

US EPA ARCHIVE DOCUMENT

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

INCREMENTAL RISK CALCULATIONS:

	Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
71556 1,1,1-Trichloroethane	NA	NA	NA	1.33E+06	NA	NA	NA
78131 Trichloro-1,2,2-trifluoroethane, 1,1,2-	NA	NA	NA	1.70E+05	NA	NA	NA
79005 1,1,2-Trichloroethane	NA	NA	NA	4.42E+08	NA	NA	NA
75343 1,1-Dichloroethane	NA	NA	NA	5.06E+06	NA	NA	NA
75354 1,1-Dichloroethylene	NA	NA	NA	2.25E+06	NA	NA	6.0E-09
120821 1,2,4-Trichlorobenzene	NA	NA	NA	3.00E+05	NA	NA	NA
95501 1,2-Dichlorobenzene	NA	NA	NA	2.77E+07	NA	NA	NA
541731 Dichlorobenzene, 1,3-	NA	NA	NA	8.88E+04	NA	NA	NA
106467 1,4-Dichlorobenzene	NA	NA	NA	7.38E+04	NA	NA	3.9E-10
78933 Butanone, 2- (MEK)	NA	NA	NA	2.23E+08	NA	NA	NA
67841 Acetone	NA	NA	NA	1.00E+09	NA	NA	NA
71432 Benzene	NA	NA	NA	1.75E+08	NA	4.2E-13	1.8E-08
74839 Bromomethane	NA	NA	NA	1.52E+07	NA	NA	NA
75150 Carbon Disulfide	NA	NA	NA	2.67E+06	NA	NA	NA
108907 Chlorobenzene	NA	NA	NA	4.72E+05	NA	NA	NA
75003 Ethyl Chloride	NA	NA	NA	5.32E+06	NA	NA	NA
67863 Chloroform	NA	NA	NA	7.92E+06	NA	NA	NA
156582 cis-1,2-Dichloroethylene	NA	NA	NA	3.50E+06	NA	NA	5.2E-08
110827 Cyclohexane	NA	NA	NA	5.50E+04	NA	NA	NA
100414 Ethylbenzene	NA	NA	NA	1.69E+05	NA	NA	NA
98828 Isopropylbenzene	NA	NA	NA	5.60E+04	NA	NA	NA
108872 Methyl cyclohexane	NA	NA	NA	1.40E+04	NA	NA	NA
1634044 Methyl-Tertiary-Butyl Ether	NA	NA	NA	5.10E+07	NA	NA	5.8E-10
75092 Methylene chloride	NA	NA	NA	1.30E+07	NA	NA	NA
127184 Tetrachloroethylene	NA	NA	NA	2.00E+05	NA	1.4E-12	NA
108883 Toluene	NA	NA	NA	5.26E+05	NA	NA	NA
156605 trans-1,2-Dichloroethylene	NA	NA	NA	8.30E+06	NA	NA	NA
79016 Trichloroethylene	NA	NA	NA	1.10E+06	NA	3.0E-10	6.8E-07
75014 Vinyl chloride	NA	NA	NA	2.76E+06	NA	2.8E-12	2.9E-08
1330207 Xylenes	NA	NA	NA	2.20E+05	NA	NA	NA
98862 Acetophenone	NA	NA	NA	6.13E+06	NA	NA	NA
91203 Naphthalene	NA	NA	NA	3.10E+04	NA	NA	5.0E-08
91576 Methyl-naphthalene, 2-	NA	NA	NA	2.46E+04	NA	NA	NA
92524 Biphenyl, 1,1'-	NA	NA	NA	8.94E+03	NA	NA	NA
208968 Acenaphthylene	NA	NA	NA	3.93E+03	NA	NA	NA
83329 Acenaphthene	NA	NA	NA	4.24E+03	NA	NA	NA
86737 Fluorene	NA	NA	NA	1.90E+03	NA	NA	NA
85018 Phenanthrene	NA	NA	NA	1.28E+03	NA	NA	5.8E-08
120127 Anthracene	NA	NA	NA	4.34E+01	NA	NA	NA
C9-C18 C9-C18 Aliphatics	NA	NA	NA	1.00E+04	NA	NA	NA
C11-C22 C11-C22 Aromatics	NA	NA	NA	5.80E+06	NA	NA	NA
C5-C8 C5-C8 Aliphatics	NA	NA	NA	1.10E+07	NA	NA	NA
C9-C10 C9-C10 Aromatics	NA	NA	NA	5.10E+07	NA	NA	NA
C9-C12 C9-C12 Aliphatics	NA	NA	NA	7.00E+04	NA	NA	NA

	95% UCL Cancer Risk	95% UCL HI
TOTAL:	3E-10	9E-07

☐ = Cancer risk > 1E-05
 or HQ/HI > 1E+00

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
 (enter "X" in "YES" box and initial groundwater conc. below)

YES

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER 95% UCL groundwater conc., C _w (µg/L)	ENTER Depth below grade to bottom of enclosed space floor, L _r (15 or 200 cm)	ENTER Depth below grade to water table, LWT (cm)	ENTER SCS soil type directly above water table	ENTER Average soil groundwater temperature, T _g (°C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k _v (cm ²)	ENTER Vadose zone soil dry bulk density, ρ _b ^v (g/cm ³)	ENTER Vadose zone soil total porosity, n ^v (unitless)	ENTER Vadose zone soil water-filled porosity, θ _w ^v (cm ³ /cm ³)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT _c (yrs)	ENTER Averaging time for noncarcinogens, AT _{nc} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Exposure time ET (hrs/day)	ENTER Conversion factor CF
76364	1,1-Dichloroethylene	1.89E-01	15	22.6	LS	10	LS	1	1.5	0.43	0.3	1.0E-06	1	70	25	25	250	8	8760
102437	1,4-Dichlorobenzene	4.81E-01	15	22.6	LS	10	LS	1	1.5	0.43	0.3	1.0E-06	1	70	25	25	250	8	8760
71432	Benzene	2.67E-01	15	22.6	LS	10	LS	1	1.5	0.43	0.3	1.0E-06	1	70	25	25	250	8	8760
67663	Chloroform	1.9	15	22.6	LS	10	LS	1	1.5	0.43	0.3	1.0E-06	1	70	25	25	250	8	8760
156302	cis-1,2-Dichloroethylene	2.58E+01	15	22.6	LS	10	LS	1	1.5	0.43	0.3	1.0E-06	1	70	25	25	250	8	8760
1634044	Methyl-Tert-butyl Ether	1.28E+01	15	22.6	LS	10	LS	1	1.5	0.43	0.3	1.0E-06	1	70	25	25	250	8	8760
127164	Tetrahydrofuran	4.18E+01	15	22.6	LS	10	LS	1	1.5	0.43	0.3	1.0E-06	1	70	25	25	250	8	8760
78018	Trichloroethylene	2.59E+01	15	22.6	LS	10	LS	1	1.5	0.43	0.3	1.0E-06	1	70	25	25	250	8	8760
78014	Trichloroethylene	2.59E+01	15	22.6	LS	10	LS	1	1.5	0.43	0.3	1.0E-06	1	70	25	25	250	8	8760
81203	Vinyl chloride	2.32E-01	15	22.6	LS	10	LS	1	1.5	0.43	0.3	1.0E-06	1	70	25	25	250	8	8760
83269	Naphthalene	2.71E+00	15	22.6	LS	10	LS	1	1.5	0.43	0.3	1.0E-06	1	70	25	25	250	8	8760
85018	Phenanthrene	2.19E+00	15	22.6	LS	10	LS	1	1.5	0.43	0.3	1.0E-06	1	70	25	25	250	8	8760

Note:
 1) Default soil parameters from Table 7 of User's Guide for Evaluating Subsurface Vapor Intrusion into Building (U.S. EPA June 16, 2003) were used for soil water-filled porosity (θ_w^v), soil organic carbon fraction (f_{oc}), soil total porosity (n), and soil dry bulk density (ρ_b^v).

Appendix C.4
 Johnson & Ettinger Model - Chemical Properties Screen
 Inhalation of Volatiles from Groundwater
 Current Commercial Scenario - RME
 Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
 Aberjona Auto Parts

Chemical
 CAS No. Chemical

75354 1,1-Dichloroethylene
 106467 1,4-Dichlorobenzene
 71432 Benzene
 67863 Chloroform
 156592 cis-1,2-Dichloroethylene
 1634044 Methyl-Tertiary-Butyl Ether
 127184 Tetrachloroethylene
 79016 Trichloroethylene
 75014 Vinyl chloride
 91203 Naphthalene
 83329 Acenaphthene
 85018 Phenanthrene

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($\text{atm}\cdot\text{m}^3/\text{mol}$)	Henry's law constant reference temperature, T_R ($^{\circ}\text{C}$)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B ($^{\circ}\text{K}$)	Critical temperature, T_C ($^{\circ}\text{K}$)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu\text{g}/\text{m}^3$) ⁻¹	Reference conc., RfC (mg/m^3)
9.00E-02	1.04E-05	2.61E-02	25	6,247	304.75	576.05	5.89E+01	2.25E+03	N/A	2.0E-01
6.90E-02	7.90E-06	2.43E-03	25	9,271	447.21	684.75	6.17E+02	7.38E+01	N/A	8.0E-01
8.80E-02	9.80E-06	5.56E-03	25	7,342	353.24	562.16	5.89E+01	1.75E+03	7.8E-06	3.0E-02
1.04E-01	1.00E-05	3.66E-03	25	6,988	334.32	536.40	3.98E+01	7.92E+03	2.3E-05	5.0E-02
7.36E-02	1.13E-05	4.07E-03	25	7,192	333.65	544.00	3.55E+01	3.50E+03	N/A	2.0E-01
1.02E-01	1.05E-05	5.87E-04	25	1,324	328.36	497.11	3.84E+01	5.10E+04	N/A	3.0E+00
7.20E-02	8.20E-06	1.84E-02	25	8,288	394.40	620.20	1.55E+02	2.00E+02	5.9E-06	N/A
7.90E-02	9.10E-06	1.03E-02	25	7,505	360.36	544.20	1.66E+02	1.10E+03	1.1E-04	4.0E-02
1.06E-01	1.23E-05	2.71E-02	25	5,250	259.25	432.00	1.86E+01	2.76E+03	8.8E-06	1.0E-01
5.90E-02	7.50E-06	4.83E-04	25	10,373	491.14	748.40	2.00E+03	3.10E+01	N/A	3.0E-03
4.21E-02	7.69E-06	1.55E-04	25	12,155	550.54	803.15	7.08E+03	4.24E+00	N/A	3.0E-03
3.30E-02	7.47E-06	1.30E-04	25	1,057	613.00	869.01	1.41E+04	1.28E+00	N/A	3.0E-03

Appendix C.4
 Johnson & Ettinger Model - Calculations Screen
 Inhalation of Volatiles from Groundwater
 Current Commercial Scenario - RME
 Southwest Properties, Walla Walla Superfund Site, Operable Unit 2
 Aberdeen Auto Parts

	Source building elevation, L_f (cm)	Vadose zone soil air-filled porosity, θ_{air}^v (cm ³ /cm ³)	Vadose zone effective total fluid saturation, S_w (cm ³ /cm ³)	Vadose zone soil intrinsic permeability, k_i (cm ²)	Vadose zone soil relative air permeability, k_{ra} (cm ²)	Vadose zone soil effective vapor permeability, k_v (cm ²)	Thickness of capillary zone, L_c (cm)	Total porosity in capillary zone, n_w (cm ³ /cm ³)	Air-filled porosity in capillary zone, θ_{air}^c (cm ³ /cm ³)	Water-filled porosity in capillary zone, θ_{water}^c (cm ³ /cm ³)	Floor-wall seam perimeter, X_{seam} (cm)	Blow-off ventilation rate, $Q_{blow-off}$ (cm ³ /s)	Area of unclosed space below grade, A_g (cm ²)	Crack-to-block area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, ΔH_{19} (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{19} (atm·m ³ /mol)	Henry's law constant at vs. ground/water temperature, H_{25} (unitless)	
75354	1,1-Dichloroethylene	67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.00E+06	3.77E-04	15	6.382	1.47E-02	6.94E-01
106487	1,4-Dichlorobenzene	67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.00E+06	3.77E-04	15	11.243	8.69E-04	3.83E-02
71432	Benzene	67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.00E+06	3.77E-04	15	8.123	2.69E-03	1.16E-01
67983	Chloroform	67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.00E+06	3.77E-04	15	7.584	1.96E-03	8.02E-02
158582	cis-1,2-Dichloroethylene	67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.00E+06	3.77E-04	15	7.734	2.04E-03	8.77E-02
1634044	Methyl-Tertiary-Butyl Ether	67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.00E+06	3.77E-04	15	1.447	5.16E-04	2.32E-02
127184	Tetrachloroethylene	67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.00E+06	3.77E-04	15	9.553	7.83E-03	3.37E-01
79018	Trichloroethylene	67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.00E+06	3.77E-04	15	8.557	4.78E-03	2.06E-01
75014	Vinyl chloride	67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.00E+06	3.77E-04	15	5.000	1.73E-02	7.46E-01
91203	Naphthalene	67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.00E+06	3.77E-04	15	12.813	1.52E-04	6.55E-03
83029	Arenaphthene	67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.00E+06	3.77E-04	15	18.123	3.67E-05	1.58E-03
85018	Phenanthrene	67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.00E+06	3.77E-04	15	1.475	1.14E-04	4.90E-03

Appendix C.4
 Johnson & Ettinger Model - Calculations Screen
 Inhalation of Volatiles from Groundwater
 Current Commercial Scenario - RME
 Southwest Properties, Well G&H Superfund Site, Oper.
 Alberta Auto Parts

		Vapor viscosity at ave. soil temperature, μ_{va} (g/cm-s)	Vadose zone effective diffusion coefficient, D_{va}^* (cm ² /s)	Capillary zone effective diffusion coefficient, D_{va}^{**} (cm ² /s)	Total overall effective diffusion coefficient, D_{va}^{***} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_c (cm)	Source vapor conc., $C_{v,source}$ (µg/m ³)	Crack radius, r_{crack} (cm)	Average vapor flow rate into blkq., Q_{crack} (cm ³ /s)	Crack effective diffusion coefficient, D_{crack}^* (cm ² /s)	Area of crack, A_{crack} (cm ²)	Exponent of equivalent fracture number, n_{eq} (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source blkq. conc., $C_{v,blkq}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RRC (µg/m ³)
75354	1,1-Dichloroethylene	1.75E-04	5.47E-04	5.12E-04	5.37E-04	67.6	15	1.07E+02	0.08	6.30E+00	5.47E-04	3.77E+02	7.77E+198	1.38E-04	1.48E-02	N/A	2.0E-01
106487	1,4-Dichlorobenzene	1.75E-04	4.39E-04	4.12E-04	4.31E-04	67.6	15	1.85E+01	0.08	6.30E+00	4.39E-04	3.77E+02	1.46E+248	1.25E-04	2.31E-03	N/A	8.0E-01
71432	Benzene	1.75E-04	5.42E-04	5.07E-04	5.32E-04	67.6	15	3.28E+01	0.09	6.30E+00	5.42E-04	3.77E+02	7.60E+200	1.38E-04	4.49E-03	7.8E-06	3.0E-02
67563	Chloroform	1.75E-04	6.43E-04	6.02E-04	6.31E-04	67.6	15	N/A	0.09	6.30E+00	6.43E-04	3.77E+02	2.16E+169	1.48E-04	N/A	2.3E-05	5.0E-02
156592	cis-1,2-Dichloroethylene	1.75E-04	4.59E-04	4.30E-04	4.50E-04	67.6	15	2.28E+03	0.09	6.30E+00	4.59E-04	3.77E+02	1.59E+237	1.27E-04	2.89E-01	N/A	2.0E-01
1634044	Methyl-Tertiary-Butyl Ether	1.75E-04	6.67E-04	6.28E-04	6.56E-04	67.6	15	2.77E+02	0.09	6.30E+00	6.67E-04	3.77E+02	1.31E+163	1.50E-04	4.17E-02	N/A	3.0E+00
127184	Tetrachloroethylene	1.75E-04	4.39E-04	4.11E-04	4.31E-04	67.6	15	1.41E+02	0.09	6.30E+00	4.39E-04	3.77E+02	9.78E+247	1.25E-04	1.76E-02	5.9E-06	N/A
79016	Trichloroethylene	1.75E-04	4.83E-04	4.52E-04	4.74E-04	67.6	15	5.19E+03	0.09	6.30E+00	4.83E-04	3.77E+02	1.94E+225	1.31E-04	6.74E-01	1.1E-04	4.0E-02
75014	Vinyl chloride	1.75E-04	6.44E-04	6.03E-04	6.32E-04	67.6	15	1.73E+02	0.09	6.30E+00	6.44E-04	3.77E+02	8.74E+188	1.48E-04	2.37E-02	6.8E-06	1.0E-01
91203	Naphthalene	1.75E-04	4.70E-04	4.50E-04	4.64E-04	67.6	15	1.77E+01	0.09	6.30E+00	4.70E-04	3.77E+02	3.45E+231	1.28E-04	2.29E-03	N/A	3.0E-03
63329	Acenaphthene	1.75E-04	7.33E-04	7.31E-04	7.33E-04	67.6	15	N/A	0.09	6.30E+00	7.33E-04	3.77E+02	2.23E+148	1.57E-04	N/A	N/A	3.0E-03
65018	Phenanthrene	1.75E-04	3.50E-04	3.41E-04	3.47E-04	67.6	15	1.03E+01	0.09	6.30E+00	3.50E-04	3.77E+02	#NUM!	1.11E-04	1.15E-03	N/A	3.0E-03

Appendix C.4
 Johnson & Ettinger Model - Results
 Inhalation of Volatiles from Groundwater
 Current Commercial Scenario - RME
 Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
 Aberjona Auto Parts

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

75354 1,1-Dichloroethylene
 106467 1,4-Dichlorobenzene
 71432 Benzene
 67663 Chloroform
 156592 cis-1,2-Dichloroethylene
 1634044 Methyl-Tertiary-Butyl Ether
 127184 Tetrachloroethylene
 79018 Trichloroethylene
 75014 Vinyl chloride
 91203 Naphthalene
 83329 Acenaphthene
 85018 Phenanthrene

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	2.25E+06	NA
NA	NA	NA	7.38E+04	NA
NA	NA	NA	1.75E+06	NA
NA	NA	NA	7.92E+06	NA
NA	NA	NA	3.50E+06	NA
NA	NA	NA	5.10E+07	NA
NA	NA	NA	2.00E+05	NA
NA	NA	NA	1.10E+06	NA
NA	NA	NA	2.76E+06	NA
NA	NA	NA	3.10E+04	NA
NA	NA	NA	4.24E+03	NA
NA	NA	NA	1.28E+03	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	1.7E-05
NA	6.6E-07
2.9E-09	3.4E-05
NA	NA
NA	3.3E-04
NA	3.2E-06
8.4E-09	NA
6.0E-06	3.8E-03
1.8E-08	5.9E-05
NA	1.7E-04
NA	NA
NA	8.7E-05

	95% UCL Cancer Risk	95% UCL HI
TOTAL:	6E-06	5E-03

= Cancer risk > 1E-05 or HQ/HI > 1E+00

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES

ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER
Chemical CAS No. (numbers only, no dashes)	85% UCL groundwater conc., C _w (µg/L)	Depth below grade to bottom of enclosed space floor, L _g (ft or 202 cm)	Depth below grade to water table, LHIT (cm)	SCS soil type directly above water table	Average soil groundwater temperature, T _g (°C)	Vadose zone SCS soil type (used to estimate soil vapor permeability)	User-defined vadose zone soil vapor permeability, k _v (cm ²)	Vadose zone soil dry bulk density, ρ _b ¹ (g/cm ³)	Vadose zone soil total porosity, n ¹ (unitless)	Vadose zone soil water-filled porosity, α _w ¹ (cm ³ /cm ³)	Target risk for carcinogens, TR (unitless)	Target hazard quotient for noncarcinogens, THQ (unitless)	Averaging time for carcinogens, AT _c (yrs)	Averaging time for noncarcinogens, AT _{nc} (yrs)	Exposure duration, ED (yrs)	Exposure frequency, EF (days/yr)	Exposure time, ET (hr/day)	Conversion factor, CF (hr·yr) ⁻¹		
75364	1,1-Dichloroethylene	7.85E-02	15	LS	10	L9	1	1.5	0.43	0.3	1.0E-06	1	70	9	9	219	8	8760		
106467	1,4-Dichlorobenzene	4.00E-02	15	LS	10	L5	1	1.5	0.43	0.3	1.0E-06	1	70	9	9	219	8	8760		
71432	Benzene	4.00E-02	15	LS	10	L9	1	1.5	0.43	0.3	1.0E-06	1	70	9	9	219	8	8760		
87663	Chloroform		15	LS	10	L8	1	1.5	0.43	0.3	1.0E-06	1	70	9	9	219	8	8760		
166562	cis-1,2-Dichloroethylene	5.00E-01	15	LS	10	L9	1	1.5	0.43	0.3	1.0E-06	1	70	9	9	219	8	8760		
163444	Methyl Tertiary Butyl Ether	5.00E-00	15	LS	10	L5	1	1.5	0.43	0.3	1.0E-06	1	70	9	9	219	8	8760		
127104	Tetrachloroethylene	4.19E-01	15	LS	10	L5	1	1.5	0.43	0.3	1.0E-06	1	70	9	9	219	8	8760		
78014	Trichloroethylene	5.00E-01	15	LS	10	L5	1	1.5	0.43	0.3	1.0E-06	1	70	9	9	219	8	8760		
91263	Vinyl chloride	4.00E-02	15	LS	10	L9	1	1.5	0.43	0.3	1.0E-06	1	70	9	9	219	8	8760		
83328	Naphthalene	1.32E+00	15	LS	10	L5	1	1.5	0.43	0.3	1.0E-06	1	70	9	9	219	8	8760		
85518	Phenanthrene	2.19E+00	15	LS	10	L9	1	1.5	0.43	0.3	1.0E-06	1	70	9	9	219	8	8760		

Note: 1) Default soil parameters from table 7 of User's Guide for Evaluating Subsurface Vapor Intrusion into Building (U.S. EPA June 18, 2003) were used for soil water filled porosity (α_w), soil organic carbon fraction (f_{oc}), soil total porosity (n), and soil dry bulk density (ρ_b).

Appendix C.4
 Johnson & Eitinger Model - Chemical Properties Screen
 Inhalation of Volatiles from Groundwater
 Current Commercial Scenario - CT
 Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
 Aberjona Auto Parts

Chemical CAS No.	Chemical	Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($\text{atm}\cdot\text{m}^3/\text{mol}$)	Henry's law constant reference temperature, T_R ($^{\circ}\text{C}$)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B ($^{\circ}\text{K}$)	Critical temperature, T_C ($^{\circ}\text{K}$)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu\text{g}/\text{m}^3$) ⁻¹	Reference conc., RfC (mg/m^3)
75354	1,1-Dichloroethylene	9.00E-02	1.04E-05	2.61E-02	25	6,247	304.75	576.05	5.89E+01	2.25E+03	N/A	2.0E-01
106467	1,4-Dichlorobenzene	6.90E-02	7.90E-06	2.43E-03	25	9,271	447.21	884.75	6.17E+02	7.38E+01	N/A	8.0E-01
71432	Benzene	8.80E-02	9.80E-08	5.56E-03	25	7,342	353.24	562.16	5.89E+01	1.75E+03	7.8E-08	3.0E-02
67663	Chloroform	1.04E-01	1.00E-05	3.66E-03	25	6,988	334.32	536.40	3.98E+01	7.92E+03	2.3E-05	5.0E-02
156592	cis-1,2-Dichloroethylene	7.36E-02	1.13E-05	4.07E-03	25	7,192	333.65	544.00	3.55E+01	3.50E+03	N/A	2.0E-01
1634044	Methyl-Tertiary-Butyl Ether	1.02E-01	1.05E-05	5.87E-04	25	1,324	328.36	497.11	3.84E+01	5.10E+04	N/A	3.0E+00
127184	Tetrachloroethylene	7.20E-02	8.20E-06	1.84E-02	25	8,288	394.40	620.20	1.55E+02	2.00E+02	5.9E-06	N/A
79016	Trichloroethylene	7.90E-02	9.10E-06	1.03E-02	25	7,505	360.36	544.20	1.66E+02	1.10E+03	1.1E-04	4.0E-02
75014	Vinyl chloride	1.06E-01	1.23E-05	2.71E-02	25	5,250	259.25	432.00	1.86E+01	2.76E+03	8.8E-06	1.0E-01
91203	Naphthalene	5.90E-02	7.50E-06	4.83E-04	25	10,373	491.14	748.40	2.00E+03	3.10E+01	N/A	3.0E-03
83329	Acenaphthene	4.21E-02	7.69E-06	1.55E-04	25	12,155	550.54	803.15	7.08E+03	4.24E+00	N/A	3.0E-03
85018	Phenanthrene	3.30E-02	7.47E-06	1.30E-04	25	1,057	613.00	869.01	1.41E+04	1.28E+00	N/A	3.0E-03

C.4

Ettinger Model - Calculations Screen
of Volatiles from Groundwater
Commercial Scenario - CT
Site Properties, Wells G&H Superfund Site, Ops
Auto Parts

	Vapor viscosity at ave. soil temperature, μ rs (g/cm-s)	Vadose zone effective diffusion coefficient, D_{v}^{eff} (cm ² /s)	Capillary zone effective diffusion coefficient, D_{cz}^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_{T}^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)	Source vapor conc., C_{source} (μ g/m ³)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm ³ /s)	Crack effective diffusion coefficient, D_{crack} (cm ² /s)	Area of crack, A_{crack} (cm ²)	Exponent of equivalent foundation Peclet number, $exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (μ g/m ³)
propylene	1.75E-04	5.47E-04	5.12E-04	5.37E-04	67.6	15	4.98E+01	0.10	6.36E+00	5.47E-04	4.00E+02	3.54E+189	1.43E-04	7.10E-03
robenzene	1.75E-04	4.38E-04	4.12E-04	4.31E-04	67.6	15	1.53E+00	0.10	6.36E+00	4.38E-04	4.00E+02	3.22E+236	1.29E-04	1.97E-04
n	1.75E-04	5.42E-04	5.07E-04	5.32E-04	67.6	15	4.63E+00	0.10	6.36E+00	5.42E-04	4.00E+02	2.79E+191	1.42E-04	6.58E-04
chloroethylene	1.75E-04	6.43E-04	6.02E-04	6.31E-04	67.6	15	N/A	0.10	6.36E+00	6.43E-04	4.00E+02	2.41E+161	1.52E-04	N/A
rtiary-Butyl Ether	1.75E-04	4.59E-04	4.30E-04	4.50E-04	67.6	15	4.39E+01	0.10	6.36E+00	4.59E-04	4.00E+02	1.15E+226	1.32E-04	5.78E-03
oethylene	1.75E-04	6.67E-04	6.28E-04	6.56E-04	67.6	15	1.11E+02	0.10	6.36E+00	6.67E-04	4.00E+02	2.87E+155	1.55E-04	1.72E-02
thylene	1.75E-04	4.39E-04	4.11E-04	4.31E-04	67.6	15	1.41E+02	0.10	6.36E+00	4.39E-04	4.00E+02	2.20E+236	1.29E-04	1.82E-02
ride	1.75E-04	4.83E-04	4.52E-04	4.74E-04	67.6	15	1.03E+02	0.10	6.36E+00	4.83E-04	4.00E+02	4.34E+214	1.35E-04	1.39E-02
ine	1.75E-04	6.44E-04	6.02E-04	6.32E-04	67.6	15	2.98E+01	0.10	6.36E+00	6.44E-04	4.00E+02	1.02E+161	1.53E-04	4.55E-03
ene	1.75E-04	4.70E-04	4.50E-04	4.64E-04	67.6	15	8.64E+00	0.10	6.36E+00	4.70E-04	4.00E+02	4.60E+220	1.34E-04	1.15E-03
ene	1.75E-04	7.33E-04	7.31E-04	7.33E-04	67.6	15	N/A	0.10	6.36E+00	7.33E-04	4.00E+02	2.40E+141	1.61E-04	N/A
ene	1.75E-04	3.50E-04	3.41E-04	3.47E-04	67.6	15	1.03E+01	0.10	6.36E+00	3.50E-04	4.00E+02	4.27E+296	1.15E-04	1.19E-03

Appendix C.4
 Johnson & Ettinger Model - Results
 Inhalation of Volatiles from Groundwater
 Current Commercial Scenario - CT
 Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
 Aberjona Auto Parts

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

INCREMENTAL RISK CALCULATIONS:

75354 1,1-Dichloroethylene
 106467 1,4-Dichlorobenzene
 71432 Benzene
 87663 Chloroform
 156592 cis-1,2-Dichloroethylene
 1634044 Methyl-Tertiary-Butyl Ether
 127184 Tetrachloroethylene
 79018 Trichloroethylene
 75014 Vinyl chloride
 91203 Naphthalene
 83329 Acenaphthene
 85018 Phenanthrene

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	2.25E+06	NA
NA	NA	NA	7.38E+04	NA
NA	NA	NA	1.75E+06	NA
NA	NA	NA	7.92E+06	NA
NA	NA	NA	3.50E+06	NA
NA	NA	NA	5.10E+07	NA
NA	NA	NA	2.00E+05	NA
NA	NA	NA	1.10E+06	NA
NA	NA	NA	2.76E+06	NA
NA	NA	NA	3.10E+04	NA
NA	NA	NA	4.24E+03	NA
NA	NA	NA	1.28E+03	NA

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	7.1E-06
NA	4.9E-08
1.3E-10	4.4E-06
NA	NA
NA	5.8E-06
NA	1.1E-06
2.8E-09	NA
3.9E-08	7.0E-05
1.0E-09	9.1E-06
NA	7.7E-05
NA	NA
NA	7.9E-05

95% UCL	
Cancer Risk	95% UCL HI
TOTAL: 4E-08	3E-04

= Cancer risk > 1E-05
 or HQ/HI > 1E+00

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
 (enter "X" in "YES" box and initial groundwater conc. below)

YES

ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER
Chemical CAS No. (numbers only, no dashes)	95% UCL groundwater conc., C _w (µg/L)	Depth below grade to bottom of enclosed space floor, L (15 or 200 cm)	Depth below grade to water table, LWT (cm)	SCS soil type directly above water table	Average soil groundwater temperature, T _s (°C)	Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	User-defined vadose zone soil vapor permeability, k _v (cm ²)	Vadose zone soil dry bulk density, ρ _b (g/cm ³)	Vadose zone soil total porosity, n ^t (unitless)	Vadose zone soil water-filled porosity, θ _v (cm ³ /cm ³)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT _c (yr)	ENTER Averaging time for noncarcinogens, AT _{nc} (yr)	ENTER Exposure duration, ED (yr)	ENTER Exposure frequency, EF (days/yr)	ENTER Exposure time ET (hr/day)	ENTER Conversion factor CF (hr ² /yr)	
76364	1,1-Dichloroethylene	1.94E-01	52.12	82.6	LS	10	LS	1	1.6	0.43	0.3	1.0E-06	1	70	6	6	350	16	8760	
106447	1,4-Dichlorobenzene	4.84E-01	52.12	82.6	LS	10	LS	1	1.6	0.43	0.3	1.0E-06	1	70	6	6	350	16	8760	
71432	Benzene	1.00E-01	52.12	82.6	LS	10	LS	1	1.6	0.43	0.3	1.0E-06	1	70	6	6	350	16	8760	
67693	Chloroform		52.12	82.6	LS	10	LS	1	1.5	0.43	0.3	1.0E-06	1	70	6	6	350	16	8760	
155562	cis-1,2-Dichloroethylene	8.00E+00	52.12	82.6	LS	10	LS	1	1.5	0.43	0.3	1.0E-06	1	70	6	6	350	16	8760	
127184	Tetrachloroethylene	4.18E-01	52.12	82.6	LS	10	LS	1	1.5	0.43	0.3	1.0E-06	1	70	6	6	350	16	8760	
79010	Trichloroethylene	2.50E+01	52.12	82.6	LS	10	LS	1	1.5	0.43	0.3	1.0E-06	1	70	6	6	350	16	8760	
79014	Vinyl Chloride	2.45E-01	52.12	82.6	LS	10	LS	1	1.5	0.43	0.3	1.0E-06	1	70	6	6	350	16	8760	
91323	Trichloroethene	2.70E+00	52.12	82.6	LS	10	LS	1	1.5	0.43	0.3	1.0E-06	1	70	6	6	350	16	8760	
85018	Phenanthrene	2.10E+00	52.12	82.6	LS	10	LS	1	1.8	0.43	0.3	1.0E-06	1	70	6	6	350	16	8760	

Note:
 1) Default soil parameters from table 7 of User's Guide for Evaluating Subsurface Vapor Intrusion into Building (U.S. EPA June 10, 2003) were used for soil water filled porosity (θ_v), soil organic carbon fraction (f_{oc}), soil total porosity (n), and soil dry bulk density (ρ_b).

Appendix C.4
 Johnson & Ettinger Model - Chemical Properties Screen
 Inhalation of Volatiles from Groundwater
 Current Child Residential Scenario - RME
 Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
 Aberjona Auto Parts

Chemical CAS No.	Chemical	Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($\text{atm}\cdot\text{m}^3/\text{mol}$)	Henry's law constant reference temperature, T_R ($^{\circ}\text{C}$)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B ($^{\circ}\text{K}$)	Critical temperature, T_C ($^{\circ}\text{K}$)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu\text{g}/\text{m}^3\cdot\text{y}^{-1}$)	Reference conc., R/C (mg/m^3)
75354	1,1-Dichloroethylene	9.00E-02	1.04E-05	2.61E-02	25	6,247	304.75	576.05	5.89E+01	2.25E+03	N/A	2.0E-01
106467	1,4-Dichlorobenzene	6.90E-02	7.90E-06	2.43E-03	25	9,271	447.21	684.75	6.17E+02	7.38E+01	N/A	8.0E-01
71432	Benzene	8.80E-02	9.80E-06	5.56E-03	25	7,342	353.24	562.16	5.89E+01	1.75E+03	7.8E-06	3.0E-02
67663	Chloroform	1.04E-01	1.00E-05	3.66E-03	25	6,968	334.32	536.40	3.98E+01	7.92E+03	2.3E-05	5.0E-02
156592	cis-1,2-Dichloroethylene	7.36E-02	1.13E-05	4.07E-03	25	7,192	333.65	544.00	3.55E+01	3.50E+03	N/A	2.0E-01
127184	Tetrachloroethylene	7.20E-02	8.20E-06	1.84E-02	25	8,288	394.40	620.20	1.55E+02	2.00E+02	5.9E-06	N/A
79018	Trichloroethylene	7.90E-02	9.10E-06	1.03E-02	25	7,505	380.36	544.20	1.68E+02	1.10E+03	1.1E-04	4.0E-02
75014	Vinyl chloride	1.06E-01	1.23E-05	2.71E-02	25	5,250	259.25	432.00	1.86E+01	2.76E+03	8.8E-06	1.0E-01
91209	Naphthalene	5.90E-02	7.50E-08	4.83E-04	25	10,373	491.14	748.40	2.00E+03	3.10E+01	N/A	3.0E-03
85018	Phenanthrene	3.30E-02	7.47E-06	1.30E-04	25	1,057	613.00	869.01	1.41E+04	1.28E+00	N/A	3.0E-03

Appendix C-4
 Johnson & Ettinger Model - Calculations Screen
 Inhalation of Volatiles from Groundwater
 Current Child Residential Scenario - RME
 Southwest Properties, Wells G&H Superfund Site, Coarable Unit 2
 Abernethy Auto Parts

		Source- building separation, L_f (cm)	Vadose zone soil air-filled porosity, θ_a^* (cm ³ /cm ³)	Vadose zone total fluid saturation, S_w (cm ³ /cm ³)	Vadose zone soil intrinsic permeability, k_i (cm ²)	Vadose zone soil relative air permeability, k_{ra} (cm ²)	Vadose zone soil effective vapor permeability, k_e (cm ²)	Thickness of capillary zone, L_c (cm)	Total porosity in capillary zone, n_{ca} (cm ³ /cm ³)	Air-filled porosity in capillary zone, θ_{air} (cm ³ /cm ³)	Water-filled porosity in capillary zone, θ_{wca} (cm ³ /cm ³)	Floor- wall seam perimeter, X_{crack} (cm)	Blow- ventilation rate, Q_{ave} (cm ³ /s)	Area of enclosed space below grade, A_g (cm ²)	Crack- to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization of ave. groundwater temperature, ΔH_{17} (cal/mol)	Henry's law constant of ave. groundwater temperature, H_{17} (atm-m ³ /mol)	Henry's law constant of ve. groundwater temperature, H_{17a} (unitless)
75354	1,1-Dichloroethylene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	6.392	1.47E-02	6.34E-01
106467	1,4-Dichlorobenzene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	11.243	8.89E-04	3.83E-02
71432	Benzene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	6.122	2.69E-03	1.18E-01
67663	Chloroform	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	7.554	1.86E-03	8.92E-02
136592	cis-1,2-Dichloroethylene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	7.734	2.94E-03	8.77E-02
127154	Tetrachloroethylene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	9.553	7.83E-03	3.37E-01
75016	Trichloroethylene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	6.557	4.79E-03	2.06E-01
75014	Vinyl chloride	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	5.000	1.73E-02	7.46E-01
91203	Naphthalene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	12.913	1.52E-04	6.55E-03
55016	Phenanthrene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	1.479	1.14E-04	4.80E-03

Appendix C.4 Johnson & Ettinger Model - Calculations Screen Infiltration of Volatiles from Groundwater Current Child Residential Scenarios - RME Southwest Properties, Water G&H Superfund Site, Over Aberjona Auto Parts		Vapor viscosity at ave. soil temperature, μ_{air} (g/cm.s)	Vadose zone effective diffusion coefficient, D_{vz}^* (cm ² /s)	Capillary zone effective diffusion coefficient, D_{cz}^* (cm ² /s)	Total overall effective diffusion coefficient, D_{tr}^* (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_c (cm)	Source vapor conc., C_{source} (μ g/m ³)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{avg} (cm ³ /s)	Crack effective diffusion coefficient, D_{crack}^{eff} (cm ² /s)	Area of crack, A_{crack} (cm ²)	Exponent of equivalent Peclet number, $\exp(Pe)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., C_{bldg} (μ g/m ³)	Unit risk factor, URF (μ g/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
75354	1,1-Dichloroethene	1.75E-04	5.47E-04	5.12E-04	5.25E-04	30.48	52.12	1.23E+02	0.10	5.22E+00	5.47E-04	4.00E+02	3.87E+155	1.75E-04	2.16E-02	N/A	2.0E-01
726457	1,4-Dichlorobenzene	1.75E-04	4.39E-04	4.12E-04	4.22E-04	30.48	52.12	1.85E+01	0.10	5.22E+00	4.39E-04	4.00E+02	1.36E+194	1.75E-04	3.15E-03	N/A	8.0E-01
74432	Benzene	1.75E-04	5.42E-04	5.07E-04	5.20E-04	30.48	52.12	1.16E+01	0.10	5.22E+00	5.42E-04	4.00E+02	1.40E+157	1.75E-04	2.03E-03	7.8E-06	3.0E-02
67683	Chloroform	1.75E-04	6.43E-04	6.02E-04	6.17E-04	30.48	52.12	N/A	0.10	5.22E+00	6.43E-04	4.00E+02	2.93E+132	1.80E-04	N/A	2.3E-03	5.0E-02
156692	cis-1,2-Dichloroethene	1.75E-04	4.59E-04	4.30E-04	4.41E-04	30.48	52.12	7.02E+02	0.10	5.22E+00	4.59E-04	4.00E+02	3.82E+185	1.71E-04	1.20E-01	N/A	2.0E-01
127184	Tetrachloroethylene	1.75E-04	4.39E-04	4.11E-04	4.21E-04	30.48	52.12	1.41E+02	0.10	5.22E+00	4.39E-04	4.00E+02	9.83E+193	1.70E-04	2.39E-02	3.9E-06	N/A
79016	Trichloroethylene	1.75E-04	4.83E-04	4.52E-04	4.64E-04	30.48	52.12	5.18E+03	0.10	5.22E+00	4.83E-04	4.00E+02	1.52E+176	1.73E-04	8.90E-01	1.1E-04	4.0E-02
75014	Vinyl chloride	1.75E-04	6.44E-04	6.02E-04	6.18E-04	30.48	52.12	1.79E+02	0.10	5.22E+00	6.44E-04	4.00E+02	1.44E+132	1.80E-04	3.22E-02	8.8E-06	1.0E-01
91203	Naphthalene	1.75E-04	4.70E-04	4.50E-04	4.67E-04	30.48	52.12	1.77E+01	0.10	5.22E+00	4.70E-04	4.00E+02	1.34E+181	1.72E-04	3.05E-03	N/A	3.0E-03
85018	Phenanthrene	1.75E-04	3.50E-04	3.41E-04	3.44E-04	30.48	52.12	1.03E+01	0.10	5.22E+00	3.50E-04	4.00E+02	3.05E+243	1.64E-04	1.68E-03	N/A	3.0E-03

Appendix C.4
 Johnson & Ettinger Model - Results
 Inhalation of Volatiles from Groundwater
 Current Child Residential Scenario - RME
 Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
 Aberjona Auto Parts

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

INCREMENTAL RISK CALCULATIONS:

		Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
75354	1,1-Dichloroethylene	NA	NA	NA	2.25E+06	NA
106467	1,4-Dichlorobenzene	NA	NA	NA	7.38E+04	NA
71432	Benzene	NA	NA	NA	1.75E+06	NA
67663	Chloroform	NA	NA	NA	7.92E+06	NA
156592	cis-1,2-Dichloroethylene	NA	NA	NA	3.50E+06	NA
127184	Tetrachloroethylene	NA	NA	NA	2.00E+05	NA
79016	Trichloroethylene	NA	NA	NA	1.10E+06	NA
75014	Vinyl chloride	NA	NA	NA	2.76E+06	NA
91203	Naphthalene	NA	NA	NA	3.10E+04	NA
85018	Phenanthrene	NA	NA	NA	1.28E+03	NA

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	6.9E-05
NA	2.5E-06
8.7E-10	4.3E-05
NA	NA
NA	3.8E-04
7.7E-09	NA
5.4E-06	1.4E-02
1.6E-08	2.1E-04
NA	6.5E-04
NA	3.6E-04

	95% UCL Cancer Risk	95% UCL HI
TOTAL:	5E-06	2E-02

= Cancer risk > 1E-05 or HQ/HI > 1E+00

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
 (enter "X" in "YES" box and initial groundwater conc. below)

YES

ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER
Chemical CAS No. (numbers only, no dashes)	95% UCL groundwater conc., C _w (µg/L)	Depth below grade to bottom of enclosed space floor, L _b (15 or 200 cm)	Depth below grade to water table, LWT (cm)	SGS soil type directly above water table	Average soil/ groundwater temperature, T _s (°C)	Vadose zone SGS soil type (used to estimate soil vapor permeability)	OR	User-defined vadose zone soil vapor permeability, k _v (cm ²)	Vadose zone soil dry bulk density, ρ _b (g/cm ³)	Vadose zone soil total porosity, n ^t (unitless)	Vadose zone soil water-filled porosity, S _w ^v (cm ³ /cm ³)	Target risk for carcinogens, TR (unitless)	Target hazard quotient for noncarcinogens, THQ (unitless)	Average time for carcinogens, AT _c (yrs)	Average time for noncarcinogens, AT _{nc} (yrs)	Exposure duration, ED (yrs)	Exposure frequency, EF (days/yr)	Exposure time ET (hr/day)	Coverage factor CF (hr/yr)
76354	1,1-Dichloroethylene	1.17E-01	82.12	82.6	LS	10	LS	1	1.6	0.43	0.3	1.0E-06	1	70	2	2	350	16	8760
106467	1,4-Dichlorobenzene	6.30E-01	82.12	82.6	LS	10	LS	1	1.5	0.43	0.3	1.0E-06	1	70	2	2	350	16	8760
71432	Benzene	7.90E-02	82.12	82.6	LS	10	LS	1	1.5	0.43	0.3	1.0E-06	1	70	2	2	350	16	8760
67993	Chloroform	8.21E-02	82.12	82.6	LS	10	LS	1	1.5	0.43	0.3	1.0E-06	1	70	2	2	350	16	8760
186882	cis-1,2-Dichloroethylene	8.00E+00	82.12	82.6	LS	10	LS	1	1.5	0.43	0.3	1.0E-06	1	70	2	2	350	16	8760
127184	Tetrachloroethylene	4.18E-01	82.12	82.6	LS	10	LS	1	1.5	0.43	0.3	1.0E-06	1	70	2	2	350	16	8760
78014	Trichloroethylene	2.18E+01	82.12	82.6	LS	10	LS	1	1.5	0.43	0.3	1.0E-06	1	70	2	2	350	16	8760
78014	Vinyl chloride	1.07E-01	82.12	82.6	LS	10	LS	1	1.5	0.43	0.3	1.0E-06	1	70	2	2	350	16	8760
81203	Naphthalene	1.88E+00	82.12	82.6	LS	10	LS	1	1.5	0.43	0.3	1.0E-06	1	70	2	2	350	16	8760
85018	Phenanthrene	2.10E+00	82.12	82.6	LS	10	LS	1	1.5	0.43	0.3	1.0E-06	1	70	2	2	350	16	8760

Note:
 1) Default soil parameters from Table 7 of User's Guide for Evaluating Subsurface Vapor Intrusion into Building (U.S. EPA June 19, 2003) were used for soil water filled porosity (S_w^v), soil organic carbon fraction (f_{oc}), soil total porosity (n^t), and soil dry bulk density (ρ_b).

Appendix C.4
 Johnson & Ettinger Model - Chemical Properties Screen
 Inhalation of Volatiles from Groundwater
 Current Child Residential Scenario - CT
 Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
 Aberjona Auto Parts

Chemical CAS No.	Chemical	Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($\text{atm}\cdot\text{m}^3/\text{mol}$)	Henry's law constant reference temperature, T_R ($^\circ\text{C}$)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B ($^\circ\text{K}$)	Critical temperature, T_C ($^\circ\text{K}$)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu\text{g}/\text{m}^3$) $^{-1}$	Reference conc., RfC (mg/m^3)
75354	1,1-Dichloroethylene	9.00E-02	1.04E-05	2.61E-02	25	6,247	304.75	576.05	5.89E+01	2.25E+03	N/A	2.0E-01
106467	1,4-Dichlorobenzene	6.90E-02	7.90E-06	2.43E-03	25	9,271	447.21	684.75	6.17E+02	7.38E+01	N/A	8.0E-01
71432	Benzene	8.80E-02	9.80E-06	5.56E-03	25	7,342	353.24	562.16	5.89E+01	1.75E+03	7.8E-06	3.0E-02
67863	Chloroform	1.04E-01	1.00E-05	3.66E-03	25	6,988	334.32	536.40	3.98E+01	7.92E+03	2.3E-05	5.0E-02
158592	cis-1,2-Dichloroethylene	7.38E-02	1.13E-05	4.07E-03	25	7,192	333.65	544.00	3.55E+01	3.50E+03	N/A	2.0E-01
127184	Tetrachloroethylene	7.20E-02	8.20E-06	1.84E-02	25	8,288	394.40	620.20	1.55E+02	2.00E+02	5.9E-06	N/A
79016	Trichloroethylene	7.90E-02	9.10E-06	1.03E-02	25	7,505	360.36	544.20	1.66E+02	1.10E+03	1.1E-04	4.0E-02
75014	Vinyl chloride	1.06E-01	1.23E-05	2.71E-02	25	5,250	259.25	432.00	1.86E+01	2.76E+03	8.8E-06	1.0E-01
91203	Naphthalene	5.90E-02	7.50E-06	4.83E-04	25	10,373	491.14	748.40	2.00E+03	3.10E+01	N/A	3.0E-03
85018	Phenanthrene	3.30E-02	7.47E-06	1.30E-04	25	1,057	613.00	869.01	1.41E+04	1.28E+00	N/A	3.0E-03

Appendix C.4
 Johnson & Ettinger Model - Calculations Screen
 Inhalation of Volatiles from Groundwater
 Current Child Residential Scenario - CT
 Southwest Property, Wells GSH Superfund Site, Operable Unit 2
 Aherstone Auto Parts

		Source- building separation, L_f (cm)	Vadose zone soil air-filled porosity, θ_a^* (cm ³ /cm ³)	Vadose zone effective total fluid saturation, S_w (cm ³ /cm ³)	Vadose zone soil intrinsic permeability, k_i (cm ²)	Vadose zone soil relative air permeability, k_{ra} (cm ²)	Vadose zone soil effective vapor permeability, k_v (cm ²)	Thickness of capillary zone, L_{ca} (cm)	Total porosity in capillary zone, n_{ca} (cm ³ /cm ³)	Air-filled porosity in capillary zone, $\theta_{a,ca}$ (cm ³ /cm ³)	Water-filled porosity in capillary zone, $\theta_{w,ca}$ (cm ³ /cm ³)	Floor- wall seam perimeter, X _{crack} (cm)	Blkg ventilation rate, Q_{blkg} (cm ³ /s)	Area of enclosed space below grade, A_b (cm ²)	Crack- to-total area ratio, η (unless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,g}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{vg} (atm-m ³ /mol)	Henry's law constant of vs. groundwater temperature, H_{Tg} (unless)
75364	1,1-Dichloroethylene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	6.392	1.47E-02	5.34E-01
106467	1,4-Dichlorobenzene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	11.243	8.89E-04	3.83E-02
71432	Benzene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	8.122	2.89E-03	1.18E-01
67663	Chloroform	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	7.854	1.86E-03	8.02E-02
156892	cis-1,2-Dichloroethylene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	7.734	2.04E-03	8.77E-02
127184	Tetrachloroethylene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	9.553	7.83E-03	3.37E-01
79018	Trichloroethylene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	8.557	4.79E-03	2.06E-01
75014	Vinyl chloride	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	5.000	1.73E-02	7.46E-01
91203	Naphthalene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	12.913	1.52E-04	6.55E-03
85018	Phenanthrene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	1.479	1.14E-04	4.90E-03

Appendix C.4
 Johnson & Ettinger Model - Calculations Screen
 Inhalation of Volatiles from Groundwater
 Current Child Residential Scenario - CT
 Southwest Property, Wells G&H Superfund Site, Oper.
 Aberlona Auto Parts

	Vapor viscosity at ave. soil temperature, μ (g/cm-s)	Vadose zone effective diffusion coefficient, D_{v}^{*} (cm ² /s)	Capillary zone effective diffusion coefficient, D_{m}^{*} (cm ² /s)	Total overall effective diffusion coefficient, D_{ov}^{*} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_c (cm)	Source vapor conc., C_{swg} (μ g/m ³)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{in} (cm ³ /s)	Crack effective diffusion coefficient, D_{crack}^{*} (cm ² /s)	Area of crack, A_{crack} (cm ²)	Exponent of equivalent foundation pallet number, $exp(Pa)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., C_{bldg} (μ g/m ³)	Unit risk factor, URF (μ g/m ³) ⁻¹	Reference conc., RTC (mg/m ³)	
75354	1,1-Dichloroethylene	1.75E-04	5.47E-04	5.12E-04	5.25E-04	30.48	52.12	7.42E+01	0.10	5.22E+00	5.47E-04	4.00E+02	3.87E+165	1.78E-04	1.31E-02	N/A	2.0E-01
109467	1,4-Dichlorobenzene	1.75E-04	4.38E-04	4.12E-04	4.22E-04	30.48	52.12	1.64E+01	0.10	5.22E+00	4.38E-04	4.00E+02	1.38E+194	1.70E-04	2.79E-03	N/A	8.0E-01
71432	Benzene	1.75E-04	5.42E-04	5.07E-04	5.20E-04	30.48	52.12	6.66E+00	0.10	5.22E+00	5.42E-04	4.00E+02	1.45E+157	1.78E-04	1.53E-03	7.9E-06	3.0E-02
67063	Chloroform	1.75E-04	6.43E-04	6.02E-04	6.17E-04	30.48	52.12	N/A	0.10	5.22E+00	6.43E-04	4.00E+02	2.93E+132	1.80E-04	N/A	2.9E-05	5.0E-02
159592	1,2-Dichloroethylene	1.75E-04	4.96E-04	4.30E-04	4.41E-04	30.48	52.12	7.02E+02	0.10	5.22E+00	4.96E-04	4.00E+02	3.62E+165	1.71E-04	1.20E-01	N/A	2.0E-01
127154	Tetrachloroethylene	1.75E-04	4.33E-04	4.11E-04	4.21E-04	30.48	52.12	1.41E+02	0.10	5.22E+00	4.33E-04	4.00E+02	8.93E+193	1.70E-04	2.39E-02	5.9E-06	N/A
75016	Trichloroethylene	1.75E-04	4.83E-04	4.52E-04	4.64E-04	30.48	52.12	4.43E+03	0.10	5.22E+00	4.83E-04	4.00E+02	1.52E+176	1.73E-04	7.66E-01	1.1E-04	4.0E-02
75014	Vinyl chloride	1.75E-04	6.44E-04	6.02E-04	6.19E-04	30.48	52.12	1.47E+02	0.10	5.22E+00	6.44E-04	4.00E+02	1.44E+132	1.80E-04	2.64E-02	8.8E-04	1.0E-01
61203	Naphthalene	1.75E-04	4.70E-04	4.50E-04	4.67E-04	30.48	52.12	8.86E+00	0.10	5.22E+00	4.70E-04	4.00E+02	1.34E+161	1.72E-04	1.53E-03	N/A	3.0E-03
85018	Phenanthrene	1.75E-04	3.50E-04	3.41E-04	3.44E-04	30.48	52.12	1.92E+01	0.10	5.22E+00	3.50E-04	4.00E+02	3.05E+243	1.64E-04	1.68E-03	N/A	3.0E-03

Appendix C.4
 Johnson & Ettinger Model - Results
 Inhalation of Volatiles from Groundwater
 Current Child Residential Scenario - CT
 Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
 Aberjona Auto Parts

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

INCREMENTAL RISK CALCULATIONS:

75354 1,1-Dichloroethylene
 106467 1,4-Dichlorobenzene
 71432 Benzene
 67663 Chloroform
 156592 cis-1,2-Dichloroethylene
 127184 Tetrachloroethylene
 79016 Trichloroethylene
 75014 Vinyl chloride
 91203 Naphthalene
 85018 Phenanthrene

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	2.25E+06	NA
NA	NA	NA	7.38E+04	NA
NA	NA	NA	1.75E+06	NA
NA	NA	NA	7.92E+06	NA
NA	NA	NA	3.50E+06	NA
NA	NA	NA	2.00E+05	NA
NA	NA	NA	1.10E+06	NA
NA	NA	NA	2.76E+06	NA
NA	NA	NA	3.10E+04	NA
NA	NA	NA	1.28E+03	NA

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	4.2E-05
NA	2.2E-06
2.2E-10	3.2E-05
NA	NA
NA	3.8E-04
2.6E-09	NA
1.5E-06	1.2E-02
4.2E-09	1.7E-04
NA	3.3E-04
NA	3.6E-04

	95% UCL Cancer Risk	95% UCL HI
TOTAL:	2E-06	1E-02

= Cancer risk > 1E-05
 or HQ/HI > 1E+00

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
 (enter "X" in "YES" box and initial groundwater conc. below)

YES

ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER
Chemical CAS No. (numbers only, no dashes)	95% LCL groundwater conc., C _w (µg/L)	Depth below grade to bottom of enclosed space floor, LF (15 or 200 cm)	Depth below grade to water table, LWT (cm)	SCS soil base directly above water table	Average soil groundwater temperature, T _s (°C)	Vadose zone SCS soil base (need to estimate soil vapor permeability)	OR	User-defined vadose zone soil vapor permeability, k _v (cm ²)	Vadose zone soil dry bulk density, ρ _b (g/cm ³)	Vadose zone soil total porosity, n ^t (unitless)	Vadose zone soil water-filled porosity, e _w (cm ³ /cm ³)	Target risk for carcinogens, TR (unitless)	Target hazard quotient for noncarcinogens, THQ (unitless)	Average time for carcinogens, AT _c (yr)	Average time for noncarcinogens, AT _{nc} (yr)	Exposure duration, ED (yr)	Exposure frequency, EF (days/yr)	Exposure time ET (hrs/day)	Conversion factor CF (hr/yr)	
75354	1,1-Dichloroethylene	1.94E-01	52.12	62.6	18	10	1	1.6	0.43	0.3	1.0E-06	1	70	24	24	350	18	8760		
106487	1,4-Dichlorobenzene	4.84E-01	52.12	62.6	18	10	1	1.6	0.43	0.3	1.0E-06	1	70	24	24	350	18	8760		
71432	Benzene	1.00E-01	52.12	62.6	18	10	1	1.6	0.43	0.3	1.0E-06	1	70	24	24	350	18	8760		
67863	Chloroform	5.00E-01	52.12	62.6	18	10	1	1.6	0.43	0.3	1.0E-06	1	70	24	24	350	18	8760		
156582	cis-1,2-Dichloroethylene	8.00E+00	52.12	62.6	18	10	1	1.6	0.43	0.3	1.0E-06	1	70	24	24	350	18	8760		
127184	Tetrachloroethylene	4.19E-01	52.12	62.6	18	10	1	1.6	0.43	0.3	1.0E-06	1	70	24	24	350	18	8760		
78018	Trichloroethylene	2.60E+01	52.12	62.6	18	10	1	1.6	0.43	0.3	1.0E-06	1	70	24	24	350	18	8760		
75014	Vinyl chloride	2.40E-01	52.12	62.6	18	10	1	1.6	0.43	0.3	1.0E-06	1	70	24	24	350	18	8760		
91203	Hexachlorocyclopentadiene	2.70E+00	52.12	62.6	18	10	1	1.6	0.43	0.3	1.0E-06	1	70	24	24	350	18	8760		
88018	Phenanthrene	2.10E+00	52.12	62.6	18	10	1	1.6	0.43	0.3	1.0E-06	1	70	24	24	350	18	8760		

Note: 1) Default soil parameters from table 7 of User's Guide for Evaluating Subsurface Vapor Intrusion into Building (U.S. EPA June 18, 2003) were used for soil water filled porosity (e_w), soil organic carbon fraction (f_{oc}), soil total porosity (n), and soil dry bulk density (ρ_b).

Appendix C.4
 Johnson & Ettinger Model - Chemical Properties Screen
 Inhalation of Volatiles from Groundwater
 Current Adult Residential Scenario - RME
 Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
 Aberjona Auto Parts

Chemical CAS No.	Chemical	Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($\text{atm}\cdot\text{m}^3/\text{mol}$)	Henry's law constant reference temperature, T_R ($^{\circ}\text{C}$)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B ($^{\circ}\text{K}$)	Critical temperature, T_C ($^{\circ}\text{K}$)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu\text{g}/\text{m}^3\cdot\text{yr}$)	Reference conc., RFC (mg/m^3)
75354	1,1-Dichloroethylene	9.00E-02	1.04E-05	2.61E-02	25	6,247	304.75	576.05	5.89E+01	2.25E+03	N/A	2.0E-01
106467	1,4-Dichlorobenzene	6.90E-02	7.90E-06	2.43E-03	25	9,271	447.21	684.75	6.17E+02	7.38E+01	N/A	8.0E-01
71432	Benzene	8.80E-02	9.80E-06	5.56E-03	25	7,342	353.24	562.16	5.89E+01	1.75E+03	7.8E-06	3.0E-02
67863	Chloroform	1.04E-01	1.00E-05	3.66E-03	25	6,988	334.32	536.40	3.98E+01	7.92E+03	2.3E-05	5.0E-02
158592	cis-1,2-Dichloroethylene	7.36E-02	1.13E-05	4.07E-03	25	7,192	333.65	544.00	3.55E+01	3.50E+03	N/A	2.0E-01
127184	Tetrachloroethylene	7.20E-02	8.20E-06	1.84E-02	25	8,288	394.40	620.20	1.55E+02	2.00E+02	5.9E-06	N/A
79016	Trichloroethylene	7.90E-02	9.10E-06	1.03E-02	25	7,505	360.36	544.20	1.66E+02	1.10E+03	1.1E-04	4.0E-02
75014	Vinyl chloride	1.06E-01	1.23E-05	2.71E-02	25	5,250	259.25	432.00	1.86E+01	2.76E+03	8.8E-06	1.0E-01
91203	Naphthalene	5.90E-02	7.50E-06	4.83E-04	25	10,373	491.14	748.40	2.00E+03	3.10E+01	N/A	3.0E-03
85018	Phenanthrene	3.30E-02	7.47E-06	1.30E-04	25	1,057	613.00	869.01	1.41E+04	1.28E+00	N/A	3.0E-03

Appendix C.4
 Johnson & Ettinger Model - Calculations Screen
 Inhalation of Volatiles from Groundwater
 Current Adult Residential Scenario - RME
 Southwell Properties, Wells G&H Superfund Site, Operable Unit 2
 Abernethy Auto Parts

	Source- building separation, L_1 (cm)	Vadose zone soil air-filled porosity, θ_a^v (cm ³ /cm ³)	Vadose zone effective total fluid saturation, S_w (cm ³ /cm ³)	Vadose zone soil intrinsic permeability, k (cm ²)	Vadose zone soil relative air permeability, k_{ra} (cm ²)	Vadose zone soil effective vapor permeability, k_v (cm ²)	Thickness of capillary zone, L_w (cm)	Total porosity in capillary zone, n_w (cm ³ /cm ³)	Air-filled porosity in capillary zone, $\theta_{a,c}$ (cm ³ /cm ³)	Water-filled porosity in capillary zone, $\theta_{w,c}$ (cm ³ /cm ³)	Floor- wall seam perimeter, X_{crack} (cm)	Bldg. ventilation rate, Q_{vent} (cm ³ /s)	Area of enclosed space below grade, A_g (cm ²)	Crack- to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, ΔH_{10} (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{10} (atm-cm ³ /mol)	Henry's law constant at ve. groundwater temperature, H_{10} (unitless)	
75304	1,1-Dichloroethylene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	6.282	1.47E-02	6.34E-01
106467	1,4-Dichlorobenzene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	11.243	8.89E-04	3.83E-02
71432	Benzene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	8.122	2.59E-03	1.18E-01
67663	Chloroform	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	7.654	1.89E-03	8.02E-02
136592	cis-1,2-Dichloroethylene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	7.134	2.04E-03	8.77E-02
127184	Trichloroethylene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	9.553	7.63E-03	3.37E-01
79016	Trichloroethylene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	8.557	4.79E-03	2.06E-01
79014	Vinyl chloride	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	5.000	1.73E-02	7.48E-01
81203	Naphthalene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	12.913	1.52E-04	8.55E-03
85018	Phenanthrene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	1.479	1.14E-04	4.90E-03

Appendix C.4 Johnson & Ettrich Model - Calculations Screen Inhalation of Volatiles from Groundwater Current Adult Residential Scenario - RME Southwest Properties, Wells G&H Superfund Site, Oper Aberjona Auto Parts		Vapor viscosity at ave. soil temperature, μ Pa (p/cm-s)	Vadose zone effective diffusion coefficient, D_{eff}^v (cm ² /s)	Caulery zone effective diffusion coefficient, D_{eff}^c (cm ² /s)	Total overall effective diffusion coefficient, D_{eff}^T (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_c (cm)	Source vapor conc., C_{soil} (μ g/m ³)	Crack radius, r_{crack} (cm)	Average vapor flow rate into blk., Q_{avg} (cm ³ /s)	Crack effective diffusion coefficient, D_{crack} (cm ² /s)	Area of crack, A_{crack} (cm ²)	Exponent of equivalent foundation picket number, $\exp(P_n)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source blk. conc., C_{blk} (μ g/m ³)	Unit risk factor, URF (μ g/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
75394	1,1-Dichloroethene	1.75E-04	5.47E-04	6.12E-04	5.25E-04	30.48	52.12	1.23E+02	0.10	5.22E+00	5.47E-04	4.00E+02	3.87E+155	1.78E-04	2.18E-02	N/A	2.0E-01
106467	1,4-Dichlorobenzene	1.75E-04	4.38E-04	4.12E-04	4.22E-04	30.48	52.12	1.85E+01	0.10	5.22E+00	4.38E-04	4.00E+02	1.36E+194	1.70E-04	3.15E-03	N/A	8.0E-01
71432	Benzene	1.75E-04	5.42E-04	5.07E-04	5.20E-04	30.48	52.12	1.16E+01	0.10	5.22E+00	5.42E-04	4.00E+02	1.40E+197	1.75E-04	2.03E-03	7.8E-06	3.0E-02
67663	Chloroform	1.75E-04	6.49E-04	6.02E-04	6.17E-04	30.48	52.12	N/A	0.10	5.22E+00	6.49E-04	4.00E+02	2.93E+132	1.80E-04	N/A	2.3E-05	5.0E-02
156592	cis-1,2-Dichloroethene	1.75E-04	4.59E-04	4.30E-04	4.41E-04	30.48	52.12	7.22E+02	0.10	5.22E+00	4.59E-04	4.00E+02	3.62E+185	1.71E-04	1.20E-01	N/A	2.0E-01
127184	Tetrachloroethene	1.75E-04	4.39E-04	4.11E-04	4.21E-04	30.48	52.12	1.41E+02	0.10	5.22E+00	4.39E-04	4.00E+02	9.93E+193	1.70E-04	2.38E-02	5.9E-06	N/A
79016	Trichloroethene	1.75E-04	4.83E-04	4.52E-04	4.64E-04	30.48	52.12	5.15E+03	0.10	5.22E+00	4.83E-04	4.00E+02	1.52E+176	1.73E-04	8.90E-01	1.1E-04	4.0E-02
75014	Vinyl chloride	1.75E-04	6.44E-04	6.02E-04	6.18E-04	30.48	52.12	1.79E+02	0.10	5.22E+00	6.44E-04	4.00E+02	1.44E+132	1.80E-04	3.22E-02	6.9E-06	1.0E-01
81203	Naphthalene	1.75E-04	4.70E-04	4.30E-04	4.37E-04	30.48	52.12	1.77E+01	0.10	5.22E+00	4.70E-04	4.00E+02	1.34E+181	1.72E-04	3.05E-03	N/A	3.0E-03
85018	Phenanthrene	1.75E-04	3.50E-04	3.41E-04	3.44E-04	30.48	52.12	1.03E+01	0.10	5.22E+00	3.50E-04	4.00E+02	3.05E+243	1.64E-04	1.68E-03	N/A	3.0E-03

Appendix C.4
 Johnson & Eftinger Model - Results
 Inhalation of Volatiles from Groundwater
 Current Adult Residential Scenario - RME
 Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
 Aberjona Auto Parts

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

INCREMENTAL RISK CALCULATIONS:

75354 1,1-Dichloroethylene
 106467 1,4-Dichlorobenzene
 71432 Benzene
 67663 Chloroform
 158592 cis-1,2-Dichloroethylene
 127184 Tetrachloroethylene
 79016 Trichloroethylene
 75014 Vinyl chloride
 91203 Naphthalene
 85018 Phenanthrene

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	2.25E+06	NA
NA	NA	NA	7.38E+04	NA
NA	NA	NA	1.75E+06	NA
NA	NA	NA	7.92E+06	NA
NA	NA	NA	3.50E+06	NA
NA	NA	NA	2.00E+05	NA
NA	NA	NA	1.10E+06	NA
NA	NA	NA	2.76E+06	NA
NA	NA	NA	3.10E+04	NA
NA	NA	NA	1.28E+03	NA

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	6.9E-05
NA	2.5E-06
3.5E-09	4.3E-05
NA	NA
NA	3.8E-04
3.1E-08	NA
2.1E-05	1.4E-02
6.2E-08	2.1E-04
NA	6.5E-04
NA	3.6E-04

	95% UCL Cancer Risk	95% UCL HI
TOTAL:	2E-05	2E-02

= Cancer risk > 1E-05 or HQ/HI > 1E+00

END

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES
 OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
 (enter "X" in "YES" box and initial groundwater conc. below)

YES

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER 95% UCL groundwater conc., C _w (µg/L)	ENTER Depth below grade to bottom of enclosed space floor, LF (15 or 200 cm)	ENTER Depth below grade to water table, LWT (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T _s (°C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR Note	ENTER User-defined vadose zone soil vapor permeability, k _v (cm ²)	ENTER Vadose zone soil dry bulk density, ρ _b ^v (g/cm ³)	ENTER Vadose zone soil total porosity, n ^v (unitless)
75354	1,1-Dichloroethylene	1.17E-01	52.12	LS	10	LS	1	1.5	0.43	
106467	1,4-Dichlorobenzene	4.30E-01	52.12	LS	10	LS	1	1.5	0.43	
71432	Benzene	7.50E-02	52.12	LS	10	LS	1	1.5	0.43	
67663	Chloroform		52.12	LS	10	LS	1	1.5	0.43	
156592	cis-1,2-Dichloroethylene	8.00E+00	52.12	LS	10	LS	1	1.5	0.43	
127184	Tetrachloroethylene	4.18E-01	52.12	LS	10	LS	1	1.5	0.43	
79016	Trichloroethylene	2.15E+01	52.12	LS	10	LS	1	1.5	0.43	
75014	Vinyl chloride	1.97E-01	52.12	LS	10	LS	1	1.5	0.43	
91203	Naphthalene	1.35E+00	52.12	LS	10	LS	1	1.5	0.43	
85018	Phenanthrene	2.10E+00	52.12	LS	10	LS	1	1.5	0.43	

Note:

1) Default soil parameters from table 7 of User's Guide for Evaluating Subsurface Vapor Intrusion into Building (U.S. EPA June 19, 2003) were used for soil water filled porosity (θ_w), soil organic carbon fraction (f_{oc}), soil total porosity (n), and

Appendix C.4
 Johnson & Ettlinger Model - Data Entry Screen
 Inhalation of Volatiles from Groundwater
 Current Adult Residential Scenario - CT
 Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
 Aberjona Auto Parts

ENTER Chemical CAS No. (numbers only, no dashes)	Enter X in appro Chemical	ENTER Vadose zone soil water-filled porosity, θ_w^v (cm ³ /cm ³)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT _C (yrs)	ENTER Averaging time for noncarcinogens, AT _{Nc} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Exposure time ET (hrs/day)	ENTER Conversion factor CF (hrs/yr)
75354	1,1-Dichloroethylene	0.3	1.0E-06	1	70	7	7	350	16	8760
106467	1,4-Dichlorobenzene	0.3	1.0E-06	1	70	7	7	350	16	8760
71432	Benzene	0.3	1.0E-06	1	70	7	7	350	16	8760
67663	Chloroform	0.3	1.0E-06	1	70	7	7	350	16	8760
156592	cis-1,2-Dichloroethylene	0.3	1.0E-06	1	70	7	7	350	16	8760
127184	Tetrachloroethylene	0.3	1.0E-06	1	70	7	7	350	16	8760
79016	Trichloroethylene	0.3	1.0E-06	1	70	7	7	350	16	8760
75014	Vinyl chloride	0.3	1.0E-06	1	70	7	7	350	16	8760
91203	Naphthalene	0.3	1.0E-06	1	70	7	7	350	16	8760
85018	Phenanthrene	0.3	1.0E-06	1	70	7	7	350	16	8760

1 soil dry bulk density (ρ_b).

Appendix C.4
 Johnson & Ettinger Model - Chemical Properties Screen
 Inhalation of Volatiles from Groundwater
 Current Adult Residential Scenario - CT
 Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
 Aberjona Auto Parts

Chemical CAS No.	Chemical	Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($\text{atm}\cdot\text{m}^3/\text{mol}$)	Henry's law constant reference temperature, T_R ($^{\circ}\text{C}$)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B ($^{\circ}\text{K}$)	Critical temperature, T_C ($^{\circ}\text{K}$)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu\text{g}/\text{m}^3$) ⁻¹	Reference conc., RfC (mg/m^3)
75354	1,1-Dichloroethylene	9.00E-02	1.04E-05	2.61E-02	25	6,247	304.75	576.05	5.89E+01	2.25E+03	N/A	2.0E-01
106467	1,4-Dichlorobenzene	6.90E-02	7.90E-06	2.43E-03	25	9,271	447.21	684.75	6.17E+02	7.38E+01	N/A	8.0E-01
71432	Benzene	8.80E-02	9.80E-06	5.56E-03	25	7,342	353.24	562.16	5.89E+01	1.75E+03	7.8E-06	3.0E-02
67663	Chloroform	1.04E-01	1.00E-05	3.66E-03	25	6,988	334.32	536.40	3.98E+01	7.92E+03	2.3E-05	5.0E-02
156592	cis-1,2-Dichloroethylene	7.36E-02	1.13E-05	4.07E-03	25	7,192	333.65	544.00	3.55E+01	3.50E+03	N/A	2.0E-01
127184	Tetrachloroethylene	7.20E-02	8.20E-06	1.84E-02	25	8,288	394.40	620.20	1.55E+02	2.00E+02	5.9E-06	N/A
79016	Trichloroethylene	7.90E-02	9.10E-06	1.03E-02	25	7,505	360.36	544.20	1.66E+02	1.10E+03	1.1E-04	4.0E-02
75014	Vinyl chloride	1.06E-01	1.23E-05	2.71E-02	25	5,250	259.25	432.00	1.86E+01	2.76E+03	8.8E-06	1.0E-01
91203	Naphthalene	5.90E-02	7.50E-06	4.83E-04	25	10,373	491.14	748.40	2.00E+03	3.10E+01	N/A	3.0E-03
85018	Phenanthrene	3.30E-02	7.47E-06	1.30E-04	25	1,057	613.00	869.01	1.41E+04	1.28E+00	N/A	3.0E-03

Appendix C.4
 Johnson & Ettinger Model - Calculations Screen
 Inhalation of Volatiles from Groundwater
 Current Adult Residential Scenario - CT
 Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
 Aberjona Auto Parts

	Source- building separation, L_T (cm)	Vadose zone soil air-filled porosity, $\theta_{a,v}$ (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{wv} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rav} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor- wall seam perimeter, Xcrack (cm)	Bldg. ventilation rate, Q_{bldg} (cm^3/s)	
76354	1,1-Dichloroethylene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04
106467	1,4-Dichlorobenzene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04
71432	Benzene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04
67663	Chloroform	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04
156692	cis-1,2-Dichloroethylene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04
127184	Tetrachloroethylene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04
79016	Trichloroethylene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04
75014	Vinyl chloride	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04
91203	Naphthalene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04
85018	Phenanthrene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04

Appendix C.4
 Johnson & Ettinger Model - Calculations Screen
 Inhalation of Volatiles from Groundwater
 Current Adult Residential Scenario - CT
 Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
 Aberjona Auto Parts

		Area of enclosed space below grade, A_B (cm ²)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m ³ /mol)	Henry's law constant at ve. groundwat temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D_{vz}^{eff} (cm ² /s)	Capillary zone effective diffusion coefficient, D_{cz}^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_{ov}^{eff} (cm ² /s)	Diffusion path length, L_d (cm)	Convection path length, L_c (cm)	Source vapor conc., C_{source} (µg/m ³)
75354	1,1-Dichloroethylene	1.80E+06	2.22E-04	52.12	6,392	1.47E-02	6.34E-01	1.75E-04	5.47E-04	5.12E-04	5.25E-04	30.48	52.12	7.42E+01
108467	1,4-Dichlorobenzene	1.80E+06	2.22E-04	52.12	11,243	8.89E-04	3.83E-02	1.75E-04	4.38E-04	4.12E-04	4.22E-04	30.48	52.12	1.64E+01
71432	Benzene	1.80E+06	2.22E-04	52.12	8,122	2.69E-03	1.16E-01	1.75E-04	5.42E-04	5.07E-04	5.20E-04	30.48	52.12	8.68E+00
87663	Chloroform	1.80E+06	2.22E-04	52.12	7,554	1.86E-03	8.02E-02	1.75E-04	6.43E-04	6.02E-04	6.17E-04	30.48	52.12	
156592	cis-1,2-Dichloroethylene	1.80E+06	2.22E-04	52.12	7,734	2.04E-03	8.77E-02	1.75E-04	4.59E-04	4.30E-04	4.41E-04	30.48	52.12	7.02E+02
127184	Tetrachloroethylene	1.80E+06	2.22E-04	52.12	9,553	7.83E-03	3.37E-01	1.75E-04	4.39E-04	4.11E-04	4.21E-04	30.48	52.12	4.43E+03
79016	Trichloroethylene	1.80E+06	2.22E-04	52.12	8,557	4.79E-03	2.06E-01	1.75E-04	4.83E-04	4.52E-04	4.64E-04	30.48	52.12	1.41E+02
76014	Vinyl chloride	1.80E+06	2.22E-04	52.12	5,000	1.73E-02	7.46E-01	1.75E-04	6.44E-04	6.02E-04	6.18E-04	30.48	52.12	1.47E+02
91203	Naphthalene	1.80E+06	2.22E-04	52.12	12,913	1.52E-04	6.55E-03	1.75E-04	4.70E-04	4.50E-04	4.57E-04	30.48	52.12	8.86E+00
85018	Phenanthrene	1.80E+06	2.22E-04	52.12	1,479	1.14E-04	4.90E-03	1.75E-04	3.50E-04	3.41E-04	3.44E-04	30.48	52.12	1.03E+01

Appendix C.4
 Johnson & Ettinger Model - Calculations Screen
 Inhalation of Volatiles from Groundwater
 Current Adult Residential Scenario - CT
 Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
 Aberjona Auto Parts

		Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{vack} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF ($\mu g/m^3 \cdot yr$) ⁻¹	Reference conc., RfC (mg/m^3)
76354	1,1-Dichloroethylene	0.10	5.22E+00	5.47E-04	4.00E+02	3.87E+155	1.76E-04	1.31E-02	N/A	2.0E-01
106467	1,4-Dichlorobenzene	0.10	5.22E+00	4.38E-04	4.00E+02	1.36E+184	1.70E-04	2.79E-03	N/A	8.0E-01
71432	Benzene	0.10	5.22E+00	6.42E-04	4.00E+02	1.40E+157	1.76E-04	1.53E-03	7.8E-06	3.0E-02
87663	Chloroform	0.10	5.22E+00	6.43E-04	4.00E+02	2.93E+132	1.80E-04	N/A	2.3E-05	6.0E-02
156692	cis-1,2-Dichloroethylene	0.10	5.22E+00	4.59E-04	4.00E+02	3.62E+185	1.71E-04	1.20E-01	N/A	2.0E-01
127184	Tetrachloroethylene	0.10	5.22E+00	4.39E-04	4.00E+02	9.93E+193	1.70E-04	2.39E-02	5.9E-06	N/A
79016	Trichloroethylene	0.10	5.22E+00	4.63E-04	4.00E+02	1.52E+176	1.73E-04	7.66E-01	1.1E-04	4.0E-02
76014	Vinyl chloride	0.10	5.22E+00	6.44E-04	4.00E+02	1.44E+132	1.80E-04	2.64E-02	8.8E-06	1.0E-01
91203	Naphthalene	0.10	5.22E+00	4.70E-04	4.00E+02	1.34E+181	1.72E-04	1.53E-03	N/A	3.0E-03
85018	Phenanthrene	0.10	5.22E+00	3.50E-04	4.00E+02	3.05E+243	1.64E-04	1.68E-03	N/A	3.0E-03

Appendix C.4
 Johnson & Ettinger Model - Results
 Inhalation of Volatiles from Groundwater
 Current Adult Residential Scenario - CT
 Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
 Aberjona Auto Parts

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

INCREMENTAL RISK CALCULATIONS:

75354 1,1-Dichloroethylene
 106467 1,4-Dichlorobenzene
 71432 Benzene
 67663 Chloroform
 156592 cis-1,2-Dichloroethylene
 127184 Tetrachloroethylene
 79016 Trichloroethylene
 75014 Vinyl chloride
 91203 Naphthalene
 85018 Phenanthrene

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	2.25E+06	NA
NA	NA	NA	7.38E+04	NA
NA	NA	NA	1.75E+06	NA
NA	NA	NA	7.92E+06	NA
NA	NA	NA	3.50E+06	NA
NA	NA	NA	2.00E+05	NA
NA	NA	NA	1.10E+06	NA
NA	NA	NA	2.76E+06	NA
NA	NA	NA	3.10E+04	NA
NA	NA	NA	1.28E+03	NA

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	4.2E-05
NA	2.2E-06
7.6E-10	3.2E-05
NA	NA
NA	3.8E-04
9.0E-09	NA
5.4E-06	1.2E-02
1.5E-08	1.7E-04
NA	3.3E-04
NA	3.6E-04

	95% UCL Cancer Risk	95% UCL HI
TOTAL:	5E-06	1E-02

= Cancer risk > 1E-05
 or HQ/HI > 1E+00

CALCULATE RISK-BASED SOIL CONCENTRATION (enter "X" in "YES" box)

YES OR

SL-SCREEN
 Version 2.3.03/01

CALCULATE INCREMENTAL RISKS FROM ACTUAL SOIL CONCENTRATION (enter "X" in "YES" box and initial soil conc. below)

YES X

ENTER Chemical CAS No. (numbers only, no dashes)	Chemical	Enter initial soil concentration		ENTER Depth below ground to bottom of enclosed storage floor, Lr (ft or 300 cm)	ENTER Depth below ground to top of contamination, Lr (ft)	ENTER Average soil temperature, Ts (°C)	ENTER Volatile zone SO2 soil flow (used to estimate soil vapor permeability) Note	ENTER User-defined volatile zone soil vapor permeability, K _v (cm ² /s)	ENTER Volatile zone SO2 dry bulk density, ρ _d (g/cm ³)	ENTER Volatile zone soil total porosity, n _t (unitless)	ENTER Volatile zone soil water-filled porosity, n _w (cm ³ /cm ³)	ENTER Volatile zone soil organic carbon fraction, f _{oc} (unitless)	ENTER Average time for calculation, ATC (min)	ENTER Average time for noncalculation, ATNC (min)	ENTER Exposure duration, ED (hr/yr)	ENTER Exposure frequency, EF (hr/day)	ENTER Exposure time ET (hr/yr)	ENTER Concentration factor CF (mg/L)	ENTER Terror risk for carcinogens, TR (unitless)	ENTER Terror hazard quotient for noncarcinogens, THQ (unitless)
		ENTER Mean soil conc., CR (ppm)	ENTER Mean soil conc., CR (ppm)																	
9909	Trimethylbenzene, 1,2,4	15	15	10	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
94000	Dichlorobenzene, 1,2- (total)	15	15	10	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
106673	Trimethylbenzene, 1,3,5-	15	15	10	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
104613	n-Butylbenzene	15	15	10	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
6100	Naphthalene	2.74E+03	15	15	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
8669	Isopropyltoluene, 4-	15	15	10	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
13066	Bulkybenzene, sec.	15	15	10	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
7407	Chlorobenzene	2.49E+03	15	15	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
7804	Vinyl chloride	2.81E+02	15	15	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
7400	Bromobenzene	15	15	10	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
7000	Ethyl chloride	8.90E+01	15	15	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
7004	1,1-Dichloroethane	1.20E+02	15	15	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
7011	1,1,2,2-Tetrachloroethane, 1,1,2-	15	15	10	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
8001	Acetone	3.24E+02	15	15	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
7900	Carbon Disulfide	15	15	10	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
7500	Methyl acetate	15	15	10	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
7500	Methylene chloride	7.27E+02	15	15	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
10000	Isane-1,2-Dichloroethane	7.75E+01	15	15	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
10004	Methyl Tertiary Butyl Ether	5.76E+01	15	15	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
7003	1,1-Dichloroethane	3.56E+02	15	15	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
14000	cis-1,2-Dichloroethane	1.80E+02	15	15	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
7000	Butane, 2- (MEK)	15	15	10	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
7100	1,1,1-Trichloroethane	15	15	10	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
7100	Cyclohexane	15	15	10	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
14007	Benzene	2.10E+02	15	15	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
7004	Trichloroethylene	2.91E+02	15	15	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
14407	Methyl cyclohexane	4.45E+02	15	15	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
10000	Toluene	5.85E+02	15	15	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
12714	Tetrachloroethylene	1.47E+02	15	15	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
10000	Chlorobenzene	3.11E+02	15	15	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
10010	Ethylbenzene	1.84E+02	15	15	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
13300	Xylene	15	15	10	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
10000	Styrene	15	15	10	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
14000	Isopropylbenzene	15	15	10	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
7004	1,1,2,2-Tetrachloroethane	15	15	10	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
54731	Dichlorobenzene, 1,3-	1.00E+02	15	15	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
10007	1,4-Dichlorobenzene	2.30E+02	15	15	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
8001	1,2-Dichlorobenzene	8.10E+01	15	15	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
10001	1,2,4-Trichlorobenzene	15	15	10	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
10007	Benzaldehyde	15	15	10	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
8404	Methylnaphthalene, 2-	8.41E+03	15	15	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
8204	Benzene, 1,1-	15	15	10	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
30000	Acetanaphthylene	8.00E+02	15	15	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
6100	Acetanaphthylene	15	15	10	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
10000	Diethylurea	1.75E+03	15	15	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
8000	Fluorene	15	15	10	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
8004	Phenanthrene	3.89E+04	15	15	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
10007	Anthracene	15	15	10	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
CS-2	CS-C8 Aromatics	8.35E+04	15	15	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
CS-10	CS-C12 Aromatics	8.11E+04	15	15	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
CS-20	CS-C16 Aromatics	4.31E+06	15	15	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
CS-16	CS-C18 Aromatics	8.04E+08	15	15	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1
11100	C11-C22 Aromatics	4.10E+08	15	15	10	10	LB	1	1.5	0.43	0.3	0.002	70	25	25	250	5	5750	1.0E-06	1

Note: 1) Default soil parameters from table 7 of User's Guide for Evaluating Subsurface Vapor Intrusion into Building (U.S. EPA June 19, 2003) were used for soil water filled porosity (n_w), soil organic carbon fraction (f_{oc}), soil total porosity (n_t), and soil dry bulk density (ρ_d).

Appendix C.4
 Johnson & Ellinger Model - Data Entry Screen
 Inhalation of Volatiles from Soil
 Future Commercial Scenario - RME
 Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
 Whitney Barrel

Chemical CAS No. (numbers only, no dashes)	Chemical	Diffusivity in air, D _a (cm ² /s)	Diffusivity in water, D _w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T _R (°C)	Enthalpy of vaporization at the normal boiling point, ΔH _{v,b} (cal/mol)	Normal boiling point, T _B (°K)	Critical temperature, T _C (°K)	Organic carbon partition coefficient, K _{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., R/C (mg/m ³)	Physical state at soil temperature, (S,L,G)
95636	Trimethylbenzene, 1,2,4-	7.80E-02	9.03E-06	5.70E-03	25	1.25E+03	442.30	649.11	3.72E+03	5.70E+01	N/A	6.0E-03	L
540590	Dichloroethylene, 1,2- (total)	5.59E-02	6.47E-06	4.30E-04	20	1.32E+03	585.00	877.50	1.28E+02	1.30E+00	#N/A	#N/A	0.0E+00
108678	Trimethylbenzene, 1,3,5-	6.48E-02	7.86E-06	7.81E-03	25	1.25E+03	442.30	649.11	1.67E+03	2.00E+01	N/A	6.0E-03	L
104518	n-Butylbenzene	7.25E-02	8.39E-06	1.25E-02	25	1.23E+03	456.00	684.00	2.51E+03	1.26E+00	#N/A	#N/A	L
91203	Naphthalene	5.90E-02	7.50E-06	4.83E-04	25	1.04E+04	491.14	748.40	2.00E+03	3.10E+01	N/A	3.0E-03	S
99876	Isopropyltoluene, 4-	7.25E-02	8.39E-06	8.60E+00	25	1.24E+03	450.10	652.04	1.58E+03	2.34E+01	N/A	4.0E-01	L
135988	Butylbenzene, sec-	8.00E-02	8.00E-06	1.67E-02	25	1.24E+03	446.65	669.98	3.11E+04	1.76E+01	#N/A	#N/A	0.0E+00
74873	Chloromethane	1.26E-01	6.50E-06	8.67E-03	25	1.35E+03	249.00	373.50	1.43E+01	5.32E+03	N/A	9.0E-02	0.0E+00
75014	Vinyl chloride	1.06E-01	1.23E-05	2.71E-02	25	5.25E+03	259.25	432.00	1.86E+01	2.76E+03	8.8E-06	1.0E-01	L
74839	Bromomethane	7.26E-02	1.21E-05	6.22E-03	25	5.49E+03	276.50	414.75	1.43E+01	1.52E+04	N/A	5.0E-03	0.0E+00
75003	Ethyl Chloride	1.26E-01	6.50E-06	8.67E-03	25	1.36E+03	249.00	373.50	1.43E+01	5.32E+03	N/A	1.0E+01	L
75354	1,1-Dichloroethylene	9.00E-02	1.04E-05	2.61E-02	25	6.25E+03	304.75	578.05	5.89E+01	2.25E+03	N/A	2.0E-01	L
76131	Trichloro-1,1,2-trifluoroethane, 1,1,2-	2.88E-02	8.07E-06	5.17E-01	25	1.33E+03	320.70	481.05	2.25E+02	1.70E+02	N/A	3.0E+01	0.0E+00
67641	Acetone	1.24E-01	1.14E-05	3.88E-05	25	6.96E+03	329.20	508.10	5.75E-01	1.00E+06	N/A	N/A	L
75150	Carbon Disulfide	1.04E-01	1.29E-05	1.27E-02	25	6.39E+03	319.00	552.00	5.14E+01	2.67E+03	N/A	7.0E-01	L
79209	Methyl Acetate	1.04E-01	1.00E-05	1.13E-04	25	1.31E+03	365.00	547.50	3.32E+00	2.43E+05	#N/A	#N/A	0.0E+00
75092	Methylene chloride	1.01E-01	1.17E-05	2.19E-03	25	6.71E+03	313.00	510.00	1.17E+01	1.30E+04	4.7E-07	3.0E+00	L
156605	trans-1,2-Dichloroethylene	7.07E-02	1.19E-05	9.39E-03	25	1.33E+03	320.85	516.50	5.25E+01	6.30E+03	N/A	2.0E-01	L
1634044	Methyl-Tertiary-Butyl Ether	1.02E-01	1.05E-05	5.87E-04	25	1.32E+03	328.36	497.11	3.84E+01	5.10E+04	N/A	3.0E+00	L
75343	1,1-Dichloroethane	7.42E-02	1.05E-05	5.61E-03	25	6.90E+03	330.55	523.00	3.16E+01	5.06E+03	N/A	5.0E-01	L
156592	cis-1,2-Dichloroethylene	7.36E-02	1.13E-05	4.07E-03	25	7.19E+03	333.65	544.00	3.55E+01	3.50E+03	N/A	2.0E-01	L
78933	Butanone, 2- (MEK)	8.08E-02	9.80E-06	5.60E-05	25	1.31E+03	352.50	528.75	3.83E+00	2.23E+05	N/A	N/A	0.0E+00
71556	1,1,1-Trichloroethane	7.80E-02	8.80E-06	1.72E-02	25	7.14E+03	347.24	545.00	1.10E+02	1.33E+03	N/A	2.2E+00	L
110827	Cyclohexane	8.00E-02	9.00E-06	2.00E+00	25	1.31E+03	353.85	530.78	1.60E+02	5.50E+01	#N/A	#N/A	0.0E+00
71432	Benzene	8.80E-02	9.80E-06	5.56E-03	25	7.34E+03	353.24	562.16	5.89E+01	1.75E+03	7.8E-06	3.0E-02	L
79016	Trichloroethylene	7.90E-02	9.10E-06	1.03E-02	25	7.51E+03	360.36	544.20	1.66E+02	1.10E+03	1.1E-04	4.0E-02	L
108872	Methyl cyclohexane	9.86E-02	8.52E-06	4.23E-01	25	1.30E+03	373.80	560.85	2.68E+02	1.40E+01	N/A	3.0E+00	L
108883	Toluene	8.70E-02	8.60E-06	6.63E-03	25	7.93E+03	383.78	591.79	1.82E+02	5.26E+02	N/A	4.0E-01	L
127184	Tetrachloroethylene	7.20E-02	8.20E-06	1.84E-02	25	8.29E+03	394.40	620.20	1.55E+02	2.00E+02	5.9E-08	N/A	L
108807	Chlorobenzene	7.30E-02	8.70E-06	3.71E-03	25	8.41E+03	404.87	632.40	2.19E+02	4.72E+02	N/A	6.0E-02	L
100414	Ethylbenzene	7.50E-02	7.80E-06	7.88E-03	25	8.50E+03	409.34	617.20	3.63E+02	1.69E+02	N/A	1.0E+00	L
1330207	Xylenes	7.69E-02	8.44E-06	6.73E-06	25	1.26E+03	417.40	616.21	2.41E+02	2.20E+02	N/A	1.0E-01	L
100425	Styrene	7.10E-02	8.00E-06	2.76E-03	25	8.74E+03	418.31	636.00	7.76E+02	3.10E+02	#N/A	#N/A	L
98828	Isopropylbenzene	6.50E-02	7.83E-06	1.47E-02	25	1.26E+03	425.40	631.01	9.31E+03	5.60E+01	N/A	4.0E-01	L
79345	1,1,2,2-Tetrachloroethane	7.10E-02	7.90E-06	3.44E-04	25	9.00E+03	419.60	661.15	9.33E+01	2.97E+03	#N/A	#N/A	L
541731	Dichlorobenzene, 1,3-	4.14E-02	8.85E-06	4.70E-03	25	1.24E+03	446.00	683.96	1.70E+02	6.88E+01	N/A	N/A	L
106467	1,4-Dichlorobenzene	6.90E-02	7.90E-06	2.43E-03	25	9.27E+03	447.21	684.75	6.17E+02	7.38E+01	N/A	8.0E-01	S
95501	1,2-Dichlorobenzene	6.88E-02	9.41E-06	1.62E-06	25	9.70E+03	465.00	697.50	5.34E+01	2.77E+04	N/A	N/A	S
120821	1,2,4-Trichlorobenzene	3.00E-02	8.23E-06	1.42E-03	25	1.05E+04	486.15	725.00	1.78E+03	3.00E+02	N/A	2.0E-01	L
100527	Benzaldehyde	7.30E-02	9.07E-06	2.62E-05	25	1.24E+03	452.00	678.00	3.27E+01	6.57E+03	#N/A	#N/A	0.0E+00
91576	Methylnaphthalene, 2-	4.84E-02	7.75E-06	1.01E-03	25	1.17E+03	514.05	767.01	8.51E+03	2.46E+01	N/A	3.0E-03	S
92524	Biphenyl, 1,1'-	4.04E-02	8.15E-06	3.03E-04	25	1.15E+03	529.10	793.65	6.25E+03	6.94E+00	N/A	N/A	0.0E+00
208968	Acenaphthylene	4.43E-02	7.44E-06	2.80E-04	25	1.12E+03	553.00	792.01	4.79E+03	3.93E+00	N/A	3.0E-03	S
83329	Acenaphthene	4.21E-02	7.69E-06	1.55E-04	25	1.22E+04	550.54	803.15	7.08E+03	4.24E+00	N/A	3.0E-03	S
132649	Dibenzofuran	2.67E-02	5.93E-06	4.00E-03	25	1.11E+03	559.00	824.01	8.13E+03	1.00E+01	N/A	N/A	S
86737	Fluorene	3.63E-02	7.88E-06	9.41E-08	25	1.27E+04	570.44	870.00	7.71E+03	1.90E+00	N/A	3.0E-03	S
85018	Phenanthrene	3.30E-02	7.47E-06	1.30E-04	25	1.06E+03	613.00	869.01	1.41E+04	1.28E+00	N/A	3.0E-03	S
120127	Anthracene	3.24E-02	7.74E-06	6.51E-05	25	1.31E+04	615.18	873.00	2.95E+04	4.34E-02	N/A	3.0E-03	S
C5-C8	C5-C8 Aliphatics	6.00E-02	1.00E-05	1.30E+00	25	NA	NA	NA	2.27E+03	1.10E+04	N/A	2.0E-01	S
C9-C12	C9-C12 Aliphatics	6.00E-02	1.00E-05	1.56E+00	25	NA	NA	NA	1.50E+05	7.00E+01	N/A	2.0E-01	S
C9-C10	C9-C10 Aromatics	6.00E-02	1.00E-05	7.92E-03	25	NA	NA	NA	1.78E+03	5.10E+04	N/A	5.0E-02	S
C9-C18	C9-C18 Aliphatics	6.00E-02	1.00E-05	1.66E+00	25	NA	NA	NA	6.80E+05	1.00E+01	N/A	2.0E-01	S
C11-C22	C11-C22 Aromatics	6.00E-02	1.00E-05	7.32E-04	25	NA	NA	NA	5.00E+03	5.80E+03	N/A	5.0E-02	S

Appendix C.4
 Johnson & Etlinger Model - Data Entry Screen
 Inhalation of Volatiles from Soil
 Future Commercial Scenario - RME
 Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
 Whitney Barre

Chemical CAS No. (numbers only, no dashes)	Chemical	Source building separation, LT (cm)	Vadose zone soil air-filled porosity, θ_a (cm ³ /cm ³)	Vadose zone effective total fluid saturation, S_e (cm ³ /cm ³)	Vadose zone soil intrinsic permeability, k_i (cm ²)	Vadose zone soil relative air permeability, k_{ra} (cm ²)	Vadose zone soil effective vapor permeability, k_v (cm ²)	Floor-wall seam perimeter, Xorack (cm)	Initial soil concentration used, CR (μ g/kg)	Bldg. ventilation rate, Q_{vent} (cm ³ /s)	Area of enclosed space below grade, A_B (cm ²)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{L,T}$ (cal/mol)	Henry's law constant at ave. soil temperature, $H_{L,T}$ (atm-m ³ /mol)	Henry's law constant at ave. soil temperature, HTS (unitless)	Vapor viscosity at ave. soil temperature, μ_{ms} (g/cm-s)	Vadose zone effective diffusion coefficient, D_{eff} (cm ² /s)
95938	Trimethylbenzene, 1,2,4-	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	4.30E+06	2.62E+06	9.50E+06	1.30E-04	15	1.65E+03	4.99E-03	2.13E-01	1.75E-04	4.77E-04
540690	Dichloroethylene, 1,2- (total)	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	5.90E+02	2.62E+06	9.50E+06	1.30E-04	15	1.75E+03	3.87E-04	1.87E-02	1.75E-04	3.77E-04
109678	Trimethylbenzene, 1,3,5-	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	7.13E+04	2.62E+06	9.50E+06	1.30E-04	15	1.65E+03	6.80E-03	2.93E-01	1.75E-04	3.95E-04
104518	n-Butylbenzene	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	6.93E+03	2.62E+06	9.50E+06	1.30E-04	15	1.63E+03	1.09E-02	4.69E-01	1.75E-04	4.41E-04
91203	Naphthalene	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	2.74E+03	2.62E+06	9.50E+06	1.30E-04	15	1.29E+04	1.62E-04	6.55E-03	1.75E-04	4.70E-04
99878	Isopropyltoluene, 4-	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	7.31E+06	2.62E+06	9.50E+06	1.30E-04	15	1.67E+03	7.49E+00	3.22E+02	1.75E-04	4.39E-04
135988	Bulkybenzene, sec-	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	1.10E+06	2.62E+06	9.50E+06	1.30E-04	15	1.63E+03	1.46E-02	6.27E-01	1.75E-04	4.86E-04
74873	Chloromethane	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	2.49E+02	2.62E+06	9.50E+06	1.30E-04	15	1.20E+03	7.79E-03	3.35E-01	1.75E-04	7.68E-04
75014	Vinyl chloride	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	2.61E+02	2.62E+06	9.50E+06	1.30E-04	15	6.00E+03	1.73E-02	7.48E-01	1.75E-04	6.44E-04
74839	Bromomethane	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	3.99E+06	2.62E+06	9.50E+06	1.30E-04	15	5.39E+03	3.84E-03	1.65E-01	1.75E-04	4.48E-04
75003	Ethyl Chloride	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	8.60E+01	2.62E+06	9.50E+06	1.30E-04	15	1.20E+03	7.79E-03	3.35E-01	1.75E-04	7.68E-04
75354	1,1-Dichloroethylene	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	1.20E+02	2.62E+06	9.50E+06	1.30E-04	15	6.39E+03	1.47E-02	6.34E-01	1.75E-04	6.47E-04
75131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	3.39E+05	2.62E+06	9.50E+06	1.30E-04	15	1.44E+03	4.55E-01	1.96E+01	1.75E-04	1.75E-04
75150	Carbon Disulfide	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	3.74E+02	2.62E+06	9.50E+06	1.30E-04	15	7.56E+03	1.97E-05	8.50E-04	1.75E-04	2.07E-03
67841	Acetone	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	8.78E+05	2.62E+06	9.50E+06	1.30E-04	15	6.68E+03	6.99E-03	3.01E-01	1.75E-04	6.34E-04
79209	Methyl Acetate	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	6.93E+07	2.62E+06	9.50E+06	1.30E-04	15	1.60E+03	9.89E-05	4.25E-03	1.75E-04	6.81E-04
75092	Methylene chloride	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	7.07E+02	2.62E+06	9.50E+06	1.30E-04	15	7.03E+03	1.17E-03	5.63E-02	1.75E-04	4.35E-04
159806	trans-1,2-Dichloroethylene	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	7.72E+01	2.62E+06	9.50E+06	1.30E-04	15	1.47E+03	8.27E-03	3.56E-01	1.75E-04	4.32E-04
1634044	Methyl-Tertiary-Butyl Ether	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	5.75E+01	2.62E+06	9.50E+06	1.30E-04	15	1.45E+03	5.18E-04	2.22E-02	1.75E-04	6.87E-04
76343	1,1-Dichloroethane	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	3.58E+02	2.62E+06	9.50E+06	1.30E-04	15	7.45E+03	2.88E-03	1.22E-01	1.75E-04	4.56E-04
156582	cis-1,2-Dichloroethylene	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	1.80E+02	2.62E+06	9.50E+06	1.30E-04	15	7.79E+03	2.04E-03	8.77E-02	1.75E-04	4.59E-04
78833	Butanone, 2- (MEK)	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	4.63E+07	2.62E+06	9.50E+06	1.30E-04	15	1.49E+03	4.90E-05	2.11E-03	1.75E-04	6.45E-04
71556	1,1,1-Trichloroethane	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	8.01E+06	2.62E+06	9.50E+06	1.30E-04	15	7.89E+03	8.50E-03	3.69E-01	1.75E-04	4.75E-04
110627	Cyclohexane	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	3.98E+06	2.62E+06	9.50E+06	1.30E-04	15	1.49E+03	1.75E+00	7.54E+01	1.75E-04	4.85E-04
71432	Benzene	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	2.10E+02	2.62E+06	9.50E+06	1.30E-04	15	8.12E+03	2.69E-03	1.16E-01	1.75E-04	5.42E-04
79016	Trichloroethylene	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	2.91E+02	2.62E+06	9.50E+06	1.30E-04	15	8.98E+03	4.79E-03	2.06E-01	1.75E-04	4.83E-04
108872	Methyl cyclohexane	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	4.45E+02	2.62E+06	9.50E+06	1.30E-04	15	1.51E+03	3.70E-01	1.59E+01	1.75E-04	5.82E-04
108883	Toluene	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	5.89E+02	2.62E+06	9.50E+06	1.30E-04	15	9.15E+03	2.92E-03	1.26E-01	1.75E-04	5.34E-04
127194	Tetrachloroethylene	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	1.47E+02	2.62E+06	9.50E+06	1.30E-04	15	9.55E+03	7.83E-03	3.37E-01	1.75E-04	4.39E-04
108907	Chlorobenzene	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	3.11E+02	2.62E+06	9.50E+06	1.30E-04	15	9.80E+03	1.64E-03	6.85E-02	1.75E-04	4.65E-04
130614	Ethylbenzene	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	1.84E+02	2.62E+06	9.50E+06	1.30E-04	15	1.02E+04	3.18E-03	1.37E-01	1.75E-04	4.60E-04
1330207	Xylenes	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	1.50E+05	2.62E+06	9.50E+06	1.30E-04	15	1.54E+03	5.86E-06	2.52E-04	1.75E-04	3.75E-03
100425	Styrene	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	8.44E+05	2.62E+06	9.50E+06	1.30E-04	15	1.05E+04	1.09E-03	4.87E-02	1.75E-04	4.47E-04
99828	Isopropylbenzene	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	1.06E+06	2.62E+06	9.50E+06	1.30E-04	15	1.54E+03	1.28E-02	5.51E-01	1.75E-04	3.92E-04
79345	1,1,2,2-Tetrachloroethane	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	1.10E+06	2.62E+06	9.50E+06	1.30E-04	15	1.06E+04	1.34E-04	5.77E-03	1.75E-04	5.85E-04
641731	Dichlorobenzene, 1,3-	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	1.00E+02	2.62E+06	9.50E+06	1.30E-04	15	1.60E+03	4.11E-03	1.77E-01	1.75E-04	2.56E-04
106467	1,4-Dichlorobenzene	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	2.50E+02	2.62E+06	9.50E+06	1.30E-04	15	1.12E+04	8.89E-04	3.83E-02	1.75E-04	4.39E-04
85501	1,2-Dichlorobenzene	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	5.10E+01	2.62E+06	9.50E+06	1.30E-04	15	1.21E+04	6.51E-07	2.37E-05	1.75E-04	3.94E-02
120821	1,2,4-Trichlorobenzene	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	1.13E+06	2.62E+06	9.50E+06	1.30E-04	15	1.32E+04	4.35E-04	1.87E-02	1.75E-04	2.95E-04
100927	Benzaldehyde	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	1.74E+06	2.62E+06	9.50E+06	1.30E-04	15	1.63E+03	2.29E-05	9.84E-04	1.75E-04	1.95E-08
91576	Methylnaphthalene, 2-	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	6.41E+03	2.62E+06	9.50E+06	1.30E-04	15	1.51E+03	8.80E-04	3.81E-02	1.75E-04	3.13E-04
82524	Biocetyl, 1,1'	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	8.81E+04	2.62E+06	9.50E+06	1.30E-04	15	1.47E+03	2.66E-04	1.14E-02	1.75E-04	3.15E-04
208968	Acenaphthylene	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	4.00E+02	2.62E+06	9.50E+06	1.30E-04	15	1.51E+03	2.45E-04	1.09E-02	1.75E-04	3.95E-04
83320	Acenaphthene	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	6.09E+04	2.62E+06	9.50E+06	1.30E-04	15	1.81E+04	3.67E-05	1.68E-03	1.75E-04	7.33E-04
132849	Dibenzofuran	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	1.79E+03	2.62E+06	9.50E+06	1.30E-04	15	1.47E+03	3.51E-03	1.51E-01	1.75E-04	1.66E-04
65737	Fluorene	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	2.97E+04	2.62E+06	9.50E+06	1.30E-04	15	1.62E+04	2.20E-08	6.48E-07	1.75E-04	8.16E-01
85018	Phenanthrene	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04	3.64E+04	2.62E+06	9.50E+06	1.30E-04	15	1.48E+03	1.14E-04	4.80E-03	1.75E-04	3.50E-03
120127	Anthracene	1	0.130	0.859	1.82E-08	0.390	6.33E-09	1.72E+04										

Appendix C 4
 Johnson & Ettinger Model - Data Entry Screen
 Inhalation of Volatiles from Soil
 Future Commercial Scenario - RME
 Southwest Properties, Wells G&H Superfund Site, Operable
 Whitney Barn

Chemical CAS No. (numbers only, no dashes)	Chemical	Diffusion path length, L _d (cm)	Convection path length, L _c (cm)	Soil-water partition coefficient, K _d (cm ³ /g)	Source vapor conc., C _{soil} (µg/m ³)	Crack radius, r _{crack} (cm)	Average vapor flow rate into bldg., Q _{avg} (cm ³ /s)	Crack effective diffusion coefficient, D _{crack} (cm ² /s)	Area of crack, A _{crack} (cm ²)	Exponent of equivalent roundabout Picket number, exp(Pick) (unitless)	Infinite indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., C _{soil} (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
96938	Trimethylbenzene, 1,2,4-	1	15	7.43E+00	N/A	0.10	2.74E+01	4.77E-04	1.23E+03	2.79E+303	1.08E-05	N/A	N/A	8.0E-03
840690	Dichloroethylene, 1,2-(1,1-d)	1	16	2.67E-01	N/A	0.10	2.74E+01	3.77E-04	1.23E+03	#NUM!	1.08E-05	N/A	#N/A	#N/A
108978	Trimethylbenzene, 1,3,5-	1	15	3.34E+00	N/A	0.10	2.74E+01	3.95E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	8.0E-03
104518	n-Butylbenzene	1	15	6.02E+00	N/A	0.10	2.74E+01	4.41E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	#N/A
91303	Naphthalene	1	15	4.00E+00	4.27E+03	0.10	2.74E+01	4.70E-04	1.23E+03	9.67E+307	1.08E-05	4.61E-02	N/A	3.0E-03
96978	Isopropylbenzene, 4-	1	15	3.18E+00	N/A	0.10	2.74E+01	4.39E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	4.0E-01
135988	Butylbenzene, sec-	1	15	6.22E-01	N/A	0.10	2.74E+01	4.98E-04	1.23E+03	6.47E+297	1.08E-05	N/A	N/A	#N/A
74873	Chloromethane	1	15	2.86E-02	3.24E+06	0.10	2.74E+01	7.66E-04	1.23E+03	1.14E+189	1.08E-05	3.81E+00	N/A	9.0E-02
76014	Vinyl chloride	1	15	3.72E-02	6.48E+06	0.10	2.74E+01	8.44E-04	1.23E+03	6.27E+224	1.08E-05	6.99E+00	8.8E-06	1.0E-01
74838	Bromomethane	1	15	2.86E-02	N/A	0.10	2.74E+01	4.48E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	5.0E-03
75003	Ethyl Chloride	1	16	2.86E-02	1.12E+06	0.10	2.74E+01	7.66E-04	1.23E+03	1.14E+189	1.08E-05	1.21E+00	N/A	1.0E+01
75354	1,1-Dichloroethylene	1	15	1.18E-01	2.04E+06	0.10	2.74E+01	5.47E-04	1.23E+03	3.62E+284	1.08E-05	2.21E+00	N/A	2.0E-01
78131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	1	16	4.60E-01	N/A	0.10	2.74E+01	1.75E-04	1.23E+03	#NUM!	1.07E-05	N/A	N/A	3.0E+01
87841	Acetone	1	16	1.15E-03	1.37E+03	0.10	2.74E+01	2.07E-03	1.23E+03	9.18E+69	1.08E-05	1.48E-02	N/A	N/A
75150	Carbon Disulfide	1	16	1.03E-01	N/A	0.10	2.74E+01	8.34E-04	1.23E+03	1.26E+228	1.08E-05	N/A	N/A	7.0E-01
79209	Methyl Acetate	1	16	6.84E-03	N/A	0.10	2.74E+01	8.81E-04	1.23E+03	1.17E+188	1.08E-05	N/A	N/A	#N/A
75092	Methylene chloride	1	16	2.34E-02	1.80E+06	0.10	2.74E+01	8.35E-04	1.23E+03	8.65E+227	1.08E-05	1.73E+00	4.7E-07	3.0E+00
158905	trans-1,2-Dichloroethylene	1	16	1.05E-01	8.20E+04	0.10	2.74E+01	4.32E-04	1.23E+03	#NUM!	1.08E-05	8.85E-01	N/A	2.0E-01
1634044	Methyl-Tertiary-Butyl Ether	1	16	7.69E-02	4.58E+03	0.10	2.74E+01	8.87E-04	1.23E+03	9.48E+216	1.08E-05	4.98E-02	N/A	3.0E+00
75343	1,1-Dichloroethane	1	16	8.32E-02	1.82E+06	0.10	2.74E+01	4.69E-04	1.23E+03	#NUM!	1.08E-05	1.75E+00	N/A	6.0E-01
156502	cis-1,2-Dichloroethylene	1	16	7.10E-02	8.85E+04	0.10	2.74E+01	4.69E-04	1.23E+03	#NUM!	1.08E-05	8.13E-01	N/A	3.0E-01
78933	Butane, 2- (MEK)	1	16	7.88E-03	N/A	0.10	2.74E+01	9.49E-04	1.23E+03	1.18E+183	1.08E-05	N/A	N/A	N/A
71666	1,1,1-Trichloroethane	1	15	2.20E-01	N/A	0.10	2.74E+01	4.78E-04	1.23E+03	4.36E+304	1.08E-05	N/A	N/A	2.2E+00
110827	Cyclohexane	1	15	3.20E-01	N/A	0.10	2.74E+01	4.85E-04	1.23E+03	3.18E+298	1.08E-05	N/A	N/A	#N/A
71432	Benzene	1	15	1.18E-01	7.41E+04	0.10	2.74E+01	5.43E-04	1.23E+03	1.81E+267	1.08E-05	8.02E-01	7.8E-06	3.0E-02
79010	Trichloroethylene	1	15	3.32E-01	1.09E+06	0.10	2.74E+01	4.83E-04	1.23E+03	3.77E+299	1.08E-05	1.18E+00	1.1E-04	4.0E-02
108872	Methyl cyclohexane	1	15	6.36E-01	3.35E+06	0.10	2.74E+01	5.98E-04	1.23E+03	1.60E+242	1.08E-05	3.82E+01	N/A	3.0E+00
108883	Toluene	1	15	3.64E-01	1.28E+06	0.10	2.74E+01	5.34E-04	1.23E+03	1.10E+271	1.08E-05	1.39E+00	N/A	4.0E-01
127184	Tetrachloroethylene	1	15	3.10E-01	9.19E+04	0.10	2.74E+01	4.39E-04	1.23E+03	#NUM!	1.08E-05	9.82E-01	5.9E-08	N/A
108907	Chlorobenzene	1	15	4.38E-01	3.21E+04	0.10	2.74E+01	4.55E-04	1.23E+03	#NUM!	1.08E-05	3.48E-01	N/A	8.0E-02
100414	Ethylbenzene	1	15	7.28E-01	2.88E+04	0.10	2.74E+01	4.60E-04	1.23E+03	#NUM!	1.08E-05	2.90E-01	N/A	1.0E+00
1330207	Xylenes	1	15	4.82E-01	N/A	0.10	2.74E+01	3.76E-03	1.23E+03	4.03E+38	1.09E-05	N/A	N/A	1.0E-01
100425	Styrene	1	15	1.65E+00	N/A	0.10	2.74E+01	4.47E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	#N/A
98826	Isopropylbenzene	1	15	1.88E+01	N/A	0.10	2.74E+01	3.85E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	4.0E-01
79346	1,1,3,3-Tetrachloroethane	1	15	1.87E-01	N/A	0.10	2.74E+01	5.65E-04	1.23E+03	1.98E+259	1.08E-05	N/A	N/A	#N/A
641731	Dichlorobenzene, 1,3-	1	15	3.40E-01	3.19E+04	0.10	2.74E+01	2.59E-04	1.23E+03	#NUM!	1.07E-05	3.42E-01	N/A	N/A
109487	1,4-Dichlorobenzene	1	15	1.21E+00	6.96E+03	0.10	2.74E+01	4.38E-04	1.23E+03	#NUM!	1.08E-05	7.19E-02	N/A	8.0E-01
95501	1,2-Dichlorobenzene	1	15	1.07E-01	3.84E+00	0.10	2.74E+01	3.84E-02	1.23E+03	4.74E+03	1.09E-05	4.29E-05	N/A	N/A
129821	1,2,4-Trichlorobenzene	1	15	3.99E+00	N/A	0.10	2.74E+01	2.29E-04	1.23E+03	#NUM!	1.07E-05	N/A	N/A	2.0E-01
100827	Benzaldehyde	1	15	6.54E-02	N/A	0.10	2.74E+01	1.35E-03	1.23E+03	2.80E+107	1.08E-05	N/A	N/A	#N/A
91577	Methylnaphthalene, 2-	1	15	1.70E-01	1.20E+04	0.10	2.74E+01	1.13E-04	1.23E+03	#NUM!	1.08E-05	1.29E-01	N/A	3.0E-03
82524	Biphenyl, 1,1'-	1	15	1.25E+01	N/A	0.10	2.74E+01	3.15E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	N/A
209968	Acephenanthrene	1	15	9.67E+00	4.31E+02	0.10	2.74E+01	3.38E-04	1.23E+03	#NUM!	1.08E-05	4.64E-03	N/A	3.0E-03
83329	Acenaphthene	1	15	1.42E+01	N/A	0.10	2.74E+01	7.33E-04	1.23E+03	2.13E+187	1.08E-05	N/A	N/A	3.0E-03
132849	Dibenzofuran	1	15	1.83E+03	1.94E+04	0.10	2.74E+01	1.05E-04	1.23E+03	#NUM!	1.07E-05	1.75E-01	N/A	N/A
86737	Fluorene	1	15	1.54E+01	N/A	0.10	2.74E+01	8.18E-01	1.23E+03	1.60E+00	3.24E-06	N/A	N/A	3.0E-03
85016	Phenanthrene	1	15	2.83E+01	8.27E+03	0.10	2.74E+01	3.50E-04	1.23E+03	#NUM!	1.08E-05	8.78E-02	N/A	3.0E-03
120127	Anthracene	1	15	5.90E+01	N/A	0.10	2.74E+01	1.90E-03	1.23E+03	5.14E+90	1.08E-05	N/A	N/A	3.0E-03
CS-C8	CS-C8 Aliphatics	1	15	4.63E+00	3.84E+06	0.10	2.74E+01	3.84E-04	1.23E+03	#NUM!	1.08E-05	4.14E+03	N/A	2.0E-01
CB-C12	CB-C12 Aliphatics	1	15	3.00E+02	6.78E+06	0.10	2.74E+01	3.84E-04	1.23E+03	#NUM!	1.08E-05	7.29E+01	N/A	2.0E-01
CB-C10	CB-C10 Aromatics	1	15	3.96E+00	1.95E+07	0.10	2.74E+01	3.89E-04	1.23E+03	#NUM!	1.08E-05	2.10E+02	N/A	5.0E-02
CB-C18	CB-C18 Aliphatics	1	15	1.39E+03	1.89E+08	0.10	2.74E+01	3.84E-04	1.23E+03	#NUM!	1.08E-05	1.70E+03	N/A	2.0E-01
C11-C22	C11-C22 Aromatics	1	15	1.00E+01	8.23E+08	0.10	2.74E+01	4.27E-04	1.23E+03	#NUM!	1.08E-05	6.72E+01	N/A	5.0E-02

Appendix C.4
 Johnson & Edgar Model - Data Entry Screen
 Inhalation of Volatiles from Soil
 Future Commercial Scenario - RME
 Southwest Petroleum, Well O&H Superfund Site, Downable Unit 2
 Whitney Barrel

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Chemical CAS No. (numbers only, no dashes)	Chemical	Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based Indoor exposure soil conc., (µg/kg)	Soil saturation conc., (µg/kg)	Final indoor exposure soil conc., (µg/kg)
95936	Trimethylbenzene, 1,2,4-	NA	NA	NA	4.38E+05	NA
64090	Dichloroethene, 1,2- (total)	NA	NA	NA	5.96E+02	NA
104678	Trimethylbenzene, 1,3,5-	NA	NA	NA	7.13E+04	NA
104518	n-Butylbenzene	NA	NA	NA	8.63E+03	NA
91203	Naphthalene	NA	NA	NA	1.30E+05	NA
96876	Isopropyltoluene, 4-	NA	NA	NA	7.31E+05	NA
135668	Butylbenzene, sec-	NA	NA	NA	1.10E+08	NA
74873	Chloroethane	NA	NA	NA	1.37E+09	NA
75014	Vinyl chloride	NA	NA	NA	8.33E+05	NA
74830	Bromomethane	NA	NA	NA	3.89E+06	NA
75003	Ethyl Chloride	NA	NA	NA	1.37E+09	NA
75354	1,1-Dichloroethene	NA	NA	NA	6.36E+05	NA
70131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	NA	NA	NA	3.99E+05	NA
67641	Acetone	NA	NA	NA	2.01E+08	NA
75160	Carbon Disulfide	NA	NA	NA	6.78E+05	NA
79208	Methyl Acetate	NA	NA	NA	6.03E+07	NA
76092	Methylene chloride	NA	NA	NA	2.86E+08	NA
169606	trans-1,2-Dichloroethane	NA	NA	NA	2.12E+06	NA
1034044	Methyl Tertiary-Butyl Ether	NA	NA	NA	1.42E+07	NA
75343	1,1-Dichloroethane	NA	NA	NA	1.36E+06	NA
156962	cis-1,2-Dichloroethane	NA	NA	NA	9.75E+05	NA
78933	Butanone, 2- (MEK)	NA	NA	NA	4.63E+07	NA
71566	1,1,1-Trichloroethane	NA	NA	NA	6.01E+05	NA
110627	Cyclohexane	NA	NA	NA	1.66E+07	NA
71432	Benzene	NA	NA	NA	5.74E+05	NA
79018	Trichloroethylene	NA	NA	NA	6.95E+05	NA
106872	Methyl cyclohexane	NA	NA	NA	2.85E+04	NA
106863	Toluene	NA	NA	NA	3.02E+05	NA
127184	Tetrachloroethylene	NA	NA	NA	1.65E+05	NA
106807	Chlorobenzene	NA	NA	NA	3.04E+05	NA
100414	Ethylbenzene	NA	NA	NA	1.58E+05	NA
1330207	Xylenes	NA	NA	NA	1.50E+05	NA
100426	Styrene	NA	NA	NA	6.44E+05	NA
96628	Isopropylbenzene	NA	NA	NA	1.66E+06	NA
79245	1,1,2,2-Tetrachloroethane	NA	NA	NA	1.15E+06	NA
541731	Dichlorobenzene, 1,3-	NA	NA	NA	3.82E+04	NA
104647	1,4-Dichlorobenzene	NA	NA	NA	1.08E+05	NA
96501	1,2-Dichlorobenzene	NA	NA	NA	8.50E+05	NA
130321	1,2,4-Trichlorobenzene	NA	NA	NA	1.13E+06	NA
100627	Benzonitrile	NA	NA	NA	1.74E+06	NA
91578	Methylnaphthalene, 2-	NA	NA	NA	4.24E+05	NA
92524	Biphenyl, 1,1'-	NA	NA	NA	8.81E+04	NA
209988	Acenaphthylene	NA	NA	NA	3.84E+04	NA
83336	Acenaphthene	NA	NA	NA	8.69E+04	NA
132849	Dibenzofuran	NA	NA	NA	1.85E+05	NA
96737	Fluorene	NA	NA	NA	2.97E+04	NA
86018	Phenanthrene	NA	NA	NA	3.84E+04	NA
120127	Anthracene	NA	NA	NA	2.37E+03	NA
C9-C9	C9-C9 Aromatics	NA	NA	NA	7.89E+07	NA
C9-C12	C9-C12 Aromatics	NA	NA	NA	2.12E+07	NA
C9-C10	C9-C10 Aromatics	NA	NA	NA	1.92E+08	NA
C9-C18	C9-C18 Aromatics	NA	NA	NA	1.35E+07	NA
C11-C22	C11-C22 Aromatics	NA	NA	NA	6.92E+07	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from Intrusion to Indoor air, carcinogen (unitless)	Hazard quotient from vapor Intrusion to Indoor air, noncarcinogen (unitless)
NA	NA
NA	NA
NA	NA
NA	NA
NA	3.5E-03
NA	NA
NA	NA
NA	NA
NA	8.8E-03
5.0E-06	1.6E-02
NA	NA
NA	2.6E-06
NA	2.5E-03
NA	NA
NA	NA
NA	NA
6.0E-06	1.3E-04
NA	1.0E-03
NA	3.8E-06
NA	8.0E-04
NA	7.0E-04
NA	NA
NA	NA
5.1E-07	6.1E-03
1.1E-05	6.7E-03
NA	2.8E-03
NA	1.6E-04
4.8E-07	NA
NA	1.5E-03
NA	9.8E-05
NA	NA
NA	NA
NA	NA
NA	NA
NA	NA
NA	2.1E-03
NA	NA
NA	NA
NA	NA
NA	NA
NA	3.5E-04
NA	NA
NA	NA
NA	NA
NA	5.1E-03
NA	NA
NA	4.7E+00
NA	8.3E-02
NA	8.5E-01
NA	1.6E+00
NA	3.1E-01

95% UCL
 Cancer
 Risk
 2E-05
 95% UCL
 HI
 8.1E+00
 TOTAL: 2E-05 8.1E+00
 [] = Cancer risk > 1E-05
 or HQ/HT > 1E+00

Trimethylbenzene, 1,2,4-
 MESSAGE: Soil conc. >= saturation (Cas). Risk/HQ calculated at Cas.
 Dichloroethene, 1,2- (total)
 MESSAGE: Soil conc. >= saturation (Cas). Risk/HQ calculated at Cas.
 Trimethylbenzene, 1,3,5-
 MESSAGE: Soil conc. >= saturation (Cas). Risk/HQ calculated at Cas.
 n-Butylbenzene
 MESSAGE: Soil conc. >= saturation (Cas). Risk/HQ calculated at Cas.
 Naphthalene
 MESSAGE: Soil conc. >= saturation (Cas). Risk/HQ calculated at Cas.
 Isopropyltoluene, 4-
 MESSAGE: Soil conc. >= saturation (Cas). Risk/HQ calculated at Cas.
 Butylbenzene, sec-
 MESSAGE: Soil conc. >= saturation (Cas). Risk/HQ calculated at Cas.
 Chloroethane
 MESSAGE: Soil conc. >= saturation (Cas). Risk/HQ calculated at Cas.
 Vinyl chloride
 MESSAGE: Soil conc. >= saturation (Cas). Risk/HQ calculated at Cas.
 Bromomethane
 MESSAGE: Soil conc. >= saturation (Cas). Risk/HQ calculated at Cas.
 Ethyl Chloride
 MESSAGE: Soil conc. >= saturation (Cas). Risk/HQ calculated at Cas.
 1,1-Dichloroethene
 MESSAGE: Soil conc. >= saturation (Cas). Risk/HQ calculated at Cas.
 Trichloro-1,2,2-trifluoroethane, 1,1,2-
 MESSAGE: Soil conc. >= saturation (Cas). Risk/HQ calculated at Cas.
 Acetone
 MESSAGE: Soil conc. >= saturation (Cas). Risk/HQ calculated at Cas.
 Carbon Disulfide
 MESSAGE: Soil conc. >= saturation (Cas). Risk/HQ calculated at Cas.
 Methyl Acetate
 MESSAGE: Soil conc. >= saturation (Cas). Risk/HQ calculated at Cas.
 Methylene chloride
 MESSAGE: Soil conc. >= saturation (Cas). Risk/HQ calculated at Cas.
 trans-1,2-Dichloroethane
 MESSAGE: Soil conc. >= saturation (Cas). Risk/HQ calculated at Cas.
 Methyl Tertiary-Butyl Ether
 MESSAGE: Soil conc. >= saturation (Cas). Risk/HQ calculated at Cas.
 1,1-Dichloroethane
 MESSAGE: Soil conc. >= saturation (Cas). Risk/HQ calculated at Cas.
 cis-1,2-Dichloroethane
 MESSAGE: Soil conc. >= saturation (Cas). Risk/HQ calculated at Cas.
 Butanone, 2- (MEK)
 MESSAGE: Soil conc. >= saturation (Cas). Risk/HQ calculated at Cas.
 1,1,1-Trichloroethane
 MESSAGE: Soil conc. >= saturation (Cas). Risk/HQ calculated at Cas.
 Cyclohexane
 MESSAGE: Soil conc. >= saturation (Cas). Risk/HQ calculated at Cas.
 Benzene
 MESSAGE: Soil conc. >= saturation (Cas). Risk/HQ calculated at Cas.
 Trichloroethylene

CALCULATE RISK-BASED SOIL CONCENTRATION (enter "X" in "YES" box)

SL-SCREEN
Version 2.3, 03/01

YES OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL SOIL CONCENTRATION (enter "X" in "YES" box and initial soil conc. below)

YES X

ENTER Chemical CAS No. (Inorganic only, no dyes)	Enter initial soil concentration		ENTER Depth below grade to bottom of exposed soil conc. L ₁ (ft or 300 cm)	ENTER Depth below grade to top of contamination L ₂ (ft)	ENTER Average soil temperature, T _a (°C)	ENTER Vadose zone SCS soil type used to estimate soil vapor conductivity, Note OR	ENTER User-defined vadose zone soil vapor conductivity, K _v (cm ² /sec)	ENTER Vadose zone soil total porosity, P _t (unitless)	ENTER Vadose zone soil water-filled porosity, P _w (unitless)	ENTER Vadose zone soil organic carbon fraction, f _{oc} (unitless)	ENTER Averaging time for contaminant, ATC (hrs)	ENTER Averaging time for noncancerous, ATNC (hrs)	ENTER Exposure duration, ED (days)	ENTER Exposure frequency, EF (days/yr)	ENTER Exposure time ET (hrs/day)	ENTER Conversion factor CF (mg/kg)	ENTER Target level for cancerous, TL _C (µg/kg)	ENTER Target hazard quotient for noncancerous, THQ (unitless)	
	Chemical	Mean soil conc., C ₀ (µg/g)																	ENTER Mean soil conc., C ₁ (µg/g)
9809	Trinitrobenzene, 1,2,4		10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
94860	Dichloroethene, 1,2 (total)		10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
10667	Trinitrobenzene, 1,3,5		10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
146818	n-Butylbenzene		10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
9180	Naphthalene	2.74E+02	10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
98076	Isopropylbenzene, 4-		10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
12666	Butylbenzene, sec.		10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
F4073	Chloroethane	2.49E+02	10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
75014	Vinyl chloride	2.67E+02	10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
F4030	Bromoethane		10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
79000	Ethyl chloride	8.80E+01	10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
F5044	1,1-Dichloroethene	8.34E+01	10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
F6131	Trichloro-1,2,2-trifluoroethane, 1,1,2-		10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
97961	Acetone	3.24E+02	10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
F3199	Carbon Dioxide		10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
79099	Methyl acetate		10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
F5090	Methylene chloride	7.27E+02	10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
106605	trans-1,2-Dichloroethene	7.73E+01	10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
103004	Methyl-Tertiary-Butyl Ether	8.70E+01	10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
F3343	1,1-Dichloroethane	3.58E+02	10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
106688	cis-1,2-Dichloroethene	1.80E+02	10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
F6663	Butanone, 2- (MEK)		10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
F1999	1,1,1-Trichloroethane		10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
110407	Cyclohexane		10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
F1632	Benzene	8.09E+01	10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
F9916	Trichloroethylene	2.91E+02	10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
106672	Methyl cyclohexane	4.49E+02	10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
106684	Toluene	2.93E+02	10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
F2164	Tetrachloroethene	1.47E+02	10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
106697	Chlorobenzene	3.11E+02	10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
106144	Ethylbenzene	1.84E+02	10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
103997	Xylene		10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
103929	Styrene		10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
9406	Isopropylbenzene		10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
F9946	1,1,2,2-Tetrachloroethane		10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
941791	Dichlorobenzene, 1,3-	1.00E+02	10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
941847	1,4-Dichlorobenzene	2.84E+02	10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
99991	1,2-Dichlorobenzene	9.10E+01	10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
106671	1,2,4-Trichlorobenzene		10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
106677	Benzonitrile		10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
F1919	Methylenechloride, 2-	8.41E+03	10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
20634	Bisphenol, 1,1'		10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
20696	Acenaphthylene	4.00E+02	10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
62028	Acenaphthene		10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
63068	Ortho-xylene	1.76E+03	10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
64792	Fluorene		10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
89916	Phenanthrene	3.00E+04	10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
106670	Anthracene		10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
64624	CS-C8 Aliphatics	8.80E+04	10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
64610	CS-C12 Aliphatics	6.11E+04	10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
64616	CS-C18 Aliphatics	4.31E+02	10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
64619	CS-C19 Aliphatics	8.25E+00	10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1
61100	C11-C22 Aromatics	9.24E+06	10	10	10	LB	1	1.0	0.43	0.3	0.002	70	9	9	210	6	8700	1.0E-06	1

Note: 1) Default soil permeability from Table 7 of User's Guide for Evaluating Subsurface Vapor Intrusion into Building (U.S. EPA June 18, 2001) were used for soil water filled porosity (P_w), soil organic carbon fraction (f_{oc}), soil total porosity (P_t), and soil dry bulk density (ρ_d).

Appendix C.4
 Johnson & Ettinger Model - Data Entry Screen
 Inhalation of Volatiles from Soil
 Future Commercial Scenario - CT
 Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
 Whitney Barrel

Chemical CAS No. (numbers only, no dashes)	Chemical	Diffusivity in air, D _a (cm ² /s)	Diffusivity in water, D _w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T _R (°C)	Enthalpy of vaporization at the normal boiling point, ΔH _{v,b} (cal/mol)	Normal boiling point, T _b (°K)	Critical temperature, T _c (°K)	Organic carbon partition coefficient, K _{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
95636	Trimethylbenzene, 1,2,4-	7.80E-02	9.03E-06	5.70E-03	25	1.25E+03	442.30	649.11	3.72E+03	5.70E+01	N/A	6.0E-03	L
540590	Dichloroethylene, 1,2- (total)	5.59E-02	6.47E-06	4.30E-04	20	1.32E+03	585.00	877.50	1.28E+02	1.30E+00	#N/A	#N/A	0.0E+00
108678	Trimethylbenzene, 1,3,5-	6.48E-02	7.86E-06	7.81E-03	25	1.25E+03	442.30	649.11	1.67E+03	2.00E+01	N/A	6.0E-03	L
104518	n-Butylbenzene	7.25E-02	8.39E-06	1.25E-02	25	1.23E+03	456.00	684.00	2.51E+03	1.26E+00	#N/A	#N/A	L
91203	Naphthalene	5.90E-02	7.50E-06	4.83E-04	25	1.04E+04	491.14	748.40	2.00E+03	3.10E+01	N/A	3.0E-03	S
99976	Isopropyltoluene, 4-	7.25E-02	8.39E-06	8.60E+00	25	1.24E+03	450.10	652.04	1.58E+03	2.34E+01	N/A	4.0E-01	L
135986	Butylbenzene, sec.	8.00E-02	8.00E-06	1.67E-02	25	1.24E+03	446.65	689.98	3.11E+04	1.76E+01	#N/A	#N/A	0.0E+00
74673	Chloromethane	1.26E-01	6.50E-06	8.67E-03	25	1.35E+03	249.00	373.50	1.43E+01	5.32E+03	N/A	9.0E-02	0.0E+00
75014	Vinyl chloride	1.06E-01	1.23E-05	2.71E-02	25	5.25E+03	259.25	432.00	1.86E+01	2.76E+03	8.8E-06	1.0E-01	L
74839	Bromomethane	7.28E-02	1.21E-05	8.22E-03	25	5.49E+03	278.50	414.75	1.43E+01	1.52E+04	N/A	5.0E-03	0.0E+00
75003	Ethyl Chloride	1.26E-01	6.50E-06	8.67E-03	25	1.36E+03	249.00	373.50	1.43E+01	5.32E+03	N/A	1.0E+01	L
75354	1,1-Dichloroethylene	9.00E-02	1.04E-05	2.61E-02	25	6.25E+03	304.75	576.05	5.89E+01	2.25E+03	N/A	2.0E-01	L
76131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	2.88E-02	8.07E-06	5.17E-01	25	1.33E+03	320.70	481.05	2.25E+02	1.70E+02	N/A	3.0E+01	0.0E+00
87641	Acetone	1.24E-01	1.14E-05	3.88E-05	25	6.96E+03	329.20	508.10	5.75E-01	1.00E+06	N/A	N/A	L
75150	Carbon Disulfide	1.04E-01	1.29E-05	1.27E-02	25	6.39E+03	319.00	552.00	5.14E+01	2.67E+03	N/A	7.0E-01	L
79209	Methyl Acetate	1.04E-01	1.00E-05	1.13E-04	25	1.31E+03	365.00	547.50	3.32E+00	2.43E+05	#N/A	#N/A	0.0E+00
75092	Methylene chloride	1.01E-01	1.17E-05	2.19E-03	25	6.71E+03	313.00	510.00	1.17E+01	1.30E+04	4.7E-07	3.0E+00	L
156605	trans-1,2-Dichloroethylene	7.07E-02	1.19E-05	9.39E-03	25	1.33E+03	320.85	516.50	5.25E+01	8.30E+03	N/A	2.0E-01	L
163404	Methyl-Tertiary-Butyl Ether	1.02E-01	1.05E-05	5.87E-04	25	1.32E+03	328.36	497.11	3.84E+01	5.10E+04	N/A	3.0E+00	L
75343	1,1-Dichloroethane	7.42E-02	1.05E-05	5.61E-03	25	6.90E+03	330.65	523.00	3.16E+01	5.06E+03	N/A	5.0E-01	L
158592	dis-1,2-Dichloroethylene	7.36E-02	1.13E-05	4.07E-03	25	7.19E+03	333.65	544.00	3.55E+01	3.50E+03	N/A	2.0E-01	L
78933	Butanone, 2- (MEK)	8.08E-02	9.80E-06	5.60E-05	25	1.31E+03	352.60	528.75	3.83E+00	2.23E+05	N/A	N/A	0.0E+00
71556	1,1,1-Trichloroethane	7.80E-02	8.80E-06	1.72E-02	25	7.14E+03	347.24	545.00	1.10E+02	1.33E+03	N/A	2.2E+00	L
110827	Cyclohexane	8.00E-02	9.00E-06	2.00E+00	25	1.31E+03	353.85	530.78	1.60E+02	5.50E+01	#N/A	#N/A	0.0E+00
71432	Benzene	8.80E-02	9.80E-06	5.56E-03	25	7.34E+03	353.24	562.16	5.89E+01	1.75E+03	7.8E-06	3.0E-02	L
79016	Trichloroethylene	7.90E-02	9.10E-06	1.03E-02	25	7.51E+03	360.36	544.20	1.66E+02	1.10E+03	1.1E-04	4.0E-02	L
108872	Methyl cyclohexane	9.86E-02	8.52E-06	4.23E-01	25	1.30E+03	373.90	560.85	2.68E+02	1.40E+01	N/A	3.0E+00	L
108983	Toluene	8.70E-02	8.80E-06	6.03E-03	25	7.93E+03	383.78	591.79	1.82E+02	5.26E+02	N/A	4.0E-01	L
127184	Tetrachloroethylene	7.20E-02	8.20E-06	1.84E-02	25	8.29E+03	394.40	620.20	1.55E+02	2.00E+02	5.9E-06	N/A	L
108907	Chlorobenzene	7.30E-02	8.70E-06	3.71E-03	25	8.41E+03	404.67	632.40	2.19E+02	4.72E+02	N/A	6.0E-02	L
100414	Ethylbenzene	7.50E-02	7.80E-06	7.88E-03	25	8.50E+03	409.34	617.20	3.83E+02	1.69E+02	N/A	1.0E+00	L
1330207	Xylenes	7.69E-02	8.44E-06	6.73E-06	25	1.26E+03	417.40	616.21	2.41E+02	2.20E+02	N/A	1.0E-01	L
100425	Styrene	7.10E-02	8.00E-06	2.76E-03	25	8.74E+03	418.31	636.00	7.76E+02	3.10E+02	#N/A	#N/A	L
98828	Isopropylbenzene	6.50E-02	7.83E-06	1.47E-02	25	1.26E+03	425.40	631.01	9.31E+03	5.60E+01	N/A	4.0E-01	L
79345	1,1,2,2-Tetrachloroethane	7.10E-02	7.90E-06	3.44E-04	25	9.00E+03	419.80	661.15	9.33E+01	2.97E+03	#N/A	#N/A	L
541731	Dichlorobenzene, 1,3-	4.14E-02	8.85E-06	4.70E-03	25	1.24E+03	448.00	683.96	1.70E+02	8.88E+01	N/A	N/A	L
108467	1,4-Dichlorobenzene	6.90E-02	7.90E-06	2.43E-03	25	9.27E+03	447.21	694.75	6.17E+02	7.38E+01	N/A	8.0E-01	S
95501	1,2-Dichlorobenzene	6.88E-02	9.41E-06	1.62E-06	25	9.70E+03	465.00	697.50	5.34E+01	2.77E+04	N/A	N/A	S
120821	1,2,4-Trichlorobenzene	3.00E-02	8.23E-06	1.42E-03	25	1.05E+04	488.15	725.00	1.78E+03	3.00E+02	N/A	2.0E-01	L
100527	Benzaldehyde	7.30E-02	9.07E-06	2.62E-05	25	1.24E+03	452.00	678.00	3.27E+01	8.57E+03	#N/A	#N/A	0.0E+00
91576	Methylnaphthalene, 2-	4.84E-02	7.75E-06	1.01E-03	25	1.17E+03	614.05	761.01	8.51E+03	2.46E+01	N/A	3.0E-03	S
92524	Biphenyl, 1,1'-	4.04E-02	8.15E-06	3.03E-04	25	1.15E+03	529.10	793.65	6.25E+03	6.94E+00	N/A	N/A	0.0E+00
208968	Acenaphthylene	4.43E-02	7.44E-06	2.80E-04	25	1.12E+03	553.00	792.01	4.79E+03	3.93E+00	N/A	3.0E-03	S
83329	Acenaphthene	4.21E-02	7.69E-06	1.55E-04	25	1.22E+04	550.54	803.15	7.08E+03	4.24E+00	N/A	3.0E-03	S
132649	Dibenzofuran	2.67E-02	5.93E-06	4.00E-03	25	1.11E+03	559.00	824.01	8.13E+03	1.00E+01	N/A	N/A	S
86737	Fluorene	3.63E-02	7.86E-06	9.41E-08	25	1.27E+04	570.44	870.00	7.71E+03	1.90E+00	N/A	3.0E-03	S
85018	Phenanthrene	3.30E-02	7.47E-06	1.30E-04	25	1.06E+03	613.00	869.01	1.41E+04	1.28E+00	N/A	3.0E-03	S
120127	Anthracene	3.24E-02	7.74E-06	6.51E-05	25	1.31E+04	615.18	873.00	2.95E+04	4.34E-02	N/A	3.0E-03	S
C5-C8	C5-C8 Aliphatics	6.00E-02	1.00E-05	1.30E+00	25	NA	NA	NA	2.27E+03	1.10E+04	N/A	2.0E-01	S
C9-C12	C9-C12 Aliphatics	6.00E-02	1.00E-05	1.58E+00	25	NA	NA	NA	1.50E+05	7.00E+01	N/A	2.0E-01	S
C9-C10	C9-C10 Aromatics	6.00E-02	1.00E-05	7.92E-03	25	NA	NA	NA	1.78E+03	5.10E+04	N/A	5.0E-02	S
C9-C18	C9-C18 Aliphatics	6.00E-02	1.00E-05	1.66E+00	25	NA	NA	NA	6.80E+05	1.00E+01	N/A	2.0E-01	S
C11-C22	C11-C22 Aromatics	6.00E-02	1.00E-05	7.32E-04	25	NA	NA	NA	5.00E+03	5.80E+03	N/A	5.0E-02	S

Appendix C.4
 Johnson & Ettinger Model - Data Entry Screen
 Inhalation of Volatiles from Soil
 Future Commercial Scenario - CT
 Southwest Properties, Wells GS-1 Superfund Site, Operable Unit 2
 Whitney Barrel

Chemical CAS No. (numbers only, no dashes)	Chemical	Source- building separatn, LT (cm)	Vadose zone soil air-filled porosity, θ_a (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_w (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{ra} (cm^2)	Vadose zone soil effective vapor permeability, k_e (cm^2)	Floor- wall seam permeat., Xracc (cm)	Initial soil concentration used, OR ($\mu g/kg$)	Bldg. ventilation rate, Q_{vent} (m^3/s)	Area of enclosed space below grade, A_e (cm^2)	Crack- to-total area ratio, τ (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,20}$ (cal/mol)	Henry's law constant at ave. soil temperature, $H_{T,20}$ (atm-m ³ /mol)	Henry's law constant at ave. soil temperature, HTS (unitless)	Vapor viscosity at ave. soil temperature, $\mu_{T,20}$ ($g/cm-s$)	Vadose zone effective diffusion, D_{eff}^v (cm^2/s)
96836	Trimethylbenzene, 1,2,4-	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	4.38E+05	2.52E+08	9.50E+06	1.30E-04	15	1.56E+03	4.99E+03	2.13E-01	1.76E-04	4.77E-04
540590	Dichloroethylene, 1,2- (total)	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	5.96E+02	2.52E+08	9.50E+06	1.30E-04	15	1.73E+03	3.87E+04	1.87E-02	1.76E-04	3.77E-04
108678	Trimethylbenzene, 1,3,5-	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	7.13E+04	2.52E+08	9.50E+06	1.30E-04	15	1.58E+03	6.80E+03	2.93E-01	1.76E-04	3.95E-04
104518	n-Butylbenzene	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	8.03E+03	2.52E+08	9.50E+06	1.30E-04	15	1.53E+03	1.09E+02	4.68E-01	1.76E-04	4.41E-04
91203	Naphthalene	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	2.74E+03	2.52E+08	9.50E+06	1.30E-04	15	1.29E+04	1.62E+04	8.65E-03	1.76E-04	4.70E-04
98876	Isopropyltoluene, 4-	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	7.31E+05	2.52E+08	9.50E+06	1.30E-04	15	1.67E+03	7.48E+00	3.22E+02	1.76E-04	4.39E-04
135988	Butylbenzene, sec-	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	1.10E+06	2.52E+08	9.50E+06	1.30E-04	15	1.53E+03	1.46E+02	8.27E-01	1.76E-04	4.68E-04
74873	Chloroethane	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	2.49E+02	2.52E+08	9.50E+06	1.30E-04	15	1.20E+03	7.79E+03	3.35E-01	1.76E-04	7.86E-04
75014	Vinyl chloride	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	2.81E+02	2.52E+08	9.50E+06	1.30E-04	15	5.00E+03	1.73E+02	7.48E-01	1.76E-04	6.44E-04
74839	Bromomethane	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	3.89E+06	2.52E+08	9.50E+06	1.30E-04	15	5.39E+03	3.84E+03	1.66E-01	1.76E-04	4.48E-04
75003	Ethyl Chloride	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	8.89E+01	2.52E+08	9.50E+06	1.30E-04	15	1.20E+03	7.79E+03	3.35E-01	1.76E-04	7.86E-04
75354	1,1-Dichloroethylene	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	6.34E+01	2.52E+08	9.50E+06	1.30E-04	15	6.39E+03	1.47E+02	6.34E-01	1.76E-04	5.47E-04
76131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	3.99E+05	2.52E+08	9.50E+06	1.30E-04	15	1.44E+03	4.65E+01	1.08E+01	1.76E-04	1.76E-04
67841	Acetone	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	3.24E+02	2.52E+08	9.50E+06	1.30E-04	15	7.98E+03	1.07E+05	8.50E-04	1.76E-04	2.07E-03
75150	Carbon Disulfide	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	8.78E+05	2.52E+08	9.50E+06	1.30E-04	15	6.84E+03	8.99E+03	3.01E-01	1.76E-04	6.34E-04
79209	Methyl Acetate	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	5.03E+07	2.52E+08	9.50E+06	1.30E-04	15	1.50E+03	9.68E+05	4.25E-03	1.76E-04	8.61E-04
75092	Methylene chloride	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	7.27E+02	2.52E+08	9.50E+06	1.30E-04	15	7.03E+03	1.17E+03	6.03E-02	1.76E-04	8.35E-04
158905	trans-1,2-Dichloroethylene	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	7.73E+01	2.52E+08	9.50E+06	1.30E-04	15	1.42E+03	8.27E+03	3.68E-01	1.76E-04	4.32E-04
1634044	Methyl-Tertiary-Butyl Ether	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	5.75E+01	2.52E+08	9.50E+06	1.30E-04	15	1.45E+03	5.16E+04	2.22E-02	1.76E-04	6.67E-04
72343	1,1-Dichloroethane	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	3.58E+02	2.52E+08	9.50E+06	1.30E-04	15	7.49E+03	2.89E+03	1.24E-01	1.76E-04	4.58E-04
158592	cis-1,2-Dichloroethylene	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	1.60E+02	2.52E+08	9.50E+06	1.30E-04	15	7.73E+03	2.04E+03	8.77E-02	1.76E-04	4.59E-04
79923	Butane, 2- (MEK)	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	4.83E+07	2.52E+08	9.50E+06	1.30E-04	15	1.49E+03	4.90E+05	2.11E-03	1.76E-04	4.45E-04
71558	1,1,1-Trichloroethane	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	6.01E+05	2.52E+08	9.50E+06	1.30E-04	15	7.88E+03	8.60E+03	3.86E-01	1.76E-04	4.75E-04
110827	Cyclohexane	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	3.88E+05	2.52E+08	9.50E+06	1.30E-04	15	1.49E+03	1.78E+00	7.64E+01	1.76E-04	4.85E-04
71432	Benzene	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	8.08E+01	2.52E+08	9.50E+06	1.30E-04	15	8.12E+03	2.89E+03	1.16E-01	1.76E-04	6.42E-04
78018	Trichloroethylene	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	2.91E+02	2.52E+08	9.50E+06	1.30E-04	15	8.98E+03	4.79E+03	2.06E-01	1.76E-04	4.83E-04
108872	Methyl cyclohexane	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	4.43E+02	2.52E+08	9.50E+06	1.30E-04	15	1.51E+03	3.79E+01	1.54E+01	1.76E-04	5.98E-04
108883	Toluene	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	5.83E+02	2.52E+08	9.50E+06	1.30E-04	15	6.65E+03	7.83E+03	3.87E-01	1.76E-04	4.39E-04
127184	Tetrachloroethylene	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	1.47E+02	2.52E+08	9.50E+06	1.30E-04	15	8.65E+03	4.54E+03	8.85E-02	1.76E-04	4.55E-04
108907	Chlorobenzene	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	3.11E+02	2.52E+08	9.50E+06	1.30E-04	15	1.02E+04	3.18E+03	1.37E-01	1.76E-04	4.60E-04
100414	Ethylbenzene	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	1.84E+02	2.52E+08	9.50E+06	1.30E-04	15	1.54E+03	5.88E+06	2.52E-04	1.76E-04	1.75E-03
1330207	Xylenes	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	5.44E+05	2.52E+08	9.50E+06	1.30E-04	15	1.05E+04	1.08E+03	4.67E-02	1.76E-04	4.47E-04
100425	Styrene	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	1.08E+06	2.52E+08	9.50E+06	1.30E-04	15	1.54E+03	1.28E+02	5.61E-01	1.76E-04	3.65E-04
98828	Isopropylbenzene	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	1.18E+06	2.52E+08	9.50E+06	1.30E-04	15	1.06E+04	1.34E+04	5.77E-03	1.76E-04	5.65E-04
79345	1,1,2,2-Tetrachloroethane	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	1.00E+02	2.52E+08	9.50E+06	1.30E-04	15	1.50E+03	4.11E+03	1.77E-01	1.76E-04	2.58E-04
641731	Dichlorobenzene, 1,3-	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	2.60E+02	2.52E+08	9.50E+06	1.30E-04	15	1.12E+04	8.89E+04	3.83E-02	1.76E-04	4.38E-04
108487	1,4-Dichlorobenzene	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	1.00E+02	2.52E+08	9.50E+06	1.30E-04	15	1.21E+04	6.51E+07	2.37E-05	1.76E-04	3.84E-02
96501	1,2-Dichlorobenzene	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	5.10E+01	2.52E+08	9.50E+06	1.30E-04	15	1.32E+04	4.35E+04	1.87E-02	1.76E-04	2.26E-04
120821	1,2,4-Trichlorobenzene	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	1.13E+06	2.52E+08	9.50E+06	1.30E-04	15	1.63E+03	2.29E+05	9.84E-04	1.76E-04	1.56E-03
100627	Benzonitrile	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	1.74E+06	2.52E+08	9.50E+06	1.30E-04	15	1.63E+03	2.29E+05	9.84E-04	1.76E-04	1.56E-03
91576	Methylnaphthalene, 2-	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	5.41E+03	2.52E+08	9.50E+06	1.30E-04	15	1.61E+03	8.89E+04	3.81E-02	1.76E-04	3.13E-04
82524	Biphenyl, 1,1-	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	8.81E+04	2.52E+08	9.50E+06	1.30E-04	15	1.47E+03	2.69E+04	1.14E-02	1.76E-04	3.15E-04
208968	Acenaphthylene	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	4.00E+02	2.52E+08	9.50E+06	1.30E-04	15	1.61E+03	2.49E+04	1.05E-02	1.76E-04	3.38E-04
83328	Acenaphthene	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	8.08E+04	2.52E+08	9.50E+06	1.30E-04	15	1.61E+04	3.67E+06	1.55E-05	1.76E-04	7.33E-04
132849	Indenzofuran	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	1.79E+03	2.52E+08	9.50E+06	1.30E-04	15	1.47E+03	3.61E+03	1.61E-01	1.76E-04	1.89E-04
96737	Fluorene	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	2.97E+04	2.52E+08	9.50E+06	1.30E-04	15	1.62E+04	2.20E+08	9.49E-07	1.76E-04	8.16E-01
85019	Phenanthrene	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	3.64E+04	2.52E+08	9.50E+06	1.30E-04	15	1.48E+03	1.14E+04	4.90E-03	1.76E-04	3.50E-04
120127	Anthracene	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	2.67E+03	2.52E+08	9.50E+06	1.30E-04	15	1.84E+04	1.28E+05	5.43E-04	1.76E-04	1.80E-03
C6-C8	C6-C8 Aliphatics	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	8.83E+04	2.52E+08	9.50E+06	1.30E-04	15	NA	6.48E-01	2.79E+01	1.76E-04	3.84E-04
C9-C12	C9-C12 Aliphatics	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	6.11E+04	2.52E+08	9.50E+06	1.30E-04	15	NA	7.80E-01	3.38E+01	1.76E-04	3.84E-04
C9-C10	C9-C10 Aromatics	1	0.130	0.858	1.62E-08	0.390	6.33E-09	1.72E+04	4.31E+05	2.52E+08	9.50E+06	1.30E-04	15	NA	3.88E+03	1.70E-01	1.76E-04	3.09E-04
C9-C18	C9-C18 Aliphatics																	

Appendix C.4
 Johnson & Ettinger Model - Data Entry Screen
 Inhalation of Volatiles from Soil
 Future Commercial Scenario - C1
 Southwest Properties, Wells G&H Superfund Site, Operable
 Whitney Barn

Chemical CAS No. (numbers only, no dashes)	Chemical	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)	Soil-water partition coefficient, K_d (cm ³ /g)	Source vapor conc., C_{soil} ($\mu\text{g}/\text{m}^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{avg} (cm ³ /s)	Crack effective diffusion coefficient, D_{eff} (cm ² /s)	Area of crack, A_{crack} (cm ²)	Exponent of equivalent foundation Peclet number, $\exp(Pe)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., C_{bldg} ($\mu\text{g}/\text{m}^3$)	Unit risk factor, URF ($\mu\text{g}/\text{m}^3$) ⁻¹	Reference conc., RfC (mg/m ³)
95838	Trimethylbenzene, 1,2,4	1	15	7.43E+00	N/A	0.10	2.74E+01	4.77E-04	1.23E+03	2.75E+303	1.08E-05	N/A	N/A	5.0E-03
540590	Dichloroethylene, 1,2- (cis)	1	15	2.57E-01	N/A	0.10	2.74E+01	3.77E-04	1.23E+03	#NUM!	1.08E-05	N/A	#N/A	#N/A
108678	Trimethylbenzene, 1,3,5	1	15	3.34E+00	N/A	0.10	2.74E+01	3.95E-04	1.23E+03	#NUM!	1.08E-05	N/A	#N/A	6.0E-03
104518	n-Butylbenzene	1	15	5.02E+00	N/A	0.10	2.74E+01	4.41E-04	1.23E+03	#NUM!	1.08E-05	N/A	#N/A	#N/A
91203	Naphthalene	1	15	4.00E+00	4.27E+03	0.10	2.74E+01	4.70E-04	1.23E+03	0.87E+307	1.08E-05	4.81E-02	N/A	3.0E-03
98976	Isopropyltoluene, 4-	1	15	3.16E+00	N/A	0.10	2.74E+01	4.39E-04	1.23E+03	#NUM!	1.08E-05	N/A	#N/A	4.0E-01
135685	Bulkybenzene, sec-	1	15	6.22E+01	N/A	0.10	2.74E+01	4.86E-04	1.23E+03	5.47E+297	1.08E-05	N/A	#N/A	#N/A
74873	Chloroethane	1	15	2.88E-02	3.24E+05	0.10	2.74E+01	7.89E-04	1.23E+03	1.14E+199	1.08E-05	3.51E+00	N/A	6.0E-02
75014	Vinyl chloride	1	15	3.72E-02	6.48E+05	0.10	2.74E+01	6.44E-04	1.23E+03	5.27E+224	1.08E-05	0.99E+00	8.8E-06	1.0E-01
74839	Bromomethane	1	15	2.86E-02	N/A	0.10	2.74E+01	4.48E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	5.0E-03
75003	Ethyl Chloride	1	15	2.89E-02	1.12E+05	0.10	2.74E+01	7.89E-04	1.23E+03	1.14E+189	1.08E-05	1.21E+00	N/A	1.0E-01
76364	1,1-Dichloroethylene	1	15	1.18E-01	1.08E+05	0.10	2.74E+01	5.47E-04	1.23E+03	3.82E+284	1.08E-05	1.17E+00	N/A	2.0E-01
78131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	1	15	4.50E-01	N/A	0.10	2.74E+01	1.75E-04	1.23E+03	#NUM!	1.07E-05	N/A	N/A	3.0E+01
67841	Acetone	1	15	1.15E-03	1.37E+03	0.10	2.74E+01	2.07E-03	1.23E+03	9.18E+99	1.08E-05	1.48E-02	N/A	N/A
76160	Carbon Disulfide	1	15	1.03E-01	N/A	0.10	2.74E+01	6.34E-04	1.23E+03	1.29E+220	1.08E-05	N/A	N/A	7.0E-01
79209	Methyl Acetate	1	15	6.64E-03	N/A	0.10	2.74E+01	8.61E-04	1.23E+03	1.17E+188	1.08E-05	N/A	#N/A	#N/A
76062	Methylene chloride	1	15	2.34E-02	1.90E+05	0.10	2.74E+01	6.35E-04	1.23E+03	8.55E+227	1.08E-05	1.79E+00	4.7E-07	3.0E+00
156805	Inane-1,2-Dichloroethylene	1	15	1.06E-01	8.20E+04	0.10	2.74E+01	4.32E-04	1.23E+03	#NUM!	1.08E-05	8.85E-01	N/A	2.0E-01
183404	Methyl-Tertiary-Butyl Ether	1	15	7.68E-02	4.58E+03	0.10	2.74E+01	6.67E-04	1.23E+03	6.48E+216	1.08E-05	4.96E-02	N/A	3.0E+00
76343	1,1-Dichloroethane	1	15	6.32E-02	1.82E+05	0.10	2.74E+01	4.58E-04	1.23E+03	#NUM!	1.08E-05	1.75E+00	N/A	5.0E-01
195692	1,2-Dichloroethylene	1	15	7.10E-02	5.66E+04	0.10	2.74E+01	4.59E-04	1.23E+03	#NUM!	1.08E-05	6.12E-01	N/A	2.0E-01
78553	Butane, 2- (MEK)	1	15	7.88E-03	N/A	0.10	2.74E+01	9.45E-04	1.23E+03	1.18E+153	1.08E-05	N/A	N/A	N/A
110627	1,1,1-Trichloroethane	1	15	2.20E-01	N/A	0.10	2.74E+01	4.76E-04	1.23E+03	4.36E+304	1.08E-05	N/A	N/A	2.2E+00
71432	Cyclohexane	1	15	3.20E-01	N/A	0.10	2.74E+01	4.85E-04	1.23E+03	3.16E+298	1.08E-05	N/A	#N/A	#N/A
74327	Benzene	1	15	1.19E-01	2.85E+04	0.10	2.74E+01	5.42E-04	1.23E+03	1.61E+287	1.08E-05	3.08E-01	7.8E-06	3.0E-02
79016	Trichloroethylene	1	15	3.32E-01	1.09E+05	0.10	2.74E+01	4.83E-04	1.23E+03	3.77E+299	1.08E-05	1.18E+00	1.1E-04	4.0E-02
108872	Methyl cyclohexane	1	15	5.36E-01	3.25E+08	0.10	2.74E+01	6.86E-04	1.23E+03	1.60E+242	1.08E-05	3.82E-01	N/A	3.0E+00
108883	Toluene	1	15	3.64E-01	1.28E+05	0.10	2.74E+01	5.34E-04	1.23E+03	1.10E+271	1.08E-05	1.39E+00	N/A	4.0E-01
127184	Tetrachloroethylene	1	15	3.10E-01	9.19E+04	0.10	2.74E+01	4.38E-04	1.23E+03	#NUM!	1.08E-05	8.92E-01	5.8E-06	N/A
108807	Chlorobenzene	1	15	4.38E-01	3.21E+04	0.10	2.74E+01	4.55E-04	1.23E+03	#NUM!	1.08E-05	3.46E-01	N/A	6.0E-02
100414	Ethylbenzene	1	15	7.26E-01	2.65E+04	0.10	2.74E+01	4.60E-04	1.23E+03	#NUM!	1.08E-05	2.90E-01	N/A	1.0E+00
1330207	Xylenes	1	15	4.82E-01	N/A	0.10	2.74E+01	3.75E-03	1.23E+03	4.03E+38	1.09E-05	N/A	N/A	1.0E-01
100425	Styrene	1	15	1.55E+00	N/A	0.10	2.74E+01	4.47E-04	1.23E+03	#NUM!	1.08E-05	N/A	#N/A	#N/A
98828	Isopropylbenzene	1	15	1.86E+01	N/A	0.10	2.74E+01	3.85E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	4.0E-01
78345	1,1,2,2-Tetrachloroethane	1	15	1.87E-01	N/A	0.10	2.74E+01	5.65E-04	1.23E+03	1.89E+255	1.08E-05	N/A	#N/A	#N/A
541731	Dichlorobenzene, 1,3-	1	15	3.40E-01	3.19E+04	0.10	2.74E+01	2.56E-04	1.23E+03	#NUM!	1.07E-05	3.42E-01	N/A	N/A
109467	1,4-Dichlorobenzene	1	15	1.23E+00	6.60E+03	0.10	2.74E+01	4.38E-04	1.23E+03	#NUM!	1.08E-05	7.19E-02	N/A	5.0E-01
95501	1,2-Dichlorobenzene	1	15	1.07E-01	3.94E+00	0.10	2.74E+01	3.04E-02	1.23E+03	4.74E+03	1.09E-05	4.28E-05	N/A	N/A
120521	1,2,4-Trichlorobenzene	1	15	3.59E+00	N/A	0.10	2.74E+01	2.26E-04	1.23E+03	#NUM!	1.07E-05	N/A	N/A	2.0E-01
91576	Methylnaphthalene, 2-	1	15	8.64E-02	N/A	0.10	2.74E+01	1.35E-03	1.23E+03	2.80E+107	1.08E-05	N/A	#N/A	#N/A
92524	Biphenyl, 1,1'	1	15	1.70E+01	1.20E+04	0.10	2.74E+01	3.13E-04	1.23E+03	#NUM!	1.08E-05	1.29E-01	N/A	3.0E-03
208988	Acenaphthylene	1	15	1.25E+01	N/A	0.10	2.74E+01	3.19E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	N/A
83329	Acenaphthene	1	15	9.67E+00	4.31E+02	0.10	2.74E+01	3.38E-04	1.23E+03	#NUM!	1.08E-05	4.84E-03	N/A	3.0E-03
132648	Dibenzofuran	1	15	1.42E+01	N/A	0.10	2.74E+01	7.33E-04	1.23E+03	2.13E+197	1.08E-05	N/A	N/A	3.0E-03
86737	Fluorene	1	15	1.63E+01	1.84E+04	0.10	2.74E+01	1.86E-04	1.23E+03	#NUM!	1.07E-05	1.75E-01	N/A	N/A
85018	Phenanthrene	1	15	1.54E+01	N/A	0.10	2.74E+01	8.18E-01	1.23E+03	1.50E+00	3.24E-06	N/A	N/A	3.0E-03
120127	Anthracene	1	15	2.63E+01	8.27E+03	0.10	2.74E+01	3.80E-04	1.23E+03	#NUM!	1.08E-05	6.75E-02	N/A	3.0E-03
C5-C8	C5-C8 Aliphatics	1	15	6.90E+01	N/A	0.10	2.74E+01	1.60E-03	1.23E+03	5.15E+90	1.08E-05	N/A	N/A	3.0E-03
C9-C12	C9-C12 Aliphatics	1	15	4.53E+00	3.84E+09	0.10	2.74E+01	3.64E-04	1.23E+03	#NUM!	1.08E-05	4.14E+03	N/A	2.0E-01
C9-C10	C9-C10 Aromatics	1	15	3.00E+02	6.78E+06	0.10	2.74E+01	3.84E-04	1.23E+03	#NUM!	1.08E-05	7.28E+01	N/A	2.0E-01
C9-C18	C9-C18 Aliphatics	1	15	3.58E+00	1.95E+07	0.10	2.74E+01	3.89E-04	1.23E+03	#NUM!	1.08E-05	2.10E+02	N/A	5.0E-02
C11-C22	C11-C22 Aromatics	1	15	1.38E+03	2.42E+07	0.10	2.74E+01	3.64E-04	1.23E+03	#NUM!	1.08E-05	2.61E+02	N/A	2.0E-01
C11-C22	C11-C22 Aromatics	1	15	1.00E+01	1.40E+08	0.10	2.74E+01	4.27E-04	1.23E+03	#NUM!	1.08E-05	1.51E+01	N/A	5.0E-02

CALCULATE RISK-BASED SOIL CONCENTRATION (enter "X" in "YES" box)

YES
 NO

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL SOIL CONCENTRATION (enter "X" in "YES" box and initial soil conc. below)

YES
 NO

ENTER Chemical CAS No. (number only, no dashes)	ENTER Initial soil concentration Mean soil conc., OR COP (ug/g)	ENTER Depth below grade to bottom of exposed space (ft.) L1 (1.5 or 200 cm)	ENTER Depth below grade to top of contamination, L2 (ft.)	ENTER Average soil temperature, T _a (°C)	ENTER Vadose zone POR (used to estimate soil vapor permeability, K _{ov})	ENTER CR	ENTER User-defined vadose zone soil vapor permeability, K _{ov} (cm ² /s)	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER	ENTER
								Vadose zone soil dry bulk density, ρ _b (g/cm ³)	Vadose zone soil total organic carbon, f _{oc} (%)	Vadose zone soil water-filled porosity, θ _w (cm ³ /cm ³)	Vadose zone soil organic carbon fraction, f _{oc} (%)	Average time for carcinogens, ATC (yr)	Average time for noncarcinogens, ATNC (yr)	Exposure duration, ED (hr/yr)	Exposure frequency, EF (days/yr)	Exposure time ET (hr/day)	Conversion factor CF (mg/kg) (ug/g)	Target risk for carcinogens, TR (10 ⁻⁶ /yr)	Target hazard quotient for noncarcinogens, THQ (10 ⁻³)			
9009	Trimehylbenzene, 1,2,4-	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1				
9009	Dichlorobenzene, 1,2- (total)	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1				
100613	Trimehylbenzene, 1,3,5-	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1				
100613	n-Butylbenzene	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1				
91305	Naphthalene	2.74E+03	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1			
90079	Isopropylbenzene, 4-	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1				
100604	Butylbenzene, sec-	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1				
74873	Chloromethane	2.49E+02	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1			
79814	Vinyl chloride	2.61E+02	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1			
74873	Bromomethane	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1				
79802	Ethyl Chloride	6.80E+01	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1			
79804	1,1-Dichloroethane	1.20E+02	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1			
79101	1,1,1-Trichloroethane, 1,1,2-	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1				
87411	Acetone	3.24E+02	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1			
51384	Carbon Dioxide	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1				
79808	Methyl Acetate	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1				
79808	Methylene chloride	7.27E+02	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1			
90068	trans-1,2-Dichloroethane	7.73E+01	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1			
90064	Methyl Tertiary-Butyl Ether	6.79E+01	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1			
79804	1,1-Dichloroethane	3.58E+02	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1			
91302	cis-1,2-Dichloroethane	1.80E+02	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1			
79802	Benzene, 2, (MSE)	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1				
71882	1,1,1-Trichloroethane	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1				
116477	Cyclohexane	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1				
71427	Benzene	2.10E+02	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1			
79819	Trichloroethylene	2.91E+02	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1			
106472	Methyl cyclohexane	4.49E+02	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1			
90049	Toluene	1.93E+02	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1			
107149	Tetrahydrofuran	1.47E+02	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1			
106807	Chlorobenzene	3.11E+02	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1			
100614	Ethylbenzene	1.84E+02	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1			
100607	Xylenes	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1				
100628	Styrene	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1				
90068	Isopropylbenzene	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1				
79130	1,1,2,2-Tetrachloroethane	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1				
91371	Dichlorobenzene, 1,3-	1.00E+02	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1			
90067	1,4-Dichlorobenzene	2.00E+02	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1			
90064	1,2-Dichlorobenzene	3.10E+01	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1			
120621	1,2,4-Trichlorobenzene	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1				
106827	Benzaldehyde	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1				
87678	Methylnaphthalene, 2-	6.41E+03	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1			
83381	Baphenyl, 1,1'-	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1				
300664	Acanaphthylene	4.00E+02	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1			
83383	Acanaphthylene	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1				
83389	Diethylfuran	1.70E+03	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1			
84213	Fluorene	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1				
90719	Phenanthrene	3.86E+04	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1			
120627	Anthracene	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1				
84214	CS-C3 Aliphatics	9.83E+04	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1			
84216	CS-C12 Aliphatics	8.17E+04	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1			
84217	CS-C10 Aromatics	4.31E+08	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1			
84218	CS-C18 Aliphatics	6.04E+08	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1			
84219	CS-C22 Aromatics	4.15E+08	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	6	6	78	2.5	8780	1.0E-06	1			

Note:
 1) Default soil parameters from table T of User's Guide for Evaluating Subsurface Vapor Intrusion into Buildings (U.S. EPA June 16, 2005) were used for soil water filled porosity (θ_w), soil organic carbon fraction (f_{oc}), soil total porosity (θ_t), and soil dry bulk density (ρ_b).

Appendix C.4

Johnson & Ettinger Model - Data Entry Screen

Inhalation of Volatiles from Soil

Future Child Recreational Scenario - RME

Southwest Properties, Wells G&H Superfund Site, Operable Unit 2

Whitney Barrel

Chemical CAS No. (numbers only, no dashes)	Chemical	Diffusivity in air, D _a (cm ² /s)	Diffusivity in water, D _w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T _R (°C)	Enthalpy of vaporization at the normal boiling point, ΔH _{v,b} (cal/mol)	Normal boiling point, T _B (°K)	Critical temperature, T _C (°K)	Organic carbon partition coefficient, K _{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S.L.G)
95636	Trimethylbenzene, 1,2,4-	7.80E-02	9.03E-06	5.70E-03	25	1.25E+03	442.30	649.11	3.72E+03	5.70E+01	N/A	6.0E-03	L
540590	Dichloroethylene, 1,2- (total)	5.59E-02	6.47E-06	4.30E-04	20	1.32E+03	585.00	877.50	1.26E+02	1.30E+00	#N/A	#N/A	0.0E+00
108678	Trimethylbenzene, 1,3,5-	6.48E-02	7.86E-06	7.81E-03	25	1.25E+03	442.30	649.11	1.67E+03	2.00E+01	N/A	6.0E-03	L
104518	n-Butylbenzene	7.25E-02	8.39E-06	1.25E-02	25	1.23E+03	456.00	684.00	2.51E+03	1.26E+00	#N/A	#N/A	L
91203	Naphthalene	5.90E-02	7.50E-06	4.83E-04	25	1.04E+04	491.14	748.40	2.00E+03	3.10E+01	N/A	3.0E-03	S
99876	Isopropyltoluene, 4-	7.25E-02	8.39E-06	8.60E+00	25	1.24E+03	450.10	652.04	1.58E+03	2.34E+01	N/A	4.0E-01	L
135988	Bulybenzene, sec-	8.00E-02	8.00E-06	1.67E-02	25	1.24E+03	446.65	669.98	3.11E+04	1.76E+01	#N/A	#N/A	0.0E+00
74873	Chloromethane	1.26E-01	6.50E-06	8.67E-03	25	1.35E+03	249.00	373.50	1.43E+01	5.32E+03	N/A	9.0E-02	0.0E+00
75014	Vinyl chloride	1.06E-01	1.23E-05	2.71E-02	25	5.25E+03	259.25	432.00	1.86E+01	2.76E+03	6.8E-06	1.0E-01	L
74839	Bromomethane	7.28E-02	1.21E-05	6.22E-03	25	5.49E+03	276.50	414.75	1.43E+01	1.52E+04	N/A	5.0E-03	0.0E+00
75003	Ethyl Chloride	1.26E-01	6.50E-06	8.67E-03	25	1.36E+03	249.00	373.50	1.43E+01	5.32E+03	N/A	1.0E+01	L
75354	1,1-Dichloroethylene	9.00E-02	1.04E-05	2.61E-02	25	6.25E+03	304.75	576.05	5.89E+01	2.25E+03	N/A	2.0E-01	L
76131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	2.68E-02	8.07E-06	5.17E-01	25	1.33E+03	320.70	481.05	2.25E+02	1.70E+02	N/A	3.0E+01	0.0E+00
67641	Acetone	1.24E-01	1.14E-05	3.88E-05	25	8.96E+03	329.20	508.10	5.75E-01	1.00E+06	N/A	N/A	L
75150	Carbon Disulfide	1.04E-01	1.29E-05	1.27E-02	25	6.39E+03	319.00	552.00	5.14E+01	2.67E+03	N/A	7.0E-01	L
79209	Methyl Acetate	1.04E-01	1.00E-05	1.13E-04	25	1.31E+03	365.00	547.50	3.32E+00	2.43E+05	#N/A	#N/A	0.0E+00
75092	Methylene chloride	1.01E-01	1.17E-05	2.19E-03	25	6.71E+03	313.00	510.00	1.17E+01	1.30E+04	4.7E-07	3.0E+00	L
156605	trans-1,2-Dichloroethylene	7.07E-02	1.19E-05	9.39E-03	25	1.33E+03	320.85	516.50	5.25E+01	6.30E+03	N/A	2.0E-01	L
1634044	Methyl-Tertiary-Butyl Ether	1.02E-01	1.05E-05	5.87E-04	25	1.32E+03	328.36	497.11	3.84E+01	5.10E+04	N/A	3.0E+00	L
75343	1,1-Dichloroethane	7.42E-02	1.05E-05	5.61E-03	25	6.90E+03	330.55	523.00	3.16E+01	5.05E+03	N/A	5.0E-01	L
156592	cis-1,2-Dichloroethylene	7.36E-02	1.13E-05	4.07E-03	25	7.19E+03	333.65	544.00	3.55E+01	3.50E+03	N/A	2.0E-01	L
78933	Butanone, 2- (MEK)	8.08E-02	9.80E-06	5.60E-05	25	1.31E+03	352.50	528.75	3.83E+00	2.23E+05	N/A	N/A	0.0E+00
71556	1,1,1-Trichloroethane	7.80E-02	8.80E-06	1.72E-02	25	7.14E+03	347.24	545.00	1.10E+02	1.33E+03	N/A	2.2E+00	L
110827	Cyclohexane	8.00E-02	9.00E-06	2.00E+00	25	1.31E+03	353.85	530.78	1.60E+02	5.50E+01	#N/A	#N/A	0.0E+00
71432	Benzene	8.80E-02	9.80E-06	5.56E-03	25	7.34E+03	353.24	562.16	5.89E+01	1.75E+03	7.8E-06	3.0E-02	L
79016	Trichloroethylene	7.90E-02	9.10E-06	1.03E-02	25	7.51E+03	360.36	544.20	1.66E+02	1.10E+03	1.1E-04	4.0E-02	L
108872	Methyl cyclohexane	9.86E-02	8.52E-06	4.23E-01	25	1.30E+03	373.90	560.85	2.68E+02	1.40E+01	N/A	3.0E+00	L
108883	Toluene	8.70E-02	8.60E-06	6.63E-03	25	7.93E+03	383.78	591.79	1.82E+02	5.26E+02	N/A	4.0E-01	L
127184	Tetrachloroethylene	7.20E-02	8.20E-06	1.84E-02	25	8.29E+03	394.40	620.20	1.55E+02	2.00E+02	5.9E-06	N/A	L
108907	Chlorobenzene	7.30E-02	8.70E-06	3.71E-03	25	8.41E+03	404.87	632.40	2.19E+02	4.72E+02	N/A	6.0E-02	L
100414	Ethylbenzene	7.50E-02	7.80E-06	7.88E-03	25	8.50E+03	409.34	617.20	3.63E+02	1.69E+02	N/A	1.0E+00	L
1330207	Xylenes	7.69E-02	8.44E-06	6.73E-06	25	1.26E+03	417.40	616.21	2.41E+02	2.20E+02	N/A	1.0E-01	L
100425	Styrene	7.10E-02	8.00E-06	2.76E-03	25	8.74E+03	418.31	638.00	7.76E+02	3.10E+02	#N/A	#N/A	L
98828	Isopropylbenzene	6.50E-02	7.83E-06	1.47E-02	25	1.26E+03	425.40	631.01	9.31E+03	5.60E+01	N/A	4.0E-01	L
79345	1,1,2,2-Tetrachloroethane	7.10E-02	7.90E-06	3.44E-04	25	9.00E+03	419.60	661.15	9.33E+01	2.97E+03	#N/A	#N/A	L
541731	Dichlorobenzene, 1,3-	4.14E-02	6.85E-06	4.70E-03	25	1.24E+03	446.00	683.96	1.70E+02	6.88E+01	N/A	N/A	L
106467	1,4-Dichlorobenzene	6.90E-02	7.90E-06	2.43E-03	25	9.27E+03	447.21	684.75	6.17E+02	7.38E+01	N/A	8.0E-01	S
95501	1,2-Dichlorobenzene	6.88E-02	9.41E-06	1.62E-06	25	9.70E+03	465.00	697.50	5.34E+01	2.77E+04	N/A	N/A	S
120821	1,2,4-Trichlorobenzene	3.00E-02	8.23E-06	1.42E-03	25	1.05E+04	486.15	725.00	1.78E+03	3.00E+02	N/A	2.0E-01	L
100527	Benzaldehyde	7.30E-02	9.07E-06	2.62E-05	25	1.24E+03	452.00	678.00	3.27E+01	8.57E+03	#N/A	#N/A	0.0E+00
91576	Methylnaphthalene, 2-	4.84E-02	7.75E-06	1.01E-03	25	1.17E+03	514.05	761.01	8.51E+03	2.46E+01	N/A	3.0E-03	S
92524	Biphenyl, 1,1'-	4.04E-02	8.15E-06	3.03E-04	25	1.15E+03	529.10	793.65	6.25E+03	6.94E+00	N/A	N/A	0.0E+00
208968	Acenaphthylene	4.43E-02	7.44E-06	2.80E-04	25	1.12E+03	553.00	792.01	4.79E+03	3.93E+00	N/A	3.0E-03	S
83329	Acenaphthene	4.21E-02	7.69E-06	1.55E-04	25	1.22E+04	550.54	803.15	7.08E+03	4.24E+00	N/A	3.0E-03	S
132649	Dibenzofuran	2.67E-02	5.93E-06	4.00E-03	25	1.11E+03	559.00	824.01	8.13E+03	1.00E+01	N/A	N/A	S
86737	Fluorene	3.63E-02	7.88E-06	9.41E-08	25	1.27E+04	570.44	870.00	7.71E+03	1.90E+00	N/A	3.0E-03	S
85018	Phenanthrene	3.30E-02	7.47E-06	1.30E-04	25	1.06E+03	613.00	869.01	1.41E+04	1.28E+00	N/A	3.0E-03	S
120127	Anthracene	3.24E-02	7.74E-06	6.51E-05	25	1.31E+04	615.18	873.00	2.95E+04	4.34E-02	N/A	3.0E-03	S
C5-C8	C5-C8 Aliphatics	6.00E-02	1.00E-05	1.30E+00	25	NA	NA	NA	2.27E+03	1.10E+04	N/A	2.0E-01	S
C9-C12	C9-C12 Aliphatics	6.00E-02	1.00E-05	1.56E+00	25	NA	NA	NA	1.50E+05	7.00E+01	N/A	2.0E-01	S
C9-C10	C9-C10 Aromatics	6.00E-02	1.00E-05	7.92E-03	25	NA	NA	NA	1.78E+03	5.10E+04	N/A	5.0E-02	S
C9-C18	C9-C18 Aliphatics	6.00E-02	1.00E-05	1.66E+00	25	NA	NA	NA	6.80E+05	1.00E+01	N/A	2.0E-01	S
C11-C22	C11-C22 Aromatics	6.00E-02	1.00E-05	7.32E-04	25	NA	NA	NA	5.00E+03	5.80E+03	N/A	5.0E-02	S

Appendix C.4
 Johnson & Ettinger Model - Data Entry Screen
 Inhalation of Volatiles from Soil
 Future Child Recreational Scenario - RME
 Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
 Whiskey Barrel

Chemical CAS No. (numbers only, no dashes)	Chemical	Source- building separation, LT (cm)	Vadose zone soil air-filled porosity, θ_v (cm ³ /cm ³)	Vadose zone effective total fluid saturation, S_w (cm ³ /cm ³)	Vadose zone acid intrinsic permeability, k_i (cm ²)	Vadose zone acid relative air permeability, k_{ra} (cm ²)	Vadose zone acid effective vapor permeability, k_v (cm ²)	Floor- wall seam perimeter, Xcrack (cm)	Initial soil concentration used, CR (ug/kg)	Bldg. ventilation rate, Q_{vent} (cm ³ /s)	Area of enclosed space below grade, A_b (cm ²)	Crack- to-total area ratio, τ (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,rs}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{rs} (atm-m ³ /mol)	Henry's law constant at ave. soil temperature, HTS (unitless)	Vapor viscosity at ave. soil temperature, μ_{rs} (g/cm-s)	Vadose zone effective diffusion coefficient, $D_{v,rs}^*$ (cm ² /s)
96996	Trimethylbenzene, 1,2,4-	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	4.38E+05	2.62E+06	9.50E+06	1.30E-04	15	1.55E+03	4.86E-03	2.13E-01	1.75E-04	4.77E-04
540690	Dichlorobenzene, 1,2- (total)	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	5.96E+02	2.52E+06	9.50E+06	1.30E-04	15	1.73E+03	3.87E-04	1.67E-02	1.75E-04	3.77E-04
106878	Trimethylbenzene, 1,3,5-	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	7.13E+04	2.52E+06	9.50E+06	1.30E-04	15	1.56E+03	6.80E-03	2.93E-01	1.75E-04	3.85E-04
104518	n-Butylbenzene	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	8.83E+03	2.52E+06	9.50E+06	1.30E-04	15	1.53E+03	1.09E-02	4.80E-01	1.75E-04	4.41E-04
91203	Naphthalene	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	2.74E+03	2.52E+06	9.50E+06	1.30E-04	15	1.29E+04	1.52E-04	9.56E-03	1.75E-04	4.70E-04
96876	Isopropyltoluene, 4-	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	7.31E+05	2.52E+06	9.50E+06	1.30E-04	15	1.57E+03	7.48E+00	3.22E+02	1.75E-04	4.39E-04
135688	Butylbenzene, sec-	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	1.10E+06	2.52E+06	9.50E+06	1.30E-04	15	1.53E+03	1.48E-02	6.27E-01	1.75E-04	4.86E-04
74873	Chloromethane	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	2.40E+02	2.52E+06	9.50E+06	1.30E-04	15	1.20E+03	7.79E-03	3.35E-01	1.75E-04	7.98E-04
76014	Vinyl chloride	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	2.61E+02	2.52E+06	9.50E+06	1.30E-04	15	5.00E+03	1.73E-02	7.46E-01	1.75E-04	6.44E-04
74839	Bromomethane	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	3.68E+06	2.52E+06	9.50E+06	1.30E-04	15	5.39E+03	3.64E-03	1.65E-01	1.75E-04	4.48E-04
75003	Ethyl Chloride	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	8.80E+01	2.52E+06	9.50E+06	1.30E-04	15	1.20E+03	7.78E-03	3.35E-01	1.75E-04	7.98E-04
75384	1,1-Dichloroethylene	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	1.20E+02	2.52E+06	9.50E+06	1.30E-04	15	6.39E+03	1.47E-02	8.34E-01	1.75E-04	5.47E-04
78131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	3.98E+05	2.52E+06	9.50E+06	1.30E-04	15	1.44E+03	4.66E-01	1.95E+01	1.75E-04	2.97E-03
87841	Acetone	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	3.24E+02	2.52E+06	9.50E+06	1.30E-04	15	7.58E+03	1.97E-05	6.50E-04	1.75E-04	2.97E-03
76150	Carbon Disulfide	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	6.78E+05	2.52E+06	9.50E+06	1.30E-04	15	8.88E+03	6.89E-02	3.01E-01	1.75E-04	6.34E-04
75209	Methyl Acetate	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	5.00E+07	2.52E+06	9.50E+06	1.30E-04	15	1.82E+03	8.85E-05	4.25E-03	1.75E-04	8.61E-04
15503	Methylene chloride	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	7.27E+02	2.52E+06	9.50E+06	1.30E-04	15	7.03E+03	1.17E-03	5.03E-02	1.75E-04	8.35E-04
156806	trans-1,2-Dichloroethylene	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	7.73E+01	2.52E+06	9.50E+06	1.30E-04	15	1.42E+03	8.72E-03	3.56E-01	1.75E-04	4.32E-04
1634044	Methyl-Tert-butyl Ether	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	5.75E+01	2.52E+06	9.50E+06	1.30E-04	15	1.45E+03	5.18E-04	2.22E-02	1.75E-04	6.87E-04
76343	1,1-Dichloroethane	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	3.58E+02	2.52E+06	9.50E+06	1.30E-04	15	7.45E+03	2.88E-03	1.24E-01	1.75E-04	4.89E-04
155582	cis-1,2-Dichloroethylene	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	1.80E+02	2.52E+06	9.50E+06	1.30E-04	15	7.73E+03	2.04E-03	8.77E-02	1.75E-04	4.59E-04
78833	Butanone, 2- (MEK)	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	4.83E+07	2.52E+06	9.50E+06	1.30E-04	15	1.48E+03	4.90E-06	2.11E-03	1.75E-04	9.45E-04
71566	1,1,1-Trichloroethane	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	6.01E+06	2.52E+06	9.50E+06	1.30E-04	15	7.88E+03	8.50E-03	3.68E-01	1.75E-04	4.76E-04
110827	Cyclohexane	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	3.88E+05	2.52E+06	9.50E+06	1.30E-04	15	1.49E+03	1.75E+00	7.54E-01	1.75E-04	4.85E-04
71432	Benzene	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	2.10E+02	2.52E+06	9.50E+06	1.30E-04	15	8.12E+03	2.69E-03	1.16E-01	1.75E-04	5.42E-04
79016	Trichloroethylene	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	2.81E+02	2.52E+06	9.50E+06	1.30E-04	15	8.58E+03	4.79E-03	2.08E-01	1.75E-04	4.83E-04
106872	Methyl cyclohexane	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	4.45E+02	2.52E+06	9.50E+06	1.30E-04	15	1.81E+03	3.70E-01	1.58E+01	1.75E-04	5.88E-04
109883	Toluene	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	5.85E+02	2.52E+06	9.50E+06	1.30E-04	15	9.15E+03	2.82E-03	1.26E-01	1.75E-04	5.34E-04
127184	Tetrachloroethylene	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	1.47E+02	2.52E+06	9.50E+06	1.30E-04	15	9.65E+03	7.83E-03	3.37E-01	1.75E-04	4.39E-04
106907	Chlorobenzene	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	3.11E+02	2.52E+06	9.50E+06	1.30E-04	15	9.90E+03	1.54E-03	6.85E-02	1.75E-04	4.65E-04
100414	Ethylbenzene	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	1.84E+02	2.52E+06	9.50E+06	1.30E-04	15	1.02E+04	3.18E-03	1.37E-01	1.75E-04	4.60E-04
1330207	Xylenes	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	1.60E+05	2.52E+06	9.50E+06	1.30E-04	15	1.54E+03	5.88E-08	2.62E-04	1.75E-04	3.75E-03
100426	Styrene	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	3.44E+05	2.52E+06	9.50E+06	1.30E-04	15	1.05E+04	1.09E-02	4.67E-02	1.75E-04	4.47E-04
96828	Isopropylbenzene	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	1.08E+06	2.52E+06	9.50E+06	1.30E-04	15	1.54E+03	1.28E-02	5.51E-01	1.75E-04	3.95E-04
79345	1,1,2,2-Tetrachloroethane	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	1.15E+06	2.52E+06	9.50E+06	1.30E-04	15	1.05E+04	1.34E-04	5.77E-03	1.75E-04	6.85E-04
541731	Dichlorobenzene, 1,3-	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	1.00E+02	2.52E+06	9.50E+06	1.30E-04	15	1.50E+03	4.11E-03	1.77E-01	1.75E-04	2.66E-04
106467	1,4-Dichlorobenzene	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	2.50E+02	2.52E+06	9.50E+06	1.30E-04	15	1.12E+04	8.69E-04	3.83E-02	1.75E-04	4.38E-04
86501	1,2-Dichlorobenzene	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	5.19E+01	2.52E+06	9.50E+06	1.30E-04	15	1.21E+04	5.51E-07	2.37E-05	1.75E-04	3.94E-02
120821	1,2,4-Trichlorobenzene	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	1.13E+08	2.52E+06	9.50E+06	1.30E-04	15	1.32E+04	4.35E-04	1.87E-02	1.75E-04	2.25E-04
100527	Benzaldehyde	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	1.74E+06	2.52E+06	9.50E+06	1.30E-04	15	1.53E+03	2.29E-06	9.86E-04	1.75E-04	1.25E-03
91576	Methylnaphthalene, 2-	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	5.41E+03	2.52E+06	9.50E+06	1.30E-04	15	1.81E+03	6.89E-04	3.81E-02	1.75E-04	3.19E-04
92524	Biphenyl, 1,1'-	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	6.81E+04	2.52E+06	9.50E+06	1.30E-04	15	1.47E+03	2.98E-04	1.14E-02	1.75E-04	3.16E-04
208968	Acenaphthylene	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	4.00E+02	2.52E+06	9.50E+06	1.30E-04	15	1.51E+03	2.45E-04	1.05E-02	1.75E-04	3.38E-04
83326	Acenaphthene	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	8.09E+04	2.52E+06	9.50E+06	1.30E-04	15	1.81E+04	3.87E-05	1.58E-03	1.75E-04	7.33E-04
132046	Dibenzofuran	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	1.79E+03	2.52E+06	9.50E+06	1.30E-04	15	1.47E+03	3.51E-03	1.51E-01	1.75E-04	1.98E-04
86737	Fluorene	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	2.97E+04	2.52E+06	9.50E+06	1.30E-04	15	1.62E+04	2.23E-08	9.48E-07	1.75E-04	8.16E-01
85018	Phenanthrene	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	3.84E+04	2.52E+06	9.50E+06	1.30E-04	15	1.48E+03	1.14E-04	4.90E-03	1.75E-04	3.52E-04
120127	Anthracene	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	2.57E+03	2.52E+06	9.50E+06	1.30E-04	15	1.84E+04	1.28E-06	5.43E-04	1.75E-04	1.82E-03
05-08	05-08 Aliphatics	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	9.85E+04	2.52E+06	9.50E+06	1.30E-04	15	NA	6.48E-01	2.79E+01	1.75E-04	3.84E-04
09-C12	09-C12 Aliphatics	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	8.11E+04	2.62E+06	9.50E+06	1.30E-04	15	NA	7.90E-01	3.94E+01	1.75E-04	3.64E-04
09-C10	09-C10 Aliphatics	1	0.130	0.859	1.82E-08	0.390	8.33E-09	1.72E+04	4.31E+06	2.62E+06	9.50E+06	1.30E-04	15	NA	3.98E-03	1.70E-01	1.75E-04	3.89E-04
09-C18	09-C18 Aliphatics</																	

Appendix C.4
 Johnson & Ettinger Model - Data Entry Screen
 Inhalation of Volatiles from Soil
 Futura Child Recreational Scenario - RME
 Southwest Properties, Wells GBH Superfund Site, Operable
 Whitney Barrel

Chemical CAS No. (numbers only, no dashes)	Chemical	Diffusion path length, L _d (cm)	Convection path length, L _c (cm)	Soil-water partition coefficient, K _{oc} (cm ³ /g)	Source vapor conc., C _{soil} (µg/m ³)	Crack radius, r _{crack} (cm)	Average vapor flow rate into bldg., Q _{avg} (cm ³ /s)	Crack effective diffusion coefficient, D _{eff} (cm ² /s)	Area of crack, A _{crack} (cm ²)	Exponent of equivalent Paclet number, exp(Pac)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., C _{avg} (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
96638	Trimethylbenzene, 1,2,4-	1	15	7.43E+00	N/A	0.10	2.74E+01	4.77E-04	1.23E+03	2.76E+303	1.08E-05	N/A	N/A	6.0E-03
540690	Dichlorobenzene, 1,2, (total)	1	15	2.57E-01	N/A	0.10	2.74E+01	3.77E-04	1.23E+03	#NUM!	1.08E-05	N/A	#N/A	#N/A
105878	Trimethylbenzene, 1,3,5-	1	15	3.34E+00	N/A	0.10	2.74E+01	3.95E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	6.0E-03
104518	n-Butylbenzene	1	15	6.02E+00	N/A	0.10	2.74E+01	4.41E-04	1.23E+03	#NUM!	1.08E-05	N/A	#N/A	#N/A
91203	Naphthalene	1	15	4.00E+00	4.27E+03	0.10	2.74E+01	4.70E-04	1.23E+03	9.87E+307	1.08E-05	4.61E-02	N/A	3.0E-03
96878	Isopropyltoluene, 4-	1	15	3.18E+00	N/A	0.10	2.74E+01	4.39E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	4.0E-01
135668	Bulbiferene, sec	1	15	8.22E+01	N/A	0.10	2.74E+01	4.89E-04	1.23E+03	5.47E+297	1.08E-05	N/A	#N/A	#N/A
74873	Chloromethane	1	15	2.99E-02	3.24E+05	0.10	2.74E+01	7.88E-04	1.23E+03	1.14E+189	1.08E-05	3.51E+00	N/A	9.0E-02
75014	Vinyl chloride	1	15	3.12E-02	9.48E+06	0.10	2.74E+01	6.44E-04	1.23E+03	6.27E+224	1.08E-05	8.89E+00	8.8E-08	1.0E-01
74839	Bromomethane	1	15	2.99E-02	N/A	0.10	2.74E+01	4.89E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	5.0E-03
75003	Ethyl Chloride	1	15	2.99E-02	1.12E+05	0.10	2.74E+01	7.88E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	1.0E+01
75354	1,1-Dichloroethane	1	15	1.15E-01	2.04E+05	0.10	2.74E+01	5.47E-04	1.23E+03	3.62E+284	1.08E-05	2.21E+00	N/A	2.0E-01
78131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	1	15	4.80E-01	N/A	0.10	2.74E+01	1.75E-04	1.23E+03	#NUM!	1.07E-05	N/A	N/A	3.0E+01
87841	Acetone	1	15	1.15E-03	1.37E+03	0.10	2.74E+01	2.07E-03	1.23E+03	9.18E+89	1.08E-05	1.48E-02	N/A	N/A
76160	Carbon Disulfide	1	15	1.03E-01	N/A	0.10	2.74E+01	8.34E-04	1.23E+03	1.25E+228	1.08E-05	N/A	N/A	7.0E-01
79200	Methyl Acetate	1	15	6.84E-03	N/A	0.10	2.74E+01	9.61E-04	1.23E+03	1.17E+188	1.08E-05	N/A	N/A	#N/A
75092	Methylene chloride	1	15	2.34E-02	1.80E+05	0.10	2.74E+01	6.35E-04	1.23E+03	8.55E+227	1.08E-05	1.73E+00	4.7E-07	3.0E+00
156806	trans-1,2-Dichloroethene	1	15	1.05E-01	8.20E+04	0.10	2.74E+01	4.32E-04	1.23E+03	#NUM!	1.08E-05	3.85E-01	N/A	2.0E-01
1634044	Methyl-Tertiary-Butyl Ether	1	15	7.88E-02	4.58E+03	0.10	2.74E+01	9.67E-04	1.23E+03	9.48E+216	1.08E-05	4.98E-02	N/A	3.0E+00
75343	1,1-Dichloroethane	1	15	6.32E-02	1.02E+05	0.10	2.74E+01	4.58E-04	1.23E+03	#NUM!	1.08E-05	1.75E+00	N/A	5.0E-01
186892	cis-1,2-Dichloroethene	1	15	7.10E-02	5.68E+04	0.10	2.74E+01	4.58E-04	1.23E+03	#NUM!	1.08E-05	6.12E-01	N/A	2.0E-01
75933	Butane, 2- (MEK)	1	15	7.88E-03	N/A	0.10	2.74E+01	9.45E-04	1.23E+03	1.18E+153	1.08E-05	N/A	N/A	N/A
71556	1,1,1-Trichloroethane	1	15	2.20E-01	N/A	0.10	2.74E+01	4.75E-04	1.23E+03	4.20E+304	1.08E-05	N/A	N/A	2.2E+00
110827	Cyclohexane	1	15	3.20E-01	N/A	0.10	2.74E+01	4.85E-04	1.23E+03	3.18E+298	1.08E-05	N/A	#N/A	#N/A
71432	Benzene	1	15	1.18E-01	7.41E+04	0.10	2.74E+01	5.42E-04	1.23E+03	1.81E+287	1.08E-05	8.02E-01	7.8E-08	3.0E-02
29016	Trichloroethene	1	15	3.32E-01	1.06E+05	0.10	2.74E+01	4.83E-04	1.23E+03	3.77E+299	1.08E-05	1.18E+00	1.1E-04	4.0E-02
108872	Methyl cyclohexane	1	15	5.35E-01	3.38E+08	0.10	2.74E+01	5.98E-04	1.23E+03	1.50E+242	1.08E-05	3.62E+01	N/A	3.0E+00
108803	Toluene	1	15	3.84E-01	1.28E+05	0.10	2.74E+01	5.34E-04	1.23E+03	1.10E+271	1.08E-05	1.39E+00	N/A	4.0E-01
127184	Tetrachloroethene	1	15	3.10E-01	9.19E+04	0.10	2.74E+01	4.29E-04	1.23E+03	#NUM!	1.08E-05	3.82E-01	N/A	5.9E-08
108907	Chlorobenzene	1	15	4.38E-01	3.21E+04	0.10	2.74E+01	4.55E-04	1.23E+03	#NUM!	1.08E-05	3.46E-01	N/A	1.0E+00
100414	Ethylbenzene	1	15	7.29E-01	2.88E+04	0.10	2.74E+01	4.80E-04	1.23E+03	#NUM!	1.08E-05	2.90E-01	N/A	1.0E-01
1330207	Xylenes	1	15	4.82E-01	N/A	0.10	2.74E+01	3.75E-03	1.23E+03	4.03E+38	1.08E-05	N/A	N/A	1.0E-01
100426	Styrene	1	15	1.55E+00	N/A	0.10	2.74E+01	4.47E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	#N/A
98828	Isopropylbenzene	1	15	1.86E+01	N/A	0.10	2.74E+01	3.95E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	4.0E-01
79345	1,1,2,2-Tetrachloroethane	1	15	1.87E-01	N/A	0.10	2.74E+01	5.05E-04	1.23E+03	1.68E+258	1.08E-05	N/A	N/A	#N/A
541731	Dichlorobenzene, 1,3-	1	15	3.40E-01	3.19E+04	0.10	2.74E+01	2.56E-04	1.23E+03	#NUM!	1.07E-05	3.42E-01	N/A	N/A
106467	1,4-Dichlorobenzene	1	15	1.23E+00	6.66E+03	0.10	2.74E+01	4.38E-04	1.23E+03	#NUM!	1.08E-05	7.19E-02	N/A	8.0E-01
95501	1,2-Dichlorobenzene	1	15	1.07E-01	3.84E+00	0.10	2.74E+01	3.84E-02	1.23E+03	4.74E+03	1.08E-05	4.28E-05	N/A	N/A
120821	1,2,4-Trichlorobenzene	1	15	3.58E+00	N/A	0.10	2.74E+01	2.22E-04	1.23E+03	#NUM!	1.07E-05	N/A	N/A	2.0E-01
91678	Benzofluorene	1	15	8.64E-02	N/A	0.10	2.74E+01	1.35E-03	1.23E+03	2.60E+107	1.08E-05	N/A	#N/A	#N/A
91678	Methylisobutylene, 2-	1	15	1.70E+01	1.20E+04	0.10	2.74E+01	3.13E-04	1.23E+03	#NUM!	1.08E-05	1.29E-01	N/A	3.0E-03
92624	Biphenyl, 1,1'	1	15	1.23E+01	N/A	0.10	2.74E+01	3.15E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	N/A
208988	Acenaphthylene	1	15	9.57E+00	4.31E+02	0.10	2.74E+01	7.33E-04	1.23E+03	2.13E+197	1.08E-05	N/A	N/A	3.0E-03
83329	Acenaphthene	1	15	1.42E+01	N/A	0.10	2.74E+01	1.86E-04	1.23E+03	#NUM!	1.08E-05	4.84E-03	N/A	3.0E-03
132549	Dibenzofuran	1	15	1.83E+01	1.64E+04	0.10	2.74E+01	8.18E-01	1.23E+03	#NUM!	1.08E-05	N/A	N/A	N/A
86737	Fluorene	1	15	1.54E+01	N/A	0.10	2.74E+01	1.80E-03	1.23E+03	#NUM!	1.07E-05	1.78E-01	N/A	N/A
85018	Phenanthrene	1	15	2.81E+01	6.27E+03	0.10	2.74E+01	3.50E-04	1.23E+03	1.50E+00	3.24E-05	N/A	N/A	3.0E-03
120127	Anthracene	1	15	5.90E+01	N/A	0.10	2.74E+01	1.80E-03	1.23E+03	5.14E+80	1.08E-05	6.78E-02	N/A	3.0E-03
C5-C8	C5-C8 Aliphatics	1	15	4.53E+00	3.84E+08	0.10	2.74E+01	3.84E-04	1.23E+03	#NUM!	1.08E-05	4.14E-03	N/A	3.0E-01
C9-C12	C9-C12 Aliphatics	1	15	3.00E+02	6.78E+08	0.10	2.74E+01	3.84E-04	1.23E+03	#NUM!	1.08E-05	7.39E+01	N/A	2.0E-01
C9-C10	C9-C10 Aromatics	1	15	3.58E+00	1.95E+07	0.10	2.74E+01	3.89E-04	1.23E+03	#NUM!	1.08E-05	2.10E+02	N/A	5.0E-02
C9-C18	C9-C18 Aliphatics	1	15	1.38E+03	1.58E+08	0.10	2.74E+01	3.54E-04	1.23E+03	#NUM!	1.08E-05	1.70E+03	N/A	2.0E-01
C11-C22	C11-C22 Aromatics	1	15	1.00E+01	6.23E+06	0.10	2.74E+01	4.27E-04	1.23E+03	#NUM!	1.08E-05	6.72E+01	N/A	5.0E-02

Appendix C.4
Johnson & Edinger Model - Data Entry Screen
Inhalation of Volatiles from Soil
Future Child Recreational Scenario - RME
Southwest Properties, Waste O&H Superfund Site, Operable Unit 2
Whitney Barn

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

INCREMENTAL RISK CALCULATIONS:

Chemical CAS No. (numbers only, no dashes)	Chemical	Indoor exposure soil conc. carcinogen (µg/kg)	Indoor exposure soil conc. noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc. (µg/kg)	Soil saturation conc. C _s (µg/kg)	Final indoor exposure soil conc. (µg/kg)	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
95036	Trimethylbenzene, 1,2,4-	NA	NA	NA	4.38E+05	NA	NA	NA
540500	Dichloroethene, 1,2- (total)	NA	NA	NA	5.98E+02	NA	NA	NA
108878	Trimethylbenzene, 1,3,5-	NA	NA	NA	7.12E+04	NA	NA	NA
104510	n-Butylbenzene	NA	NA	NA	6.63E+03	NA	NA	NA
91200	Naphthalene	NA	NA	NA	1.30E+05	NA	NA	3.4E-04
99870	Isopropyltoluene, 4-	NA	NA	NA	7.31E+05	NA	NA	NA
135608	Buthylbenzene, sec-	NA	NA	NA	1.49E+06	NA	NA	NA
74873	Chloromethane	NA	NA	NA	1.37E+09	NA	NA	6.7E-04
76014	Vinyl chloride	NA	NA	NA	8.33E+05	NA	1.2E-07	1.6E-03
74839	Bromomethane	NA	NA	NA	3.69E+09	NA	NA	NA
75033	Ethyl Chloride	NA	NA	NA	1.37E+06	NA	NA	2.7E-06
75184	1,1-Dichloroethene	NA	NA	NA	8.39E+08	NA	NA	2.6E-04
76131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	NA	NA	NA	3.99E+05	NA	NA	NA
67841	Acetone	NA	NA	NA	2.01E+08	NA	NA	NA
73150	Carbon Disulfide	NA	NA	NA	8.78E+05	NA	NA	NA
79200	Methyl Acetate	NA	NA	NA	5.03E+07	NA	NA	NA
75022	Methylene chloride	NA	NA	NA	2.99E+06	NA	1.8E-09	1.3E-05
158005	trans-1,2-Dichloroethene	NA	NA	NA	4.42E+07	NA	NA	9.8E-05
1634044	Methyl-Tertiary-Butyl Ether	NA	NA	NA	1.42E+07	NA	NA	3.7E-07
75343	1,1-Dichloroethane	NA	NA	NA	1.38E+06	NA	NA	7.8E-05
156562	cis-1,2-Dichloroethene	NA	NA	NA	9.75E+05	NA	NA	6.8E-03
78933	Butane, 2- (MEK)	NA	NA	NA	4.63E+07	NA	NA	NA
71566	1,1,1-Trichloroethane	NA	NA	NA	4.42E+06	NA	NA	NA
110827	Cyclohexane	NA	NA	NA	3.98E+06	NA	NA	NA
71432	Benzene	NA	NA	NA	5.74E+05	NA	1.2E-08	5.9E-04
76018	Trichloroethylene	NA	NA	NA	6.95E+05	NA	2.6E-07	6.6E-04
108872	Methyl cyclohexane	NA	NA	NA	2.86E+04	NA	NA	2.7E-04
108863	Toluene	NA	NA	NA	3.02E+05	NA	NA	7.7E-05
127184	Tetrachloroethylene	NA	NA	NA	1.08E+09	NA	1.1E-08	NA
108907	Chlorobenzene	NA	NA	NA	3.04E+05	NA	NA	1.3E-04
100414	Ethylbenzene	NA	NA	NA	1.98E+05	NA	NA	6.6E-08
1330207	Xylene	NA	NA	NA	1.50E+05	NA	NA	NA
100426	Styrene	NA	NA	NA	6.44E+05	NA	NA	NA
95023	Isopropylbenzene	NA	NA	NA	1.05E+06	NA	NA	NA
79345	1,1,2,2-Tetrachloroethane	NA	NA	NA	1.15E+09	NA	NA	NA
541731	Dichlorobenzene, 1,3-	NA	NA	NA	3.82E+04	NA	NA	NA
100467	1,4-Dichlorobenzene	NA	NA	NA	1.08E+06	NA	NA	2.0E-06
95501	1,2-Dichlorobenzene	NA	NA	NA	8.51E+06	NA	NA	NA
120821	1,2,4-Trichlorobenzene	NA	NA	NA	1.13E+08	NA	NA	NA
100527	Benzaldehyde	NA	NA	NA	1.74E+06	NA	NA	NA
91879	Methylnaphthalene, 2-	NA	NA	NA	4.24E+05	NA	NA	6.6E-04
92524	Stilbene, 1,1'-	NA	NA	NA	8.91E+04	NA	NA	NA
205958	Acenaphthylene	NA	NA	NA	3.85E+04	NA	NA	3.4E-05
85329	Acenaphthene	NA	NA	NA	6.08E+04	NA	NA	NA
132649	Dibenzofuran	NA	NA	NA	1.95E+05	NA	NA	NA
96737	Fluorene	NA	NA	NA	2.97E+04	NA	NA	NA
95018	Phenanthrene	NA	NA	NA	3.64E+04	NA	NA	5.0E-04
120127	Aztracene	NA	NA	NA	2.57E+03	NA	NA	NA
C5-C8	C5-C8 Aliphatics	NA	NA	NA	7.89E+07	NA	NA	4.8E-01
CP-C12	CP-C12 Aliphatics	NA	NA	NA	2.12E+07	NA	NA	3.1E-03
CA-C10	CA-C10 Aromatics	NA	NA	NA	1.62E+06	NA	NA	9.3E-02
CA-C18	CA-C18 Aliphatics	NA	NA	NA	1.36E+07	NA	NA	1.9E-01
C11-C22	C11-C22 Aromatics	NA	NA	NA	8.92E+07	NA	NA	3.0E-02

TOTAL: 95% UCL Cancer Risk 4E-07 85% UCL HI 7.9E-01

☐ = Cancer risk > 1E-05 or HQ/HI > 1E+00

Trimethylbenzene, 1,2,4- MESSAGE: Soil conc. = saturation (Ceat). Risk/HQ calculated at Ceat.
 Dichloroethene, 1,2- (total) MESSAGE: Soil conc. = saturation (Ceat). Risk/HQ calculated at Ceat.
 Trimethylbenzene, 1,3,5- MESSAGE: Soil conc. = saturation (Ceat). Risk/HQ calculated at Ceat.
 n-Butylbenzene MESSAGE: Soil conc. = saturation (Ceat). Risk/HQ calculated at Ceat.
 Naphthalene MESSAGE: Soil conc. = saturation (Ceat). Risk/HQ calculated at Ceat.
 Isopropyltoluene, 4- MESSAGE: Soil conc. = saturation (Ceat). Risk/HQ calculated at Ceat.
 Butylbenzene, sec- MESSAGE: Soil conc. = saturation (Ceat). Risk/HQ calculated at Ceat.
 Chloromethane MESSAGE: Soil conc. = saturation (Ceat). Risk/HQ calculated at Ceat.
 Vinyl chloride MESSAGE: Soil conc. = saturation (Ceat). Risk/HQ calculated at Ceat.
 Bromomethane MESSAGE: Soil conc. = saturation (Ceat). Risk/HQ calculated at Ceat.
 Ethyl Chloride MESSAGE: Soil conc. = saturation (Ceat). Risk/HQ calculated at Ceat.
 1,1-Dichloroethene MESSAGE: Soil conc. = saturation (Ceat). Risk/HQ calculated at Ceat.
 Trichloro-1,2,2-trifluoroethane, 1,1,2- MESSAGE: Soil conc. = saturation (Ceat). Risk/HQ calculated at Ceat.
 Acetone MESSAGE: Soil conc. = saturation (Ceat). Risk/HQ calculated at Ceat.
 Carbon Disulfide MESSAGE: Soil conc. = saturation (Ceat). Risk/HQ calculated at Ceat.
 Methyl Acetate MESSAGE: Soil conc. = saturation (Ceat). Risk/HQ calculated at Ceat.
 Methylene chloride MESSAGE: Soil conc. = saturation (Ceat). Risk/HQ calculated at Ceat.
 trans-1,2-Dichloroethene MESSAGE: Soil conc. = saturation (Ceat). Risk/HQ calculated at Ceat.
 Methyl-Tertiary-Butyl Ether MESSAGE: Soil conc. = saturation (Ceat). Risk/HQ calculated at Ceat.
 1,1-Dichloroethane MESSAGE: Soil conc. = saturation (Ceat). Risk/HQ calculated at Ceat.
 cis-1,2-Dichloroethene MESSAGE: Soil conc. = saturation (Ceat). Risk/HQ calculated at Ceat.
 Butane, 2- (MEK) MESSAGE: Soil conc. = saturation (Ceat). Risk/HQ calculated at Ceat.
 1,1,1-Trichloroethane MESSAGE: Soil conc. = saturation (Ceat). Risk/HQ calculated at Ceat.
 Cyclohexane MESSAGE: Soil conc. = saturation (Ceat). Risk/HQ calculated at Ceat.
 Benzene MESSAGE: Soil conc. = saturation (Ceat). Risk/HQ calculated at Ceat.
 Trichloroethylene MESSAGE: Soil conc. = saturation (Ceat). Risk/HQ calculated at Ceat.

CALCULATE RISK-BASED SOIL CONCENTRATION (enter "X" in "YEM" box)

SL-SCREEN
Version 2.3.0301

YES

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL SOIL CONCENTRATION (enter "X" in "IEB" box and initial soil conc. below)

YES

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER initial soil concentration Mean soil conc. OR (ug/kg)	ENTER Depth below grade to bottom of installed space floor Lp (ft)	ENTER Depth below grade to top of contamination L1 (ft)	ENTER Average soil temperature Ts (°C)	ENTER Vadose zone SCS soil bulk density (used to estimate soil vapor permeability) OR Note	ENTER User-defined vadose zone soil vapor permeability Kv (cm²)	ENTER Vadose zone soil dry bulk density ρb(dry) (g/cm³)	ENTER Vadose zone soil porosity n (unitless)	ENTER Vadose zone soil water-filled porosity θw (cm³/cm³)	ENTER Vadose zone soil organic carbon fraction, foc (unitless)	ENTER Atmospheric time for contaminants, ATC (hrs)	ENTER Atmospheric time for noncontaminants, ATNC (hrs)	ENTER Exposure duration, ED (days)	ENTER Exposure frequency, EF (days/yr)	ENTER Exposure rate ET (hr/day)	ENTER Correction factor CF (unitless)	ENTER Target hazard index for contaminants, THQ (unitless)	ENTER Target hazard index for noncontaminants, THQ (unitless)	
																			Chemical name
10028	Trimethylbenzene, 1,2,4-		15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
10029	Dichlorobenzene, 1,2- (o,d)		15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
10074	Trimethylbenzene, 1,3,5-		15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
10080	n-Butylbenzene		15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
10102	Naphthalene	2.74E+03	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
10104	Isopropylbenzene, 4-		15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
10184	Butylbenzene, sec-		15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
74070	Chloromethane	2.49E+02	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
75004	Vinyl chloride	2.81E+02	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
7428	Bromomethane		15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
75002	Ethyl chloride	6.60E+01	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
73042	1,1-Dichloroethane	6.34E+01	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
74111	Trichloro-1,2,2-trifluoroethane, 1,1,2-		15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
67641	Acetone	3.34E+02	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
75181	Carbon disulfide		15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
75281	Methyl acetate		15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
75251	Methylene chloride	7.27E+02	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
10060	trans-1,2-Dichloroethane	7.73E+01	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
10044	Methyl-Tertiary-Butyl Ether	6.75E+01	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
75241	1,1-Dichloroethane	3.56E+02	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
10043	cis-1,2-Dichloroethane	1.80E+02	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
75231	Sulfone, 2- (MEK)		15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
71164	1,1,1-Trichloroethane		15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
11067	Cyclohexane		15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
75102	Benzene	8.08E+01	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
75101	Trichloroethylene	2.81E+02	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
10047	Methyl cyclohexane	4.49E+02	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
10045	Toluene	3.85E+02	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
12114	Tetrachloroethylene	1.47E+02	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
10047	Chlorobenzene	3.11E+02	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
10044	Ethylbenzene	1.84E+02	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
133617	Xylene		15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
10023	Styrene		15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
10028	Isopropylbenzene		15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
75048	1,1,2,2-Tetrachloroethane		15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
14171	Dichlorobenzene, 1,2-	1.00E+02	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
10047	1,4-Dichlorobenzene	3.80E+02	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
10041	1,3-Dichlorobenzene	6.10E+01	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
13021	1,2,4-Trichlorobenzene		15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
10027	Benzaldehyde		15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
91571	Methylnaphthalene, 2-	5.41E+03	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
91561	Biphenyl, 1,1'		15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
91049	Acenaphthylene	4.09E+02	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
13229	Acenaphthene		15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
13246	Dibenzofuran	1.79E+03	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
10747	Fluorene		15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
88018	Phenanthrene	3.99E+04	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
12627	Anthracene		15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
09-09	C6-C8 Aliphatics	6.63E+04	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
09-10	C9-C12 Aliphatics	6.51E+04	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
09-19	C9-C10 Aromatics	4.31E+06	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
09-24	C9-C15 Aromatics	9.23E+06	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1
09-28	C11-C22 Aromatics	9.24E+06	15	15	10	LB	1	1.5	0.43	0.3	0.002	70	2	2	26	2.5	8790	1.0E-06	1

Note:
1) Default soil parameters from table 7 of User's Guide for Evaluating Subsurface Vapor Intrusion into Buildings (U) 8, EPA (June 18, 2000) were used for soil water filled porosity (θw), soil organic carbon fraction (foc), soil total porosity (n), and soil dry bulk density (ρb).

Appendix C.4
 Johnson & Ettinger Model - Data Entry Screen
 Inhalation of Volatiles from Soil
 Future Child Recreational Scenario - CT
 Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
 Whitney Barrel

Chemical CAS No. (numbers only, no dashes)	Chemical	Diffusivity in air, D _a (cm ² /s)	Diffusivity in water, D _w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T _R (°C)	Enthalpy of vaporization at the normal boiling point, ΔH _{v,b} (cal/mol)	Normal boiling point, T _b (°K)	Critical temperature, T _c (°K)	Organic carbon partition coefficient, K _{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RIC (mg/m ³)	Physical state at soil temperature, (S,L,G)
95636	Trimethylbenzene, 1,2,4-	7.60E-02	9.03E-06	5.70E-03	25	1.25E+03	442.30	649.11	3.72E+03	5.70E+01	N/A	6.0E-03	L
540590	Dichloroethylene, 1,2- (total)	5.59E-02	6.47E-06	4.30E-04	20	1.32E+03	585.00	877.50	1.28E+02	1.30E+00	#N/A	#N/A	0.0E+00
108678	Trimethylbenzene, 1,3,5-	6.48E-02	7.86E-06	7.81E-03	25	1.25E+03	442.30	649.11	1.67E+03	2.00E+01	N/A	6.0E-03	L
104518	n-Butylbenzene	7.25E-02	8.39E-06	1.25E-02	25	1.23E+03	456.00	684.00	2.51E+03	1.26E+00	#N/A	#N/A	L
91203	Naphthalene	5.90E-02	7.50E-06	4.83E-04	25	1.04E+04	491.14	748.40	2.00E+03	3.10E+01	N/A	3.0E-03	S
99876	Isopropyltoluene, 4-	7.25E-02	8.39E-06	8.60E+00	25	1.24E+03	450.10	652.04	1.58E+03	2.34E+01	N/A	4.0E-01	L
135888	Butylbenzene, sec-	8.00E-02	8.00E-06	1.07E-02	25	1.24E+03	446.65	669.98	3.11E+04	1.76E+01	#N/A	#N/A	0.0E+00
74873	Chloromethane	1.28E-01	6.50E-06	8.87E-03	25	1.35E+03	249.00	373.50	1.43E+01	5.32E+03	N/A	9.0E-02	0.0E+00
75014	Vinyl chloride	1.06E-01	1.23E-05	2.71E-02	25	5.25E+03	269.25	432.00	1.86E+01	2.78E+03	6.8E-06	1.0E-01	L
74839	Bromomethane	7.28E-02	1.21E-05	6.22E-03	25	5.49E+03	276.50	414.75	1.43E+01	1.52E+04	N/A	5.0E-03	0.0E+00
75003	Ethyl Chloride	1.26E-01	6.50E-06	8.67E-03	25	1.36E+03	249.00	373.50	1.43E+01	5.32E+03	N/A	1.0E+01	L
75354	1,1-Dichloroethylene	9.00E-02	1.04E-05	2.61E-02	25	6.25E+03	304.75	578.05	5.89E+01	2.25E+03	N/A	2.0E-01	L
76131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	2.68E-02	8.07E-06	5.17E-01	25	1.33E+03	320.70	481.05	2.25E+02	1.70E+02	N/A	3.0E+01	0.0E+00
67641	Acetone	1.24E-01	1.14E-05	3.88E-05	25	6.86E+03	329.20	508.10	5.75E-01	1.00E+06	N/A	N/A	L
75150	Carbon Disulfide	1.04E-01	1.29E-05	1.27E-02	25	6.39E+03	319.00	552.00	5.14E+01	2.67E+03	N/A	7.0E-01	L
78209	Methyl Acetate	1.04E-01	1.00E-05	1.13E-04	25	1.31E+03	365.00	647.50	3.32E+00	2.43E+05	#N/A	#N/A	0.0E+00
75092	Methylene chloride	1.01E-01	1.17E-05	2.19E-03	25	6.71E+03	313.00	510.00	1.17E+01	1.30E+04	4.7E-07	3.0E+00	L
156605	trans-1,2-Dichloroethylene	7.07E-02	1.19E-05	9.39E-03	25	1.33E+03	320.85	516.50	5.25E+01	6.30E+03	N/A	2.0E-01	L
1634044	Methyl-Tertiary-Butyl Ether	1.02E-01	1.05E-05	5.87E-04	25	1.32E+03	328.36	497.11	3.84E+01	5.10E+04	N/A	3.0E+00	L
75343	1,1-Dichloroethane	7.42E-02	1.05E-05	5.61E-03	25	6.90E+03	330.55	523.00	3.16E+01	5.08E+03	N/A	5.0E-01	L
156592	cis-1,2-Dichloroethylene	7.36E-02	1.13E-05	4.07E-03	25	7.19E+03	333.65	544.00	3.55E+01	3.50E+03	N/A	2.0E-01	L
78933	Butanone, 2- (MEK)	8.08E-02	9.80E-06	5.60E-05	25	1.31E+03	352.50	528.75	3.83E+00	2.23E+05	N/A	N/A	0.0E+00
71566	1,1,1-Trichloroethane	7.80E-02	8.80E-06	1.72E-02	25	7.14E+03	347.24	545.00	1.10E+02	1.33E+03	N/A	2.2E+00	L
110827	Cyclohexane	8.00E-02	9.00E-06	2.00E+00	25	1.31E+03	353.85	530.78	1.60E+02	5.50E+01	#N/A	#N/A	0.0E+00
71432	Benzene	8.80E-02	9.80E-06	5.56E-03	25	7.34E+03	353.24	562.16	5.89E+01	1.75E+03	7.8E-06	3.0E-02	L
79016	Trichloroethylene	7.90E-02	9.10E-06	1.03E-02	25	7.51E+03	360.36	544.20	1.66E+02	1.10E+03	1.1E-04	4.0E-02	L
108872	Methyl cyclohexane	9.86E-02	8.52E-06	4.23E-01	25	1.30E+03	373.90	560.85	2.68E+02	1.40E+01	N/A	3.0E+00	L
108883	Toluene	8.70E-02	8.60E-06	6.63E-03	25	7.93E+03	383.78	591.79	1.82E+02	5.26E+02	N/A	4.0E-01	L
127184	Tetrachloroethylene	7.20E-02	8.20E-06	1.84E-02	25	8.29E+03	394.40	620.20	1.55E+02	2.00E+02	5.9E-06	N/A	L
108907	Chlorobenzene	7.30E-02	8.70E-06	3.71E-03	25	8.41E+03	404.87	632.40	2.19E+02	4.72E+02	N/A	6.0E-02	L
100414	Ethylbenzene	7.50E-02	7.80E-06	7.88E-03	25	8.50E+03	409.34	617.20	3.63E+02	1.69E+02	N/A	1.0E+00	L
1330207	Xylenes	7.69E-02	8.44E-06	6.73E-06	25	1.28E+03	417.40	618.21	2.41E+02	2.20E+02	N/A	1.0E-01	L
100425	Styrene	7.10E-02	8.00E-06	2.76E-03	25	8.74E+03	418.31	636.00	7.76E+02	3.10E+02	#N/A	#N/A	L
98828	Isopropylbenzene	6.50E-02	7.83E-06	1.47E-02	25	1.26E+03	425.40	631.01	9.31E+03	5.60E+01	N/A	4.0E-01	L
79345	1,1,2,2-Tetrachloroethane	7.10E-02	7.90E-06	3.44E-04	25	9.00E+03	419.60	661.15	9.33E+01	2.97E+03	#N/A	#N/A	L
541731	Dichlorobenzene, 1,3-	4.14E-02	8.85E-06	4.70E-03	25	1.24E+03	446.00	683.96	1.70E+02	6.88E+01	N/A	N/A	L
106487	1,4-Dichlorobenzene	6.90E-02	7.90E-06	2.43E-03	25	9.27E+03	447.21	684.75	6.17E+02	7.38E+01	N/A	8.0E-01	S
95501	1,2-Dichlorobenzene	6.88E-02	9.41E-06	1.62E-06	25	9.70E+03	465.00	697.50	5.34E+01	2.77E+04	N/A	N/A	S
120621	1,2,4-Trichlorobenzene	3.00E-02	8.23E-06	1.42E-03	25	1.05E+04	486.15	725.00	1.78E+03	3.00E+02	N/A	2.0E-01	L
100527	Benzaldehyde	7.30E-02	9.07E-06	2.62E-05	25	1.24E+03	452.00	678.00	3.27E+01	8.57E+03	#N/A	#N/A	0.0E+00
91576	Methylnaphthalene, 2-	4.84E-02	7.78E-06	1.01E-03	25	1.17E+03	514.05	761.01	8.51E+03	2.46E+01	N/A	3.0E-03	S
92524	Biphenyl, 1,1'-	4.04E-02	8.15E-06	3.03E-04	25	1.15E+03	529.10	793.65	6.25E+03	6.94E+00	N/A	N/A	0.0E+00
208968	Acenaphthylene	4.43E-02	7.44E-06	2.80E-04	25	1.12E+03	553.00	792.01	4.79E+03	3.93E+00	N/A	3.0E-03	S
83329	Acenaphthene	4.21E-02	7.69E-06	1.55E-04	25	1.22E+04	550.54	803.15	7.08E+03	4.24E+00	N/A	3.0E-03	S
132649	Dibenzofuran	2.87E-02	5.93E-06	4.00E-03	25	1.11E+03	559.00	824.01	8.13E+03	1.00E+01	N/A	N/A	S
86737	Fluorene	3.83E-02	7.88E-06	9.41E-08	25	1.27E+04	570.44	870.00	7.71E+03	1.90E+00	N/A	3.0E-03	S
85018	Phenanthrene	3.30E-02	7.47E-06	1.30E-04	25	1.06E+03	613.00	869.01	1.41E+04	1.28E+00	N/A	3.0E-03	S
120127	Anthracene	3.24E-02	7.74E-06	6.51E-05	25	1.31E+04	615.18	873.00	2.95E+04	4.34E-02	N/A	3.0E-03	S
C5-C8	C5-C8 Aliphatics	6.00E-02	1.00E-05	1.30E+00	25	NA	NA	NA	2.27E+03	1.10E+04	N/A	2.0E-01	S
C9-C12	C9-C12 Aliphatics	6.00E-02	1.00E-05	1.56E+00	25	NA	NA	NA	1.50E+05	7.00E+01	N/A	2.0E-01	S
C9-C10	C9-C10 Aromatics	6.00E-02	1.00E-05	7.92E-03	25	NA	NA	NA	1.78E+03	5.10E+04	N/A	5.0E-02	S
C9-C18	C9-C18 Aliphatics	6.00E-02	1.00E-05	1.66E+00	25	NA	NA	NA	6.80E+05	1.00E+01	N/A	2.0E-01	S
C11-C22	C11-C22 Aromatics	6.00E-02	1.00E-05	7.32E-04	25	NA	NA	NA	5.00E+03	5.80E+03	N/A	5.0E-02	S

Appendix C.4
 Johnson & Ettinger Model - Data Entry Screen
 Inhalation of Volatiles from Soil
 Future Child Recreational Scenario - CT
 Southwest Pyrites, Wells GWH Superfund Site, Operable Unit 2
 Whitney Barrel

Chemical CAS No.	Chemical	Source-building separation, LT (cm)	Vadose zone soil air-filled porosity, θ_a^v (cm^3/cm^3)	Vadose zone effective total fluid saturation, $S_{e, \text{eff}}$ (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k (cm^2)	Vadose zone soil relative air permeability, $k_{r, \text{air}}$ (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, CR ($\mu\text{g}/\text{kg}$)	Edg. ventilation rate, Q_{edg} (cm^3/s)	Area of enclosed space below grade, A_g (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization s. av. soil temperature, $\Delta H_{v, \text{av}}$ (cal/mol)	Henry's law constant at av. soil temperature, $H_{v, \text{av}}$ (atm-m ³ /mol)	Henry's law constant at av. soil temperature, HTS (unitless)	Vapor viscosity at av. soil temperature, $\mu_{v, \text{av}}$ (g/cm-s)	Vadose zone effective diffusion coefficient, D_{eff} (cm^2/s)
95836	Trimethylbenzene, 1,2,4-	1	0.130	0.859	1.62E-08	0.390	8.33E-09	1.72E+04	4.38E+05	2.52E+08	9.50E+06	1.30E-04	15	1.55E+03	4.08E-03	2.13E-01	1.75E-04	4.77E-04
540590	Dichloroethylene, 1,2- (cis)	1	0.130	0.859	1.62E-08	0.390	8.33E-09	1.72E+04	5.96E+02	2.52E+08	9.50E+06	1.30E-04	15	1.73E+03	3.87E-04	1.67E-02	1.75E-04	3.77E-04
109578	Trimethylbenzene, 1,3,5-	1	0.130	0.859	1.62E-08	0.390	8.33E-09	1.72E+04	7.13E+04	2.52E+08	9.50E+06	1.30E-04	15	1.55E+03	6.80E-03	2.93E-01	1.75E-04	3.95E-04
104518	n-Butylbenzene	1	0.130	0.859	1.62E-08	0.390	8.33E-09	1.72E+04	8.63E+03	2.52E+08	9.50E+06	1.30E-04	15	1.53E+03	1.09E-02	4.66E-01	1.75E-04	4.41E-04
91203	Naphthalene	1	0.130	0.859	1.62E-08	0.390	8.33E-09	1.72E+04	2.74E+03	2.52E+08	9.50E+06	1.30E-04	15	1.28E+04	1.52E-04	6.55E-03	1.75E-04	4.70E-04
99878	Isopropyltoluene, 4-	1	0.130	0.859	1.62E-08	0.390	8.33E-09	1.72E+04	7.11E+06	2.52E+08	9.50E+06	1.30E-04	15	1.53E+03	1.46E-02	3.22E+02	1.75E-04	4.39E-04
135988	Bulkybenzene, sec.	1	0.130	0.859	1.62E-08	0.390	8.33E-09	1.72E+04	1.10E+08	2.52E+08	9.50E+06	1.30E-04	15	1.57E+03	7.48E+00	3.22E+02	1.75E-04	4.39E-04
74873	Chloromethane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.49E+02	2.52E+08	9.50E+06	1.30E-04	15	1.30E+03	7.79E-04	3.35E-01	1.75E-04	4.88E-04
75014	Vinyl chloride	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.61E+02	2.52E+08	9.50E+06	1.30E-04	15	5.00E+03	1.73E-02	7.46E-01	1.75E-04	7.69E-04
74839	Bromomethane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.69E+06	2.52E+08	9.50E+06	1.30E-04	15	5.39E+03	3.84E-03	1.05E-01	1.75E-04	4.49E-04
75003	Ethyl Chloride	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	8.60E+01	2.52E+08	9.50E+06	1.30E-04	15	1.20E+03	7.78E-03	3.39E-01	1.75E-04	7.89E-04
75354	1,1-Dichloroethylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	8.34E+01	2.52E+08	9.50E+06	1.30E-04	15	6.39E+03	1.47E-02	6.34E-01	1.75E-04	5.47E-04
76131	Trichloro-1,2,2-Infuroethane, 1,1,2-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.99E+05	2.52E+08	9.50E+06	1.30E-04	15	1.44E+03	4.56E-01	1.96E+01	1.75E-04	1.75E-04
67641	Acetone	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.24E+02	2.52E+08	9.50E+06	1.30E-04	15	7.56E+03	1.97E-05	8.50E-04	1.75E-04	2.07E-03
75160	Carbon Disulfide	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	8.78E+05	2.52E+08	9.50E+06	1.30E-04	15	6.88E+03	6.89E-03	3.01E-01	1.75E-04	6.34E-04
75092	Methyl Acetate	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	6.03E+07	2.52E+08	9.50E+06	1.30E-04	15	1.50E+03	9.88E-05	4.25E-03	1.75E-04	8.61E-04
75092	Methyl Chloride	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	7.27E+02	2.52E+08	9.50E+06	1.30E-04	15	7.03E+03	1.17E-03	5.03E-02	1.75E-04	4.32E-04
158806	trans-1,2-Dichloroethylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	7.73E+01	2.52E+08	9.50E+06	1.30E-04	15	1.42E+03	8.27E-03	3.56E-01	1.75E-04	4.32E-04
1834044	Methyl-Tertiary-Butyl Ether	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.83E+02	2.52E+08	9.50E+06	1.30E-04	15	1.45E+03	6.18E-04	2.22E-02	1.75E-04	6.67E-04
75343	1,1-Dichloroethane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	4.83E+07	2.52E+08	9.50E+06	1.30E-04	15	7.45E+03	2.88E-03	1.24E-01	1.75E-04	4.58E-04
156582	cis-1,2-Dichloroethylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	8.01E+05	2.52E+08	9.50E+06	1.30E-04	15	7.73E+03	2.04E-03	8.77E-02	1.75E-04	4.59E-04
78933	Butanone, 2- (MEK)	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	6.01E+05	2.52E+08	9.50E+06	1.30E-04	15	1.49E+03	4.90E-05	2.11E-03	1.75E-04	9.45E-04
71566	1,1,1-Trichloroethane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	8.88E+06	2.52E+08	9.50E+06	1.30E-04	15	7.88E+03	8.50E-03	3.86E-01	1.75E-04	4.76E-04
110827	Cyclohexane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.88E+06	2.52E+08	9.50E+06	1.30E-04	15	1.46E+03	1.79E-04	7.54E+01	1.75E-04	4.82E-04
71432	Benzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	8.08E+01	2.52E+08	9.50E+06	1.30E-04	15	8.12E+03	1.69E-03	1.16E-01	1.75E-04	2.42E-04
79016	Trichloroethylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.91E+02	2.52E+08	9.50E+06	1.30E-04	15	8.58E+03	4.79E-03	2.06E-01	1.75E-04	4.83E-04
108872	Methyl cyclohexane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	4.45E+02	2.52E+08	9.50E+06	1.30E-04	15	1.51E+03	3.70E-01	1.68E+01	1.75E-04	5.98E-04
108843	Toluene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.85E+02	2.52E+08	9.50E+06	1.30E-04	15	9.16E+03	2.82E-03	1.26E-01	1.75E-04	5.35E-04
127184	Tetrachloroethylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.47E+02	2.52E+08	9.50E+06	1.30E-04	15	9.55E+03	7.83E-03	3.37E-01	1.75E-04	4.39E-04
105907	Chlorobenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.11E+02	2.52E+08	9.50E+06	1.30E-04	15	8.80E+03	1.54E-03	6.85E-02	1.75E-04	4.56E-04
100414	Ethylbenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.84E+02	2.52E+08	9.50E+06	1.30E-04	15	1.02E+04	3.18E-03	1.37E-01	1.75E-04	4.60E-04
1330207	Xylenes	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.60E+06	2.52E+08	9.50E+06	1.30E-04	15	1.64E+03	5.88E-06	2.52E-04	1.75E-04	3.75E-03
100425	Styrene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.44E+05	2.52E+08	9.50E+06	1.30E-04	15	1.06E+04	1.08E-03	4.67E-02	1.75E-04	4.47E-04
98626	Isopropylbenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.08E+06	2.52E+08	9.50E+06	1.30E-04	15	1.54E+03	1.28E-02	5.51E-01	1.75E-04	3.96E-04
79345	1,1,2,2-Tetrachloroethane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.15E+06	2.52E+08	9.50E+06	1.30E-04	15	1.05E+04	1.34E-04	5.77E-03	1.75E-04	5.65E-04
541731	Dichlorobenzene, 1,3-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.00E+02	2.52E+08	9.50E+06	1.30E-04	15	1.50E+03	4.11E-03	1.77E-01	1.75E-04	2.56E-04
108467	1,4-Dichlorobenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.50E+02	2.52E+08	9.50E+06	1.30E-04	15	1.12E+04	8.89E-04	3.83E-02	1.75E-04	4.38E-04
96501	1,2-Dichlorobenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.10E+01	2.52E+08	9.50E+06	1.30E-04	15	1.21E+04	5.51E-07	2.37E-05	1.75E-04	3.94E-02
120821	1,2,4-Trichlorobenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.13E+08	2.52E+08	9.50E+06	1.30E-04	15	1.32E+04	4.35E-04	1.67E-02	1.75E-04	2.26E-04
100527	Benzaldehyde	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.74E+08	2.52E+08	9.50E+06	1.30E-04	15	1.53E+03	2.29E-05	6.94E-04	1.75E-04	1.35E-04
91579	Methylnaphthalene, 2-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.41E+03	2.52E+08	9.50E+06	1.30E-04	15	1.51E+03	2.68E-04	1.14E-02	1.75E-04	3.15E-04
92524	Biphenyl, 1,1'-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	8.81E+04	2.52E+08	9.50E+06	1.30E-04	15	1.47E+03	2.08E-04	1.14E-02	1.75E-04	3.15E-04
208988	Acenaphthylene	1	0.130	0.669	1.62E-08	0.390	6.33E-09	1.72E+04	4.00E+02	2.52E+08	9.50E+06	1.30E-04	15	1.51E+03	2.45E-04	1.05E-03	1.75E-04	3.39E-04
83329	Acenaphthene	1	0.130	0.669	1.62E-08	0.390	6.33E-09	1.72E+04	6.09E+04	2.52E+08	9.50E+06	1.30E-04	15	1.81E+04	3.87E-05	1.58E-03	1.75E-04	3.39E-04
132849	Dibenzofuran	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.79E+03	2.52E+08	9.50E+06	1.30E-04	15	1.47E+03	3.61E-03	1.51E-01	1.75E-04	1.69E-04
96737	Fluorene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.87E+04	2.52E+08	9.50E+06	1.30E-04	15	1.62E+04	2.20E-08	9.48E-07	1.75E-04	8.18E-01
85816	Phenanthrene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.64E+04	2.52E+08	9.50E+06	1.30E-04	15	1.48E+03	1.14E-04	4.80E-03	1.75E-04	3.50E-04
128127	Anthracene	1	0															

Appendix C.4
 Johnson & Ellinger Model - Data Entry Screen
 Inhalation of Volatiles from Soil
 Future Child Recreational Scenario - CT
 Southwest Properties, Walla G&H Superfund Site, Operable
 Whitney Barrel

Chemical CAS No. (numbers only, no dashes)	Chemical	Diffusion path length, L _d (cm)	Convection path length, L _p (cm)	Soil-water partition coefficient, K _d (cm ³ /g)	Vapor conc., C _{soil} (ug/m ³)	Crack radius, r _{crack} (cm)	Average vapor flow rate into bldg., Q _{avg} (cm ³ /s)	Crack effective diffusion coefficient, D _{crack} (cm ² /s)	Area of crack, A _{crack} (cm ²)	Exponent of equivalent pore number, exp(Pe) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg conc., C _{bldg} (ug/m ³)	Unit risk factor, URF (ug/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
95638	Trimethylbenzene, 1,2,4-	1	15	7.43E+00	N/A	0.10	2.74E+01	4.77E-04	1.23E+03	2.75E+003	1.08E-05	N/A	N/A	5.0E-03
540690	Dichloroethylene, 1,2 (cis)	1	15	2.67E-01	N/A	0.10	2.74E+01	3.77E-04	1.23E+03	#NUM!	1.08E-05	N/A	#N/A	#N/A
109878	Trimethylbenzene, 1,3,5-	1	15	3.34E+00	N/A	0.10	2.74E+01	3.96E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	6.0E-03
104518	n-Butylbenzene	1	15	8.02E+00	N/A	0.10	2.74E+01	4.41E-04	1.23E+03	#NUM!	1.08E-05	N/A	#N/A	#N/A
91203	Naphthalene	1	15	4.00E+00	4.27E+03	0.10	2.74E+01	4.70E-04	1.23E+03	8.87E+307	1.08E-05	4.61E-02	N/A	3.0E-03
96878	Isopropyltoluene, 4-	1	15	3.18E+00	N/A	0.10	2.74E+01	4.39E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	4.0E-01
135888	Butylbenzene, sec.	1	15	6.23E-01	N/A	0.10	2.74E+01	7.88E-04	1.23E+03	5.47E+287	1.08E-05	N/A	N/A	#N/A
74873	Chloromethane	1	15	2.98E-02	3.24E+06	0.10	2.74E+01	7.88E-04	1.23E+03	1.14E+189	1.08E-05	3.51E+00	N/A	8.0E-02
75014	Vinyl chloride	1	15	3.72E-02	6.48E+05	0.10	2.74E+01	8.44E-04	1.23E+03	5.27E+224	1.08E-05	6.99E+00	8.9E-06	1.0E-01
74839	Bromomethane	1	15	2.98E-02	N/A	0.10	2.74E+01	4.48E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	5.0E-03
75003	Ethyl Chloride	1	15	2.86E-02	1.12E+06	0.10	2.74E+01	7.68E-04	1.23E+03	1.14E+189	1.08E-05	1.21E+00	N/A	1.0E-01
75354	1,1-Dichloroethylene	1	15	1.19E-01	1.09E+05	0.10	2.74E+01	5.47E-04	1.23E+03	3.82E+294	1.08E-05	1.17E+00	N/A	2.0E-01
78131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	1	15	4.60E-01	N/A	0.10	2.74E+01	1.75E-04	1.23E+03	#NUM!	1.07E-05	N/A	N/A	3.0E-01
67641	Acetone	1	15	1.19E-03	1.37E+03	0.10	2.74E+01	2.07E-03	1.23E+03	8.18E+89	1.09E-05	1.48E-02	N/A	N/A
75150	Carbon Disulfide	1	15	1.03E-01	N/A	0.10	2.74E+01	6.34E-04	1.23E+03	1.25E+228	1.08E-05	N/A	N/A	7.0E-01
78209	Methyl Acetate	1	15	6.84E-03	N/A	0.10	2.74E+01	8.81E-04	1.23E+03	1.17E+169	1.08E-05	N/A	#N/A	#N/A
75092	Methylene chloride	1	15	2.34E-02	1.60E+05	0.10	2.74E+01	6.35E-04	1.23E+03	8.65E+227	1.08E-05	1.73E+00	4.7E-07	3.0E+00
159605	trans-1,2-Dichloroethylene	1	15	1.05E-01	8.20E+04	0.10	2.74E+01	4.32E-04	1.23E+03	#NUM!	1.08E-05	8.66E-01	N/A	2.0E-01
1634044	Methyl-Tertiary-Butyl Ether	1	15	7.88E-02	4.68E+03	0.10	2.74E+01	5.87E-04	1.23E+03	9.48E+216	1.08E-05	4.99E-02	N/A	3.0E-00
75343	1,1-Dichloroethane	1	15	6.32E-02	1.82E+05	0.10	2.74E+01	4.68E-04	1.23E+03	#NUM!	1.08E-05	1.75E+00	N/A	5.0E-01
159592	cis-1,2-Dichloroethylene	1	15	7.10E-02	5.86E+04	0.10	2.74E+01	4.69E-04	1.23E+03	#NUM!	1.08E-05	8.12E-01	N/A	2.0E-01
78933	Butanone, 2- (MEK)	1	15	7.69E-03	N/A	0.10	2.74E+01	8.49E-04	1.23E+03	1.18E+153	1.08E-05	N/A	N/A	N/A
71559	1,1,1-Trichloroethane	1	15	2.20E-01	N/A	0.10	2.74E+01	4.75E-04	1.23E+03	4.36E+304	1.09E-05	N/A	N/A	2.2E+00
110827	Cyclohexane	1	15	3.20E-01	N/A	0.10	2.74E+01	4.85E-04	1.23E+03	3.18E+298	1.08E-05	N/A	#N/A	#N/A
71432	Benzene	1	15	1.18E-01	2.85E+04	0.10	2.74E+01	5.42E-04	1.23E+03	1.81E+287	1.08E-05	3.08E-01	7.6E-08	3.0E-02
79016	Trichloroethylene	1	15	3.32E-01	1.09E+05	0.10	2.74E+01	4.83E-04	1.23E+03	3.77E+299	1.08E-05	1.18E+00	1.1E-04	4.0E-02
108872	Methyl cyclohexane	1	15	5.36E-01	3.35E+06	0.10	2.74E+01	5.88E-04	1.23E+03	1.60E+242	1.08E-05	3.82E+01	N/A	3.0E-00
108883	Toluene	1	15	3.84E-01	1.28E+05	0.10	2.74E+01	5.34E-04	1.23E+03	1.10E+271	1.08E-05	1.36E+00	N/A	4.0E-01
127184	Tetrachloroethylene	1	15	3.10E-01	9.19E+04	0.10	2.74E+01	4.39E-04	1.23E+03	#NUM!	1.08E-05	9.92E-01	5.9E-09	N/A
109807	Chlorobenzene	1	15	4.38E-01	3.21E+04	0.10	2.74E+01	4.65E-04	1.23E+03	#NUM!	1.08E-05	3.48E-01	N/A	8.0E-02
100414	Ethylbenzene	1	15	7.28E-01	2.88E+04	0.10	2.74E+01	4.80E-04	1.23E+03	#NUM!	1.09E-05	2.80E-01	N/A	1.0E+00
1330207	Xylene	1	15	4.82E-01	N/A	0.10	2.74E+01	3.75E-03	1.23E+03	4.03E+38	1.09E-05	N/A	N/A	1.0E-01
100425	Styrene	1	15	1.55E+00	N/A	0.10	2.74E+01	4.47E-04	1.23E+03	#NUM!	1.08E-05	N/A	#N/A	#N/A
96828	Isopropylbenzene	1	15	1.66E+01	N/A	0.10	2.74E+01	3.96E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	4.0E-01
79345	1,1,2,2-Tetrachloroethane	1	15	1.87E-01	N/A	0.10	2.74E+01	6.85E-04	1.23E+03	1.88E+268	1.08E-05	N/A	#N/A	#N/A
641731	Dichlorobenzene, 1,3-	1	15	3.40E-01	3.19E+04	0.10	2.74E+01	2.66E-04	1.23E+03	#NUM!	1.07E-05	3.42E-01	N/A	N/A
108487	1,4-Dichlorobenzene	1	15	1.23E+00	6.86E+03	0.10	2.74E+01	4.38E-04	1.23E+03	#NUM!	1.08E-05	7.19E-02	N/A	8.0E-01
95601	1,2-Dichlorobenzene	1	15	1.07E-01	3.84E+00	0.10	2.74E+01	3.84E-02	1.23E+03	4.74E+03	1.08E-05	4.28E-05	N/A	N/A
120821	1,2,4-Trichlorobenzene	1	15	3.86E+00	N/A	0.10	2.74E+01	2.25E-04	1.23E+03	#NUM!	1.07E-05	N/A	N/A	2.0E-01
100027	Benzaldehyde	1	15	6.34E-02	N/A	0.10	2.74E+01	1.95E-03	1.23E+03	2.80E+107	1.08E-05	N/A	#N/A	#N/A
91579	Methylnaphthalene, 2-	1	15	1.70E+01	1.20E+04	0.10	2.74E+01	3.13E-04	1.23E+03	#NUM!	1.08E-05	1.29E-01	N/A	3.0E-03
92524	Biphenyl, 1,1'	1	15	1.25E+01	N/A	0.10	2.74E+01	3.15E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	N/A
208988	Acenaphthylene	1	15	9.57E+00	4.31E+02	0.10	2.74E+01	3.38E-04	1.23E+03	#NUM!	1.08E-05	4.84E-03	N/A	3.0E-03
83329	Acenaphthene	1	15	1.42E+01	N/A	0.10	2.74E+01	7.33E-04	1.23E+03	2.13E+187	1.08E-05	N/A	N/A	3.0E-03
132849	Dibenzofuran	1	15	1.83E+01	1.84E+04	0.10	2.74E+01	7.86E-04	1.23E+03	#NUM!	1.07E-05	1.75E-01	N/A	N/A
66737	Fluorene	1	15	1.54E+01	N/A	0.10	2.74E+01	8.18E-01	1.23E+03	1.50E+00	1.32E-05	N/A	N/A	3.0E-03
65016	Phenanthrene	1	15	2.83E+01	6.27E+03	0.10	2.74E+01	3.60E-04	1.23E+03	#NUM!	1.08E-05	6.78E-02	N/A	3.0E-03
120127	Anthracene	1	15	5.90E+01	N/A	0.10	2.74E+01	1.80E-03	1.23E+03	5.14E+90	1.08E-05	N/A	N/A	3.0E-03
C5-C8	C5-C8 Aliphatics	1	15	4.53E+00	3.84E+08	0.10	2.74E+01	3.84E-04	1.23E+03	#NUM!	1.08E-05	4.14E+03	N/A	2.0E-01
C9-C12	C9-C12 Aliphatics	1	15	3.00E+02	6.76E+06	0.10	2.74E+01	3.84E-04	1.23E+03	#NUM!	1.08E-05	7.20E+01	N/A	2.0E-01
O9-C10	O9-C10 Aromatics	1	15	3.66E+00	1.96E+07	0.10	2.74E+01	3.88E-04	1.23E+03	#NUM!	1.08E-05	2.10E+02	N/A	5.0E-02
O9-C18	O9-C18 Aliphatics	1	15	1.38E+03	2.42E+07	0.10	2.74E+01	3.84E-04	1.23E+03	#NUM!	1.08E-05	2.81E+02	N/A	2.0E-01
C11-C22	C11-C22 Aromatics	1	15	1.00E+01	1.40E+08	0.10	2.74E+01	4.27E-04	1.23E+03	#NUM!	1.08E-05	1.61E+01	N/A	5.0E-02

RESULTS SHEET

Appendix C.4
Johnson & Edinger Model - Data Entry Screen
Inhalation of Volatiles from Soil
Future Child Recreational Scenario - CT
Southeast Powerline, Wells Glyn Superfund Site, Coverable Unit 2
Whitney Barre

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Chemical CAS No. (numbers only, no dashes)	Chemical	Indoor exposure soil conc. carcinogen (µg/kg)	Indoor exposure soil conc. noncarcinogen (µg/kg)	Risk-based Indoor exposure soil conc. (µg/kg)	Soil saturation C _{soil} conc. (µg/kg)	Final indoor exposure soil conc. (µg/kg)
95036	Trimethylbenzene, 1,2,4-	NA	NA	NA	4.38E+05	NA
94090	Dichloroethylene, 1,2- (total)	NA	NA	NA	5.98E+02	NA
106478	Trinitrobenzene, 1,3,5-	NA	NA	NA	7.13E+04	NA
104518	n-Sublimane	NA	NA	NA	8.63E+03	NA
91203	Naphthalene	NA	NA	NA	1.30E+05	NA
99070	Isopropyltoluene, 4-	NA	NA	NA	7.31E+03	NA
135906	Bulbimane, sec-	NA	NA	NA	1.10E+06	NA
74873	Chloromethane	NA	NA	NA	1.37E+08	NA
79014	Vinyl chloride	NA	NA	NA	9.33E+05	NA
74838	Bromomethane	NA	NA	NA	3.69E+08	NA
75003	Ethyl Chloride	NA	NA	NA	1.37E+06	NA
75334	1,1-Dichloroethylene	NA	NA	NA	9.36E+05	NA
78131	Trichloro-1,2,2-trifluoroethylene, 1,1,2-	NA	NA	NA	3.99E+03	NA
67841	Acetone	NA	NA	NA	3.01E+06	NA
75150	Carbon Disulfide	NA	NA	NA	3.79E+05	NA
79209	Methyl Acetate	NA	NA	NA	5.03E+07	NA
78092	Methylene chloride	NA	NA	NA	2.98E+06	NA
188605	trans-1,2-Dichloroethylene	NA	NA	NA	5.12E+06	NA
1834044	Methyl-Tertiary-Butyl Ether	NA	NA	NA	1.42E+07	NA
75343	1,1-Dichloroethane	NA	NA	NA	1.39E+06	NA
150592	cis-1,2-Dichloroethylene	NA	NA	NA	9.75E+05	NA
78933	Bulimane, 2- (MEK)	NA	NA	NA	4.83E+07	NA
71556	1,1,1-Trichloroethane	NA	NA	NA	9.01E+05	NA
110827	Cyclohexane	NA	NA	NA	2.88E+05	NA
71432	Benzene	NA	NA	NA	5.74E+05	NA
78018	Trichloroethylene	NA	NA	NA	6.03E+05	NA
103072	Methyl cyclohexane	NA	NA	NA	5.94E+04	NA
104883	Toluene	NA	NA	NA	3.02E+05	NA
127184	Tetrachloroethylene	NA	NA	NA	1.98E+05	NA
104907	Chlorobenzene	NA	NA	NA	3.04E+05	NA
100414	Ethylbenzene	NA	NA	NA	1.58E+05	NA
1330207	Xylenes	NA	NA	NA	1.60E+05	NA
100423	Styrene	NA	NA	NA	3.44E+02	NA
98328	Isopentane	NA	NA	NA	1.08E+06	NA
79345	1,1,2,2-Tetrachloroethane	NA	NA	NA	1.15E+06	NA
541731	Dichlorobenzene, 1,3-	NA	NA	NA	3.62E+04	NA
106467	1,4-Dichlorobenzene	NA	NA	NA	1.00E+05	NA
93501	1,2-Dichlorobenzene	NA	NA	NA	2.56E+06	NA
120921	1,2,4-Trichlorobenzene	NA	NA	NA	1.13E+06	NA
100527	Benzaldehyde	NA	NA	NA	1.74E+08	NA
91578	Methylnaphthalene, 2-	NA	NA	NA	4.24E+05	NA
92324	Bahterol, 1,1-	NA	NA	NA	9.81E+04	NA
206986	Acetophenone	NA	NA	NA	1.74E+04	NA
83328	Acetanilide	NA	NA	NA	9.98E+04	NA
132849	Dibenzofuran	NA	NA	NA	1.85E+05	NA
86737	Fluorene	NA	NA	NA	2.97E+04	NA
85011	Phenanthrene	NA	NA	NA	3.54E+04	NA
120127	Anthracene	NA	NA	NA	2.67E+03	NA
CS-C8	CS-C8 Aliphatics	NA	NA	NA	7.66E+07	NA
CB-C12	CB-C12 Aliphatics	NA	NA	NA	2.12E+07	NA
CB-C10	CB-C10 Aliphatics	NA	NA	NA	1.82E+06	NA
CB-C18	CB-C18 Aliphatics	NA	NA	NA	1.36E+07	NA
C11-C22	C11-C22 Aromatics	NA	NA	NA	3.82E+07	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to Indoor air, (unit/less)	Hazard quotient from vapor intrusion to Indoor air, noncarcinogen (unit/less)
NA	NA
NA	NA
NA	NA
NA	1.1E-04
NA	NA
NA	NA
NA	2.9E-04
1.3E-08	5.2E-04
NA	NA
NA	8.0E-07
NA	4.3E-09
NA	NA
NA	NA
1.7E-10	4.3E-08
NA	3.3E-06
NA	1.2E-07
NA	2.4E-05
NA	2.3E-05
NA	NA
NA	NA
NA	NA
8.1E-10	7.6E-03
2.7E-08	2.2E-04
NA	9.0E-05
NA	2.6E-05
1.2E-09	NA
NA	4.3E-05
NA	2.2E-08
NA	NA
NA	NA
NA	NA
NA	8.7E-07
NA	NA
NA	NA
NA	1.1E-05
NA	NA
NA	NA
NA	NA
NA	1.7E-04
NA	NA
NA	1.3E-01
NA	2.7E-03
NA	3.1E-02
NA	9.7E-03
NA	2.2E-03

95% UCL
Cancer
Risk
TOTAL: 4E-08

95% UCL
Cancer
Risk
TOTAL: 2.0E-01

☐ = Cancer risk > 1E-05
or HQ/HI > 1E+00

Trimethylbenzene, 1,2,4-
MESSAGE: Soil conc. >= saturation (C_{soil}). Risk/HQ calculated at C_{soil}.
Dichloroethylene, 1,2- (total)
MESSAGE: Soil conc. >= saturation (C_{soil}). Risk/HQ calculated at C_{soil}.
Trinitrobenzene, 1,3,5-
MESSAGE: Soil conc. >= saturation (C_{soil}). Risk/HQ calculated at C_{soil}.
n-Sublimane
MESSAGE: Soil conc. >= saturation (C_{soil}). Risk/HQ calculated at C_{soil}.
Naphthalene
MESSAGE: Soil conc. >= saturation (C_{soil}). Risk/HQ calculated at C_{soil}.
Isopropyltoluene, 4-
MESSAGE: Soil conc. >= saturation (C_{soil}). Risk/HQ calculated at C_{soil}.
Bulbimane, sec-
MESSAGE: Soil conc. >= saturation (C_{soil}). Risk/HQ calculated at C_{soil}.
Chloromethane
MESSAGE: Soil conc. >= saturation (C_{soil}). Risk/HQ calculated at C_{soil}.
Vinyl chloride
MESSAGE: Soil conc. >= saturation (C_{soil}). Risk/HQ calculated at C_{soil}.
Bromomethane
MESSAGE: Soil conc. >= saturation (C_{soil}). Risk/HQ calculated at C_{soil}.
Ethyl Chloride
MESSAGE: Soil conc. >= saturation (C_{soil}). Risk/HQ calculated at C_{soil}.
1,1-Dichloroethylene
MESSAGE: Soil conc. >= saturation (C_{soil}). Risk/HQ calculated at C_{soil}.
Trichloro-1,2,2-trifluoroethylene, 1,1,2-
MESSAGE: Soil conc. >= saturation (C_{soil}). Risk/HQ calculated at C_{soil}.
Acetone
MESSAGE: Soil conc. >= saturation (C_{soil}). Risk/HQ calculated at C_{soil}.
Carbon Disulfide
MESSAGE: Soil conc. >= saturation (C_{soil}). Risk/HQ calculated at C_{soil}.
Methyl Acetate
MESSAGE: Soil conc. >= saturation (C_{soil}). Risk/HQ calculated at C_{soil}.
Methylene chloride
MESSAGE: Soil conc. >= saturation (C_{soil}). Risk/HQ calculated at C_{soil}.
trans-1,2-Dichloroethylene
MESSAGE: Soil conc. >= saturation (C_{soil}). Risk/HQ calculated at C_{soil}.
Methyl-Tertiary-Butyl Ether
MESSAGE: Soil conc. >= saturation (C_{soil}). Risk/HQ calculated at C_{soil}.
1,1-Dichloroethane
MESSAGE: Soil conc. >= saturation (C_{soil}). Risk/HQ calculated at C_{soil}.
cis-1,2-Dichloroethylene
MESSAGE: Soil conc. >= saturation (C_{soil}). Risk/HQ calculated at C_{soil}.
Bulimane, 2- (MEK)
MESSAGE: Soil conc. >= saturation (C_{soil}). Risk/HQ calculated at C_{soil}.
1,1,1-Trichloroethane
MESSAGE: Soil conc. >= saturation (C_{soil}). Risk/HQ calculated at C_{soil}.
Cyclohexane
MESSAGE: Soil conc. >= saturation (C_{soil}). Risk/HQ calculated at C_{soil}.
Benzene
MESSAGE: Soil conc. >= saturation (C_{soil}). Risk/HQ calculated at C_{soil}.
Trichloroethylene
MESSAGE: Soil conc. >= saturation (C_{soil}). Risk/HQ calculated at C_{soil}.

CALCULATE RISK-BASED SOIL CONCENTRATION (enter "X" in "YES" box)

SL-SCREEN
 Version 2.3.03/01

YES

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL SOIL CONCENTRATION (enter "X" in "YES" box and initial soil conc. below)

YES

ENTER Chemical CAS No. (numbers only, no dashes)	Enter initial soil concentration.		ENTER Depth to bottom of unconsolidated soil layer L _u (ft)	ENTER Depth below surface to base of consolidation L _t (ft)	ENTER Average soil temperature T _a (°C)	ENTER Vadose zone SO ₂ soil flow coefficient K ₁ (cm ² /s)	ENTER User-defined vadose zone soil vapor permeability, K _v (cm ² /s)	ENTER Vadose zone soil dry bulk density, ρ _b (g/cm ³)	ENTER Vadose zone soil initial moisture, w _i (g/g)	ENTER Vadose zone soil water-filled porosity, θ _w (cm ³ /cm ³)	ENTER Vadose zone soil organic carbon fraction, f _{oc} (g/g)	ENTER Averaging time for carcinogens, ATC (hrs)	ENTER Averaging time for noncarcinogens, ATNC (hrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Exposure level ET (mg/kg)	ENTER Conversion factor CF (mg/kg)	ENTER Target Risk for carcinogens, TR (10 ⁻⁶ /yr)	ENTER Target Risk for noncarcinogens, TRHQ (10 ⁻⁶ /yr)
	Chemical	Mean soil conc. OR (μg/g)	(1.0 or 200 ppm)	(ft)	(ft)	(°C)	(cm ² /s)	(cm ² /s)	(g/cm ³)	(g/g)	(cm ³ /cm ³)	(g/g)	(hrs)	(hrs)	(yrs)	(days/yr)	(mg/kg)	(mg/kg)	(10 ⁻⁶ /yr)
0403	Trinitrobenzene, 1,2,4-		15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
0406	Dichlorobenzene, 1,2- (total)		15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
0408	Trinitrobenzene, 1,3,5-		15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
0410	n-Butylbenzene		15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
0415	Naphthalene	2.74E+03	15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
0416	Isopropylbenzene, 4-		15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
13864	Butylbenzene, sec-		15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
14473	Chlorobenzene	2.49E+02	15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
14511	Vinyl chloride	2.81E+02	15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
14528	Bromobenzene		15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
15003	Ethyl chloride	8.80E+01	15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
16384	1,1-Dichloroethane	1.20E+02	15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
17111	Trichloro-1,2,2,2-tetrafluoroethane, 1,1,1-		15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
07411	Acetone	3.24E+02	15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
78180	Carbon Dioxide		15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
10099	Methyl acetate		15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
10085	Methylene chloride	7.37E+02	15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
10066	trans-1,2-Dichloroethane	7.73E+01	15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
103404	Methyl-Tertiary-Butyl Ether	8.79E+01	15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
75241	1,1-Dichloroethane	3.88E+02	15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
10488	cis-1,2-Dichloroethane	1.90E+02	15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
10453	Butane, 2- (MEK)		15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
77990	1,1,1-Trichloroethane		15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
10407	Cyclohexane		15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
74452	Benzene	2.10E+02	15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
79176	Trichloroethylene	3.81E+02	15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
10443	Methyl cyclohexane	4.49E+02	15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
10445	Toluene	5.83E+02	15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
12784	Tetrachloroethylene	1.47E+02	15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
10887	Chlorobenzene	3.11E+02	15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
10014	Ethylbenzene	1.84E+02	15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
12007	Xylene		15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
10428	Styrene		15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
9428	Isopropylbenzene		15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
75248	1,1,2,2-tetrachloroethane		15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
84151	Dichlorobenzene, 1,3-	1.00E+02	15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
10447	1,4-Dichlorobenzene	2.50E+02	15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
88051	1,2-Dichlorobenzene	6.10E+01	15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
12021	1,2,4-Trichlorobenzene		15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
88027	Benzaldehyde		15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
87874	Methylstyrene, 2-	8.41E+03	15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
10456	Benzene, 1,1-		15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
20088	Acenaphthylene	4.00E+02	15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
83328	Acenaphthene		15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
12646	Dibenzofuran	1.79E+03	15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
8777	Fluorene		15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
88418	Phenanthrene	3.66E+04	15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
10417	Anthracene		15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
05-09	CS-C8 Aromatic	8.82E+04	15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
06-12	CS-C12 Aromatic	5.17E+04	15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
09-08	CS-C10 Aromatic	4.37E+04	15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
09-18	CS-C18 Aromatic	8.04E+08	15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1
C11-09	C11-C22 Aromatic	4.10E+08	15	15	10	LS	1	1.5	0.43	0.3	0.002	70	24	24	78	2.5	8780	1.0E-06	1

Note:
 1) Default soil parameters from table 7 of User's Guide for Evaluating Subsurface Vapor Intrusion into Building (U.S. EPA June 19, 2002) were used for soil water filled porosity (θ_w), soil organic carbon fraction (f_{oc}), soil total porosity (n), and soil dry bulk density (ρ_b).

Appendix C.4

Johnson & Etlinger Model - Data Entry Screen

Inhalation of Volatiles from Soil

Future Adult Recreational Scenario - RME

Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
Whitney Barrel

Chemical CAS No. (numbers only, no dashes)	Chemical	Diffusivity in air, D _a (cm ² /s)	Diffusivity in water, D _w (cm ² /s)	Henry's law constant at reference temperature, H (atm·m ³ /mol)	Henry's law constant reference temperature, T _R (°C)	Enthalpy of vaporization at the normal boiling point, ΔH _{v,b} (cal/mol)	Normal boiling point, T _b (°K)	Critical temperature, T _c (°K)	Organic carbon partition coefficient, K _{oc} (cm ³ /g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF (μg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)	Physical state at soil temperature, (S,L,G)
95636	Trimethylbenzene, 1,2,4-	7.80E-02	9.03E-06	5.70E-03	25	1.25E+03	442.30	649.11	3.72E+03	5.70E+01	N/A	6.0E-03	L
54590	Dichloroethylene, 1,2- (total)	5.59E-02	6.47E-06	4.30E-04	20	1.32E+03	585.00	677.50	1.28E+02	1.30E+00	#N/A	#N/A	0.0E+00
108678	Trimethylbenzene, 1,3,5-	6.48E-02	7.86E-06	7.81E-03	25	1.25E+03	442.30	649.11	1.67E+03	2.00E+01	N/A	6.0E-03	L
104518	n-Butylbenzene	7.25E-02	8.39E-06	1.25E-02	25	1.23E+03	456.00	684.00	2.51E+03	1.26E+00	#N/A	#N/A	L
91203	Naphthalene	5.90E-02	7.50E-06	4.83E-04	25	1.04E+04	491.14	748.40	2.00E+03	3.10E+01	N/A	3.0E-03	S
99876	Isopropyltoluene, 4-	7.25E-02	8.39E-06	8.60E+00	25	1.24E+03	450.10	652.04	1.58E+03	2.34E+01	N/A	4.0E-01	L
135988	Butylbenzene, sec-	8.09E-02	8.00E-06	1.67E-02	25	1.24E+03	446.65	669.98	3.11E+04	1.76E+01	#N/A	#N/A	0.0E+00
74873	Chloromethane	1.28E-01	6.50E-06	8.67E-03	25	1.35E+03	249.00	373.50	1.43E+01	5.32E+03	N/A	9.0E-02	0.0E+00
75014	Vinyl chloride	1.08E-01	1.23E-05	2.71E-02	25	5.25E+03	259.25	432.00	1.86E+01	2.76E+03	8.8E-06	1.0E-01	L
74839	Bromomethane	7.28E-02	1.21E-05	6.22E-03	25	5.49E+03	276.50	414.75	1.43E+01	1.52E+04	N/A	5.0E-03	0.0E+00
75003	Ethyl Chloride	1.26E-01	6.50E-06	8.67E-03	25	1.36E+03	249.00	373.50	1.43E+01	5.32E+03	N/A	1.0E+01	L
76354	1,1-Dichloroethylene	9.00E-02	1.04E-05	2.61E-02	25	6.25E+03	304.75	576.05	5.89E+01	2.25E+03	N/A	2.0E-01	L
76131	Trichloro-1,1,2,2-tetrafluoroethane, 1,1,2-	2.88E-02	8.07E-06	5.17E-01	25	1.33E+03	320.70	481.05	2.25E+02	1.70E+02	N/A	3.0E+01	0.0E+00
67641	Acetone	1.24E-01	1.14E-05	3.88E-05	25	6.96E+03	329.20	508.10	5.75E-01	1.00E+06	N/A	N/A	L
75150	Carbon Disulfide	1.04E-01	1.29E-05	1.27E-02	25	6.39E+03	319.00	552.00	5.14E+01	2.67E+03	N/A	7.0E-01	L
79209	Methyl Acetate	1.04E-01	1.00E-05	1.13E-04	25	1.31E+03	365.00	547.50	3.32E+00	2.43E+05	#N/A	#N/A	0.0E+00
75092	Methylene chloride	1.01E-01	1.17E-05	2.19E-03	25	6.71E+03	313.00	510.00	1.17E+01	1.30E+04	4.7E-07	3.0E+00	L
156605	trans-1,2-Dichloroethylene	7.07E-02	1.19E-05	9.39E-03	25	1.33E+03	320.85	516.50	5.25E+01	8.30E+03	N/A	2.0E-01	L
1634044	Methyl-Tertiary-Butyl Ether	1.02E-01	1.05E-05	5.87E-04	25	1.32E+03	328.38	497.11	3.84E+01	5.10E+04	N/A	3.0E+00	L
75343	1,1-Dichloroethane	7.42E-02	1.05E-05	5.61E-03	25	6.90E+03	330.55	523.00	3.16E+01	5.06E+03	N/A	5.0E-01	L
156592	cis-1,2-Dichloroethylene	7.38E-02	1.13E-05	4.07E-03	25	7.19E+03	333.65	544.00	3.55E+01	3.50E+03	N/A	2.0E-01	L
78933	Butanone, 2- (MEK)	8.08E-02	9.80E-06	5.60E-05	25	1.31E+03	352.50	528.75	3.83E+00	2.23E+05	N/A	N/A	0.0E+00
71556	1,1,1-Trichloroethane	7.80E-02	8.80E-06	1.72E-02	25	7.14E+03	347.24	545.00	1.10E+02	1.33E+03	N/A	2.2E+00	L
110827	Cyclohexane	8.00E-02	9.00E-06	2.00E+00	25	1.31E+03	353.85	530.78	1.60E+02	5.50E+01	#N/A	#N/A	0.0E+00
71432	Benzene	8.80E-02	9.80E-06	5.66E-03	25	7.34E+03	353.24	562.16	5.89E+01	1.75E+03	7.8E-06	3.0E-02	L
79016	Trichloroethylene	7.90E-02	9.10E-06	1.03E-02	25	7.51E+03	360.36	544.20	1.66E+02	1.10E+03	1.1E-04	4.0E-02	L
108872	Methyl cyclohexane	9.86E-02	8.52E-06	4.23E-01	25	1.30E+03	373.90	580.85	2.68E+02	1.40E+01	N/A	3.0E+00	L
108868	Toluene	8.70E-02	8.80E-06	6.63E-03	25	7.93E+03	383.78	591.79	1.82E+02	5.26E+02	N/A	4.0E-01	L
127184	Tetrachloroethylene	7.20E-02	8.20E-06	1.84E-02	25	8.29E+03	394.40	620.20	1.55E+02	2.00E+02	5.9E-06	N/A	L
108907	Chlorobenzene	7.30E-02	8.70E-06	3.71E-03	25	8.41E+03	404.87	632.40	2.19E+02	4.72E+02	N/A	6.0E-02	L
100414	Ethylbenzene	7.50E-02	7.80E-06	7.88E-03	25	8.50E+03	409.34	617.20	3.63E+02	1.69E+02	N/A	1.0E+00	L
1330207	Xylenes	7.69E-02	8.44E-06	6.73E-06	25	1.26E+03	417.40	616.21	2.41E+02	2.20E+02	N/A	1.0E-01	L
100425	Styrene	7.10E-02	8.00E-06	2.78E-03	25	8.74E+03	418.31	636.00	7.76E+02	3.10E+02	#N/A	#N/A	L
88828	Isopropylbenzene	6.50E-02	7.83E-06	1.47E-02	25	1.26E+03	425.40	631.01	9.31E+03	5.60E+01	N/A	4.0E-01	L
79345	1,1,2,2-Tetrachloroethane	7.10E-02	7.90E-06	3.44E-04	25	9.00E+03	419.60	661.15	9.33E+01	2.97E+03	#N/A	#N/A	L
541731	Dichlorobenzene, 1,3-	4.14E-02	8.85E-06	4.70E-03	25	1.24E+03	446.00	683.96	1.70E+02	8.88E+01	N/A	N/A	L
108467	1,4-Dichlorobenzene	6.90E-02	7.90E-06	2.43E-03	25	9.27E+03	447.21	684.75	6.17E+02	7.36E+01	N/A	8.0E-01	S
95501	1,2-Dichlorobenzene	6.88E-02	9.41E-06	1.62E-06	25	9.70E+03	465.00	697.50	5.34E+01	2.77E+04	N/A	N/A	S
120821	1,2,4-Trichlorobenzene	3.00E-02	8.23E-06	1.42E-03	25	1.05E+04	486.15	725.00	1.78E+03	3.00E+02	N/A	2.0E-01	L
100527	Benzaldehyde	7.30E-02	9.07E-06	2.62E-05	25	1.24E+03	452.00	678.00	3.27E+01	6.57E+03	#N/A	#N/A	0.0E+00
91576	Methylnaphthalene, 2-	4.84E-02	7.75E-06	1.01E-03	25	1.17E+03	514.05	761.01	8.51E+03	2.46E+01	N/A	3.0E-03	S
92524	Biphenyl, 1,1'-	4.04E-02	8.15E-06	3.03E-04	25	1.15E+03	529.10	793.65	6.25E+03	6.94E+00	N/A	N/A	0.0E+00
208968	Acenaphthylene	4.43E-02	7.44E-06	2.60E-04	25	1.12E+03	553.00	792.01	4.79E+03	3.93E+00	N/A	3.0E-03	S
83329	Acenaphthene	4.21E-02	7.69E-06	1.55E-04	25	1.22E+04	550.54	803.15	7.08E+03	4.24E+00	N/A	3.0E-03	S
132649	Dibenzofuran	2.67E-02	5.93E-06	4.00E-03	25	1.11E+03	559.00	824.01	8.13E+03	1.00E+01	N/A	N/A	S
86737	Fluorene	3.63E-02	7.88E-06	9.41E-08	25	1.27E+04	570.44	870.00	7.71E+03	1.90E+00	N/A	3.0E-03	S
85018	Phenanthrene	3.30E-02	7.47E-06	1.30E-04	25	1.06E+03	613.00	869.01	1.41E+04	1.28E+00	N/A	3.0E-03	S
120127	Anthracene	3.24E-02	7.74E-06	6.51E-05	25	1.31E+04	615.18	873.00	2.95E+04	4.34E-02	N/A	3.0E-03	S
C5-C8	C5-C8 Aliphatics	6.00E-02	1.00E-05	1.30E+00	25	NA	NA	NA	2.27E+03	1.10E+04	N/A	2.0E-01	S
C9-C12	C9-C12 Aliphatics	6.00E-02	1.00E-05	1.56E+00	25	NA	NA	NA	1.50E+05	7.00E+01	N/A	2.0E-01	S
C9-C10	C9-C10 Aromatics	6.00E-02	1.00E-05	7.92E-03	25	NA	NA	NA	1.78E+03	5.10E+04	N/A	5.0E-02	S
C9-C18	C9-C18 Aliphatics	6.00E-02	1.00E-05	1.66E+00	25	NA	NA	NA	6.80E+05	1.00E+01	N/A	2.0E-01	S
C11-C22	C11-C22 Aromatics	6.00E-02	1.00E-05	7.32E-04	25	NA	NA	NA	5.00E+03	5.80E+03	N/A	5.0E-02	S

Appendix C.4
 Johnson & Etlinger Model - Data Entry Screen
 Inhalation of Volatiles from Soil
 Future Adult Recreational Scenario - RME
 Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
 Whitney Barre

Chemical CAS No. (numbers only, no dashes)	Chemical	Source- building separation, LT (cm)	Vadose zone soil air-filled porosity, θ_v (cm ³ /cm ³)	Vadose zone effective total fluid saturation, S_u (cm ³ /cm ³)	Vadose zone intrinsic permeability, k (cm ²)	Vadose zone soil relative air permeability, k_{ra} (cm ²)	Vadose zone soil effective vapor permeability, k_v (cm ²)	Floor- wall seam perimeter, Xorack (cm)	Initial soil concentration used, CR (ug/kg)	Bldg. ventilation rate, Q_{vent} (cm ³ /s)	Area of enclosed space below grade, A_b (cm ²)	Crack- to-total area ratio, η (unitless)	Crack depth below grade, Z_{max} (cm)	Enthalpy of vaporization & ave. soil temperature, ΔH_{vs} (cal/mol)	Henry's law constant at ave. soil temperature, H_{ps} (atm-m ³ /mol)	Henry's law constant at ave. soil temperature, HTS (unitless)	Vapor viscosity at ave. soil temperature, μ_{vs} (p-cm-s)	Vadose zone effective diffusion coefficient, D^*_{v} (cm ² /s)
95036	Trimethylbenzene, 1,2,4	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	4.36E+05	2.52E+08	9.50E+06	1.30E-04	15	1.55E+03	4.99E-03	2.13E-01	1.75E-04	4.77E-04
540590	Dichloromethane, 1,2, (dist)	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	5.98E+02	2.52E+08	9.50E+06	1.30E-04	15	1.73E+03	3.27E-04	1.87E-02	1.75E-04	3.77E-04
108678	Trimethylbenzene, 1,3,5-	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	7.13E+04	2.52E+08	9.50E+06	1.30E-04	15	1.55E+03	8.80E-03	2.95E-01	1.75E-04	3.95E-04
104519	n-Butylbenzene	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	6.83E+03	2.52E+08	9.50E+06	1.30E-04	15	1.53E+03	1.09E-02	4.69E-01	1.75E-04	4.41E-04
91203	Naphthalene	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	2.74E+03	2.52E+08	9.50E+06	1.30E-04	15	1.29E+04	1.52E-04	6.65E-03	1.75E-04	4.70E-04
99876	Isopropyltoluene, 4-	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	7.31E+06	2.52E+08	9.50E+06	1.30E-04	15	1.57E+03	7.48E+00	3.22E+02	1.75E-04	4.39E-04
135888	Butylbenzene, sec-	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	1.10E+06	2.52E+08	9.50E+06	1.30E-04	15	1.53E+03	1.46E-02	6.27E-01	1.75E-04	4.86E-04
74873	Chloromethane	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	2.49E+02	2.52E+08	9.50E+06	1.30E-04	15	1.20E+03	7.79E-03	3.35E-01	1.75E-04	7.08E-04
75014	Vinyl chloride	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	2.81E+02	2.52E+08	9.50E+06	1.30E-04	15	5.00E+03	1.73E-02	7.48E-01	1.75E-04	8.44E-04
74839	Bromomethane	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	3.89E+06	2.52E+08	9.50E+06	1.30E-04	15	5.39E+03	3.84E-03	1.65E-01	1.75E-04	4.48E-04
75003	Ethyl Chloride	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	8.40E+01	2.52E+08	9.50E+06	1.30E-04	15	1.20E+03	7.78E-03	3.35E-01	1.75E-04	7.88E-04
75354	1,1-Dichloroethylene	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	1.20E+02	2.52E+08	9.50E+06	1.30E-04	15	6.39E+03	1.47E-02	6.34E-01	1.75E-04	5.47E-04
70131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	3.90E+05	2.52E+08	9.50E+06	1.30E-04	15	1.44E+03	4.55E-01	1.96E+01	1.75E-04	1.75E-04
67841	Acetone	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	3.24E+02	2.52E+08	9.50E+06	1.30E-04	15	7.50E+03	1.97E-05	6.50E-04	1.75E-04	2.07E-03
76160	Carbon Disulfide	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	8.78E+06	2.52E+08	9.50E+06	1.30E-04	15	6.98E+03	8.89E-03	3.91E-01	1.75E-04	6.34E-04
79209	Methyl Acetate	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	6.09E+07	2.52E+08	9.50E+06	1.30E-04	15	1.55E+03	9.88E-05	4.95E-03	1.75E-04	8.61E-04
75092	Methylene chloride	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	7.37E+02	2.52E+08	9.50E+06	1.30E-04	15	7.05E+03	1.17E-02	5.03E-02	1.75E-04	6.35E-04
156405	Methyl-Tertiary-Butyl Ether	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	7.73E+01	2.52E+08	9.50E+06	1.30E-04	15	1.47E+03	8.27E-03	3.59E-01	1.75E-04	4.32E-04
183404	1,1-Dichloroethane	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	5.75E+01	2.52E+08	9.50E+06	1.30E-04	15	1.45E+03	5.15E-04	2.22E-02	1.75E-04	6.87E-04
76343	1,1-Dichloroethane	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	3.58E+02	2.52E+08	9.50E+06	1.30E-04	15	7.45E+03	2.88E-03	1.24E-01	1.75E-04	4.58E-04
156592	cis-1,2-Dichloroethylene	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	1.90E+02	2.52E+08	9.50E+06	1.30E-04	15	7.73E+03	2.04E-03	8.77E-02	1.75E-04	4.59E-04
78833	Butanone, 2- (MEK)	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	4.93E+07	2.52E+08	9.50E+06	1.30E-04	15	1.49E+03	4.90E-05	2.11E-03	1.75E-04	9.45E-04
71956	1,1,1-Trichloroethane	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	6.01E+06	2.52E+08	9.50E+06	1.30E-04	15	7.88E+03	8.50E-03	3.86E-01	1.75E-04	4.75E-04
110827	Cyclohexane	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	3.88E+05	2.52E+08	9.50E+06	1.30E-04	15	1.49E+03	1.75E+00	7.64E-01	1.75E-04	4.85E-04
71432	Benzene	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	2.10E+02	2.52E+08	9.50E+06	1.30E-04	15	8.12E+03	2.69E-03	1.16E-01	1.75E-04	5.42E-04
79018	Trichloroethylene	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	2.81E+02	2.52E+08	9.50E+06	1.30E-04	15	8.56E+03	4.79E-03	2.05E-01	1.75E-04	4.83E-04
106872	Methyl cyclohexane	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	4.45E+02	2.52E+08	9.50E+06	1.30E-04	15	1.61E+03	3.70E-01	1.59E+01	1.75E-04	5.98E-04
108883	Toluene	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	5.85E+02	2.52E+08	9.50E+06	1.30E-04	15	9.15E+03	2.62E-03	1.29E-01	1.75E-04	5.34E-04
127184	Tetrachloroethylene	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	1.47E+02	2.52E+08	9.50E+06	1.30E-04	15	9.55E+03	7.83E-03	3.37E-01	1.75E-04	4.39E-04
108907	Chlorobenzene	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	3.11E+02	2.52E+08	9.50E+06	1.30E-04	15	9.80E+03	1.54E-03	8.85E-02	1.75E-04	4.55E-04
100414	Ethylbenzene	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	1.84E+02	2.52E+08	9.50E+06	1.30E-04	15	1.02E+04	9.18E-03	1.37E-01	1.75E-04	4.80E-04
1330207	Xylenes	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	1.50E+05	2.52E+08	9.50E+06	1.30E-04	15	1.54E+03	5.80E-06	2.52E-04	1.75E-04	3.75E-03
100425	Styrene	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	5.44E+05	2.52E+08	9.50E+06	1.30E-04	15	1.05E+04	1.09E-03	4.67E-02	1.75E-04	4.47E-04
98838	Isopropylbenzene	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	1.06E+06	2.52E+08	9.50E+06	1.30E-04	15	1.54E+03	1.28E-02	5.51E-01	1.75E-04	3.85E-04
78348	1,1,2,2-Tetrachloroethane	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	1.15E+06	2.52E+08	9.50E+06	1.30E-04	15	1.95E+04	1.34E-04	5.77E-03	1.75E-04	5.65E-04
641751	Dichlorobenzene, 1,3-	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	1.00E+02	2.52E+08	9.50E+06	1.30E-04	15	1.50E+03	4.11E-03	1.77E-01	1.75E-04	2.58E-04
198487	1,4-Dichlorobenzene	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	2.90E+02	2.52E+08	9.50E+06	1.30E-04	15	1.12E+04	8.89E-04	3.83E-02	1.75E-04	4.38E-04
96501	1,2-Dichlorobenzene	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	5.10E+01	2.52E+08	9.50E+06	1.30E-04	15	1.21E+04	5.61E-07	2.37E-05	1.75E-04	3.84E-02
120821	1,2,4-Trichlorobenzene	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	1.13E+06	2.52E+08	9.50E+06	1.30E-04	15	1.32E+04	4.35E-04	1.67E-02	1.75E-04	2.65E-04
100527	Benzaldehyde	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	1.74E+06	2.52E+08	9.50E+06	1.30E-04	15	1.63E+03	2.29E-06	9.84E-04	1.75E-04	1.85E-03
91576	Methylnaphthalene, 2-	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	6.41E+03	2.52E+08	9.50E+06	1.30E-04	15	1.61E+03	8.86E-04	3.81E-02	1.75E-04	3.13E-04
62524	Biphenyl, 1,1'-	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	8.81E+04	2.52E+08	9.50E+06	1.30E-04	15	1.47E+03	2.88E-04	1.14E-02	1.75E-04	3.15E-04
208960	Acanaphthylene	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	4.00E+02	2.52E+08	9.50E+06	1.30E-04	15	1.61E+03	2.45E-04	1.05E-02	1.75E-04	3.38E-04
83329	Acanaphthylene	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	6.09E+04	2.52E+08	9.50E+06	1.30E-04	15	1.61E+03	3.87E-05	1.58E-03	1.75E-04	7.35E-04
132849	Dibenzofuran	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	1.70E+03	2.52E+08	9.50E+06	1.30E-04	15	1.47E+03	3.51E-03	1.61E-01	1.75E-04	1.85E-04
86737	Fluorene	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	2.87E+04	2.52E+08	9.50E+06	1.30E-04	15	1.62E+04	2.20E-08	9.48E-07	1.75E-04	6.15E-01
85018	Phenanthrene	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	3.94E+04	2.52E+08	9.50E+06	1.30E-04	15	1.48E+03	1.14E-04	4.90E-03	1.75E-04	3.50E-04
120127	Anthracene	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	2.57E+03	2.52E+08	9.50E+06	1.30E-04	15	1.84E+04	1.26E-06	5.43E-04	1.75E-04	1.80E-03
09-C8	09-C8 Aliphatics	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	9.68E+04	2.52E+08	9.50E+06	1.30E-04	15	NA	6.48E-01	2.79E+01	1.75E-04	3.84E-04
09-C12	09-C12 Aliphatics	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	8.11E+04	2.52E+08	9.50E+06	1.30E-04	15	NA	7.60E-01	3.98E+01	1.75E-04	3.64E-04
09-C10	09-C10 Aliphatics	1	0.130	0.659	1.82E-08	0.390	6.33E-09	1.72E+04	4.91E+06	2.52E+08	9.50E+06	1.30E-04	15	NA	3.98E-03	1.70E-01	1.75E-04	3.69E-04
09-C16	09-C16 Aliphatics	1	0.															

Appendix C.4
 Johnson & Ettinger Model - Data Entry Screen
 Inhalation of Volatiles from Soil
 Future Adult Recreational Scenario - RME
 Southwest Properties, Wells G&H Superfund Site, Operable
 Whilney Barrel

Chemical CAS No. (numbers only, no dashes)	Chemical	Diffusion path length, L _d (cm)	Convection path length, L _c (cm)	Soil-water partition coefficient, K _d (cm ³ /g)	Source vapor conc., C _{soil} (µg/m ³)	Crack radius, r _{crack} (cm)	Average vapor flow rate into bldg., Q _{vap} (cm ³ /s)	Crack effective diffusion coefficient, D ^{eff} (cm ² /s)	Area of crack, A _{crack} (cm ²)	Exponent of equivalent foundation Pdaet number, exp(Pdaet) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg conc., C _{bldg} (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
95936	Trimethylbenzene, 1,2,4-	1	15	7.43E+00	N/A	0.10	2.74E+01	4.77E-04	1.23E+03	2.75E+303	1.08E-06	N/A	N/A	8.0E-03
540990	Dichloroethylenes, 1,2- (total)	1	15	2.57E-01	N/A	0.10	2.74E+01	3.77E-04	1.23E+03	#NUM!	1.08E-06	N/A	#N/A	#N/A
108678	Trimethylbenzene, 1,3,5-	1	15	3.34E+00	N/A	0.10	2.74E+01	3.96E-04	1.23E+03	#NUM!	1.08E-06	N/A	#N/A	8.0E-03
104518	n-Butylbenzene	1	15	5.02E+00	N/A	0.10	2.74E+01	4.41E-04	1.23E+03	#NUM!	1.08E-06	N/A	#N/A	#N/A
81203	Naphthalene	1	15	4.00E+00	4.27E+03	0.10	2.74E+01	4.70E-04	1.23E+03	9.87E+307	1.08E-06	4.61E-02	N/A	3.0E-03
60876	Isopropyltoluene, 4-	1	15	3.18E+00	N/A	0.10	2.74E+01	4.39E-04	1.23E+03	#NUM!	1.08E-06	N/A	N/A	4.0E-01
135988	Bulylbenzene, sec-	1	15	8.22E+01	N/A	0.10	2.74E+01	4.86E-04	1.23E+03	6.47E+287	1.08E-06	N/A	#N/A	#N/A
74473	Chloromethane	1	15	2.86E-02	3.24E+06	0.10	2.74E+01	7.68E-04	1.23E+03	1.14E+189	1.08E-06	3.51E+00	N/A	9.0E-02
75014	Vinyl chloride	1	15	3.72E-02	6.48E+06	0.10	2.74E+01	6.44E-04	1.23E+03	5.27E+224	1.08E-06	6.99E+00	8.8E-08	1.0E-01
74439	Bromomethane	1	15	2.86E-02	N/A	0.10	2.74E+01	4.48E-04	1.23E+03	#NUM!	1.08E-06	N/A	N/A	5.0E-03
75003	Ethyl Chloride	1	15	2.86E-02	1.12E+06	0.10	2.74E+01	7.68E-04	1.23E+03	1.14E+189	1.08E-06	1.21E+00	N/A	1.0E+01
75354	1,1-Dichloroethylene	1	15	1.18E-01	2.04E+06	0.10	2.74E+01	5.47E-04	1.23E+03	3.62E+264	1.08E-06	2.21E+00	N/A	2.0E-01
78131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	1	15	4.50E-01	N/A	0.10	2.74E+01	1.76E-04	1.23E+03	#NUM!	1.07E-06	N/A	N/A	3.0E+01
87641	Acetone	1	15	1.15E-03	1.37E+03	0.10	2.74E+01	2.07E-03	1.23E+03	9.18E+89	1.09E-06	1.48E-02	N/A	N/A
75180	Carbon Dioxide	1	15	1.03E-01	N/A	0.10	2.74E+01	6.34E-04	1.23E+03	1.26E+228	1.08E-06	N/A	N/A	7.0E-01
78209	Methyl Acetate	1	15	6.84E-03	N/A	0.10	2.74E+01	6.81E-04	1.23E+03	1.17E+188	1.08E-06	N/A	#N/A	N/A
75092	Methylene chloride	1	15	2.34E-02	1.80E+06	0.10	2.74E+01	6.35E-04	1.23E+03	8.55E+227	1.08E-06	1.73E+00	4.7E-07	3.0E+00
156805	trans-1,2-Dichloroethylene	1	15	1.05E-01	8.20E+04	0.10	2.74E+01	4.32E-04	1.23E+03	#NUM!	1.08E-06	8.85E-01	N/A	2.0E-01
1834044	Methyl-Tertary-Butyl Ether	1	15	7.88E-02	4.58E+03	0.10	2.74E+01	6.67E-04	1.23E+03	9.48E+216	1.08E-06	4.96E-02	N/A	3.0E+01
75343	1,1-Dichloroethane	1	15	6.32E-02	1.82E+06	0.10	2.74E+01	4.58E-04	1.23E+03	#NUM!	1.08E-06	1.75E+00	N/A	8.0E-01
158592	cis-1,2-Dichloroethylene	1	15	7.10E-02	8.69E+04	0.10	2.74E+01	4.59E-04	1.23E+03	#NUM!	1.08E-06	6.12E-01	N/A	2.0E-01
78933	Butanone, 2- (MEK)	1	15	1.88E-03	N/A	0.10	2.74E+01	9.48E-04	1.23E+03	1.19E+153	1.08E-06	N/A	N/A	N/A
71598	1,1,1-Trichloroethane	1	15	2.20E-01	N/A	0.10	2.74E+01	4.76E-04	1.23E+03	4.36E+304	1.08E-06	N/A	N/A	2.2E+00
110827	Cyclohexane	1	15	3.20E-01	N/A	0.10	2.74E+01	4.85E-04	1.23E+03	3.16E+288	1.08E-06	N/A	#N/A	#N/A
71432	Benzene	1	15	1.18E-01	7.41E+04	0.10	2.74E+01	5.42E-04	1.23E+03	1.61E+267	1.08E-06	8.02E-01	7.8E-08	3.0E-02
78018	Trichloroethylene	1	15	3.32E-01	1.09E+06	0.10	2.74E+01	4.83E-04	1.23E+03	3.77E+288	1.08E-06	1.18E+00	1.1E-04	4.0E-02
108872	Methyl cyclohexane	1	15	5.36E-01	3.36E+06	0.10	2.74E+01	5.88E-04	1.23E+03	1.50E+242	1.08E-06	3.52E+01	N/A	3.0E+00
108883	Toluene	1	15	3.64E-01	1.28E+06	0.10	2.74E+01	5.34E-04	1.23E+03	1.10E+271	1.08E-06	1.39E+00	N/A	4.0E-01
127184	Trichloroethylene	1	15	3.10E-01	9.19E+04	0.10	2.74E+01	4.39E-04	1.23E+03	#NUM!	1.08E-06	8.92E-01	5.6E-06	N/A
108907	Chlorobenzene	1	15	4.38E-01	3.21E+04	0.10	2.74E+01	4.66E-04	1.23E+03	#NUM!	1.08E-06	3.46E-01	N/A	8.0E-02
100414	Ethylbenzene	1	15	7.26E-01	2.88E+04	0.10	2.74E+01	4.60E-04	1.23E+03	#NUM!	1.08E-06	2.90E-01	N/A	1.0E+00
1330207	Xylenes	1	15	4.82E-01	N/A	0.10	2.74E+01	3.76E-03	1.23E+03	4.03E+38	1.09E-06	N/A	N/A	1.0E-01
100425	Styrene	1	15	1.66E+00	N/A	0.10	2.74E+01	4.47E-04	1.23E+03	#NUM!	1.08E-06	N/A	#N/A	N/A
98828	Isopropylbenzene	1	15	1.86E+01	N/A	0.10	2.74E+01	3.85E-04	1.23E+03	#NUM!	1.08E-06	N/A	N/A	4.0E-01
78346	1,1,2,2-Tetrachloroethane	1	15	1.87E-01	N/A	0.10	2.74E+01	6.65E-04	1.23E+03	1.68E+268	1.08E-06	N/A	#N/A	N/A
541731	Dichlorobenzene, 1,3-	1	15	3.40E-01	3.19E+04	0.10	2.74E+01	2.66E-04	1.23E+03	#NUM!	1.07E-06	3.42E-01	N/A	N/A
109467	1,4-Dichlorobenzene	1	15	1.23E+00	8.68E+03	0.10	2.74E+01	4.38E-04	1.23E+03	#NUM!	1.08E-06	7.19E-02	N/A	8.0E-01
86501	1,2-Dichlorobenzene	1	15	1.07E-01	3.94E+00	0.10	2.74E+01	3.84E-02	1.23E+03	4.74E+03	1.09E-06	4.28E-06	N/A	N/A
120821	1,2,4-Trichlorobenzene	1	15	3.58E+00	N/A	0.10	2.74E+01	2.25E-04	1.23E+03	#NUM!	1.07E-06	N/A	N/A	2.0E-01
100327	Benzaldehyde	1	15	6.54E-02	N/A	0.10	2.74E+01	1.35E-03	1.23E+03	2.80E+107	1.08E-06	N/A	#N/A	#N/A
91576	Hexachlorocyclopentadiene, 2-	1	15	1.70E+01	1.20E+04	0.10	2.74E+01	3.13E-04	1.23E+03	#NUM!	1.08E-06	1.29E-01	N/A	3.0E-03
92524	Bisphenol, 1,1'	1	15	1.25E+01	N/A	0.10	2.74E+01	3.15E-04	1.23E+03	#NUM!	1.08E-06	N/A	N/A	N/A
208089	Acenaphthylene	1	15	9.57E+00	4.31E+02	0.10	2.74E+01	3.16E-04	1.23E+03	#NUM!	1.08E-06	4.64E-03	N/A	3.0E-03
83328	Acenaphthene	1	15	1.42E+01	N/A	0.10	2.74E+01	7.33E-04	1.23E+03	2.13E+197	1.08E-06	N/A	N/A	3.0E-03
132649	Dibenzofuran	1	15	1.93E+01	1.64E+04	0.10	2.74E+01	1.85E-04	1.23E+03	#NUM!	1.07E-06	1.75E-01	N/A	N/A
86737	Fluorene	1	15	1.54E+01	N/A	0.10	2.74E+01	8.16E-01	1.23E+03	1.50E+00	3.24E-06	N/A	N/A	3.0E-03
82016	Phenanthrene	1	15	2.93E+01	8.27E+03	0.10	2.74E+01	3.60E-04	1.23E+03	#NUM!	1.08E-06	6.78E-02	N/A	3.0E-03
120127	Anthracene	1	15	8.90E+01	N/A	0.10	2.74E+01	1.80E-03	1.23E+03	5.14E+90	1.08E-06	N/A	N/A	3.0E-03
C5-C8	C5-C8 Aliphatics	1	15	4.53E+00	3.94E+06	0.10	2.74E+01	3.64E-04	1.23E+03	#NUM!	1.08E-06	4.14E+03	N/A	2.0E-01
C9-C12	C9-C12 Aliphatics	1	15	3.00E+02	8.78E+08	0.10	2.74E+01	3.04E-04	1.23E+03	#NUM!	1.08E-06	7.28E+01	N/A	2.0E-01
C9-C10	C9-C10 Aromatics	1	15	3.68E+00	1.66E+07	0.10	2.74E+01	3.99E-04	1.23E+03	#NUM!	1.08E-06	2.10E+02	N/A	5.0E-02
C9-C18	C9-C18 Aliphatics	1	15	1.36E+03	1.58E+08	0.10	2.74E+01	3.84E-04	1.23E+03	#NUM!	1.08E-06	1.70E+03	N/A	2.0E-01
C11-C22	C11-C22 Aromatics	1	15	1.00E+01	8.23E+06	0.10	2.74E+01	4.27E-04	1.23E+03	#NUM!	1.08E-06	6.72E+01	N/A	5.0E-02

