

ATTACHMENT 1

DATA TREATMENT

Data Treatment

This attachment discussed the use and treatment of the analytical data prior to use in the baseline human health risk assessment.

The following criteria were applied to the analytical data:

- If a value is not flagged, the value was used as reported (a detected value);
- If a value is flagged with "J", the value was used as reported (a detected value);
- If a value is flagged with "R" or "UR", the value was considered not to exist and was not used (a rejected value); and
- If the value is flagged with "U" or "UJ", the result was considered a nondetected (an undetected) value.

Prior to using analytical data for a primary sample with an associated field duplicate, the analytical values for the primary sample and the field duplicate were averaged together to provide a single set of values for the field duplicate pair. The following conventions were used for averaging field duplicate samples together:

- If both samples have detected values (flagged with "J" or unflagged), both values were averaged together. If one value or both values are flagged with "J" prior to averaging, the resulting averaged value was flagged with "J".
- If both samples have nondetected values (flagged with "U" or "UJ"), the lower value and its flag were used.
- If one sample has a nondetected value (flagged with "U" or "UJ") and the other sample has a detected value (flagged with "J" or unflagged) the following is done:
 - If the detected value is less than or equal to the nondetected value, the detected value and its flag were used; or
 - If the detected value is greater than the nondetected value, the detected value and 1/2 the nondetected value were averaged together. The resulting averaged value was flagged with "J".

- If one sample has a nonrejected value (flagged with "J", "U", "UJ" or unflagged) and one sample has a rejected value (flagged with "R" or "UR"), the nonrejected value and its flag were used.

The range of detection limits was determined based on the individual sample-specific detection limit (or sample quantitation limit; SQL) for each analyte. Because of sample dilution and/or sample weights, laboratory detection limits for individual samples can be higher than the method-specified detection limits. Minimum and maximum SQLs were determined for each analyte using each sample's SQL for all samples analyzed, regardless of whether the analyte was detected in any particular sample.

The frequency of detection is the number of samples with detected values per the number of samples analyzed. The number of samples with detected values was determined by totaling all samples with detected values (flagged with "J" or unflagged). The number of samples analyzed was determined by totaling all samples with detected or nondetected values (flagged with "U", "UJ", "J" or unflagged). Rejected values (flagged with "R" or "UR") were not included in the total number of samples analyzed. The mean of the field duplicate sample and corresponding sample was included when determining the number of samples analyzed and the number of detected values.

Arithmetic mean concentrations and 95% Upper Confidence Limits (UCLs) were calculated using all detected values (flagged with "J" or unflagged) and $\frac{1}{2}$ of the SQL for non-detected values (flagged with "U" or "UJ"). In some cases, the mean or 95% UCL was greater than the maximum value because of high or widely varying detection limits, because a detected value is below the SQL (flagged with "J" on the laboratory report), or because a small dataset was used. Detected values below the SQL are considered to be estimated concentrations, but are used in the risk assessment.

ATTACHMENT 2

DERIVATION OF ALLOWABLE DAILY INTAKE

Sodium

The recommended intake of sodium is 2,300 mg/day, according to some authorities (Luft, 1990). This number was rounded to 2,000 and divided by 10 to insure to add a ten-fold measure of safety since no official RDA was available. Back calculations were then done as follows to determine acceptable daily intakes in water and soil/sediment, using 2 l/day as the ingestion rate of water and 200 mg/kg as the soil/sediment ingestion rate (for a child) (USEPA, 1989)

Water:

$$X \text{ mg/l} \times 2 \text{ l/day} = 200 \text{ mg/day}$$

$$X = 100 \text{ mg/l (100,000 } \mu\text{g/l)}$$

Soil:

$$X \text{ mg/kg} \times 200 \text{ mg/day} \times \text{kg}/10^6 \text{mg} = 200 \text{ mg/day}$$

$$X = 1,000,000 \text{ mg/kg soil}$$

Calcium

The recommended daily allowance of calcium is 800 mg/day for adults (NRC, 1989). This number was selected as acceptable and back calculations done as follows to determine acceptable daily intakes in water and soil/sediment, using 2 l/day as the ingestion rate of water and 200 mg/kg as the soil/sediment ingestion rate (for a child) (USEPA, 1989).

Water:

$$X \text{ mg/l} \times 2 \text{ l/day} = 800 \text{ mg/day}$$

$$X = 400 \text{ mg/l (400,000 } \mu\text{g/l)}$$

Soil:

$$X \text{ mg/kg} \times 200 \text{ mg/day} \times \text{kg}/10^6 \text{ mg} = 800 \text{ mg/day}$$

$$X = 4,000,000 \text{ mg/kg soil}$$

Magnesium

Average daily magnesium intake in the United States reportedly ranges from 230 to 310 mg/kg (Shils, 1990). Therefore, 230 mg/kg was chosen as the acceptable level and that number divided by 10 to insure to add a ten-fold measure of safety since no official RDA was available. Back calculations were done as follows to determine acceptable daily intakes in water and soil/sediment using 2 l/day as the ingestion rate of water and 200 mg/kg as the soil/sediment ingestion rate (for a child) (USEPA, 1989).

Water:

$$\frac{X \text{ mg/l} \times 2 \text{ l/day}}{70 \text{ kg}} = 23 \text{ mg/kg/day}$$

$$X = 805 \text{ mg/l (805,000 } \mu\text{g/l)}$$

Soil:

$$\frac{X \text{ mg/kg} \times 200 \text{ mg/day} \times \text{kg}/10^6 \text{ mg}}{70 \text{ kg}} = 23 \text{ mg/kg/day}$$

$$X = 8,050,000 \text{ mg/kg soil}$$

Potassium

The NRC has determined that the estimated adequate and safe intake level for potassium is between 1,875 and 5,600 mg/day (NRC, 1989). However, acute poisoning in children has been observed at levels as low as 2,000 mg/day (NRC, 1980). Therefore, 2,000 mg/day was chosen as the acceptable level and that number divided by 10 to insure to add a ten-fold measure of safety since no official RDA was available. Back calculations were done as follows to determine acceptable daily intakes in water and soil/sediment, using 2 l/day as the ingestion rate of water and 200 mg/kg as the soil ingestion rate (for a child) (USEPA, 1989).

Water:

$$X \text{ mg/l} \times 2 \text{ l/day} = 200 \text{ mg/day}$$

$$X = 100 \text{ mg/l (100,000 } \mu\text{g/l)}$$

Soil:

$$X \text{ mg/kg} \times 200 \text{ mg/day} \times \text{kg}/10^6 \text{ mg} = 200 \text{ mg/day}$$

$$X = 1,000,000 \text{ mg/kg soil}$$

REFERENCES

- Luft, F.C. 1990. Sodium, chloride, and potassium. In *Present knowledge in nutrition*, Brown, M.L., ed, 6th ed. Washington, D.C.: International Life Sciences Institute. pp. 233-240.
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- Shils, M.E. 1990. Magnesium. In *Present knowledge in nutrition*, Brown, M.L., ed, 6th ed. Washington, D.C.: International Life Sciences Institute. pp. 224-232.
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ATTACHMENT 3

**DERIVATION OF AIR
EXPOSURE POINT CONCENTRATIONS**

**SUMMARY STATISTICS FOR SOILS TO OUTDOOR AIR -
LAGOON AREA - FUTURE**

Analytes	Maximum Detected Concentration
<u>VOCs (mg/Kg)</u>	
1,2-Dichlorobenzene	5.5E+02
1,2-Dichloroethane	1.4E+01
1,3-Dichlorobenzene	2.8E+01
1,4-Dichlorobenzene	1.1E+02
Benzene	3.9E+00
Bromodichloromethane	2.7E+01
Carbon tetrachloride	1.0E+01
Chlorobenzene	1.9E+01
Chloroform	3.8E+01
Tetrachloroethylene	6.7E+00
Trichloroethylene	1.2E+01
Xylene	6.9E+01

**SUMMARY STATISTICS FOR GROUNDWATER TO
OUTDOOR AIR - LAGOON AREA - FUTURE**

Analytes	Maximum Detected Concentration
<u>VOCs (ug/L)</u>	
1,3-Dichlorobenzene	6.9E-01
1,4-Dichlorobenzene	7.9E+00
Carbon tetrachloride	1.0E+00
Chlorobenzene	3.6E+01
Methylene chloride	5.9E+02
Tetrachloroethylene	7.8E+01

**SOIL TO OUTDOOR AIR
FUTURE UTILITY WORKER - LAGOON AREA**

	Soil EPC	Soil Temp.	Soil Temp.	Henry's Law Constant	Henry's Law Reference	Normal Boiling Point	Enthalpy of vaporization	Critical Temp.	Enthalpy of vaporization	Gas Constant	Henry's Law Constant	Gas Constant	Henry's Law Constant	
	C_R	T_S	T_S	H_R	T_R	T_B	$\Delta H_{v,B}$	T_C	constant	at T_S	R_c	H_{TS}	R	H'_{TS}
Units:	$\mu\text{g}/\text{kg}$	$^{\circ}\text{C}$	K	$\text{atm}\cdot\text{m}^3/\text{mol}$	K	K	cal/mol	K	unitless	cal/mol	$\text{cal}/\text{mol}\cdot\text{K}$	$\text{atm}\cdot\text{m}^3/\text{mol}$	$\text{m}^3\cdot\text{atm}/\text{mol}\cdot\text{K}$	unitless
Formula:	Input	(10 for screening)	$(T_S + 273.15)$	lookup	$(\text{lookup} + 273.15)$	lookup	lookup	lookup	(Note 7)	(Note 8)	(Note 9)			$H_{TS} / (R * T_S)$
VOCs														
1,2-Dichlorobenzene	5.5E+05	1.00E+01	2.83E+02	1.90E-03	2.98E+02	4.54E+02	9.70E+03	7.05E+02	3.60E-01	1.17E+04	1.99E+00	1.90E-03	8.21E-05	8.18E-02
1,2-Dichloroethane	1.4E+04	1.00E+01	2.83E+02	9.78E-04	2.98E+02	3.57E+02	7.64E+03	5.61E+02	3.54E-01	8.52E+03	1.99E+00	9.78E-04	8.21E-05	4.21E-02
1,3-Dichlorobenzene	2.8E+04	1.00E+01	2.83E+02	3.24E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	3.24E-03	8.21E-05	1.39E-01
1,4-Dichlorobenzene	1.1E+05	1.00E+01	2.83E+02	2.43E-03	2.98E+02	4.47E+02	9.27E+03	6.85E+02	3.67E-01	1.12E+04	1.99E+00	2.43E-03	8.21E-05	1.05E-01
Benzene	3.9E+03	1.00E+01	2.83E+02	5.56E-03	2.98E+02	3.53E+02	7.34E+03	5.62E+02	3.49E-01	8.12E+03	1.99E+00	5.56E-03	8.21E-05	2.39E-01
Bromodichloromethane	2.7E+04	1.00E+01	2.83E+02	1.60E-03	2.98E+02	3.63E+02	7.00E+03	5.86E+02	3.43E-01	7.78E+03	1.99E+00	1.60E-03	8.21E-05	6.89E-02
Carbon tetrachloride	1.0E+04	1.00E+01	2.83E+02	3.05E-02	2.98E+02	3.50E+02	7.13E+03	5.57E+02	3.49E-01	7.86E+03	1.99E+00	3.05E-02	8.21E-05	1.31E+00
Chlorobenzene	1.9E+04	1.00E+01	2.83E+02	3.71E-03	2.98E+02	4.05E+02	8.41E+03	6.32E+02	3.58E-01	9.80E+03	1.99E+00	3.71E-03	8.21E-05	1.60E-01
Chloroform	3.8E+04	1.00E+01	2.83E+02	3.66E-03	2.98E+02	3.34E+02	6.99E+03	5.36E+02	3.45E-01	7.55E+03	1.99E+00	3.66E-03	8.21E-05	1.58E-01
Tetrachloroethylene	6.7E+03	1.00E+01	2.83E+02	1.84E-02	2.98E+02	3.94E+02	8.29E+03	6.20E+02	3.55E-01	9.55E+03	1.99E+00	1.84E-02	8.21E-05	7.92E-01
Trichloroethylene	1.2E+04	1.00E+01	2.83E+02	1.03E-02	2.98E+02	3.60E+02	7.51E+03	5.44E+02	3.74E-01	8.56E+03	1.99E+00	1.03E-02	8.21E-05	4.43E-01
Xylene	6.9E+04	1.00E+01	2.83E+02	7.34E-03	2.98E+02	4.12E+02	8.52E+03	6.17E+02	3.78E-01	1.03E+04	1.99E+00	7.34E-03	8.21E-05	3.16E-01

(continued)
SOIL TO OUTDOOR AIR
FUTURE UTILITY WORKER - LAGOON AREA

	Conversion Factor $\mu\text{g}/\text{kg}$ to g/g Conv01 Units: $\mu\text{g}/\text{kg} / \text{g}/\text{g}$ Formula:	SCS soil type in vadose zone ST_v unitless (Note 11)	Vadose zone soil dry bulk density ρ_b g/cm^3 (1.5 for screening)	Vadose zone soil water-filled porosity $\theta_{w,v}$ cm^3/cm^3 (0.3 for screening)	Organic carbon partition coefficient K_{oc} cm^3/g lookup	Vadose zone organic carbon fraction $f_{oc,v}$ unitless (0.002 for screening)	Soil-water partition coefficient K_d cm^3/g $K_{oc} * f_{oc}$	Vadose zone soil total porosity n_v cm^3/cm^3 (0.43 for screening)	Vadose zone soil air-filled porosity $\theta_{a,v}$ cm^3/cm^3 $n_v - \theta_{w,v}$	Conversion Factor g/cm^3 to $\mu\text{g}/\text{m}^3$ Conv03 $\text{g}/\text{cm}^3 / \mu\text{g}/\text{m}^3$	Source Vapor Conc. C_{source} $\mu\text{g}/\text{m}^3$ (Note 21)
VOCs											
1,2-Dichlorobenzene	1.00E-09	SCL	1.50E+00	3.00E-01	6.17E+02	2.00E-03	1.23E+00	4.30E-01	1.30E-01	1.00E+12	3.12E+07
1,2-Dichloroethane	1.00E-09	SCL	1.50E+00	3.00E-01	1.74E+01	2.00E-03	3.48E-02	4.30E-01	1.30E-01	1.00E+12	2.47E+06
1,3-Dichlorobenzene	1.00E-09	SCL	1.50E+00	3.00E-01	6.17E+02	2.00E-03	1.23E+00	4.30E-01	1.30E-01	1.00E+12	2.70E+06
1,4-Dichlorobenzene	1.00E-09	SCL	1.50E+00	3.00E-01	6.17E+02	2.00E-03	1.23E+00	4.30E-01	1.30E-01	1.00E+12	7.97E+06
Benzene	1.00E-09	SCL	1.50E+00	3.00E-01	5.89E+01	2.00E-03	1.18E-01	4.30E-01	1.30E-01	1.00E+12	2.76E+06
Bromodichloromethane	1.00E-09	SCL	1.50E+00	3.00E-01	5.50E+01	2.00E-03	1.10E-01	4.30E-01	1.30E-01	1.00E+12	5.88E+06
Carbon tetrachloride	1.00E-09	SCL	1.50E+00	3.00E-01	1.74E+02	2.00E-03	3.48E-01	4.30E-01	1.30E-01	1.00E+12	1.98E+07
Chlorobenzene	1.00E-09	SCL	1.50E+00	3.00E-01	2.19E+02	2.00E-03	4.38E-01	4.30E-01	1.30E-01	1.00E+12	4.65E+06
Chloroform	1.00E-09	SCL	1.50E+00	3.00E-01	3.98E+01	2.00E-03	7.96E-02	4.30E-01	1.30E-01	1.00E+12	2.04E+07
Tetrachloroethylene	1.00E-09	SCL	1.50E+00	3.00E-01	1.55E+02	2.00E-03	3.10E-01	4.30E-01	1.30E-01	1.00E+12	9.17E+06
Trichloroethylene	1.00E-09	SCL	1.50E+00	3.00E-01	1.66E+02	2.00E-03	3.32E-01	4.30E-01	1.30E-01	1.00E+12	9.33E+06
Xylene	1.00E-09	SCL	1.50E+00	3.00E-01	4.07E+02	2.00E-03	8.14E-01	4.30E-01	1.30E-01	1.00E+12	2.09E+07

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SOIL TO OUTDOOR AIR
FUTURE UTILITY WORKER - LAGOON AREA

	Depth below grade to bottom of trench L_F	Depth below grade to contamination L_1	Source Trench Separation L_T	Diffusivity in air D_a	Diffusivity in water D_w	Vadose zone Effective Diffusion Coeff. D_v^{eff}	Total Overall Effective Diffusion Coeff. D_T^{eff}	Area of Trench Below Grade A_B	Trench Ventilation Rate Q_{trench}	Pressure Diff. between soil & enclosed space ΔP	Vadose zone soil saturated hydraulic conductivity $K_{s,v}$	Conversion Factor hr to s Conv02 s/hr
Units:	cm	cm	cm	cm^2/s	cm^2/s	cm^2/s	cm^2/s	cm^2	cm^3/s	$g/cm-s^2$	cm/hr	
Formula:	(120 (4') for screening)	(400 for screening)	$L_1 - L_F$	lookup	lookup	(Note 13)	(Note 4)	(Note 2)	(Note 22)	(40 for screening)	lookup	
VOCs												
1,2-Dichlorobenzene	1.20E+02	4.00E+02	2.80E+02	6.90E-02	7.90E-06	4.28E-04	4.28E-04	3.29E+05	1.70E+05	4.00E+01	1.31E+00	3.60E+03
1,2-Dichloroethane	1.20E+02	4.00E+02	2.80E+02	1.04E-01	9.90E-06	6.53E-04	6.53E-04	3.29E+05	1.70E+05	4.00E+01	1.31E+00	3.60E+03
1,3-Dichlorobenzene	1.20E+02	4.00E+02	2.80E+02	6.92E-02	7.86E-06	4.25E-04	4.25E-04	3.29E+05	1.70E+05	4.00E+01	1.31E+00	3.60E+03
1,4-Dichlorobenzene	1.20E+02	4.00E+02	2.80E+02	6.90E-02	7.90E-06	4.26E-04	4.26E-04	3.29E+05	1.70E+05	4.00E+01	1.31E+00	3.60E+03
Benzene	1.20E+02	4.00E+02	2.80E+02	8.80E-02	9.80E-06	5.37E-04	5.37E-04	3.29E+05	1.70E+05	4.00E+01	1.31E+00	3.60E+03
Bromodichloromethane	1.20E+02	4.00E+02	2.80E+02	2.98E-02	1.06E-05	1.96E-04	1.96E-04	3.29E+05	1.70E+05	4.00E+01	1.31E+00	3.60E+03
Carbon tetrachloride	1.20E+02	4.00E+02	2.80E+02	7.80E-02	8.80E-06	4.73E-04	4.73E-04	3.29E+05	1.70E+05	4.00E+01	1.31E+00	3.60E+03
Chlorobenzene	1.20E+02	4.00E+02	2.80E+02	7.30E-02	8.70E-06	4.48E-04	4.48E-04	3.29E+05	1.70E+05	4.00E+01	1.31E+00	3.60E+03
Chloroform	1.20E+02	4.00E+02	2.80E+02	1.04E-01	1.00E-05	6.37E-04	6.37E-04	3.29E+05	1.70E+05	4.00E+01	1.31E+00	3.60E+03
Tetrachloroethylene	1.20E+02	4.00E+02	2.80E+02	7.20E-02	8.20E-06	4.37E-04	4.37E-04	3.29E+05	1.70E+05	4.00E+01	1.31E+00	3.60E+03
Trichloroethylene	1.20E+02	4.00E+02	2.80E+02	7.90E-02	9.10E-06	4.81E-04	4.81E-04	3.29E+05	1.70E+05	4.00E+01	1.31E+00	3.60E+03
Xylene	1.20E+02	4.00E+02	2.80E+02	7.00E-02	7.80E-06	4.27E-04	4.27E-04	3.29E+05	1.70E+05	4.00E+01	1.31E+00	3.60E+03

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SOIL TO OUTDOOR AIR
FUTURE UTILITY WORKER - LAGOON AREA

	Viscosity of water at 10°C	Viscosity of water at system temp.	Density of water	Acceleration due to gravity	Vadose zone soil intrinsic permeability	Vadose zone residual soil water content	Vadose zone effective total fluid saturation	Vadose zone van Genuchten shape parameter	Vadose zone soil relative air permeability	Vadose zone soil effective vapor permeability	Thickness of soil between soilgas & trench
	$\mu_{w,10}$	μ_w	ρ_w	g	$k_{i,v}$	$\theta_{r,v}$	S_{e}	M_v	k_{rg}	k_v	L_{soil}
Units:	g/cm-s	g/cm-s	g/cm ³	cm/s ²	cm ²	cm ³ /cm ³	unitless	unitless	unitless	cm ²	cm
Formula:		(Note 16)	(0.999 for screening)		(Note 17)	lookup	(Note 18)	lookup	(Note 19)	(Note 20)	(1 for screening)
	check										
VOCs											
1,2-Dichlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	4.85E-09	1.00E-01	6.06E-01	3.24E-01	5.37E-01	2.61E-09	1.00E+00
1,2-Dichloroethane	1.31E-02	1.31E-02	9.99E-01	9.81E+02	4.85E-09	1.00E-01	6.06E-01	3.24E-01	5.37E-01	2.61E-09	1.00E+00
1,3-Dichlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	4.85E-09	1.00E-01	6.06E-01	3.24E-01	5.37E-01	2.61E-09	1.00E+00
1,4-Dichlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	4.85E-09	1.00E-01	6.06E-01	3.24E-01	5.37E-01	2.61E-09	1.00E+00
Benzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	4.85E-09	1.00E-01	6.06E-01	3.24E-01	5.37E-01	2.61E-09	1.00E+00
Bromodichloromethane	1.31E-02	1.31E-02	9.99E-01	9.81E+02	4.85E-09	1.00E-01	6.06E-01	3.24E-01	5.37E-01	2.61E-09	1.00E+00
Carbon tetrachloride	1.31E-02	1.31E-02	9.99E-01	9.81E+02	4.85E-09	1.00E-01	6.06E-01	3.24E-01	5.37E-01	2.61E-09	1.00E+00
Chlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	4.85E-09	1.00E-01	6.06E-01	3.24E-01	5.37E-01	2.61E-09	1.00E+00
Chloroform	1.31E-02	1.31E-02	9.99E-01	9.81E+02	4.85E-09	1.00E-01	6.06E-01	3.24E-01	5.37E-01	2.61E-09	1.00E+00
Tetrachloroethylene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	4.85E-09	1.00E-01	6.06E-01	3.24E-01	5.37E-01	2.61E-09	1.00E+00
Trichloroethylene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	4.85E-09	1.00E-01	6.06E-01	3.24E-01	5.37E-01	2.61E-09	1.00E+00
Xylene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	4.85E-09	1.00E-01	6.06E-01	3.24E-01	5.37E-01	2.61E-09	1.00E+00

(continued)
SOIL TO OUTDOOR AIR
FUTURE UTILITY WORKER - LAGOON AREA

	Vapor viscosity at avg. soil temp.	Avg. Vapor Flow Rate Into trench	Infinite Source Attenuation Coeff.	Infinite Source Trench Conc.
	μts	Q_{soil}	α	C_{trench}
Units:	g/cm-s	cm ³ /s	unitless	μg/m ³
Formula:	$0.00018 \cdot (T_g/298.15)^{-0.5}$	(Note 5)	(Note 6)	$C_{\text{source}} \cdot \alpha$
	check			
VOCs				
1,2-Dichlorobenzene	1.75E-04	5.95E-04	3.50E-09	1.1E-01
1,2-Dichloroethane	1.75E-04	5.95E-04	3.50E-09	8.6E-03
1,3-Dichlorobenzene	1.75E-04	5.95E-04	3.50E-09	9.4E-03
1,4-Dichlorobenzene	1.75E-04	5.95E-04	3.50E-09	2.8E-02
Benzene	1.75E-04	5.95E-04	3.50E-09	9.6E-03
Bromodichloromethane	1.75E-04	5.95E-04	3.49E-09	2.1E-02
Carbon tetrachloride	1.75E-04	5.95E-04	3.50E-09	6.9E-02
Chlorobenzene	1.75E-04	5.95E-04	3.50E-09	1.6E-02
Chloroform	1.75E-04	5.95E-04	3.50E-09	7.1E-02
Tetrachloroethylene	1.75E-04	5.95E-04	3.50E-09	3.2E-02
Trichloroethylene	1.75E-04	5.95E-04	3.50E-09	3.3E-02
Xylene	1.75E-04	5.95E-04	3.50E-09	7.3E-02

(continued)

**SOIL TO OUTDOOR AIR
FUTURE UTILITY WORKER - LAGOON AREA**

Notes:

Reference: *User's Guide for the Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings*, USEPA, September 1997.

- (1) Assumed equivalent to D_i^{eff} of soil layer i in contact with the floor
- (2) For screening, assume a trench 4 ft deep, 3 ft wide, and 30 ft long.
- (3) Depth to water table minus depth to bottom of floor must be > thickness of capillary fringe, which is based on the soil type (typ. around 30 cm). Use 400 cm for screening purposes.
- (4) $D_T^{eff} = L_T / (L_T / D_v^{eff})$
- (5) $Q_{soil} = (2 * \pi * \Delta P * k_v * X_{crack}) / (H_{TS} * \ln(2 * Z_{crack} / r_{crack}))$
- (6) $\alpha = [(D_T^{eff} * A_{fl} / (Q_{building} * L_T)) * \text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack}))] / [\text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack})) + (D_T^{eff} * A_{fl} / (Q_{building} * L_T)) + (D_T^{eff} * A_{fl} / (Q_{soil} * L_T)) * (\text{EXP}(Q_{soil} * L_{crack} / (D^{crack} * A_{crack})) - 1)]$
- (7) A function of the ratio T_H/T_C :

T_H/T_C	α
<0.57	0.30
0.57-0.71	$0.74(T_H/T_C) - 0.116$
>0.71	0.41

- (8) $\Delta H_{v,TS} = \Delta H_{v,0} * [(1 - T_S/T_C) / (1 - T_H/T_C)]^n$
- (9) $H_{TS} = \text{EXP}[-\Delta H_{v,TS} / R_c * (1/T_S - 1/T_R)] * H_R$
- (10) Refer to 12 SCS soil types - use SC for screening.
- (11) Refer to 12 SCS soil types - use SCL for screening.
- (12) $L_{cz} = 0.15 / (0.2 * D_{cz})$
- (13) $D_v^{eff} = D_v * (\theta_{w,v}^{3.33} / n_v^2) + (D_w / H'_{TS}) * (\theta_{w,v}^{3.33} / n_v^2)$
- (14) $D_{cz}^{eff} = D_{cz} * (\theta_{w,cz}^{3.33} / n_{cz}^2) + (D_w / H'_{TS}) * (\theta_{w,cz}^{3.33} / n_{cz}^2)$
- (15) $\theta_{w,cz} = \theta_{T,cz} + ((\theta_{s,cz} * \theta_{r,cz}) / (2^{M_{cz}}))$, where the value 2 in the formula is used for screening, but may be refined based on soil parameters (see USEPA, 1999).
- (16) $\mu_w = \mu_{w,10} * (T_S / 283.15)^{0.5}$
- (17) $k_{i,v} = K_{s,v} * 1 / \text{Conv}02 * \mu_w / (\rho_w * g)$
- (18) $S_{ic} = (\theta_{w,v} - \theta_{r,v}) / (n_v - \theta_{r,v})$
- (19) $k_R = (1 - S_{ic})^{0.5} * (1 - S_{ic}^{1/M_v, 2M_v})$
- (20) $k_v = k_{i,v} * k_{R,i}$; note that the model is very sensitive to this parameter and if site-specific values are available, they should be used.
- (21) $C_{soil} = H'_{TS} * C_R * \text{Conv}01 * \rho_0 / (\theta_{w,v} + K_d * \rho_0 + H'_{TS} * \theta_{s,v}) * \text{Conv}02$
- (22) For screening, assume a trench 4 ft deep, 3 ft wide, 30 ft long and an air exchange rate of 60/hr. The air exchange rate is based on the assumption that the wind speed in the trench is a small fraction of the ground wind speed and that it could take up to 1 minute for a contaminant to be cleared from the trench air space.

**GROUNDWATER TO OUTDOOR AIR
FUTURE UTILITY WORKER - LAGOON AREA**

	GW EPC	GW Temp.	GW Temp.	Henry's Law Constant at ref. temp.	Henry's Law Reference Temp.	Normal Boiling Point	Enthalpy of vaporization at T _R	Critical Temp.	constant	Enthalpy of vaporization at T _R	Gas Constant	Henry's Law Constant at T _R	Gas Constant	Henry's Law Constant
	C _w	T _S	T _R	H _R	T _R	T _B	ΔH _{v,TS}	T _C	n	ΔH _{v,TS}	R _e	H _{TS}	R	H _{TS}
Units:	μg/L	°C	K	atm·m ³ /mol	K	K	cal/mol	K	unitless	cal/mol	cal/mol-K	atm·m ³ /mol	m ³ ·atm/mol-K	unitless
Formula:	Input	(10 for screening)	(T _S +273.15)	lookup	(lookup+273.15)	lookup	lookup	lookup	(Note 7)	(Note 8)		(Note 9)		H _{TS} / (R * T _S)
VOCs														
1,3-Dichlorobenzene	6.9E-01	1.00E+01	2.83E+02	3.24E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	3.24E-03	8.21E-05	1.39E-01
1,4-Dichlorobenzene	7.9E+00	1.00E+01	2.83E+02	2.43E-03	2.98E+02	4.47E+02	9.27E+03	6.85E+02	3.67E-01	1.12E+04	1.99E+00	2.43E-03	8.21E-05	1.05E-01
Carbon tetrachloride	1.0E+00	1.00E+01	2.83E+02	3.05E-02	2.98E+02	3.50E+02	7.13E+03	5.57E+02	3.49E-01	7.86E+03	1.99E+00	3.05E-02	8.21E-05	1.31E+00
Chlorobenzene	3.6E+01	1.00E+01	2.83E+02	3.71E-03	2.98E+02	4.05E+02	8.41E+03	6.32E+02	3.58E-01	9.80E+03	1.99E+00	3.71E-03	8.21E-05	1.60E-01
Methylene chloride	5.9E+02	1.00E+01	2.83E+02	2.19E-03	2.98E+02	3.13E+02	6.71E+03	5.10E+02	3.38E-01	7.03E+03	1.99E+00	2.19E-03	8.21E-05	9.41E-02
Tetrachloroethylene	7.8E+01	1.00E+01	2.83E+02	1.84E-02	2.98E+02	3.94E+02	8.29E+03	6.20E+02	3.55E-01	9.55E+03	1.99E+00	1.84E-02	8.21E-05	7.92E-01

Notes:

Reference: *User's Guide for the Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings*, USEPA, September 1997.

- Assumed equivalent to D_i^{eff} of soil layer i in contact with the floor
- For screening, assume a trench 4 ft deep, 3 ft wide, and 30 ft long.
- Depth to water table minus depth to bottom of floor must be > thickness of capillary fringe, which is based on the soil type (typ. around 30 cm) Use 400 cm for screening purposes
- $D_i^{eff} = L_T / ((L_{WT} - L_T) / D_{v,TS}^{eff}) + (L_{WT} / D_{v,TS}^{eff})$
- $Q_{well} = \Delta P * k_v * L_{well} / \mu_{w,TS}$; not from above reference
- $\alpha = [D_i^{eff} * A_{ij} / (Q_{well} * L_i)] / [(D_i^{eff} * A_{ij} / (Q_{well} * L_i)) + 1]$; assumes no resistance (Peclet number is infinite)
- A function of the ratio T_R/T_C:

T_R/T_C	α
<0.57	0.30
0.57-0.71	0.74*(T _R /T _C)-0.116
>0.71	0.41
- $\Delta H_{v,TS} = \Delta H_{v,B} * [(1 - T_R/T_C) / (1 - T_B/T_C)]^B$
- $H_{TS} = \text{EXP}[-\Delta H_{v,TS} / R_e * (1/T_S - 1/T_R)] * H_R$
- Refer to 12 SCS soil types - use SC for screening.
- Refer to 12 SCS soil types - use SCL for screening.
- $L_{ex} = 0.15 / (0.2 * D_{ex})$
- $D_v^{eff} = D_v * (\theta_{w,TS} / \theta_{w,B})^{1.33} / n_e^2 + (D_w / H_{TS}) * (\theta_{w,TS} / \theta_{w,B})^{1.33} / n_e^2$
- $D_{ex}^{eff} = D_{ex} * (\theta_{w,ex} / \theta_{w,B})^{1.33} / n_{ex}^2 + (D_w / H_{TS}) * (\theta_{w,ex} / \theta_{w,B})^{1.33} / n_{ex}^2$
- $\theta_{w,ex} = \theta_{w,TS} + ((\theta_{w,ex} - \theta_{w,TS}) * (2^{M_{ex}}))$, where the value 2 in the formula is used for screening, but may be refined based on soil parameters (see USEPA, 1999).
- $\mu_w = \mu_{w,TS} * (T_S / 283.15)^{0.5}$
- $k_{i,v} = K_{i,v} * 1/Conv02 * \mu_w / (\rho_w * g)$
- $S_{ie} = (\theta_{w,v} - \theta_{i,v}) / (n_e - \theta_{i,v})$
- $k_{Ri} = (1 - S_{ie})^{0.5} * (1 - S_{ie}^{1.4})^{M_{Ri}}$
- $k_v = k_{i,v} * k_{Ri}$; note that the model is very sensitive to this parameter and if site-specific values are available, they should be used.
- For screening, assume a trench 4 ft deep, 3 ft wide, 30 ft long, and an air exchange rate of 60/hr. The air exchange rate is based on the assumption that the wind speed in the trench is a small fraction of the ground wind speed and that it could take up to 1 minute for a contaminant to be cleared from the trench air space.

(continued)
GROUNDWATER TO OUTDOOR AIR
FUTURE UTILITY WORKER - LAGOON AREA

	Conversion Factor m ³ to L Conv01 Units: L/m ³ Formula:	Source Vapor Conc. C _{source} µg/m ³ C _w *H _{Ts} *Conv01	Depth below grade to bottom of trench L _P cm (120 (4) for screening)	Depth below grade to water table L _{WT} cm (Note 3)	Source Trench Separation L _T cm L _{WT} - L _P	SCS soil type directly above water table ST _{WT} unitless (Note 10)	SCS soil type in vadose zone ST _v unitless (Note 11)	Capillary zone mean particle diameter D _{cz} cm lookup	Thickness of capillary zone L _{cz} cm (Note 12)	Diffusivity in air D _a cm ² /s lookup	Diffusivity in water D _w cm ² /s lookup	Vadose zone soil total porosity n _v cm ³ /cm ³ (0.43 for screening)
VOCs												
1,3-Dichlorobenzene	1.00E+03	9.62E+01	1.20E+02	4.00E+02	2.80E+02	SC	SCL	2.50E-02	3.00E+01	6.92E-02	7.86E-06	4.30E-01
1,4-Dichlorobenzene	1.00E+03	8.26E+02	1.20E+02	4.00E+02	2.80E+02	SC	SCL	2.50E-02	3.00E+01	6.90E-02	7.90E-06	4.30E-01
Carbon tetrachloride	1.00E+03	1.31E+03	1.20E+02	4.00E+02	2.80E+02	SC	SCL	2.50E-02	3.00E+01	7.80E-02	8.80E-06	4.30E-01
Chlorobenzene	1.00E+03	5.75E+03	1.20E+02	4.00E+02	2.80E+02	SC	SCL	2.50E-02	3.00E+01	7.30E-02	8.70E-06	4.30E-01
Methylene chloride	1.00E+03	5.56E+04	1.20E+02	4.00E+02	2.80E+02	SC	SCL	2.50E-02	3.00E+01	1.01E-01	1.17E-05	4.30E-01
Tetrachloroethylene	1.00E+03	6.18E+04	1.20E+02	4.00E+02	2.80E+02	SC	SCL	2.50E-02	3.00E+01	7.20E-02	8.20E-06	4.30E-01

(continued)
GROUNDWATER TO OUTDOOR AIR
FUTURE UTILITY WORKER - LAGOON AREA

	Vadose zone soil water-filled porosity	Vadose zone soil air-filled porosity	Vadose zone Effective Diffusion Coeff.	Capillary zone soil total porosity	Capillary zone residual soil water content	Capillary zone saturated soil water content	Capillary zone van Genuchten shape parameter	Capillary zone soil water-filled porosity	Capillary zone soil air-filled porosity	Capillary zone Effective Diffusion Coeff.	Total Overall Effective Diffusion Coeff.
	θ_{wv}	θ_{av}	D_v^{eff}	n_{cz}	$\theta_{r,cz}$	$\theta_{s,cz}$	M_{cz}	$\theta_{w,cz}$	$\theta_{a,cz}$	D_{cz}^{eff}	D_1^{eff}
Units:	cm^3/cm^3	cm^3/cm^3	cm^2/s	cm^3/cm^3	cm^3/cm^3	cm^3/cm^3	unitless	cm^3/cm^3	cm^3/cm^3	cm^2/s	cm^2/s
Formula:	(0.3 for screening)	$n_v - \theta_{w,v}$	(Note 13)	(0.43 for screening)	lookup	lookup	lookup	(Note 13)	$n_{cz} - \theta_{w,cz}$	(Note 14)	(Note 4)
VOCs											
1,3-Dichlorobenzene	3.00E-01	1.30E-01	4.25E-04	4.30E-01	1.00E-01	3.80E-01	1.87E-01	3.46E-01	8.40E-02	1.07E-04	3.22E-04
1,4-Dichlorobenzene	3.00E-01	1.30E-01	4.26E-04	4.30E-01	1.00E-01	3.80E-01	1.87E-01	3.46E-01	8.40E-02	1.10E-04	3.25E-04
Carbon tetrachloride	3.00E-01	1.30E-01	4.73E-04	4.30E-01	1.00E-01	3.80E-01	1.87E-01	3.46E-01	8.40E-02	1.12E-04	3.51E-04
Chlorobenzene	3.00E-01	1.30E-01	4.48E-04	4.30E-01	1.00E-01	3.80E-01	1.87E-01	3.46E-01	8.40E-02	1.12E-04	3.39E-04
Methylene chloride	3.00E-01	1.30E-01	6.24E-04	4.30E-01	1.00E-01	3.80E-01	1.87E-01	3.46E-01	8.40E-02	1.63E-04	4.79E-04
Tetrachloroethylene	3.00E-01	1.30E-01	4.37E-04	4.30E-01	1.00E-01	3.80E-01	1.87E-01	3.46E-01	8.40E-02	1.04E-04	3.25E-04

(continued)

GROUNDWATER TO OUTDOOR AIR
FUTURE UTILITY WORKER - LAGOON AREA

	Area of Trench Below Grade	Trench Ventilation Rate	Pressure Diff. between soil & enclosed space	Vadose zone soil saturated hydraulic conductivity	Conversion Factor	Viscosity of water at 10°C	Viscosity of water at system temp.	Density of water	Acceleration due to gravity	Vadose zone soil intrinsic penneability	Vadose zone residual soil water content	Vadose zone effective total fluid saturation
	A_B	Q_{trench}	ΔP	$K_{s,v}$	Conv02	$\mu_{w,10}$	μ_w	ρ_w	g	$k_{i,v}$	$\theta_{r,v}$	S_{re}
Units:	cm ²	cm ³ /s	g/cm-s ²	cm/hr	s/hr	g/cm-s	g/cm-s	g/cm ³	cm/s ²	cm ²	cm ³ /cm ³	unitless
Formula:	(Note 2)	(Note 21)	(40 for screening)	lookup			(Note 16)	(0.999 for screening)		(Note 17)	lookup	(Note 18)
VOCs							check					
1,3-Dichlorobenzene	3.29E+05	1.70E+05	4.00E+01	1.31E+00	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	4.85E-09	1.00E-01	6.06E-01
1,4-Dichlorobenzene	3.29E+05	1.70E+05	4.00E+01	1.31E+00	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	4.85E-09	1.00E-01	6.06E-01
Carbon tetrachloride	3.29E+05	1.70E+05	4.00E+01	1.31E+00	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	4.85E-09	1.00E-01	6.06E-01
Chlorobenzene	3.29E+05	1.70E+05	4.00E+01	1.31E+00	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	4.85E-09	1.00E-01	6.06E-01
Methylene chloride	3.29E+05	1.70E+05	4.00E+01	1.31E+00	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	4.85E-09	1.00E-01	6.06E-01
Tetrachloroethylene	3.29E+05	1.70E+05	4.00E+01	1.31E+00	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	4.85E-09	1.00E-01	6.06E-01

(continued)

**GROUNDWATER TO OUTDOOR AIR
FUTURE UTILITY WORKER - LAGOON AREA**

	Vadose zone van Genuchten shape parameter M_v	Vadose zone soil relative air permeability k_{rg}	Vadose zone soil effective vapor permeability k_v	Thickness of soil between soilgas & trench L_{soil}	Vapor viscosity at avg. soil temp. μ_{TS}	Avg. Vapor Flow Rate Into trench Q_{soil}	Infinite Source Attenuation Coeff. α	Infinite Source Trench Conc. C_{trench}
Units:	unitless	unitless	cm^2	cm	$g/cm-s$	cm^3/s	unitless	$\mu g/m^3$
Formula:	lookup	(Note 19)	(Note 20)	(1 for screening)	$0.00018 \cdot (T_s/298.15)^{0.5}$	(Note 5)	(Note 6)	$C_{source} \cdot \alpha$
VOCs					check			
1,3-Dichlorobenzene	3.24E-01	5.37E-01	2.61E-09	1.00E+00	1.75E-04	5.95E-04	3.50E-09	3.4E-07
1,4-Dichlorobenzene	3.24E-01	5.37E-01	2.61E-09	1.00E+00	1.75E-04	5.95E-04	3.50E-09	2.9E-06
Carbon tetrachloride	3.24E-01	5.37E-01	2.61E-09	1.00E+00	1.75E-04	5.95E-04	3.50E-09	4.6E-06
Chlorobenzene	3.24E-01	5.37E-01	2.61E-09	1.00E+00	1.75E-04	5.95E-04	3.50E-09	2.0E-05
Methylene chloride	3.24E-01	5.37E-01	2.61E-09	1.00E+00	1.75E-04	5.95E-04	3.50E-09	1.9E-04
Tetrachloroethylene	3.24E-01	5.37E-01	2.61E-09	1.00E+00	1.75E-04	5.95E-04	3.50E-09	2.2E-04

SUMMARY OF MODELED AIR DATA FOR LAGOON AREA

	FUTURE UTILITY WORKER Outdoor Air		
	Soil	Groundwater	Sum
	ug/m ³		
VOCs			
1,2-Dichlorobenzene	1.1E-01		1.1E-01
1,2-Dichloroethane	8.6E-03		8.6E-03
1,3-Dichlorobenzene	9.4E-03	3.4E-07	9.4E-03
1,4-Dichlorobenzene	2.8E-02	2.9E-06	2.8E-02
Benzene	9.6E-03		9.6E-03
Bromodichloromethane	2.1E-02		2.1E-02
Carbon tetrachloride	6.9E-02	4.6E-06	6.9E-02
Chlorobenzene	1.6E-02	2.0E-05	1.6E-02
Chloroform	7.1E-02		7.1E-02
Methylene chloride		1.9E-04	1.9E-04
Tetrachloroethylene	3.2E-02	2.2E-04	3.2E-02
Trichloroethylene	3.3E-02		3.3E-02
Xylene	7.3E-02		7.3E-02

ATTACHMENT 4

STEPS TO CALCULATE DERMALLY ABSORBED DOSE

Updated Dermal Equations and Parameters

provided by USEPA Region 1

2000

**DERMAL ABSORPTION CALCULATION FOR RME EXPOSURE - SURFACE WATER; LAGOON 2; CURRENT TRESPASSER
NON-CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L * L/1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	4700.0 cm2
Event time (hr/event):	t_event =	1.0 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	36.0 days/yr
Exposure duration (years):	ED =	10.0 years
Body weight (kg):	BW =	45.0 kg
Averaging time (days):	AT =	3650.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSGI =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	753%	Y	6.2	6.68	29.85
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	5.0E-13	1.6E-12	1.7E-11		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

↑
Input values
ug/L * (0.001/1000) = mg/cm3

↙
Output values

**DERMAL ABSORPTION CALCULATION FOR CT EXPOSURE - SURFACE WATER; LAGOON 2; CURRENT TRESPASSER
NON-CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L* $L^3/1000\text{ cm}^3$):	Conc =	1.0E-03 mg/cm ³ (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm ³ = 1000 ppb
Area exposed (cm ²):	A =	4700.0 cm ²
Event time (hr/event):	t_event =	0.5 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	24.0 days/yr
Exposure duration (years):	ED =	5.0 years
Body weight (kg):	BW =	45.0 kg
Averaging time (days):	AT =	1825.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm ³ /day = L/day * 1000 cm ³ /L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSIG =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	533%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm ³)	DA_event (mg/cm ² -evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0,5	5.0E-13	1.1E-12	7.8E-12		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.8	16.04

↑ Input values
 ug/L * (0.001/1000) = mg/cm³

↙ Output values

**DERMAL ABSORPTION CALCULATION FOR CT EXPOSURE - SURFACE WATER; LAGOON 4; CURRENT TRESPASSER
NON-CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L * L/1000 cm3): Input site specific concentrations in Column marked "Conc"	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration) = 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	4700.0 cm2
Event time (hr/event):	t_event =	0.5 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	24.0 days/yr
Exposure duration (years):	ED =	5.0 years
Body weight (kg):	BW =	45.0 kg
Averaging time (days): for carcinogenic effects, AT=70 years (25,550 days) for noncarcinogenic effects, AT=ED (in days)	AT =	1825.0 days
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSIG =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	533%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	4.3E-14	9.7E-14	6.7E-13		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

Input values
ug/L * (0.001/1000) = mg/cm3

Output values

**DERMAL ABSORPTION CALCULATION FOR RME EXPOSURE - SURFACE WATER; LAGOON 5; CURRENT TRESPASSER
NON-CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*L/1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	4700.0 cm2
Event time (hr/event):	t_event =	1.0 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	36.0 days/yr
Exposure duration (years):	ED =	10.0 years
Body weight (kg):	BW =	45.0 kg
Averaging time (days):	AT =	3650.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSIG =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	753%	Y	8.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	4.2E-13	1.3E-12	1.4E-11		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

↑ Input values
 ug/L * (0.001/1000) = mg/cm3

← Output values

**DERMAL ABSORPTION CALCULATION FOR CT EXPOSURE - SURFACE WATER; LAGOON 5; CURRENT TRESPASSER
NON-CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*L/1000 cm3): Input site specific concentrations in Column marked "Conc"	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration) = 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	4700.0 cm2
Event time (hr/event):	t_event =	0.5 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	24.0 days/yr
Exposure duration (years):	ED =	5.0 years
Body weight (kg):	BW =	45.0 kg
Averaging time (days): for carcinogenic effects, AT=70 years (25,550 days) for noncarcinogenic effects, AT=ED (in days)	AT =	1625.0 days
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSIG =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemical's outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	533%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0,6	t_star3 B<=0,6
	0.5	4.2E-13	9.5E-13	6.5E-12		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

↑ Input values
 ug/L * (0.001/1000) = mg/cm3

← Output values

**DERMAL ABSORPTION CALCULATION FOR RME EXPOSURE - SURFACE WATER; HOOSIC RIVER - CURRENT RECREATIONAL VISITOR
NON-CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*L/1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	4700.0 cm2
Event time (hr/event):	t_event =	2.5 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	36.0 days/yr
Exposure duration (years):	ED =	10.0 years
Body weight (kg):	BW =	45.0 kg
Averaging time (days):	AT =	3650.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSGI =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 188 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	1191%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	1.8E-12	9.1E-12	9.4E-11		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

↑ Input values
 ug/L * (0.001/1000) = mg/cm3

↙ Output values

**DERMAL ABSORPTION CALCULATION FOR CT EXPOSURE - SURFACE WATER; HOOSIC RIVER - CURRENT RECREATIONAL VISITOR
NON-CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	4700.0 cm2
Event time (hr/event):	t_event =	0.5 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	24.0 days/yr
Exposure duration (years):	ED =	5.0 years
Body weight (kg):	BW =	45.0 kg
Averaging time (days):	AT =	1825.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSIG =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	533%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	1.8E-12	4.1E-12	2.8E-11		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

Input values
ug/L * (0.001/1000) = mg/cm3

Output values

**DERMAL ABSORPTION CALCULATION FOR RME EXPOSURE - SURFACE WATER; LAGOON 2; FUTURE ADULT PARK VISITOR
NON-CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L * L/1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	5700.0 cm2
Event time (hr/event):	t_event =	1.0 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	60.0 days/yr
Exposure duration (years):	ED =	24.0 years
Body weight (kg):	BW =	70.0 kg
Averaging time (days):	AT =	8760.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day.

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSIG =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	913%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	5.0E-13	1.6E-12	2.1E-11		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

↑ Input values
 ug/L * (0.001/1000) = mg/cm3

← Output values

DERMAL ABSORPTION CALCULATION FOR CT EXPOSURE - SURFACE WATER; LAGOON 2; FUTURE ADULT PARK VISITOR
NON-CANCER RISK

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*L/1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"	= 1 mg/L (1 ppm)	= 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	5700.0 cm2
Event time (hr/event):	t_event =	0.5 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	30.0 days/yr
Exposure duration (years):	ED =	7.0 years
Body weight (kg):	BW =	70.0 kg
Averaging time (days):	AT =	2555.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSIG =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
 ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	646%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	6.0E-13	1.1E-12	7.6E-12		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

Input values
 ug/L * (0.001/1000) = mg/cm3

Output values

DERMAL ABSORPTION CALCULATION FOR RME EXPOSURE - SURFACE WATER; LAGOON 4; FUTURE ADULT PARK VISITOR
NON-CANCER RISK

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	5700.0 cm2
Event time (hr/event):	t_event =	1.0 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	60.0 days/yr
Exposure duration (years):	ED =	24.0 years
Body weight (kg):	BW =	70.0 kg
Averaging time (days):	AT =	8760.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSIG =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
 ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 188 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	913%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc	b	c		t_star1 B>0.6	t_star3 B<=0.6
	0.5	4.3E-14	1.4E-13	1.8E-12		-4.80E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

↑ Input values ↓ Output values
 ug/L * (0.001/1000) = mg/cm3

DERMAL ABSORPTION CALCULATION FOR CT EXPOSURE - SURFACE WATER; LAGOON 4; FUTURE ADULT PARK VISITOR
NON-CANCER RISK

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	5700.0 cm2
Event time (hr/event):	t_event =	0.5 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	30.0 days/yr
Exposure duration (years):	ED =	7.0 years
Body weight (kg):	BW =	70.0 kg
Averaging time (days):	AT =	2555.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSGI =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
 ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
	FA for (tau>3)	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	646%	Y	6.2	6.68	29.65
	0.5	4.3E-14	9.7E-14	6.5E-13		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

Input values: ug/L * (0.001/1000) = mg/cm3
 Output values:

**DERMAL ABSORPTION CALCULATION FOR RME EXPOSURE - SURFACE WATER; LAGOON 5; FUTURE ADULT PARK VISITOR
NON-CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	5700.0 cm2
Event time (hr/event):	t_event =	1.0 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	60.0 days/yr
Exposure duration (years):	ED =	24.0 years
Body weight (kg):	BW =	70.0 kg
Averaging time (days):	AT =	8760.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = Uday * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSGI =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	913%	Y	8.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	4.2E-13	1.3E-12	1.8E-11		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

↑ Input values ↙ Output values
 ug/L * (0.001/1000) = mg/cm3

**DERMAL ABSORPTION CALCULATION FOR CT EXPOSURE - SURFACE WATER; HOOSIC RIVER - FUTURE ADULT PARK VISITOR
NON-CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	5700.0 cm2
Event time (hr/event):	L_event =	0.5 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	30.0 days/yr
Exposure duration (years):	ED =	7.0 years
Body weight (kg):	BW =	70.0 kg
Averaging time (days):	AT =	2555.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSGI =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	646%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	1.8E-12	4.1E-12	2.7E-11		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

↑
 Input values
 ug/L * (0.001/1000) = mg/cm3

↙
Output values

**DERMAL ABSORPTION CALCULATION FOR CT EXPOSURE - SURFACE WATER; LAGOON 2; FUTURE YOUNG CHILD PARK VISITOR
NON-CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	2900.0 cm2
Event time (hr/event):	t_event =	0.5 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	30.0 days/yr
Exposure duration (years):	ED =	2.0 years
Body weight (kg):	BW =	15.0 kg
Averaging time (days):	AT =	730.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	Isc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSGI =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	329%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/isc)	Dsc/isc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	5.0E-13	1.1E-12	1.8E-11		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

↑ Input values
 ug/L * (0.001/1000) = mg/cm3

↘ Output values

**DERMAL ABSORPTION CALCULATION FOR RME EXPOSURE - SURFACE WATER; LAGOON 4; FUTURE YOUNG CHILD PARK VISITOR
NON-CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L * L/1000 cm ³):	Conc =	1.0E-03 mg/cm ³ (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm ³ = 1000 ppb
Area exposed (cm ²):	A =	2900.0 cm ²
Event time (hr/event):	t _{event} =	1.0 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	60.0 days/yr
Exposure duration (years):	ED =	6.0 years
Body weight (kg):	BW =	15.0 kg
Averaging time (days):	AT =	2190.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	l _{sc} =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA _{event} * A * EV	IR =	2000.0 (cm ³ /day = L/day * 1000 cm ³ /L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSGI =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_{event} and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t _{star} (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	465%	Y	6.2	6.68	29.85
	FA for tau>3	Conc (mg/cm ³)	DA _{event} (mg/cm ² -evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t _{star1} B>0.6	t _{star3} B<=0.6
	0.5	4.3E-14	1.4E-13	4.4E-12		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

↑
Input values
ug/L * (0.001/1000) = mg/cm³

↙
Output values

**DERMAL ABSORPTION CALCULATION FOR CT EXPOSURE - SURFACE WATER; LAGOON 4; FUTURE YOUNG CHILD PARK VISITOR
NON-CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*L/1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	2900.0 cm2
Event time (hr/event):	t_event =	0.5 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	30.0 days/yr
Exposure duration (years):	ED =	2.0 years
Body weight (kg):	BW =	15.0 kg
Averaging time (days):	AT =	730.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSGI =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	329%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	4.3E-14	9.7E-14	1.5E-12		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

Input values
ug/L * (0.001/1000) = mg/cm3

Output values

**DERMAL ABSORPTION CALCULATION FOR RME EXPOSURE - SURFACE WATER; LAGOON 5; FUTURE YOUNG CHILD PARK VISITOR
NON-CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*L/1000 cm3): Input site specific concentrations in Column marked "Conc"	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration) = 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	2900.0 cm2
Event time (hr/event):	t_event =	1.0 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	60.0 days/yr
Exposure duration (years):	ED =	6.0 years
Body weight (kg):	BW =	15.0 kg
Averaging time (days): for carcinogenic effects, AT=70 years (25,550 days) for noncarcinogenic effects, AT=ED (in days)	AT =	2190.0 days
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSIG =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	465%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	4.2E-13	1.3E-12	4.3E-11		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

↑ Input values
 ug/L * (0.001/1000) = mg/cm3

↙ Output values

**DERMAL ABSORPTION CALCULATION FOR CT EXPOSURE - SURFACE WATER; LAGOON 5; FUTURE YOUNG CHILD PARK VISITOR
NON-CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L * L/1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	2900.0 cm2
Event time (hr/event):	t_event =	0.5 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	30.0 days/yr
Exposure duration (years):	ED =	2.0 years
Body weight (kg):	BW =	15.0 kg
Averaging time (days):	AT =	730.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSGI =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	329%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	4.2E-13	9.5E-13	1.5E-11		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

↑ Input values
 ug/L * (0.001/1000) = mg/cm3

↙ Output values

**DERMAL ABSORPTION CALCULATION FOR CT EXPOSURE - SURFACE WATER; HOOSIC RIVER - FUTURE YOUNG CHILD PARK VISITOR
NON-CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	2900.0 cm2
Event time (hr/event):	t_event =	0.5 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	30.0 days/yr
Exposure duration (years):	ED =	2.0 years
Body weight (kg):	BW =	15.0 kg
Averaging time (days):	AT =	730.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSGI =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	329%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	1.8E-12	4.1E-12	6.5E-11		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

Input values
ug/L * (0.001/1000) = mg/cm3

Output values

DERMAL ABSORPTION CALCULATION FOR RME EXPOSURE - SURFACE WATER; HOOSIC RIVER - FUTURE YOUNG CHILD PARK VISITOR
NON-CANCER RISK

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*L/1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	2900.0 cm2
Event time (hr/event):	t_event =	2.5 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	60.0 days/yr
Exposure duration (years):	ED =	6.0 years
Body weight (kg):	BW =	15.0 kg
Averaging time (days):	AT =	2190.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSGI =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
 ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	735%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	1.8E-12	9.1E-12	2.9E-10		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

↑ Input values ↓ Output values
 ug/L * (0.001/1000) = mg/cm3

DERMAL ABSORPTION CALCULATION FOR RME EXPOSURE - SURFACE WATER; LAGOON 2; CURRENT TRESPASSER
CANCER RISK

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	4700.0 cm2
Event time (hr/event):	t_event =	1.0 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	36.0 days/yr
Exposure duration (years):	ED =	10.0 years
Body weight (kg):	BW =	45.0 kg
Averaging time (days):	AT =	25550.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSIG =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
 ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky In NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	753%	Y	6.2	6.68	29.65
	FA for tau=3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	5.0E-13	1.6E-12	2.4E-12		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

↑
 Input values
 ug/L * (0.001/1000) = mg/cm3

↙
 Output values

**DERMAL ABSORPTION CALCULATION FOR CT EXPOSURE - SURFACE WATER; LAGOON 2; CURRENT TRESPASSER
CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*1000 cm3): input site specific concentrations in Column marked "Conc"	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration) = 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	4700.0 cm2
Event time (hr/event):	t_event =	0.5 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	24.0 days/yr
Exposure duration (years):	ED =	5.0 years
Body weight (kg):	BW =	45.0 kg
Averaging time (days): for carcinogenic effects, AT=70 years (25,550 days) for noncarcinogenic effects, AT=ED (in days)	AT =	25550.0 days
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSIG =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	533%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	5.0E-13	1.1E-12	5.6E-13		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

Input values: ug/L * (0.001/1000) = mg/cm3
 Output values

**DERMAL ABSORPTION CALCULATION FOR RME EXPOSURE - SURFACE WATER; LAGOON 4; CURRENT TRESPASSER
CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*L/1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	4700.0 cm2
Event time (hr/event):	t_event =	1.0 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	36.0 days/yr
Exposure duration (years):	ED =	10.0 years
Body weight (kg):	BW =	45.0 kg
Averaging time (days):	AT =	25550.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSIG =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	753%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	4.3E-14	1.4E-13	2.0E-13		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

↑ Input values
 ug/L * (0.001/1000) = mg/cm3

← Output values

**DERMAL ABSORPTION CALCULATION FOR CT EXPOSURE - SURFACE WATER; LAGOON 4; CURRENT TRESPASSER
CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L * L/1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	4700.0 cm2
Event time (hr/event):	t_event =	0.5 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	24.0 days/yr
Exposure duration (years):	ED =	5.0 years
Body weight (kg):	BW =	45.0 kg
Averaging time (days):	AT =	25550.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	isc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSGI =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	533%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/isc)	Dsc/isc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	4.3E-14	9.7E-14	4.8E-14		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	18.04

↑
Input values
ug/L * (0.001/1000) = mg/cm3

↙
Output values

**DERMAL ABSORPTION CALCULATION FOR RME EXPOSURE - SURFACE WATER; LAGOON 5; CURRENT TRESPASSER
CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L * L/1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	4700.0 cm2
Event time (hr/event):	t_event =	1.0 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	36.0 days/yr
Exposure duration (years):	ED =	10.0 years
Body weight (kg):	BW =	45.0 kg
Averaging time (days):	AT =	25550.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSGI =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	753%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	4.2E-13	1.3E-12	2.0E-12		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

Input values
ug/L * (0.001/1000) = mg/cm3

Output values

**DERMAL ABSORPTION CALCULATION FOR CT EXPOSURE - SURFACE WATER; HOOSIC RIVER - CURRENT ADOLESCENT RECREATIONAL VISITOR
CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*L/1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	4700.0 cm2
Event time (hr/event):	t_event =	0.5 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	24.0 days/yr
Exposure duration (years):	ED =	5.0 years
Body weight (kg):	BW =	45.0 kg
Averaging time (days):	AT =	25550.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSIG =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	533%	Y	6.2	6.68	29.68
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	1.8E-12	4.1E-12	2.0E-12		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

Input values
ug/L * (0.001/1000) = mg/cm3

Output values

**DERMAL ABSORPTION CALCULATION FOR RME EXPOSURE - SURFACE WATER; LAGOON 2; FUTURE ADULT PARK VISITOR
CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*L/1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	5700.0 cm2
Event time (hr/event):	t_event =	1.0 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	60.0 days/yr
Exposure duration (years):	ED =	24.0 years
Body weight (kg):	BW =	70.0 kg
Averaging time (days):	AT =	25550.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSIG =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	913%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	5.0E-13	1.6E-12	7.4E-12		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

↑
Input values
ug/L * (0.001/1000) = mg/cm3

↙
Output values

**DERMAL ABSORPTION CALCULATION FOR CT EXPOSURE - SURFACE WATER; LAGOON 2; FUTURE ADULT PARK VISITOR
CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G16

Concentration (mg/L * L/1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	5700.0 cm2
Event time (hr/event):	t_event =	0.5 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	30.0 days/yr
Exposure duration (years):	ED =	7.0 years
Body weight (kg):	BW =	70.0 kg
Averaging time (days):	AT =	25550.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	isc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSIG =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky In NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	646%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/isc)	Dsc/isc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	5.0E-13	1.1E-12	7.6E-13		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	18.04

Input values
ug/L * (0.001/1000) = mg/cm3

Output values

**DERMAL ABSORPTION CALCULATION FOR RME EXPOSURE - SURFACE WATER; LAGOON 4; FUTURE ADULT PARK VISITOR
CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*L/1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	5700.0 cm2
Event time (hr/event):	t_event =	1.0 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	60.0 days/yr
Exposure duration (years):	ED =	24.0 years
Body weight (kg):	BW =	70.0 kg
Averaging time (days):	AT =	25550.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSIG =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	913%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-eyt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	4.3E-14	1.4E-13	6.3E-13		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

Input values
ug/L * (0.001/1000) = mg/cm3

Output values

**DERMAL ABSORPTION CALCULATION FOR CT EXPOSURE - SURFACE WATER; LAGOON 4; FUTURE ADULT PARK VISITOR
CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*L/1000 cm3): input site specific concentrations in Column marked "Conc"	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration) = 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	5700.0 cm2
Event time (hr/event):	t_event =	0.5 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	30.0 days/yr
Exposure duration (years):	ED =	7.0 years
Body weight (kg):	BW =	70.0 kg
Averaging time (days): for carcinogenic effects, AT=70 years (25,550 days) for noncarcinogenic effects, AT=ED (in days)	AT =	25550.0 days
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSIG =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 188 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	646%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	4.3E-14	9.7E-14	6.5E-14		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

Input values Output values
 ug/L * (0.001/1000) = mg/cm3

DERMAL ABSORPTION CALCULATION FOR RME EXPOSURE - SURFACE WATER; LAGOON 5; FUTURE ADULT PARK VISITOR
CANCER RISK

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*L/1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	5700.0 cm2
Event time (hr/event):	t_event =	1.0 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	60.0 days/yr
Exposure duration (years):	ED =	24.0 years
Body weight (kg):	BW =	70.0 kg
Averaging time (days):	AT =	25550.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSGI =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
 ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1748018	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	913%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	4.2E-13	1.3E-12	6.2E-12		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

↑ Input values
 ug/L * (0.001/1000) = mg/cm3

↙ Output values

DERMAL ABSORPTION CALCULATION FOR CT EXPOSURE - SURFACE WATER: LAGOON 5: FUTURE ADULT PARK VISITOR
CANCER RISK

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G16

Concentration (mg/L * L/1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	5700.0 cm2
Event time (hr/event):	t_event =	0.5 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	30.0 days/yr
Exposure duration (years):	ED =	7.0 years
Body weight (kg):	BW =	70.0 kg
Averaging time (days):	AT =	25550.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSGI =	1.0 (assumed 100% GI absorption)

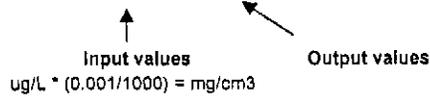
IR: Ingestion rate of drinking water
 ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 166 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	646%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	4.2E-13	9.5E-13	6.4E-13		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04



DERMAL ABSORPTION CALCULATION FOR RME EXPOSURE - SURFACE WATER: HOOSIC RIVER - FUTURE ADULT PARK VISITOR
CANCER RISK

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*L/1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	5700.0 cm2
Event time (hr/event):	t_event =	2.5 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	60.0 days/yr
Exposure duration (years):	ED =	24.0 years
Body weight (kg):	BW =	70.0 kg
Averaging time (days):	AT =	25550.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSIG =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
 ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	1444%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	1.8E-12	9.1E-12	4.2E-11		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

Input values Output values
 ug/L * (0.001/1000) = mg/cm3

**DERMAL ABSORPTION CALCULATION FOR CT EXPOSURE - SURFACE WATER; HOOSIC RIVER - FUTURE ADULT PARK VISITOR
CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L * L/1000 cm ³):	Conc =	1.0E-03 mg/cm ³ (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm ³ = 1000 ppb
Area exposed (cm ²):	A =	5700.0 cm ²
Event time (hr/event):	t_event =	0.5 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	30.0 days/yr
Exposure duration (years):	ED =	7.0 years
Body weight (kg):	BW =	70.0 kg
Averaging time (days):	AT =	25550.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm ³ /day = L/day * 1000 cm ³ /L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSIG =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	646%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm ³)	DA_event (mg/cm ² -evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	1.8E-12	4.1E-12	2.7E-12		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

Input values Output values
 ug/L * (0.001/1000) = mg/cm³

DERMAL ABSORPTION CALCULATION FOR RME EXPOSURE - SURFACE WATER; LAGOON 2; FUTURE YOUNG CHILD PARK VISITOR
CANCER RISK

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	2900.0 cm2
Event time (hr/event):	t_event =	1.0 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	60.0 days/yr
Exposure duration (years):	ED =	6.0 years
Body weight (kg):	BW =	15.0 kg
Averaging time (days):	AT =	25550.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSIG =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
 ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	465%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	5.0E-13	1.6E-12	4.4E-12		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

↑ Input values ↙ Output values
 ug/L * (0.001/1000) = mg/cm3

**DERMAL ABSORPTION CALCULATION FOR CT EXPOSURE - SURFACE WATER; LAGOON 2; FUTURE YOUNG CHILD PARK VISITOR
CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	2900.0 cm2
Event time (hr/event):	L_event =	0.5 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	30.0 days/yr
Exposure duration (years):	ED =	2.0 years
Body weight (kg):	BW =	15.0 kg
Averaging time (days):	AT =	25550.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSIG =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	L_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	329%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	L_star1 B>0.6	L_star3 B<=0.6
	0.5	5.0E-13	1.1E-12	5.1E-13		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

↑
Input values
ug/L * (0.001/1000) = mg/cm3

↙
Output values

DERMAL ABSORPTION CALCULATION FOR RME EXPOSURE - SURFACE WATER; LAGOON 4; FUTURE YOUNG CHILD PARK VISITOR
CANCER RISK

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*L/1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	2900.0 cm2
Event time (hr/event):	t_event =	1.0 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	60.0 days/yr
Exposure duration (years):	ED =	6.0 years
Body weight (kg):	BW =	15.0 kg
Averaging time (days):	AT =	25550.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSGI =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
 ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	465%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	4.3E-14	1.4E-13	3.8E-13		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

↑ Input values ↙ Output values
 ug/L * (0.001/1000) = mg/cm3

DERMAL ABSORPTION CALCULATION FOR RME EXPOSURE - SURFACE WATER; LAGOON 5; FUTURE YOUNG CHILD PARK VISITOR
CANCER RISK

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99).

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	2900.0 cm2
Event time (hr/event):	t_event =	1.0 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	60.0 days/yr
Exposure duration (years):	ED =	6.0 years
Body weight (kg):	BW =	15.0 kg
Averaging time (days):	AT =	25550.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSGI =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
 ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	465%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	4.2E-13	1.3E-12	3.7E-12		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

↑
 Input values
 ug/L * (0.001/1000) = mg/cm3

↙
 Output values

DERMAL ABSORPTION CALCULATION FOR CT EXPOSURE - SURFACE WATER; LAGOON 5; FUTURE YOUNG CHILD PARK VISITOR
CANCER RISK

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*1/1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	2900.0 cm2
Event time (hr/event):	t_event =	0.5 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	30.0 days/yr
Exposure duration (years):	ED =	2.0 years
Body weight (kg):	BW =	15.0 kg
Averaging time (days):	AT =	25550.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSIG =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
 ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	L_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	329%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	4.2E-13	9.5E-13	4.3E-13		-4.80E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

↑
 Input values
 ug/L * (0.001/1000) = mg/cm3

↙
 Output values

**DERMAL ABSORPTION CALCULATION FOR CT EXPOSURE - SURFACE WATER; HOOSIC RIVER - FUTURE YOUNG CHILD PARK VISITOR
CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*L/1000 cm3): Input site specific concentrations in Column marked "Conc"	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration) = 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	2900.0 cm2
Event time (hr/event):	t_event =	0.5 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	30.0 days/yr
Exposure duration (years):	ED =	2.0 years
Body weight (kg):	BW =	15.0 kg
Averaging time (days): for carcinogenic effects, AT=70 years (25,550 days) for noncarcinogenic effects, AT=ED (in days)	AT =	25550.0 days
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSIG =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	329%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	1.8E-12	4.1E-12	1.9E-12		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

↑
input values
ug/L * (0.001/1000) = mg/cm3

↙
Output values

DERMAL ABSORPTION CALCULATION FOR RME EXPOSURE - SURFACE WATER; LAGOON 2; FUTURE UTILITY WORKER
NON-CANCER RISK

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*L/1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	3300.0 cm2
Event time (hr/event):	t_event =	1.0 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	66.0 days/yr
Exposure duration (years):	ED =	1.0 years
Body weight (kg):	BW =	70.0 kg
Averaging time (days):	AT =	365.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSGI =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
 ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	529%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	5.0E-13	1.6E-12	1.4E-11		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

↑
 Input values
 ug/L * (0.001/1000) = mg/cm3

↙
 Output values

**DERMAL ABSORPTION CALCULATION FOR CT EXPOSURE - SURFACE WATER; LAGOON 2; FUTURE UTILITY WORKER
NON-CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*L/1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	3300.0 cm2
Event time (hr/event):	t_event =	0.5 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	22.0 days/yr
Exposure duration (years):	ED =	1.0 years
Body weight (kg):	BW =	70.0 kg
Averaging time (days):	AT =	365.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSIG =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	L_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	374%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	5.0E-13	1.1E-12	3.2E-12		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

Input values
ug/L * (0.001/1000) = mg/cm3

Output values

**DERMAL ABSORPTION CALCULATION FOR RME EXPOSURE - SURFACE WATER; LAGOON 4; FUTURE UTILITY WORKER
NON-CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	3300.0 cm2
Event time (hr/event):	t_event =	1.0 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	66.0 days/yr
Exposure duration (years):	ED =	1.0 years
Body weight (kg):	BW =	70.0 kg
Averaging time (days):	AT =	365.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSIG =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	529%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	4.3E-14	1.4E-13	1.2E-12		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

↑ Input values
 ug/L * (0.001/1000) = mg/cm3

← Output values

DERMAL ABSORPTION CALCULATION FOR CT EXPOSURE - SURFACE WATER; LAGOON 4; FUTURE UTILITY WORKER
NON-CANCER RISK

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	3300.0 cm2
Event time (hr/event):	t_event =	0.5 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	22.0 days/yr
Exposure duration (years):	ED =	1.0 years
Body weight (kg):	BW =	70.0 kg
Averaging time (days):	AT =	365.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSIG =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
 ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	lau (hr)	t_star (hr)
* 186 TCDD	1746018	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	374%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	4.3E-14	9.7E-14	2.8E-13		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

↑ Input values
 ug/L * (0.001/1000) = mg/cm3

↙ Output values

**DERMAL ABSORPTION CALCULATION FOR RME EXPOSURE - SURFACE WATER; LAGOON 5; FUTURE UTILITY WORKER
NON-CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*L/1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	3300.0 cm2
Event time (hr/event):	t_event =	1.0 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	66.0 days/yr
Exposure duration (years):	ED =	1.0 years
Body weight (kg):	BW =	70.0 kg
Averaging time (days):	AT =	365.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSIG =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	529%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	4.2E-13	1.3E-12	1.1E-11		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

↑ Input values ↓ Output values
 ug/L * (0.001/1000) = mg/cm3

**DERMAL ABSORPTION CALCULATION FOR CT EXPOSURE - SURFACE WATER; LAGOON 5; FUTURE UTILITY WORKER
NON-CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	3300.0 cm2
Event time (hr/event):	t_event =	0.5 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	22.0 days/yr
Exposure duration (years):	ED =	1.0 years
Body weight (kg):	BW =	70.0 kg
Averaging time (days):	AT =	365.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSGI =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	374%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	4.2E-13	9.5E-13	2.7E-12		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

↑ Input values
 ug/L * (0.001/1000) = mg/cm3

← Output values

**DERMAL ABSORPTION CALCULATION FOR RME EXPOSURE - SURFACE WATER; LAGOON 2; FUTURE UTILITY WORKER
CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L * L/1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	3300.0 cm2
Event time (hr/event):	t_event =	1.0 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	66.0 days/yr
Exposure duration (years):	ED =	1.0 years
Body weight (kg):	BW =	70.0 kg
Averaging time (days):	AT =	25550.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSGI =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	529%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	5.0E-13	1.6E-12	2.0E-13		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

↑ Input values
 ug/L * (0.001/1000) = mg/cm3

← Output values

**DERMAL ABSORPTION CALCULATION FOR RME EXPOSURE - SURFACE WATER; LAGOON 4; FUTURE UTILITY WORKER
CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L * L/1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	3300.0 cm2
Event time (hr/event):	t_event =	1.0 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	66.0 days/yr
Exposure duration (years):	ED =	1.0 years
Body weight (kg):	BW =	70.0 kg
Averaging time (days):	AT =	25550.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSGI =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	529%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	4.3E-14	1.4E-13	1.7E-14		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

↑
Input values
ug/L * (0.001/1000) = mg/cm3

↙ Output values

**DERMAL ABSORPTION CALCULATION FOR CT EXPOSURE - SURFACE WATER; LAGOON 4; FUTURE UTILITY WORKER
CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*U/1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	3300.0 cm2
Event time (hr/event):	t_event =	0.5 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	22.0 days/yr
Exposure duration (years):	ED =	1.0 years
Body weight (kg):	BW =	70.0 kg
Averaging time (days):	AT =	25550.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSIG =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	374%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	4.3E-14	9.7E-14	4.0E-15		-4.60E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

Input values
ug/L * (0.001/1000) = mg/cm3

Output values

**DERMAL ABSORPTION CALCULATION FOR RME EXPOSURE - SURFACE WATER; LAGOON 5; FUTURE UTILITY WORKER
CANCER RISK**

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*L/1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	3300.0 cm2
Event time (hr/event):	t_event =	1.0 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	66.0 days/yr
Exposure duration (years):	ED =	1.0 years
Body weight (kg):	BW =	70.0 kg
Averaging time (days):	AT =	25550.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	isc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSGI =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	529%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/isc)	Dsc/isc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	4.2E-13	1.3E-12	1.6E-13		-4.80E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

↑ Input values ↙ Output values
 ug/L * (0.001/1000) = mg/cm3

DERMAL ABSORPTION CALCULATION FOR CT EXPOSURE - SURFACE WATER; LAGOON 5; FUTURE UTILITY WORKER
CANCER RISK

FOR ORGANIC CHEMICALS IN WATER (updated on 11/99)

Worksheet to Calculate Dermal Absorption of Organic Chemicals from Aqueous Media (updated 11/99)

Enter the Following Exposure Conditions: for site specific conditions, change values in Cells G5-G18

Concentration (mg/L*L/1000 cm3):	Conc =	1.0E-03 mg/cm3 (default value for purpose of illustration)
Input site specific concentrations in Column marked "Conc"		= 1 mg/L (1 ppm) = 1 ug/cm3 = 1000 ppb
Area exposed (cm2):	A =	3300.0 cm2
Event time (hr/event):	t_event =	0.5 hr/event
Event frequency (events/day):	EV =	1.0 event/day
Exposure frequency (days/year):	EF =	22.0 days/yr
Exposure duration (years):	ED =	1.0 years
Body weight (kg):	BW =	70.0 kg
Averaging time (days):	AT =	25550.0 days
for carcinogenic effects, AT=70 years (25,550 days)		
for noncarcinogenic effects, AT=ED (in days)		
Skin thickness (assumed to be 10 um):	lsc =	1.0E-03 cm

Default conditions for screening purposes:

Compare Dermal to Drinking: Adults showering for 35 minutes/day, compared to drinking 2L water/day

Dermal (mg/day) = DA_event * A * EV	IR =	2000.0 (cm3/day = L/day * 1000 cm3/L)
Drinking (mg/day) = Conc * IR * ABSIG	ABSGI =	1.0 (assumed 100% GI absorption)

IR: Ingestion rate of drinking water
 ABSIG: Absorption fraction in GI tract

Refer to Appendix A for equations to evaluate DA_event and DAD

(*): outside of the Effective Prediction Domain (EPD) determined by the Flynn's measured Kp data

95% LCI and UCI are evaluated by Dr. Paul Pinsky in NCEA using SAS

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Chemicals outside EPD (*)	Derm/ Drink Kp	Chem Assess	B	tau (hr)	t_star (hr)
* 186 TCDD	1746016	322.0	6.80	3.0E-02	9.0E-01		2.9E+01	*	374%	Y	6.2	6.68	29.65
	FA for tau>3	Conc (mg/cm3)	DA_event (mg/cm2-evt)	DAD (mg/kg-day)		log(Ds/lsc)	Dsc/lsc	Dsc		b	c	t_star1 B>0.6	t_star3 B<=0.6
	0.5	4.2E-13	9.5E-13	3.9E-14		-4.80E+00	2.49E-05	2.49E-08		2.7E+01	6.2E+00	29.6	16.04

↑ Input values ← Output values
 ug/L * (0.001/1000) = mg/cm3