

**ALABAMA RISK-BASED CORRECTIVE ACTION  
(ARBCA) COMPUTATIONAL SOFTWARE**

*Developed to be consistent with:*  
**Alabama Risk-Based Corrective Action Guidance Manual  
April 2008**

**CONTINUE**

*Version 2.1-R, May 2009.*

**EXIT**

*Developed by:*  
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**ALABAMA RISK-BASED CORRECTIVE ACTION (ARBCA)  
COMPUTATIONAL SOFTWARE**

**TITLE**

**SITE INFORMATION**

**MAIN MENU**

**SITE No.**

**SITE NAME**

**ADDRESS**

**USACE OMS-28**

**CONTACT NAME**

**TELEPHONE NO.**

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MAIN MENU	
INPUT	
RM-1 <input type="radio"/> RM-2 <input checked="" type="radio"/>	
SITE	ABBREVIATIONS
1. USER-SPECIFIED COCs & PROPERTIES (OPTIONAL)	2. SELECT COCs
3. EXPOSURE MODEL	4. TARGET RISK
5. PHYSICAL AND CHEMICAL PROPERTIES OF COCs	6. TOXICOLOGICAL PROPERTIES OF COCs
7. EXPOSURE FACTORS	8. FATE AND TRANSPORT PARAMETERS
9. PROTECTION OF GROUNDWATER USE	10. PROTECTION OF SURFACE WATER
11. SOIL & GW PROTECTIVE OF INDOOR INHALATION	12. CHEMICAL-SPECIFIC INPUTS FOR OTHER EXPOSURE PATHWAYS
13. CLEAN-UP LEVEL CALCULATION	
OUTPUT	
FORWARD MODE MENU	BACKWARD MODE MENU

**FORWARD MODE MENU**

**MAIN MENU**

**I N P U T - REPRESENTATIVE CONCENTRATIONS**

**RESIDENT**

**TRESPASSER**

**PROTECTION OF GROUNDWATER USE**

**SOIL & GW PROTECTIVE OF INDOOR INHALATION**

**COMMERCIAL WORKER**

**CONSTRUCTION WORKER**

**PROTECTION OF SURFACE WATER**

**O U T P U T - CALCULATED RISK**

**RESIDENT CHILD**

**RESIDENT**

**TRESPASSER**

**RESIDENT ADULT**

**COMMERCIAL WORKER**

**CONSTRUCTION WORKER**

**O U T P U T - CALCULATED CONCENTRATIONS**

**PROTECTION OF GROUNDWATER USE**

**WITHOUT BIODEGRADATION**

**WITH BIODEGRADATION**

**PROTECTION OF SURFACE WATER**

**WITHOUT BIODEGRADATION**

**WITH BIODEGRADATION**

**SOIL & GROUNDWATER PROTECTIVE OF INDOOR INHALATION  
(Includes Horizontal Migration)**

**RESIDENT - WITHOUT BIODEGRADATION**

**RESIDENT - WITH BIODEGRADATION**

**TRESPASSER - WITHOUT BIODEGRADATION**

**TRESPASSER - WITH BIODEGRADATION**

**COMMERCIAL WK. - WITHOUT BIODEGRADATION**

**COMMERCIAL WK. - WITH BIODEGRADATION**

**BACKWARD MODE MENU**

**MAIN MENU**

**OUTPUT - CLEAN-UP LEVELS**

**RESIDENT CHILD**

**RESIDENT**

**TRESPASSER**

**RESIDENT ADULT**

**COMMERCIAL WORKER**

**CONSTRUCTION WORKER**

**OUTPUT - ALLOWABLE CONCENTRATIONS**

**PROTECTION OF GROUNDWATER USE**

**WITHOUT BIODEGRADATION**

**WITH BIODEGRADATION**

**PROTECTION OF SURFACE WATER**

**WITHOUT BIODEGRADATION**

**WITH BIODEGRADATION**

**SOIL & GROUNDWATER PROTECTIVE OF INDOOR INHALATION  
(Includes Horizontal Migration)**

**RESIDENT - WITHOUT BIODEGRADATION**

**RESIDENT - WITH BIODEGRADATION**

**TRESPASSER - WITHOUT BIODEGRADATION**

**TRESPASSER - WITH BIODEGRADATION**

**COMMERCIAL WK. - WITHOUT BIODEGRADATION**

**COMMERCIAL WK. - WITH BIODEGRADATION**

SITE:

**USER-SPECIFIED CHEMICALS OF CONCERN & PROPERTIES  
PHYSICAL AND CHEMICAL PROPERTIES**

Chemicals	CAS #	MCL [mg/L]	Molecular Weight (MW) [g/g-mol]	Water Solubility (S) [mg/L]	Henry's Law Constant (H) [L-water/L-air]	Org. Carbon Adsorption Coeff. (K <sub>oc</sub> ) [cm <sup>3</sup> /g]	Soil-Water Partition Coefficient (K <sub>d</sub> ) [cm <sup>3</sup> /g]	Molecular Diffusion Coefficient	
								in air (D <sup>a</sup> ) [cm <sup>2</sup> /s]	in water (D <sup>w</sup> ) [cm <sup>2</sup> /s]
User-Specified Chemical 1									
User-Specified Chemical 2									
User-Specified Chemical 3									
User-Specified Chemical 4									
User-Specified Chemical 5									

**TOXICOLOGICAL PROPERTIES**

Chemicals	Cancer Group	Slope Factor		Reference Dose		Absorption Factor		Bioconcentration Factor in Fish (BCF) [L/kg]
		Oral (SF <sub>o</sub> ) [kg-day/mg]	Inh. (SF <sub>i</sub> ) [kg-day/mg]	Oral (RfD <sub>o</sub> ) [mg/kg-day]	Inh. (RfD <sub>i</sub> ) [mg/kg-day]	Dermal (RAF <sub>d</sub> ) [--]	Oral (RAF <sub>o</sub> ) [--]	
User-Specified Chemical 1								
User-Specified Chemical 2								
User-Specified Chemical 3								
User-Specified Chemical 4								
User-Specified Chemical 5								

\*Type:

V: Volatile Organic Compounds  
S: Semi-Volatile Organic Compounds

P: Pesticides & Herbicides  
I: Inorganics      For exclusive use by Melissa Montgomery of Thompson Engineering, Inc.

**SELECT CHEMICALS OF CONCERN**

<b>CHEMICALS</b>	<b>TYPE* and CAS #</b>
<input type="checkbox"/> Acetone	V 67-64-1

**MAIN MENU**      **CLEAR ALL**      **DONE**

**\* V: Volatile Organic Compounds      S: Semi-Volatile Organic Compounds**  
**P: Pesticides & Herbicides      I: Inorganics**

**EXPOSURE MODEL**

**SITE:**

<b>Source and Exposure Pathways</b>	<b>Resident *</b>	<b>Commercial Worker</b>	<b>Trespasser</b>	<b>Construction Worker **</b>
<b>Air</b>				
Indoor Air	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>N/A</u>
Outdoor Air	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Surficial Soil (0 to 1 ft.)</b>				
Dermal Contact	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Ingestion	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Outdoor Inhalation of Vapor Emissions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outdoor Inhalation of Particulates	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>or</b>				
Combined Pathway: Outdoor Inhalation of vapor emissions and particulates, Ingestion, and Dermal Contact	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Subsurface Soil (&gt; 1 ft. to watertable)</b>				
Indoor Inhalation of Vapor Emissions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>N/A</u>
Outdoor Inhalation of Vapor Emission	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>N/A</u>
<b>Soil Vapor</b>				
Indoor Inhalation of Vapor Emissions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>N/A</u>
Outdoor Inhalation of Vapor Emissions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Groundwater (First Encountered Zone)</b>				
Indoor Inhalation of Vapor Emissions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>N/A</u>
Outdoor Inhalation of Vapor Emissions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ingestion	<input checked="" type="checkbox"/>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>

**Other Exposure Pathways**

<b>Protection of Groundwater Use</b>	<input checked="" type="checkbox"/>
<b>Protection of Surface Water</b>	<input type="checkbox"/>
<b>Soil &amp; Groundwater Protective of Indoor Inhalation</b>	
Resident	<input type="checkbox"/>
Commercial Worker	<input type="checkbox"/>
Trespasser	<input type="checkbox"/>

\* Includes calculations for child, and adult.

\*\* For construction worker, thickness of surficial soil is from ground surface to depth of construction.

N/A Not Applicable

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**SITE:**

**TARGET RISK**

<b>Parameter</b>	<b>Symbol</b>	<b>Default Value</b>	<b>Value Used</b>	<b>Comment</b>
<b>Potential Carcinogenic Health Effects</b>				
Individual Excessive Lifetime Cancer Risk for all chemicals and all exposure pathways	TR <sub>cum</sub>	1.00E-05	1.00E-05	Default Value
<b>Potential Non-Carcinogenic Health Effects</b>				
Hazard Index for all chemicals and all exposure pathways	HI	1.0	1.0	Default Value

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SITE:

PHYSICAL AND CHEMICAL PROPERTIES OF CHEMICALS OF CONCERN

Chemicals of Concern	Molecular Weight (MW) [g/mol]	Water Solubility (S) [mg/L]	Henry's Law Constant (H) [L-water/L-air]	Org. Carbon Adsorption Coeff. (K <sub>oc</sub> ) [cm <sup>3</sup> /g]	Soil-Water Sorption Coeff. Vadose Zone (K <sub>sv</sub> ) [cm <sup>3</sup> -water /g-soil]	Soil-Water Sorption Coeff. Saturated zone (K <sub>ss</sub> ) [cm <sup>3</sup> /g]	Molecular Diffusion Coefficient		Saturated Soil Concentration [mg/kg]
							in air (D <sup>a</sup> ) [cm <sup>2</sup> /s]	in water (D <sup>w</sup> ) [cm <sup>2</sup> /s]	
Tetrachloroethene (PCE)	1.66E+02	2.00E+02	7.50E-01	1.60E+02	3.20E-01	3.20E-01	7.20E-02	8.20E-06	9.18E+01
Trichloroethene (TCE)	1.31E+02	1.10E+03	4.20E-01	1.70E+02	3.40E-01	3.40E-01	7.90E-02	9.10E-06	4.86E+02

NA: Not Available

The values in red are calculated.

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**SITE:**

**TOXICOLOGICAL PROPERTIES OF CHEMICALS OF CONCERN**

Chemicals of Concern	Slope Factor		Reference Dose		Absorption Factor	
	Oral (SF <sub>o</sub> )	Inh. (SF <sub>i</sub> )	Oral (RfD <sub>o</sub> )	Inh. (RfD <sub>i</sub> )	Oral (RAF <sub>o</sub> )	Dermal (RAF <sub>d</sub> )
	[kg-day/mg]	[kg-day/mg]	[mg/kg-day]	[mg/kg-day]	[--]	[--]
Tetrachloroethene (PCE)	5.40E-01	2.10E-02	1.00E-02	1.40E-01	1	0.01
Trichloroethene (TCE)	1.30E-02	7.00E-03	6.00E-03	5.67E-03	1	0.01

NA: Not Available

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SITE:

EXPOSURE FACTORS

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Parameter	Symbol	Unit	Default Value	Value Used	Comment
Averaging Time for Carcinogen	AT <sub>c</sub>	year	70	70	Default Value
Averaging Time for Non-Carcinogen	AT <sub>n</sub>	year	=ED	=ED	Default Value
<b>Body Weight:</b>					
Resident Child	BW	kg	15	15	Default Value
Resident Adult	BW	kg	70	70	Default Value
Trespasser	BW	kg	45	45	Default Value
Commercial Worker	BW	kg	70	70	Default Value
Construction Worker	BW	kg	70	70	Default Value
<b>Exposure Duration:</b>					
Resident Child	ED	year	6	6	Default Value
Resident Adult	ED	year	30	30	Default Value
Trespasser	ED	year	10	10	Default Value
Commercial Worker	ED	year	25	25	Default Value
Construction Worker	ED	year	1	1	Default Value
<b>Exposure Frequency:</b>					
Resident Child	EF	day/year	350	350	Default Value
Resident Adult	EF	day/year	350	350	Default Value
Trespasser	EF	day/year	350	350	Default Value
Commercial Worker	EF	day/year	250	250	Default Value
Construction Worker	EF	day/year	250	250	Default Value
<b>Soil Ingestion Rate:</b>					
Resident Child	IRS	mg/day	200	200	Default Value
Resident Adult	IRS	mg/day	100	100	Default Value
Trespasser	IRS	mg/day	100	100	Default Value
Commercial Worker	IRS	mg/day	75	75	Default Value
Construction Worker	IRS	mg/day	177	177	Default Value
<b>Water Ingestion Rate:</b>					
Resident Child	IRW	L/day	1	1	Default Value
Resident Adult	IRW	L/day	2	2	Default Value
<b>Hourly Indoor Inhalation Rate:</b>					
Resident Child	IR <sub>ai</sub>	m <sup>3</sup> /hr	0.5	0.500	Default Value
Resident Adult	IR <sub>ai</sub>	m <sup>3</sup> /hr	0.833	0.833	Default Value
Trespasser	IR <sub>ai</sub>	m <sup>3</sup> /hr	1.5	1.500	Default Value
Commercial Worker	IR <sub>ai</sub>	m <sup>3</sup> /hr	1.5	1.500	Default Value
Construction Worker	IR <sub>ai</sub>	m <sup>3</sup> /hr	1.5	1.500	Default Value
<b>Exposure Time for Indoor Inhalation:</b>					
Resident Child	ET <sub>in</sub>	hr/day	24	24	Default Value
Resident Adult	ET <sub>in</sub>	hr/day	24	24	Default Value
Trespasser	ET <sub>in</sub>	hr/day	24	24	Default Value
Commercial Worker	ET <sub>in</sub>	hr/day	10	10	Default Value
Construction Worker	ET <sub>in</sub>	hr/day	10	10	Default Value
<b>Daily Indoor Inhalation Rate:</b>					
Resident Child	IR <sub>ai_d</sub>	m <sup>3</sup> /day	12.0	12.0	Calculated
Resident Adult	IR <sub>ai_d</sub>	m <sup>3</sup> /day	20.0	20.0	Calculated
Trespasser	IR <sub>ai_d</sub>	m <sup>3</sup> /day	36.0	36.0	Calculated
Commercial Worker	IR <sub>ai_d</sub>	m <sup>3</sup> /day	15.0	15.0	Calculated
Construction Worker	IR <sub>ai_d</sub>	m <sup>3</sup> /day	15.0	15.0	Calculated

The values in red are calculated.

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SITE:

**EXPOSURE FACTORS**

(Page 2 of 2)

Parameter	Symbol	Unit	Default Value	Value Used	Comment
<b>Hourly Outdoor Inhalation Rate:</b>					
Resident Child	IR <sub>ao</sub>	m <sup>3</sup> /hr	0.5	0.500	Default Value
Resident Adult	IR <sub>ao</sub>	m <sup>3</sup> /hr	0.833	0.833	Default Value
Trespasser	IR <sub>ao</sub>	m <sup>3</sup> /hr	1.5	1.500	Default Value
Commercial Worker	IR <sub>ao</sub>	m <sup>3</sup> /hr	1.5	1.500	Default Value
Construction Worker	IR <sub>ao</sub>	m <sup>3</sup> /hr	1.5	1.500	Default Value
<b>Exposure Time for Outdoor Inhalation:</b>					
Resident Child	ET <sub>out</sub>	hr/day	10	10	Default Value
Resident Adult	ET <sub>out</sub>	hr/day	10	10	Default Value
Trespasser	ET <sub>out</sub>	hr/day	10	10	Default Value
Commercial Worker	ET <sub>out</sub>	hr/day	10	10	Default Value
Construction Worker	ET <sub>out</sub>	hr/day	10	10	Default Value
<b>Daily Outdoor Inhalation Rate:</b>					
Resident Child	IR <sub>ao_d</sub>	m <sup>3</sup> /day	5.0	5.0	Calculated
Resident Adult	IR <sub>ao_d</sub>	m <sup>3</sup> /day	8.3	8.3	Calculated
Trespasser	IR <sub>ao_d</sub>	m <sup>3</sup> /day	15.0	15.0	Calculated
Commercial Worker	IR <sub>ao_d</sub>	m <sup>3</sup> /day	15.0	15.0	Calculated
Construction Worker	IR <sub>ao_d</sub>	m <sup>3</sup> /day	15.0	15.0	Calculated
<b>Soil to Skin Adherence Factor:</b>					
Resident Child	M	mg/cm <sup>2</sup>	0.2	0.2	Default Value
Resident Adult	M	mg/cm <sup>2</sup>	0.07	0.07	Default Value
Trespasser	M	mg/cm <sup>2</sup>	0.2	0.2	Default Value
Commercial Worker	M	mg/cm <sup>3</sup>	0.2	0.2	Default Value
Construction Worker	M	mg/cm <sup>2</sup>	0.2	0.2	Default Value
<b>Skin Surface Area for Dermal Contact:</b>					
Resident Child	SA	cm <sup>2</sup> /day	2800	2800	Default Value
Resident Adult	SA	cm <sup>2</sup> /day	5700	5700	Default Value
Trespasser	SA	cm <sup>2</sup> /day	5700	5700	Default Value
Commercial Worker	SA	cm <sup>2</sup> /day	5700	5700	Default Value
Construction Worker	SA	cm <sup>2</sup> /day	5700	5700	Default Value

The values in red are calculated.

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SITE:

## FATE AND TRANSPORT PARAMETERS

Parameter	Symbol	Unit	Default Value	Value Used	Comment
<b>SOIL PARAMETERS:</b>					
Length of soil source area parallel to wind direction	$W_a$	cm	**	1463.04	Site-Specific Value
Depth to subsurface soil sources	$L_s$	cm	30.48	30.48	Default Value
Lower depth of surficial soil zone	$d$	cm	30.48	30.48	Default Value
Depth to soil vapor measurement	$d_{sv}$	cm	30.48	30.48	Default Value
<b>VADOSE ZONE:</b>					
Total soil porosity	$\theta_T$	$\text{cm}^3/\text{cm}^3\text{-soil}$	0.30	0.300	Default Value
Volumetric water content	$\theta_{ws}$	$\text{cm}^3/\text{cm}^3$	0.10	0.10	Default Value
Volumetric air content	$\theta_{as}$	$\text{cm}^3/\text{cm}^3$	0.20	0.20	Calculated
Thickness	$h_v$	cm	295	219.9424	Calculated
Dry soil bulk density	$\rho_s$	$\text{g}/\text{cm}^3$	1.8	1.8	Default Value
Fractional organic carbon content	$f_{oc}$	$\text{g-C}/\text{g-soil}$	0.002	0.002	Default Value
<b>FOUNDATION/WALL CRACKS:</b>					
Total soil porosity	$\theta_{Tcrack}$	$\text{cm}^3/\text{cm}^3\text{-soil}$	0.30	0.300	Default Value
Volumetric water content	$\theta_{wcrack}$	$\text{cm}^3/\text{cm}^3$	0.10	0.10	Default Value
Volumetric air content	$\theta_{acrack}$	$\text{cm}^3/\text{cm}^3$	0.20	0.20	Calculated
<b>CAPILLARY FRINGE:</b>					
Total soil porosity	$\theta_{Tcap}$	$\text{cm}^3/\text{cm}^3\text{-soil}$	0.30	0.300	Default Value
Volumetric water content	$\theta_{wcap}$	$\text{cm}^3/\text{cm}^3$	0.27	0.27	Calculated
Volumetric air content	$\theta_{acap}$	$\text{cm}^3/\text{cm}^3$	0.03	0.03	Calculated
Thickness	$h_{cap}$	cm	5	5	Default Value
<b>GROUNDWATER PARAMETERS:</b>					
Depth to groundwater	$L_{gw}$	cm	300	224.9424	Site-Specific Value
Width of GW source perpendicular to GW flow direction	$Y$	cm	**	2011.68	Site-Specific Value
Length of GW source parallel to GW flow direction	$W$	cm	**	1463.04	Site-Specific Value
Total soil porosity in the saturated zone	$\theta_{TS}$	$\text{cm}^3/\text{cm}^3$	0.30	0.36	Site-Specific Value
Dry soil bulk density in the saturated zone	$\rho_{ss}$	$\text{g}/\text{cm}^3$	1.8	1.68	Site-Specific Value
Fractional organic carbon content in the saturated zone	$f_{ocs}$	$\text{g-C}/\text{g-soil}$	0.002	0.002	Default Value
Groundwater mixing zone thickness	$\delta_{gw}$	cm	200	200	Default Value
Hydraulic conductivity in the saturated zone	$K$	$\text{cm}/\text{year}$	31536	31536	Default Value
Hydraulic gradient in the saturated zone	$i$	$\text{cm}/\text{cm}$	0.005	0.36576	Site-Specific Value
Groundwater darcy velocity	$U_{gw}$	$\text{cm}/\text{year}$	11534.61	11534.61	Calculated
Infiltration rate	$I$	$\text{cm}/\text{year}$	14.8	16.256	Site-Specific Value
<b>AMBIENT AIR PARAMETERS:</b>					
Breathing zone height	$\delta_a$	cm	200	200	Default Value
Wind speed within the breathing zone	$U_a$	$\text{cm}/\text{s}$	225	225	Default Value
<b>ENCLOSED SPACE PARAMETERS:</b>					
<b>Enclosed Space Air Exchange Rate:</b>					
Residential	ER	1/sec	0.00014	0.00014	Default Value
Trespasser	ER	1/sec	0.00014	0.00014	Default Value
Commercial/construction worker	ER	1/sec	0.00023	0.00023	Default Value
<b>Enclosed Space Volume/Infiltration Area Ratio:</b>					
Residential	$L_B$	cm	200	200	Default Value
Trespasser	$L_B$	cm	200	200	Default Value
Commercial/construction worker	$L_B$	cm	300	609.6	Site-Specific Value
<b>Enclosed Space Foundation or Wall Thickness:</b>					
Residential	$L_{crack}$	cm	15	15	Default Value
Trespasser	$L_{crack}$	cm	15	15	Default Value
Commercial/construction worker	$L_{crack}$	cm	15	15	Default Value
<b>Area Fraction of Cracks in Foundation/Walls:</b>					
Residential	$\eta$	$\text{cm}^2/\text{cm}^2$	0.01	0.01	Default Value
Trespasser	$\eta$	$\text{cm}^2/\text{cm}^2$	0.01	0.01	Default Value
Commercial/construction worker	$\eta$	$\text{cm}^2/\text{cm}^2$	0.01	0.01	Default Value
<b>PARTICULATE EMISSION RATE:</b>					
Residential and commercial	$P_e$	$\text{g}/\text{cm}^2\text{sec}$	6.90E-14	6.90E-14	Default Value
Trespasser	$P_e$	$\text{g}/\text{cm}^2\text{sec}$	6.90E-09	6.90E-09	Default Value
Construction worker	$P_e$	$\text{g}/\text{cm}^2\text{sec}$	6.90E-09	6.90E-09	Default Value
<b>AVERAGING TIME FOR VAPOR FLUX:</b>					
Resident child	$\tau$	sec	1.89E+08	1.89E+08	Calculated
Resident adult	$\tau$	sec	9.46E+08	9.46E+08	Calculated
Trespasser	$\tau$	sec	3.15E+08	3.15E+08	Calculated
Commercial worker	$\tau$	sec	7.88E+08	7.88E+08	Calculated
Construction worker	$\tau$	sec	3.15E+07	3.15E+07	Calculated

\*\* : The source area (assumed to be square) should be classified as either (i) small (270 yd) = (1500 cm X 1500 cm), (ii) medium (1/2 acre) = (4,498 cm X 4,498 cm), or (iii) large (1 acre) = (6,362 cm X 6,362 cm)

The values in red are calculated.

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**SITE:**

**PROTECTION OF GROUNDWATER USE**

<b>Parameter</b>	<b>Symbol</b>	<b>Unit</b>	<b>Default Value</b>	<b>Value Used</b>	<b>Comment</b>
Distance from the Downgradient Edge of the Groundwater Source to the Point of Exposure	$X_{poe}$	ft	variable	155	Site-specific
Longitudinal Dispersivity	$\alpha_x$	ft	variable	15.500	Calculated
Transverse Dispersivity	$\alpha_y$	ft	variable	5.167	Calculated
Vertical Dispersivity	$\alpha_z$	ft	variable	0.775	Calculated
Distance from the Downgradient Edge of the Groundwater Source to the Point of Compliance	$X_{poc}$	ft	variable	0	Site-specific
Longitudinal Dispersivity	$\alpha_x$	ft	variable	0.000	Calculated
Transverse Dispersivity	$\alpha_y$	ft	variable	0.000	Calculated
Vertical Dispersivity	$\alpha_z$	ft	variable	0.000	Calculated

**Enter additional chemical-specific values on the "Chemical-Specific Inputs for Other Exposure Pathways" table.**

**The values in red are calculated.**

**This software evaluates the groundwater protection pathway using the Domenico Model. For sites in geologic environments not suited for the Domenico Model ( such as karst or fractured flow regimes), an alternative more appropriate model or modeling pack should be used.**

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SITE:

PROTECTION OF SURFACE WATER

Parameter	Symbol	Unit	Value Used	Comment
Concentration protective of surface water (Allowable stream concentration at the downstream edge of the stream's mixing zone or at point of discharge if mixing zone is not used)	$C_{sw}$	mg/L	Chemical-specific <sup>1</sup>	Refer to Guidance Document
Average minimum flow of stream for seven consecutive days that has a probable recurrence interval of once-in-ten years	7Q10	ft <sup>3</sup> /sec	Chemical-specific <sup>1</sup>	Site-specific
<b>7Q10 either is a user-input above, or if left blank above, is calculated as per equation D-4.9 in Appendix D of the guidance document assuming that weighting is not necessary.</b>				
Average minimum flow of stream for seven consecutive days that has a probable recurrence interval of once-in-ten years	7Q10	ft <sup>3</sup> /sec	#NUM!	Calculated
Stream flow recession index	G	--	0	Site-specific
Contributing drainage area	A	miles <sup>2</sup>	0	Site-specific
Mean annual precipitation	P	inches	0	Site-specific
Stream flow rate	$Q_{sw}$	ft <sup>3</sup> /day	0.00	Calculated
Impacted groundwater discharge into the stream	$Q_{gw}$	ft <sup>3</sup> /day	0.00	Calculated
Cross-sectional area of the impacted groundwater flow	$A_{gw}$	ft <sup>2</sup>	0.00	Calculated
Width of the groundwater plume discharging into the stream	$L_p$	ft	0	Site-specific
<b><u><math>L_p</math> either is a user-input above, or if left blank above, is calculated as per equation D-4.5 in Appendix D of the guidance document.</u></b>				
Width of the groundwater plume discharging into the stream	$L_p$	ft		Calculated
Thickness of the groundwater plume discharging into the stream	$D_p$	ft	20.70	Calculated
Concentration upstream of the point of groundwater discharge into the stream	$C_{su}$	mg/L	Chemical-specific <sup>1</sup>	Site-specific
Distance from the downgradient edge of the groundwater source to the stream	$X_s$	ft	200.00	Site-specific
Longitudinal dispersivity	$\alpha_x$	ft	20.00	Calculated
Transverse dispersivity	$\alpha_y$	ft	6.67	Calculated
Vertical dispersivity	$\alpha_z$	ft	1.00	Calculated
Distance from the downgradient edge of the groundwater source to the point of compliance	$X_{spoc}$	ft	11.90	Site-specific
Longitudinal dispersivity	$\alpha_x$	ft	1.19	Calculated
Transverse dispersivity	$\alpha_y$	ft	0.40	Calculated
Vertical dispersivity	$\alpha_z$	ft	0.06	Calculated

<sup>1</sup>: Enter the chemical-specific values on the "Chemical-Specific Inputs for Other Exposure Pathways" input table.

The values in red are calculated.

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**SITE:**

**SOIL & GROUNDWATER PROTECTIVE OF INDOOR INHALATION**

Parameter	Symbol	Unit	Default Value	Value Used	Comment
<b>Resident</b>					
Distance from the Downgradient Edge of the Groundwater Source to the On/Off-site Building	$X_{bld}$	ft	variable	1000	Site-specific
Longitudinal Dispersivity	$\alpha_x$	ft	variable	100.000	Calculated
Transverse Dispersivity	$\alpha_y$	ft	variable	33.333	Calculated
Vertical Dispersivity	$\alpha_z$	ft	variable	5.000	Calculated
Distance from the Downgradient Edge of the Groundwater Source to the Point of Compliance (Sentry Well)	$X_{poc}$	ft	variable	11.9	Site-specific
Longitudinal Dispersivity	$\alpha_x$	ft	variable	1.190	Calculated
Transverse Dispersivity	$\alpha_y$	ft	variable	0.397	Calculated
Vertical Dispersivity	$\alpha_z$	ft	variable	0.060	Calculated
<b>Commercial Worker</b>					
Distance from the Downgradient Edge of the Groundwater Source to the On/Off-site Building	$X_{bld}$	ft	variable	1000	Site-specific
Longitudinal Dispersivity	$\alpha_x$	ft	variable	100.000	Calculated
Transverse Dispersivity	$\alpha_y$	ft	variable	33.333	Calculated
Vertical Dispersivity	$\alpha_z$	ft	variable	5.000	Calculated
Distance from the Downgradient Edge of the Groundwater Source to the Point of Compliance (Sentry Well)	$X_{poc}$	ft	variable	11.9	Site-specific
Longitudinal Dispersivity	$\alpha_x$	ft	variable	1.190	Calculated
Transverse Dispersivity	$\alpha_y$	ft	variable	0.397	Calculated
Vertical Dispersivity	$\alpha_z$	ft	variable	0.060	Calculated
<b>Trespasser</b>					
Distance from the Downgradient Edge of the Groundwater Source to the On/Off-site Building	$X_{bld}$	ft	variable	1000	Site-specific
Longitudinal Dispersivity	$\alpha_x$	ft	variable	100.000	Calculated
Transverse Dispersivity	$\alpha_y$	ft	variable	33.333	Calculated
Vertical Dispersivity	$\alpha_z$	ft	variable	5.000	Calculated
Distance from the Downgradient Edge of the Groundwater Source to the Point of Compliance (Sentry Well)	$X_{poc}$	ft	variable	11.9	Site-specific
Longitudinal Dispersivity	$\alpha_x$	ft	variable	1.190	Calculated
Transverse Dispersivity	$\alpha_y$	ft	variable	0.397	Calculated
Vertical Dispersivity	$\alpha_z$	ft	variable	0.060	Calculated

Enter additional chemical-specific values on the "Chemical-Specific Inputs for Other Exposure Pathways" table.

The values in red are calculated.

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SITE:

CHEMICAL-SPECIFIC INPUTS FOR OTHER EXPOSURE PATHWAYS

Chemicals of Concern	MCL [mg/L]	Unsaturated Zone DAF			Half-Life [days]	Concentration Upstream of the Point of Discharge (C <sub>su</sub> ) [mg/L]	Bioconcentration Factor in Fish (BCF) [L/kg]	Concentration Protective of Surface Water (C <sub>sw</sub> )			
		Default Value [--]	Value Used [--]	Comment				Default Value <sup>1</sup> [mg/L]	User-Specified Value [mg/L]	Value Used [mg/L]	Comment
<input type="checkbox"/> Tetrachloroethene (PCE)	0.005	1.00E+00	1	Default	3.60E+02	30.60	6.03E-03		6.03E-03	Default	
<input checked="" type="checkbox"/> Trichloroethene (TCE)	0.005	1.00E+00	1	Default	3.60E+02	10.60	2.40E-02		2.40E-02	Default	

<sup>1</sup>: The default concentration protective of surface water at the downstream edge of the mixing zone or at point of discharge is calculated based on consumption of water and fish.

NA: Not Available

NTOX: Default value for C<sub>sw</sub> cannot be calculated since toxicological properties for the COC is not available.

MCL: Maximum Contaminant Levels

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**SITE:**

**CLEAN-UP LEVEL CALCULATION**

When the cumulative risk criteria has to be satisfied clean-up levels are not unique. Several different combinations of clean-up levels can satisfy the cumulative risk criteria. Following are two of the many options available:

- Option 1** - Reduce each of the representative concentrations by the risk reduction factor. Risk reduction factor is the ratio of the calculated site-wide risk to the target cumulative risk.
- Option 2** - Each of the representative concentration is reduced by a factor such that the risk from each COC and each ROE is identical.

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**SITE:**

**ABBREVIATIONS**

<b>Parameter</b>	
HI	Hazard Index (sum of hazard quotient)
HQ	Hazard Quotient
IELCR	Individual Excess Lifetime Cancer Risk
M	The concentration is MCL.
N/A	The soil concentration at the source is not applicable since the groundwater concentration has been entered/selected.
NA	Volatilization factor was not calculated due to lack of Henry's law constant
NC	Pathway is not complete.
NCL	The clean-up level is not calculated since the target risk is not exceeded.
NCO	The risk/clean-up level cannot be calculated since the chemical of concern is not selected/entered.
NCsw	The concentrations cannot be calculated since the conc. protective of surface water (Csw) is not available/entered.
NHL	The DAF/concentration cannot be calculated since the half-life for the COC is not available/entered.
NMZ	No mixing zone
NPCP	The risk/concentration cannot be calculated since the physical and chemical properties for the COC is not available.
NREP	The risk cannot be calculated since the representative concentration is not available/entered.
NTOX	The risk/concentration cannot be calculated since the toxicological properties for the COC is not available.
RM	Risk Management
--	The clean-up level/concentration cannot be calculated for this COC since the input properties is not available/entered.
*	Calculated concentration exceeded saturated soil concentration. Calculated value is shown.
+	Calculated concentration exceeded saturated vapor concentration. Calculated value is shown.
#	Calculated concentration exceeded solubility. Calculated value is shown.
>1E+300	When DAF is greater then >1+300, the concentrations shown is saturated soil concentration for soil and/or solubility for groundwater.

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SITE:

REPRESENTATIVE CONCENTRATION FOR A RESIDENT

CHEMICALS OF CONCERN	AIR		SURFICIAL SOIL					SUBSURFACE SOIL		SOIL VAPOR		GROUNDWATER		
	Indoor	Outdoor	Dermal Contact	Ingestion	Outdoor Inhalation of Vapor Emissions	Outdoor Inhalation of Particulates	Combined Pathway	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Ingestion
	[mg/m <sup>3</sup> -air]		[mg/kg]							[mg/m <sup>3</sup> ]		[mg/L]		
Tetrachloroethene (PCE)	NA	NA	9.33E-01	9.33E-01	NA	9.33E-01	NA	NA	NA	NA	NA	NA	NA	2.34E-01
Trichloroethene (TCE)	NA	NA	5.86E-01	5.86E-01	NA	5.86E-01	NA	NA	NA	NA	NA	NA	NA	1.62E-01

Soil concentrations are presented on a dry weight basis.

NA: Not Available

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SITE:

**REPRESENTATIVE CONCENTRATION FOR A COMMERCIAL WORKER**

CHEMICALS OF CONCERN	AIR		SURFICIAL SOIL					SUBSURFACE SOIL		SOIL VAPOR		GROUNDWATER	
	Indoor	Outdoor	Dermal Contact	Ingestion	Outdoor Inhalation of Vapor Emissions	Outdoor Inhalation of Particulates	Combined Pathway	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions
	[mg/m <sup>3</sup> -air]		[mg/kg]					[mg/m <sup>3</sup> ]		[mg/L]			
Tetrachloroethene (PCE)	NA	NA	9.33E-01	9.33E-01	NA	9.33E-01	NA	NA	NA	NA	NA	NA	NA
Trichloroethene (TCE)	NA	NA	5.86E-01	5.86E-01	NA	5.86E-01	NA	NA	NA	NA	NA	NA	NA

Soil concentrations are presented on a dry weight basis.

NA: Not Available

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SITE:

REPRESENTATIVE CONCENTRATION FOR A TRESPASSER

CHEMICALS OF CONCERN	AIR		SURFICIAL SOIL					SUBSURFACE SOIL		SOIL VAPOR		GROUNDWATER	
	Indoor	Outdoor	Dermal Contact	Ingestion	Outdoor Inhalation of Vapor Emissions	Outdoor Inhalation of Particulates	Combined Pathway	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions
	[mg/m <sup>3</sup> -air]		[mg/kg]					[mg/m <sup>3</sup> ]		[mg/L]			
Tetrachloroethene (PCE)	NA	NA	9.33E-01	9.33E-01	NA	9.33E-01	NA	NA	NA	NA	NA	NA	NA
Trichloroethene (TCE)	NA	NA	5.86E-01	5.86E-01	NA	5.86E-01	NA	NA	NA	NA	NA	NA	NA

Soil concentrations are presented on a dry weight basis.

NA: Not Available

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**SITE:**

**REPRESENTATIVE CONCENTRATION FOR A CONSTRUCTION WORKER**

CHEMICALS OF CONCERN	AIR	SOIL UPTO DEPTH OF CONSTRUCTION					SOIL VAPOR	GROUNDWATER
	Outdoor	Dermal Contact	Ingestion	Outdoor Inhalation of Vapor Emissions	Outdoor Inhalation of Particulates	Combined Pathway	Outdoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions
	[mg/m <sup>3</sup> -air]	[mg/kg]					[mg/m <sup>3</sup> ]	[mg/L]
Tetrachloroethene (PCE)	NA	9.33E-01	9.33E-01	NA	9.33E-01	NA	NA	NA
Trichloroethene (TCE)	NA	5.86E-01	5.86E-01	NA	5.86E-01	NA	NA	NA

Soil concentrations are presented on a dry weight basis.

NA: Not Available

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SITE:

**REPRESENTATIVE CONCENTRATION FOR  
PROTECTION OF GROUNDWATER USE**

CHEMICALS OF CONCERN	SOURCE CONCENTRATIONS	
	Soil ●	Groundwater ○
	[mg/kg]	[mg/L]
Tetrachloroethene (PCE)	9.33E-01	2.00E-04
Trichloroethene (TCE)	5.86E-01	1.33E-01

Soil concentrations are presented on a dry weight basis by Melissa Montgomery of Thompson Engineering, Inc.

SITE:

**REPRESENTATIVE CONCENTRATION FOR  
PROTECTION OF SURFACE WATER**

CHEMICALS OF CONCERN	SOURCE CONCENTRATIONS	
	Soil ●	Groundwater ○
	[mg/kg]	[mg/L]
Tetrachloroethene (PCE)	9.33E-01	2.00E-04
Trichloroethene (TCE)	5.86E-01	1.33E-01

Soil concentrations are presented on a dry weight basis by Melissa Montgomery of Thompson Engineering, Inc.

SITE:

**REPRESENTATIVE CONCENTRATION FOR SOIL & GROUNDWATER PROTECTIVE OF INDOOR INHALATION**

CHEMICALS OF CONCERN	SOURCE CONC. FOR RESIDENT		SOURCE CONC. FOR COMMERCIAL WK.		SOURCE CONC. FOR TRESPASSER.	
	Soil ○	Groundwater●	Soil ●	Groundwater○	Soil ●	Groundwater○
	[mg/kg]	[mg/L]	[mg/kg]	[mg/L]	[mg/kg]	[mg/L]
Tetrachloroethene (PCE)	9.33E-01	2.00E-04	9.33E-01	2.00E-04	9.33E-01	2.00E-04
Trichloroethene (TCE)	5.86E-01	1.62E-01	5.86E-01	1.62E-01	5.86E-01	1.62E-01

Soil concentrations are presented on a dry weight basis.

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SITE:

**RM-2 CARCINOGENIC CLEAN-UP LEVELS FOR A RESIDENT CHILD**

CHEMICALS OF CONCERN	AIR		SURFICIAL SOIL					SUBSURFACE SOIL		SOIL VAPOR		GROUNDWATER		
	Indoor	Outdoor	Dermal Contact	Ingestion	Outdoor Inhalation of Vapor Emissions	Outdoor Inhalation of Particulates	Combined Pathway	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Ingestion
	[mg/m <sup>3</sup> -air]		[mg/kg]					[mg/m <sup>3</sup> -air]		[mg/L]				
Tetrachloroethene (PCE)	NC	NC	1.32E-02	1.32E-02	NC	1.32E-02	NC	NC	NC	NC	NC	NC	NC	3.32E-03
Trichloroethene (TCE)	NC	NC	8.32E-03	8.32E-03	NC	8.32E-03	NC	NC	NC	NC	NC	NC	NC	2.30E-03

AIR		
Indoor	Outdoor	Dermal Contact
[mg/m <sup>3</sup> -air]		
NC	NC	2.89E-01
NC	NC	1.82E-01

Soil concentrations are presented on a dry weight basis.

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SITE:

**RM-2 NON-CARCINOGENIC CLEAN-UP LEVELS FOR A RESIDENT CHILD**

CHEMICALS OF CONCERN	SURFICIAL SOIL				SUBSURFACE SOIL		SOIL VAPOR		GROUNDWATER		
	Ingestion	Outdoor Inhalation of Vapor Emissions	Outdoor Inhalation of Particulates	Combined Pathway	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Ingestion
	[mg/kg]				[mg/m <sup>3</sup> -air]		[mg/L]				
Tetrachloroethene (PCE)	2.89E-01	NC	2.89E-01	NC	NC	NC	NC	NC	NC	NC	7.26E-02
Trichloroethene (TCE)	1.82E-01	NC	1.82E-01	NC	NC	NC	NC	NC	NC	NC	5.02E-02

AIR		SURFICIAL SOIL		
Indoor	Outdoor	Dermal Contact	Ingestion	Outdoor Inhalation of Vapor Emissions
[mg/m <sup>3</sup> -air]				
NC	NC	1.32E-02	1.32E-02	NC
NC	NC	8.32E-03	8.32E-03	NC

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**SITE:**

**RM-2 CLEAN-UP LEVELS FOR A RESIDENT CHILD**

CHEMICALS OF CONCERN	L		SUBSURFACE SOIL		SOIL VAPOR		GROUNDWATER		
	Outdoor Inhalation of Particulates	Combined Pathway	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Ingestion
	[mg/kg]				[mg/m <sup>3</sup> ]		[mg/L]		
Tetrachloroethene (PCE)	1.32E-02	NC	NC	NC	NC	NC	NC	NC	3.32E-03
Trichloroethene (TCE)	8.32E-03	NC	NC	NC	NC	NC	NC	NC	2.30E-03

Soil concentrations are presented on a d

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SITE:

RM-2 IELCR FOR A RESIDENT CHILD

CUMULATIVE IELCR	7.04E-04		SURFICIAL SOIL					SUBSURFACE SOIL		SOIL VAPOR		GROUNDWATER		
	Indoor	Outdoor	Dermal Contact	Ingestion	Outdoor Inhalation of Vapor Emissions	Outdoor Inhalation of Particulates	Combined Pathway	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Ingestion
CUMULATIVE HI	3.22E+00													
<b>CHEMICALS OF CONCERN</b>														
Tetrachloroethene (PCE)	NC	NC	1.55E-08	5.52E-07	NC	1.20E-15	NC	NC	NC	NC	NC	NC	NC	6.92E-04
Trichloroethene (TCE)	NC	NC	2.34E-10	8.35E-09	NC	2.52E-16	NC	NC	NC	NC	NC	NC	NC	1.15E-05
<b>CUMULATIVE RISK</b>														

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SITE:

RM-2 HQ FOR A RESIDENT CHILD

CUMULATIVE IELCR	AIR		SURFICIAL SOIL					SUBSURFACE SOIL		SOIL VAPOR		GROUNDWATER		
	Indoor	Outdoor	Dermal Contact	Ingestion	Outdoor Inhalation of Vapor Emissions	Outdoor Inhalation of Particulates	Combined Pathway	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Ingestion
7.04E-04														
CUMULATIVE HI	3.22E+00													
<b>CHEMICALS OF CONCERN</b>														
Tetrachloroethene (PCE)	NC	NC	3.34E-05	1.19E-03	NC	4.78E-12	NC	NC	NC	NC	NC	NC	NC	1.50E+00
Trichloroethene (TCE)	NC	NC	3.50E-05	1.25E-03	NC	7.41E-11	NC	NC	NC	NC	NC	NC	NC	1.73E+00
<b>CUMULATIVE RISK</b>														

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SITE:

RM-2 CUMULATIVE RISK FOR A RESIDENT CHILD

<b>CUMULATIVE IELCR</b>	7.04E-04	<b>SUM OF IELCR</b>	<b>SUM OF HQ (HI)</b>
<b>CUMULATIVE HI</b>	3.22E+00		
<b>CHEMICALS OF CONCERN</b>			
Tetrachloroethene (PCE)		6.93E-04	1.50E+00
Trichloroethene (TCE)		1.15E-05	1.73E+00
<b>CUMULATIVE RISK</b>		7.04E-04	3.22E+00

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SITE:

RM-2 CLEAN-UP LEVELS FOR A RESIDENT ADULT

CHEMICALS OF CONCERN	AIR		SURFICIAL SOIL					SUBSURFACE SOIL		SOIL VAPOR		GROUNDWATER		
	Indoor	Outdoor	Dermal Contact	Ingestion	Outdoor Inhalation of Vapor Emissions	Outdoor Inhalation of Particulates	Combined Pathway	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Ingestion
	[mg/m <sup>3</sup> -air]		[mg/kg]							[mg/m <sup>3</sup> ]		[mg/L]		
Tetrachloroethene (PCE)	NC	NC	6.18E-03	6.18E-03	NC	6.18E-03	NC	NC	NC	NC	NC	NC	NC	1.55E-03
Trichloroethene (TCE)	NC	NC	3.88E-03	3.88E-03	NC	3.88E-03	NC	NC	NC	NC	NC	NC	NC	1.07E-03

Soil concentrations are presented on a dry weight basis.

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SITE:

RM-2 IELCR FOR A RESIDENT ADULT

CUMULATIVE IELCR	1.51E-03		AIR		SURFICIAL SOIL			SUBSURFACE SOIL		SOIL VAPOR		GROUNDWATER				
	CUMULATIVE HI	1.38E+00	Indoor	Outdoor	Dermal Contact	Ingestion	Outdoor Inhalation of Vapor Emissions	Outdoor Inhalation of Particulates	Combined Pathway	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Ingestion
CHEMICALS OF CONCERN																
Tetrachloroethene (PCE)			NC	NC	1.18E-08	2.96E-07	NC	2.15E-15	NC	NC	NC	NC	NC	NC	NC	1.48E-03
Trichloroethene (TCE)			NC	NC	1.78E-10	4.47E-09	NC	4.50E-16	NC	NC	NC	NC	NC	NC	NC	2.47E-05
CUMULATIVE RISK																

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SITE:

RM-2 HQ FOR A RESIDENT ADULT

CUMULATIVE IELCR	1.51E-03		AIR		SURFICIAL SOIL			SUBSURFACE SOIL		SOIL VAPOR		GROUNDWATER				
	CUMULATIVE HI	1.38E+00	Indoor	Outdoor	Dermal Contact	Ingestion	Outdoor Inhalation of Vapor Emissions	Outdoor Inhalation of Particulates	Combined Pathway	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Ingestion
CHEMICALS OF CONCERN																
Tetrachloroethene (PCE)			NC	NC	5.10E-06	1.28E-04	NC	1.71E-12	NC	NC	NC	NC	NC	NC	NC	6.41E-01
Trichloroethene (TCE)			NC	NC	5.34E-06	1.34E-04	NC	2.65E-11	NC	NC	NC	NC	NC	NC	NC	7.40E-01
CUMULATIVE RISK																

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SITE:

RM-2 CUMULATIVE RISK FOR A RESIDENT ADULT

<b>CUMULATIVE IELCR</b>	1.51E-03	<b>SUM OF IELCR</b>	<b>SUM OF HQ (HI)</b>
<b>CUMULATIVE HI</b>	1.38E+00		
<b>CHEMICALS OF CONCERN</b>			
Tetrachloroethene (PCE)		1.48E-03	6.41E-01
Trichloroethene (TCE)		2.47E-05	7.40E-01
<b>CUMULATIVE RISK</b>		1.51E-03	1.38E+00

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SITE:

**RM-2 CLEAN-UP LEVELS FOR A RESIDENT**

CHEMICALS OF CONCERN	AIR		SURFICIAL SOIL					SUBSURFACE SOIL		SOIL VAPOR		GROUNDWATER		
	Indoor	Outdoor	Dermal Contact	Ingestion	Outdoor Inhalation of Vapor Emissions	Outdoor Inhalation of Particulates	Combined Pathway	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Ingestion
	[mg/m <sup>3</sup> -air]		[mg/kg]							[mg/m <sup>3</sup> ]		[mg/L]		
Tetrachloroethene (PCE)	NC	NC	6.18E-03	6.18E-03	NC	6.18E-03	NC	NC	NC	NC	NC	NC	NC	1.55E-03
Trichloroethene (TCE)	NC	NC	3.88E-03	3.88E-03	NC	3.88E-03	NC	NC	NC	NC	NC	NC	NC	1.07E-03

Soil concentrations are presented on a dry weight basis.

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SITE:

RM-2 IELCR FOR A RESIDENT

CUMULATIVE IELCR	AIR		SURFICIAL SOIL				SUBSURFACE SOIL		SOIL VAPOR		GROUNDWATER			
	Indoor	Outdoor	Dermal Contact	Ingestion	Outdoor Inhalation of Vapor Emissions	Outdoor Inhalation of Particulates	Combined Pathway	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Ingestion
1.51E-03														
CUMULATIVE HI	3.22E+00													
<b>CHEMICALS OF CONCERN</b>														
Tetrachloroethene (PCE)	NC	NC	1.55E-08	5.52E-07	NC	2.15E-15	NC	NC	NC	NC	NC	NC	NC	1.48E-03
Trichloroethene (TCE)	NC	NC	2.34E-10	8.35E-09	NC	4.50E-16	NC	NC	NC	NC	NC	NC	NC	2.47E-05
<b>CUMULATIVE RISK</b>														

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SITE:

RM-2 HQ FOR A RESIDENT

CUMULATIVE IELCR	1.51E-03		AIR		SURFICIAL SOIL			SUBSURFACE SOIL		SOIL VAPOR		GROUNDWATER				
	CUMULATIVE HI	3.22E+00	Indoor	Outdoor	Dermal Contact	Ingestion	Outdoor Inhalation of Vapor Emissions	Outdoor Inhalation of Particulates	Combined Pathway	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Ingestion
<b>CHEMICALS OF CONCERN</b>																
Tetrachloroethene (PCE)			NC	NC	3.34E-05	1.19E-03	NC	4.78E-12	NC	NC	NC	NC	NC	NC	NC	1.50E+00
Trichloroethene (TCE)			NC	NC	3.50E-05	1.25E-03	NC	7.41E-11	NC	NC	NC	NC	NC	NC	NC	1.73E+00
<b>CUMULATIVE RISK</b>																

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**SITE:**

<b>CUMULATIVE IFLCR</b>	1.51E-03
<b>CUMULATIVE HI</b>	3.22E+00
<b>CHEMICALS OF CONCERN</b>	
Tetrachloroethene (PCE)	
Trichloroethene (TCE)	
<b>CUMULATIVE RISK</b>	

SITE:

RM-2 CUMULATIVE RISK FOR A RESIDENT

<b>CUMULATIVE IELCR</b>	1.51E-03	SUM OF IELCR	SUM OF HQ (HI)
<b>CUMULATIVE HI</b>	3.22E+00		
<b>CHEMICALS OF CONCERN</b>			
Tetrachloroethene (PCE)	1.48E-03		1.50E+00
Trichloroethene (TCE)	2.47E-05		1.73E+00
<b>CUMULATIVE RISK</b>	1.51E-03		3.22E+00

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SITE:

**RM-2 CARCINOGENIC CLEAN-UP LEVELS FOR A COMMERCIAL WORKER**

**RM-2 NON-CAR**

CHEMICALS OF CONCERN	AIR		SURFICIAL SOIL					SUBSURFACE SOIL		SOIL VAPOR		GROUNDWATER	
	Indoor	Outdoor	Dermal Contact	Ingestion	Outdoor Inhalation of Vapor Emissions	Outdoor Inhalation of Particulates	Combined Pathway	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions
	[mg/m <sup>3</sup> -air]		[mg/kg]					[mg/m <sup>3</sup> -air]		[mg/L]			
Tetrachloroethene (PCE)	NCL	NCL	NCL	NCL	NCL	NCL	NCL	NCL	NCL	NCL	NCL	NCL	NCL
Trichloroethene (TCE)	NCL	NCL	NCL	NCL	NCL	NCL	NCL	NCL	NCL	NCL	NCL	NCL	NCL

AIR		S	
Indoor	Outdoor	Dermal Contact	Ingestion
[mg/m <sup>3</sup> -air]			
NCL	NCL	NCL	NCL
NCL	NCL	NCL	NCL

Soil concentrations are presented on a dry weight basis.

For exclusive use by Melissa Montgomery of Thompson Engineering, Inc.

SITE:

**GENOTOXIC CLEAN-UP LEVELS FOR A COMMERCIAL WORKER**

**RM-2 CLEAN-UP LEVELS**

CHEMICALS OF CONCERN	SURFICIAL SOIL			SUBSURFACE SOIL		SOIL VAPOR		GROUNDWATER	
	Outdoor Inhalation of Vapor Emissions	Outdoor Inhalation of Particulates	Combined Pathway	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions
	[mg/kg]					[mg/m <sup>3</sup> -air]		[mg/L]	
Tetrachloroethene (PCE)	NCL	NCL	NCL	NCL	NCL	NCL	NCL	NCL	NCL
Trichloroethene (TCE)	NCL	NCL	NCL	NCL	NCL	NCL	NCL	NCL	NCL

AIR		SURFICIAL SOIL			
Indoor	Outdoor	Dermal Contact	Ingestion	Outdoor Inhalation of Vapor Emissions	Outdoor Inhalation of Particulates
[mg/m <sup>3</sup> -air]		[mg/kg]			
NCL	NCL	NCL	NCL	NCL	NCL
NCL	NCL	NCL	NCL	NCL	NCL

Soil concentrations are presented on a

For exclusive use by Melissa Montgomery of Thompson Engineering, Inc.

**SITE:**

**/ELS FOR A COMMERCIAL WORKER**

CHEMICALS OF CONCERN	SUBSURFACE SOIL			SOIL VAPOR		GROUNDWATER	
	Combined Pathway	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions
		[mg/m <sup>3</sup> ]				[mg/L]	
Tetrachloroethene (PCE)	NCL	NCL	NCL	NCL	NCL	NCL	NCL
Trichloroethene (TCE)	NCL	NCL	NCL	NCL	NCL	NCL	NCL

Soil concentrations are presented on a

For exclusive use by Melissa Montgomery of Thompson Engineering, Inc.

SITE:

**RM-2 IELCR FOR A COMMERCIAL WORKER**

<table border="1"> <tr> <td><b>CUMULATIVE IELCR</b></td> <td>1.54E-07</td> </tr> <tr> <td><b>CUMULATIVE HI</b></td> <td>1.61E-04</td> </tr> <tr> <td colspan="2"><b>CHEMICALS OF CONCERN</b></td> </tr> </table>	<b>CUMULATIVE IELCR</b>	1.54E-07	<b>CUMULATIVE HI</b>	1.61E-04	<b>CHEMICALS OF CONCERN</b>		AIR		SURFICIAL SOIL				SUBSURFACE SOIL		SOIL VAPOR		GROUNDWATER	
	<b>CUMULATIVE IELCR</b>	1.54E-07																
<b>CUMULATIVE HI</b>	1.61E-04																	
<b>CHEMICALS OF CONCERN</b>																		
	Indoor	Outdoor	Dermal Contact	Ingestion	Outdoor Inhalation of Vapor Emissions	Outdoor Inhalation of Particulates	Combined Pathway	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions					
Tetrachloroethene (PCE)	NC	NC	2.01E-08	1.32E-07	NC	2.30E-15	NC	NC	NC	NC	NC	NC	NC					
Trichloroethene (TCE)	NC	NC	3.03E-10	2.00E-09	NC	4.82E-16	NC	NC	NC	NC	NC	NC	NC					
<b>CUMULATIVE RISK</b>																		

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SITE:

RM-2 HQ FOR A COMMERCIAL WORKER

CUMULATIVE IEL CR	AIR		SURFICIAL SOIL					SUBSURFACE SOIL		SOIL VAPOR		GROUNDWATER	
	Indoor	Outdoor	Dermal Contact	Ingestion	Outdoor Inhalation of Vapor Emissions	Outdoor Inhalation of Particulates	Combined Pathway	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions
CUMULATIVE HI	1.61E-04												
<b>CHEMICALS OF CONCERN</b>													
Tetrachloroethene (PCE)	NC	NC	1.04E-05	6.85E-05	NC	2.19E-12	NC	NC	NC	NC	NC	NC	NC
Trichloroethene (TCE)	NC	NC	1.09E-05	7.17E-05	NC	3.40E-11	NC	NC	NC	NC	NC	NC	NC
<b>CUMULATIVE RISK</b>													

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SITE:

RM-2 CUMULATIVE RISK FOR A COMMERCIAL WORKER

<b>CUMULATIVE IELCR</b>	1.54E-07	<b>SUM OF IELCR</b>	<b>SUM OF HQ (HI)</b>
<b>CUMULATIVE HI</b>	1.61E-04		
<b>CHEMICALS OF CONCERN</b>			
Tetrachloroethene (PCE)		1.52E-07	7.89E-05
Trichloroethene (TCE)		2.30E-09	8.26E-05
<b>CUMULATIVE RISK</b>		1.54E-07	1.61E-04

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**SITE:**

**RM-2 CLEAN-UP LEVELS FOR A TRESPASSER**

CHEMICALS OF CONCERN	AIR		SURFICIAL SOIL					SUBSURFACE SOIL		SOIL VAPOR		GROUNDWATER	
	Indoor	Outdoor	Dermal Contact	Ingestion	Outdoor Inhalation of Vapor Emissions	Outdoor Inhalation of Particulates	Combined Pathway	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions
	[mg/m <sup>3</sup> -air]		[mg/kg]							[mg/m <sup>3</sup> ]		[mg/L]	
Tetrachloroethene (PCE)	NCL	NCL	NCL	NCL	NCL	NCL	NCL	NCL	NCL	NCL	NCL	NCL	NCL
Trichloroethene (TCE)	NCL	NCL	NCL	NCL	NCL	NCL	NCL	NCL	NCL	NCL	NCL	NCL	NCL

Soil concentrations are presented on a dry weight basis.

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SITE:

RM-2 IELCR FOR A TRESPASSER

CUMULATIVE IELCR	1.74E-07		AIR		SURFICIAL SOIL				SUBSURFACE SOIL		SOIL VAPOR		GROUNDWATER			
	Indoor	Outdoor	Dermal Contact	Ingestion	Outdoor Inhalation of Vapor Emissions	Outdoor Inhalation of Particulates	Combined Pathway	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions			
CUMULATIVE HI	4.61E-04		CHEMICALS OF CONCERN													
Tetrachloroethene (PCE)	NC	NC	1.75E-08	1.53E-07	NC	2.01E-10	NC	NC	NC	NC	NC	NC	NC	NC		
Trichloroethene (TCE)	NC	NC	2.64E-10	2.32E-09	NC	4.20E-11	NC	NC	NC	NC	NC	NC	NC	NC		
CUMULATIVE RISK																

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SITE:

RM-2 HQ FOR A TRESPASSER

CUMULATIVE IELCR	AIR		SURFICIAL SOIL				SUBSURFACE SOIL		SOIL VAPOR		GROUNDWATER		
	Indoor	Outdoor	Dermal Contact	Ingestion	Outdoor Inhalation of Vapor Emissions	Outdoor Inhalation of Particulates	Combined Pathway	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions
1.74E-07													
CUMULATIVE HI													
4.61E-04													
<b>CHEMICALS OF CONCERN</b>													
Tetrachloroethene (PCE)	NC	NC	2.27E-05	1.99E-04	NC	4.78E-07	NC	NC	NC	NC	NC	NC	NC
Trichloroethene (TCE)	NC	NC	2.37E-05	2.08E-04	NC	7.41E-06	NC	NC	NC	NC	NC	NC	NC
<b>CUMULATIVE RISK</b>													

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SITE:

RM-2 CUMULATIVE RISK FOR A TRESPASSER

		SUM OF IELCR	SUM OF HQ (HI)
<b>CUMULATIVE IELCR</b>	1.74E-07		
<b>CUMULATIVE HI</b>	4.61E-04		
<b>CHEMICALS OF CONCERN</b>			
Tetrachloroethene (PCE)		1.71E-07	2.22E-04
Trichloroethene (TCE)		2.63E-09	2.39E-04
<b>CUMULATIVE RISK</b>		1.74E-07	4.61E-04

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**SITE:**

**RM-2 CLEAN-UP LEVELS FOR A CONSTRUCTION WORKER**

CHEMICALS OF CONCERN	AIR	SOIL UPTO DEPTH OF CONSTRUCTION					SOIL VAPOR	GROUNDWATER
	Outdoor	Dermal Contact	Ingestion	Outdoor Inhalation of Vapor Emissions	Outdoor Inhalation of Particulates	Combined Pathway	Outdoor Inhalation of Vapor Emissions	Outdoor Inhalation of Vapor Emissions
	[mg/m <sup>3</sup> -air]	[mg/kg]					[mg/m <sup>3</sup> ]	[mg/L]
Tetrachloroethene (PCE)	NCL	NCL	NCL	NCL	NCL	NCL	NCL	NCL
Trichloroethene (TCE)	NCL	NCL	NCL	NCL	NCL	NCL	NCL	NCL

Soil concentrations are presented on a dry weight basis.

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SITE:

**RM-2 IELCR FOR A CONSTRUCTION WORKER**

CUMULATIVE IELCR	1.35E-08	AIR	SOIL UPTO DEPTH OF CONSTRUCTION				SOIL VAPOR	GROUNDWATER
		Outdoor	Dermal Contact	Ingestion	Outdoor Inhalation of Vapor Emissions	Outdoor Inhalation of Particulates	Combined Pathway	Outdoor Inhalation of Vapor Emissions
CUMULATIVE HI	3.56E-04							
<b>CHEMICALS OF CONCERN</b>								
Tetrachloroethene (PCE)		NC	8.03E-10	1.25E-08	NC	9.22E-12	NC	NC
Trichloroethene (TCE)		NC	1.21E-11	1.88E-10	NC	1.93E-12	NC	NC
<b>CUMULATIVE RISK</b>								

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SITE:

**RM-2 HQ FOR A CONSTRUCTION WORKER**

CUMULATIVE IELCR	1.35E-08	AIR	SOIL UPTO DEPTH OF CONSTRUCTION				SOIL VAPOR	GROUNDWATER
		Outdoor	Dermal Contact	Ingestion	Outdoor Inhalation of Vapor Emissions	Outdoor Inhalation of Particulates	Combined Pathway	Outdoor Inhalation of Vapor Emissions
CUMULATIVE HI	3.56E-04							
<b>CHEMICALS OF CONCERN</b>								
Tetrachloroethene (PCE)		NC	1.04E-05	1.62E-04	NC	2.19E-07	NC	NC
Trichloroethene (TCE)		NC	1.09E-05	1.69E-04	NC	3.40E-06	NC	NC
<b>CUMULATIVE RISK</b>								

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SITE:

**RM-2 CUMULATIVE RISK FOR A CONSTRUCTION WORKER**

<b>CUMULATIVE IELCR</b>	1.35E-08	<b>SUM OF IELCR</b>	<b>SUM OF HQ (HI)</b>
<b>CUMULATIVE HI</b>	3.56E-04		
<b>CHEMICALS OF CONCERN</b>			
Tetrachloroethene (PCE)		1.33E-08	1.72E-04
Trichloroethene (TCE)		2.03E-10	1.83E-04
<b>CUMULATIVE RISK</b>		1.35E-08	3.56E-04

For exclusive use by Melissa Montgomery of Thompson Engineering, Inc.

**SITE:**

**PROTECTION OF GROUNDWATER USE - WITHOUT BIODEGRADATION**

CHEMICALS OF CONCERN	DILUTION ATTENUATION FACTORS			ALLOWABLE CONCENTRATION AT			
	Unsaturated Zone	Point of Compliance (Sentry Well)	Point of Exposure	Soil Source	Groundwater Source	Point of Compliance (Sentry Well)	Point of Exposure
	[--]	[--]	[--]	[mg/kg]	[mg/L]	[mg/L]	[mg/L]
Tetrachloroethene (PCE)	1.00E+00	1.00E+00	5.16E+00	1.16E+00	2.58E-02	2.58E-02	5.00E-03 M
Trichloroethene (TCE)	1.00E+00	1.00E+00	5.16E+00	1.12E+00	2.58E-02	2.58E-02	5.00E-03 M

Soil concentrations are presented on a dry weight basis.

For exclusive use by Melissa Montgomery of Thompson Engineering, Inc.

**SITE:**

**PROTECTION OF GROUNDWATER USE - WITH BIODEGRADATION**

CHEMICALS OF CONCERN	HALF-LIFE [days]	DILUTION ATTENUATION FACTOR			ALLOWABLE CONCENTRATION AT			
		Unsaturated zone [--]	Point of Compliance (Sentry Well) [--]	Point of Exposure [--]	Soil Source [mg/kg]	Groundwater Source [mg/L]	Point of Compliance (Sentry Well) [mg/L]	Point of Exposure [mg/L]
Tetrachloroethene (PCE)	3.60E+02	1.00E+00	1.00E+00	6.64E+00	1.49E+00	3.32E-02	3.32E-02	5.00E-03 M
Trichloroethene (TCE)	3.60E+02	1.00E+00	1.00E+00	6.71E+00	1.45E+00	3.35E-02	3.35E-02	5.00E-03 M

Soil concentrations are presented on a dry weight basis.

For exclusive use by Melissa Montgomery of Thompson Engineering, Inc.

**SITE:**

**PROTECTION OF GROUNDWATER USE - WITHOUT BIODEGRADATION**

CHEMICALS OF CONCERN	DILUTION ATTENUATION FACTORS			CONCENTRATION AT			
	Unsaturated Zone	Point of Compliance (Sentry Well)	Point of Exposure	Soil Source	Groundwater Source	Point of Compliance (Sentry Well)	Point of Exposure
	[--]	[--]	[--]	[mg/kg]	[mg/L]	[mg/L]	[mg/L]
Tetrachloroethene (PCE)	1.00E+00	1.00E+00	5.16E+00	9.33E-01	2.07E-02	2.07E-02	4.02E-03
Trichloroethene (TCE)	1.00E+00	1.00E+00	5.16E+00	5.86E-01	1.35E-02	1.35E-02	2.62E-03

Soil concentrations are presented on a dry weight basis.

For exclusive use by Melissa Montgomery of Thompson Engineering, Inc.

**SITE:**

**PROTECTION OF GROUNDWATER USE - WITH BIODEGRADATION**

CHEMICALS OF CONCERN	HALF-LIFE [days]	DILUTION ATTENUATION FACTOR			CONCENTRATION AT			
		Unsaturated zone [--]	Point of Compliance (Sentry Well) [--]	Point of Exposure [--]	Soil Source [mg/kg]	Groundwater Source [mg/L]	Point of Compliance (Sentry Well) [mg/L]	Point of Exposure [mg/L]
Tetrachloroethene (PCE)	3.60E+02	1.00E+00	1.00E+00	6.64E+00	9.33E-01	2.07E-02	2.07E-02	3.12E-03
Trichloroethene (TCE)	3.60E+02	1.00E+00	1.00E+00	6.71E+00	5.86E-01	1.35E-02	1.35E-02	2.02E-03

Soil concentrations are presented on a dry weight basis.

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SITE:

**PROTECTION OF SURFACE WATER - WITHOUT BIODEGRADATION**

CHEMICALS OF CONCERN	DILUTION ATTENUATION FACTOR			ALLOWABLE CONCENTRATION AT					Conc. Protective of Surface Water (Csw) [mg/L]
	Unsaturated Zone	Point of Compliance (Sentry Well)	Point of Discharge	Soil Source	Groundwater Source	Point of Compliance (Sentry Well)	Point of Discharge	End of Mixing Zone	
	[--]	[--]	[--]	[mg/kg]	[mg/L]	[mg/L]	[mg/L]	[mg/L]	
Tetrachloroethene (PCE)	NC	NC	NC	NC	NC	NC	NC	NC	NC
Trichloroethene (TCE)	NC	NC	NC	NC	NC	NC	NC	NC	NC

Soil concentrations are presented on a dry weight basis.

For exclusive use by Melissa Montgomery of Thompson Engineering, Inc.

SITE:

**PROTECTION OF SURFACE WATER - WITH BIODEGRADATION**

CHEMICALS OF CONCERN	HALF-LIFE [days]	DILUTION ATTENUATION FACTORS			ALLOWABLE CONCENTRATION AT					Conc. Protective of Surface Water (C <sub>sw</sub> ) [mg/L]
		Unsaturated Zone [--]	Point of Compliance (Sentry Well) [--]	Point of Discharge [--]	Soil Source [mg/kg]	Groundwater Source [mg/L]	Point of Compliance (Sentry Well) [mg/L]	Point of Discharge [mg/L]	End of Mixing Zone [mg/L]	
Tetrachloroethene (PCE)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Trichloroethene (TCE)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Soil concentrations are presented on a dry weight basis.

For exclusive use by Melissa Montgomery of Thompson Engineering, Inc.

SITE:

**PROTECTION OF SURFACE WATER - WITHOUT BIODEGRADATION**

CHEMICALS OF CONCERN	DILUTION ATTENUATION FACTOR			CONCENTRATION AT					Conc. Protective of Surface Water (Csw) [mg/L]
	Unsaturated Zone	Point of Compliance (Sentry Well)	Point of Discharge	Soil Source	Groundwater Source	Point of Compliance (Sentry Well)	Point of Discharge	End of Mixing Zone	
	[--]	[--]	[--]	[mg/kg]	[mg/L]	[mg/L]	[mg/L]	[mg/L]	
Tetrachloroethene (PCE)	NC	NC	NC	NC	NC	NC	NC	NC	NC
Trichloroethene (TCE)	NC	NC	NC	NC	NC	NC	NC	NC	NC

Soil concentrations are presented on a dry weight basis.

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SITE:

**PROTECTION OF SURFACE WATER - WITH BIODEGRADATION**

CHEMICALS OF CONCERN	HALF-LIFE [days]	DILUTION ATTENUATION FACTORS			CONCENTRATION AT					Conc. Protective of Surface Water (C <sub>sw</sub> ) [mg/L]
		Unsaturated Zone [--]	Point of Compliance (Sentry Well) [--]	Point of Discharge [--]	Soil Source [mg/kg]	Groundwater Source [mg/L]	Point of Compliance (Sentry Well) [mg/L]	Point of Discharge [mg/L]	End of Mixing Zone [mg/L]	
Tetrachloroethene (PCE)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Trichloroethene (TCE)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Soil concentrations are presented on a dry weight basis.

For exclusive use by Melissa Montgomery of Thompson Engineering, Inc.

SITE:

**SOIL & GROUNDWATER PROTECTIVE OF INDOOR INHALATION FOR A RESIDENT - WITHOUT BIODEGRADATION**

CHEMICALS OF CONCERN	DILUTION ATTENUATION FACTORS			ALLOWABLE CONCENTRATION AT			
	Unsaturated Zone	Point of Compliance (Sentry Well)	On/Off-site Building	Soil Source	Groundwater Source	Point of Compliance (Sentry Well)	On/Off-site Building
	[--]	[--]	[--]	[mg/kg]	[mg/L]	[mg/L]	[mg/L]
Tetrachloroethene (PCE)	NC	NC	NC	NC	NC	NC	NC
Trichloroethene (TCE)	NC	NC	NC	NC	NC	NC	NC

Soil concentrations are presented on a dry weight basis.

For exclusive use by Melissa Montgomery of Thompson Engineering, Inc.

**SITE:**

**SOIL & GROUNDWATER PROTECTIVE OF INDOOR INHALATION FOR A RESIDENT - WITH BIODEGRADATION**

CHEMICALS OF CONCERN	HALF-LIFE [days]	DILUTION ATTENUATION FACTOR			ALLOWABLE CONCENTRATION AT			
		Unsaturated zone [--]	Point of Compliance (Sentry Well) [--]	On/Off-site Building [--]	Soil Source [mg/kg]	Groundwater Source [mg/L]	Point of Compliance (Sentry Well) [mg/L]	On/Off-site Building [mg/L]
Tetrachloroethene (PCE)	NC	NC	NC	NC	NC	NC	NC	NC
Trichloroethene (TCE)	NC	NC	NC	NC	NC	NC	NC	NC

Soil concentrations are presented on a dry weight basis.

For exclusive use by Melissa Montgomery of Thompson Engineering, Inc.

SITE:

**SOIL & GROUNDWATER PROTECTIVE OF INDOOR INHALATION FOR A RESIDENT - WITHOUT BIODEGRADATION**

CHEMICALS OF CONCERN	DILUTION ATTENUATION FACTORS			CONCENTRATION AT			
	Unsaturated Zone	Point of Compliance (Sentry Well)	On/Off-site Building	Soil Source	Groundwater Source	Point of Compliance (Sentry Well)	On/Off-site Building
	[--]	[--]	[--]	[mg/kg]	[mg/L]	[mg/L]	[mg/L]
Tetrachloroethene (PCE)	NC	NC	NC	NC	NC	NC	NC
Trichloroethene (TCE)	NC	NC	NC	NC	NC	NC	NC

Soil concentrations are presented on a dry weight basis.

For exclusive use by Melissa Montgomery of Thompson Engineering, Inc.

**SITE:**

**SOIL & GROUNDWATER PROTECTIVE OF INDOOR INHALATION FOR A RESIDENT - WITH BIODEGRADATION**

CHEMICALS OF CONCERN	HALF-LIFE [days]	DILUTION ATTENUATION FACTOR			CONCENTRATION AT			
		Unsaturated zone [--]	Point of Compliance (Sentry Well) [--]	On/Off-site Building [--]	Soil Source [mg/kg]	Groundwater Source [mg/L]	Point of Compliance (Sentry Well) [mg/L]	On/Off-site Building [mg/L]
Tetrachloroethene (PCE)	NC	NC	NC	NC	NC	NC	NC	NC
Trichloroethene (TCE)	NC	NC	NC	NC	NC	NC	NC	NC

Soil concentrations are presented on a dry weight basis.

For exclusive use by Melissa Montgomery of Thompson Engineering, Inc.

SITE:

**SOIL & GROUNDWATER PROTECTIVE OF INDOOR INHALATION FOR A COMMERCIAL WORKER  
WITHOUT BIODEGRADATION**

CHEMICALS OF CONCERN	DILUTION ATTENUATION FACTORS			ALLOWABLE CONCENTRATION AT			
	Unsaturated Zone	Point of Compliance (Sentry Well)	On/Off-site Building	Soil Source	Groundwater Source	Point of Compliance (Sentry Well)	On/Off-site Building
	[--]	[--]	[--]	[mg/kg]	[mg/L]	[mg/L]	[mg/L]
Tetrachloroethene (PCE)	NC	NC	NC	NC	NC	NC	NC
Trichloroethene (TCE)	NC	NC	NC	NC	NC	NC	NC

Soil concentrations are presented on a dry weight basis.

For exclusive use by Melissa Montgomery of Thompson Engineering, Inc.

**SOIL & GROUNDWATER PROTECTIVE OF INDOOR INHALATION FOR A COMMERCIAL WORKER - WITH BIODEGRADATION**

SITE:

CHEMICALS OF CONCERN	HALF-LIFE [days]	DILUTION ATTENUATION FACTOR			ALLOWABLE CONCENTRATION AT			
		Unsaturated zone [--]	Point of Compliance (Sentry Well) [--]	On/Off-site Building [--]	Soil Source [mg/kg]	Groundwater Source [mg/L]	Point of Compliance (Sentry Well) [mg/L]	On/Off-site Building [mg/L]
Tetrachloroethene (PCE)	NC	NC	NC	NC	NC	NC	NC	NC
Trichloroethene (TCE)	NC	NC	NC	NC	NC	NC	NC	NC

Soil concentrations are presented on a dry weight basis.

For exclusive use by Melissa Montgomery of Thompson Engineering, Inc.

SITE:

**SOIL & GROUNDWATER PROTECTIVE OF INDOOR INHALATION FOR A COMMERCIAL WORKER  
WITHOUT BIODEGRADATION**

CHEMICALS OF CONCERN	DILUTION ATTENUATION FACTORS			CONCENTRATION AT			
	Unsaturated Zone [--]	Point of Compliance (Sentry Well) [--]	On/Off-site Building [--]	Soil Source [mg/kg]	Groundwater Source [mg/L]	Point of Compliance (Sentry Well) [mg/L]	On/Off-site Building [mg/L]
Tetrachloroethene (PCE)	NC	NC	NC	NC	NC	NC	NC
Trichloroethene (TCE)	NC	NC	NC	NC	NC	NC	NC

Soil concentrations are presented on a dry weight basis.

For exclusive use by Melissa Montgomery of Thompson Engineering, Inc.



**SOIL & GROUNDWATER PROTECTIVE OF INDOOR INHALATION FOR A COMMERCIAL WORKER - WITH BIODEGRADATION**

SITE:

CHEMICALS OF CONCERN	HALF-LIFE [days]	DILUTION ATTENUATION FACTOR			CONCENTRATION AT			
		Unsaturated zone [--]	Point of Compliance (Sentry Well) [--]	On/Off-site Building [--]	Soil Source [mg/kg]	Groundwater Source [mg/L]	Point of Compliance (Sentry Well) [mg/L]	On/Off-site Building [mg/L]
Tetrachloroethene (PCE)	NC	NC	NC	NC	NC	NC	NC	NC
Trichloroethene (TCE)	NC	NC	NC	NC	NC	NC	NC	NC

Soil concentrations are presented on a dry weight basis.

For exclusive use by Melissa Montgomery of Thompson Engineering, Inc.

SITE:

**SOIL & GROUNDWATER PROTECTIVE OF INDOOR INHALATION FOR A TRESPASSER - WITHOUT BIODEGRADATION**

CHEMICALS OF CONCERN	DILUTION ATTENUATION FACTORS			ALLOWABLE CONCENTRATION AT			
	Unsaturated Zone [--]	Point of Compliance (Sentry Well) [--]	On/Off-site Building [--]	Soil Source [mg/kg]	Groundwater Source [mg/L]	Point of Compliance (Sentry Well) [mg/L]	On/Off-site Building [mg/L]
Tetrachloroethene (PCE)	NC	NC	NC	NC	NC	NC	NC
Trichloroethene (TCE)	NC	NC	NC	NC	NC	NC	NC

Soil concentrations are presented on a dry weight basis.

For exclusive use by Melissa Montgomery of Thompson Engineering, Inc.

SITE:

**SOIL & GROUNDWATER PROTECTIVE OF INDOOR INHALATION FOR A TRESPASSER - WITH BIODEGRADATION**

CHEMICALS OF CONCERN	HALF-LIFE [days]	DILUTION ATTENUATION FACTOR			ALLOWABLE CONCENTRATION AT			
		Unsaturated zone [--]	Point of Compliance (Sentry Well) [--]	On/Off-site Building [--]	Soil Source [mg/kg]	Groundwater Source [mg/L]	Point of Compliance (Sentry Well) [mg/L]	On/Off-site Building [mg/L]
Tetrachloroethene (PCE)	NC	NC	NC	NC	NC	NC	NC	NC
Trichloroethene (TCE)	NC	NC	NC	NC	NC	NC	NC	NC

Soil concentrations are presented on a dry weight basis.

For exclusive use by Melissa Montgomery of Thompson Engineering, Inc.

SITE:

**SOIL & GROUNDWATER PROTECTIVE OF INDOOR INHALATION FOR A TRESPASSER - WITHOUT BIODEGRADATION**

CHEMICALS OF CONCERN	DILUTION ATTENUATION FACTORS			CONCENTRATION AT			
	Unsaturated Zone	Point of Compliance (Sentry Well)	On/Off-site Building	Soil Source	Groundwater Source	Point of Compliance (Sentry Well)	On/Off-site Building
	[--]	[--]	[--]	[mg/kg]	[mg/L]	[mg/L]	[mg/L]
Tetrachloroethene (PCE)	NC	NC	NC	NC	NC	NC	NC
Trichloroethene (TCE)	NC	NC	NC	NC	NC	NC	NC

Soil concentrations are presented on a dry weight basis.

For exclusive use by Melissa Montgomery of Thompson Engineering, Inc.

SITE:

**SOIL & GROUNDWATER PROTECTIVE OF INDOOR INHALATION FOR A TRESPASSER - WITH  
BIODEGRADATION**

CHEMICALS OF CONCERN	HALF-LIFE [days]	DILUTION ATTENUATION FACTOR			CONCENTRATION AT			
		Unsaturated zone [--]	Point of Compliance (Sentry Well) [--]	On/Off-site Building [--]	Soil Source [mg/kg]	Groundwater Source [mg/L]	Point of Compliance (Sentry Well) [mg/L]	On/Off-site Building [mg/L]
Tetrachloroethene (PCE)	NC	NC	NC	NC	NC	NC	NC	NC
Trichloroethene (TCE)	NC	NC	NC	NC	NC	NC	NC	NC

Soil concentrations are presented on a dry weight basis.

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