult 5 |
| $PbB_{adult,0}$ | Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL) | 1.7 | 1.7 | 2.2 | 2.2 | 2 |
| PbS | Site-specific soil lead concentration (mg/kg) [1] | 609 | 609 | 609 | 609 | 609 |
| BKSF | Biokinetic slope factor (ug/dL per ug/day) | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| $IR_s$ | Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day) | 0.100 | 0.100 | 0.100 | 0.100 | 0.100 |
| $AF_s$ | Absolute gastrointestinal absorption fraction (unitless) | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |
| $EF_s$ | Exposure frequency (days/year) | 250 | 250 | 250 | 250 | 250 |
| AT | Averaging time (days/year) | 365 | 365 | 365 | 365 | 365 |
| $GSD_{i,adult}$ | Estimate of individual geometric standard deviation among adults (unitless) | 1.8 | 2.1 | 1.8 | 2.1 | 2 |
| $R_{fetal/maternal}$ | Constant of proportionality between fetal blood lead concentration at birth and maternal blood lead concentration (unitless) | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| **$PbB_{adult,central}$** | **Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)** | **3.70** | **3.70** | **4.20** | **4.20** | **4.00** |
| **$PbB_{fetal,GM}$** | **Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who ha exposures to soil lead at concentration, PbS.** | **3.33** | **3.33** | **3.78** | **3.78** | **3.60** |
| | **Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL.** | **3.08%** | **6.93%** | **4.90%** | **9.50%** | **7.04%** |
| **$PbB_{fetal,0.95}$** | **Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have site exposures to soil lead at concentration, PbS.** | **8.76** | **11.29** | **9.95** | **12.82** | **11.27** |
| **RBRG** | **Lead soil concentration corresponding to a 95th percentile 10 ug/dL lead blood level in a fetus (mg/kg).** | **768** | **480** | **616** | **328** | **472** |

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the $EF_s$ is less than 1 day/week.

[1] The arithmetic mean concentration is the exposure point concentration.

SITE NAME: AREA B: LOWER FERRY CREEK - DELBUONO WETLANDS
LOCATION: FERRY CREEK, STRATFORD, CONNECTICUT
RECEPTOR: COMMERCIAL WORKER - HOT SPOT - SOILS 0-15 FEET - CENTRAL TENDENCY EXPOSURE
DATE: July 20, 2000

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and the blood lead concentration in the developing fetuses of adult women. (U.S. EPA, Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, December 1996). U.S. EPA, Use of the TRW Interim Adult Lead Methodology in Risk Assessment, April 7, 1999.

RELEVANT EQUATIONS: $PbB_{fetal,\,GM} = R_{fetal/maternal} \times [PbB_{adult,\,0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,\,0.95} = PbB_{fetal,\,GM} \times GSD_{i,\,adult}^{1.645}$

Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL = 1-NORMDIST ((ln(10)-ln(PbS))/ln($GSD_i$))

| Exposure Parameter | Description (units) | $GSD_i$ = 1.8 - 2.1; $PbB_{adult,\,0}$ = 1.7 - 2.2 | | | | |
|---|---|---|---|---|---|---|
| | | Adult 1 | Adult 2 | Adult 3 | Adult 4 | Adult 5 |
| $PbB_{adult,\,0}$ | Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL) | 1.7 | 1.7 | 2.2 | 2.2 | 2 |
| PbS | Site-specific soil lead concentration (mg/kg) [1] | 609 | 609 | 609 | 609 | 609 |
| BKSF | Biokinetic slope factor (ug/dL per ug/day) | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| $IR_s$ | Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day) | 0.050 | 0.050 | 0.050 | 0.050 | 0.050 |
| $AF_s$ | Absolute gastrointestinal absorption fraction (unitless) | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |
| $EF_s$ | Exposure frequency (days/year) | 250 | 250 | 250 | 250 | 250 |
| AT | Averaging time (days/year) | 365 | 365 | 365 | 365 | 365 |
| $GSD_{i,\,adult}$ | Estimate of individual geometric standard deviation among adults (unitless) | 1.8 | 2.1 | 1.8 | 2.1 | 2 |
| $R_{fetal/maternal}$ | Constant of proportionality between fetal blood lead concentration at birth and maternal blood lead concentration (unitless) | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| **$PbB_{adult,\,central}$** | **Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)** | **2.70** | **2.70** | **3.20** | **3.20** | **3.00** |
| **$PbB_{fetal,\,GM}$** | **Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have site exposures to soil lead at concentration, PbS.** | **2.43** | **2.43** | **2.88** | **2.88** | **2.70** |
| | **Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL.** | **0.81%** | **2.83%** | **1.71%** | **4.67%** | **2.95%** |
| **$PbB_{fetal,\,0.95}$** | **Calculated 95th percentile blood lead concentrations among fetuses born to women having site exposures (ug/dL)** | **6.39** | **8.24** | **7.58** | **9.76** | **8.45** |
| **RBRG** | **Lead soil concentration corresponding to a 95th percentile 10 ug/dL lead blood level in a fetus (mg/kg).** | **1536** | **960** | **1232** | **656** | **945** |

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the $EF_s$ is less than 1 day/week.

[1] The arithmetic mean concentration is the exposure point concentration.

SITE NAME: AREA F: SELBY POND
LOCATION: FERRY CREEK, STRATFORD, CONNECTICUT
RECEPTOR: FREQUENT ADULT RECREATIONAL USER - REASONABLE MAXIMUM EXPOSURE
DATE: July 20, 2000

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and the blood lead concentration in the developing fetuses of adult women. (U.S. EPA, Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, December 1996). U.S. EPA, Use of the TRW Interim Adult Lead Methodology in Risk Assessment, April 7, 1999.

RELEVANT EQUATIONS: $PbB_{fetal,\,GM} = R_{fetal/maternal} \times [PbB_{adult,\,0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,\,0.95} = PbB_{fetal,\,GM} \times GSD_{i,\,adult}^{1.645}$

Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL = 1-NORMDIST ((ln(10)-ln(PbS))/ln($GSD_i$))

| Exposure Parameter | Description (units) | $GSD_i$ = 1.8 - 2.1; $PbB_{adult,\,0}$ = 1.7 - 2.2 | | | | |
|---|---|---|---|---|---|---|
| | | Adult 1 | Adult 2 | Adult 3 | Adult 4 | Adult 5 |
| $PbB_{adult,\,0}$ | Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL) | 1.7 | 1.7 | 2.2 | 2.2 | 2 |
| PbS | Site-specific soil lead concentration (mg/kg) [1] | 256 | 256 | 256 | 256 | 256 |
| BKSF | Biokinetic slope factor (ug/dL per ug/day) | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| $IR_s$ | Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day) | 0.100 | 0.100 | 0.100 | 0.100 | 0.100 |
| $AF_s$ | Absolute gastrointestinal absorption fraction (unitless) | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |
| $EF_s$ | Exposure frequency (days/year) | 90 | 90 | 90 | 90 | 90 |
| AT | Averaging time (days/year) | 365 | 365 | 365 | 365 | 365 |
| $GSD_{i,\,adult}$ | Estimate of individual geometric standard deviation among adults (unitless) | 1.8 | 2.1 | 1.8 | 2.1 | 2 |
| $R_{fetal/maternal}$ | Constant of proportionality between fetal blood lead concentration at birth and maternal blood lead concentration (unitless) | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| **$PbB_{adult,\,central}$** | **Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)** | **2.00** | **2.00** | **2.50** | **2.50** | **2.30** |
| **$PbB_{fetal,\,GM}$** | **Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have site exposures to soil lead at concentration, PbS.** | **1.80** | **1.80** | **2.25** | **2.25** | **2.07** |
| | **Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL.** | **0.18%** | **1.05%** | **0.56%** | **2.23%** | **1.16%** |
| **$PbB_{fetal,\,0.95}$** | **Calculated 95th percentile blood lead concentrations among fetuses born to women having site exposures (ug/dL)** | **4.74** | **6.11** | **5.92** | **7.63** | **6.48** |
| **RBRG** | **Lead soil concentration corresponding to a 95th percentile 10 ug/dL lead blood level in a fetus (mg/kg).** | **2133** | **1334** | **1711** | **911** | **1312** |

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the $EF_s$ is less than 1 day/week.

[1] The arithmetic mean concentration is the exposure point concentration.

**SITE NAME:** AREA F: SELBY POND
**LOCATION:** FERRY CREEK, STRATFORD, CONNECTICUT
**RECEPTOR:** FREQUENT ADULT RECREATIONAL USER - CENTRAL TENDENCY EXPOSURE
**DATE:** July 20, 2000

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and the blood lead concentration in the developing fetuses of adult women. (U.S. EPA, Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, December 1996). U.S. EPA, Use of the TRW Interim Adult Lead Methodology in Risk Assessment, April 7, 1999.

RELEVANT EQUATIONS: $PbB_{fetal,\,GM} = R_{fetal/maternal} \times [PbB_{adult,\,0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,\,0.95} = PbB_{fetal,\,GM} \times GSD_{i,\,adult}^{1.645}$

Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL = 1-NORMDIST ((ln(10)-ln(PbS))/ln($GSD_i$))

| Exposure Parameter | Description (units) | $GSD_i$ = 1.8 - 2.1; $PbB_{adult,\,0}$ = 1.7 - 2.2 | | | | |
|---|---|---|---|---|---|---|
| | | Adult 1 | Adult 2 | Adult 3 | Adult 4 | Adult 5 |
| $PbB_{adult,\,0}$ | Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL) | 1.7 | 1.7 | 2.2 | 2.2 | 2 |
| PbS | Site-specific soil lead concentration (mg/kg) [1] | 256 | 256 | 256 | 256 | 256 |
| BKSF | Biokinetic slope factor (ug/dL per ug/day) | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| $IR_s$ | Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day) | 0.050 | 0.050 | 0.050 | 0.050 | 0.050 |
| $AF_s$ | Absolute gastrointestinal absorption fraction (unitless) | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |
| $EF_s$ | Exposure frequency (days/year) | 90 | 90 | 90 | 90 | 90 |
| AT | Averaging time (days/year) | 365 | 365 | 365 | 365 | 365 |
| $GSD_{i,\,adult}$ | Estimate of individual geometric standard deviation among adults (unitless) | 1.8 | 2.1 | 1.8 | 2.1 | 2 |
| $R_{fetal/maternal}$ | Constant of proportionality between fetal blood lead concentration at birth and maternal blood lead concentration (unitless) | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| **$PbB_{adult,\,central}$** | **Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)** | **1.85** | **1.85** | **2.35** | **2.35** | **2.15** |
| **$PbB_{fetal,\,GM}$** | **Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have site exposures to soil lead at concentration, PbS.** | **1.67** | **1.67** | **2.12** | **2.12** | **1.94** |
| | **Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL.** | **0.11%** | **0.79%** | **0.41%** | **1.82%** | **0.89%** |
| **$PbB_{fetal,\,0.95}$** | **Calculated 95th percentile blood lead concentrations among fetuses born to women having site exposures (ug/dL)** | **4.38** | **5.65** | **5.57** | **7.17** | **6.06** |
| **RBRG** | **Lead soil concentration corresponding to a 95th percentile 10 ug/dL lead blood level in a fetus (mg/kg).** | **4267** | **2668** | **3422** | **1823** | **2624** |

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the $EF_s$ is less than 1 day/week.

[1] The arithmetic mean concentration is the exposure point concentration.