TABLE 6-5
SOIL TO OUTDOOR AIR
SURFACE SOIL (0-2 feet)
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Aberjona Auto Parts

	Soil EPC CR	Soil Temp. T_S	Soil Temp. T_S	Henry's Law Constant at ref. temp. H_R	Henry's Law Reference Temp. T_R	Normal Boiling Point T_B	Enthalpy of vaporization at T_S ΔH_{vB}	Critical Temp. T_C	constant n	Enthalpy of vaporization at T_S ΔH_{vTS}	Gas Constant R_c	Henry's Law Constant at T_S H_{TS}	Gas Constant R	Henry's Law Constant H'_{TS}
Units:	µg/kg	°C	K	atm-m³/mol	K	K	cal/mol	K	unitless	cal/mol	cal/mol-K	atm-m³/mol	m³-atm/mol-K	unitless
Formula:	Input	(10 for screening)	(T_S + 273.15)	lookup	(lookup+273.15)	lookup	lookup	lookup	(Note 7)	(Note 8)		(Note 9)		H_{TS} / (R * T'_S)
Analyte														
Dichloroethylene, 1,2- (total)	ND	1.00E+01	2.83E+02	4.07E-03	2.98E+02	3.28E+02	1.32E+03	4.92E+02	3.77E-01	1.45E+03	1.99E+00	4.07E-03	8.21E-05	1.75E-01
Naphthalene	ND	1.00E+01	2.83E+02	4.83E-04	2.98E+02	4.91E+02	1.04E+04	7.48E+02	3.70E-01	1.29E+04	1.99E+00	4.83E-04	8.21E-05	2.08E-02
Chloromethane	ND	1.00E+01	2.83E+02	8.67E-03	2.98E+02	2.49E+02	1.35E+03	3.74E+02	3.77E-01	1.20E+03	1.99E+00	8.67E-03	8.21E-05	3.73E-01
Vinyl Chloride	ND	1.00E+01	2.83E+02	2.71E-02	2.98E+02	2.59E+02	5.25E+03	4.32E+02	3.28E-01	5.00E+03	1.99E+00	2.71E-02	8.21E-05	1.17E+00
Methyl bromide	2.40E+00	1.00E+01	2.83E+02	6.24E-03	2.98E+02	2.77E+02	5.71E+03	4.67E+02	3.22E-01	5.65E+03	1.99E+00	6.24E-03	8.21E-05	2.69E-01
Ethyl Chloride	ND	1.00E+01	2.83E+02	1.09E-02	2.98E+02	2.85E+02	1.36E+03	4.28E+02	3.77E-01	1.37E+03	1.99E+00	1.09E-02	8.21E-05	4.69E-01
1,1-Dichloroethene	4.80E+00	1.00E+01	2.83E+02	2.61E-02	2.98E+02	3.05E+02	6.25E+03	5.76E+02	3.00E-01	6.39E+03	1.99E+00	2.61E-02	8.21E-05	1.12E+00
Acetone	3.70E+00	1.00E+01	2.83E+02	3.88E-05	2.98E+02	3.29E+02	6.96E+03	5.08E+02	3.63E-01	7.56E+03	1.99E+00	3.88E-05	8.21E-05	1.67E-03
Carbon disulfide	ND	1.00E+01	2.83E+02	3.02E-02	2.98E+02	3.19E+02	6.39E+03	5.52E+02	3.12E-01	6.68E+03	1.99E+00	3.02E-02	8.21E-05	1.30E+00
Methyl acetate	ND	1.00E+01	2.83E+02	1.13E-04	2.98E+02	3.65E+02	1.31E+03	5.48E+02	3.77E-01	1.50E+03	1.99E+00	1.13E-04	8.21E-05	4.86E-03
Methylene chloride	ND	1.00E+01	2.83E+02	2.19E-03	2.98E+02	3.13E+02	6.71E+03	5.10E+02	3.38E-01	7.03E+03	1.99E+00	2.19E-03	8.21E-05	9.43E-02
Methyl-Tertiary-Butyl Ether	ND	1.00E+01	2.83E+02	5.87E-04	2.98E+02	3.28E+02	1.32E+03	4.97E+02	3.73E-01	1.45E+03	1.99E+00	5.87E-04	8.21E-05	2.53E-02
1,1-Dichloroethane	ND	1.00E+01	2.83E+02	5.61E-03	2.98E+02	3.31E+02	6.90E+03	5.23E+02	3.52E-01	7.45E+03	1.99E+00	5.61E-03	8.21E-05	2.41E-01
cis-1,2-Dichloroethene	ND	1.00E+01	2.83E+02	4.07E-03	2.98E+02	3.34E+02	7.19E+03	5.44E+02	3.38E-01	7.73E+03	1.99E+00	4.07E-03	8.21E-05	1.75E-01
Butanone, 2- (MEK)	ND	1.00E+01	2.83E+02	5.60E-05	2.98E+02	3.53E+02	1.31E+03	5.29E+02	3.77E-01	1.49E+03	1.99E+00	5.60E-05	8.21E-05	2.41E-03
1,1,1-Trichloroethane	ND	1.00E+01	2.83E+02	1.72E-02	2.98E+02	3.47E+02	7.14E+03	5.45E+02	3.55E-01	7.88E+03	1.99E+00	1.72E-02	8.21E-05	7.40E-01
Cyclohexane	ND	1.00E+01	2.83E+02	2.00E+00	2.98E+02	3.54E+02	1.31E+03	5.31E+02	3.77E-01	1.49E+03	1.99E+00	2.00E+00	8.21E-05	8.61E+01
Benzene	ND	1.00E+01	2.83E+02	5.55E-03	2.98E+02	3.53E+02	7.34E+03	5.62E+02	3.49E-01	8.12E+03	1.99E+00	5.55E-03	8.21E-05	2.39E-01
Trichloroethene	ND	1.00E+01	2.83E+02	1.03E-02	2.98E+02	3.60E+02	7.51E+03	5.44E+02	3.74E-01	8.56E+03	1.99E+00	1.03E-02	8.21E-05	4.43E-01
Methylcyclohexane	ND	1.00E+01	2.83E+02	4.23E-01	2.98E+02	3.74E+02	1.30E+03	5.61E+02	3.77E-01	1.51E+03	1.99E+00	4.23E-01	8.21E-05	1.82E+01
Toluene	2.23E+01	1.00E+01	2.83E+02	6.64E-03	2.98E+02	3.84E+02	7.93E+03	5.92E+02	3.64E-01	9.15E+03	1.99E+00	6.64E-03	8.21E-05	2.86E-01
Tetrachloroethene	ND	1.00E+01	2.83E+02	1.84E-02	2.98E+02	3.94E+02	8.29E+03	6.20E+02	3.55E-01	9.55E+03	1.99E+00	1.84E-02	8.21E-05	7.92E-01
Chlorobenzene	ND	1.00E+01	2.83E+02	3.71E-03	2.98E+02	4.05E+02	8.41E+03	6.32E+02	3.58E-01	9.80E+03	1.99E+00	3.71E-03	8.21E-05	1.60E-01
Ethylbenzene	1.60E+01	1.00E+01	2.83E+02	7.88E-03	2.98E+02	4.09E+02	8.50E+03	6.17E+02	3.75E-01	1.02E+04	1.99E+00	7.88E-03	8.21E-05	3.39E-01
Xylenes	1.62E+02	1.00E+01	2.83E+02	6.73E-06	2.98E+02	4.17E+02	1.26E+03	6.16E+02	3.85E-01	1.54E+03	1.99E+00	6.73E-06	8.21E-05	2.90E-04
Styrene	2.70E+00	1.00E+01	2.83E+02	2.76E-03	2.98E+02	4.18E+02	8.74E+03	6.36E+02	3.71E-01	1.05E+04	1.99E+00	2.76E-03	8.21E-05	1.19E-01
1,1,2,2-Tetrachloroethane	ND	1.00E+01	2.83E+02	3.44E-04	2.98E+02	4.20E+02	9.00E+03	6.61E+02	3.54E-01	1.05E+04	1.99E+00	3.44E-04	8.21E-05	1.48E-02
1,3-Dichlorobenzene	ND	1.00E+01	2.83E+02	4.70E-03	2.98E+02	4.46E+02	1.24E+03	6.84E+02	3.67E-01	1.50E+03	1.99E+00	4.70E-03	8.21E-05	2.02E-01
1,4-Dichlorobenzene	ND	1.00E+01	2.83E+02	2.43E-03	2.98E+02	4.47E+02	9.27E+03	6.85E+02	3.67E-01	1.12E+04	1.99E+00	2.43E-03	8.21E-05	1.05E-01
1,2-Dichlorobenzene	ND	1.00E+01	2.83E+02	1.90E-03	2.98E+02	4.54E+02	9.70E+03	7.05E+02	3.60E-01	1.17E+04	1.99E+00	1.90E-03	8.21E-05	8.18E-02
1,2,4-Trichlorobenzene	ND	1.00E+01	2.83E+02	1.42E-03	2.98E+02	4.86E+02	1.05E+04	7.25E+02	3.80E-01	1.32E+04	1.99E+00	1.42E-03	8.21E-05	6.11E-02
Benzaldehyde	ND	1.00E+01	2.83E+02	2.62E-05	2.98E+02	4.52E+02	0.00E+00	6.78E+02	3.77E-01	0.00E+00	1.99E+00	2.62E-05	8.21E-05	1.13E-03
2-Methylnaphthalene	1.42E+03	1.00E+01	2.83E+02	1.01E-03	2.98E+02	5.14E+02	1.17E+03	7.61E+02	3.84E-01	1.51E+03	1.99E+00	1.01E-03	8.21E-05	4.36E-02
1,1'-Biphenyl	ND	1.00E+01	2.83E+02	3.03E-04	2.98E+02	5.29E+02	1.15E+03	7.94E+02	3.77E-01	1.47E+03	1.99E+00	3.03E-04	8.21E-05	1.30E-02
Acenaphthylene	1.42E+02	1.00E+01	2.83E+02	2.80E-04	2.98E+02	5.53E+02	1.12E+03	7.92E+02	4.01E-01	1.51E+03	1.99E+00	2.80E-04	8.21E-05	1.21E-02
Acenaphthene	7.10E+01	1.00E+01	2.83E+02	1.55E-04	2.98E+02	5.51E+02	1.22E+04	8.03E+02	3.91E-01	1.61E+04	1.99E+00	1.55E-04	8.21E-05	6.67E-03
Dibenzofuran	1.42E+02	1.00E+01	2.83E+02	4.00E-03	2.98E+02	5.59E+02	1.11E+03	8.24E+02	3.86E-01	1.47E+03	1.99E+00	4.00E-03	8.21E-05	1.72E-01
Fluorene	1.42E+02	1.00E+01	2.83E+02	6.37E-05	2.98E+02	5.70E+02	1.27E+04	8.70E+02	3.69E-01	1.62E+04	1.99E+00	6.37E-05	8.21E-05	2.74E-03
Phenanthrene	1.28E+03	1.00E+01	2.83E+02	1.30E-04	2.98E+02	6.13E+02	1.06E+03	8.69E+02	4.06E-01	1.48E+03	1.99E+00	1.30E-04	8.21E-05	5.59E-03
Anthracene	2.84E+02	1.00E+01	2.83E+02	6.51E-05	2.98E+02	6.15E+02	1.31E+04	8.73E+02	4.05E-01	1.84E+04	1.99E+00	6.51E-05	8.21E-05	2.80E-03
C5-C8 Aliphatics	1.00E+03	1.00E+01	2.83E+02	1.30E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.30E+00	8.21E-05	5.58E+01
C9-C12 Aliphatics	1.00E+03	1.00E+01	2.83E+02	1.56E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.56E+00	8.21E-05	6.71E+01
C9-C10 Aromatics	ND	1.00E+01	2.83E+02	7.92E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	7.92E-03	8.21E-05	3.41E-01
C9-C18 Aliphatics	ND	1.00E+01	2.83E+02	1.65E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.65E+00	8.21E-05	7.10E+01
C11-C22 Aromatics	1.80E+04	1.00E+01	2.83E+02	7.17E-04	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	7.17E-04	8.21E-05	3.09E-02

TABLE 6-5 (continued)
SOIL TO OUTDOOR AIR
SURFACE SOIL (0-2 feet)
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Aberjona Auto Parts

	Conversion Factor µg/kg to g/g	SCS soil type in vadose zone	Vadose zone soil dry bulk density	Vadose zone soil water-filled porosity	Organic carbon partition coefficient	Vadose zone organic carbon fraction	Soil-water partition coefficient	Vadose zone soil total porosity	Vadose zone soil air-filled porosity	Conversion Factor g/cm³ to µg/m³	Source Vapor Conc.
	Conv01	ST_v	ρ_b	$\theta_{w,v}$	K_{oc}	$f_{oc,v}$	K_d	n_v	$\theta_{a,v}$	Conv03	C_{source}
Units:	µg/kg / g/g	unitless	g/cm³	cm³/cm³	cm³/g	unitless	cm³/g	cm³/cm³	cm³/cm³	g/cm³ / µg/m³	µg/m³
Formula:		(Note 11)	(1.5 for screening)	(0.3 for screening)	lookup	(0.002 for screening)	$K_{oc} * f_{oc}$	(0.43 for screening)	$n_v - \theta_{w,v}$		(Note 21)
Analyte											
Dichloroethylene, 1,2- (total)	1.00E-09	LS	1.50E+00	3.00E-01	4.38E+01	2.00E-03	8.76E-02	4.30E-01	1.30E-01	1.00E+12	ND
Naphthalene	1.00E-09	LS	1.50E+00	3.00E-01	2.00E+03	2.00E-03	4.00E+00	4.30E-01	1.30E-01	1.00E+12	ND
Chloromethane	1.00E-09	LS	1.50E+00	3.00E-01	1.43E+01	2.00E-03	2.86E-02	4.30E-01	1.30E-01	1.00E+12	ND
Vinyl Chloride	1.00E-09	LS	1.50E+00	3.00E-01	1.86E+01	2.00E-03	3.72E-02	4.30E-01	1.30E-01	1.00E+12	ND
Methyl bromide	1.00E-09	LS	1.50E+00	3.00E-01	1.05E+01	2.00E-03	2.10E-02	4.30E-01	1.30E-01	1.00E+12	2.64E+03
Ethyl Chloride	1.00E-09	LS	1.50E+00	3.00E-01	2.73E+01	2.00E-03	5.46E-02	4.30E-01	1.30E-01	1.00E+12	ND
1,1-Dichloroethene	1.00E-09	LS	1.50E+00	3.00E-01	5.89E+01	2.00E-03	1.18E-01	4.30E-01	1.30E-01	1.00E+12	1.30E+04
Acetone	1.00E-09	LS	1.50E+00	3.00E-01	5.75E-01	2.00E-03	1.15E-03	4.30E-01	1.30E-01	1.00E+12	3.07E+01
Carbon disulfide	1.00E-09	LS	1.50E+00	3.00E-01	4.57E+01	2.00E-03	9.14E-02	4.30E-01	1.30E-01	1.00E+12	ND
Methyl acetate	1.00E-09	LS	1.50E+00	3.00E-01	3.32E+00	2.00E-03	6.64E-03	4.30E-01	1.30E-01	1.00E+12	ND
Methylene chloride	1.00E-09	LS	1.50E+00	3.00E-01	1.17E+01	2.00E-03	2.34E-02	4.30E-01	1.30E-01	1.00E+12	ND
Methyl-Tertiary-Butyl Ether	1.00E-09	LS	1.50E+00	3.00E-01	3.84E+01	2.00E-03	7.68E-02	4.30E-01	1.30E-01	1.00E+12	ND
1,1-Dichloroethane	1.00E-09	LS	1.50E+00	3.00E-01	3.16E+01	2.00E-03	6.32E-02	4.30E-01	1.30E-01	1.00E+12	ND
cis-1,2-Dichloroethene	1.00E-09	LS	1.50E+00	3.00E-01	3.55E+01	2.00E-03	7.10E-02	4.30E-01	1.30E-01	1.00E+12	ND
Butanone, 2- (MEK)	1.00E-09	LS	1.50E+00	3.00E-01	3.83E+00	2.00E-03	7.66E-03	4.30E-01	1.30E-01	1.00E+12	ND
1,1,1-Trichloroethane	1.00E-09	LS	1.50E+00	3.00E-01	1.10E+02	2.00E-03	2.20E-01	4.30E-01	1.30E-01	1.00E+12	ND
Cyclohexane	1.00E-09	LS	1.50E+00	3.00E-01	1.60E+02	2.00E-03	3.20E-01	4.30E-01	1.30E-01	1.00E+12	ND
Benzene	1.00E-09	LS	1.50E+00	3.00E-01	6.17E+01	2.00E-03	1.23E-01	4.30E-01	1.30E-01	1.00E+12	ND
Trichloroethene	1.00E-09	LS	1.50E+00	3.00E-01	1.66E+02	2.00E-03	3.32E-01	4.30E-01	1.30E-01	1.00E+12	ND
Methylcyclohexane	1.00E-09	LS	1.50E+00	3.00E-01	2.68E+02	2.00E-03	5.36E-01	4.30E-01	1.30E-01	1.00E+12	ND
Toluene	1.00E-09	LS	1.50E+00	3.00E-01	1.40E+02	2.00E-03	2.80E-01	4.30E-01	1.30E-01	1.00E+12	1.26E+04
Tetrachloroethene	1.00E-09	LS	1.50E+00	3.00E-01	2.65E+02	2.00E-03	5.30E-01	4.30E-01	1.30E-01	1.00E+12	ND
Chlorobenzene	1.00E-09	LS	1.50E+00	3.00E-01	2.19E+02	2.00E-03	4.38E-01	4.30E-01	1.30E-01	1.00E+12	ND
Ethylbenzene	1.00E-09	LS	1.50E+00	3.00E-01	2.04E+02	2.00E-03	4.08E-01	4.30E-01	1.30E-01	1.00E+12	8.51E+03
Xylenes	1.00E-09	LS	1.50E+00	3.00E-01	2.41E+02	2.00E-03	4.82E-01	4.30E-01	1.30E-01	1.00E+12	6.89E+01
Styrene	1.00E-09	LS	1.50E+00	3.00E-01	7.76E+02	2.00E-03	1.55E+00	4.30E-01	1.30E-01	1.00E+12	1.82E+02
1,1,2,2-Tetrachloroethane	1.00E-09	LS	1.50E+00	3.00E-01	9.33E+01	2.00E-03	1.87E-01	4.30E-01	1.30E-01	1.00E+12	ND
1,3-Dichlorobenzene	1.00E-09	LS	1.50E+00	3.00E-01	1.70E+02	2.00E-03	3.40E-01	4.30E-01	1.30E-01	1.00E+12	ND
1,4-Dichlorobenzene	1.00E-09	LS	1.50E+00	3.00E-01	6.17E+02	2.00E-03	1.23E+00	4.30E-01	1.30E-01	1.00E+12	ND
1,2-Dichlorobenzene	1.00E-09	LS	1.50E+00	3.00E-01	6.17E+02	2.00E-03	1.23E+00	4.30E-01	1.30E-01	1.00E+12	ND
1,2,4-Trichlorobenzene	1.00E-09	LS	1.50E+00	3.00E-01	1.78E+03	2.00E-03	3.56E+00	4.30E-01	1.30E-01	1.00E+12	ND
Benzaldehyde	1.00E-09	LS	1.50E+00	3.00E-01	3.27E+01	2.00E-03	6.54E-02	4.30E-01	1.30E-01	1.00E+12	ND
2-Methylnaphthalene	1.00E-09	LS	1.50E+00	3.00E-01	8.51E+03	2.00E-03	1.70E+01	4.30E-01	1.30E-01	1.00E+12	3.59E+03
1,1'-Biphenyl	1.00E-09	LS	1.50E+00	3.00E-01	6.25E+03	2.00E-03	1.25E+01	4.30E-01	1.30E-01	1.00E+12	ND
Acenaphthylene	1.00E-09	LS	1.50E+00	3.00E-01	4.79E+03	2.00E-03	9.57E+00	4.30E-01	1.30E-01	1.00E+12	1.75E+02
Acenaphthene	1.00E-09	LS	1.50E+00	3.00E-01	7.08E+03	2.00E-03	1.42E+01	4.30E-01	1.30E-01	1.00E+12	3.30E+01
Dibenzofuran	1.00E-09	LS	1.50E+00	3.00E-01	8.13E+03	2.00E-03	1.63E+01	4.30E-01	1.30E-01	1.00E+12	1.48E+03
Fluorene	1.00E-09	LS	1.50E+00	3.00E-01	1.38E+04	2.00E-03	2.76E+01	4.30E-01	1.30E-01	1.00E+12	1.40E+01
Phenanthrene	1.00E-09	LS	1.50E+00	3.00E-01	1.41E+04	2.00E-03	2.83E+01	4.30E-01	1.30E-01	1.00E+12	2.51E+02
Anthracene	1.00E-09	LS	1.50E+00	3.00E-01	2.95E+04	2.00E-03	5.90E+01	4.30E-01	1.30E-01	1.00E+12	1.34E+01
C5-C8 Aliphatics	1.00E-09	LS	1.50E+00	3.00E-01	2.27E+03	2.00E-03	4.53E+00	4.30E-01	1.30E-01	1.00E+12	5.83E+06
C9-C12 Aliphatics	1.00E-09	LS	1.50E+00	3.00E-01	1.50E+05	2.00E-03	3.00E+02	4.30E-01	1.30E-01	1.00E+12	2.19E+05
C9-C10 Aromatics	1.00E-09	LS	1.50E+00	3.00E-01	1.78E+03	2.00E-03	3.56E+00	4.30E-01	1.30E-01	1.00E+12	ND
C9-C18 Aliphatics	1.00E-09	LS	1.50E+00	3.00E-01	6.80E+05	2.00E-03	1.36E+03	4.30E-01	1.30E-01	1.00E+12	ND
C11-C22 Aromatics	1.00E-09	LS	1.50E+00	3.00E-01	5.00E+03	2.00E-03	1.00E+01	4.30E-01	1.30E-01	1.00E+12	5.44E+04

TABLE 6-5 (continued)
SOIL TO OUTDOOR AIR
SURFACE SOIL (0-2 feet)
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Aberjona Auto Parts

	Depth below grade to bottom of trench	Depth below grade to contamination	Source Trench Separation	Diffusivity in air	Diffusivity in water	Vadose zone Effective Diffusion Coeff.	Total Overall Effective Diffusion Coeff.	Area of Trench Below Grade	Trench Ventilation Rate	Pressure Diff. between soil & enclosed space	Vadose zone soil saturated hydraulic conductivity	Conversion Factor hr to s
	L_T	L_c	L_T	D_a	D_w	D_v^{eff}	D_T^{eff}	A_B	Q_{trench}	ΔP	$K_{s,v}$	Conv02
Units:	cm	cm	cm	cm^2/s	cm^2/s	cm^2/s	cm^2/s	cm^2	cm^3/s	$g/cm{\cdot}s^2$	cm/hr	s/hr
Formula:	(120 (4') for screening)	(121 for screening)	$L_c - L_T$	lookup	lookup	(Note 13)	(Note 4)	(Note 2)	(Note 22)	(40 for screening)	lookup	
Analyte												
Dichloroethylene, 1,2- (total)	1.20E+02	1.21E+02	1.00E+00	1.23E-01	9.38E-06	7.51E-04	7.51E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Naphthalene	1.20E+02	1.21E+02	1.00E+00	5.90E-02	7.50E-06	3.93E-04	3.93E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Chloromethane	1.20E+02	1.21E+02	1.00E+00	1.26E-01	6.50E-06	7.65E-04	7.65E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Vinyl Chloride	1.20E+02	1.21E+02	1.00E+00	1.06E-01	1.23E-06	6.42E-04	6.42E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Methyl bromide	1.20E+02	1.21E+02	1.00E+00	7.28E-02	1.21E-05	4.46E-04	4.46E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Ethyl Chloride	1.20E+02	1.21E+02	1.00E+00	2.71E-01	1.15E-05	1.64E-03	1.64E-03	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,1-Dichloroethene	1.20E+02	1.21E+02	1.00E+00	9.00E-02	1.04E-05	5.46E-04	5.46E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Acetone	1.20E+02	1.21E+02	1.00E+00	1.24E-01	1.14E-05	1.42E-03	1.42E-03	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Carbon disulfide	1.20E+02	1.21E+02	1.00E+00	1.04E-01	1.00E-05	6.31E-04	6.31E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Methyl acetate	1.20E+02	1.21E+02	1.00E+00	1.04E-01	1.00E-05	8.32E-04	8.32E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Methylene chloride	1.20E+02	1.21E+02	1.00E+00	1.01E-01	1.17E-05	6.24E-04	6.24E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Methyl-Tertiary-Butyl Ether	1.20E+02	1.21E+02	1.00E+00	1.02E-01	1.05E-05	6.61E-04	6.61E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,1-Dichloroethane	1.20E+02	1.21E+02	1.00E+00	7.42E-02	1.05E-05	4.54E-04	4.54E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
cis-1,2-Dichloroethene	1.20E+02	1.21E+02	1.00E+00	7.36E-02	1.13E-05	4.52E-04	4.52E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Butanone, 2- (MEK)	1.20E+02	1.21E+02	1.00E+00	8.08E-02	9.80E-06	8.89E-04	8.89E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,1,1-Trichloroethane	1.20E+02	1.21E+02	1.00E+00	7.80E-02	8.80E-06	4.74E-04	4.74E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Cyclohexane	1.20E+02	1.21E+02	1.00E+00	8.00E-02	9.00E-06	4.85E-04	4.85E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Benzene	1.20E+02	1.21E+02	1.00E+00	8.80E-02	9.80E-06	5.37E-04	5.37E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Trichloroethene	1.20E+02	1.21E+02	1.00E+00	7.90E-02	9.10E-06	4.81E-04	4.81E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Methylcyclohexane	1.20E+02	1.21E+02	1.00E+00	9.86E-02	8.52E-06	5.98E-04	5.98E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Toluene	1.20E+02	1.21E+02	1.00E+00	8.70E-02	8.60E-06	5.30E-04	5.30E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Tetrachloroethene	1.20E+02	1.21E+02	1.00E+00	7.20E-02	8.20E-06	4.37E-04	4.37E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Chlorobenzene	1.20E+02	1.21E+02	1.00E+00	7.30E-02	8.70E-06	4.48E-04	4.48E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Ethylbenzene	1.20E+02	1.21E+02	1.00E+00	7.50E-02	7.80E-06	4.57E-04	4.57E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Xylenes	1.20E+02	1.21E+02	1.00E+00	7.69E-02	8.44E-06	3.33E-03	3.33E-03	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Styrene	1.20E+02	1.21E+02	1.00E+00	7.10E-02	8.00E-06	4.37E-04	4.37E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,1,2,2-Tetrachloroethane	1.20E+02	1.21E+02	1.00E+00	7.10E-02	7.90E-06	4.83E-04	4.83E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,3-Dichlorobenzene	1.20E+02	1.21E+02	1.00E+00	4.14E-02	8.85E-06	2.55E-04	2.55E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,4-Dichlorobenzene	1.20E+02	1.21E+02	1.00E+00	6.90E-02	7.90E-06	4.26E-04	4.26E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,2-Dichlorobenzene	1.20E+02	1.21E+02	1.00E+00	6.90E-02	7.90E-06	4.28E-04	4.28E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,2,4-Trichlorobenzene	1.20E+02	1.21E+02	1.00E+00	3.00E-02	8.23E-06	1.95E-04	1.95E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Benzaldehyde	1.20E+02	1.21E+02	1.00E+00	7.30E-02	9.07E-06	1.23E-03	1.23E-03	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
2-Methylnaphthalene	1.20E+02	1.21E+02	1.00E+00	4.84E-02	7.75E-06	3.11E-04	3.11E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,1'-Biphenyl	1.20E+02	1.21E+02	1.00E+00	4.04E-02	8.15E-06	3.06E-04	3.06E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Acenaphthylene	1.20E+02	1.21E+02	1.00E+00	4.43E-02	7.44E-06	3.29E-04	3.29E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Acenaphthene	1.20E+02	1.21E+02	1.00E+00	4.21E-02	7.69E-06	3.68E-04	3.68E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Dibenzofuran	1.20E+02	1.21E+02	1.00E+00	2.67E-02	5.93E-06	1.65E-04	1.65E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Fluorene	1.20E+02	1.21E+02	1.00E+00	3.63E-02	7.88E-06	5.02E-04	5.02E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Phenanthrene	1.20E+02	1.21E+02	1.00E+00	3.30E-02	7.47E-06	3.31E-04	3.31E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Anthracene	1.20E+02	1.21E+02	1.00E+00	3.24E-02	7.74E-06	4.67E-04	4.67E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
C5-C8 Aliphatics	1.20E+02	1.21E+02	1.00E+00	8.00E-02	1.00E-05	4.85E-04	4.85E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
C9-C12 Aliphatics	1.20E+02	1.21E+02	1.00E+00	7.00E-02	1.00E-05	4.24E-04	4.24E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
C9-C10 Aromatics	1.20E+02	1.21E+02	1.00E+00	7.00E-02	1.00E-05	4.27E-04	4.27E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
C9-C18 Aliphatics	1.20E+02	1.21E+02	1.00E+00	7.00E-02	5.00E-06	4.24E-04	4.24E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
C11-C22 Aromatics	1.20E+02	1.21E+02	1.00E+00	6.00E-02	1.00E-05	3.95E-04	3.95E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03

TABLE 6-5 (continued)
SOIL TO OUTDOOR AIR
SURFACE SOIL (0-2 feet)
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Aberjona Auto Parts

	Viscosity of water at 10°C	Viscosity of water at system temp.	Density of water	Acceleration due to gravity	Vadose zone soil intrinsic permeability	Vadose zone residual soil water content	Vadose zone effective total fluid saturation	Vadose zone van Genuchten shape parameter	Vadose zone soil relative air permeability	Vadose zone soil effective vapor permeability	Thickness of soil between soilgas & trench
	μ_{w-10}	μ_w	ρ_w	g	$k_{i,v}$	$\theta_{r,v}$	S_{te}	M_v	k_{rg}	k_v	L_{soil}
Units:	g/cm-s	g/cm-s	g/cm^3	cm/s^2	cm^2	cm^3/cm^3	unitless	unitless	unitless	cm^2	cm
Formula:		(Note 16)	(0.999 for screening)		(Note 17)	lookup	(Note 18)	lookup	(Note 19)	(Note 20)	(1 for screening)
Analyte											
Dichloroethylene, 1,2- (total)	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Naphthalene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Chloromethane	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Vinyl Chloride	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Methyl bromide	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Ethyl Chloride	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,1-Dichloroethene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Acetone	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Carbon disulfide	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Methyl acetate	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Methylene chloride	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Methyl-Tertiary-Butyl Ether	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,1-Dichloroethane	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
cis-1,2-Dichloroethene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Butanone, 2- (MEK)	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,1,1-Trichloroethane	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Cyclohexane	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Benzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Trichloroethene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Methylcyclohexane	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Toluene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Tetrachloroethene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Chlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Ethylbenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Xylenes	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Styrene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,1,2,2-Tetrachloroethane	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,3-Dichlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,4-Dichlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,2-Dichlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,2,4-Trichlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Benzaldehyde	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
2-Methylnaphthalene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,1'-Biphenyl	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Acenaphthylene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Acenaphthene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Dibenzofuran	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Fluorene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Phenanthrene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Anthracene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
C5-C8 Aliphatics	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
C9-C12 Aliphatics	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
C9-C10 Aromatics	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
C9-C18 Aliphatics	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
C11-C22 Aromatics	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00

TABLE 6-5 (continued)
SOIL TO OUTDOOR AIR
SURFACE SOIL (0-2 feet)
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Aberjona Auto Parts

	Vapor viscosity at avg. soil temp.	Avg. Vapor Flow Rate Into trench	Infinite Source Attenuation Coeff.	Infinite Source Trench Conc.
	μ_{TS}	Q_{soil}	α	C_{trench}
Units:	g/cm-s	cm^3/s	unitless	$\mu g/m^3$
Formula:	0.00018*(T$_s$/298.15)^0.5	(Note 5)	(Note 6)	C_{source} * α
Analyte				
Dichloroethylene, 1,2- (total)	1.75E-04	1.44E-03	8.50E-09	ND
Naphthalene	1.75E-04	1.44E-03	8.50E-09	ND
Chloromethane	1.75E-04	1.44E-03	8.50E-09	ND
Vinyl Chloride	1.75E-04	1.44E-03	8.50E-09	ND
Methyl bromide	1.75E-04	1.44E-03	8.50E-09	2.24E-05
Ethyl Chloride	1.75E-04	1.44E-03	8.50E-09	ND
1,1-Dichloroethene	1.75E-04	1.44E-03	8.50E-09	1.10E-04
Acetone	1.75E-04	1.44E-03	8.50E-09	2.61E-07
Carbon disulfide	1.75E-04	1.44E-03	8.50E-09	ND
Methyl acetate	1.75E-04	1.44E-03	8.50E-09	ND
Methylene chloride	1.75E-04	1.44E-03	8.50E-09	ND
Methyl-Tertiary-Butyl Ether	1.75E-04	1.44E-03	8.50E-09	ND
1,1-Dichloroethane	1.75E-04	1.44E-03	8.50E-09	ND
cis-1,2-Dichloroethene	1.75E-04	1.44E-03	8.50E-09	ND
Butanone, 2- (MEK)	1.75E-04	1.44E-03	8.50E-09	ND
1,1,1-Trichloroethane	1.75E-04	1.44E-03	8.50E-09	ND
Cyclohexane	1.75E-04	1.44E-03	8.50E-09	ND
Benzene	1.75E-04	1.44E-03	8.50E-09	ND
Trichloroethene	1.75E-04	1.44E-03	8.50E-09	ND
Methylcyclohexane	1.75E-04	1.44E-03	8.50E-09	ND
Toluene	1.75E-04	1.44E-03	8.50E-09	1.07E-04
Tetrachloroethene	1.75E-04	1.44E-03	8.50E-09	ND
Chlorobenzene	1.75E-04	1.44E-03	8.50E-09	ND
Ethylbenzene	1.75E-04	1.44E-03	8.50E-09	7.23E-05
Xylenes	1.75E-04	1.44E-03	8.50E-09	5.85E-07
Styrene	1.75E-04	1.44E-03	8.50E-09	1.55E-06
1,1,2,2-Tetrachloroethane	1.75E-04	1.44E-03	8.50E-09	ND
1,3-Dichlorobenzene	1.75E-04	1.44E-03	8.50E-09	ND
1,4-Dichlorobenzene	1.75E-04	1.44E-03	8.50E-09	ND
1,2-Dichlorobenzene	1.75E-04	1.44E-03	8.50E-09	ND
1,2,4-Trichlorobenzene	1.75E-04	1.44E-03	8.50E-09	ND
Benzaldehyde	1.75E-04	1.44E-03	8.50E-09	ND
2-Methylnaphthalene	1.75E-04	1.44E-03	8.50E-09	3.05E-05
1,1'-Biphenyl	1.75E-04	1.44E-03	8.50E-09	ND
Acenaphthylene	1.75E-04	1.44E-03	8.50E-09	1.49E-06
Acenaphthene	1.75E-04	1.44E-03	8.50E-09	2.80E-07
Dibenzofuran	1.75E-04	1.44E-03	8.50E-09	1.26E-05
Fluorene	1.75E-04	1.44E-03	8.50E-09	1.19E-07
Phenanthrene	1.75E-04	1.44E-03	8.50E-09	2.13E-06
Anthracene	1.75E-04	1.44E-03	8.50E-09	1.14E-07
C5-C8 Aliphatics	1.75E-04	1.44E-03	8.50E-09	4.96E-02
C9-C12 Aliphatics	1.75E-04	1.44E-03	8.50E-09	1.86E-03
C9-C10 Aromatics	1.75E-04	1.44E-03	8.50E-09	ND
C9-C18 Aliphatics	1.75E-04	1.44E-03	8.50E-09	ND
C11-C22 Aromatics	1.75E-04	1.44E-03	8.50E-09	4.63E-04

TABLE 6-5 (continued)
SOIL TO OUTDOOR AIR
SURFACE SOIL (0-2 feet)
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Aberjona Auto Parts

Notes:

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

(1) Assumed equivalent to D_i^{eff} of soil layer i in contact with the floor

(2) For screening, assume a trench 4 ft deep, 3 ft wide, and 30 ft long.

(3) Depth to water table minus depth to bottom of floor must be > thickness of capillary fringe, which is based on the soil type (typ. around 30 cm). Use 400 cm for screening purposes.

(4) $D_T^{eff} = L_T / (L_T / D_v^{eff})$

(5) $Q_{soil} = (2*\pi*\Delta P*k_v*X_{crack}) / (\mu_{TS}*ln(2*Z_{crack}/r_{crack}))$

(6) $\alpha = [(D_T^{eff}*A_B/(Q_{building}*L_T))*EXP(Q_{soil}*L_{crack}/(D^{crack}*A_{crack}))]/[EXP(Q_{soil}*L_{crack}/(D^{crack}*A_{crack}))+(D_T^{eff}*A_B/(Q_{building}*L_T))+(D_T^{eff}*A_B/(Q_{soil}*L_T))*(EXP(Q_{soil}*L_{crack}/(D^{crack}*A_{crack}))-1)]$

(7) A function of the ratio T_B/T_C:

T_B/T_C	β
<0.57	0.30
0.57-0.71	$0.74(T_B/T_C)-0.116$
>0.71	0.41

(8) $\Delta H_{vTS} = \Delta H_{vB}*[(1-T_S/T_C)/(1-T_B/T_C)]^{\beta}$

(9) $H_{TS} = EXP[-\Delta H_{vTS}/R_o*(1/T_S-1/T_B)]*H_B$

(10) Refer to 12 SCS soil types - use SC for screening.

(11) Refer to 12 SCS soil types - use SCL for screening.

(12) $L_{cz} = 0.15 / (0.2 * D_{cz})$

(13) $D_v^{eff} = D_a*(\theta_{avu}^{3.33}/n_v^2)+(D_w/H'_{TS})(\theta_{wvu}^{3.33}/n_v^2)$

(14) $D_{cz}^{eff} = D_a*(\theta_{avcz}^{3.33}/n_{cz}^2)+(D_w/H'_{TS})(\theta_{wvcz}^{3.33}/n_{cz}^2)$

(15) $\theta_{wvcz} = \theta_{r,cz}+((\theta_{s,cz}-\theta_{r,cz})/(2^{Mcz}))$, where the value 2 in the formula is used for screening, but may be refined based on soil parameters (see USEPA, 1999).

(16) $\mu_w = \mu_{w-10} * (T'_s / 283.15)^{0.5}$

(17) $k_{L,v} = K_{s,v} * 1/Conv02 * \mu_w / (\rho_w * g)$

(18) $S_w = (\theta_{w,v} - \theta_{r,v}) / (n_v - \theta_{r,v})$

(19) $k_{rg} = (1 - S_w)^{0.5} * (1-S_w^{1/Mv})^{2Mv}$

(20) $k_v = k_{L,v} * k_{rg}$; note that the model is very sensitive to this parameter and if site-specific values are available, they should be used.

(21) $C_{source} = H'_{TS} * C_R * Conv01 * \rho_b / (\theta_{w,v} + K_d * \rho_b + H'_{TS} * \theta_{a,v}) * Conv02$

(22) For screening, assume a trench 4 ft deep, 3 ft wide, 30 ft long and an air exchange rate of 60/hr. The air exchange rate is based on the assumption that the wind speed in the trench is a small fraction of the ground wind speed and that it could take up to 1 minute for a contaminant to be cleared from the trench air space.

TABLE 6-5
SOIL TO OUTDOOR AIR
SURFACE SOIL (0- 2 feet)
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Whitney Barrel

	Soil EPC CR	Soil Temp. T_S	Soil Temp. T_S	Henry's Law Constant at ref. temp. H_R	Henry's Law Reference Temp. T_R	Normal Boiling Point T_B	Enthalpy of vaporization at T_S ΔH_{vB}	Critical Temp. T_C	constant n	Enthalpy of vaporization at T_S ΔH_{vTS}	Gas Constant R_v	Henry's Law Constant at T_S H_{TS}	Gas Constant R	Henry's Law Constant H'_{TS}
Units:	µg/kg	°C	K	atm-m³/mol	K	K	cal/mol	K	unitless	cal/mol	cal/mol-K	atm-m³/mol	m³-atm/mol-K	unitless
Formula:	Input	(10 for screening)	(T_S+273.15)	lookup	(lookup+273.15)	lookup	lookup	lookup	(Note 7)	(Note 8)		(Note 9)		H_{TS} / (R * T_S)
Analyte														
Dichloroethylene, 1,2- (total)	ND	1.00E+01	2.83E+02	4.07E-03	2.98E+02	3.28E+02	1.32E+03	4.92E+02	3.77E-01	1.45E+03	1.99E+00	4.07E-03	8.21E-05	1.75E-01
Naphthalene	1.30E+03	1.00E+01	2.83E+02	4.83E-04	2.98E+02	4.91E+02	1.04E+04	7.48E+02	3.70E-01	1.29E+04	1.99E+00	4.83E-04	8.21E-05	2.08E-02
Chloromethane	4.50E+02	1.00E+01	2.83E+02	8.67E-03	2.98E+02	2.49E+02	1.35E+03	3.74E+02	3.77E-01	1.20E+03	1.99E+00	8.67E-03	8.21E-05	3.73E-01
Vinyl Chloride	2.80E+02	1.00E+01	2.83E+02	2.71E-02	2.98E+02	2.59E+02	5.25E+03	4.32E+02	3.28E-01	5.00E+03	1.99E+00	2.71E-02	8.21E-05	1.17E+00
Methyl bromide	ND	1.00E+01	2.83E+02	6.24E-03	2.98E+02	2.77E+02	5.71E+03	4.67E+02	3.22E-01	5.65E+03	1.99E+00	6.24E-03	8.21E-05	2.69E-01
Ethyl Chloride	1.00E+01	1.00E+01	2.83E+02	1.09E-02	2.98E+02	2.85E+02	1.36E+03	4.28E+02	3.77E-01	1.37E+03	1.99E+00	1.09E-02	8.21E-05	4.69E-01
1,1-Dichloroethene	1.60E+00	1.00E+01	2.83E+02	2.61E-02	2.98E+02	3.05E+02	6.25E+03	5.76E+02	3.00E-01	6.39E+03	1.99E+00	2.61E-02	8.21E-05	1.12E+00
Acetone	1.20E+02	1.00E+01	2.83E+02	3.88E-05	2.98E+02	3.29E+02	6.96E+03	5.08E+02	3.63E-01	7.56E+03	1.99E+00	3.88E-05	8.21E-05	1.67E-03
Carbon disulfide	4.60E+01	1.00E+01	2.83E+02	3.02E-02	2.98E+02	3.19E+02	6.39E+03	5.52E+02	3.12E-01	6.68E+03	1.99E+00	3.02E-02	8.21E-05	1.30E+00
Methyl acetate	2.50E+02	1.00E+01	2.83E+02	1.13E-04	2.98E+02	3.65E+02	1.31E+03	5.48E+02	3.77E-01	1.50E+03	1.99E+00	1.13E-04	8.21E-05	4.86E-03
Methylene chloride	ND	1.00E+01	2.83E+02	2.19E-03	2.98E+02	3.13E+02	6.71E+03	5.10E+02	3.38E-01	7.03E+03	1.99E+00	2.19E-03	8.21E-05	9.43E-02
Methyl-Tertiary-Butyl Ether	3.70E+02	1.00E+01	2.83E+02	5.87E-04	2.98E+02	3.28E+02	1.32E+03	4.97E+02	3.73E-01	1.45E+03	1.99E+00	5.87E-04	8.21E-05	2.53E-02
1,1-Dichloroethane	2.70E+00	1.00E+01	2.83E+02	5.61E-03	2.98E+02	3.31E+02	6.90E+03	5.23E+02	3.52E-01	7.45E+03	1.99E+00	5.61E-03	8.21E-05	2.41E-01
cis-1,2-Dichloroethene	2.50E+00	1.00E+01	2.83E+02	4.07E-03	2.98E+02	3.34E+02	7.19E+03	5.44E+02	3.38E-01	7.73E+03	1.99E+00	4.07E-03	8.21E-05	1.75E-01
Butanone, 2- (MEK)	2.90E+01	1.00E+01	2.83E+02	5.60E-05	2.98E+02	3.53E+02	1.31E+03	5.29E+02	3.77E-01	1.49E+03	1.99E+00	5.60E-05	8.21E-05	2.41E-03
1,1,1-Trichloroethane	ND	1.00E+01	2.83E+02	1.72E-02	2.98E+02	3.47E+02	7.14E+03	5.45E+02	3.55E-01	7.88E+03	1.99E+00	1.72E-02	8.21E-05	7.40E-01
Cyclohexane	2.60E+00	1.00E+01	2.83E+02	2.00E+00	2.98E+02	3.54E+02	1.31E+03	5.31E+02	3.77E-01	1.49E+03	1.99E+00	2.00E+00	8.21E-05	8.61E+01
Benzene	1.20E+02	1.00E+01	2.83E+02	5.55E-03	2.98E+02	3.53E+02	7.34E+03	5.62E+02	3.49E-01	8.12E+03	1.99E+00	5.55E-03	8.21E-05	2.39E-01
Trichloroethene	1.40E+00	1.00E+01	2.83E+02	1.03E-02	2.98E+02	3.60E+02	7.51E+03	5.44E+02	3.74E-01	8.56E+03	1.99E+00	1.03E-02	8.21E-05	4.43E-01
Methylcyclohexane	1.70E+02	1.00E+01	2.83E+02	4.23E-01	2.98E+02	3.74E+02	1.30E+03	5.61E+02	3.77E-01	1.51E+03	1.99E+00	4.23E-01	8.21E-05	1.82E+01
Toluene	2.90E+02	1.00E+01	2.83E+02	6.64E-03	2.98E+02	3.84E+02	7.93E+03	5.92E+02	3.64E-01	9.15E+03	1.99E+00	6.64E-03	8.21E-05	2.86E-01
Tetrachloroethene	1.50E+00	1.00E+01	2.83E+02	1.84E-02	2.98E+02	3.94E+02	8.29E+03	6.20E+02	3.55E-01	9.55E+03	1.99E+00	1.84E-02	8.21E-05	7.92E-01
Chlorobenzene	4.60E+01	1.00E+01	2.83E+02	3.71E-03	2.98E+02	4.05E+02	8.41E+03	6.32E+02	3.58E-01	9.80E+03	1.99E+00	3.71E-03	8.21E-05	1.60E-01
Ethylbenzene	1.90E+02	1.00E+01	2.83E+02	7.88E-03	2.98E+02	4.09E+02	8.50E+03	6.17E+02	3.75E-01	1.02E+04	1.99E+00	7.88E-03	8.21E-05	3.39E-01
Xylenes	7.20E+02	1.00E+01	2.83E+02	6.73E-06	2.98E+02	4.17E+02	1.26E+03	6.16E+02	3.85E-01	1.54E+03	1.99E+00	6.73E-06	8.21E-05	2.90E-04
Styrene	ND	1.00E+01	2.83E+02	2.76E-03	2.98E+02	4.18E+02	8.74E+03	6.36E+02	3.71E-01	1.05E+04	1.99E+00	2.76E-03	8.21E-05	1.19E-01
1,1,2,2-Tetrachloroethane	7.00E-01	1.00E+01	2.83E+02	3.44E-04	2.98E+02	4.20E+02	9.00E+03	6.61E+02	3.54E-01	1.05E+04	1.99E+00	3.44E-04	8.21E-05	1.48E-02
1,3-Dichlorobenzene	4.30E+00	1.00E+01	2.83E+02	4.70E-03	2.98E+02	4.46E+02	1.24E+03	6.84E+02	3.67E-01	1.50E+03	1.99E+00	4.70E-03	8.21E-05	2.02E-01
1,4-Dichlorobenzene	3.70E+00	1.00E+01	2.83E+02	2.43E-03	2.98E+02	4.47E+02	9.27E+03	6.85E+02	3.67E-01	1.12E+04	1.99E+00	2.43E-03	8.21E-05	1.05E-01
1,2-Dichlorobenzene	2.90E+00	1.00E+01	2.83E+02	1.90E-03	2.98E+02	4.54E+02	9.70E+03	7.05E+02	3.60E-01	1.17E+04	1.99E+00	1.90E-03	8.21E-05	8.18E-02
1,2,4-Trichlorobenzene	3.50E+00	1.00E+01	2.83E+02	1.42E-03	2.98E+02	4.86E+02	1.05E+04	7.25E+02	3.80E-01	1.32E+04	1.99E+00	1.42E-03	8.21E-05	6.11E-02
Benzaldehyde	4.40E+02	1.00E+01	2.83E+02	2.62E-05	2.98E+02	4.52E+02	0.00E+00	6.78E+02	3.77E-01	0.00E+00	1.99E+00	2.62E-05	8.21E-05	1.13E-03
2-Methylnaphthalene	1.20E+03	1.00E+01	2.83E+02	1.01E-03	2.98E+02	5.14E+02	1.17E+03	7.61E+02	3.84E-01	1.51E+03	1.99E+00	1.01E-03	8.21E-05	4.36E-02
1,1'-Biphenyl	6.20E+02	1.00E+01	2.83E+02	3.03E-04	2.98E+02	5.29E+02	1.15E+03	7.94E+02	3.77E-01	1.47E+03	1.99E+00	3.03E-04	8.21E-05	1.30E-02
Acenaphthylene	4.00E+02	1.00E+01	2.83E+02	2.80E-04	2.98E+02	5.53E+02	1.12E+03	7.92E+02	4.01E-01	1.51E+03	1.99E+00	2.80E-04	8.21E-05	1.21E-02
Acenaphthene	7.90E+03	1.00E+01	2.83E+02	1.55E-04	2.98E+02	5.51E+02	1.22E+04	8.03E+02	3.91E-01	1.61E+04	1.99E+00	1.55E-04	8.21E-05	6.67E-03
Dibenzofuran	4.60E+03	1.00E+01	2.83E+02	4.00E-03	2.98E+02	5.59E+02	1.11E+03	8.24E+02	3.86E-01	1.47E+03	1.99E+00	4.00E-03	8.21E-05	1.72E-01
Fluorene	9.80E+03	1.00E+01	2.83E+02	6.37E-05	2.98E+02	5.70E+02	1.27E+04	8.70E+02	3.69E-01	1.62E+04	1.99E+00	6.37E-05	8.21E-05	2.74E-03
Phenanthrene	6.80E+04	1.00E+01	2.83E+02	1.30E-04	2.98E+02	6.13E+02	1.06E+03	8.69E+02	4.06E-01	1.48E+03	1.99E+00	1.30E-04	8.21E-05	5.59E-03
Anthracene	1.90E+04	1.00E+01	2.83E+02	6.51E-05	2.98E+02	6.15E+02	1.31E+04	8.73E+02	4.05E-01	1.84E+04	1.99E+00	6.51E-05	8.21E-05	2.80E-03
C5-C8 Aliphatics	9.00E+03	1.00E+01	2.83E+02	1.30E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.30E+00	8.21E-05	5.58E+01
C9-C12 Aliphatics	1.20E+04	1.00E+01	2.83E+02	1.56E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.56E+00	8.21E-05	6.71E+01
C9-C10 Aromatics	5.00E+03	1.00E+01	2.83E+02	7.92E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	7.92E-03	8.21E-05	3.41E-01
C9-C18 Aliphatics	8.50E+04	1.00E+01	2.83E+02	1.65E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.65E+00	8.21E-05	7.10E+01
C11-C22 Aromatics	5.79E+05	1.00E+01	2.83E+02	7.17E-04	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	7.17E-04	8.21E-05	3.09E-02

TABLE 6-5 (continued)
SOIL TO OUTDOOR AIR
SURFACE SOIL (0- 2 feet)
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Whitney Barrel

	Conversion Factor µg/kg to g/g	SCS soil type in vadose zone	Vadose zone soil dry bulk density	Vadose zone soil water-filled porosity	Organic carbon partition coefficient	Vadose zone organic carbon fraction	Soil-water partition coefficient	Vadose zone soil total porosity	Vadose zone soil air-filled porosity	Conversion Factor g/cm³ to µg/m³	Source Vapor Conc.
	Conv01	ST_v	ρ_b	θ_{wv}	K_{oc}	$f_{oc,v}$	K_d	n_v	θ_{av}	Conv03	C_{source}
Units:	µg/kg / g/g	unitless	g/cm³	cm³/cm³	cm³/g	unitless	cm³/g	cm³/cm³	cm³/cm³	g/cm³ / µg/m³	µg/m³
Formula:		(Note 11)	(1.5 for screening)	(0.3 for screening)	lookup	(0.002 for screening)	$K_{oc} * f_{oc}$	(0.43 for screening)	$n_v - \theta_{wv}$		(Note 21)
Analyte											
Dichloroethylene, 1,2- (total)	1.00E-09	LS	1.50E+00	3.00E-01	4.38E+01	2.00E-03	8.76E-02	4.30E-01	1.30E-01	1.00E+12	ND
Naphthalene	1.00E-09	LS	1.50E+00	3.00E-01	2.00E+03	2.00E-03	4.00E+00	4.30E-01	1.30E-01	1.00E+12	6.43E+03
Chloromethane	1.00E-09	LS	1.50E+00	3.00E-01	1.43E+01	2.00E-03	2.86E-02	4.30E-01	1.30E-01	1.00E+12	6.43E+05
Vinyl Chloride	1.00E-09	LS	1.50E+00	3.00E-01	1.86E+01	2.00E-03	3.72E-02	4.30E-01	1.30E-01	1.00E+12	9.65E+05
Methyl bromide	1.00E-09	LS	1.50E+00	3.00E-01	1.05E+01	2.00E-03	2.10E-02	4.30E-01	1.30E-01	1.00E+12	ND
Ethyl Chloride	1.00E-09	LS	1.50E+00	3.00E-01	2.73E+01	2.00E-03	5.46E-02	4.30E-01	1.30E-01	1.00E+12	1.59E+04
1,1-Dichloroethene	1.00E-09	LS	1.50E+00	3.00E-01	5.89E+01	2.00E-03	1.18E-01	4.30E-01	1.30E-01	1.00E+12	4.33E+03
Acetone	1.00E-09	LS	1.50E+00	3.00E-01	5.75E-01	2.00E-03	1.15E-03	4.30E-01	1.30E-01	1.00E+12	9.95E+02
Carbon disulfide	1.00E-09	LS	1.50E+00	3.00E-01	4.57E+01	2.00E-03	9.14E-02	4.30E-01	1.30E-01	1.00E+12	1.48E+05
Methyl acetate	1.00E-09	LS	1.50E+00	3.00E-01	3.32E+00	2.00E-03	6.64E-03	4.30E-01	1.30E-01	1.00E+12	5.87E+03
Methylene chloride	1.00E-09	LS	1.50E+00	3.00E-01	1.17E+01	2.00E-03	2.34E-02	4.30E-01	1.30E-01	1.00E+12	ND
Methyl-Tertiary-Butyl Ether	1.00E-09	LS	1.50E+00	3.00E-01	3.84E+01	2.00E-03	7.68E-02	4.30E-01	1.30E-01	1.00E+12	3.35E+04
1,1-Dichloroethane	1.00E-09	LS	1.50E+00	3.00E-01	3.16E+01	2.00E-03	6.32E-02	4.30E-01	1.30E-01	1.00E+12	2.29E+03
cis-1,2-Dichloroethene	1.00E-09	LS	1.50E+00	3.00E-01	3.55E+01	2.00E-03	7.10E-02	4.30E-01	1.30E-01	1.00E+12	1.53E+03
Butanone, 2- (MEK)	1.00E-09	LS	1.50E+00	3.00E-01	3.83E+00	2.00E-03	7.66E-03	4.30E-01	1.30E-01	1.00E+12	3.36E+02
1,1,1-Trichloroethane	1.00E-09	LS	1.50E+00	3.00E-01	1.10E+02	2.00E-03	2.20E-01	4.30E-01	1.30E-01	1.00E+12	ND
Cyclohexane	1.00E-09	LS	1.50E+00	3.00E-01	1.60E+02	2.00E-03	3.20E-01	4.30E-01	1.30E-01	1.00E+12	2.80E+04
Benzene	1.00E-09	LS	1.50E+00	3.00E-01	6.17E+01	2.00E-03	1.23E-01	4.30E-01	1.30E-01	1.00E+12	8.33E+04
Trichloroethene	1.00E-09	LS	1.50E+00	3.00E-01	1.66E+02	2.00E-03	3.32E-01	4.30E-01	1.30E-01	1.00E+12	1.09E+03
Methylcyclohexane	1.00E-09	LS	1.50E+00	3.00E-01	2.68E+02	2.00E-03	5.36E-01	4.30E-01	1.30E-01	1.00E+12	1.34E+06
Toluene	1.00E-09	LS	1.50E+00	3.00E-01	1.40E+02	2.00E-03	2.80E-01	4.30E-01	1.30E-01	1.00E+12	1.64E+05
Tetrachloroethene	1.00E-09	LS	1.50E+00	3.00E-01	2.65E+02	2.00E-03	5.30E-01	4.30E-01	1.30E-01	1.00E+12	1.49E+03
Chlorobenzene	1.00E-09	LS	1.50E+00	3.00E-01	2.19E+02	2.00E-03	4.38E-01	4.30E-01	1.30E-01	1.00E+12	1.13E+04
Ethylbenzene	1.00E-09	LS	1.50E+00	3.00E-01	2.04E+02	2.00E-03	4.08E-01	4.30E-01	1.30E-01	1.00E+12	1.01E+05
Xylenes	1.00E-09	LS	1.50E+00	3.00E-01	2.41E+02	2.00E-03	4.82E-01	4.30E-01	1.30E-01	1.00E+12	3.06E+02
Styrene	1.00E-09	LS	1.50E+00	3.00E-01	7.76E+02	2.00E-03	1.55E+00	4.30E-01	1.30E-01	1.00E+12	ND
1,1,2,2-Tetrachloroethane	1.00E-09	LS	1.50E+00	3.00E-01	9.33E+01	2.00E-03	1.87E-01	4.30E-01	1.30E-01	1.00E+12	2.67E+01
1,3-Dichlorobenzene	1.00E-09	LS	1.50E+00	3.00E-01	1.70E+02	2.00E-03	3.40E-01	4.30E-01	1.30E-01	1.00E+12	1.56E+03
1,4-Dichlorobenzene	1.00E-09	LS	1.50E+00	3.00E-01	6.17E+02	2.00E-03	1.23E+00	4.30E-01	1.30E-01	1.00E+12	2.68E+02
1,2-Dichlorobenzene	1.00E-09	LS	1.50E+00	3.00E-01	6.17E+02	2.00E-03	1.23E+00	4.30E-01	1.30E-01	1.00E+12	1.65E+02
1,2,4-Trichlorobenzene	1.00E-09	LS	1.50E+00	3.00E-01	1.78E+03	2.00E-03	3.56E+00	4.30E-01	1.30E-01	1.00E+12	5.68E+01
Benzaldehyde	1.00E-09	LS	1.50E+00	3.00E-01	3.27E+01	2.00E-03	6.54E-02	4.30E-01	1.30E-01	1.00E+12	1.87E+03
2-Methylnaphthalene	1.00E-09	LS	1.50E+00	3.00E-01	8.51E+03	2.00E-03	1.70E+01	4.30E-01	1.30E-01	1.00E+12	3.04E+03
1,1'-Biphenyl	1.00E-09	LS	1.50E+00	3.00E-01	6.25E+03	2.00E-03	1.25E+01	4.30E-01	1.30E-01	1.00E+12	6.37E+02
Acenaphthylene	1.00E-09	LS	1.50E+00	3.00E-01	4.79E+03	2.00E-03	9.57E+00	4.30E-01	1.30E-01	1.00E+12	4.93E+02
Acenaphthene	1.00E-09	LS	1.50E+00	3.00E-01	7.08E+03	2.00E-03	1.42E+01	4.30E-01	1.30E-01	1.00E+12	3.67E+03
Dibenzofuran	1.00E-09	LS	1.50E+00	3.00E-01	8.13E+03	2.00E-03	1.63E+01	4.30E-01	1.30E-01	1.00E+12	4.80E+04
Fluorene	1.00E-09	LS	1.50E+00	3.00E-01	1.38E+04	2.00E-03	2.76E+01	4.30E-01	1.30E-01	1.00E+12	9.66E+02
Phenanthrene	1.00E-09	LS	1.50E+00	3.00E-01	1.41E+04	2.00E-03	2.83E+01	4.30E-01	1.30E-01	1.00E+12	1.34E+04
Anthracene	1.00E-09	LS	1.50E+00	3.00E-01	2.95E+04	2.00E-03	5.90E+01	4.30E-01	1.30E-01	1.00E+12	8.99E+02
C5-C8 Aliphatics	1.00E-09	LS	1.50E+00	3.00E-01	2.27E+03	2.00E-03	4.53E+00	4.30E-01	1.30E-01	1.00E+12	5.25E+07
C9-C12 Aliphatics	1.00E-09	LS	1.50E+00	3.00E-01	1.50E+05	2.00E-03	3.00E+02	4.30E-01	1.30E-01	1.00E+12	2.63E+06
C9-C10 Aromatics	1.00E-09	LS	1.50E+00	3.00E-01	1.78E+03	2.00E-03	3.56E+00	4.30E-01	1.30E-01	1.00E+12	4.50E+05
C9-C18 Aliphatics	1.00E-09	LS	1.50E+00	3.00E-01	6.80E+05	2.00E-03	1.36E+03	4.30E-01	1.30E-01	1.00E+12	4.42E+06
C11-C22 Aromatics	1.00E-09	LS	1.50E+00	3.00E-01	5.00E+03	2.00E-03	1.00E+01	4.30E-01	1.30E-01	1.00E+12	1.75E+06

TABLE 6-5 (continued)
SOIL TO OUTDOOR AIR
SURFACE SOIL (0- 2 feet)
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Whitney Barrel

	Depth below grade to bottom of trench	Depth below grade to contamination	Source Trench Separation	Diffusivity in air	Diffusivity in water	Vadose zone Effective Diffusion Coeff.	Total Overall Effective Diffusion Coeff.	Area of Trench Below Grade	Trench Ventilation Rate	Pressure Diff. between soil & enclosed space	Vadose zone soil saturated hydraulic conductivity	Conversion Factor hr to s
	L_F	L_t	L_T	D_a	D_w	D_v^{eff}	D_T^{eff}	A_B	Q_{trench}	ΔP	$K_{s,v}$	Conv02
Units:	cm	cm	cm	cm^2/s	cm^2/s	cm^2/s	cm^2/s	cm^2	cm^3/s	$g/cm\text{-}s^2$	cm/hr	s/hr
Formula:	(120 (4') for screening)	(121 for screening)	$L_t - L_F$	lookup	lookup	(Note 13)	(Note 4)	(Note 2)	(Note 22)	(40 for screening)	lookup	
Analyte												
Dichloroethylene, 1,2- (total)	1.20E+02	1.21E+02	1.00E+00	1.23E-01	9.38E-06	7.51E-04	7.51E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Naphthalene	1.20E+02	1.21E+02	1.00E+00	5.90E-02	7.50E-06	3.93E-04	3.93E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Chloromethane	1.20E+02	1.21E+02	1.00E+00	1.26E-01	6.50E-06	7.65E-04	7.65E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Vinyl Chloride	1.20E+02	1.21E+02	1.00E+00	1.06E-01	1.23E-06	6.42E-04	6.42E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Methyl bromide	1.20E+02	1.21E+02	1.00E+00	7.28E-02	1.21E-05	4.46E-04	4.46E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Ethyl Chloride	1.20E+02	1.21E+02	1.00E+00	2.71E-01	1.15E-05	1.64E-03	1.64E-03	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,1-Dichloroethene	1.20E+02	1.21E+02	1.00E+00	9.00E-02	1.04E-05	5.46E-04	5.46E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Acetone	1.20E+02	1.21E+02	1.00E+00	1.24E-01	1.14E-05	1.42E-03	1.42E-03	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Carbon disulfide	1.20E+02	1.21E+02	1.00E+00	1.04E-01	1.00E-05	6.31E-04	6.31E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Methyl acetate	1.20E+02	1.21E+02	1.00E+00	1.04E-01	1.00E-05	8.32E-04	8.32E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Methylene chloride	1.20E+02	1.21E+02	1.00E+00	1.01E-01	1.17E-05	6.24E-04	6.24E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Methyl-Tertiary-Butyl Ether	1.20E+02	1.21E+02	1.00E+00	1.02E-01	1.05E-05	6.61E-04	6.61E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,1-Dichloroethane	1.20E+02	1.21E+02	1.00E+00	7.42E-02	1.05E-05	4.54E-04	4.54E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
cis-1,2-Dichloroethene	1.20E+02	1.21E+02	1.00E+00	7.36E-02	1.13E-05	4.52E-04	4.52E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Butanone, 2- (MEK)	1.20E+02	1.21E+02	1.00E+00	8.08E-02	9.80E-06	8.89E-04	8.89E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,1,1-Trichloroethane	1.20E+02	1.21E+02	1.00E+00	7.80E-02	8.80E-06	4.74E-04	4.74E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Cyclohexane	1.20E+02	1.21E+02	1.00E+00	8.00E-02	9.00E-06	4.85E-04	4.85E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Benzene	1.20E+02	1.21E+02	1.00E+00	8.80E-02	9.80E-06	5.37E-04	5.37E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Trichloroethene	1.20E+02	1.21E+02	1.00E+00	7.90E-02	9.10E-06	4.81E-04	4.81E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Methylcyclohexane	1.20E+02	1.21E+02	1.00E+00	9.86E-02	8.52E-06	5.98E-04	5.98E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Toluene	1.20E+02	1.21E+02	1.00E+00	8.70E-02	8.60E-06	5.30E-04	5.30E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Tetrachloroethene	1.20E+02	1.21E+02	1.00E+00	7.20E-02	8.20E-06	4.37E-04	4.37E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Chlorobenzene	1.20E+02	1.21E+02	1.00E+00	7.30E-02	8.70E-06	4.48E-04	4.48E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Ethylbenzene	1.20E+02	1.21E+02	1.00E+00	7.50E-02	7.80E-06	4.57E-04	4.57E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Xylenes	1.20E+02	1.21E+02	1.00E+00	7.69E-02	8.44E-06	3.33E-03	3.33E-03	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Styrene	1.20E+02	1.21E+02	1.00E+00	7.10E-02	8.00E-06	4.37E-04	4.37E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,1,2,2-Tetrachloroethane	1.20E+02	1.21E+02	1.00E+00	7.10E-02	7.90E-06	4.83E-04	4.83E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,3-Dichlorobenzene	1.20E+02	1.21E+02	1.00E+00	4.14E-02	8.85E-06	2.55E-04	2.55E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,4-Dichlorobenzene	1.20E+02	1.21E+02	1.00E+00	6.90E-02	7.90E-06	4.26E-04	4.26E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,2-Dichlorobenzene	1.20E+02	1.21E+02	1.00E+00	6.90E-02	7.90E-06	4.28E-04	4.28E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,2,4-Trichlorobenzene	1.20E+02	1.21E+02	1.00E+00	3.00E-02	8.23E-06	1.95E-04	1.95E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Benzaldehyde	1.20E+02	1.21E+02	1.00E+00	7.30E-02	9.07E-06	1.23E-03	1.23E-03	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
2-Methylnaphthalene	1.20E+02	1.21E+02	1.00E+00	4.84E-02	7.75E-06	3.11E-04	3.11E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,1'-Biphenyl	1.20E+02	1.21E+02	1.00E+00	4.04E-02	8.15E-06	3.06E-04	3.06E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Acenaphthylene	1.20E+02	1.21E+02	1.00E+00	4.43E-02	7.44E-06	3.29E-04	3.29E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Acenaphthene	1.20E+02	1.21E+02	1.00E+00	4.21E-02	7.69E-06	3.68E-04	3.68E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Dibenzofuran	1.20E+02	1.21E+02	1.00E+00	2.67E-02	5.93E-06	1.65E-04	1.65E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Fluorene	1.20E+02	1.21E+02	1.00E+00	3.63E-02	7.88E-06	5.02E-04	5.02E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Phenanthrene	1.20E+02	1.21E+02	1.00E+00	3.30E-02	7.47E-06	3.31E-04	3.31E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Anthracene	1.20E+02	1.21E+02	1.00E+00	3.24E-02	7.74E-06	4.67E-04	4.67E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
C5-C8 Aliphatics	1.20E+02	1.21E+02	1.00E+00	8.00E-02	1.00E-05	4.85E-04	4.85E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
C9-C12 Aliphatics	1.20E+02	1.21E+02	1.00E+00	7.00E-02	1.00E-05	4.24E-04	4.24E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
C9-C10 Aromatics	1.20E+02	1.21E+02	1.00E+00	7.00E-02	1.00E-05	4.27E-04	4.27E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
C9-C18 Aliphatics	1.20E+02	1.21E+02	1.00E+00	7.00E-02	5.00E-06	4.24E-04	4.24E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
C11-C22 Aromatics	1.20E+02	1.21E+02	1.00E+00	6.00E-02	1.00E-05	3.95E-04	3.95E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03

TABLE 6-5 (continued)
SOIL TO OUTDOOR AIR
SURFACE SOIL (0- 2 feet)
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Whitney Barrel

	Viscosity of water at 10°C	Viscosity of water at system temp.	Density of water	Acceleration due to gravity	Vadose zone soil intrinsic permeability	Vadose zone residual soil water content	Vadose zone effective total fluid saturation	Vadose zone van Genuchten shape parameter	Vadose zone soil relative air permeability	Vadose zone soil effective vapor permeability	Thickness of soil between soilgas & trench
	$\mu_{w,10}$	μ_w	ρ_w	g	$k_{i,v}$	$\theta_{r,v}$	S_w	M_v	k_{rg}	k_v	L_{soil}
Units:	g/cm-s	g/cm-s	g/cm^3	cm/s^2	cm^2	cm^3/cm^3	unitless	unitless	unitless	cm^2	cm
Formula:		(Note 16)	(0.999 for screening)		(Note 17)	lookup	(Note 18)	lookup	(Note 19)	(Note 20)	(1 for screening)
Analyte											
Dichloroethylene, 1,2- (total)	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Naphthalene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Chloromethane	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Vinyl Chloride	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Methyl bromide	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Ethyl Chloride	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,1-Dichloroethene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Acetone	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Carbon disulfide	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Methyl acetate	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Methylene chloride	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Methyl-Tertiary-Butyl Ether	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,1-Dichloroethane	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
cis-1,2-Dichloroethene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Butanone, 2- (MEK)	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,1,1-Trichloroethane	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Cyclohexane	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Benzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Trichloroethene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Methylcyclohexane	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Toluene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Tetrachloroethene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Chlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Ethylbenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Xylenes	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Styrene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,1,2,2-Tetrachloroethane	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,3-Dichlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,4-Dichlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,2-Dichlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,2,4-Trichlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Benzaldehyde	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
2-Methylnaphthalene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,1'-Biphenyl	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Acenaphthylene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Acenaphthene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Dibenzofuran	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Fluorene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Phenanthrene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Anthracene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
C5-C8 Aliphatics	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
C9-C12 Aliphatics	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
C9-C10 Aromatics	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
C9-C18 Aliphatics	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
C11-C22 Aromatics	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00

TABLE 6-5 (continued)
SOIL TO OUTDOOR AIR
SURFACE SOIL (0- 2 feet)
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Whitney Barrel

	Vapor viscosity at avg. soil temp.	Avg. Vapor Flow Rate Into trench	Infinite Source Attenuation Coeff.	Infinite Source Trench Conc.
	μ_{TS}	Q_{soil}	α	C_{trench}
Units:	g/cm-s	cm^3/s	unitless	$\mu g/m^3$
Formula:	0.00018*(T$_s$/298.15)^0.5	(Note 5)	(Note 6)	C_{source} * α
Analyte				
Dichloroethylene, 1,2- (total)	1.75E-04	1.44E-03	8.50E-09	ND
Naphthalene	1.75E-04	1.44E-03	8.50E-09	5.47E-05
Chloromethane	1.75E-04	1.44E-03	8.50E-09	5.47E-03
Vinyl Chloride	1.75E-04	1.44E-03	8.50E-09	8.20E-03
Methyl bromide	1.75E-04	1.44E-03	8.50E-09	ND
Ethyl Chloride	1.75E-04	1.44E-03	8.50E-09	1.35E-04
1,1-Dichloroethene	1.75E-04	1.44E-03	8.50E-09	3.68E-05
Acetone	1.75E-04	1.44E-03	8.50E-09	8.46E-06
Carbon disulfide	1.75E-04	1.44E-03	8.50E-09	1.26E-03
Methyl acetate	1.75E-04	1.44E-03	8.50E-09	4.99E-05
Methylene chloride	1.75E-04	1.44E-03	8.50E-09	ND
Methyl-Tertiary-Butyl Ether	1.75E-04	1.44E-03	8.50E-09	2.85E-04
1,1-Dichloroethane	1.75E-04	1.44E-03	8.50E-09	1.95E-05
cis-1,2-Dichloroethene	1.75E-04	1.44E-03	8.50E-09	1.30E-05
Butanone, 2- (MEK)	1.75E-04	1.44E-03	8.50E-09	2.86E-06
1,1,1-Trichloroethane	1.75E-04	1.44E-03	8.50E-09	ND
Cyclohexane	1.75E-04	1.44E-03	8.50E-09	2.38E-04
Benzene	1.75E-04	1.44E-03	8.50E-09	7.08E-04
Trichloroethene	1.75E-04	1.44E-03	8.50E-09	9.25E-06
Methylcyclohexane	1.75E-04	1.44E-03	8.50E-09	1.14E-02
Toluene	1.75E-04	1.44E-03	8.50E-09	1.40E-03
Tetrachloroethene	1.75E-04	1.44E-03	8.50E-09	1.26E-05
Chlorobenzene	1.75E-04	1.44E-03	8.50E-09	9.58E-05
Ethylbenzene	1.75E-04	1.44E-03	8.50E-09	8.59E-04
Xylenes	1.75E-04	1.44E-03	8.50E-09	2.60E-06
Styrene	1.75E-04	1.44E-03	8.50E-09	ND
1,1,2,2-Tetrachloroethane	1.75E-04	1.44E-03	8.50E-09	2.27E-07
1,3-Dichlorobenzene	1.75E-04	1.44E-03	8.50E-09	1.33E-05
1,4-Dichlorobenzene	1.75E-04	1.44E-03	8.50E-09	2.28E-06
1,2-Dichlorobenzene	1.75E-04	1.44E-03	8.50E-09	1.40E-06
1,2,4-Trichlorobenzene	1.75E-04	1.44E-03	8.50E-09	4.83E-07
Benzaldehyde	1.75E-04	1.44E-03	8.50E-09	1.59E-05
2-Methylnaphthalene	1.75E-04	1.44E-03	8.50E-09	2.58E-05
1,1'-Biphenyl	1.75E-04	1.44E-03	8.50E-09	5.41E-06
Acenaphthylene	1.75E-04	1.44E-03	8.50E-09	4.19E-06
Acenaphthene	1.75E-04	1.44E-03	8.50E-09	3.12E-05
Dibenzofuran	1.75E-04	1.44E-03	8.50E-09	4.08E-04
Fluorene	1.75E-04	1.44E-03	8.50E-09	8.21E-06
Phenanthrene	1.75E-04	1.44E-03	8.50E-09	1.14E-04
Anthracene	1.75E-04	1.44E-03	8.50E-09	7.64E-06
C5-C8 Aliphatics	1.75E-04	1.44E-03	8.50E-09	4.46E-01
C9-C12 Aliphatics	1.75E-04	1.44E-03	8.50E-09	2.24E-02
C9-C10 Aromatics	1.75E-04	1.44E-03	8.50E-09	3.83E-03
C9-C18 Aliphatics	1.75E-04	1.44E-03	8.50E-09	3.75E-02
C11-C22 Aromatics	1.75E-04	1.44E-03	8.50E-09	1.49E-02

TABLE 6-5 (continued)
SOIL TO OUTDOOR AIR
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Whitney Barrel

Notes:

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

(1) Assumed equivalent to D_i^{eff} of soil layer i in contact with the floor

(2) For screening, assume a trench 4 ft deep, 3 ft wide, and 30 ft long.

(3) Depth to water table minus depth to bottom of floor must be > thickness of capillary fringe, which is based on the soil type (typ. around 30 cm). Use 400 cm for screening purposes.

(4) $D_T^{eff} = L_T / (L_T / D_v^{eff})$

(5) $Q_{soil} = (2*\pi*\Delta P*k_v*X_{crack}) / (\mu_{TS}*\ln(2*Z_{crack}/r_{crack}))$

(6) $\alpha = [(D_T^{eff}*A_B/(Q_{building}*L_T))*EXP(Q_{soil}*L_{crack}/(D^{crack}*A_{crack}))]/[EXP(Q_{soil}*L_{crack}/(D^{crack}*A_{crack}))+(D_T^{eff}*A_B/(Q_{building}*L_T))+(D_T^{eff}*A_B/(Q_{soil}*L_T))*(EXP(Q_{soil}*L_{crack}/(D^{crack}*A_{crack}))-1)]$

(7) A function of the ratio T_B/T_C:

T_B/T_C	η
<0.57	0.30
0.57-0.71	$0.74(T_B/T_C)-0.116$
>0.71	0.41

(8) $\Delta H_{vTS} = \Delta H_{vB}*[(1-T_S/T_C)/(1-T_B/T_C)]^{\eta}$

(9) $H_{TS} = EXP[-\Delta H_{vTS}/R_u*(1/T_S-1/T_R)]*H_R$

(10) Refer to 12 SCS soil types - use SC for screening.

(11) Refer to 12 SCS soil types - use SCL for screening.

(12) $L_{cz} = 0.15 / (0.2 * D_{cz})$

(13) $D_v^{eff} = D_a*(\theta_{av}^{3.33}/n_v^2)+(D_w/H'_{TS})(\theta_{wv}^{3.33}/n_v^2)$

(14) $D_{cz}^{eff} = D_a*(\theta_{acz}^{3.33}/n_{cz}^2)+(D_w/H'_{TS})(\theta_{wcz}^{3.33}/n_{cz}^2)$

(15) $\theta_{wcz} = \theta_{r,cz}+(\theta_{s,cz}-\theta_{r,cz})/(2^{bhcz})$, where the value 2 in the formula is used for screening, but may be refined based on soil parameters (see USEPA, 1999).

(16) $\mu_w = \mu_{w,10} * (T_S / 283.15)^{0.5}$

(17) $k_{i,v} = K_{v,v} * 1/Conv02 * \mu_w / (\rho_w * g)$

(18) $S_w = (\theta_{w,v} - \theta_{r,v}) / (n_v - \theta_{r,v})$

(19) $k_{rg} = (1 - S_w)^{0.5} * (1-S_w^{1/bhv})^{2bhv}$

(20) $k_v = k_{i,v} * k_{rg}$; note that the model is very sensitive to this parameter and if site-specific values are available, they should be used.

(21) $C_{source} = H'_{TS} * C_B * Conv01 * \rho_b / (\theta_{w,v} + K_d * \rho_b + H'_{TS} * \theta_{a,v}) * Conv02$

(22) For screening, assume a trench 4 ft deep, 3 ft wide, 30 ft long and an air exchange rate of 60/hr. The air exchange rate is based on the assumption that the wind speed in the trench is a small fraction of the ground wind speed and that it could take up to 1 minute for a contaminant to be cleared from the trench air space.

TABLE 6-5
SOIL TO OUTDOOR AIR
SURFACE SOIL (0-2 feet)
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Murphy Waste Oil

	Soil EPC	Soil Temp.	Soil Temp.	Henry's Law Constant at ref. temp.	Henry's Law Reference Temp.	Normal Boiling Point	Enthalpy of vaporization at T_S	Critical Temp.	constant	Enthalpy of vaporization at T_S	Gas Constant	Henry's Law Constant at T_S	Gas Constant	Henry's Law Constant
	CR	T_S	T_S	H_R	T_R	T_B	ΔH_{vB}	T_C	n	ΔH_{vTS}	R_c	H_{TS}	R	H'_{TS}
Units:	µg/kg	°C	K	atm-m³/mol	K	K	cal/mol	K	unitless	cal/mol	cal/mol-K	atm-m³/mol	m³-atm/mol-K	unitless
Formula:	Input	(10 for screening)	(T_S + 273.15)	lookup	(lookup+273.15)	lookup	lookup	lookup	(Note 7)	(Note 8)		(Note 9)		H_{TS} / (R * T_S)
Analyte														
Dichloroethylene, 1,2- (total)	4.90E+00	1.00E+01	2.83E+02	4.07E-03	2.98E+02	3.28E+02	1.32E+03	4.92E+02	3.77E-01	1.45E+03	1.99E+00	4.07E-03	8.21E-05	1.75E-01
Naphthalene	4.00E+02	1.00E+01	2.83E+02	4.83E-04	2.98E+02	4.91E+02	1.04E+04	7.48E+02	3.70E-01	1.29E+04	1.99E+00	4.83E-04	8.21E-05	2.08E-02
Chloromethane	ND	1.00E+01	2.83E+02	8.67E-03	2.98E+02	2.49E+02	1.35E+03	3.74E+02	3.77E-01	1.20E+03	1.99E+00	8.67E-03	8.21E-05	3.73E-01
Vinyl Chloride	ND	1.00E+01	2.83E+02	2.71E-02	2.98E+02	2.59E+02	5.25E+03	4.32E+02	3.28E-01	5.00E+03	1.99E+00	2.71E-02	8.21E-05	1.17E+00
Methyl bromide	ND	1.00E+01	2.83E+02	6.24E-03	2.98E+02	2.77E+02	5.71E+03	4.67E+02	3.22E-01	5.65E+03	1.99E+00	6.24E-03	8.21E-05	2.69E-01
Ethyl Chloride	ND	1.00E+01	2.83E+02	1.09E-02	2.98E+02	2.85E+02	1.36E+03	4.28E+02	3.77E-01	1.37E+03	1.99E+00	1.09E-02	8.21E-05	4.69E-01
1,1-Dichloroethene	1.60E+00	1.00E+01	2.83E+02	2.61E-02	2.98E+02	3.05E+02	6.25E+03	5.76E+02	3.00E-01	6.39E+03	1.99E+00	2.61E-02	8.21E-05	1.12E+00
Acetone	ND	1.00E+01	2.83E+02	3.88E-05	2.98E+02	3.29E+02	6.96E+03	5.08E+02	3.63E-01	7.56E+03	1.99E+00	3.88E-05	8.21E-05	1.67E-03
Carbon disulfide	ND	1.00E+01	2.83E+02	3.02E-02	2.98E+02	3.19E+02	6.39E+03	5.52E+02	3.12E-01	6.68E+03	1.99E+00	3.02E-02	8.21E-05	1.30E+00
Methyl acetate	ND	1.00E+01	2.83E+02	1.13E-04	2.98E+02	3.65E+02	1.31E+03	5.48E+02	3.77E-01	1.50E+03	1.99E+00	1.13E-04	8.21E-05	4.86E-03
Methylene chloride	1.80E+01	1.00E+01	2.83E+02	2.19E-03	2.98E+02	3.13E+02	6.71E+03	5.10E+02	3.38E-01	7.03E+03	1.99E+00	2.19E-03	8.21E-05	9.43E-02
Methyl-Tertiary-Butyl Ether	ND	1.00E+01	2.83E+02	5.87E-04	2.98E+02	3.28E+02	1.32E+03	4.97E+02	3.73E-01	1.45E+03	1.99E+00	5.87E-04	8.21E-05	2.53E-02
1,1-Dichloroethane	4.60E+01	1.00E+01	2.83E+02	5.61E-03	2.98E+02	3.31E+02	6.90E+03	5.23E+02	3.52E-01	7.45E+03	1.99E+00	5.61E-03	8.21E-05	2.41E-01
cis-1,2-Dichloroethene	2.10E+02	1.00E+01	2.83E+02	4.07E-03	2.98E+02	3.34E+02	7.19E+03	5.44E+02	3.38E-01	7.73E+03	1.99E+00	4.07E-03	8.21E-05	1.75E-01
Butanone, 2- (MEK)	ND	1.00E+01	2.83E+02	5.60E-05	2.98E+02	3.53E+02	1.31E+03	5.29E+02	3.77E-01	1.49E+03	1.99E+00	5.60E-05	8.21E-05	2.41E-03
1,1,1-Trichloroethane	3.20E+01	1.00E+01	2.83E+02	1.72E-02	2.98E+02	3.47E+02	7.14E+03	5.45E+02	3.55E-01	7.88E+03	1.99E+00	1.72E-02	8.21E-05	7.40E-01
Cyclohexane	ND	1.00E+01	2.83E+02	2.00E+00	2.98E+02	3.54E+02	1.31E+03	5.31E+02	3.77E-01	1.49E+03	1.99E+00	2.00E+00	8.21E-05	8.61E+01
Benzene	5.00E-01	1.00E+01	2.83E+02	5.55E-03	2.98E+02	3.53E+02	7.34E+03	5.62E+02	3.49E-01	8.12E+03	1.99E+00	5.55E-03	8.21E-05	2.39E-01
Trichloroethene	1.30E+03	1.00E+01	2.83E+02	1.03E-02	2.98E+02	3.60E+02	7.51E+03	5.44E+02	3.74E-01	8.56E+03	1.99E+00	1.03E-02	8.21E-05	4.43E-01
Methylcyclohexane	ND	1.00E+01	2.83E+02	4.23E-01	2.98E+02	3.74E+02	1.30E+03	5.61E+02	3.77E-01	1.51E+03	1.99E+00	4.23E-01	8.21E-05	1.82E+01
Toluene	7.70E+00	1.00E+01	2.83E+02	6.64E-03	2.98E+02	3.84E+02	7.93E+03	5.92E+02	3.64E-01	9.15E+03	1.99E+00	6.64E-03	8.21E-05	2.86E-01
Tetrachloroethene	2.40E+02	1.00E+01	2.83E+02	1.84E-02	2.98E+02	3.94E+02	8.29E+03	6.20E+02	3.55E-01	9.55E+03	1.99E+00	1.84E-02	8.21E-05	7.92E-01
Chlorobenzene	ND	1.00E+01	2.83E+02	3.71E-03	2.98E+02	4.05E+02	8.41E+03	6.32E+02	3.58E-01	9.80E+03	1.99E+00	3.71E-03	8.21E-05	1.60E-01
Ethylbenzene	3.70E+00	1.00E+01	2.83E+02	7.88E-03	2.98E+02	4.09E+02	8.50E+03	6.17E+02	3.75E-01	1.02E+04	1.99E+00	7.88E-03	8.21E-05	3.39E-01
Xylenes	1.95E+01	1.00E+01	2.83E+02	6.73E-06	2.98E+02	4.17E+02	1.26E+03	6.16E+02	3.85E-01	1.54E+03	1.99E+00	6.73E-06	8.21E-05	2.90E-04
Styrene	ND	1.00E+01	2.83E+02	2.76E-03	2.98E+02	4.18E+02	8.74E+03	6.36E+02	3.71E-01	1.05E+04	1.99E+00	2.76E-03	8.21E-05	1.19E-01
1,1,2,2-Tetrachloroethane	ND	1.00E+01	2.83E+02	3.44E-04	2.98E+02	4.20E+02	9.00E+03	6.61E+02	3.54E-01	1.05E+04	1.99E+00	3.44E-04	8.21E-05	1.48E-02
1,3-Dichlorobenzene	ND	1.00E+01	2.83E+02	4.70E-03	2.98E+02	4.46E+02	1.24E+03	6.84E+02	3.67E-01	1.50E+03	1.99E+00	4.70E-03	8.21E-05	2.02E-01
1,4-Dichlorobenzene	ND	1.00E+01	2.83E+02	2.43E-03	2.98E+02	4.47E+02	9.27E+03	6.85E+02	3.67E-01	1.12E+04	1.99E+00	2.43E-03	8.21E-05	1.05E-01
1,2-Dichlorobenzene	ND	1.00E+01	2.83E+02	1.90E-03	2.98E+02	4.54E+02	9.70E+03	7.05E+02	3.60E-01	1.17E+04	1.99E+00	1.90E-03	8.21E-05	8.18E-02
1,2,4-Trichlorobenzene	ND	1.00E+01	2.83E+02	1.42E-03	2.98E+02	4.86E+02	1.05E+04	7.25E+02	3.30E-01	1.32E+04	1.99E+00	1.42E-03	8.21E-05	6.11E-02
Benzaldehyde	ND	1.00E+01	2.83E+02	2.62E-05	2.98E+02	4.52E+02	0.00E+00	6.78E+02	3.77E-01	0.00E+00	1.99E+00	2.62E-05	8.21E-05	1.13E-03
2-Methylnaphthalene	6.90E+01	1.00E+01	2.83E+02	1.01E-03	2.98E+02	5.14E+02	1.17E+03	7.61E+02	3.84E-01	1.51E+03	1.99E+00	1.01E-03	8.21E-05	4.36E-02
1,1'-Biphenyl	ND	1.00E+01	2.83E+02	3.03E-04	2.98E+02	5.29E+02	1.15E+03	7.94E+02	3.77E-01	1.47E+03	1.99E+00	3.03E-04	8.21E-05	1.30E-02
Acenaphthylene	4.10E+03	1.00E+01	2.83E+02	2.80E-04	2.98E+02	5.53E+02	1.12E+03	7.92E+02	4.01E-01	1.51E+03	1.99E+00	2.80E-04	8.21E-05	1.21E-02
Acenaphthene	4.20E+03	1.00E+01	2.83E+02	1.55E-04	2.98E+02	5.51E+02	1.22E+04	8.03E+02	3.91E-01	1.61E+04	1.99E+00	1.55E-04	8.21E-05	6.67E-03
Dibenzofuran	3.50E+01	1.00E+01	2.83E+02	4.00E-03	2.98E+02	5.59E+02	1.11E+03	8.24E+02	3.86E-01	1.47E+03	1.99E+00	4.00E-03	8.21E-05	1.72E-01
Fluorene	7.30E+02	1.00E+01	2.83E+02	6.37E-05	2.98E+02	5.70E+02	1.27E+04	8.70E+02	3.69E-01	1.62E+04	1.99E+00	6.37E-05	8.21E-05	2.74E-03
Phenanthrene	5.60E+03	1.00E+01	2.83E+02	1.30E-04	2.98E+02	6.13E+02	1.06E+03	8.69E+02	4.06E-01	1.48E+03	1.99E+00	1.30E-04	8.21E-05	5.59E-03
Anthracene	1.60E+03	1.00E+01	2.83E+02	6.51E-05	2.98E+02	6.15E+02	1.31E+04	8.73E+02	4.05E-01	1.84E+04	1.99E+00	6.51E-05	8.21E-05	2.80E-03
C5-C8 Aliphatics	1.00E+03	1.00E+01	2.83E+02	1.30E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.30E+00	8.21E-05	5.58E+01
C9-C12 Aliphatics	1.00E+03	1.00E+01	2.83E+02	1.56E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.56E+00	8.21E-05	6.71E+01
C9-C10 Aromatics	ND	1.00E+01	2.83E+02	7.92E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	7.92E-03	8.21E-05	3.41E-01
C9-C18 Aliphatics	ND	1.00E+01	2.83E+02	1.65E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.65E+00	8.21E-05	7.10E+01
C11-C22 Aromatics	4.70E+06	1.00E+01	2.83E+02	7.17E-04	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	7.17E-04	8.21E-05	3.09E-02

TABLE 6-5 (continued)
SOIL TO OUTDOOR AIR
SURFACE SOIL (0-2 feet)
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Murphy Waste Oil

	Conversion Factor µg/kg to g/g	SCS soil type in vadose zone	Vadose zone soil dry bulk density	Vadose zone soil water-filled porosity	Organic carbon partition coefficient	Vadose zone organic carbon fraction	Soil-water partition coefficient	Vadose zone soil total porosity	Vadose zone soil air-filled porosity	Conversion Factor g/cm³ to µg/m³	Source Vapor Conc.
	Conv01	ST_v	ρ_b	$\theta_{w,v}$	K_{oc}	$f_{oc,v}$	K_d	n_v	$\theta_{a,v}$	Conv03	C_{source}
Units:	µg/kg / g/g	unitless	g/cm³	cm³/cm³	cm³/g	unitless	cm³/g	cm³/cm³	cm³/cm³	g/cm³ / µg/m³	µg/m³
Formula:		(Note 11)	(1.5 for screening)	(0.3 for screening)	lookup	(0.002 for screening)	$K_{oc} * f_{oc}$	(0.43 for screening)	$n_v - \theta_{w,v}$		(Note 21)
Analyte											
Dichloroethylene, 1,2- (total)	1.00E-09	LS	1.50E+00	3.00E-01	4.38E+01	2.00E-03	8.76E-02	4.30E-01	1.30E-01	1.00E+12	2.84E+03
Naphthalene	1.00E-09	LS	1.50E+00	3.00E-01	2.00E+03	2.00E-03	4.00E+00	4.30E-01	1.30E-01	1.00E+12	1.98E+03
Chloromethane	1.00E-09	LS	1.50E+00	3.00E-01	1.43E+01	2.00E-03	2.86E-02	4.30E-01	1.30E-01	1.00E+12	ND
Vinyl Chloride	1.00E-09	LS	1.50E+00	3.00E-01	1.86E+01	2.00E-03	3.72E-02	4.30E-01	1.30E-01	1.00E+12	ND
Methyl bromide	1.00E-09	LS	1.50E+00	3.00E-01	1.05E+01	2.00E-03	2.10E-02	4.30E-01	1.30E-01	1.00E+12	ND
Ethyl Chloride	1.00E-09	LS	1.50E+00	3.00E-01	2.73E+01	2.00E-03	5.46E-02	4.30E-01	1.30E-01	1.00E+12	ND
1,1-Dichloroethene	1.00E-09	LS	1.50E+00	3.00E-01	5.89E+01	2.00E-03	1.18E-01	4.30E-01	1.30E-01	1.00E+12	4.33E+03
Acetone	1.00E-09	LS	1.50E+00	3.00E-01	5.75E-01	2.00E-03	1.15E-03	4.30E-01	1.30E-01	1.00E+12	ND
Carbon disulfide	1.00E-09	LS	1.50E+00	3.00E-01	4.57E+01	2.00E-03	9.14E-02	4.30E-01	1.30E-01	1.00E+12	ND
Methyl acetate	1.00E-09	LS	1.50E+00	3.00E-01	3.32E+00	2.00E-03	6.64E-03	4.30E-01	1.30E-01	1.00E+12	ND
Methylene chloride	1.00E-09	LS	1.50E+00	3.00E-01	1.17E+01	2.00E-03	2.34E-02	4.30E-01	1.30E-01	1.00E+12	7.33E+03
Methyl-Tertiary-Butyl Ether	1.00E-09	LS	1.50E+00	3.00E-01	3.84E+01	2.00E-03	7.68E-02	4.30E-01	1.30E-01	1.00E+12	ND
1,1-Dichloroethane	1.00E-09	LS	1.50E+00	3.00E-01	3.16E+01	2.00E-03	6.32E-02	4.30E-01	1.30E-01	1.00E+12	3.91E+04
cis-1,2-Dichloroethene	1.00E-09	LS	1.50E+00	3.00E-01	3.55E+01	2.00E-03	7.10E-02	4.30E-01	1.30E-01	1.00E+12	1.29E+05
Butanone, 2- (MEK)	1.00E-09	LS	1.50E+00	3.00E-01	3.83E+00	2.00E-03	7.66E-03	4.30E-01	1.30E-01	1.00E+12	ND
1,1,1-Trichloroethane	1.00E-09	LS	1.50E+00	3.00E-01	1.10E+02	2.00E-03	2.20E-01	4.30E-01	1.30E-01	1.00E+12	4.89E+04
Cyclohexane	1.00E-09	LS	1.50E+00	3.00E-01	1.60E+02	2.00E-03	3.20E-01	4.30E-01	1.30E-01	1.00E+12	ND
Benzene	1.00E-09	LS	1.50E+00	3.00E-01	6.17E+01	2.00E-03	1.23E-01	4.30E-01	1.30E-01	1.00E+12	3.47E+02
Trichloroethene	1.00E-09	LS	1.50E+00	3.00E-01	1.66E+02	2.00E-03	3.32E-01	4.30E-01	1.30E-01	1.00E+12	1.01E+06
Methylcyclohexane	1.00E-09	LS	1.50E+00	3.00E-01	2.68E+02	2.00E-03	5.36E-01	4.30E-01	1.30E-01	1.00E+12	ND
Toluene	1.00E-09	LS	1.50E+00	3.00E-01	1.40E+02	2.00E-03	2.80E-01	4.30E-01	1.30E-01	1.00E+12	4.36E+03
Tetrachloroethene	1.00E-09	LS	1.50E+00	3.00E-01	2.65E+02	2.00E-03	5.30E-01	4.30E-01	1.30E-01	1.00E+12	2.38E+05
Chlorobenzene	1.00E-09	LS	1.50E+00	3.00E-01	2.19E+02	2.00E-03	4.38E-01	4.30E-01	1.30E-01	1.00E+12	ND
Ethylbenzene	1.00E-09	LS	1.50E+00	3.00E-01	2.04E+02	2.00E-03	4.08E-01	4.30E-01	1.30E-01	1.00E+12	1.97E+03
Xylenes	1.00E-09	LS	1.50E+00	3.00E-01	2.41E+02	2.00E-03	4.82E-01	4.30E-01	1.30E-01	1.00E+12	8.28E+00
Styrene	1.00E-09	LS	1.50E+00	3.00E-01	7.76E+02	2.00E-03	1.55E+00	4.30E-01	1.30E-01	1.00E+12	ND
1,1,2,2-Tetrachloroethane	1.00E-09	LS	1.50E+00	3.00E-01	9.33E+01	2.00E-03	1.87E-01	4.30E-01	1.30E-01	1.00E+12	ND
1,3-Dichlorobenzene	1.00E-09	LS	1.50E+00	3.00E-01	1.70E+02	2.00E-03	3.40E-01	4.30E-01	1.30E-01	1.00E+12	ND
1,4-Dichlorobenzene	1.00E-09	LS	1.50E+00	3.00E-01	6.17E+02	2.00E-03	1.23E+00	4.30E-01	1.30E-01	1.00E+12	ND
1,2-Dichlorobenzene	1.00E-09	LS	1.50E+00	3.00E-01	6.17E+02	2.00E-03	1.23E+00	4.30E-01	1.30E-01	1.00E+12	ND
1,2,4-Trichlorobenzene	1.00E-09	LS	1.50E+00	3.00E-01	1.78E+03	2.00E-03	3.56E+00	4.30E-01	1.30E-01	1.00E+12	ND
Benzaldehyde	1.00E-09	LS	1.50E+00	3.00E-01	3.27E+01	2.00E-03	6.54E-02	4.30E-01	1.30E-01	1.00E+12	ND
2-Methylnaphthalene	1.00E-09	LS	1.50E+00	3.00E-01	8.51E+03	2.00E-03	1.70E+01	4.30E-01	1.30E-01	1.00E+12	1.75E+02
1,1'-Biphenyl	1.00E-09	LS	1.50E+00	3.00E-01	6.25E+03	2.00E-03	1.25E+01	4.30E-01	1.30E-01	1.00E+12	ND
Acenaphthylene	1.00E-09	LS	1.50E+00	3.00E-01	4.79E+03	2.00E-03	9.57E+00	4.30E-01	1.30E-01	1.00E+12	5.06E+03
Acenaphthene	1.00E-09	LS	1.50E+00	3.00E-01	7.08E+03	2.00E-03	1.42E+01	4.30E-01	1.30E-01	1.00E+12	1.95E+03
Dibenzofuran	1.00E-09	LS	1.50E+00	3.00E-01	8.13E+03	2.00E-03	1.63E+01	4.30E-01	1.30E-01	1.00E+12	3.66E+02
Fluorene	1.00E-09	LS	1.50E+00	3.00E-01	1.38E+04	2.00E-03	2.76E+01	4.30E-01	1.30E-01	1.00E+12	7.20E+01
Phenanthrene	1.00E-09	LS	1.50E+00	3.00E-01	1.41E+04	2.00E-03	2.83E+01	4.30E-01	1.30E-01	1.00E+12	1.10E+03
Anthracene	1.00E-09	LS	1.50E+00	3.00E-01	2.95E+04	2.00E-03	5.90E+01	4.30E-01	1.30E-01	1.00E+12	7.57E+01
C5-C8 Aliphatics	1.00E-09	LS	1.50E+00	3.00E-01	2.27E+03	2.00E-03	4.53E+00	4.30E-01	1.30E-01	1.00E+12	5.83E+06
C9-C12 Aliphatics	1.00E-09	LS	1.50E+00	3.00E-01	1.50E+05	2.00E-03	3.00E+02	4.30E-01	1.30E-01	1.00E+12	2.19E+05
C9-C10 Aromatics	1.00E-09	LS	1.50E+00	3.00E-01	1.78E+03	2.00E-03	3.56E+00	4.30E-01	1.30E-01	1.00E+12	ND
C9-C18 Aliphatics	1.00E-09	LS	1.50E+00	3.00E-01	6.80E+05	2.00E-03	1.36E+03	4.30E-01	1.30E-01	1.00E+12	ND
C11-C22 Aromatics	1.00E-09	LS	1.50E+00	3.00E-01	5.00E+03	2.00E-03	1.00E+01	4.30E-01	1.30E-01	1.00E+12	1.42E+07

TABLE 6-5 (continued)
SOIL TO OUTDOOR AIR
SURFACE SOIL (0-2 feet)
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Murphy Waste Oil

	Depth below grade to bottom of trench	Depth below grade to contamination	Source Trench Separation	Diffusivity in air	Diffusivity in water	Vadose zone Effective Diffusion Coeff.	Total Overall Effective Diffusion Coeff.	Area of Trench Below Grade	Trench Ventilation Rate	Pressure Diff. between soil & enclosed space	Vadose zone soil saturated hydraulic conductivity	Conversion Factor hr to s
	L_F	L_c	L_T	D_a	D_w	D_v^{eff}	D_T^{eff}	A_B	Q_{trench}	ΔP	$K_{s,v}$	Conv02
Units:	cm	cm	cm	cm^2/s	cm^2/s	cm^2/s	cm^2/s	cm^2	cm^3/s	$g/cm\text{-}s^2$	cm/hr	s/hr
Formula:	(120 (4') for screening)	(121 for screening)	$L_c - L_F$	lookup	lookup	(Note 13)	(Note 4)	(Note 2)	(Note 22)	(40 for screening)	lookup	
Analyte												
Dichloroethylene, 1,2- (total)	1.20E+02	1.21E+02	1.00E+00	1.23E-01	9.38E-06	7.51E-04	7.51E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Naphthalene	1.20E+02	1.21E+02	1.00E+00	5.90E-02	7.50E-06	3.93E-04	3.93E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Chloromethane	1.20E+02	1.21E+02	1.00E+00	1.26E-01	6.50E-06	7.65E-04	7.65E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Vinyl Chloride	1.20E+02	1.21E+02	1.00E+00	1.06E-01	1.23E-06	6.42E-04	6.42E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Methyl bromide	1.20E+02	1.21E+02	1.00E+00	7.28E-02	1.21E-05	4.46E-04	4.46E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Ethyl Chloride	1.20E+02	1.21E+02	1.00E+00	2.71E-01	1.15E-05	1.64E-03	1.64E-03	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,1-Dichloroethene	1.20E+02	1.21E+02	1.00E+00	9.00E-02	1.04E-05	5.46E-04	5.46E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Acetone	1.20E+02	1.21E+02	1.00E+00	1.24E-01	1.14E-05	1.42E-03	1.42E-03	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Carbon disulfide	1.20E+02	1.21E+02	1.00E+00	1.04E-01	1.00E-05	6.31E-04	6.31E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Methyl acetate	1.20E+02	1.21E+02	1.00E+00	1.04E-01	1.00E-05	8.32E-04	8.32E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Methylene chloride	1.20E+02	1.21E+02	1.00E+00	1.01E-01	1.17E-05	6.24E-04	6.24E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Methyl-Tertiary-Butyl Ether	1.20E+02	1.21E+02	1.00E+00	1.02E-01	1.05E-05	6.61E-04	6.61E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,1-Dichloroethane	1.20E+02	1.21E+02	1.00E+00	7.42E-02	1.05E-05	4.54E-04	4.54E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
cis-1,2-Dichloroethene	1.20E+02	1.21E+02	1.00E+00	7.36E-02	1.13E-05	4.52E-04	4.52E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Butanone, 2- (MEK)	1.20E+02	1.21E+02	1.00E+00	8.08E-02	9.80E-06	8.89E-04	8.89E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,1,1-Trichloroethane	1.20E+02	1.21E+02	1.00E+00	7.80E-02	8.80E-06	4.74E-04	4.74E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Cyclohexane	1.20E+02	1.21E+02	1.00E+00	8.00E-02	9.00E-06	4.85E-04	4.85E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Benzene	1.20E+02	1.21E+02	1.00E+00	8.80E-02	9.80E-06	5.37E-04	5.37E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Trichloroethene	1.20E+02	1.21E+02	1.00E+00	7.90E-02	9.10E-06	4.81E-04	4.81E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Methylcyclohexane	1.20E+02	1.21E+02	1.00E+00	9.86E-02	8.52E-06	5.98E-04	5.98E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Toluene	1.20E+02	1.21E+02	1.00E+00	8.70E-02	8.60E-06	5.30E-04	5.30E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Tetrachloroethene	1.20E+02	1.21E+02	1.00E+00	7.20E-02	8.20E-06	4.37E-04	4.37E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Chlorobenzene	1.20E+02	1.21E+02	1.00E+00	7.30E-02	8.70E-06	4.48E-04	4.48E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Ethylbenzene	1.20E+02	1.21E+02	1.00E+00	7.50E-02	7.80E-06	4.57E-04	4.57E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Xylenes	1.20E+02	1.21E+02	1.00E+00	7.69E-02	8.44E-06	3.33E-03	3.33E-03	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Styrene	1.20E+02	1.21E+02	1.00E+00	7.10E-02	8.00E-06	4.37E-04	4.37E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,1,2,2-Tetrachloroethane	1.20E+02	1.21E+02	1.00E+00	7.10E-02	7.90E-06	4.83E-04	4.83E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,3-Dichlorobenzene	1.20E+02	1.21E+02	1.00E+00	4.14E-02	8.85E-06	2.55E-04	2.55E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,4-Dichlorobenzene	1.20E+02	1.21E+02	1.00E+00	6.90E-02	7.90E-06	4.26E-04	4.26E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,2-Dichlorobenzene	1.20E+02	1.21E+02	1.00E+00	6.90E-02	7.90E-06	4.28E-04	4.28E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,2,4-Trichlorobenzene	1.20E+02	1.21E+02	1.00E+00	3.00E-02	8.23E-06	1.95E-04	1.95E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Benzaldehyde	1.20E+02	1.21E+02	1.00E+00	7.30E-02	9.07E-06	1.23E-03	1.23E-03	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
2-Methylnaphthalene	1.20E+02	1.21E+02	1.00E+00	4.84E-02	7.75E-06	3.11E-04	3.11E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,1'-Biphenyl	1.20E+02	1.21E+02	1.00E+00	4.04E-02	8.15E-06	3.06E-04	3.06E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Acenaphthylene	1.20E+02	1.21E+02	1.00E+00	4.43E-02	7.44E-06	3.29E-04	3.29E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Acenaphthene	1.20E+02	1.21E+02	1.00E+00	4.21E-02	7.69E-06	3.68E-04	3.68E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Dibenzofuran	1.20E+02	1.21E+02	1.00E+00	2.67E-02	5.93E-06	1.65E-04	1.65E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Fluorene	1.20E+02	1.21E+02	1.00E+00	3.63E-02	7.88E-06	5.02E-04	5.02E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Phenanthrene	1.20E+02	1.21E+02	1.00E+00	3.30E-02	7.47E-06	3.31E-04	3.31E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Anthracene	1.20E+02	1.21E+02	1.00E+00	3.24E-02	7.74E-06	4.67E-04	4.67E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
C5-C8 Aliphatics	1.20E+02	1.21E+02	1.00E+00	8.00E-02	1.00E-05	4.85E-04	4.85E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
C9-C12 Aliphatics	1.20E+02	1.21E+02	1.00E+00	7.00E-02	1.00E-05	4.24E-04	4.24E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
C9-C10 Aromatics	1.20E+02	1.21E+02	1.00E+00	7.00E-02	1.00E-05	4.27E-04	4.27E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
C9-C18 Aliphatics	1.20E+02	1.21E+02	1.00E+00	7.00E-02	5.00E-06	4.24E-04	4.24E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
C11-C22 Aromatics	1.20E+02	1.21E+02	1.00E+00	6.00E-02	1.00E-05	3.95E-04	3.95E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03

TABLE 6-5 (continued)
SOIL TO OUTDOOR AIR
SURFACE SOIL (0-2 feet)
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Murphy Waste Oil

	Viscosity of water at 10°C	Viscosity of water at system temp.	Density of water	Acceleration due to gravity	Vadose zone soil intrinsic permeability	Vadose zone residual soil water content	Vadose zone effective total fluid saturation	Vadose zone van Genuchten shape parameter	Vadose zone soil relative air permeability	Vadose zone soil effective vapor permeability	Thickness of soil between soilgas & trench
	μ_{w-10}	μ_w	ρ_w	g	$k_{i,v}$	$\theta_{r,v}$	S_{te}	M_v	k_{rg}	k_v	L_{soil}
Units:	g/cm-s	g/cm-s	g/cm³	cm/s²	cm²	cm³/cm³	unitless	unitless	unitless	cm²	cm
Formula:		(Note 16)	(0.999 for screening)		(Note 17)	lookup	(Note 18)	lookup	(Note 19)	(Note 20)	(1 for screening)
Analyte											
Dichloroethylene, 1,2- (total)	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Naphthalene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Chloromethane	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Vinyl Chloride	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Methyl bromide	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Ethyl Chloride	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,1-Dichloroethene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Acetone	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Carbon disulfide	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Methyl acetate	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Methylene chloride	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Methyl-Tertiary-Butyl Ether	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,1-Dichloroethane	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
cis-1,2-Dichloroethene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Butanone, 2- (MEK)	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,1,1-Trichloroethane	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Cyclohexane	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Benzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Trichloroethene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Methylcyclohexane	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Toluene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Tetrachloroethene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Chlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Ethylbenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Xylenes	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Styrene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,1,2,2-Tetrachloroethane	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,3-Dichlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,4-Dichlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,2-Dichlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,2,4-Trichlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Benzaldehyde	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
2-Methylnaphthalene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,1'-Biphenyl	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Acenaphthylene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Acenaphthene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Dibenzofuran	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Fluorene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Phenanthrene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Anthracene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
C5-C8 Aliphatics	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
C9-C12 Aliphatics	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
C9-C10 Aromatics	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
C9-C18 Aliphatics	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
C11-C22 Aromatics	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00

TABLE 6-5 (continued)
SOIL TO OUTDOOR AIR
SURFACE SOIL (0-2 feet)
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Murphy Waste Oil

	Vapor viscosity at avg. soil temp.	Avg. Vapor Flow Rate Into trench	Infinite Source Attenuation Coeff.	Infinite Source Trench Conc.
Units:	g/cm-s	cm^3/s	unitless	$\mu g/m^3$
Formula:	0.00018*(Ts/298.15)^0.5	(Note 5)	(Note 6)	C_{source} * α
Analyte				
Dichloroethylene, 1,2- (total)	1.75E-04	1.44E-03	8.50E-09	2.41E-05
Naphthalene	1.75E-04	1.44E-03	8.50E-09	1.68E-05
Chloromethane	1.75E-04	1.44E-03	8.50E-09	ND
Vinyl Chloride	1.75E-04	1.44E-03	8.50E-09	ND
Methyl bromide	1.75E-04	1.44E-03	8.50E-09	ND
Ethyl Chloride	1.75E-04	1.44E-03	8.50E-09	ND
1,1-Dichloroethene	1.75E-04	1.44E-03	8.50E-09	3.68E-05
Acetone	1.75E-04	1.44E-03	8.50E-09	ND
Carbon disulfide	1.75E-04	1.44E-03	8.50E-09	ND
Methyl acetate	1.75E-04	1.44E-03	8.50E-09	ND
Methylene chloride	1.75E-04	1.44E-03	8.50E-09	6.23E-05
Methyl-Tertiary-Butyl Ether	1.75E-04	1.44E-03	8.50E-09	ND
1,1-Dichloroethane	1.75E-04	1.44E-03	8.50E-09	3.32E-04
cis-1,2-Dichloroethene	1.75E-04	1.44E-03	8.50E-09	1.09E-03
Butanone, 2- (MEK)	1.75E-04	1.44E-03	8.50E-09	ND
1,1,1-Trichloroethane	1.75E-04	1.44E-03	8.50E-09	4.16E-04
Cyclohexane	1.75E-04	1.44E-03	8.50E-09	ND
Benzene	1.75E-04	1.44E-03	8.50E-09	2.95E-06
Trichloroethene	1.75E-04	1.44E-03	8.50E-09	8.59E-03
Methylcyclohexane	1.75E-04	1.44E-03	8.50E-09	ND
Toluene	1.75E-04	1.44E-03	8.50E-09	3.70E-05
Tetrachloroethene	1.75E-04	1.44E-03	8.50E-09	2.02E-03
Chlorobenzene	1.75E-04	1.44E-03	8.50E-09	ND
Ethylbenzene	1.75E-04	1.44E-03	8.50E-09	1.67E-05
Xylenes	1.75E-04	1.44E-03	8.50E-09	7.04E-08
Styrene	1.75E-04	1.44E-03	8.50E-09	ND
1,1,2,2-Tetrachloroethane	1.75E-04	1.44E-03	8.50E-09	ND
1,3-Dichlorobenzene	1.75E-04	1.44E-03	8.50E-09	ND
1,4-Dichlorobenzene	1.75E-04	1.44E-03	8.50E-09	ND
1,2-Dichlorobenzene	1.75E-04	1.44E-03	8.50E-09	ND
1,2,4-Trichlorobenzene	1.75E-04	1.44E-03	8.50E-09	ND
Benzaldehyde	1.75E-04	1.44E-03	8.50E-09	ND
2-Methylnaphthalene	1.75E-04	1.44E-03	8.50E-09	1.48E-06
1,1'-Biphenyl	1.75E-04	1.44E-03	8.50E-09	ND
Acenaphthylene	1.75E-04	1.44E-03	8.50E-09	4.30E-05
Acenaphthene	1.75E-04	1.44E-03	8.50E-09	1.66E-05
Dibenzofuran	1.75E-04	1.44E-03	8.50E-09	3.11E-06
Fluorene	1.75E-04	1.44E-03	8.50E-09	6.12E-07
Phenanthrene	1.75E-04	1.44E-03	8.50E-09	9.36E-06
Anthracene	1.75E-04	1.44E-03	8.50E-09	6.43E-07
C5-C8 Aliphatics	1.75E-04	1.44E-03	8.50E-09	4.96E-02
C9-C12 Aliphatics	1.75E-04	1.44E-03	8.50E-09	1.86E-03
C9-C10 Aromatics	1.75E-04	1.44E-03	8.50E-09	ND
C9-C18 Aliphatics	1.75E-04	1.44E-03	8.50E-09	ND
C11-C22 Aromatics	1.75E-04	1.44E-03	8.50E-09	1.21E-01

TABLE 6-5 (continued)
SOIL TO OUTDOOR AIR
SURFACE SOIL (0-2 feet)
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Murphy Waste Oil

Notes:

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

(1) Assumed equivalent to D_i^{eff} of soil layer i in contact with the floor

(2) For screening, assume a trench 4 ft deep, 3 ft wide, and 30 ft long.

(3) Depth to water table minus depth to bottom of floor must be > thickness of capillary fringe, which is based on the soil type (typ. around 30 cm). Use 400 cm for screening purposes.

(4) $D_T^{eff} = L_T / (L_T / D_v^{eff})$

(5) $Q_{soil} = (2*\pi*\Delta P*k_v*X_{crack}) / (\mu_{TS}*\ln(2*Z_{crack}/r_{crack}))$

(6) $\alpha = [(D_T^{eff}*A_B/(Q_{soil}*L_T))*EXP(Q_{soil}*L_{crack}/(D^{crack}*A_{crack}))]/[EXP(Q_{soil}*L_{crack}/(D^{crack}*A_{crack}))+(D_T^{eff}*A_B/(Q_{building}*L_T))+(D_T^{eff}*A_B/(Q_{soil}*L_T))*(EXP(Q_{soil}*L_{crack}/(D^{crack}*A_{crack}))-1)]$

(7) A function of the ratio T_B/T_C:

T_B/T_C	n
<0.57	0.30
0.57-0.71	$0.74(T_B/T_C)-0.116$
>0.71	0.41

(8) $\Delta H_{vTS} = \Delta H_{vB}*[(1-T_S/T_C)/(1-T_B/T_C)]^n$

(9) $H_{TS} = EXP[-\Delta H_{vTS}/R_u*(1/T_S-1/T_R)]*H_R$

(10) Refer to 12 SCS soil types - use SC for screening.

(11) Refer to 12 SCS soil types - use SCL for screening.

(12) $L_{cz} = 0.15 / (0.2 * D_{cz})$

(13) $D_s^{eff} = D_a*(\theta_{avs}^{3.33}/n_s^2)+(D_w/H'_{TS})(\theta_{wvs}^{3.33}/n_s^2)$

(14) $D_{cz}^{eff} = D_a*(\theta_{avcz}^{3.33}/n_{cz}^2)+(D_w/H'_{TS})(\theta_{wvcz}^{3.33}/n_{cz}^2)$

(15) $\theta_{wvcz} = \theta_{s,cz}+((\theta_{s,cz}-\theta_{r,cz})/(2^{hcm}))$, where the value 2 in the formula is used for screening, but may be refined based on soil parameters (see USEPA, 1999).

(16) $\mu_w = \mu_{w,10} * (T'_S / 283.15)^{0.5}$

(17) $k_{r,v} = K_{s,v} * 1/Conv02 * \mu_w / (\rho_w * g)$

(18) $S_w = (\theta_{w,v} - \theta_{r,v}) / (n_v - \theta_{r,v})$

(19) $k_{rg} = (1 - S_w)^{0.5} * (1-S_w^{1/0.67})^{2/3}$

(20) $k_v = k_{r,v} * k_{rg}$; note that the model is very sensitive to this parameter and if site-specific values are available, they should be used.

(21) $C_{soilair} = H'_{TS} * C_R * Conv01 * \rho_b / (\theta_{w,v} + K_d * \rho_b + H'_{TS} * \theta_{a,v}) * Conv02$

(22) For screening, assume a trench 4 ft deep, 3 ft wide, 30 ft long and an air exchange rate of 60/hr. The air exchange rate is based on the assumption that the wind speed in the trench is a small fraction of the ground wind speed and that it could take up to 1 minute for a contaminant to be cleared from the trench air space.

TABLE 6-5
SOIL TO OUTDOOR AIR
SUBSURFACE SOIL - (2-15 feet)
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Aberjona Auto Parts

Units: / Formula:	Soil EPC CR µg/kg Input	Soil Temp. T_s °C (10 for screening)	Soil Temp. T_S K (T_s + 273.15)	Henry's Law Constant at ref. temp. H_R atm-m³/mol lookup	Henry's Law Reference Temp. T_R K (lookup+273.15)	Normal Boiling Point T_B K lookup	Enthalpy of vaporization at T_S ΔH_{vB} cal/mol lookup	Critical Temp. T_C K lookup	constant n unitless (Note 7)	Enthalpy of vaporization at T_S ΔH_{vTS} cal/mol (Note 8)	Gas Constant R_s cal/mol-K	Henry's Law Constant at T_S H_{TS} atm-m³/mol (Note 9)	Gas Constant R m³-atm/mol-K	Henry's Law Constant H'_{TS} unitless H_{TS} / (R * T_S)
Analyte														
Trimethylbenzene, 1,2,4-	ND	1.00E+01	2.83E+02	5.70E-03	2.98E+02	4.42E+02	1.25E+03	6.49E+02	3.88E-01	1.55E+03	1.99E+00	5.70E-03	8.21E-05	2.45E-01
Dichloroethylene, 1,2- (total)	ND	1.00E+01	2.83E+02	4.07E-03	2.98E+02	3.28E+02	1.32E+03	4.92E+02	3.77E-01	1.45E+03	1.99E+00	4.07E-03	8.21E-05	1.75E-01
Trimethylbenzene, 1,3,5-	ND	1.00E+01	2.83E+02	7.81E-03	2.98E+02	4.42E+02	1.25E+03	6.49E+02	3.88E-01	1.55E+03	1.99E+00	7.81E-03	8.21E-05	3.36E-01
n-Butylbenzene	ND	1.00E+01	2.83E+02	1.25E-02	2.98E+02	4.56E+02	1.23E+03	6.84E+02	3.77E-01	1.53E+03	1.99E+00	1.25E-02	8.21E-05	5.38E-01
Naphthalene	2.60E+04	1.00E+01	2.83E+02	4.83E-04	2.98E+02	4.91E+02	1.04E+04	7.48E+02	3.70E-01	1.29E+04	1.99E+00	4.83E-04	8.21E-05	2.08E-02
Isopropyltoluene, 4-	ND	1.00E+01	2.83E+02	8.60E+00	2.98E+02	4.50E+02	1.24E+03	6.52E+02	3.95E-01	1.57E+03	1.99E+00	8.60E+00	8.21E-05	3.70E+02
Butylbenzene, sec-	ND	1.00E+01	2.83E+02	1.67E-02	2.98E+02	4.47E+02	1.24E+03	6.70E+02	3.77E-01	1.53E+03	1.99E+00	1.67E-02	8.21E-05	7.19E-01
Vinyl Chloride	ND	1.00E+01	2.83E+02	2.71E-02	2.98E+02	2.59E+02	5.25E+03	4.32E+02	3.28E-01	5.00E+03	1.99E+00	2.71E-02	8.21E-05	1.17E+00
Ethyl Chloride	ND	1.00E+01	2.83E+02	1.09E-02	2.98E+02	2.85E+02	1.36E+03	4.28E+02	3.77E-01	1.37E+03	1.99E+00	1.09E-02	8.21E-05	4.69E-01
1,1-Dichloroethene	1.95E+00	1.00E+01	2.83E+02	2.61E-02	2.98E+02	3.05E+02	6.25E+03	5.76E+02	3.00E-01	6.39E+03	1.99E+00	2.61E-02	8.21E-05	1.12E+00
Trichloro-1,2,2-trifluoroethane, 1,1	ND	1.00E+01	2.83E+02	5.17E-01	2.98E+02	3.21E+02	1.33E+03	4.81E+02	3.77E-01	1.44E+03	1.99E+00	5.17E-01	8.21E-05	2.23E+01
Acetone	5.30E+02	1.00E+01	2.83E+02	3.88E-05	2.98E+02	3.29E+02	6.96E+03	5.08E+02	3.63E-01	7.56E+03	1.99E+00	3.88E-05	8.21E-05	1.67E-03
Carbon disulfide	ND	1.00E+01	2.83E+02	3.02E-02	2.98E+02	3.19E+02	6.39E+03	5.52E+02	3.12E-01	6.68E+03	1.99E+00	3.02E-02	8.21E-05	1.30E+00
Methyl acetate	ND	1.00E+01	2.83E+02	1.13E-04	2.98E+02	3.65E+02	1.31E+03	5.48E+02	3.77E-01	1.50E+03	1.99E+00	1.13E-04	8.21E-05	4.86E-03
Methylene chloride	ND	1.00E+01	2.83E+02	2.19E-03	2.98E+02	3.13E+02	6.71E+03	5.10E+02	3.38E-01	7.03E+03	1.99E+00	2.19E-03	8.21E-05	9.43E-02
trans-1,2-Dichloroethene	ND	1.00E+01	2.83E+02	9.39E-03	2.98E+02	3.21E+02	6.72E+03	5.17E+02	3.44E-01	7.14E+03	1.99E+00	9.39E-03	8.21E-05	4.04E-01
Methyl-Tertiary-Butyl Ether	1.30E+02	1.00E+01	2.83E+02	5.87E-04	2.98E+02	3.28E+02	1.32E+03	4.97E+02	3.73E-01	1.45E+03	1.99E+00	5.87E-04	8.21E-05	2.53E-02
1,1-Dichloroethane	ND	1.00E+01	2.83E+02	5.61E-03	2.98E+02	3.31E+02	6.90E+03	5.23E+02	3.52E-01	7.45E+03	1.99E+00	5.61E-03	8.21E-05	2.41E-01
cis-1,2-Dichloroethene	ND	1.00E+01	2.83E+02	4.07E-03	2.98E+02	3.34E+02	7.19E+03	5.44E+02	3.38E-01	7.73E+03	1.99E+00	4.07E-03	8.21E-05	1.75E-01
Butanone, 2- (MEK)	1.70E+02	1.00E+01	2.83E+02	5.60E-05	2.98E+02	3.53E+02	1.31E+03	5.29E+02	3.77E-01	1.49E+03	1.99E+00	5.60E-05	8.21E-05	2.41E-03
1,1,1-Trichloroethane	ND	1.00E+01	2.83E+02	1.72E-02	2.98E+02	3.47E+02	7.14E+03	5.45E+02	3.55E-01	7.88E+03	1.99E+00	1.72E-02	8.21E-05	7.40E-01
Cyclohexane	ND	1.00E+01	2.83E+02	2.00E+00	2.98E+02	3.54E+02	1.31E+03	5.31E+02	3.77E-01	1.49E+03	1.99E+00	2.00E+00	8.21E-05	8.61E+01
Benzene	4.40E+01	1.00E+01	2.83E+02	5.55E-03	2.98E+02	3.53E+02	7.34E+03	5.62E+02	3.49E-01	8.12E+03	1.99E+00	5.55E-03	8.21E-05	2.39E-01
Trichloroethene	ND	1.00E+01	2.83E+02	1.03E-02	2.98E+02	3.60E+02	7.51E+03	5.44E+02	3.74E-01	8.56E+03	1.99E+00	1.03E-02	8.21E-05	4.43E-01
Methylcyclohexane	ND	1.00E+01	2.83E+02	4.23E-01	2.98E+02	3.74E+02	1.30E+03	5.61E+02	3.77E-01	1.51E+03	1.99E+00	4.23E-01	8.21E-05	1.82E+01
Toluene	4.00E+02	1.00E+01	2.83E+02	6.64E-03	2.98E+02	3.84E+02	7.93E+03	5.92E+02	3.64E-01	9.15E+03	1.99E+00	6.64E-03	8.21E-05	2.86E-01
Tetrachloroethene	ND	1.00E+01	2.83E+02	1.84E-02	2.98E+02	3.94E+02	8.29E+03	6.20E+02	3.55E-01	9.55E+03	1.99E+00	1.84E-02	8.21E-05	7.92E-01
Chlorobenzene	ND	1.00E+01	2.83E+02	3.71E-03	2.98E+02	4.05E+02	8.41E+03	6.32E+02	3.58E-01	9.80E+03	1.99E+00	3.71E-03	8.21E-05	1.60E-01
Ethylbenzene	4.40E+03	1.00E+01	2.83E+02	7.88E-03	2.98E+02	4.09E+02	8.50E+03	6.17E+02	3.75E-01	1.02E+04	1.99E+00	7.88E-03	8.21E-05	3.39E-01
Xylenes	4.80E+03	1.00E+01	2.83E+02	6.73E-06	2.98E+02	4.17E+02	1.26E+03	6.16E+02	3.85E-01	1.54E+03	1.99E+00	6.73E-06	8.21E-05	2.90E-04
Isopropylbenzene	ND	1.00E+01	2.83E+02	1.47E-02	2.98E+02	4.25E+02	1.26E+03	6.31E+02	3.83E-01	1.54E+03	1.99E+00	1.47E-02	8.21E-05	6.33E-01
1,3-Dichlorobenzene	ND	1.00E+01	2.83E+02	4.70E-03	2.98E+02	4.46E+02	1.24E+03	6.84E+02	3.67E-01	1.50E+03	1.99E+00	4.70E-03	8.21E-05	2.02E-01
1,4-Dichlorobenzene	ND	1.00E+01	2.83E+02	2.43E-03	2.98E+02	4.47E+02	9.27E+03	6.85E+02	3.67E-01	1.12E+04	1.99E+00	2.43E-03	8.21E-05	1.05E-01
1,2-Dichlorobenzene	ND	1.00E+01	2.83E+02	1.90E-03	2.98E+02	4.54E+02	9.70E+03	7.05E+02	3.60E-01	1.17E+04	1.99E+00	1.90E-03	8.21E-05	8.18E-02
1,2,4-Trichlorobenzene	ND	1.00E+01	2.83E+02	1.42E-03	2.98E+02	4.86E+02	1.05E+04	7.25E+02	3.80E-01	1.32E+04	1.99E+00	1.42E-03	8.21E-05	6.11E-02
Benzaldehyde	1.90E+03	1.00E+01	2.83E+02	2.62E-05	2.98E+02	4.52E+02	0.00E+00	6.78E+02	3.77E-01	0.00E+00	1.99E+00	2.62E-05	8.21E-05	1.13E-03
2-Methylnaphthalene	3.24E+04	1.00E+01	2.83E+02	1.01E-03	2.98E+02	5.14E+02	1.17E+03	7.61E+02	3.84E-01	1.51E+03	1.99E+00	1.01E-03	8.21E-05	4.36E-02
2,4,5-Trichlorophenol	ND	1.00E+01	2.83E+02	4.34E-06	2.98E+02	5.26E+02	1.30E+04	7.59E+02	3.97E-01	1.73E+04	1.99E+00	4.34E-06	8.21E-05	1.87E-04
1,1'-Biphenyl	ND	1.00E+01	2.83E+02	3.03E-04	2.98E+02	5.29E+02	1.15E+03	7.94E+02	3.77E-01	1.47E+03	1.99E+00	3.03E-04	8.21E-05	1.30E-02
Acenaphthylene	6.90E+03	1.00E+01	2.83E+02	2.80E-04	2.98E+02	5.53E+02	1.12E+03	7.92E+02	4.01E-01	1.51E+03	1.99E+00	2.80E-04	8.21E-05	1.21E-02
Acenaphthene	1.00E+04	1.00E+01	2.83E+02	1.55E-04	2.98E+02	5.51E+02	1.22E+04	8.03E+02	3.91E-01	1.61E+04	1.99E+00	1.55E-04	8.21E-05	6.67E-03
Dibenzofuran	ND	1.00E+01	2.83E+02	4.00E-03	2.98E+02	5.59E+02	1.11E+03	8.24E+02	3.86E-01	1.47E+03	1.99E+00	4.00E-03	8.21E-05	1.72E-01
Fluorene	ND	1.00E+01	2.83E+02	6.37E-05	2.98E+02	5.70E+02	1.27E+04	8.70E+02	3.69E-01	1.62E+04	1.99E+00	6.37E-05	8.21E-05	2.74E-03
Phenanthrene	5.00E+03	1.00E+01	2.83E+02	1.30E-04	2.98E+02	6.13E+02	1.06E+03	8.69E+02	4.06E-01	1.48E+03	1.99E+00	1.30E-04	8.21E-05	5.59E-03
Anthracene	2.00E+03	1.00E+01	2.83E+02	6.51E-05	2.98E+02	6.15E+02	1.31E+04	8.73E+02	4.05E-01	1.84E+04	1.99E+00	6.51E-05	8.21E-05	2.80E-03
C5-C8 Aliphatics	1.90E+04	1.00E+01	2.83E+02	1.30E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.30E+00	8.21E-05	5.58E+01
C9-C12 Aliphatics	6.10E+04	1.00E+01	2.83E+02	1.56E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.56E+00	8.21E-05	6.71E+01
C9-C10 Aromatics	1.77E+05	1.00E+01	2.83E+02	7.92E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	7.92E-03	8.21E-05	3.41E-01
C9-C18 Aliphatics	2.43E+06	1.00E+01	2.83E+02	1.65E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.65E+00	8.21E-05	7.10E+01
C11-C22 Aromatics	1.72E+06	1.00E+01	2.83E+02	7.17E-04	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	7.17E-04	8.21E-05	3.09E-02

TABLE 6-5 (continued)
SOIL TO OUTDOOR AIR
SUBSURFACE SOIL - (2-15 feet)
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Aberjona Auto Parts

	Conversion Factor µg/kg to g/g	SCS soil type in vadose zone	Vadose zone soil dry bulk density	Vadose zone soil water-filled porosity	Organic carbon partition coefficient	Vadose zone organic carbon fraction	Soil-water partition coefficient	Vadose zone soil total porosity	Vadose zone soil air-filled porosity	Conversion Factor g/cm³ to µg/m³	Source Vapor Conc.
	Conv01	ST_v	ρ_b	θ_{wv}	K_{oc}	$f_{oc,v}$	K_d	n_v	θ_{av}	Conv03	C_{source}
Units:	µg/kg / g/g	unitless	g/cm³	cm³/cm³	cm³/g	unitless	cm³/g	cm³/cm³	cm³/cm³	g/cm³ / µg/m³	µg/m³
Formula:		(Note 11)	(1.5 for screening)	(0.3 for screening)	lookup	(0.002 for screening)	$K_{oc} * f_{oc}$	(0.43 for screening)	$n_v - \theta_{wv}$		(Note 21)
Analyte											
Trimethylbenzene, 1,2,4-	1.00E-09	LS	1.50E+00	3.00E-01	3.72E+03	2.00E-03	7.43E+00	4.30E-01	1.30E-01	1.00E+12	ND
Dichloroethylene, 1,2- (total)	1.00E-09	LS	1.50E+00	3.00E-01	4.38E+01	2.00E-03	8.76E-02	4.30E-01	1.30E-01	1.00E+12	ND
Trimethylbenzene, 1,3,5-	1.00E-09	LS	1.50E+00	3.00E-01	1.67E+03	2.00E-03	3.34E+00	4.30E-01	1.30E-01	1.00E+12	ND
n-Butylbenzene	1.00E-09	LS	1.50E+00	3.00E-01	2.51E+03	2.00E-03	5.02E+00	4.30E-01	1.30E-01	1.00E+12	ND
Naphthalene	1.00E-09	LS	1.50E+00	3.00E-01	2.00E+03	2.00E-03	4.00E+00	4.30E-01	1.30E-01	1.00E+12	1.29E+05
Isopropyltoluene, 4-	1.00E-09	LS	1.50E+00	3.00E-01	1.58E+03	2.00E-03	3.16E+00	4.30E-01	1.30E-01	1.00E+12	ND
Butylbenzene, sec-	1.00E-09	LS	1.50E+00	3.00E-01	3.11E+04	2.00E-03	6.22E+01	4.30E-01	1.30E-01	1.00E+12	ND
Vinyl Chloride	1.00E-09	LS	1.50E+00	3.00E-01	1.86E+01	2.00E-03	3.72E-02	4.30E-01	1.30E-01	1.00E+12	ND
Ethyl Chloride	1.00E-09	LS	1.50E+00	3.00E-01	2.73E+01	2.00E-03	5.46E-02	4.30E-01	1.30E-01	1.00E+12	ND
1,1-Dichloroethene	1.00E-09	LS	1.50E+00	3.00E-01	5.89E+01	2.00E-03	1.18E-01	4.30E-01	1.30E-01	1.00E+12	5.28E+03
Trichloro-1,2,2-trifluoroethan	1.00E-09	LS	1.50E+00	3.00E-01	2.25E+02	2.00E-03	4.50E-01	4.30E-01	1.30E-01	1.00E+12	ND
Acetone	1.00E-09	LS	1.50E+00	3.00E-01	5.75E-01	2.00E-03	1.15E-03	4.30E-01	1.30E-01	1.00E+12	4.40E+03
Carbon disulfide	1.00E-09	LS	1.50E+00	3.00E-01	4.57E+01	2.00E-03	9.14E-02	4.30E-01	1.30E-01	1.00E+12	ND
Methyl acetate	1.00E-09	LS	1.50E+00	3.00E-01	3.32E+00	2.00E-03	6.64E-03	4.30E-01	1.30E-01	1.00E+12	ND
Methylene chloride	1.00E-09	LS	1.50E+00	3.00E-01	1.17E+01	2.00E-03	2.34E-02	4.30E-01	1.30E-01	1.00E+12	ND
trans-1,2-Dichloroethene	1.00E-09	LS	1.50E+00	3.00E-01	5.25E+01	2.00E-03	1.05E-01	4.30E-01	1.30E-01	1.00E+12	ND
Methyl-Tertiary-Butyl Ether	1.00E-09	LS	1.50E+00	3.00E-01	3.84E+01	2.00E-03	7.68E-02	4.30E-01	1.30E-01	1.00E+12	1.18E+04
1,1-Dichloroethane	1.00E-09	LS	1.50E+00	3.00E-01	3.16E+01	2.00E-03	6.32E-02	4.30E-01	1.30E-01	1.00E+12	ND
cis-1,2-Dichloroethene	1.00E-09	LS	1.50E+00	3.00E-01	3.55E+01	2.00E-03	7.10E-02	4.30E-01	1.30E-01	1.00E+12	ND
Butanone, 2- (MEK)	1.00E-09	LS	1.50E+00	3.00E-01	3.83E+00	2.00E-03	7.66E-03	4.30E-01	1.30E-01	1.00E+12	1.97E+03
1,1,1-Trichloroethane	1.00E-09	LS	1.50E+00	3.00E-01	1.10E+02	2.00E-03	2.20E-01	4.30E-01	1.30E-01	1.00E+12	ND
Cyclohexane	1.00E-09	LS	1.50E+00	3.00E-01	1.60E+02	2.00E-03	3.20E-01	4.30E-01	1.30E-01	1.00E+12	ND
Benzene	1.00E-09	LS	1.50E+00	3.00E-01	6.17E+01	2.00E-03	1.23E-01	4.30E-01	1.30E-01	1.00E+12	3.05E+04
Trichloroethene	1.00E-09	LS	1.50E+00	3.00E-01	1.66E+02	2.00E-03	3.32E-01	4.30E-01	1.30E-01	1.00E+12	ND
Methylcyclohexane	1.00E-09	LS	1.50E+00	3.00E-01	2.68E+02	2.00E-03	5.36E-01	4.30E-01	1.30E-01	1.00E+12	ND
Toluene	1.00E-09	LS	1.50E+00	3.00E-01	1.40E+02	2.00E-03	2.80E-01	4.30E-01	1.30E-01	1.00E+12	2.26E+05
Tetrachloroethene	1.00E-09	LS	1.50E+00	3.00E-01	2.65E+02	2.00E-03	5.30E-01	4.30E-01	1.30E-01	1.00E+12	ND
Chlorobenzene	1.00E-09	LS	1.50E+00	3.00E-01	2.19E+02	2.00E-03	4.38E-01	4.30E-01	1.30E-01	1.00E+12	ND
Ethylbenzene	1.00E-09	LS	1.50E+00	3.00E-01	2.04E+02	2.00E-03	4.08E-01	4.30E-01	1.30E-01	1.00E+12	2.34E+06
Xylenes	1.00E-09	LS	1.50E+00	3.00E-01	2.41E+02	2.00E-03	4.82E-01	4.30E-01	1.30E-01	1.00E+12	2.04E+03
Isopropylbenzene	1.00E-09	LS	1.50E+00	3.00E-01	9.31E+03	2.00E-03	1.86E+01	4.30E-01	1.30E-01	1.00E+12	ND
1,3-Dichlorobenzene	1.00E-09	LS	1.50E+00	3.00E-01	1.70E+02	2.00E-03	3.40E-01	4.30E-01	1.30E-01	1.00E+12	ND
1,4-Dichlorobenzene	1.00E-09	LS	1.50E+00	3.00E-01	6.17E+02	2.00E-03	1.23E+00	4.30E-01	1.30E-01	1.00E+12	ND
1,2-Dichlorobenzene	1.00E-09	LS	1.50E+00	3.00E-01	6.17E+02	2.00E-03	1.23E+00	4.30E-01	1.30E-01	1.00E+12	ND
1,2,4-Trichlorobenzene	1.00E-09	LS	1.50E+00	3.00E-01	1.78E+03	2.00E-03	3.56E+00	4.30E-01	1.30E-01	1.00E+12	ND
Benzaldehyde	1.00E-09	LS	1.50E+00	3.00E-01	3.27E+01	2.00E-03	6.54E-02	4.30E-01	1.30E-01	1.00E+12	8.07E+03
2-Methylnaphthalene	1.00E-09	LS	1.50E+00	3.00E-01	8.51E+03	2.00E-03	1.70E+01	4.30E-01	1.30E-01	1.00E+12	8.20E+04
2,4,5-Trichlorophenol	1.00E-09	LS	1.50E+00	3.00E-01	1.60E+03	2.00E-03	3.20E+00	4.30E-01	1.30E-01	1.00E+12	ND
1,1'-Biphenyl	1.00E-09	LS	1.50E+00	3.00E-01	6.25E+03	2.00E-03	1.25E+01	4.30E-01	1.30E-01	1.00E+12	ND
Acenaphthylene	1.00E-09	LS	1.50E+00	3.00E-01	4.79E+03	2.00E-03	9.57E+00	4.30E-01	1.30E-01	1.00E+12	8.51E+03
Acenaphthene	1.00E-09	LS	1.50E+00	3.00E-01	7.08E+03	2.00E-03	1.42E+01	4.30E-01	1.30E-01	1.00E+12	4.65E+03
Dibenzofuran	1.00E-09	LS	1.50E+00	3.00E-01	8.13E+03	2.00E-03	1.63E+01	4.30E-01	1.30E-01	1.00E+12	ND
Fluorene	1.00E-09	LS	1.50E+00	3.00E-01	1.38E+04	2.00E-03	2.76E+01	4.30E-01	1.30E-01	1.00E+12	ND
Phenanthrene	1.00E-09	LS	1.50E+00	3.00E-01	1.41E+04	2.00E-03	2.83E+01	4.30E-01	1.30E-01	1.00E+12	9.83E+02
Anthracene	1.00E-09	LS	1.50E+00	3.00E-01	2.95E+04	2.00E-03	5.90E+01	4.30E-01	1.30E-01	1.00E+12	9.47E+01
C5-C8 Aliphatics	1.00E-09	LS	1.50E+00	3.00E-01	2.27E+03	2.00E-03	4.53E+00	4.30E-01	1.30E-01	1.00E+12	1.11E+08
C9-C12 Aliphatics	1.00E-09	LS	1.50E+00	3.00E-01	1.50E+05	2.00E-03	3.00E+02	4.30E-01	1.30E-01	1.00E+12	1.34E+07
C9-C10 Aromatics	1.00E-09	LS	1.50E+00	3.00E-01	1.78E+03	2.00E-03	3.56E+00	4.30E-01	1.30E-01	1.00E+12	1.59E+07
C9-C18 Aliphatics	1.00E-09	LS	1.50E+00	3.00E-01	6.80E+05	2.00E-03	1.36E+03	4.30E-01	1.30E-01	1.00E+12	1.26E+08
C11-C22 Aromatics	1.00E-09	LS	1.50E+00	3.00E-01	5.00E+03	2.00E-03	1.00E+01	4.30E-01	1.30E-01	1.00E+12	5.20E+06

TABLE 6-5 (continued)
SOIL TO OUTDOOR AIR
SUBSURFACE SOIL - (2-15 feet)
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Aberjona Auto Parts

	Depth below grade to bottom of trench	Depth below grade to contamination	Source Trench Separation	Diffusivity in air	Diffusivity in water	Vadose zone Effective Diffusion Coeff.	Total Overall Effective Diffusion Coeff.	Area of Trench Below Grade	Trench Ventilation Rate	Pressure Diff. between soil & enclosed space	Vadose zone soil saturated hydraulic conductivity	Conversion Factor hr to s
	L_F	L_c	L_T	D_a	D_w	D_v^{eff}	D_T^{eff}	A_B	Q_{bench}	ΔP	$K_{s,v}$	Conv02
Units:	cm	cm	cm	cm^2/s	cm^2/s	cm^2/s	cm^2/s	cm^2	cm^3/s	$g/cm\text{-}s^2$	cm/hr	s/hr
Formula:	(120 (4') for screening)	(121 for screening)	$L_c - L_F$	lookup	lookup	(Note 13)	(Note 4)	(Note 2)	(Note 22)	(40 for screening)	lookup	
Analyte												
Trimethylbenzene, 1,2,4-	1.20E+02	1.21E+02	1.00E+00	7.80E-02	9.03E-06	4.76E-04	4.76E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Dichloroethylene, 1,2- (total)	1.20E+02	1.21E+02	1.00E+00	1.23E-01	9.38E-06	7.51E-04	7.51E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Trimethylbenzene, 1,3,5-	1.20E+02	1.21E+02	1.00E+00	6.48E-02	7.86E-06	3.95E-04	3.95E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
n-Butylbenzene	1.20E+02	1.21E+02	1.00E+00	7.25E-02	8.39E-06	4.41E-04	4.41E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Naphthalene	1.20E+02	1.21E+02	1.00E+00	5.90E-02	7.50E-06	3.93E-04	3.93E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Isopropyltoluene, 4-	1.20E+02	1.21E+02	1.00E+00	7.25E-02	8.39E-06	4.39E-04	4.39E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Butylbenzene, sec-	1.20E+02	1.21E+02	1.00E+00	8.00E-02	8.00E-06	4.86E-04	4.86E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Vinyl Chloride	1.20E+02	1.21E+02	1.00E+00	1.06E-01	1.23E-06	6.42E-04	6.42E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Ethyl Chloride	1.20E+02	1.21E+02	1.00E+00	2.71E-01	1.15E-05	1.64E-03	1.64E-03	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,1-Dichloroethene	1.20E+02	1.21E+02	1.00E+00	9.00E-02	1.04E-05	5.46E-04	5.46E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Trichloro-1,2,2-trifluoroethan	1.20E+02	1.21E+02	1.00E+00	2.88E-02	8.07E-06	1.75E-04	1.75E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Acetone	1.20E+02	1.21E+02	1.00E+00	1.24E-01	1.14E-05	1.42E-03	1.42E-03	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Carbon disulfide	1.20E+02	1.21E+02	1.00E+00	1.04E-01	1.00E-05	6.31E-04	6.31E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Methyl acetate	1.20E+02	1.21E+02	1.00E+00	1.04E-01	1.00E-05	8.32E-04	8.32E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Methylene chloride	1.20E+02	1.21E+02	1.00E+00	1.01E-01	1.17E-05	6.24E-04	6.24E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
trans-1,2-Dichloroethene	1.20E+02	1.21E+02	1.00E+00	7.07E-02	1.19E-05	4.31E-04	4.31E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Methyl-Tertiary-Butyl Ether	1.20E+02	1.21E+02	1.00E+00	1.02E-01	1.05E-05	6.61E-04	6.61E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,1-Dichloroethane	1.20E+02	1.21E+02	1.00E+00	7.42E-02	1.05E-05	4.54E-04	4.54E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
cis-1,2-Dichloroethene	1.20E+02	1.21E+02	1.00E+00	7.36E-02	1.13E-05	4.52E-04	4.52E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Butanone, 2- (MEK)	1.20E+02	1.21E+02	1.00E+00	8.08E-02	9.80E-06	8.89E-04	8.89E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,1,1-Trichloroethane	1.20E+02	1.21E+02	1.00E+00	7.80E-02	8.80E-06	4.74E-04	4.74E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Cyclohexane	1.20E+02	1.21E+02	1.00E+00	8.00E-02	9.00E-06	4.85E-04	4.85E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Benzene	1.20E+02	1.21E+02	1.00E+00	8.80E-02	9.80E-06	5.37E-04	5.37E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Trichloroethene	1.20E+02	1.21E+02	1.00E+00	7.90E-02	9.10E-06	4.81E-04	4.81E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Methylcyclohexane	1.20E+02	1.21E+02	1.00E+00	9.86E-02	8.52E-06	5.98E-04	5.98E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Toluene	1.20E+02	1.21E+02	1.00E+00	8.70E-02	8.60E-06	5.30E-04	5.30E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Tetrachloroethene	1.20E+02	1.21E+02	1.00E+00	7.20E-02	8.20E-06	4.37E-04	4.37E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Chlorobenzene	1.20E+02	1.21E+02	1.00E+00	7.30E-02	8.70E-06	4.48E-04	4.48E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Ethylbenzene	1.20E+02	1.21E+02	1.00E+00	7.50E-02	7.80E-06	4.57E-04	4.57E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Xylenes	1.20E+02	1.21E+02	1.00E+00	7.69E-02	8.44E-06	3.33E-03	3.33E-03	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Isopropylbenzene	1.20E+02	1.21E+02	1.00E+00	6.50E-02	7.83E-06	3.95E-04	3.95E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,3-Dichlorobenzene	1.20E+02	1.21E+02	1.00E+00	4.14E-02	8.85E-06	2.55E-04	2.55E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,4-Dichlorobenzene	1.20E+02	1.21E+02	1.00E+00	6.90E-02	7.90E-06	4.26E-04	4.26E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,2-Dichlorobenzene	1.20E+02	1.21E+02	1.00E+00	6.90E-02	7.90E-06	4.28E-04	4.28E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,2,4-Trichlorobenzene	1.20E+02	1.21E+02	1.00E+00	3.00E-02	8.23E-06	1.95E-04	1.95E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Benzaldehyde	1.20E+02	1.21E+02	1.00E+00	7.30E-02	9.07E-06	1.23E-03	1.23E-03	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
2-Methylnaphthalene	1.20E+02	1.21E+02	1.00E+00	4.84E-02	7.75E-06	3.11E-04	3.11E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
2,4,5-Trichlorophenol	1.20E+02	1.21E+02	1.00E+00	2.91E-02	7.03E-06	3.87E-03	3.87E-03	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,1'-Biphenyl	1.20E+02	1.21E+02	1.00E+00	4.04E-02	8.15E-06	3.06E-04	3.06E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Acenaphthylene	1.20E+02	1.21E+02	1.00E+00	4.43E-02	7.44E-06	3.29E-04	3.29E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Acenaphthene	1.20E+02	1.21E+02	1.00E+00	4.21E-02	7.69E-06	3.68E-04	3.68E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Dibenzofuran	1.20E+02	1.21E+02	1.00E+00	2.67E-02	5.93E-06	1.65E-04	1.65E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Fluorene	1.20E+02	1.21E+02	1.00E+00	3.63E-02	7.88E-06	5.02E-04	5.02E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Phenanthrene	1.20E+02	1.21E+02	1.00E+00	3.30E-02	7.47E-06	3.31E-04	3.31E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Anthracene	1.20E+02	1.21E+02	1.00E+00	3.24E-02	7.74E-06	4.67E-04	4.67E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
C5-C8 Aliphatics	1.20E+02	1.21E+02	1.00E+00	8.00E-02	1.00E-05	4.85E-04	4.85E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
C9-C12 Aliphatics	1.20E+02	1.21E+02	1.00E+00	7.00E-02	1.00E-05	4.24E-04	4.24E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
C9-C10 Aromatics	1.20E+02	1.21E+02	1.00E+00	7.00E-02	1.00E-05	4.27E-04	4.27E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
C9-C18 Aliphatics	1.20E+02	1.21E+02	1.00E+00	7.00E-02	5.00E-06	4.24E-04	4.24E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
C11-C22 Aromatics	1.20E+02	1.21E+02	1.00E+00	6.00E-02	1.00E-05	3.95E-04	3.95E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03

TABLE 6-5 (continued)
SOIL TO OUTDOOR AIR
SUBSURFACE SOIL - (2-15 feet)
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Aberjona Auto Parts

	Viscosity of water at 10°C	Viscosity of water at system temp.	Density of water	Acceleration due to gravity	Vadose zone soil intrinsic permeability	Vadose zone residual soil water content	Vadose zone effective total fluid saturation	Vadose zone van Genuchten shape parameter	Vadose zone soil relative air permeability	Vadose zone soil effective vapor permeability	Thickness of soil between soilgas & trench
	$\mu_{w,ref}$	μ_w	ρ_w	g	$k_{i,v}$	$\theta_{r,v}$	S_{te}	M_v	k_{rg}	k_v	L_{soil}
Units:	g/cm-s	g/cm-s	g/cm^3	cm/s^2	cm^2	cm^3/cm^3	unitless	unitless	unitless	cm^2	cm
Formula:		(Note 16)	(0.999 for screening)		(Note 17)	lookup	(Note 18)	lookup	(Note 19)	(Note 20)	(1 for screening)
Analyte											
Trimethylbenzene, 1,2,4-	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Dichloroethylene, 1,2- (total)	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Trimethylbenzene, 1,3,5-	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
n-Butylbenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Naphthalene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Isopropyltoluene, 4-	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Butylbenzene, sec-	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Vinyl Chloride	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Ethyl Chloride	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,1-Dichloroethene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Trichloro-1,2,2-trifluoroetha	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Acetone	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Carbon disulfide	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Methyl acetate	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Methylene chloride	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
trans-1,2-Dichloroethene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Methyl-Tertiary-Butyl Ether	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,1-Dichloroethane	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
cis-1,2-Dichloroethene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Butanone, 2- (MEK)	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,1,1-Trichloroethane	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Cyclohexane	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Benzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Trichloroethene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Methylcyclohexane	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Toluene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Tetrachloroethene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Chlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Ethylbenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Xylenes	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Isopropylbenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,3-Dichlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,4-Dichlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,2-Dichlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,2,4-Trichlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Benzaldehyde	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
2-Methylnaphthalene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
2,4,5-Trichlorophenol	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,1'-Biphenyl	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Acenaphthylene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Acenaphthene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Dibenzofuran	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Fluorene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Phenanthrene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Anthracene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
C5-C8 Aliphatics	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
C9-C12 Aliphatics	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
C9-C10 Aromatics	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
C9-C18 Aliphatics	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
C11-C22 Aromatics	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00

TABLE 6-5 (continued)
SOIL TO OUTDOOR AIR
SUBSURFACE SOIL - (2-15 feet)
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Aberjona Auto Parts

	Vapor viscosity at avg. soil temp.	Avg. Vapor Flow Rate Into trench	Infinite Source Attenuation Coeff.	Infinite Source Trench Conc.
	μ_{TS}	Q_{soil}	α	C_{trench}
Units:	g/cm-s	cm^3/s	unitless	$\mu g/m^3$
Formula:	0.00018*(T$_s$/298.15)^0.5	(Note 5)	(Note 6)	C_{source} * α
Analyte				
Trimethylbenzene, 1,2,4-	1.75E-04	1.44E-03	8.50E-09	ND
Dichloroethylene, 1,2- (total)	1.75E-04	1.44E-03	8.50E-09	ND
Trimethylbenzene, 1,3,5-	1.75E-04	1.44E-03	8.50E-09	ND
n-Butylbenzene	1.75E-04	1.44E-03	8.50E-09	ND
Naphthalene	1.75E-04	1.44E-03	8.50E-09	1.09E-03
Isopropyltoluene, 4-	1.75E-04	1.44E-03	8.50E-09	ND
Butylbenzene, sec-	1.75E-04	1.44E-03	8.50E-09	ND
Vinyl Chloride	1.75E-04	1.44E-03	8.50E-09	ND
Ethyl Chloride	1.75E-04	1.44E-03	8.50E-09	ND
1,1-Dichloroethene	1.75E-04	1.44E-03	8.50E-09	4.48E-05
Trichloro-1,2,2-trifluoroethan	1.75E-04	1.44E-03	8.50E-09	ND
Acetone	1.75E-04	1.44E-03	8.50E-09	3.74E-05
Carbon disulfide	1.75E-04	1.44E-03	8.50E-09	ND
Methyl acetate	1.75E-04	1.44E-03	8.50E-09	ND
Methylene chloride	1.75E-04	1.44E-03	8.50E-09	ND
trans-1,2-Dichloroethene	1.75E-04	1.44E-03	8.50E-09	ND
Methyl-Tertiary-Butyl Ether	1.75E-04	1.44E-03	8.50E-09	1.00E-04
1,1-Dichloroethane	1.75E-04	1.44E-03	8.50E-09	ND
cis-1,2-Dichloroethene	1.75E-04	1.44E-03	8.50E-09	ND
Butanone, 2- (MEK)	1.75E-04	1.44E-03	8.50E-09	1.67E-05
1,1,1-Trichloroethane	1.75E-04	1.44E-03	8.50E-09	ND
Cyclohexane	1.75E-04	1.44E-03	8.50E-09	ND
Benzene	1.75E-04	1.44E-03	8.50E-09	2.60E-04
Trichloroethene	1.75E-04	1.44E-03	8.50E-09	ND
Methylcyclohexane	1.75E-04	1.44E-03	8.50E-09	ND
Toluene	1.75E-04	1.44E-03	8.50E-09	1.92E-03
Tetrachloroethene	1.75E-04	1.44E-03	8.50E-09	ND
Chlorobenzene	1.75E-04	1.44E-03	8.50E-09	ND
Ethylbenzene	1.75E-04	1.44E-03	8.50E-09	1.99E-02
Xylenes	1.75E-04	1.44E-03	8.50E-09	1.73E-05
Isopropylbenzene	1.75E-04	1.44E-03	8.50E-09	ND
1,3-Dichlorobenzene	1.75E-04	1.44E-03	8.50E-09	ND
1,4-Dichlorobenzene	1.75E-04	1.44E-03	8.50E-09	ND
1,2-Dichlorobenzene	1.75E-04	1.44E-03	8.50E-09	ND
1,2,4-Trichlorobenzene	1.75E-04	1.44E-03	8.50E-09	ND
Benzaldehyde	1.75E-04	1.44E-03	8.50E-09	6.86E-05
2-Methylnaphthalene	1.75E-04	1.44E-03	8.50E-09	6.97E-04
2,4,5-Trichlorophenol	1.75E-04	1.44E-03	8.50E-09	ND
1,1'-Biphenyl	1.75E-04	1.44E-03	8.50E-09	ND
Acenaphthylene	1.75E-04	1.44E-03	8.50E-09	7.23E-05
Acenaphthene	1.75E-04	1.44E-03	8.50E-09	3.95E-05
Dibenzofuran	1.75E-04	1.44E-03	8.50E-09	ND
Fluorene	1.75E-04	1.44E-03	8.50E-09	ND
Phenanthrene	1.75E-04	1.44E-03	8.50E-09	8.36E-06
Anthracene	1.75E-04	1.44E-03	8.50E-09	8.04E-07
C5-C8 Aliphatics	1.75E-04	1.44E-03	8.50E-09	9.42E-01
C9-C12 Aliphatics	1.75E-04	1.44E-03	8.50E-09	1.14E-01
C9-C10 Aromatics	1.75E-04	1.44E-03	8.50E-09	1.35E-01
C9-C18 Aliphatics	1.75E-04	1.44E-03	8.50E-09	1.07E+00
C11-C22 Aromatics	1.75E-04	1.44E-03	8.50E-09	4.42E-02

TABLE 6-5 (continued)
SOIL TO OUTDOOR AIR
SUBSURFACE SOIL - (2-15 feet)
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Aberjona Auto Parts

Notes:

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

(1) Assumed equivalent to D_i^{eff} of soil layer i in contact with the floor

(2) For screening, assume a trench 4 ft deep, 3 ft wide, and 30 ft long.

(3) Depth to water table minus depth to bottom of floor must be > thickness of capillary fringe, which is based on the soil type (typ. around 30 cm). Use 400 cm for screening purposes.

(4) $D_T^{eff} = L_T / (L_T / D_v^{eff})$

(5) $Q_{soil} = (2^*\pi^*\Delta P^*k_v^*X_{crack}) / (\mu_{TS}^*\ln(2^*Z_{crack}/r_{crack}))$

(6) $\alpha = [(D_T^{eff}*A_B/(Q_{building}*L_T))*EXP(Q_{soil}*L_{crack}/(D^{crack}*A_{crack}))]/[EXP(Q_{soil}*L_{crack}/(D^{crack}*A_{crack}))+(D_T^{eff}*A_B/(Q_{building}*L_T))+(D_T^{eff}*A_B/(Q_{soil}*L_T))*(EXP(Q_{soil}*L_{crack}/(D^{crack}*A_{crack}))-1)]$

(7) A function of the ratio T_B/T_C:

T_B/T_C	β
<0.57	0.30
0.57-0.71	$0.74(T_B/T_C)-0.116$
>0.71	0.41

(8) $\Delta H_{v,TS} = \Delta H_{v,B}*[(1-T_B/T_C)/(1-T_B/T_C)]^{\beta}$

(9) $H_{TS} = EXP[-\Delta H_{v,TS}/R_u*(1/T_S-1/T_R)]*H_R$

(10) Refer to 12 SCS soil types - use SC for screening.

(11) Refer to 12 SCS soil types - use SCL for screening.

(12) $L_{cz} = 0.15 / (0.2 * D_{cz})$

(13) $D_v^{eff} = D_a*(\theta_{av}^{3.33}/n_v^2)+(D_w/H'_{TS})(\theta_{wv}^{3.33}/n_v^2)$

(14) $D_{cz}^{eff} = D_a*(\theta_{acz}^{3.33}/n_{cz}^2)+(D_w/H'_{TS})(\theta_{wcz}^{3.33}/n_{cz}^2)$

(15) $\theta_{wcz} = \theta_{r,cz}+((\theta_{s,cz}-\theta_{r,cz})/(2^{|h|/m}))$, where the value 2 in the formula is used for screening, but may be refined based on soil parameters (see USEPA, 1999).

(16) $\mu_w = \mu_{w,10} * (T'_g / 283.15)^{0.5}$

(17) $k_{s,v} = K_{s,v} * 1/Conv02 * \mu_w / (\rho_w * g)$

(18) $S_{te} = (\theta_{w,v} - \theta_{r,v}) / (n_v - \theta_{r,v})$

(19) $k_{rg} = (1 - S_{te})^{0.5} * (1-S_{te}^{1/Mv})^{2Mv}$

(20) $k_v = k_{s,v} * k_{rg}$; note that the model is very sensitive to this parameter and if site-specific values are available, they should be used.

(21) $C_{source} = H'_{TS} * C_R * Conv01 * \rho_b / (\theta_{w,v} + K_d * \rho_b + H'_{TS} * \theta_{a,v}) * Conv02$

(22) For screening, assume a trench 4 ft deep, 3 ft wide, 30 ft long and an air exchange rate of 60/hr. The air exchange rate is based on the assumption that the wind speed in the trench is a small fraction of the ground wind speed and that it could take up to 1 minute for a contaminant to be cleared from the trench air space.

TABLE 6-5
SOIL TO OUTDOOR AIR
SUBSURFACE SOIL- (2-15 feet)
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Whitney Barrel Property

Units: / Formula:	Soil EPC CR µg/kg Input	Soil Temp. T_s °C (10 for screening)	Soil Temp. T_S K (T_s + 273.15)	Henry's Law Constant at ref. temp. H_R atm-m³/mol lookup	Henry's Law Reference Temp. T_R K (lookup+273.15)	Normal Boiling Point T_B K lookup	Enthalpy of vaporization at T_S ΔH_{vB} cal/mol lookup	Critical Temp. T_C K lookup	constant n unitless (Note 7)	Enthalpy of vaporization at T_S ΔH_{vTS} cal/mol (Note 8)	Gas Constant R_e cal/mol-K	Henry's Law Constant at T_S H_{TS} atm-m³/mol (Note 9)	Gas Constant R m³-atm/mol-K	Henry's Law Constant H'_{TS} unitless H_{TS} / (R * T_S)
Analyte														
Trimethylbenzene, 1,2,4-	ND	1.00E+01	2.83E+02	5.70E-03	2.98E+02	4.42E+02	1.25E+03	6.49E+02	3.88E-01	1.55E+03	1.99E+00	5.70E-03	8.21E-05	2.45E-01
Dichloroethylene, 1,2- (total)	ND	1.00E+01	2.83E+02	4.07E-03	2.98E+02	3.28E+02	1.32E+03	4.92E+02	3.77E-01	1.45E+03	1.99E+00	4.07E-03	8.21E-05	1.75E-01
Trimethylbenzene, 1,3,5-	ND	1.00E+01	2.83E+02	7.81E-03	2.98E+02	4.42E+02	1.25E+03	6.49E+02	3.88E-01	1.55E+03	1.99E+00	7.81E-03	8.21E-05	3.36E-01
n-Butylbenzene	ND	1.00E+01	2.83E+02	1.25E-02	2.98E+02	4.56E+02	1.23E+03	6.84E+02	3.77E-01	1.53E+03	1.99E+00	1.25E-02	8.21E-05	5.38E-01
Naphthalene	1.20E+04	1.00E+01	2.83E+02	4.83E-04	2.98E+02	4.91E+02	1.04E+04	7.48E+02	3.70E-01	1.29E+04	1.99E+00	4.83E-04	8.21E-05	2.08E-02
Isopropyltoluene, 4-	ND	1.00E+01	2.83E+02	8.60E+00	2.98E+02	4.50E+02	1.24E+03	6.52E+02	3.95E-01	1.57E+03	1.99E+00	8.60E+00	8.21E-05	3.70E+02
Butylbenzene, sec-	ND	1.00E+01	2.83E+02	1.67E-02	2.98E+02	4.47E+02	1.24E+03	6.70E+02	3.77E-01	1.53E+03	1.99E+00	1.67E-02	8.21E-05	7.19E-01
Vinyl Chloride	3.90E+02	1.00E+01	2.83E+02	2.71E-02	2.98E+02	2.59E+02	5.25E+03	4.32E+02	3.28E-01	5.00E+03	1.99E+00	2.71E-02	8.21E-05	1.17E+00
Ethyl Chloride	8.60E+01	1.00E+01	2.83E+02	1.09E-02	2.98E+02	2.85E+02	1.36E+03	4.28E+02	3.77E-01	1.37E+03	1.99E+00	1.09E-02	8.21E-05	4.69E-01
1,1-Dichloroethene	1.20E+02	1.00E+01	2.83E+02	2.61E-02	2.98E+02	3.05E+02	6.25E+03	5.76E+02	3.00E-01	6.39E+03	1.99E+00	2.61E-02	8.21E-05	1.12E+00
Trichloro-1,2,2-trifluoroethane, 1,1	3.80E+00	1.00E+01	2.83E+02	5.17E-01	2.98E+02	3.21E+02	1.33E+03	4.81E+02	3.77E-01	1.44E+03	1.99E+00	5.17E-01	8.21E-05	2.23E+01
Acetone	9.40E+02	1.00E+01	2.83E+02	3.88E-05	2.98E+02	3.29E+02	6.96E+03	5.08E+02	3.63E-01	7.56E+03	1.99E+00	3.88E-05	8.21E-05	1.67E-03
Carbon disulfide	3.60E+00	1.00E+01	2.83E+02	3.02E-02	2.98E+02	3.19E+02	6.39E+03	5.52E+02	3.12E-01	6.68E+03	1.99E+00	3.02E-02	8.21E-05	1.30E+00
Methyl acetate	4.20E+02	1.00E+01	2.83E+02	1.13E-04	2.98E+02	3.65E+02	1.31E+03	5.48E+02	3.77E-01	1.50E+03	1.99E+00	1.13E-04	8.21E-05	4.86E-03
Methylene chloride	2.69E+03	1.00E+01	2.83E+02	2.19E-03	2.98E+02	3.13E+02	6.71E+03	5.10E+02	3.38E-01	7.03E+03	1.99E+00	2.19E-03	8.21E-05	9.43E-02
trans-1,2-Dichloroethene	2.00E+02	1.00E+01	2.83E+02	9.39E-03	2.98E+02	3.21E+02	6.72E+03	5.17E+02	3.44E-01	7.14E+03	1.99E+00	9.39E-03	8.21E-05	4.04E-01
Methyl-Tertiary-Butyl Ether	ND	1.00E+01	2.83E+02	5.87E-04	2.98E+02	3.28E+02	1.32E+03	4.97E+02	3.73E-01	1.45E+03	1.99E+00	5.87E-04	8.21E-05	2.53E-02
1,1-Dichloroethane	1.10E+03	1.00E+01	2.83E+02	5.61E-03	2.98E+02	3.31E+02	6.90E+03	5.23E+02	3.52E-01	7.45E+03	1.99E+00	5.61E-03	8.21E-05	2.41E-01
cis-1,2-Dichloroethene	3.80E+02	1.00E+01	2.83E+02	4.07E-03	2.98E+02	3.34E+02	7.19E+03	5.44E+02	3.38E-01	7.73E+03	1.99E+00	4.07E-03	8.21E-05	1.75E-01
Butanone, 2- (MEK)	2.10E+01	1.00E+01	2.83E+02	5.60E-05	2.98E+02	3.53E+02	1.31E+03	5.29E+02	3.77E-01	1.49E+03	1.99E+00	5.60E-05	8.21E-05	2.41E-03
1,1,1-Trichloroethane	ND	1.00E+01	2.83E+02	1.72E-02	2.98E+02	3.47E+02	7.14E+03	5.45E+02	3.55E-01	7.88E+03	1.99E+00	1.72E-02	8.21E-05	7.40E-01
Cyclohexane	5.80E+01	1.00E+01	2.83E+02	2.00E+00	2.98E+02	3.54E+02	1.31E+03	5.31E+02	3.77E-01	1.49E+03	1.99E+00	2.00E+00	8.21E-05	8.61E+01
Benzene	2.10E+02	1.00E+01	2.83E+02	5.55E-03	2.98E+02	3.53E+02	7.34E+03	5.62E+02	3.49E-01	8.12E+03	1.99E+00	5.55E-03	8.21E-05	2.39E-01
Trichloroethene	7.40E+02	1.00E+01	2.83E+02	1.03E-02	2.98E+02	3.60E+02	7.51E+03	5.44E+02	3.74E-01	8.56E+03	1.99E+00	1.03E-02	8.21E-05	4.43E-01
Methylcyclohexane	1.30E+03	1.00E+01	2.83E+02	4.23E-01	2.98E+02	3.74E+02	1.30E+03	5.61E+02	3.77E-01	1.51E+03	1.99E+00	4.23E-01	8.21E-05	1.82E+01
Toluene	3.90E+03	1.00E+01	2.83E+02	6.64E-03	2.98E+02	3.84E+02	7.93E+03	5.92E+02	3.64E-01	9.15E+03	1.99E+00	6.64E-03	8.21E-05	2.86E-01
Tetrachloroethene	5.70E+02	1.00E+01	2.83E+02	1.84E-02	2.98E+02	3.94E+02	8.29E+03	6.20E+02	3.55E-01	9.55E+03	1.99E+00	1.84E-02	8.21E-05	7.92E-01
Chlorobenzene	8.80E+02	1.00E+01	2.83E+02	3.71E-03	2.98E+02	4.05E+02	8.41E+03	6.32E+02	3.58E-01	9.80E+03	1.99E+00	3.71E-03	8.21E-05	1.60E-01
Ethylbenzene	5.70E+02	1.00E+01	2.83E+02	7.88E-03	2.98E+02	4.09E+02	8.50E+03	6.17E+02	3.75E-01	1.02E+04	1.99E+00	7.88E-03	8.21E-05	3.39E-01
Xylenes	3.33E+03	1.00E+01	2.83E+02	6.73E-06	2.98E+02	4.17E+02	1.26E+03	6.16E+02	3.85E-01	1.54E+03	1.99E+00	6.73E-06	8.21E-05	2.90E-04
Isopropylbenzene	1.20E+02	1.00E+01	2.83E+02	1.47E-02	2.98E+02	4.25E+02	1.26E+03	6.31E+02	3.83E-01	1.54E+03	1.99E+00	1.47E-02	8.21E-05	6.33E-01
1,3-Dichlorobenzene	1.00E+02	1.00E+01	2.83E+02	4.70E-03	2.98E+02	4.46E+02	1.24E+03	6.84E+02	3.67E-01	1.50E+03	1.99E+00	4.70E-03	8.21E-05	2.02E-01
1,4-Dichlorobenzene	6.40E+02	1.00E+01	2.83E+02	2.43E-03	2.98E+02	4.47E+02	9.27E+03	6.85E+02	3.67E-01	1.12E+04	1.99E+00	2.43E-03	8.21E-05	1.05E-01
1,2-Dichlorobenzene	5.10E+01	1.00E+01	2.83E+02	1.90E-03	2.98E+02	4.54E+02	9.70E+03	7.05E+02	3.60E-01	1.17E+04	1.99E+00	1.90E-03	8.21E-05	8.18E-02
1,2,4-Trichlorobenzene	3.70E+02	1.00E+01	2.83E+02	1.42E-03	2.98E+02	4.86E+02	1.05E+04	7.25E+02	3.80E-01	1.32E+04	1.99E+00	1.42E-03	8.21E-05	6.11E-02
Benzaldehyde	7.90E+01	1.00E+01	2.83E+02	2.62E-05	2.98E+02	4.52E+02	0.00E+00	6.78E+02	3.77E-01	0.00E+00	1.99E+00	2.62E-05	8.21E-05	1.13E-03
2-Methylnaphthalene	2.00E+04	1.00E+01	2.83E+02	1.01E-03	2.98E+02	5.14E+02	1.17E+03	7.61E+02	3.84E-01	1.51E+03	1.99E+00	1.01E-03	8.21E-05	4.36E-02
2,4,5-Trichlorophenol	3.90E+02	1.00E+01	2.83E+02	4.34E-06	2.98E+02	5.26E+02	1.30E+04	7.59E+02	3.97E-01	1.73E+04	1.99E+00	4.34E-06	8.21E-05	1.87E-04
1,1'-Biphenyl	5.60E+03	1.00E+01	2.83E+02	3.03E-04	2.98E+02	5.29E+02	1.15E+03	7.94E+02	3.77E-01	1.47E+03	1.99E+00	3.03E-04	8.21E-05	1.30E-02
Acenaphthylene	1.90E+01	1.00E+01	2.83E+02	2.80E-04	2.98E+02	5.53E+02	1.12E+03	7.92E+02	4.01E-01	1.51E+03	1.99E+00	2.80E-04	8.21E-05	1.21E-02
Acenaphthene	8.20E+03	1.00E+01	2.83E+02	1.55E-04	2.98E+02	5.51E+02	1.22E+04	8.03E+02	3.91E-01	1.61E+04	1.99E+00	1.55E-04	8.21E-05	6.67E-03
Dibenzofuran	1.10E+02	1.00E+01	2.83E+02	4.00E-03	2.98E+02	5.59E+02	1.11E+03	8.24E+02	3.86E-01	1.47E+03	1.99E+00	4.00E-03	8.21E-05	1.72E-01
Fluorene	1.30E+03	1.00E+01	2.83E+02	6.37E-05	2.98E+02	5.70E+02	1.27E+04	8.70E+02	3.69E-01	1.62E+04	1.99E+00	6.37E-05	8.21E-05	2.74E-03
Phenanthrene	4.70E+03	1.00E+01	2.83E+02	1.30E-04	2.98E+02	6.13E+02	1.06E+03	8.69E+02	4.06E-01	1.48E+03	1.99E+00	1.30E-04	8.21E-05	5.59E-03
Anthracene	2.20E+03	1.00E+01	2.83E+02	6.51E-05	2.98E+02	6.15E+02	1.31E+04	8.73E+02	4.05E-01	1.84E+04	1.99E+00	6.51E-05	8.21E-05	2.80E-03
C5-C8 Aliphatics	1.44E+05	1.00E+01	2.83E+02	1.30E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.30E+00	8.21E-05	5.58E+01
C9-C12 Aliphatics	1.46E+05	1.00E+01	2.83E+02	1.56E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.56E+00	8.21E-05	6.71E+01
C9-C10 Aromatics	4.98E+05	1.00E+01	2.83E+02	7.92E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	7.92E-03	8.21E-05	3.41E-01
C9-C18 Aliphatics	6.04E+06	1.00E+01	2.83E+02	1.65E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.65E+00	8.21E-05	7.10E+01
C11-C22 Aromatics	4.10E+06	1.00E+01	2.83E+02	7.17E-04	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	7.17E-04	8.21E-05	3.09E-02

TABLE 6-5
SOIL TO OUTDOOR AIR
SUBSURFACE SOIL- (2-15 feet)
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Whitney Barrel Property

	Conversion Factor µg/kg to g/g	SCS soil type in vadose zone	Vadose zone soil dry bulk density	Vadose zone soil water-filled porosity	Organic carbon partition coefficient	Vadose zone organic carbon fraction	Soil-water partition coefficient	Vadose zone soil total porosity	Vadose zone soil air-filled porosity	Conversion Factor g/cm³ to µg/m³	Source Vapor Conc.
	Conv01	ST_v	ρ_b	θ_{wv}	K_{oc}	$f_{oc,v}$	K_d	n_v	θ_{aiv}	Conv03	C_{source}
Units:	µg/kg / g/g	unitless	g/cm³	cm³/cm³	cm³/g	unitless	cm³/g	cm³/cm³	cm³/cm³	g/cm³ / µg/m³	µg/m³
Formula:		(Note 11)	(1.5 for screening)	(0.3 for screening)	lookup	(0.002 for screening)	$K_{oc} * f_{oc}$	(0.43 for screening)	$n_v - \theta_{wv}$		(Note 21)
Analyte											
Trimethylbenzene, 1,2,4-	1.00E-09	LS	1.50E+00	3.00E-01	3.72E+03	2.00E-03	7.43E+00	4.30E-01	1.30E-01	1.00E+12	ND
Dichloroethylene, 1,2- (total)	1.00E-09	LS	1.50E+00	3.00E-01	4.38E+01	2.00E-03	8.76E-02	4.30E-01	1.30E-01	1.00E+12	ND
Trimethylbenzene, 1,3,5-	1.00E-09	LS	1.50E+00	3.00E-01	1.67E+03	2.00E-03	3.34E+00	4.30E-01	1.30E-01	1.00E+12	ND
n-Butylbenzene	1.00E-09	LS	1.50E+00	3.00E-01	2.51E+03	2.00E-03	5.02E+00	4.30E-01	1.30E-01	1.00E+12	ND
Naphthalene	1.00E-09	LS	1.50E+00	3.00E-01	2.00E+03	2.00E-03	4.00E+00	4.30E-01	1.30E-01	1.00E+12	5.94E+04
Isopropyltoluene, 4-	1.00E-09	LS	1.50E+00	3.00E-01	1.58E+03	2.00E-03	3.16E+00	4.30E-01	1.30E-01	1.00E+12	ND
Butylbenzene, sec-	1.00E-09	LS	1.50E+00	3.00E-01	3.11E+04	2.00E-03	6.22E+01	4.30E-01	1.30E-01	1.00E+12	ND
Vinyl Chloride	1.00E-09	LS	1.50E+00	3.00E-01	1.86E+01	2.00E-03	3.72E-02	4.30E-01	1.30E-01	1.00E+12	1.34E+06
Ethyl Chloride	1.00E-09	LS	1.50E+00	3.00E-01	2.73E+01	2.00E-03	5.46E-02	4.30E-01	1.30E-01	1.00E+12	1.37E+05
1,1-Dichloroethene	1.00E-09	LS	1.50E+00	3.00E-01	5.89E+01	2.00E-03	1.18E-01	4.30E-01	1.30E-01	1.00E+12	3.25E+05
Trichloro-1,2,2-triflouroethan	1.00E-09	LS	1.50E+00	3.00E-01	2.25E+02	2.00E-03	4.50E-01	4.30E-01	1.30E-01	1.00E+12	3.28E+04
Acetone	1.00E-09	LS	1.50E+00	3.00E-01	5.75E-01	2.00E-03	1.15E-03	4.30E-01	1.30E-01	1.00E+12	7.80E+03
Carbon disulfide	1.00E-09	LS	1.50E+00	3.00E-01	4.57E+01	2.00E-03	9.14E-02	4.30E-01	1.30E-01	1.00E+12	1.16E+04
Methyl acetate	1.00E-09	LS	1.50E+00	3.00E-01	3.32E+00	2.00E-03	6.64E-03	4.30E-01	1.30E-01	1.00E+12	9.86E+03
Methylene chloride	1.00E-09	LS	1.50E+00	3.00E-01	1.17E+01	2.00E-03	2.34E-02	4.30E-01	1.30E-01	1.00E+12	1.09E+06
trans-1,2-Dichloroethene	1.00E-09	LS	1.50E+00	3.00E-01	5.25E+01	2.00E-03	1.05E-01	4.30E-01	1.30E-01	1.00E+12	2.38E+05
Methyl-Tertiary-Butyl Ether	1.00E-09	LS	1.50E+00	3.00E-01	3.84E+01	2.00E-03	7.68E-02	4.30E-01	1.30E-01	1.00E+12	ND
1,1-Dichloroethane	1.00E-09	LS	1.50E+00	3.00E-01	3.16E+01	2.00E-03	6.32E-02	4.30E-01	1.30E-01	1.00E+12	9.35E+05
cis-1,2-Dichloroethene	1.00E-09	LS	1.50E+00	3.00E-01	3.55E+01	2.00E-03	7.10E-02	4.30E-01	1.30E-01	1.00E+12	2.33E+05
Butanone, 2- (MEK)	1.00E-09	LS	1.50E+00	3.00E-01	3.83E+00	2.00E-03	7.66E-03	4.30E-01	1.30E-01	1.00E+12	2.43E+02
1,1,1-Trichloroethane	1.00E-09	LS	1.50E+00	3.00E-01	1.10E+02	2.00E-03	2.20E-01	4.30E-01	1.30E-01	1.00E+12	ND
Cyclohexane	1.00E-09	LS	1.50E+00	3.00E-01	1.60E+02	2.00E-03	3.20E-01	4.30E-01	1.30E-01	1.00E+12	6.26E+05
Benzene	1.00E-09	LS	1.50E+00	3.00E-01	6.17E+01	2.00E-03	1.23E-01	4.30E-01	1.30E-01	1.00E+12	1.46E+05
Trichloroethene	1.00E-09	LS	1.50E+00	3.00E-01	1.66E+02	2.00E-03	3.32E-01	4.30E-01	1.30E-01	1.00E+12	5.75E+05
Methylcyclohexane	1.00E-09	LS	1.50E+00	3.00E-01	2.68E+02	2.00E-03	5.36E-01	4.30E-01	1.30E-01	1.00E+12	1.02E+07
Toluene	1.00E-09	LS	1.50E+00	3.00E-01	1.40E+02	2.00E-03	2.80E-01	4.30E-01	1.30E-01	1.00E+12	2.21E+06
Tetrachloroethene	1.00E-09	LS	1.50E+00	3.00E-01	2.65E+02	2.00E-03	5.30E-01	4.30E-01	1.30E-01	1.00E+12	5.65E+05
Chlorobenzene	1.00E-09	LS	1.50E+00	3.00E-01	2.19E+02	2.00E-03	4.38E-01	4.30E-01	1.30E-01	1.00E+12	2.16E+05
Ethylbenzene	1.00E-09	LS	1.50E+00	3.00E-01	2.04E+02	2.00E-03	4.08E-01	4.30E-01	1.30E-01	1.00E+12	3.03E+05
Xylenes	1.00E-09	LS	1.50E+00	3.00E-01	2.41E+02	2.00E-03	4.82E-01	4.30E-01	1.30E-01	1.00E+12	1.41E+03
Isopropylbenzene	1.00E-09	LS	1.50E+00	3.00E-01	9.31E+03	2.00E-03	1.86E+01	4.30E-01	1.30E-01	1.00E+12	4.02E+03
1,3-Dichlorobenzene	1.00E-09	LS	1.50E+00	3.00E-01	1.70E+02	2.00E-03	3.40E-01	4.30E-01	1.30E-01	1.00E+12	3.63E+04
1,4-Dichlorobenzene	1.00E-09	LS	1.50E+00	3.00E-01	6.17E+02	2.00E-03	1.23E+00	4.30E-01	1.30E-01	1.00E+12	4.64E+04
1,2-Dichlorobenzene	1.00E-09	LS	1.50E+00	3.00E-01	6.17E+02	2.00E-03	1.23E+00	4.30E-01	1.30E-01	1.00E+12	2.89E+03
1,2,4-Trichlorobenzene	1.00E-09	LS	1.50E+00	3.00E-01	1.78E+03	2.00E-03	3.56E+00	4.30E-01	1.30E-01	1.00E+12	6.01E+03
Benzaldehyde	1.00E-09	LS	1.50E+00	3.00E-01	3.27E+01	2.00E-03	6.54E-02	4.30E-01	1.30E-01	1.00E+12	3.36E+02
2-Methylnaphthalene	1.00E-09	LS	1.50E+00	3.00E-01	8.51E+03	2.00E-03	1.70E+01	4.30E-01	1.30E-01	1.00E+12	5.06E+04
2,4,5-Trichlorophenol	1.00E-09	LS	1.50E+00	3.00E-01	1.60E+03	2.00E-03	3.20E+00	4.30E-01	1.30E-01	1.00E+12	2.14E+01
1,1'-Biphenyl	1.00E-09	LS	1.50E+00	3.00E-01	6.25E+03	2.00E-03	1.25E+01	4.30E-01	1.30E-01	1.00E+12	5.75E+03
Acenaphthylene	1.00E-09	LS	1.50E+00	3.00E-01	4.79E+03	2.00E-03	9.57E+00	4.30E-01	1.30E-01	1.00E+12	2.34E+01
Acenaphthene	1.00E-09	LS	1.50E+00	3.00E-01	7.08E+03	2.00E-03	1.42E+01	4.30E-01	1.30E-01	1.00E+12	3.81E+03
Dibenzofuran	1.00E-09	LS	1.50E+00	3.00E-01	8.13E+03	2.00E-03	1.63E+01	4.30E-01	1.30E-01	1.00E+12	1.15E+03
Fluorene	1.00E-09	LS	1.50E+00	3.00E-01	1.38E+04	2.00E-03	2.76E+01	4.30E-01	1.30E-01	1.00E+12	1.18E+02
Phenanthrene	1.00E-09	LS	1.50E+00	3.00E-01	1.41E+04	2.00E-03	2.83E+01	4.30E-01	1.30E-01	1.00E+12	9.24E+02
Anthracene	1.00E-09	LS	1.50E+00	3.00E-01	2.95E+04	2.00E-03	5.90E+01	4.30E-01	1.30E-01	1.00E+12	1.04E+02
C5-C8 Aliphatics	1.00E-09	LS	1.50E+00	3.00E-01	2.27E+03	2.00E-03	4.53E+00	4.30E-01	1.30E-01	1.00E+12	8.40E+08
C9-C12 Aliphatics	1.00E-09	LS	1.50E+00	3.00E-01	1.50E+05	2.00E-03	3.00E+02	4.30E-01	1.30E-01	1.00E+12	3.20E+07
C9-C10 Aromatics	1.00E-09	LS	1.50E+00	3.00E-01	1.78E+03	2.00E-03	3.56E+00	4.30E-01	1.30E-01	1.00E+12	4.48E+07
C9-C18 Aliphatics	1.00E-09	LS	1.50E+00	3.00E-01	6.80E+05	2.00E-03	1.36E+03	4.30E-01	1.30E-01	1.00E+12	3.14E+08
C11-C22 Aromatics	1.00E-09	LS	1.50E+00	3.00E-01	5.00E+03	2.00E-03	1.00E+01	4.30E-01	1.30E-01	1.00E+12	1.24E+07

TABLE 6-5
SOIL TO OUTDOOR AIR
SUBSURFACE SOIL- (2-15 feet)
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Whitney Barrel Property

	Depth below grade to bottom of trench	Depth below grade to contamination	Source Trench Separation	Diffusivity in air	Diffusivity in water	Vadose zone Effective Diffusion Coeff.	Total Overall Effective Diffusion Coeff.	Area of Trench Below Grade	Trench Ventilation Rate	Pressure Diff. between soil & enclosed space	Vadose zone soil saturated hydraulic conductivity	Conversion Factor hr to s
	L_F	L_t	L_T	D_a	D_w	D_v^{eff}	D_T^{eff}	A_B	Q_{trench}	ΔP	K_{sat}	Conv02
Units:	cm	cm	cm	cm^2/s	cm^2/s	cm^2/s	cm^2/s	cm^2	cm^3/s	$g/cm\text{-}s^2$	cm/hr	s/hr
Formula:	(120 (4') for screening)	(121 for screening)	$L_t - L_F$	lookup	lookup	(Note 13)	(Note 4)	(Note 2)	(Note 22)	(40 for screening)	lookup	
Analyte												
Trimethylbenzene, 1,2,4-	1.20E+02	1.21E+02	1.00E+00	7.80E-02	9.03E-06	4.76E-04	4.76E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Dichloroethylene, 1,2- (total)	1.20E+02	1.21E+02	1.00E+00	1.23E-01	9.38E-06	7.51E-04	7.51E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Trimethylbenzene, 1,3,5-	1.20E+02	1.21E+02	1.00E+00	6.48E-02	7.86E-06	3.95E-04	3.95E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
n-Butylbenzene	1.20E+02	1.21E+02	1.00E+00	7.25E-02	8.39E-06	4.41E-04	4.41E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Naphthalene	1.20E+02	1.21E+02	1.00E+00	5.90E-02	7.50E-06	3.93E-04	3.93E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Isopropyltoluene, 4-	1.20E+02	1.21E+02	1.00E+00	7.25E-02	8.39E-06	4.39E-04	4.39E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Butylbenzene, sec-	1.20E+02	1.21E+02	1.00E+00	8.00E-02	8.00E-06	4.86E-04	4.86E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Vinyl Chloride	1.20E+02	1.21E+02	1.00E+00	1.06E-01	1.23E-06	6.42E-04	6.42E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Ethyl Chloride	1.20E+02	1.21E+02	1.00E+00	2.71E-01	1.15E-05	1.64E-03	1.64E-03	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,1-Dichloroethene	1.20E+02	1.21E+02	1.00E+00	9.00E-02	1.04E-05	5.46E-04	5.46E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Trichloro-1,2,2-trifluoroethan	1.20E+02	1.21E+02	1.00E+00	2.88E-02	8.07E-06	1.75E-04	1.75E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Acetone	1.20E+02	1.21E+02	1.00E+00	1.24E-01	1.14E-05	1.42E-03	1.42E-03	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Carbon disulfide	1.20E+02	1.21E+02	1.00E+00	1.04E-01	1.00E-05	6.31E-04	6.31E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Methyl acetate	1.20E+02	1.21E+02	1.00E+00	1.04E-01	1.00E-05	8.32E-04	8.32E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Methylene chloride	1.20E+02	1.21E+02	1.00E+00	1.01E-01	1.17E-05	6.24E-04	6.24E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
trans-1,2-Dichloroethene	1.20E+02	1.21E+02	1.00E+00	7.07E-02	1.19E-05	4.31E-04	4.31E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Methyl-Tertiary-Butyl Ether	1.20E+02	1.21E+02	1.00E+00	1.02E-01	1.05E-05	6.61E-04	6.61E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,1-Dichloroethane	1.20E+02	1.21E+02	1.00E+00	7.42E-02	1.05E-05	4.54E-04	4.54E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
cis-1,2-Dichloroethene	1.20E+02	1.21E+02	1.00E+00	7.36E-02	1.13E-05	4.52E-04	4.52E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Butanone, 2- (MEK)	1.20E+02	1.21E+02	1.00E+00	8.08E-02	9.80E-06	8.89E-04	8.89E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,1,1-Trichloroethane	1.20E+02	1.21E+02	1.00E+00	7.80E-02	8.80E-06	4.74E-04	4.74E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Cyclohexane	1.20E+02	1.21E+02	1.00E+00	8.00E-02	9.00E-06	4.85E-04	4.85E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Benzene	1.20E+02	1.21E+02	1.00E+00	8.80E-02	9.80E-06	5.37E-04	5.37E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Trichloroethene	1.20E+02	1.21E+02	1.00E+00	7.90E-02	9.10E-06	4.81E-04	4.81E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Methylcyclohexane	1.20E+02	1.21E+02	1.00E+00	9.86E-02	8.52E-06	5.98E-04	5.98E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Toluene	1.20E+02	1.21E+02	1.00E+00	8.70E-02	8.60E-06	5.30E-04	5.30E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Tetrachloroethene	1.20E+02	1.21E+02	1.00E+00	7.20E-02	8.20E-06	4.37E-04	4.37E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Chlorobenzene	1.20E+02	1.21E+02	1.00E+00	7.30E-02	8.70E-06	4.48E-04	4.48E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Ethylbenzene	1.20E+02	1.21E+02	1.00E+00	7.50E-02	7.80E-06	4.57E-04	4.57E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Xylenes	1.20E+02	1.21E+02	1.00E+00	7.69E-02	8.44E-06	3.33E-03	3.33E-03	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Isopropylbenzene	1.20E+02	1.21E+02	1.00E+00	6.50E-02	7.83E-06	3.95E-04	3.95E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,3-Dichlorobenzene	1.20E+02	1.21E+02	1.00E+00	4.14E-02	8.85E-06	2.55E-04	2.55E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,4-Dichlorobenzene	1.20E+02	1.21E+02	1.00E+00	6.90E-02	7.90E-06	4.26E-04	4.26E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,2-Dichlorobenzene	1.20E+02	1.21E+02	1.00E+00	6.90E-02	7.90E-06	4.28E-04	4.28E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,2,4-Trichlorobenzene	1.20E+02	1.21E+02	1.00E+00	3.00E-02	8.23E-06	1.95E-04	1.95E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Benzaldehyde	1.20E+02	1.21E+02	1.00E+00	7.30E-02	9.07E-06	1.23E-03	1.23E-03	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
2-Methylnaphthalene	1.20E+02	1.21E+02	1.00E+00	4.84E-02	7.75E-06	3.11E-04	3.11E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
2,4,5-Trichlorophenol	1.20E+02	1.21E+02	1.00E+00	2.91E-02	7.03E-06	3.87E-03	3.87E-03	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,1'-Biphenyl	1.20E+02	1.21E+02	1.00E+00	4.04E-02	8.15E-06	3.06E-04	3.06E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Acenaphthylene	1.20E+02	1.21E+02	1.00E+00	4.43E-02	7.44E-06	3.29E-04	3.29E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Acenaphthene	1.20E+02	1.21E+02	1.00E+00	4.21E-02	7.69E-06	3.68E-04	3.68E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Dibenzofuran	1.20E+02	1.21E+02	1.00E+00	2.67E-02	5.93E-06	1.65E-04	1.65E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Fluorene	1.20E+02	1.21E+02	1.00E+00	3.63E-02	7.88E-06	5.02E-04	5.02E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Phenanthrene	1.20E+02	1.21E+02	1.00E+00	3.30E-02	7.47E-06	3.31E-04	3.31E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Anthracene	1.20E+02	1.21E+02	1.00E+00	3.24E-02	7.74E-06	4.67E-04	4.67E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
C5-C8 Aliphatics	1.20E+02	1.21E+02	1.00E+00	8.00E-02	1.00E-05	4.85E-04	4.85E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
C9-C12 Aliphatics	1.20E+02	1.21E+02	1.00E+00	7.00E-02	1.00E-05	4.24E-04	4.24E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
C9-C10 Aromatics	1.20E+02	1.21E+02	1.00E+00	7.00E-02	1.00E-05	4.27E-04	4.27E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
C9-C18 Aliphatics	1.20E+02	1.21E+02	1.00E+00	7.00E-02	5.00E-06	4.24E-04	4.24E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
C11-C22 Aromatics	1.20E+02	1.21E+02	1.00E+00	6.00E-02	1.00E-05	3.95E-04	3.95E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03

TABLE 6-5
SOIL TO OUTDOOR AIR
SUBSURFACE SOIL- (2-15 feet)
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Whitney Barrel Property

	Viscosity of water at 10°C	Viscosity of water at system temp.	Density of water	Acceleration due to gravity	Vadose zone soil intrinsic permeability	Vadose zone residual soil water content	Vadose zone effective total fluid saturation	Vadose zone van Genuchten shape parameter	Vadose zone soil relative air permeability	Vadose zone soil effective vapor permeability	Thickness of soil between soilgas & trench
	μ_{w-10}	μ_w	ρ_w	g	$k_{i,v}$	$\theta_{r,v}$	S_{te}	M_v	k_{rg}	k_v	L_{soil}
Units:	g/cm-s	g/cm-s	g/cm^3	cm/s^2	cm^2	cm^3/cm^3	unitless	unitless	unitless	cm^2	cm
Formula:		(Note 16)	(0.999 for screening)		(Note 17)	lookup	(Note 18)	lookup	(Note 19)	(Note 20)	(1 for screening)
Analyte											
Trimethylbenzene, 1,2,4-	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Dichloroethylene, 1,2- (total)	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Trimethylbenzene, 1,3,5-	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
n-Butylbenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Naphthalene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Isopropyltoluene, 4-	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Butylbenzene, sec-	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Vinyl Chloride	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Ethyl Chloride	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,1-Dichloroethene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Trichloro-1,2,2-triflouroethan	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Acetone	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Carbon disulfide	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Methyl acetate	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Methylene chloride	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
trans-1,2-Dichloroethene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Methyl-Tertiary-Butyl Ether	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,1-Dichloroethane	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
cis-1,2-Dichloroethene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Butanone, 2- (MEK)	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,1,1-Trichloroethane	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Cyclohexane	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Benzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Trichloroethene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Methylcyclohexane	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Toluene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Tetrachloroethene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Chlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Ethylbenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Xylenes	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Isopropylbenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,3-Dichlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,4-Dichlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,2-Dichlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,2,4-Trichlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Benzaldehyde	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
2-Methylnaphthalene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
2,4,5-Trichlorophenol	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,1'-Biphenyl	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Acenaphthylene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Acenaphthene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Dibenzofuran	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Fluorene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Phenanthrene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Anthracene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
C5-C8 Aliphatics	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
C9-C12 Aliphatics	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
C9-C10 Aromatics	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
C9-C18 Aliphatics	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
C11-C22 Aromatics	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00

TABLE 6-5
SOIL TO OUTDOOR AIR
SUBSURFACE SOIL- (2-15 feet)
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Whitney Barrel Property

	Vapor viscosity at avg. soil temp.	Avg. Vapor Flow Rate Into trench	Infinite Source Attenuation Coeff.	Infinite Source Trench Conc.
	μ_{TS}	Q_{soil}	α	C_{trench}
Units:	g/cm-s	cm^3/s	unitless	$\mu g/m^3$
Formula:	0.00018*(T'$_s$/298.15)^0.5	(Note 5)	(Note 6)	C_{source} * α
Analyte				
Trimethylbenzene, 1,2,4-	1.75E-04	1.44E-03	8.50E-09	ND
Dichloroethylene, 1,2- (total)	1.75E-04	1.44E-03	8.50E-09	ND
Trimethylbenzene, 1,3,5-	1.75E-04	1.44E-03	8.50E-09	ND
n-Butylbenzene	1.75E-04	1.44E-03	8.50E-09	ND
Naphthalene	1.75E-04	1.44E-03	8.50E-09	5.04E-04
Isopropyltoluene, 4-	1.75E-04	1.44E-03	8.50E-09	ND
Butylbenzene, sec-	1.75E-04	1.44E-03	8.50E-09	ND
Vinyl Chloride	1.75E-04	1.44E-03	8.50E-09	1.14E-02
Ethyl Chloride	1.75E-04	1.44E-03	8.50E-09	1.16E-03
1,1-Dichloroethene	1.75E-04	1.44E-03	8.50E-09	2.76E-03
Trichloro-1,2,2-trifluoroethan	1.75E-04	1.44E-03	8.50E-09	2.79E-04
Acetone	1.75E-04	1.44E-03	8.50E-09	6.63E-05
Carbon disulfide	1.75E-04	1.44E-03	8.50E-09	9.84E-05
Methyl acetate	1.75E-04	1.44E-03	8.50E-09	8.38E-05
Methylene chloride	1.75E-04	1.44E-03	8.50E-09	9.30E-03
trans-1,2-Dichloroethene	1.75E-04	1.44E-03	8.50E-09	2.02E-03
Methyl-Tertiary-Butyl Ether	1.75E-04	1.44E-03	8.50E-09	ND
1,1-Dichloroethane	1.75E-04	1.44E-03	8.50E-09	7.94E-03
cis-1,2-Dichloroethene	1.75E-04	1.44E-03	8.50E-09	1.98E-03
Butanone, 2- (MEK)	1.75E-04	1.44E-03	8.50E-09	2.07E-06
1,1,1-Trichloroethane	1.75E-04	1.44E-03	8.50E-09	ND
Cyclohexane	1.75E-04	1.44E-03	8.50E-09	5.32E-03
Benzene	1.75E-04	1.44E-03	8.50E-09	1.24E-03
Trichloroethene	1.75E-04	1.44E-03	8.50E-09	4.89E-03
Methylcyclohexane	1.75E-04	1.44E-03	8.50E-09	8.69E-02
Toluene	1.75E-04	1.44E-03	8.50E-09	1.88E-02
Tetrachloroethene	1.75E-04	1.44E-03	8.50E-09	4.80E-03
Chlorobenzene	1.75E-04	1.44E-03	8.50E-09	1.83E-03
Ethylbenzene	1.75E-04	1.44E-03	8.50E-09	2.58E-03
Xylenes	1.75E-04	1.44E-03	8.50E-09	1.20E-05
Isopropylbenzene	1.75E-04	1.44E-03	8.50E-09	3.42E-05
1,3-Dichlorobenzene	1.75E-04	1.44E-03	8.50E-09	3.09E-04
1,4-Dichlorobenzene	1.75E-04	1.44E-03	8.50E-09	3.94E-04
1,2-Dichlorobenzene	1.75E-04	1.44E-03	8.50E-09	2.46E-05
1,2,4-Trichlorobenzene	1.75E-04	1.44E-03	8.50E-09	5.10E-05
Benzaldehyde	1.75E-04	1.44E-03	8.50E-09	2.85E-06
2-Methylnaphthalene	1.75E-04	1.44E-03	8.50E-09	4.30E-04
2,4,5-Trichlorophenol	1.75E-04	1.44E-03	8.50E-09	1.82E-07
1,1'-Biphenyl	1.75E-04	1.44E-03	8.50E-09	4.89E-05
Acenaphthylene	1.75E-04	1.44E-03	8.50E-09	1.99E-07
Acenaphthene	1.75E-04	1.44E-03	8.50E-09	3.24E-05
Dibenzofuran	1.75E-04	1.44E-03	8.50E-09	9.76E-06
Fluorene	1.75E-04	1.44E-03	8.50E-09	1.01E-06
Phenanthrene	1.75E-04	1.44E-03	8.50E-09	7.85E-06
Anthracene	1.75E-04	1.44E-03	8.50E-09	8.85E-07
C5-C8 Aliphatics	1.75E-04	1.44E-03	8.50E-09	7.14E+00
C9-C12 Aliphatics	1.75E-04	1.44E-03	8.50E-09	2.72E-01
C9-C10 Aromatics	1.75E-04	1.44E-03	8.50E-09	3.81E-01
C9-C18 Aliphatics	1.75E-04	1.44E-03	8.50E-09	2.67E+00
C11-C22 Aromatics	1.75E-04	1.44E-03	8.50E-09	1.05E-01

TABLE 6-5
SOIL TO OUTDOOR AIR
SUBSURFACE SOIL- (2-15 feet)
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Whitney Barrel Property

Notes:

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

(1) Assumed equivalent to D_i^{eff} of soil layer i in contact with the floor

(2) For screening, assume a trench 4 ft deep, 3 ft wide, and 30 ft long.

(3) Depth to water table minus depth to bottom of floor must be > thickness of capillary fringe, which is based on the soil type (typ. around 30 cm). Use 400 cm for screening purposes.

(4) $D_T^{eff} = L_T / (L_T / D_v^{eff})$

(5) $Q_{soil} = (2*\pi*\Delta P*k_v*X_{crack}) / (\mu_{TS}*\ln(2*Z_{crack}/r_{crack}))$

(6) $\alpha = [(D_T^{eff}*A_B/(Q_{building}*L_T))*EXP(Q_{soil}*L_{crack}/(D^{crack}*A_{crack}))]/[EXP(Q_{soil}*L_{crack}/(D^{crack}*A_{crack}))+(D_T^{eff}*A_B/(Q_{building}*L_T))+(D_T^{eff}*A_B/(Q_{soil}*L_T))*(EXP(Q_{soil}*L_{crack}/(D^{crack}*A_{crack}))-1)]$

(7) A function of the ratio T_B/T_C:

T_B/T_C	n
<0.57	0.30
0.57-0.71	$0.74(T_B/T_C)-0.116$
>0.71	0.41

(8) $\Delta H_{vTS} = \Delta H_{vB}*[(1-T_S/T_C)/(1-T_B/T_C)]^n$

(9) $H_{TS} = EXP[-\Delta H_{vTS}/R_u*(1/T_S-1/T_R)]*H_R$

(10) Refer to 12 SCS soil types - use SC for screening.

(11) Refer to 12 SCS soil types - use SCL for screening.

(12) $L_{ss} = 0.15 / (0.2 * D_{ss})$

(13) $D_v^{eff} = D_a*(\theta_{av}^{3.33}/n_v^2)+(D_w/H'_{TS})(\theta_{wv}^{3.33}/n_v^2)$

(14) $D_{ss}^{eff} = D_a*(\theta_{ass}^{3.33}/n_{ss}^2)+(D_w/H'_{TS})(\theta_{wss}^{3.33}/n_{ss}^2)$

(15) $\theta_{wss} = \theta_{r,ss}+((\theta_{s,ss}-\theta_{r,ss})/(2^{M_{ss}}))$, where the value 2 in the formula is used for screening, but may be refined based on soil parameters (see USEPA, 1999).

(16) $\mu_w = \mu_{w,10} * (T'_S / 283.15)^{0.8}$

(17) $k_{r,v} = K_{r,v} * 1/Conv02 * \mu_w / (\rho_w * g)$

(18) $S_{ss} = (\theta_{w,v} - \theta_{r,v}) / (n_v - \theta_{r,v})$

(19) $k_{rs} = (1 - S_{ss})^{0.5} * (1-S_{ss}^{1/M_{ss}})^{2M_{ss}}$

(20) $k_v = k_{i,v} * k_{rs}$; note that the model is very sensitive to this parameter and if site-specific values are available, they should be used.

(21) $C_{source} = H'_{TS} * C_R * Conv01 * \rho_b / (\theta_{w,v} + K_d * \rho_b + H'_{TS} * \theta_{a,v}) * Conv02$

(22) For screening, assume a trench 4 ft deep, 3 ft wide, 30 ft long and an air exchange rate of 60/hr. The air exchange rate is based on the assumption that the wind speed in the trench is a small fraction of the ground wind speed and that it could take up to 1 minute for a contaminant to be cleared from the trench air space.

TABLE 6-5
SOIL TO OUTDOOR AIR
SUBSURFACE SOIL - (2-15 feet)
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Murphy Waste Oil

Units: / Formula:	Soil EPC CR µg/kg Input	Soil Temp. T_S °C (10 for screening)	Soil Temp. T'_S K (T_S + 273.15)	Henry's Law Constant at ref. temp. H_R atm-m³/mol lookup	Henry's Law Reference Temp. T_R K (lookup+273.15)	Normal Boiling Point T_B K lookup	Enthalpy of vaporization at T_S ΔH_{vB} cal/mol lookup	Critical Temp. T_C K lookup	constant n unitless (Note 7)	Enthalpy of vaporization at T_S ΔH_{vTS} cal/mol (Note 8)	Gas Constant R_c cal/mol-K	Henry's Law Constant at T_S H_{TS} atm-m³/mol (Note 9)	Gas Constant R m³-atm/mol-K	Henry's Law Constant H'_{TS} unitless H_{TS} / (R * T_S)
Analyte														
Trimethylbenzene, 1,2,4-	4.50E+04	1.00E+01	2.83E+02	5.70E-03	2.98E+02	4.42E+02	1.25E+03	6.49E+02	3.88E-01	1.55E+03	1.99E+00	5.70E-03	8.21E-05	2.45E-01
Dichloroethylene, 1,2- (total)	1.56E+03	1.00E+01	2.83E+02	4.07E-03	2.98E+02	3.28E+02	1.32E+03	4.92E+02	3.77E-01	1.45E+03	1.99E+00	4.07E-03	8.21E-05	1.75E-01
Trimethylbenzene, 1,3,5-	1.90E+04	1.00E+01	2.83E+02	7.81E-03	2.98E+02	4.42E+02	1.25E+03	6.49E+02	3.88E-01	1.55E+03	1.99E+00	7.81E-03	8.21E-05	3.36E-01
n-Butylbenzene	4.00E+02	1.00E+01	2.83E+02	1.25E-02	2.98E+02	4.56E+02	1.23E+03	6.84E+02	3.77E-01	1.53E+03	1.99E+00	1.25E-02	8.21E-05	5.38E-01
Naphthalene	2.70E+04	1.00E+01	2.83E+02	4.83E-04	2.98E+02	4.91E+02	1.04E+04	7.48E+02	3.70E-01	1.29E+04	1.99E+00	4.83E-04	8.21E-05	2.08E-02
Isopropyltoluene, 4-	2.00E+02	1.00E+01	2.83E+02	8.60E+00	2.98E+02	4.50E+02	1.24E+03	6.52E+02	3.95E-01	1.57E+03	1.99E+00	8.60E+00	8.21E-05	3.70E+02
Butylbenzene, sec-	2.60E+02	1.00E+01	2.83E+02	1.67E-02	2.98E+02	4.47E+02	1.24E+03	6.70E+02	3.77E-01	1.53E+03	1.99E+00	1.67E-02	8.21E-05	7.19E-01
Vinyl Chloride	ND	1.00E+01	2.83E+02	2.71E-02	2.98E+02	2.59E+02	5.25E+03	4.32E+02	3.28E-01	5.00E+03	1.99E+00	2.71E-02	8.21E-05	1.17E+00
Ethyl Chloride	ND	1.00E+01	2.83E+02	1.09E-02	2.98E+02	2.85E+02	1.36E+03	4.28E+02	3.77E-01	1.37E+03	1.99E+00	1.09E-02	8.21E-05	4.69E-01
1,1-Dichloroethene	1.10E+00	1.00E+01	2.83E+02	2.61E-02	2.98E+02	3.05E+02	6.25E+03	5.76E+02	3.00E-01	6.39E+03	1.99E+00	2.61E-02	8.21E-05	1.12E+00
Trichloro-1,2,2-trifluoroethane, 1,1	ND	1.00E+01	2.83E+02	5.17E-01	2.98E+02	3.21E+02	1.33E+03	4.81E+02	3.77E-01	1.44E+03	1.99E+00	5.17E-01	8.21E-05	2.23E+01
Acetone	1.30E+04	1.00E+01	2.83E+02	3.88E-05	2.98E+02	3.29E+02	6.96E+03	5.08E+02	3.63E-01	7.56E+03	1.99E+00	3.88E-05	8.21E-05	1.67E-03
Carbon disulfide	ND	1.00E+01	2.83E+02	3.02E-02	2.98E+02	3.19E+02	6.39E+03	5.52E+02	3.12E-01	6.68E+03	1.99E+00	3.02E-02	8.21E-05	1.30E+00
Methyl acetate	ND	1.00E+01	2.83E+02	1.13E-04	2.98E+02	3.65E+02	1.31E+03	5.48E+02	3.77E-01	1.50E+03	1.99E+00	1.13E-04	8.21E-05	4.86E-03
Methylene chloride	2.08E+04	1.00E+01	2.83E+02	2.19E-03	2.98E+02	3.13E+02	6.71E+03	5.10E+02	3.38E-01	7.03E+03	1.99E+00	2.19E-03	8.21E-05	9.43E-02
trans-1,2-Dichloroethene	2.40E+03	1.00E+01	2.83E+02	9.39E-03	2.98E+02	3.21E+02	6.72E+03	5.17E+02	3.44E-01	7.14E+03	1.99E+00	9.39E-03	8.21E-05	4.04E-01
Methyl-Tertiary-Butyl Ether	ND	1.00E+01	2.83E+02	5.87E-04	2.98E+02	3.28E+02	1.32E+03	4.97E+02	3.73E-01	1.45E+03	1.99E+00	5.87E-04	8.21E-05	2.53E-02
1,1-Dichloroethane	8.70E+02	1.00E+01	2.83E+02	5.61E-03	2.98E+02	3.31E+02	6.90E+03	5.23E+02	3.52E-01	7.45E+03	1.99E+00	5.61E-03	8.21E-05	2.41E-01
cis-1,2-Dichloroethene	1.00E+04	1.00E+01	2.83E+02	4.07E-03	2.98E+02	3.34E+02	7.19E+03	5.44E+02	3.38E-01	7.73E+03	1.99E+00	4.07E-03	8.21E-05	1.75E-01
Butanone, 2- (MEK)	5.19E+03	1.00E+01	2.83E+02	5.60E-05	2.98E+02	3.53E+02	1.31E+03	5.29E+02	3.77E-01	1.49E+03	1.99E+00	5.60E-05	8.21E-05	2.41E-03
1,1,1-Trichloroethane	2.10E+03	1.00E+01	2.83E+02	1.72E-02	2.98E+02	3.47E+02	7.14E+03	5.45E+02	3.55E-01	7.88E+03	1.99E+00	1.72E-02	8.21E-05	7.40E-01
Cyclohexane	ND	1.00E+01	2.83E+02	2.00E+00	2.98E+02	3.54E+02	1.31E+03	5.31E+02	3.77E-01	1.49E+03	1.99E+00	2.00E+00	8.21E-05	8.61E+01
Benzene	5.50E+02	1.00E+01	2.83E+02	5.55E-03	2.98E+02	3.53E+02	7.34E+03	5.62E+02	3.49E-01	8.12E+03	1.99E+00	5.55E-03	8.21E-05	2.39E-01
Trichloroethene	2.08E+03	1.00E+01	2.83E+02	1.03E-02	2.98E+02	3.60E+02	7.51E+03	5.44E+02	3.74E-01	8.56E+03	1.99E+00	1.03E-02	8.21E-05	4.43E-01
Methylcyclohexane	ND	1.00E+01	2.83E+02	4.23E-01	2.98E+02	3.74E+02	1.30E+03	5.61E+02	3.77E-01	1.51E+03	1.99E+00	4.23E-01	8.21E-05	1.82E+01
Toluene	1.20E+04	1.00E+01	2.83E+02	6.64E-03	2.98E+02	3.84E+02	7.93E+03	5.92E+02	3.64E-01	9.15E+03	1.99E+00	6.64E-03	8.21E-05	2.86E-01
Tetrachloroethene	3.00E+02	1.00E+01	2.83E+02	1.84E-02	2.98E+02	3.94E+02	8.29E+03	6.20E+02	3.55E-01	9.55E+03	1.99E+00	1.84E-02	8.21E-05	7.92E-01
Chlorobenzene	ND	1.00E+01	2.83E+02	3.71E-03	2.98E+02	4.05E+02	8.41E+03	6.32E+02	3.58E-01	9.80E+03	1.99E+00	3.71E-03	8.21E-05	1.60E-01
Ethylbenzene	7.60E+03	1.00E+01	2.83E+02	7.88E-03	2.98E+02	4.09E+02	8.50E+03	6.17E+02	3.75E-01	1.02E+04	1.99E+00	7.88E-03	8.21E-05	3.39E-01
Xylenes	4.80E+04	1.00E+01	2.83E+02	6.73E-06	2.98E+02	4.17E+02	1.26E+03	6.16E+02	3.85E-01	1.54E+03	1.99E+00	6.73E-06	8.21E-05	2.90E-04
Isopropylbenzene	ND	1.00E+01	2.83E+02	1.47E-02	2.98E+02	4.25E+02	1.26E+03	6.31E+02	3.83E-01	1.54E+03	1.99E+00	1.47E-02	8.21E-05	6.33E-01
1,3-Dichlorobenzene	ND	1.00E+01	2.83E+02	4.70E-03	2.98E+02	4.46E+02	1.24E+03	6.84E+02	3.67E-01	1.50E+03	1.99E+00	4.70E-03	8.21E-05	2.02E-01
1,4-Dichlorobenzene	ND	1.00E+01	2.83E+02	2.43E-03	2.98E+02	4.47E+02	9.27E+03	6.85E+02	3.67E-01	1.12E+04	1.99E+00	2.43E-03	8.21E-05	1.05E-01
1,2-Dichlorobenzene	1.20E+04	1.00E+01	2.83E+02	1.90E-03	2.98E+02	4.54E+02	9.70E+03	7.05E+02	3.60E-01	1.17E+04	1.99E+00	1.90E-03	8.21E-05	8.18E-02
1,2,4-Trichlorobenzene	ND	1.00E+01	2.83E+02	1.42E-03	2.98E+02	4.86E+02	1.05E+04	7.25E+02	3.80E-01	1.32E+04	1.99E+00	1.42E-03	8.21E-05	6.11E-02
Benzaldehyde	4.90E+01	1.00E+01	2.83E+02	2.62E-05	2.98E+02	4.52E+02	0.00E+00	6.78E+02	3.77E-01	0.00E+00	1.99E+00	2.62E-05	8.21E-05	1.13E-03
2-Methylnaphthalene	2.20E+03	1.00E+01	2.83E+02	1.01E-03	2.98E+02	5.14E+02	1.17E+03	7.61E+02	3.84E-01	1.51E+03	1.99E+00	1.01E-03	8.21E-05	4.36E-02
2,4,5-Trichlorophenol	ND	1.00E+01	2.83E+02	4.34E-06	2.98E+02	5.26E+02	1.30E+04	7.59E+02	3.97E-01	1.73E+04	1.99E+00	4.34E-06	8.21E-05	1.87E-04
1,1'-Biphenyl	ND	1.00E+01	2.83E+02	3.03E-04	2.98E+02	5.29E+02	1.15E+03	7.94E+02	3.77E-01	1.47E+03	1.99E+00	3.03E-04	8.21E-05	1.30E-02
Acenaphthylene	3.20E+03	1.00E+01	2.83E+02	2.80E-04	2.98E+02	5.53E+02	1.12E+03	7.92E+02	4.01E-01	1.51E+03	1.99E+00	2.80E-04	8.21E-05	1.21E-02
Acenaphthene	5.10E+03	1.00E+01	2.83E+02	1.55E-04	2.98E+02	5.51E+02	1.22E+04	8.03E+02	3.91E-01	1.61E+04	1.99E+00	1.55E-04	8.21E-05	6.67E-03
Dibenzofuran	ND	1.00E+01	2.83E+02	4.00E-03	2.98E+02	5.59E+02	1.11E+03	8.24E+02	3.86E-01	1.47E+03	1.99E+00	4.00E-03	8.21E-05	1.72E-01
Fluorene	7.00E+02	1.00E+01	2.83E+02	6.37E-05	2.98E+02	5.70E+02	1.27E+04	8.70E+02	3.69E-01	1.62E+04	1.99E+00	6.37E-05	8.21E-05	2.74E-03
Phenanthrene	9.00E+03	1.00E+01	2.83E+02	1.30E-04	2.98E+02	6.13E+02	1.06E+03	8.69E+02	4.06E-01	1.48E+03	1.99E+00	1.30E-04	8.21E-05	5.59E-03
Anthracene	2.60E+03	1.00E+01	2.83E+02	6.51E-05	2.98E+02	6.15E+02	1.31E+04	8.73E+02	4.05E-01	1.84E+04	1.99E+00	6.51E-05	8.21E-05	2.80E-03
C5-C8 Aliphatics	1.00E+03	1.00E+01	2.83E+02	1.30E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.30E+00	8.21E-05	5.58E+01
C9-C12 Aliphatics	1.00E+03	1.00E+01	2.83E+02	1.56E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.56E+00	8.21E-05	6.71E+01
C9-C10 Aromatics	ND	1.00E+01	2.83E+02	7.92E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	7.92E-03	8.21E-05	3.41E-01
C9-C18 Aliphatics	ND	1.00E+01	2.83E+02	1.65E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.65E+00	8.21E-05	7.10E+01
C11-C22 Aromatics	7.20E+07	1.00E+01	2.83E+02	7.17E-04	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	7.17E-04	8.21E-05	3.09E-02

TABLE 6-5 (continued)
SOIL TO OUTDOOR AIR
SUBSURFACE SOIL - (2-15 feet)
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Murphy Waste Oil

	Conversion Factor µg/kg to g/g	SCS soil type in vadose zone	Vadose zone soil dry bulk density	Vadose zone soil water-filled porosity	Organic carbon partition coefficient	Vadose zone organic carbon fraction	Soil-water partition coefficient	Vadose zone soil total porosity	Vadose zone soil air-filled porosity	Conversion Factor g/cm³ to µg/m³	Source Vapor Conc.
	Conv01	ST_v	ρ_b	θ_{wv}	K_{oc}	$f_{oc,v}$	K_d	n_v	θ_{av}	Conv03	C_{source}
Units:	µg/kg / g/g	unitless	g/cm³	cm³/cm³	cm³/g	unitless	cm³/g	cm³/cm³	cm³/cm³	g/cm³ / µg/m³	µg/m³
Formula:		(Note 11)	(1.5 for screening)	(0.3 for screening)	lookup	(0.002 for screening)	$K_{oc} * f_{oc}$	(0.43 for screening)	$n_v - \theta_{wv}$		(Note 21)
Analyte											
Trimethylbenzene, 1,2,4-	1.00E-09	LS	1.50E+00	3.00E-01	3.72E+03	2.00E-03	7.43E+00	4.30E-01	1.30E-01	1.00E+12	1.44E+06
Dichloroethylene, 1,2- (total)	1.00E-09	LS	1.50E+00	3.00E-01	4.38E+01	2.00E-03	8.76E-02	4.30E-01	1.30E-01	1.00E+12	9.01E+05
Trimethylbenzene, 1,3,5-	1.00E-09	LS	1.50E+00	3.00E-01	1.67E+03	2.00E-03	3.34E+00	4.30E-01	1.30E-01	1.00E+12	1.79E+06
n-Butylbenzene	1.00E-09	LS	1.50E+00	3.00E-01	2.51E+03	2.00E-03	5.02E+00	4.30E-01	1.30E-01	1.00E+12	4.08E+04
Naphthalene	1.00E-09	LS	1.50E+00	3.00E-01	2.00E+03	2.00E-03	4.00E+00	4.30E-01	1.30E-01	1.00E+12	1.34E+05
Isopropyltoluene, 4-	1.00E-09	LS	1.50E+00	3.00E-01	1.58E+03	2.00E-03	3.16E+00	4.30E-01	1.30E-01	1.00E+12	2.09E+06
Butylbenzene, sec-	1.00E-09	LS	1.50E+00	3.00E-01	3.11E+04	2.00E-03	6.22E+01	4.30E-01	1.30E-01	1.00E+12	2.99E+03
Vinyl Chloride	1.00E-09	LS	1.50E+00	3.00E-01	1.86E+01	2.00E-03	3.72E-02	4.30E-01	1.30E-01	1.00E+12	ND
Ethyl Chloride	1.00E-09	LS	1.50E+00	3.00E-01	2.73E+01	2.00E-03	5.46E-02	4.30E-01	1.30E-01	1.00E+12	ND
1,1-Dichloroethene	1.00E-09	LS	1.50E+00	3.00E-01	5.89E+01	2.00E-03	1.18E-01	4.30E-01	1.30E-01	1.00E+12	2.98E+03
Trichloro-1,2,2-trifluoroetha	1.00E-09	LS	1.50E+00	3.00E-01	2.25E+02	2.00E-03	4.50E-01	4.30E-01	1.30E-01	1.00E+12	ND
Acetone	1.00E-09	LS	1.50E+00	3.00E-01	5.75E-01	2.00E-03	1.15E-03	4.30E-01	1.30E-01	1.00E+12	1.08E+05
Carbon disulfide	1.00E-09	LS	1.50E+00	3.00E-01	4.57E+01	2.00E-03	9.14E-02	4.30E-01	1.30E-01	1.00E+12	ND
Methyl acetate	1.00E-09	LS	1.50E+00	3.00E-01	3.32E+00	2.00E-03	6.64E-03	4.30E-01	1.30E-01	1.00E+12	ND
Methylene chloride	1.00E-09	LS	1.50E+00	3.00E-01	1.17E+01	2.00E-03	2.34E-02	4.30E-01	1.30E-01	1.00E+12	8.45E+06
trans-1,2-Dichloroethene	1.00E-09	LS	1.50E+00	3.00E-01	5.25E+01	2.00E-03	1.05E-01	4.30E-01	1.30E-01	1.00E+12	2.85E+06
Methyl-Tertiary-Butyl Ether	1.00E-09	LS	1.50E+00	3.00E-01	3.84E+01	2.00E-03	7.68E-02	4.30E-01	1.30E-01	1.00E+12	ND
1,1-Dichloroethane	1.00E-09	LS	1.50E+00	3.00E-01	3.16E+01	2.00E-03	6.32E-02	4.30E-01	1.30E-01	1.00E+12	7.39E+05
cis-1,2-Dichloroethene	1.00E-09	LS	1.50E+00	3.00E-01	3.55E+01	2.00E-03	7.10E-02	4.30E-01	1.30E-01	1.00E+12	6.12E+06
Butanone, 2- (MEK)	1.00E-09	LS	1.50E+00	3.00E-01	3.83E+00	2.00E-03	7.66E-03	4.30E-01	1.30E-01	1.00E+12	6.02E+04
1,1,1-Trichloroethane	1.00E-09	LS	1.50E+00	3.00E-01	1.10E+02	2.00E-03	2.20E-01	4.30E-01	1.30E-01	1.00E+12	3.21E+06
Cyclohexane	1.00E-09	LS	1.50E+00	3.00E-01	1.60E+02	2.00E-03	3.20E-01	4.30E-01	1.30E-01	1.00E+12	ND
Benzene	1.00E-09	LS	1.50E+00	3.00E-01	6.17E+01	2.00E-03	1.23E-01	4.30E-01	1.30E-01	1.00E+12	3.82E+05
Trichloroethene	1.00E-09	LS	1.50E+00	3.00E-01	1.66E+02	2.00E-03	3.32E-01	4.30E-01	1.30E-01	1.00E+12	1.61E+06
Methylcyclohexane	1.00E-09	LS	1.50E+00	3.00E-01	2.68E+02	2.00E-03	5.36E-01	4.30E-01	1.30E-01	1.00E+12	ND
Toluene	1.00E-09	LS	1.50E+00	3.00E-01	1.40E+02	2.00E-03	2.80E-01	4.30E-01	1.30E-01	1.00E+12	6.79E+06
Tetrachloroethene	1.00E-09	LS	1.50E+00	3.00E-01	2.65E+02	2.00E-03	5.30E-01	4.30E-01	1.30E-01	1.00E+12	2.97E+05
Chlorobenzene	1.00E-09	LS	1.50E+00	3.00E-01	2.19E+02	2.00E-03	4.38E-01	4.30E-01	1.30E-01	1.00E+12	ND
Ethylbenzene	1.00E-09	LS	1.50E+00	3.00E-01	2.04E+02	2.00E-03	4.08E-01	4.30E-01	1.30E-01	1.00E+12	4.04E+06
Xylenes	1.00E-09	LS	1.50E+00	3.00E-01	2.41E+02	2.00E-03	4.82E-01	4.30E-01	1.30E-01	1.00E+12	2.04E+04
Isopropylbenzene	1.00E-09	LS	1.50E+00	3.00E-01	9.31E+03	2.00E-03	1.86E+01	4.30E-01	1.30E-01	1.00E+12	ND
1,3-Dichlorobenzene	1.00E-09	LS	1.50E+00	3.00E-01	1.70E+02	2.00E-03	3.40E-01	4.30E-01	1.30E-01	1.00E+12	ND
1,4-Dichlorobenzene	1.00E-09	LS	1.50E+00	3.00E-01	6.17E+02	2.00E-03	1.23E+00	4.30E-01	1.30E-01	1.00E+12	ND
1,2-Dichlorobenzene	1.00E-09	LS	1.50E+00	3.00E-01	6.17E+02	2.00E-03	1.23E+00	4.30E-01	1.30E-01	1.00E+12	6.81E+05
1,2,4-Trichlorobenzene	1.00E-09	LS	1.50E+00	3.00E-01	1.78E+03	2.00E-03	3.56E+00	4.30E-01	1.30E-01	1.00E+12	ND
Benzaldehyde	1.00E-09	LS	1.50E+00	3.00E-01	3.27E+01	2.00E-03	6.54E-02	4.30E-01	1.30E-01	1.00E+12	2.08E+02
2-Methylnaphthalene	1.00E-09	LS	1.50E+00	3.00E-01	8.51E+03	2.00E-03	1.70E+01	4.30E-01	1.30E-01	1.00E+12	5.57E+03
2,4,5-Trichlorophenol	1.00E-09	LS	1.50E+00	3.00E-01	1.60E+03	2.00E-03	3.20E+00	4.30E-01	1.30E-01	1.00E+12	ND
1,1'-Biphenyl	1.00E-09	LS	1.50E+00	3.00E-01	6.25E+03	2.00E-03	1.25E+01	4.30E-01	1.30E-01	1.00E+12	ND
Acenaphthylene	1.00E-09	LS	1.50E+00	3.00E-01	4.79E+03	2.00E-03	9.57E+00	4.30E-01	1.30E-01	1.00E+12	3.95E+03
Acenaphthene	1.00E-09	LS	1.50E+00	3.00E-01	7.08E+03	2.00E-03	1.42E+01	4.30E-01	1.30E-01	1.00E+12	2.37E+03
Dibenzofuran	1.00E-09	LS	1.50E+00	3.00E-01	8.13E+03	2.00E-03	1.63E+01	4.30E-01	1.30E-01	1.00E+12	ND
Fluorene	1.00E-09	LS	1.50E+00	3.00E-01	1.38E+04	2.00E-03	2.76E+01	4.30E-01	1.30E-01	1.00E+12	6.90E+01
Phenanthrene	1.00E-09	LS	1.50E+00	3.00E-01	1.41E+04	2.00E-03	2.83E+01	4.30E-01	1.30E-01	1.00E+12	1.77E+03
Anthracene	1.00E-09	LS	1.50E+00	3.00E-01	2.95E+04	2.00E-03	5.90E+01	4.30E-01	1.30E-01	1.00E+12	1.23E+02
C5-C8 Aliphatics	1.00E-09	LS	1.50E+00	3.00E-01	2.27E+03	2.00E-03	4.53E+00	4.30E-01	1.30E-01	1.00E+12	5.83E+06
C9-C12 Aliphatics	1.00E-09	LS	1.50E+00	3.00E-01	1.50E+05	2.00E-03	3.00E+02	4.30E-01	1.30E-01	1.00E+12	2.19E+05
C9-C10 Aromatics	1.00E-09	LS	1.50E+00	3.00E-01	1.78E+03	2.00E-03	3.56E+00	4.30E-01	1.30E-01	1.00E+12	ND
C9-C18 Aliphatics	1.00E-09	LS	1.50E+00	3.00E-01	6.80E+05	2.00E-03	1.36E+03	4.30E-01	1.30E-01	1.00E+12	ND
C11-C22 Aromatics	1.00E-09	LS	1.50E+00	3.00E-01	5.00E+03	2.00E-03	1.00E+01	4.30E-01	1.30E-01	1.00E+12	2.18E+08

TABLE 6-5 (continued)
SOIL TO OUTDOOR AIR
SUBSURFACE SOIL - (2-15 feet)

	Depth below grade to bottom of trench	Depth below grade to contamination	Source Trench Separation	Diffusivity in air	Diffusivity in water	Vadose zone Effective Diffusion Coeff.	Total Overall Effective Diffusion Coeff.	Area of Trench Below Grade	Trench Ventilation Rate	Pressure Diff. between soil & enclosed space	Vadose zone soil saturated hydraulic conductivity	Conversion Factor hr to s
	L_F	L_1	L_T	D_a	D_w	D_v^{eff}	D_T^{eff}	A_B	Q_{trench}	ΔP	$K_{s,v}$	Conv02
Units:	cm	cm	cm	cm^2/s	cm^2/s	cm^2/s	cm^2/s	cm^2	cm^3/s	$g/cm\text{-}s^2$	cm/hr	s/hr
Formula:	(120 (4') for screening)	(121 for screening)	$L_1 - L_F$	lookup	lookup	(Note 13)	(Note 4)	(Note 2)	(Note 22)	(40 for screening)	lookup	
Analyte												
Trimethylbenzene, 1,2,4-	1.20E+02	1.21E+02	1.00E+00	7.80E-02	9.03E-06	4.76E-04	4.76E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Dichloroethylene, 1,2- (total)	1.20E+02	1.21E+02	1.00E+00	1.23E-01	9.38E-06	7.51E-04	7.51E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Trimethylbenzene, 1,3,5-	1.20E+02	1.21E+02	1.00E+00	6.48E-02	7.86E-06	3.95E-04	3.95E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
n-Butylbenzene	1.20E+02	1.21E+02	1.00E+00	7.25E-02	8.39E-06	4.41E-04	4.41E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Naphthalene	1.20E+02	1.21E+02	1.00E+00	5.90E-02	7.50E-06	3.93E-04	3.93E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Isopropyltoluene, 4-	1.20E+02	1.21E+02	1.00E+00	7.25E-02	8.39E-06	4.39E-04	4.39E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Butylbenzene, sec-	1.20E+02	1.21E+02	1.00E+00	8.00E-02	8.00E-06	4.86E-04	4.86E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Vinyl Chloride	1.20E+02	1.21E+02	1.00E+00	1.06E-01	1.23E-06	6.42E-04	6.42E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Ethyl Chloride	1.20E+02	1.21E+02	1.00E+00	2.71E-01	1.15E-05	1.64E-03	1.64E-03	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,1-Dichloroethene	1.20E+02	1.21E+02	1.00E+00	9.00E-02	1.04E-05	5.46E-04	5.46E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Trichloro-1,2,2-trifluoroetha	1.20E+02	1.21E+02	1.00E+00	2.88E-02	8.07E-06	1.75E-04	1.75E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Acetone	1.20E+02	1.21E+02	1.00E+00	1.24E-01	1.14E-05	1.42E-03	1.42E-03	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Carbon disulfide	1.20E+02	1.21E+02	1.00E+00	1.04E-01	1.00E-05	6.31E-04	6.31E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Methyl acetate	1.20E+02	1.21E+02	1.00E+00	1.04E-01	1.00E-05	8.32E-04	8.32E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Methylene chloride	1.20E+02	1.21E+02	1.00E+00	1.01E-01	1.17E-05	6.24E-04	6.24E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
trans-1,2-Dichloroethene	1.20E+02	1.21E+02	1.00E+00	7.07E-02	1.19E-05	4.31E-04	4.31E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Methyl-Tertiary-Butyl Ether	1.20E+02	1.21E+02	1.00E+00	1.02E-01	1.05E-05	6.61E-04	6.61E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,1-Dichloroethane	1.20E+02	1.21E+02	1.00E+00	7.42E-02	1.05E-05	4.54E-04	4.54E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
cis-1,2-Dichloroethene	1.20E+02	1.21E+02	1.00E+00	7.36E-02	1.13E-05	4.52E-04	4.52E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Butanone, 2- (MEK)	1.20E+02	1.21E+02	1.00E+00	8.08E-02	9.80E-06	8.89E-04	8.89E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,1,1-Trichloroethane	1.20E+02	1.21E+02	1.00E+00	7.80E-02	8.80E-06	4.74E-04	4.74E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Cyclohexane	1.20E+02	1.21E+02	1.00E+00	8.00E-02	9.00E-06	4.85E-04	4.85E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Benzene	1.20E+02	1.21E+02	1.00E+00	8.80E-02	9.80E-06	5.37E-04	5.37E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Trichloroethene	1.20E+02	1.21E+02	1.00E+00	7.90E-02	9.10E-06	4.81E-04	4.81E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Methylcyclohexane	1.20E+02	1.21E+02	1.00E+00	9.86E-02	8.52E-06	5.98E-04	5.98E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Toluene	1.20E+02	1.21E+02	1.00E+00	8.70E-02	8.60E-06	5.30E-04	5.30E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Tetrachloroethene	1.20E+02	1.21E+02	1.00E+00	7.20E-02	8.20E-06	4.37E-04	4.37E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Chlorobenzene	1.20E+02	1.21E+02	1.00E+00	7.30E-02	8.70E-06	4.48E-04	4.48E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Ethylbenzene	1.20E+02	1.21E+02	1.00E+00	7.50E-02	7.80E-06	4.57E-04	4.57E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Xylenes	1.20E+02	1.21E+02	1.00E+00	7.69E-02	8.44E-06	3.33E-03	3.33E-03	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Isopropylbenzene	1.20E+02	1.21E+02	1.00E+00	6.50E-02	7.83E-06	3.95E-04	3.95E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,3-Dichlorobenzene	1.20E+02	1.21E+02	1.00E+00	4.14E-02	8.85E-06	2.55E-04	2.55E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,4-Dichlorobenzene	1.20E+02	1.21E+02	1.00E+00	6.90E-02	7.90E-06	4.26E-04	4.26E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,2-Dichlorobenzene	1.20E+02	1.21E+02	1.00E+00	6.90E-02	7.90E-06	4.28E-04	4.28E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,2,4-Trichlorobenzene	1.20E+02	1.21E+02	1.00E+00	3.00E-02	8.23E-06	1.95E-04	1.95E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Benzaldehyde	1.20E+02	1.21E+02	1.00E+00	7.30E-02	9.07E-06	1.23E-03	1.23E-03	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
2-Methylnaphthalene	1.20E+02	1.21E+02	1.00E+00	4.84E-02	7.75E-06	3.11E-04	3.11E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
2,4,5-Trichlorophenol	1.20E+02	1.21E+02	1.00E+00	2.91E-02	7.03E-06	3.87E-03	3.87E-03	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
1,1'-Biphenyl	1.20E+02	1.21E+02	1.00E+00	4.04E-02	8.15E-06	3.06E-04	3.06E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Acenaphthylene	1.20E+02	1.21E+02	1.00E+00	4.43E-02	7.44E-06	3.29E-04	3.29E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Acenaphthene	1.20E+02	1.21E+02	1.00E+00	4.21E-02	7.69E-06	3.68E-04	3.68E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Dibenzofuran	1.20E+02	1.21E+02	1.00E+00	2.67E-02	5.93E-06	1.65E-04	1.65E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Fluorene	1.20E+02	1.21E+02	1.00E+00	3.63E-02	7.88E-06	5.02E-04	5.02E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Phenanthrene	1.20E+02	1.21E+02	1.00E+00	3.30E-02	7.47E-06	3.31E-04	3.31E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
Anthracene	1.20E+02	1.21E+02	1.00E+00	3.24E-02	7.74E-06	4.67E-04	4.67E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
C5-C8 Aliphatics	1.20E+02	1.21E+02	1.00E+00	8.00E-02	1.00E-05	4.85E-04	4.85E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
C9-C12 Aliphatics	1.20E+02	1.21E+02	1.00E+00	7.00E-02	1.00E-05	4.24E-04	4.24E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
C9-C10 Aromatics	1.20E+02	1.21E+02	1.00E+00	7.00E-02	1.00E-05	4.27E-04	4.27E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
C9-C18 Aliphatics	1.20E+02	1.21E+02	1.00E+00	7.00E-02	5.00E-06	4.24E-04	4.24E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03
C11-C22 Aromatics	1.20E+02	1.21E+02	1.00E+00	6.00E-02	1.00E-05	3.95E-04	3.95E-04	3.29E+05	1.70E+05	4.00E+01	4.38E+00	3.60E+03

TABLE 6-5 (continued)
SOIL TO OUTDOOR AIR
SUBSURFACE SOIL - (2-15 feet)

	Viscosity of water at 10°C	Viscosity of water at system temp.	Density of water	Acceleration due to gravity	Vadose zone soil intrinsic permeability	Vadose zone residual soil water content	Vadose zone effective total fluid saturation	Vadose zone van Genuchten shape parameter	Vadose zone soil relative air permeability	Vadose zone soil effective vapor permeability	Thickness of soil between soilgas & trench
	μ_{w-10}	μ_w	ρ_w	g	$k_{i,v}$	$\theta_{r,v}$	S_{te}	M_v	k_{rg}	k_v	L_{soil}
Units:	g/cm-s	g/cm-s	g/cm^3	cm/s^2	cm^2	cm^3/cm^3	unitless	unitless	unitless	cm^2	cm
Formula:		(Note 16)	(0.999 for screening)		(Note 17)	lookup	(Note 18)	lookup	(Note 19)	(Note 20)	(1 for screening)
Analyte											
Trimethylbenzene, 1,2,4-	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Dichloroethylene, 1,2- (total)	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Trimethylbenzene, 1,3,5-	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
n-Butylbenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Naphthalene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Isopropyltoluene, 4-	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Butylbenzene, sec-	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Vinyl Chloride	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Ethyl Chloride	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,1-Dichloroethene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Trichloro-1,2,2-trifluoroethan	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Acetone	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Carbon disulfide	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Methyl acetate	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Methylene chloride	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
trans-1,2-Dichloroethene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Methyl-Tertiary-Butyl Ether	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,1-Dichloroethane	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
cis-1,2-Dichloroethene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Butanone, 2- (MEK)	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,1,1-Trichloroethane	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Cyclohexane	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Benzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Trichloroethene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Methylcyclohexane	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Toluene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Tetrachloroethene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Chlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Ethylbenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Xylenes	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Isopropylbenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,3-Dichlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,4-Dichlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,2-Dichlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,2,4-Trichlorobenzene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Benzaldehyde	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
2-Methylnaphthalene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
2,4,5-Trichlorophenol	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
1,1'-Biphenyl	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Acenaphthylene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Acenaphthene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Dibenzofuran	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Fluorene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Phenanthrene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
Anthracene	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
C5-C8 Aliphatics	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
C9-C12 Aliphatics	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
C9-C10 Aromatics	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
C9-C18 Aliphatics	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00
C11-C22 Aromatics	1.31E-02	1.31E-02	9.99E-01	9.81E+02	1.62E-08	4.90E-02	6.59E-01	4.27E-01	3.90E-01	6.33E-09	1.00E+00

TABLE 6-5 (continued)
SOIL TO OUTDOOR AIR
SUBSURFACE SOIL - (2-15 feet)

	Vapor viscosity at avg. soil temp. μ_{TS}	Avg. Vapor Flow Rate Into trench Q_{soil}	Infinite Source Attenuation Coeff. α	Infinite Source Trench Conc. C_{trench}
Units:	g/cm-s	cm^3/s	unitless	$\mu g/m^3$
Formula:	0.00018*(T$_s$/298.15)^0.5	(Note 5)	(Note 6)	C_{source} * α
Analyte				
Trimethylbenzene, 1,2,4-	1.75E-04	1.44E-03	8.50E-09	1.23E-02
Dichloroethylene, 1,2- (total)	1.75E-04	1.44E-03	8.50E-09	7.66E-03
Trimethylbenzene, 1,3,5-	1.75E-04	1.44E-03	8.50E-09	1.52E-02
n-Butylbenzene	1.75E-04	1.44E-03	8.50E-09	3.47E-04
Naphthalene	1.75E-04	1.44E-03	8.50E-09	1.14E-03
Isopropyltoluene, 4-	1.75E-04	1.44E-03	8.50E-09	1.78E-02
Butylbenzene, sec-	1.75E-04	1.44E-03	8.50E-09	2.54E-05
Vinyl Chloride	1.75E-04	1.44E-03	8.50E-09	ND
Ethyl Chloride	1.75E-04	1.44E-03	8.50E-09	ND
1,1-Dichloroethene	1.75E-04	1.44E-03	8.50E-09	2.53E-05
Trichloro-1,2,2-triflouroethai	1.75E-04	1.44E-03	8.50E-09	ND
Acetone	1.75E-04	1.44E-03	8.50E-09	9.15E-04
Carbon disulfide	1.75E-04	1.44E-03	8.50E-09	ND
Methyl acetate	1.75E-04	1.44E-03	8.50E-09	ND
Methylene chloride	1.75E-04	1.44E-03	8.50E-09	7.18E-02
trans-1,2-Dichloroethene	1.75E-04	1.44E-03	8.50E-09	2.42E-02
Methyl-Tertiary-Butyl Ether	1.75E-04	1.44E-03	8.50E-09	ND
1,1-Dichloroethane	1.75E-04	1.44E-03	8.50E-09	6.28E-03
cis-1,2-Dichloroethene	1.75E-04	1.44E-03	8.50E-09	5.20E-02
Butanone, 2- (MEK)	1.75E-04	1.44E-03	8.50E-09	5.11E-04
1,1,1-Trichloroethane	1.75E-04	1.44E-03	8.50E-09	2.73E-02
Cyclohexane	1.75E-04	1.44E-03	8.50E-09	ND
Benzene	1.75E-04	1.44E-03	8.50E-09	3.24E-03
Trichloroethene	1.75E-04	1.44E-03	8.50E-09	1.37E-02
Methylcyclohexane	1.75E-04	1.44E-03	8.50E-09	ND
Toluene	1.75E-04	1.44E-03	8.50E-09	5.77E-02
Tetrachloroethene	1.75E-04	1.44E-03	8.50E-09	2.53E-03
Chlorobenzene	1.75E-04	1.44E-03	8.50E-09	ND
Ethylbenzene	1.75E-04	1.44E-03	8.50E-09	3.44E-02
Xylenes	1.75E-04	1.44E-03	8.50E-09	1.73E-04
Isopropylbenzene	1.75E-04	1.44E-03	8.50E-09	ND
1,3-Dichlorobenzene	1.75E-04	1.44E-03	8.50E-09	ND
1,4-Dichlorobenzene	1.75E-04	1.44E-03	8.50E-09	ND
1,2-Dichlorobenzene	1.75E-04	1.44E-03	8.50E-09	5.79E-03
1,2,4-Trichlorobenzene	1.75E-04	1.44E-03	8.50E-09	ND
Benzaldehyde	1.75E-04	1.44E-03	8.50E-09	1.77E-06
2-Methylnaphthalene	1.75E-04	1.44E-03	8.50E-09	4.73E-05
2,4,5-Trichlorophenol	1.75E-04	1.44E-03	8.50E-09	ND
1,1'-Biphenyl	1.75E-04	1.44E-03	8.50E-09	ND
Acenaphthylene	1.75E-04	1.44E-03	8.50E-09	3.35E-05
Acenaphthene	1.75E-04	1.44E-03	8.50E-09	2.01E-05
Dibenzofuran	1.75E-04	1.44E-03	8.50E-09	ND
Fluorene	1.75E-04	1.44E-03	8.50E-09	5.87E-07
Phenanthrene	1.75E-04	1.44E-03	8.50E-09	1.50E-05
Anthracene	1.75E-04	1.44E-03	8.50E-09	1.05E-06
C5-C8 Aliphatics	1.75E-04	1.44E-03	8.50E-09	4.96E-02
C9-C12 Aliphatics	1.75E-04	1.44E-03	8.50E-09	1.86E-03
C9-C10 Aromatics	1.75E-04	1.44E-03	8.50E-09	ND
C9-C18 Aliphatics	1.75E-04	1.44E-03	8.50E-09	ND
C11-C22 Aromatics	1.75E-04	1.44E-03	8.50E-09	1.85E+00

TABLE 6-5 (continued)
SOIL TO OUTDOOR AIR
SUBSURFACE SOIL - (2-15 feet)

Notes:

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

(1) Assumed equivalent to D_i^{eff} of soil layer i in contact with the floor

(2) For screening, assume a trench 4 ft deep, 3 ft wide, and 30 ft long.

(3) Depth to water table minus depth to bottom of floor must be > thickness of capillary fringe, which is based on the soil type (typ. around 30 cm). Use 400 cm for screening purposes.

(4) $D_T^{eff} = L_T / (L_T / D_i^{eff})$

(5) $Q_{soil} = (2*\pi*\Delta P*k_v*X_{crack}) / (\mu_{TS}*\ln(2*Z_{crack}/r_{crack}))$

(6) $\alpha = [(D_T^{eff}*A_B/(Q_{building}*L_T))*EXP(Q_{soil}*L_{crack}/(D^{crack}*A_{crack}))]/[EXP(Q_{soil}*L_{crack}/(D^{crack}*A_{crack}))+(D_T^{eff}*A_B/(Q_{building}*L_T))+(D_T^{eff}*A_B/(Q_{soil}*L_T))*(EXP(Q_{soil}*L_{crack}/(D^{crack}*A_{crack}))-1)]$

(7) A function of the ratio T_B/T_C:

T_B/T_C	n
<0.57	0.30
0.57-0.71	$0.74(T_B/T_C)-0.116$
>0.71	0.41

(8) $\Delta H_{vTB} = \Delta H_{vB}*[(1-T_B/T_C)/(1-T_B/T_C)]^n$

(9) $H_{TB} = EXP[-\Delta H_{vTB}/R_u*(1/T_C-1/T_B)]*H_R$

(10) Refer to 12 SCS soil types - use SC for screening.

(11) Refer to 12 SCS soil types - use SCL for screening.

(12) $L_{cz} = 0.15 / (0.2 * D_{cz})$

(13) $D_s^{eff} = D_s*(\theta_{avs}^{3.33}/n_s^2)+(D_w/H'_{TB})(\theta_{wvs}^{3.33}/n_s^2)$

(14) $D_{cz}^{eff} = D_s*(\theta_{avcz}^{3.33}/n_{cz}^2)+(D_w/H'_{TB})(\theta_{wvcz}^{3.33}/n_{cz}^2)$

(15) $\theta_{avcz} = \theta_{r,cz}+((\theta_{s,cz}-\theta_{r,cz})/(2^{2.bcz}))$, where the value 2 in the formula is used for screening, but may be refined based on soil parameters (see USEPA, 1999).

(16) $\mu_w = \mu_{w,10} * (T_S / 283.15)^{0.5}$

(17) $k_{r,v} = K_{s,v} * 1/Conv02 * \mu_w / (\rho_w * g)$

(18) $S_w = (\theta_{w,v} - \theta_{r,v}) / (n_v - \theta_{r,v})$

(19) $k_{rg} = (1 - S_w)^{0.5} * (1-S_w^{1/0.6v})^{2.6v}$

(20) $k_v = k_{r,v} * k_{rg}$; note that the model is very sensitive to this parameter and if site-specific values are available, they should be used.

(21) $C_{source} = H'_{TS} * C_R * Conv01 * \rho_b / (\theta_{w,v} + K_d * \rho_b + H'_{TS} * \theta_{a,v}) * Conv02$

(22) For screening, assume a trench 4 ft deep, 3 ft wide, 30 ft long and an air exchange rate of 60/hr. The air exchange rate is based on the assumption that the wind speed in the trench is a small fraction of the ground wind speed and that it could take up to 1 minute for a contaminant to be cleared from the trench air space.

TABLE 6-6
GROUNDWATER TO OUTDOOR AIR
SHALLOW GROUNDWATER - COMBINED ON-SITE
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Aberjona Auto Parts

	GW EPC	GW Temp.	GW Temp.	Henry's Law Constant at ref. temp.	Henry's Law Reference Temp.	Normal Boiling Point	Enthalpy of vaporization at T_S	Critical Temp.	constant	Enthalpy of vaporization at T_S	Gas Constant	Henry's Law Constant at T_S	Gas Constant	Henry's Law Constant
	Cw	T_S	T_S	H_R	T_R	T_B	ΔH_{vB}	T_C	n	ΔH_{vTS}	R_c	H_{TS}	R	H'_{TS}
Units:	µg/L	°C	K	atm-m³/mol	K	K	cal/mol	K	unitless	cal/mol	cal/mol-K	atm-m³/mol	m³-atm/mol-K	unitless
Formula:	Input	(10 for screening)	(T_S + 273.15)	lookup	(lookup+273.15)	lookup	lookup	lookup	(Note 7)	(Note 8)		(Note 9)		H_{TS} / (R * T_S)
Analyte														
1,1,1-Trichloroethane	ND	1.00E+01	2.83E+02	1.72E-02	2.98E+02	3.47E+02	7.14E+03	5.45E+02	3.55E-01	7.88E+03	1.99E+00	1.72E-02	8.21E-05	7.40E-01
Trichloro-1,2,2-triflouroethane, 1,1,	1.0E+00	1.00E+01	2.83E+02	5.17E-01	2.98E+02	3.21E+02	1.33E+03	4.81E+02	3.77E-01	1.44E+03	1.99E+00	5.17E-01	8.21E-05	2.23E+01
1,1,2-Trichloroethane	ND	1.00E+01	2.83E+02	9.12E-04	2.98E+02	3.86E+02	8.32E+03	6.02E+02	3.59E-01	9.57E+03	1.99E+00	9.12E-04	8.21E-05	3.93E-02
1,1-Dichloroethane	ND	1.00E+01	2.83E+02	5.61E-03	2.98E+02	3.31E+02	6.90E+03	5.23E+02	3.52E-01	7.45E+03	1.99E+00	5.61E-03	8.21E-05	2.41E-01
1,1-Dichloroethene	1.9E-01	1.00E+01	2.83E+02	2.61E-02	2.98E+02	3.05E+02	6.25E+03	5.76E+02	3.00E-01	6.39E+03	1.99E+00	2.61E-02	8.21E-05	1.12E+00
1,2,4-Trichlorobenzene	ND	1.00E+01	2.83E+02	1.42E-03	2.98E+02	4.86E+02	1.05E+04	7.25E+02	3.80E-01	1.32E+04	1.99E+00	1.42E-03	8.21E-05	6.11E-02
1,2-Dichlorobenzene	ND	1.00E+01	2.83E+02	1.90E-03	2.98E+02	4.54E+02	9.70E+03	7.05E+02	3.60E-01	1.17E+04	1.99E+00	1.90E-03	8.21E-05	8.18E-02
1,3-Dichlorobenzene	ND	1.00E+01	2.83E+02	4.70E-03	2.98E+02	4.46E+02	1.24E+03	6.84E+02	3.67E-01	1.50E+03	1.99E+00	4.70E-03	8.21E-05	2.02E-01
1,4-Dichlorobenzene	4.8E-01	1.00E+01	2.83E+02	2.43E-03	2.98E+02	4.47E+02	9.27E+03	6.85E+02	3.67E-01	1.12E+04	1.99E+00	2.43E-03	8.21E-05	1.05E-01
Butanone, 2- (MEK)	ND	1.00E+01	2.83E+02	5.60E-05	2.98E+02	3.53E+02	1.31E+03	5.29E+02	3.77E-01	1.49E+03	1.99E+00	5.60E-05	8.21E-05	2.41E-03
Acetone	ND	1.00E+01	2.83E+02	3.88E-05	2.98E+02	3.29E+02	6.96E+03	5.08E+02	3.63E-01	7.56E+03	1.99E+00	3.88E-05	8.21E-05	1.67E-03
Benzene	3.2E-01	1.00E+01	2.83E+02	5.55E-03	2.98E+02	3.53E+02	7.34E+03	5.62E+02	3.49E-01	8.12E+03	1.99E+00	5.55E-03	8.21E-05	2.39E-01
Methyl bromide	ND	1.00E+01	2.83E+02	6.24E-03	2.98E+02	2.77E+02	5.71E+03	4.67E+02	3.22E-01	5.65E+03	1.99E+00	6.24E-03	8.21E-05	2.69E-01
Carbon disulfide	ND	1.00E+01	2.83E+02	3.02E-02	2.98E+02	3.19E+02	6.39E+03	5.52E+02	3.12E-01	6.68E+03	1.99E+00	3.02E-02	8.21E-05	1.30E+00
Chlorobenzene	ND	1.00E+01	2.83E+02	3.71E-03	2.98E+02	4.05E+02	8.41E+03	6.32E+02	3.58E-01	9.80E+03	1.99E+00	3.71E-03	8.21E-05	1.60E-01
Ethyl Chloride	ND	1.00E+01	2.83E+02	1.09E-02	2.98E+02	2.85E+02	1.36E+03	4.28E+02	3.77E-01	1.37E+03	1.99E+00	1.09E-02	8.21E-05	4.69E-01
Chloroform	1.1E-01	1.00E+01	2.83E+02	3.66E-03	2.98E+02	3.34E+02	6.99E+03	5.36E+02	3.45E-01	7.55E+03	1.99E+00	3.66E-03	8.21E-05	1.58E-01
cis-1,2-Dichloroethene	2.9E+01	1.00E+01	2.83E+02	4.07E-03	2.98E+02	3.34E+02	7.19E+03	5.44E+02	3.38E-01	7.73E+03	1.99E+00	4.07E-03	8.21E-05	1.75E-01
Cyclohexane	ND	1.00E+01	2.83E+02	2.00E+00	2.98E+02	3.54E+02	1.31E+03	5.31E+02	3.77E-01	1.49E+03	1.99E+00	2.00E+00	8.21E-05	8.61E+01
Ethylbenzene	ND	1.00E+01	2.83E+02	7.88E-03	2.98E+02	4.09E+02	8.50E+03	6.17E+02	3.75E-01	1.02E+04	1.99E+00	7.88E-03	8.21E-05	3.39E-01
Isopropylbenzene	ND	1.00E+01	2.83E+02	1.47E-02	2.98E+02	4.25E+02	1.26E+03	6.31E+02	3.83E-01	1.54E+03	1.99E+00	1.47E-02	8.21E-05	6.33E-01
Methylcyclohexane	ND	1.00E+01	2.83E+02	4.23E-01	2.98E+02	3.74E+02	1.30E+03	5.61E+02	3.77E-01	1.51E+03	1.99E+00	4.23E-01	8.21E-05	1.82E+01
Methyl-Tertiary-Butyl Ether	1.4E+01	1.00E+01	2.83E+02	5.87E-04	2.98E+02	3.28E+02	1.32E+03	4.97E+02	3.73E-01	1.45E+03	1.99E+00	5.87E-04	8.21E-05	2.53E-02
Methylene chloride	ND	1.00E+01	2.83E+02	2.19E-03	2.98E+02	3.13E+02	6.71E+03	5.10E+02	3.38E-01	7.03E+03	1.99E+00	2.19E-03	8.21E-05	9.43E-02
Tetrachloroethene	4.2E-01	1.00E+01	2.83E+02	1.84E-02	2.98E+02	3.94E+02	8.29E+03	6.20E+02	3.55E-01	9.55E+03	1.99E+00	1.84E-02	8.21E-05	7.92E-01
Toluene	ND	1.00E+01	2.83E+02	6.64E-03	2.98E+02	3.84E+02	7.93E+03	5.92E+02	3.64E-01	9.15E+03	1.99E+00	6.64E-03	8.21E-05	2.86E-01
trans-1,2-Dichloroethene	ND	1.00E+01	2.83E+02	9.39E-03	2.98E+02	3.21E+02	6.72E+03	5.17E+02	3.44E-01	7.14E+03	1.99E+00	9.39E-03	8.21E-05	4.04E-01
Trichloroethene	2.5E+01	1.00E+01	2.83E+02	1.03E-02	2.98E+02	3.60E+02	7.51E+03	5.44E+02	3.74E-01	8.56E+03	1.99E+00	1.03E-02	8.21E-05	4.43E-01
Vinyl Chloride	2.4E-01	1.00E+01	2.83E+02	2.71E-02	2.98E+02	2.59E+02	5.25E+03	4.32E+02	3.28E-01	5.00E+03	1.99E+00	2.71E-02	8.21E-05	1.17E+00
Xylenes	ND	1.00E+01	2.83E+02	6.73E-06	2.98E+02	4.17E+02	1.26E+03	6.16E+02	3.85E-01	1.54E+03	1.99E+00	6.73E-06	8.21E-05	2.90E-04
Acetophenone	ND	1.00E+01	2.83E+02	1.02E-05	2.98E+02	4.75E+02	1.21E+03	7.13E+02	3.77E-01	1.52E+03	1.99E+00	1.02E-05	8.21E-05	4.39E-04
Naphthalene	2.7E+00	1.00E+01	2.83E+02	4.83E-04	2.98E+02	4.91E+02	1.04E+04	7.48E+02	3.70E-01	1.29E+04	1.99E+00	4.83E-04	8.21E-05	2.08E-02
2-Methylnaphthalene	ND	1.00E+01	2.83E+02	1.01E-03	2.98E+02	5.14E+02	1.17E+03	7.61E+02	3.84E-01	1.51E+03	1.99E+00	1.01E-03	8.21E-05	4.36E-02
2,4,5-Trichlorophenol	#N/A	1.00E+01	2.83E+02	4.34E-06	2.98E+02	5.26E+02	1.30E+04	7.59E+02	3.97E-01	1.73E+04	1.99E+00	4.34E-06	8.21E-05	1.87E-04
1,1'-Biphenyl	ND	1.00E+01	2.83E+02	3.03E-04	2.98E+02	5.29E+02	1.15E+03	7.94E+02	3.77E-01	1.47E+03	1.99E+00	3.03E-04	8.21E-05	1.30E-02
Acenaphthylene	ND	1.00E+01	2.83E+02	2.80E-04	2.98E+02	5.53E+02	1.12E+03	7.92E+02	4.01E-01	1.51E+03	1.99E+00	2.80E-04	8.21E-05	1.21E-02
Acenaphthene	3.9E+00	1.00E+01	2.83E+02	1.55E-04	2.98E+02	5.51E+02	1.22E+04	8.03E+02	3.91E-01	1.61E+04	1.99E+00	1.55E-04	8.21E-05	6.67E-03
Fluorene	ND	1.00E+01	2.83E+02	6.37E-05	2.98E+02	5.70E+02	1.27E+04	8.70E+02	3.69E-01	1.62E+04	1.99E+00	6.37E-05	8.21E-05	2.74E-03
Phenanthrene	2.1E+00	1.00E+01	2.83E+02	1.30E-04	2.98E+02	6.13E+02	1.06E+03	8.69E+02	4.06E-01	1.48E+03	1.99E+00	1.30E-04	8.21E-05	5.59E-03
Anthracene	ND	1.00E+01	2.83E+02	6.51E-05	2.98E+02	6.15E+02	1.31E+04	8.73E+02	4.05E-01	1.84E+04	1.99E+00	6.51E-05	8.21E-05	2.80E-03
C9-C18 Aliphatics	ND	1.00E+01	2.83E+02	1.65E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.65E+00	8.21E-05	7.10E+01
C11-C22 Aromatics	ND	1.00E+01	2.83E+02	7.17E-04	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	7.17E-04	8.21E-05	3.09E-02
C5-C8 Aliphatics	ND	1.00E+01	2.83E+02	1.30E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.30E+00	8.21E-05	5.58E+01
C9-C10 Aromatics	ND	1.10E+01	2.84E+02	7.92E-03	2.98E+02	NA	NA	NA	NA	NA	2.99E+00	7.92E-03	8.21E-05	3.40E-01
C9-C12 Aliphatics	ND	1.20E+01	2.85E+02	1.56E+00	2.98E+02	NA	NA	NA	NA	NA	3.99E+00	1.56E+00	8.21E-05	6.67E+01

TABLE 6-6 (continued)
GROUNDWATER TO OUTDOOR AIR
SHALLOW GROUNDWATER - COMBINED ON-SITE

	Conversion Factor m^3 to L	Source Vapor Conc.	Depth below grade to bottom of trench	Depth below grade to water table	Source Trench Separation	SCS soil type directly above water table	SCS soil type in vadose zone	Capillary zone mean particle diameter	Thickness of capillary zone	Diffusivity in air	Diffusivity in water	Vadose zone soil total porosity
Units:	Conv01	C_{source}	L_F	L_{WT}	L_T	ST_{WT}	ST_v	D_{cz}	L_{cz}	D_a	D_w	n_v
	L/m^3	$\mu g/m^3$	cm	cm	cm	unitless	unitless	cm	cm	cm^2/s	cm^2/s	cm^3/cm^3
Formula:		C_w*H'_{TS}*Conv01	(120 (4') for screening)	(Note 3)	L_{WT} - L_F	(Note 10)	(Note 11)	lookup	(Note 12)	lookup	lookup	(0.43 for screening)
Analyte												
1,1,1-Trichloroethane	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.80E-02	8.80E-06	4.30E-01
Trichloro-1,2,2-triflouroethan	1.00E+03	2.23E+04	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	2.88E-02	8.07E-06	4.30E-01
1,1,2-Trichloroethane	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.80E-02	8.80E-06	4.30E-01
1,1-Dichloroethane	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.42E-02	1.05E-05	4.30E-01
1,1-Dichloroethene	1.00E+03	2.18E+02	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	9.00E-02	1.04E-05	4.30E-01
1,2,4-Trichlorobenzene	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	3.00E-02	8.23E-06	4.30E-01
1,2-Dichlorobenzene	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	6.90E-02	7.90E-06	4.30E-01
1,3-Dichlorobenzene	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	4.14E-02	8.85E-06	4.30E-01
1,4-Dichlorobenzene	1.00E+03	5.06E+01	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	6.90E-02	7.90E-06	4.30E-01
Butanone, 2- (MEK)	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	8.08E-02	9.80E-06	4.30E-01
Acetone	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	1.24E-01	1.14E-05	4.30E-01
Benzene	1.00E+03	7.64E+01	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	8.80E-02	9.80E-06	4.30E-01
Methyl bromide	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.28E-02	1.21E-05	4.30E-01
Carbon disulfide	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	1.04E-01	1.00E-05	4.30E-01
Chlorobenzene	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.30E-02	8.70E-06	4.30E-01
Ethyl Chloride	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	2.71E-01	1.15E-05	4.30E-01
Chloroform	1.00E+03	1.69E+01	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	1.04E-01	1.00E-05	4.30E-01
cis-1,2-Dichloroethene	1.00E+03	5.08E+03	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.36E-02	1.13E-05	4.30E-01
Cyclohexane	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	8.00E-02	9.00E-06	4.30E-01
Ethylbenzene	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.50E-02	7.80E-06	4.30E-01
Isopropylbenzene	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	6.50E-02	7.83E-06	4.30E-01
Methylcyclohexane	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	9.86E-02	8.52E-06	4.30E-01
Methyl-Tertiary-Butyl Ether	1.00E+03	3.54E+02	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	1.02E-01	1.05E-05	4.30E-01
Methylene chloride	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	1.01E-01	1.17E-05	4.30E-01
Tetrachloroethene	1.00E+03	3.31E+02	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.20E-02	8.20E-06	4.30E-01
Toluene	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	8.70E-02	8.60E-06	4.30E-01
trans-1,2-Dichloroethene	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.07E-02	1.19E-05	4.30E-01
Trichloroethene	1.00E+03	1.11E+04	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.90E-02	9.10E-06	4.30E-01
Vinyl Chloride	1.00E+03	2.80E+02	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	1.06E-01	1.23E-06	4.30E-01
Xylenes	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.69E-02	8.44E-06	4.30E-01
Acetophenone	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	6.00E-02	8.73E-06	4.30E-01
Naphthalene	1.00E+03	5.61E+01	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	5.90E-02	7.50E-06	4.30E-01
2-Methylnaphthalene	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	4.84E-02	7.75E-06	4.30E-01
2,4,5-Trichlorophenol	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	2.91E-02	7.03E-06	4.30E-01
1,1'-Biphenyl	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	4.04E-02	8.15E-06	4.30E-01
Acenaphthylene	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	4.43E-02	7.44E-06	4.30E-01
Acenaphthene	1.00E+03	2.60E+01	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	4.21E-02	7.69E-06	4.30E-01
Fluorene	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	3.63E-02	7.88E-06	4.30E-01
Phenanthrene	1.00E+03	1.17E+01	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	3.30E-02	7.47E-06	4.30E-01
Anthracene	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	3.24E-02	7.74E-06	4.30E-01
C9-C18 Aliphatics	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.00E-02	5.00E-06	4.30E-01
C11-C22 Aromatics	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	6.00E-02	1.00E-05	4.30E-01
C5-C8 Aliphatics	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	8.00E-02	1.00E-05	4.30E-01
C9-C10 Aromatics	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.00E-02	1.00E-05	4.30E-01
C9-C12 Aliphatics	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.00E-02	1.00E-05	4.30E-01

TABLE 6-6 (continued)
GROUNDWATER TO OUTDOOR AIR
SHALLOW GROUNDWATER - COMBINED ON-SITE

	Vadose zone soil water-filled porosity	Vadose zone soil air-filled porosity	Vadose zone Effective Diffusion Coeff.	Capillary zone soil total porosity	Capillary zone residual soil water content	Capillary zone saturated soil water content	Capillary zone van Genuchten shape parameter	Capillary zone soil water-filled porosity	Capillary zone soil air-filled porosity	Capillary zone Effective Diffusion Coeff.	Total Overall Effective Diffusion Coeff.
	$\theta_{w,v}$	$\theta_{a,v}$	D_v^{eff}	n_{cz}	$\theta_{r,cz}$	$\theta_{s,cz}$	M_{cz}	$\theta_{w,cz}$	$\theta_{a,cz}$	D_{cz}^{eff}	D_T^{eff}
Units:	cm^3/cm^3	cm^3/cm^3	cm^2/s	cm^3/cm^3	cm^3/cm^3	cm^3/cm^3	unitless	cm^3/cm^3	cm^3/cm^3	cm^2/s	cm^2/s
Formula:	(0.3 for screening)	$n_v - \theta_{w,v}$	(Note 13)	(0.43 for screening)	lookup	lookup	lookup	(Note 15)	$n_{cz} - \theta_{w,cz}$	(Note 14)	(Note 4)
Analyte											
1,1,1-Trichloroethane	3.00E-01	1.30E-01	4.74E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	5.20E-04	-6.99E-04
Trichloro-1,2,2-trifluoroethan	3.00E-01	1.30E-01	1.75E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	1.92E-04	-2.56E-04
1,1,2-Trichloroethane	3.00E-01	1.30E-01	4.95E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	5.40E-04	-8.43E-04
1,1-Dichloroethane	3.00E-01	1.30E-01	4.54E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.98E-04	-6.84E-04
1,1-Dichloroethene	3.00E-01	1.30E-01	5.46E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	6.00E-04	-8.03E-04
1,2,4-Trichlorobenzene	3.00E-01	1.30E-01	1.95E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	2.12E-04	-3.64E-04
1,2-Dichlorobenzene	3.00E-01	1.30E-01	4.28E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.69E-04	-6.73E-04
1,3-Dichlorobenzene	3.00E-01	1.30E-01	2.55E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	2.80E-04	-3.94E-04
1,4-Dichlorobenzene	3.00E-01	1.30E-01	4.26E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.67E-04	-6.59E-04
Butanone, 2- (MEK)	3.00E-01	1.30E-01	8.89E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	9.21E-04	2.56E-03
Acetone	3.00E-01	1.30E-01	1.42E-03	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	1.47E-03	3.54E-03
Benzene	3.00E-01	1.30E-01	5.37E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	5.90E-04	-8.05E-04
Methyl bromide	3.00E-01	1.30E-01	4.46E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.89E-04	-6.73E-04
Carbon disulfide	3.00E-01	1.30E-01	6.31E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	6.93E-04	-9.27E-04
Chlorobenzene	3.00E-01	1.30E-01	4.48E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.91E-04	-6.81E-04
Ethyl Chloride	3.00E-01	1.30E-01	1.64E-03	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	1.81E-03	-2.42E-03
Chloroform	3.00E-01	1.30E-01	6.37E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	6.98E-04	-9.61E-04
cis-1,2-Dichloroethene	3.00E-01	1.30E-01	4.52E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.96E-04	-6.93E-04
Cyclohexane	3.00E-01	1.30E-01	4.85E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	5.33E-04	-7.09E-04
Ethylbenzene	3.00E-01	1.30E-01	4.57E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	5.02E-04	-6.79E-04
Isopropylbenzene	3.00E-01	1.30E-01	3.95E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.34E-04	-5.84E-04
Methylcyclohexane	3.00E-01	1.30E-01	5.98E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	6.57E-04	-8.74E-04
Methyl-Tertiary-Butyl Ether	3.00E-01	1.30E-01	6.61E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	7.21E-04	-1.20E-03
Methylene chloride	3.00E-01	1.30E-01	6.24E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	6.84E-04	-9.74E-04
Tetrachloroethene	3.00E-01	1.30E-01	4.37E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.80E-04	-6.45E-04
Toluene	3.00E-01	1.30E-01	5.30E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	5.82E-04	-7.90E-04
trans-1,2-Dichloroethene	3.00E-01	1.30E-01	4.31E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.74E-04	-6.45E-04
Trichloroethene	3.00E-01	1.30E-01	4.81E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	5.28E-04	-7.13E-04
Vinyl Chloride	3.00E-01	1.30E-01	6.42E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	7.06E-04	-9.40E-04
Xylenes	3.00E-01	1.30E-01	3.33E-03	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	3.26E-03	2.36E-03
Acetophenone	3.00E-01	1.30E-01	2.32E-03	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	2.27E-03	1.70E-03
Naphthalene	3.00E-01	1.30E-01	3.93E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.27E-04	-8.08E-04
2-Methylnaphthalene	3.00E-01	1.30E-01	3.11E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	3.39E-04	-5.54E-04
2,4,5-Trichlorophenol	3.00E-01	1.30E-01	3.87E-03	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	3.74E-03	2.32E-03
1,1'-Biphenyl	3.00E-01	1.30E-01	3.06E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	3.28E-04	-1.28E-03
Acenaphthylene	3.00E-01	1.30E-01	3.29E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	3.53E-04	-1.20E-03
Acenaphthene	3.00E-01	1.30E-01	3.68E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	3.89E-04	4.25E-02
Fluorene	3.00E-01	1.30E-01	5.02E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	5.12E-04	8.01E-04
Phenanthrene	3.00E-01	1.30E-01	3.31E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	3.45E-04	1.51E-03
Anthracene	3.00E-01	1.30E-01	4.67E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.76E-04	6.96E-04
C9-C18 Aliphatics	3.00E-01	1.30E-01	4.24E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.66E-04	-6.21E-04
C11-C22 Aromatics	3.00E-01	1.30E-01	3.95E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.30E-04	-7.79E-04
C5-C8 Aliphatics	3.00E-01	1.30E-01	4.85E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	5.33E-04	-7.09E-04
C9-C10 Aromatics	3.00E-01	1.30E-01	4.27E-04	1.43E+00	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.13E+00	5.20E-02	-2.43E-05
C9-C12 Aliphatics	3.00E-01	1.30E-01	4.24E-04	2.43E+00	5.70E-02	4.10E-01	5.61E-01	2.96E-01	2.13E+00	1.48E-01	-2.40E-05

TABLE 6-6 (continued)
GROUNDWATER TO OUTDOOR AIR
SHALLOW GROUNDWATER - COMBINED ON-SITE

	Area of Trench Below Grade	Trench Ventilation Rate	Pressure Diff. between soil & enclosed space	Vadose zone soil saturated hydraulic conductivity	Conversion Factor hr to s	Viscosity of water at 10°C	Viscosity of water at system temp.	Density of water	Acceleration due to gravity	Vadose zone soil intrinsic permeability	Vadose zone residual soil water content	Vadose zone effective total fluid saturation
	A_B	Q_{trench}	ΔP	$K_{s,v}$	Conv02	$\mu_{w,10}$	μ_w	ρ_w	g	$k_{i,v}$	$\theta_{r,v}$	S_w
Units:	cm^2	cm^3/s	$g/cm\text{-}s^2$	cm/hr	s/hr	g/cm-s	g/cm-s	g/cm^3	cm/s^2	cm^2	cm^3/cm^3	unitless
Formula:	(Note 2)	(Note 21)	(40 for screening)	lookup			(Note 16)	(0.999 for screening)		(Note 17)	lookup	(Note 18)
Analyte												
1,1,1-Trichloroethane	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Trichloro-1,2,2-trifiouroethan	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
1,1,2-Trichloroethane	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
1,1-Dichloroethane	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
1,1-Dichloroethene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
1,2,4-Trichlorobenzene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
1,2-Dichlorobenzene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
1,3-Dichlorobenzene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
1,4-Dichlorobenzene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Butanone, 2- (MEK)	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Acetone	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Benzene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Methyl bromide	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Carbon disulfide	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Chlorobenzene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Ethyl Chloride	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Chloroform	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
cis-1,2-Dichloroethene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Cyclohexane	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Ethylbenzene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Isopropylbenzene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Methylcyclohexane	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Methyl-Tertiary-Butyl Ether	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Methylene chloride	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Tetrachloroethene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Toluene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
trans-1,2-Dichloroethene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Trichloroethene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Vinyl Chloride	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Xylenes	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Acetophenone	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Naphthalene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
2-Methylnaphthalene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
2,4,5-Trichlorophenol	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
1,1'-Biphenyl	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Acenaphthylene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Acenaphthene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Fluorene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Phenanthrene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Anthracene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
C9-C18 Aliphatics	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
C11-C22 Aromatics	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
C5-C8 Aliphatics	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
C9-C10 Aromatics	3.29E+05	1.70E+05	4.10E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.42E-08	5.70E-02	6.51E-01
C9-C12 Aliphatics	3.29E+05	1.70E+05	4.20E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.43E-08	5.70E-02	6.51E-01

TABLE 6-6 (continued)
GROUNDWATER TO OUTDOOR AIR
SHALLOW GROUNDWATER - COMBINED ON-SITE

	Vadose zone van Genuchten shape parameter M_v	Vadose zone soil relative air permeability k_{rg}	Vadose zone soil effective vapor permeability k_v	Thickness of soil between soilgas & trench L_{soil}	Vapor viscosity at avg. soil temp. μ_{TS}	Avg. Vapor Flow Rate Into trench Q_{soil}	Infinite Source Attenuation Coeff. α	Infinite Source Trench Conc. C_{trench}
Units:	unitless	unitless	cm^2	cm	g/cm-s	cm^3/s	unitless	$\mu g/m^3$
Formula:	lookup	(Note 19)	(Note 20)	(1 for screening)	0.00018*(T'$_s$/298.15)^0.5	(Note 5)	(Note 6)	$C_{source} * \alpha$
Analyte								
1,1,1-Trichloroethane	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
Trichloro-1,2,2-trifluoroethan	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	4.7E-04
1,1,2-Trichloroethane	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
1,1-Dichloroethane	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
1,1-Dichloroethene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	4.6E-06
1,2,4-Trichlorobenzene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
1,2-Dichlorobenzene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
1,3-Dichlorobenzene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
1,4-Dichlorobenzene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	1.1E-06
Butanone, 2- (MEK)	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
Acetone	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
Benzene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	1.6E-06
Methyl bromide	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
Carbon disulfide	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
Chlorobenzene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
Ethyl Chloride	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
Chloroform	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	3.6E-07
cis-1,2-Dichloroethene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	1.1E-04
Cyclohexane	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
Ethylbenzene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
Isopropylbenzene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
Methylcyclohexane	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
Methyl-Tertiary-Butyl Ether	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	7.5E-06
Methylene chloride	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
Tetrachloroethene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	7.0E-06
Toluene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
trans-1,2-Dichloroethene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
Trichloroethene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	2.3E-04
Vinyl Chloride	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	5.9E-06
Xylenes	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
Acetophenone	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
Naphthalene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	1.2E-06
2-Methylnaphthalene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
2,4,5-Trichlorophenol	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
1,1'-Biphenyl	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
Acenaphthylene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
Acenaphthene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	5.5E-07
Fluorene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
Phenanthrene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	2.5E-07
Anthracene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
C9-C18 Aliphatics	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
C11-C22 Aromatics	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
C5-C8 Aliphatics	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
C9-C10 Aromatics	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.76E-04	3.69E-03	2.17E-08	N/A
C9-C12 Aliphatics	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.76E-04	3.78E-03	2.23E-08	N/A

TABLE 6-6 (continued)
GROUNDWATER TO OUTDOOR AIR
SHALLOW GROUNDWATER - COMBINED ON-SITE

Notes:

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

(1) Assumed equivalent to D_i^{eff} of soil layer i in contact with the floor

(2) For screening, assume a trench 4 ft deep, 3 ft wide, and 30 ft long.

(3) Depth to water table minus depth to bottom of floor must be > thickness of capillary fringe, which is based on the soil type (typ. around 30 cm). Use 121 cm for screening purposes.

(4) $D_T^{eff} = L_T / (((L_{WT} - L_{cz} - L_F) / D_v^{eff}) + (L_{cz} / D_{cz}^{eff}))$

(5) $Q_{soil} = \Delta P * k_v * L_{soil} / \mu_{TS}$; not from above reference

(6) $\alpha = [D_T^{eff} * A_B / (Q_{soil} * L_T)] / [(D_T^{eff} * A_B / (Q_{soil} * L_T)) + 1]$; assumes no resistance (Peclet number is infinite)

(7) A function of the ratio T_B/T_C:

T_B/T_C	g
<0.57	0.30
0.57-0.71	$0.74(T_B/T_C)-0.116$
>0.71	0.41

(8) $\Delta H_{vTB} = \Delta H_{vB} * [(1-T_B/T_C)/(1-T_B/T_C)]^g$

(9) $H_{TS} = EXP[-\Delta H_{vTB}/R_v * (1/T_B - 1/T_S)] * H_R$

(10) Refer to 12 SCS soil types - use SC for screening.

(11) Refer to 12 SCS soil types - use SCL for screening.

(12) $L_{cz} = 0.15 / (0.2 * D_{cz})$

(13) $D_v^{eff} = D_a * (\theta_{av}^{3.33} / n_v^2) + (D_w / H'_{TS})(\theta_{wv}^{3.33} / n_v^2)$

(14) $D_{cz}^{eff} = D_a * (\theta_{acz}^{3.33} / n_{cz}^2) + (D_w / H'_{TS})(\theta_{wcz}^{3.33} / n_{cz}^2)$

(15) $\theta_{wcz} = \theta_{r,cz} + ((\theta_{s,cz} - \theta_{r,cz}) / (2^{2*m}))$, where the value 2 in the formula is used for screening, but may be refined based on soil parameters (see USEPA, 1999).

(16) $\mu_w = \mu_{w,10} * (T_S / 283.15)^{0.5}$

(17) $k_{r,v} = K_{w,v} * 1/Conv02 * \mu_w / (\rho_w * g)$

(18) $S_{cz} = (\theta_{cz,v} - \theta_{r,v}) / (n_v - \theta_{r,v})$

(19) $k_{rz} = (1 - S_{cz})^{0.5} * (1 - S_{cz}^{1/m})^{2m}$

(20) $k_v = k_{i,v} * k_{rz}$; note that the model is very sensitive to this parameter and if site-specific values are available, they should be used.

(21) For screening, assume a trench 4 ft deep, 3 ft wide, 30 ft long and an air exchange rate of 60/hr. The air exchange rate is based on the assumption that the wind speed in the trench is a small fraction of the ground wind speed and that it could take up to 1 minute for a contaminant to be cleared from the trench air space.

TABLE 6-6
GROUNDWATER TO OUTDOOR AIR
SHALLOW GROUNDWATER - COMBINED ON-SITE
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Whitney Barrell

	GW EPC	GW Temp.	GW Temp.	Henry's Law Constant at ref. temp.	Henry's Law Reference Temp.	Normal Boiling Point	Enthalpy of vaporization at T_S	Critical Temp.	constant	Enthalpy of vaporization at T_B	Gas Constant	Henry's Law Constant at T_S	Gas Constant	Henry's Law Constant
	Cw	T_S	T'_S	H_R	T_R	T_B	ΔH_{vaR}	T_C	n	ΔH_{vbTS}	R_c	H_{TS}	R	H'_{TS}
Units:	µg/L	°C	K	atm-m³/mol	K	K	cal/mol	K	unitless	cal/mol	cal/mol-K	atm-m³/mol	m³-atm/mol-K	unitless
Formula:	Input	(10 for screening)	(T_s + 273.15)	lookup	(lookup+273.15)	lookup	lookup	lookup	(Note 7)	(Note 8)		(Note 9)		H_{TS} / (R * T_S)
Analyte														
1,1,1-Trichloroethane	5.0E+00	1.00E+01	2.83E+02	1.72E-02	2.98E+02	3.47E+02	7.14E+03	5.45E+02	3.55E-01	7.88E+03	1.99E+00	1.72E-02	8.21E-05	7.40E-01
Trichloro-1,2,2-trifluoroethane, 1,1,	ND	1.00E+01	2.83E+02	5.17E-01	2.98E+02	3.21E+02	1.33E+03	4.81E+02	3.77E-01	1.44E+03	1.99E+00	5.17E-01	8.21E-05	2.23E+01
1,1,2-Trichloroethane	ND	1.00E+01	2.83E+02	9.12E-04	2.98E+02	3.86E+02	8.32E+03	6.02E+02	3.59E-01	9.57E+03	1.99E+00	9.12E-04	8.21E-05	3.93E-02
1,1-Dichloroethane	1.2E+02	1.00E+01	2.83E+02	5.61E-03	2.98E+02	3.31E+02	6.90E+03	5.23E+02	3.52E-01	7.45E+03	1.99E+00	5.61E-03	8.21E-05	2.41E-01
1,1-Dichloroethene	ND	1.00E+01	2.83E+02	2.61E-02	2.98E+02	3.05E+02	6.25E+03	5.76E+02	3.00E-01	6.39E+03	1.99E+00	2.61E-02	8.21E-05	1.12E+00
1,2,4-Trichlorobenzene	2.3E+01	1.00E+01	2.83E+02	1.42E-03	2.98E+02	4.86E+02	1.05E+04	7.25E+02	3.80E-01	1.32E+04	1.99E+00	1.42E-03	8.21E-05	6.11E-02
1,2-Dichlorobenzene	1.0E+01	1.00E+01	2.83E+02	1.90E-03	2.98E+02	4.54E+02	9.70E+03	7.05E+02	3.60E-01	1.17E+04	1.99E+00	1.90E-03	8.21E-05	8.18E-02
1,3-Dichlorobenzene	1.9E+01	1.00E+01	2.83E+02	4.70E-03	2.98E+02	4.46E+02	1.24E+03	6.84E+02	3.67E-01	1.50E+03	1.99E+00	4.70E-03	8.21E-05	2.02E-01
1,4-Dichlorobenzene	2.0E+02	1.00E+01	2.83E+02	2.43E-03	2.98E+02	4.47E+02	9.27E+03	6.85E+02	3.67E-01	1.12E+04	1.99E+00	2.43E-03	8.21E-05	1.05E-01
Butanone, 2- (MEK)	ND	1.00E+01	2.83E+02	5.60E-05	2.98E+02	3.53E+02	1.31E+03	5.29E+02	3.77E-01	1.49E+03	1.99E+00	5.60E-05	8.21E-05	2.41E-03
Acetone	ND	1.00E+01	2.83E+02	3.88E-05	2.98E+02	3.29E+02	6.96E+03	5.08E+02	3.63E-01	7.56E+03	1.99E+00	3.88E-05	8.21E-05	1.67E-03
Benzene	8.6E+01	1.00E+01	2.83E+02	5.55E-03	2.98E+02	3.53E+02	7.34E+03	5.62E+02	3.49E-01	8.12E+03	1.99E+00	5.55E-03	8.21E-05	2.39E-01
Methyl bromide	ND	1.00E+01	2.83E+02	6.24E-03	2.98E+02	2.77E+02	5.71E+03	4.67E+02	3.22E-01	5.65E+03	1.99E+00	6.24E-03	8.21E-05	2.69E-01
Carbon disulfide	ND	1.00E+01	2.83E+02	3.02E-02	2.98E+02	3.19E+02	6.39E+03	5.52E+02	3.12E-01	6.68E+03	1.99E+00	3.02E-02	8.21E-05	1.30E+00
Chlorobenzene	1.8E+01	1.00E+01	2.83E+02	3.71E-03	2.98E+02	4.05E+02	8.41E+03	6.32E+02	3.58E-01	9.80E+03	1.99E+00	3.71E-03	8.21E-05	1.60E-01
Ethyl Chloride	ND	1.00E+01	2.83E+02	1.09E-02	2.98E+02	2.85E+02	1.36E+03	4.28E+02	3.77E-01	1.37E+03	1.99E+00	1.09E-02	8.21E-05	4.69E-01
Chloroform	ND	1.00E+01	2.83E+02	3.66E-03	2.98E+02	3.34E+02	6.99E+03	5.36E+02	3.45E-01	7.55E+03	1.99E+00	3.66E-03	8.21E-05	1.58E-01
cis-1,2-Dichloroethene	4.8E+02	1.00E+01	2.83E+02	4.07E-03	2.98E+02	3.34E+02	7.19E+03	5.44E+02	3.38E-01	7.73E+03	1.99E+00	4.07E-03	8.21E-05	1.75E-01
Cyclohexane	ND	1.00E+01	2.83E+02	2.00E+00	2.98E+02	3.54E+02	1.31E+03	5.31E+02	3.77E-01	1.49E+03	1.99E+00	2.00E+00	8.21E-05	8.61E+01
Ethylbenzene	4.0E+01	1.00E+01	2.83E+02	7.88E-03	2.98E+02	4.09E+02	8.50E+03	6.17E+02	3.75E-01	1.02E+04	1.99E+00	7.88E-03	8.21E-05	3.39E-01
Isopropylbenzene	3.0E+00	1.00E+01	2.83E+02	1.47E-02	2.98E+02	4.25E+02	1.26E+03	6.31E+02	3.83E-01	1.54E+03	1.99E+00	1.47E-02	8.21E-05	6.33E-01
Methylcyclohexane	ND	1.00E+01	2.83E+02	4.23E-01	2.98E+02	3.74E+02	1.30E+03	5.61E+02	3.77E-01	1.51E+03	1.99E+00	4.23E-01	8.21E-05	1.82E+01
Methyl-Tertiary-Butyl Ether	5.4E+02	1.00E+01	2.83E+02	5.87E-04	2.98E+02	3.28E+02	1.32E+03	4.97E+02	3.73E-01	1.45E+03	1.99E+00	5.87E-04	8.21E-05	2.53E-02
Methylene chloride	ND	1.00E+01	2.83E+02	2.19E-03	2.98E+02	3.13E+02	6.71E+03	5.10E+02	3.38E-01	7.03E+03	1.99E+00	2.19E-03	8.21E-05	9.43E-02
Tetrachloroethene	ND	1.00E+01	2.83E+02	1.84E-02	2.98E+02	3.94E+02	8.29E+03	6.20E+02	3.55E-01	9.55E+03	1.99E+00	1.84E-02	8.21E-05	7.92E-01
Toluene	1.2E+03	1.00E+01	2.83E+02	6.64E-03	2.98E+02	3.84E+02	7.93E+03	5.92E+02	3.64E-01	9.15E+03	1.99E+00	6.64E-03	8.21E-05	2.86E-01
trans-1,2-Dichloroethene	1.5E+01	1.00E+01	2.83E+02	9.39E-03	2.98E+02	3.21E+02	6.72E+03	5.17E+02	3.44E-01	7.14E+03	1.99E+00	9.39E-03	8.21E-05	4.04E-01
Trichloroethene	2.0E+00	1.00E+01	2.83E+02	1.03E-02	2.98E+02	3.60E+02	7.51E+03	5.44E+02	3.74E-01	8.56E+03	1.99E+00	1.03E-02	8.21E-05	4.43E-01
Vinyl Chloride	4.2E+02	1.00E+01	2.83E+02	2.71E-02	2.98E+02	2.59E+02	5.25E+03	4.32E+02	3.28E-01	5.00E+03	1.99E+00	2.71E-02	8.21E-05	1.17E+00
Xylenes	4.3E+01	1.00E+01	2.83E+02	6.73E-06	2.98E+02	4.17E+02	1.26E+03	6.16E+02	3.85E-01	1.54E+03	1.99E+00	6.73E-06	8.21E-05	2.90E-04
Acetophenone	1.2E+00	1.00E+01	2.83E+02	1.02E-05	2.98E+02	4.75E+02	1.21E+03	7.13E+02	3.77E-01	1.52E+03	1.99E+00	1.02E-05	8.21E-05	4.39E-04
Naphthalene	1.4E+01	1.00E+01	2.83E+02	4.83E-04	2.98E+02	4.91E+02	1.04E+04	7.48E+02	3.70E-01	1.29E+04	1.99E+00	4.83E-04	8.21E-05	2.08E-02
2-Methylnaphthalene	ND	1.00E+01	2.83E+02	1.01E-03	2.98E+02	5.14E+02	1.17E+03	7.61E+02	3.84E-01	1.51E+03	1.99E+00	1.01E-03	8.21E-05	4.36E-02
2,4,5-Trichlorophenol	#N/A	1.00E+01	2.83E+02	4.34E-06	2.98E+02	5.26E+02	1.30E+04	7.59E+02	3.97E-01	1.73E+04	1.99E+00	4.34E-06	8.21E-05	1.87E-04
1,1'-Biphenyl	7.0E+00	1.00E+01	2.83E+02	3.03E-04	2.98E+02	5.29E+02	1.15E+03	7.94E+02	3.77E-01	1.47E+03	1.99E+00	3.03E-04	8.21E-05	1.30E-02
Acenaphthylene	3.2E+00	1.00E+01	2.83E+02	2.80E-04	2.98E+02	5.53E+02	1.12E+03	7.92E+02	4.01E-01	1.51E+03	1.99E+00	2.80E-04	8.21E-05	1.21E-02
Acenaphthene	2.1E+00	1.00E+01	2.83E+02	1.55E-04	2.98E+02	5.51E+02	1.22E+04	8.03E+02	3.91E-01	1.61E+04	1.99E+00	1.55E-04	8.21E-05	6.67E-03
Fluorene	5.5E+00	1.00E+01	2.83E+02	6.37E-05	2.98E+02	5.70E+02	1.27E+04	8.70E+02	3.69E-01	1.62E+04	1.99E+00	6.37E-05	8.21E-05	2.74E-03
Phenanthrene	3.1E+00	1.00E+01	2.83E+02	1.30E-04	2.98E+02	6.13E+02	1.06E+03	8.69E+02	4.06E-01	1.48E+03	1.99E+00	1.30E-04	8.21E-05	5.59E-03
Anthracene	ND	1.00E+01	2.83E+02	6.51E-05	2.98E+02	6.15E+02	1.31E+04	8.73E+02	4.05E-01	1.84E+04	1.99E+00	6.51E-05	8.21E-05	2.80E-03
C9-C18 Aliphatics	5.9E+01	1.00E+01	2.83E+02	1.65E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.65E+00	8.21E-05	7.10E+01
C11-C22 Aromatics	ND	1.00E+01	2.83E+02	7.17E-04	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	7.17E-04	8.21E-05	3.09E-02
C5-C8 Aliphatics	4.5E+02	1.00E+01	2.83E+02	1.30E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.30E+00	8.21E-05	5.58E+01
C9-C10 Aromatics	ND	1.00E+01	2.83E+02	7.92E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	7.92E-03	8.21E-05	3.41E-01
C9-C12 Aliphatics	5.0E+01	1.00E+01	2.83E+02	1.56E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.56E+00	8.21E-05	6.71E+01

TABLE 6-6 (continued)
GROUNDWATER TO OUTDOOR AIR
SHALLOW GROUNDWATER - COMBINED ON-SITE

	Conversion Factor m^3 to L	Source Vapor Conc. C_{source}	Depth below grade to bottom of trench L_F	Depth below grade to water table L_{WT}	Source Trench Separation L_T	SCS soil type directly above water table ST_{WT}	SCS soil type in vadose zone ST_V	Capillary zone mean particle diameter D_{cz}	Thickness of capillary zone L_{cz}	Diffusivity in air D_a	Diffusivity in water D_w	Vadose zone soil total porosity n_v
Units:	Conv01	µg/m³	cm	cm	cm	unitless	unitless	cm	cm	cm²/s	cm²/s	cm³/cm³
Formula:	L/m³	C_w*H'_{TS}*Conv01	(120 (4') for screening)	(Note 3)	L_{WT} - L_F	(Note 10)	(Note 11)	lookup	(Note 12)	lookup	lookup	(0.43 for screening)
Analyte												
1,1,1-Trichloroethane	1.00E+03	3.70E+03	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.80E-02	8.80E-06	4.30E-01
Trichloro-1,2,2-triflouroethan	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	2.88E-02	8.07E-06	4.30E-01
1,1,2-Trichloroethane	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.80E-02	8.80E-06	4.30E-01
1,1-Dichloroethane	1.00E+03	2.90E+04	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.42E-02	1.05E-05	4.30E-01
1,1-Dichloroethene	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	9.00E-02	1.04E-05	4.30E-01
1,2,4-Trichlorobenzene	1.00E+03	1.41E+03	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	3.00E-02	8.23E-06	4.30E-01
1,2-Dichlorobenzene	1.00E+03	8.18E+02	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	6.90E-02	7.90E-06	4.30E-01
1,3-Dichlorobenzene	1.00E+03	3.84E+03	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	4.14E-02	8.85E-06	4.30E-01
1,4-Dichlorobenzene	1.00E+03	2.06E+04	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	6.90E-02	7.90E-06	4.30E-01
Butanone, 2- (MEK)	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	8.08E-02	9.80E-06	4.30E-01
Acetone	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	1.24E-01	1.14E-05	4.30E-01
Benzene	1.00E+03	2.05E+04	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	8.80E-02	9.80E-06	4.30E-01
Methyl bromide	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.28E-02	1.21E-05	4.30E-01
Carbon disulfide	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	1.04E-01	1.00E-05	4.30E-01
Chlorobenzene	1.00E+03	2.87E+03	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.30E-02	8.70E-06	4.30E-01
Ethyl Chloride	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	2.71E-01	1.15E-05	4.30E-01
Chloroform	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	1.04E-01	1.00E-05	4.30E-01
cis-1,2-Dichloroethene	1.00E+03	8.41E+04	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.36E-02	1.13E-05	4.30E-01
Cyclohexane	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	8.00E-02	9.00E-06	4.30E-01
Ethylbenzene	1.00E+03	1.36E+04	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.50E-02	7.80E-06	4.30E-01
Isopropylbenzene	1.00E+03	1.90E+03	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	6.50E-02	7.83E-06	4.30E-01
Methylcyclohexane	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	9.86E-02	8.52E-06	4.30E-01
Methyl-Tertiary-Butyl Ether	1.00E+03	1.36E+04	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	1.02E-01	1.05E-05	4.30E-01
Methylene chloride	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	1.01E-01	1.17E-05	4.30E-01
Tetrachloroethene	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.20E-02	8.20E-06	4.30E-01
Toluene	1.00E+03	3.43E+05	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	8.70E-02	8.60E-06	4.30E-01
trans-1,2-Dichloroethene	1.00E+03	6.06E+03	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.07E-02	1.19E-05	4.30E-01
Trichloroethene	1.00E+03	8.87E+02	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.90E-02	9.10E-06	4.30E-01
Vinyl Chloride	1.00E+03	4.90E+05	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	1.06E-01	1.23E-06	4.30E-01
Xylenes	1.00E+03	1.23E+01	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.69E-02	8.44E-06	4.30E-01
Acetophenone	1.00E+03	5.27E-01	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	6.00E-02	8.73E-06	4.30E-01
Naphthalene	1.00E+03	2.83E+02	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	5.90E-02	7.50E-06	4.30E-01
2-Methylnaphthalene	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	4.84E-02	7.75E-06	4.30E-01
2,4,5-Trichlorophenol	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	2.91E-02	7.03E-06	4.30E-01
1,1'-Biphenyl	1.00E+03	9.13E+01	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	4.04E-02	8.15E-06	4.30E-01
Acenaphthylene	1.00E+03	3.86E+01	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	4.43E-02	7.44E-06	4.30E-01
Acenaphthene	1.00E+03	1.40E+01	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	4.21E-02	7.69E-06	4.30E-01
Fluorene	1.00E+03	1.51E+01	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	3.63E-02	7.88E-06	4.30E-01
Phenanthrene	1.00E+03	1.73E+01	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	3.30E-02	7.47E-06	4.30E-01
Anthracene	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	3.24E-02	7.74E-06	4.30E-01
C9-C18 Aliphatics	1.00E+03	4.19E+06	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.00E-02	5.00E-06	4.30E-01
C11-C22 Aromatics	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	6.00E-02	1.00E-05	4.30E-01
C5-C8 Aliphatics	1.00E+03	2.50E+07	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	8.00E-02	1.00E-05	4.30E-01
C9-C10 Aromatics	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.00E-02	1.00E-05	4.30E-01
C9-C12 Aliphatics	1.00E+03	3.36E+06	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.00E-02	1.00E-05	4.30E-01

TABLE 6-6 (continued)
GROUNDWATER TO OUTDOOR AIR
SHALLOW GROUNDWATER - COMBINED ON-SITE

	Vadose zone soil water-filled porosity	Vadose zone soil air-filled porosity	Vadose zone Effective Diffusion Coeff.	Capillary zone soil total porosity	Capillary zone residual soil water content	Capillary zone saturated soil water content	Capillary zone van Genuchten shape parameter	Capillary zone soil water-filled porosity	Capillary zone soil air-filled porosity	Capillary zone Effective Diffusion Coeff.	Total Overall Effective Diffusion Coeff.
	θ_{wsv}	θ_{asv}	D_v^{eff}	n_{cz}	$\theta_{r,cz}$	$\theta_{s,cz}$	M_{cz}	θ_{wscz}	θ_{ascz}	D_{cz}^{eff}	D_T^{eff}
Units:	cm^3/cm^3	cm^3/cm^3	cm^2/s	cm^3/cm^3	cm^3/cm^3	cm^3/cm^3	unitless	cm^3/cm^3	cm^3/cm^3	cm^2/s	cm^2/s
Formula:	(0.3 for screening)	$n_v - \theta_{wsv}$	(Note 13)	(0.43 for screening)	lookup	lookup	lookup	(Note 15)	$n_{cz} - \theta_{wscz}$	(Note 14)	(Note 4)
Analyte											
1,1,1-Trichloroethane	3.00E-01	1.30E-01	4.74E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	5.20E-04	-6.99E-04
Trichloro-1,2,2-triflouroethan	3.00E-01	1.30E-01	1.75E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	1.92E-04	-2.56E-04
1,1,2-Trichloroethane	3.00E-01	1.30E-01	4.95E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	5.40E-04	-8.43E-04
1,1-Dichloroethane	3.00E-01	1.30E-01	4.54E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.98E-04	-6.84E-04
1,1-Dichloroethene	3.00E-01	1.30E-01	5.46E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	6.00E-04	-8.03E-04
1,2,4-Trichlorobenzene	3.00E-01	1.30E-01	1.95E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	2.12E-04	-3.64E-04
1,2-Dichlorobenzene	3.00E-01	1.30E-01	4.28E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.69E-04	-6.73E-04
1,3-Dichlorobenzene	3.00E-01	1.30E-01	2.55E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	2.80E-04	-3.94E-04
1,4-Dichlorobenzene	3.00E-01	1.30E-01	4.26E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.67E-04	-6.59E-04
Butanone, 2- (MEK)	3.00E-01	1.30E-01	8.89E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	9.21E-04	2.56E-03
Acetone	3.00E-01	1.30E-01	1.42E-03	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	1.47E-03	3.54E-03
Benzene	3.00E-01	1.30E-01	5.37E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	5.90E-04	-8.05E-04
Methyl bromide	3.00E-01	1.30E-01	4.46E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.89E-04	-6.73E-04
Carbon disulfide	3.00E-01	1.30E-01	6.31E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	6.93E-04	-9.27E-04
Chlorobenzene	3.00E-01	1.30E-01	4.48E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.91E-04	-6.81E-04
Ethyl Chloride	3.00E-01	1.30E-01	1.64E-03	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	1.81E-03	-2.42E-03
Chloroform	3.00E-01	1.30E-01	6.37E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	6.98E-04	-9.61E-04
cis-1,2-Dichloroethene	3.00E-01	1.30E-01	4.52E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.96E-04	-6.93E-04
Cyclohexane	3.00E-01	1.30E-01	4.85E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	5.33E-04	-7.09E-04
Ethylbenzene	3.00E-01	1.30E-01	4.57E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	5.02E-04	-6.79E-04
Isopropylbenzene	3.00E-01	1.30E-01	3.95E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.34E-04	-5.84E-04
Methylcyclohexane	3.00E-01	1.30E-01	5.98E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	6.57E-04	-8.74E-04
Methyl-Tertiary-Butyl Ether	3.00E-01	1.30E-01	6.61E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	7.21E-04	-1.20E-03
Methylene chloride	3.00E-01	1.30E-01	6.24E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	6.84E-04	-9.74E-04
Tetrachloroethene	3.00E-01	1.30E-01	4.37E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.80E-04	-6.45E-04
Toluene	3.00E-01	1.30E-01	5.30E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	5.82E-04	-7.90E-04
trans-1,2-Dichloroethene	3.00E-01	1.30E-01	4.31E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.74E-04	-6.45E-04
Trichloroethene	3.00E-01	1.30E-01	4.81E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	5.28E-04	-7.13E-04
Vinyl Chloride	3.00E-01	1.30E-01	6.42E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	7.06E-04	-9.40E-04
Xylenes	3.00E-01	1.30E-01	3.33E-03	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	3.26E-03	2.36E-03
Acetophenone	3.00E-01	1.30E-01	2.32E-03	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	2.27E-03	1.70E-03
Naphthalene	3.00E-01	1.30E-01	3.93E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.27E-04	-8.08E-04
2-Methylnaphthalene	3.00E-01	1.30E-01	3.11E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	3.39E-04	-5.54E-04
2,4,5-Trichlorophenol	3.00E-01	1.30E-01	3.87E-03	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	3.74E-03	2.32E-03
1,1'-Biphenyl	3.00E-01	1.30E-01	3.06E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	3.28E-04	-1.28E-03
Acenaphthylene	3.00E-01	1.30E-01	3.29E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	3.53E-04	-1.20E-03
Acenaphthene	3.00E-01	1.30E-01	3.68E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	3.89E-04	4.25E-02
Fluorene	3.00E-01	1.30E-01	5.02E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	5.12E-04	8.01E-04
Phenanthrene	3.00E-01	1.30E-01	3.31E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	3.45E-04	1.51E-03
Anthracene	3.00E-01	1.30E-01	4.67E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.76E-04	6.96E-04
C9-C18 Aliphatics	3.00E-01	1.30E-01	4.24E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.66E-04	-6.21E-04
C11-C22 Aromatics	3.00E-01	1.30E-01	3.95E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.30E-04	-7.79E-04
C5-C8 Aliphatics	3.00E-01	1.30E-01	4.85E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	5.33E-04	-7.09E-04
C9-C10 Aromatics	3.00E-01	1.30E-01	4.27E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.69E-04	-6.38E-04
C9-C12 Aliphatics	3.00E-01	1.30E-01	4.24E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.66E-04	-6.21E-04

TABLE 6-6 (continued)
GROUNDWATER TO OUTDOOR AIR
SHALLOW GROUNDWATER - COMBINED ON-SITE

	Area of Trench Below Grade	Trench Ventilation Rate	Pressure Diff. between soil & enclosed space	Vadose zone soil saturated hydraulic conductivity	Conversion Factor hr to s	Viscosity of water at 10°C	Viscosity of water at system temp.	Density of water	Acceleration due to gravity	Vadose zone soil intrinsic permeability	Vadose zone residual soil water content	Vadose zone effective total fluid saturation
	A_B	Q_{trench}	ΔP	$K_{s,v}$	Conv02	$\mu_{w,10}$	μ_w	ρ_w	g	$k_{i,v}$	$\theta_{r,v}$	S_w
Units:	cm^2	cm^3/s	$g/cm\text{-}s^2$	cm/hr	s/hr	g/cm-s	g/cm-s	g/cm^3	cm/s^2	cm^2	cm^3/cm^3	unitless
Formula:	(Note 2)	(Note 21)	(40 for screening)	lookup			(Note 16)	(0.999 for screening)		(Note 17)	lookup	(Note 18)
Analyte												
1,1,1-Trichloroethane	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Trichloro-1,2,2-triflouroethan	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
1,1,2-Trichloroethane	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
1,1-Dichloroethane	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
1,1-Dichloroethene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
1,2,4-Trichlorobenzene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
1,2-Dichlorobenzene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
1,3-Dichlorobenzene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
1,4-Dichlorobenzene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Butanone, 2- (MEK)	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Acetone	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Benzene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Methyl bromide	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Carbon disulfide	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Chlorobenzene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Ethyl Chloride	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Chloroform	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
cis-1,2-Dichloroethene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Cyclohexane	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Ethylbenzene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Isopropylbenzene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Methylcyclohexane	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Methyl-Tertiary-Butyl Ether	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Methylene chloride	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Tetrachloroethene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Toluene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
trans-1,2-Dichloroethene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Trichloroethene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Vinyl Chloride	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Xylenes	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Acetophenone	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Naphthalene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
2-Methylnaphthalene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
2,4,5-Trichlorophenol	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
1,1'-Biphenyl	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Acenaphthylene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Acenaphthene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Fluorene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Phenanthrene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Anthracene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
C9-C18 Aliphatics	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
C11-C22 Aromatics	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
C5-C8 Aliphatics	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
C9-C10 Aromatics	3.29E+05	1.70E+05	4.10E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
C9-C12 Aliphatics	3.29E+05	1.70E+05	4.20E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01

TABLE 6-6 (continued)
GROUNDWATER TO OUTDOOR AIR
SHALLOW GROUNDWATER - COMBINED ON-SITE

	Vadose zone van Genuchten shape parameter	Vadose zone soil relative air permeability	Vadose zone soil effective vapor permeability	Thickness of soil between soilgas & trench	Vapor viscosity at avg. soil temp.	Avg. Vapor Flow Rate Into trench	Infinite Source Attenuation Coeff.	Infinite Source Trench Conc.
	M_v	k_{rg}	k_v	L_{soil}	μ_{TS}	Q_{soil}	α	C_{trench}
Units:	unitless	unitless	cm^2	cm	g/cm-s	cm^3/s	unitless	$\mu g/m^3$
Formula:	lookup	(Note 19)	(Note 20)	(1 for screening)	0.00018*(T$_s$/298.15)^0.5	(Note 5)	(Note 6)	C_{source} * α
Analyte								
1,1,1-Trichloroethane	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	7.8E-05
Trichloro-1,2,2-triflouroethan	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
1,1,2-Trichloroethane	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
1,1-Dichloroethane	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	6.1E-04
1,1-Dichloroethene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
1,2,4-Trichlorobenzene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	3.0E-05
1,2-Dichlorobenzene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	1.7E-05
1,3-Dichlorobenzene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	8.1E-05
1,4-Dichlorobenzene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	4.4E-04
Butanone, 2- (MEK)	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
Acetone	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
Benzene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	4.4E-04
Methyl bromide	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
Carbon disulfide	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
Chlorobenzene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	6.1E-05
Ethyl Chloride	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
Chloroform	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
cis-1,2-Dichloroethene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	1.8E-03
Cyclohexane	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
Ethylbenzene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	2.9E-04
Isopropylbenzene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	4.0E-05
Methylcyclohexane	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
Methyl-Tertiary-Butyl Ether	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	2.9E-04
Methylene chloride	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
Tetrachloroethene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
Toluene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	7.3E-03
trans-1,2-Dichloroethene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	1.3E-04
Trichloroethene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	1.9E-05
Vinyl Chloride	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	1.0E-02
Xylenes	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	2.6E-07
Acetophenone	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	1.1E-08
Naphthalene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	6.0E-06
2-Methylnaphthalene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
2,4,5-Trichlorophenol	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
1,1'-Biphenyl	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	1.9E-06
Acenaphthylene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	8.2E-07
Acenaphthene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	3.0E-07
Fluorene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	3.2E-07
Phenanthrene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	3.7E-07
Anthracene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
C9-C18 Aliphatics	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	8.9E-02
C11-C22 Aromatics	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
C5-C8 Aliphatics	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	5.3E-01
C9-C10 Aromatics	5.61E-01	2.92E-01	1.58E-08	2.00E+00	1.75E-04	7.38E-03	4.35E-08	N/A
C9-C12 Aliphatics	5.61E-01	2.92E-01	1.58E-08	3.00E+00	1.75E-04	1.13E-02	6.68E-08	2.2E-01

TABLE 6-6 (continued)
GROUNDWATER TO OUTDOOR AIR
SHALLOW GROUNDWATER - COMBINED ON-SITE

Notes:

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

(1) Assumed equivalent to D_i^{eff} of soil layer i in contact with the floor

(2) For screening, assume a trench 4 ft deep, 3 ft wide, and 30 ft long.

(3) Depth to water table minus depth to bottom of floor must be > thickness of capillary fringe, which is based on the soil type (typ. around 30 cm). Use 121 cm for screening purposes.

(4) $D_T^{eff} = L_T / (((L_{WT} - L_{ut} - L_F) / D_v^{eff}) + (L_{ut} / D_{ut}^{eff}))$

(5) $Q_{soil} = \Delta P * k_v * L_{soil} / \mu_{TS}$; not from above reference

(6) $\alpha = [D_T^{eff} * A_B / (Q_{trench} * L_T)] / [(D_T^{eff} * A_B / (Q_{soil} * L_T)) + 1]$; assumes no resistance (Peclet number is infinite)

(7) A function of the ratio T_B/T_C:

T_B/T_C	ll
<0.57	0.30
0.57-0.71	$0.74(T_B/T_C)-0.116$
>0.71	0.41

(8) $\Delta H_{v,TB} = \Delta H_{v,B} * [(1-T_B/T_C)/(1-T_B/T_C)]^{ll}$

(9) $H_{TS} = EXP[-\Delta H_{v,TB}/R_u * (1/T_B - 1/T_K)] * H_R$

(10) Refer to 12 SCS soil types - use SC for screening.

(11) Refer to 12 SCS soil types - use SCL for screening.

(12) $L_{ut} = 0.15 / (0.2 * D_{ut})$

(13) $D_v^{eff} = D_a * (\theta_{av}^{3.33} / n_v^2) + (D_w / H'_{TS})(\theta_{wv}^{3.33} / n_v^2)$

(14) $D_{ut}^{eff} = D_a * (\theta_{aut}^{3.33} / n_{ut}^2) + (D_w / H'_{TS})(\theta_{wut}^{3.33} / n_{ut}^2)$

(15) $\theta_{wut} = \theta_{r,ut} + ((\theta_{s,ut} - \theta_{r,ut}) / (2^{h_{bot}}))$, where the value 2 in the formula is used for screening, but may be refined based on soil parameters (see USEPA, 1999).

(16) $\mu_w = \mu_{w,10} * (T_a / 283.15)^{0.5}$

(17) $k_{r,v} = K_{s,v} * 1/Conv02 * \mu_w / (\rho_w * g)$

(18) $S_{ve} = (\theta_{w,v} - \theta_{r,v}) / (n_v - \theta_{r,v})$

(19) $k_{rg} = (1 - S_{ve})^{0.5} * (1 - S_{ve}^{1/Mv})^{2Mv}$

(20) $k_v = k_{r,v} * k_{rg}$; note that the model is very sensitive to this parameter and if site-specific values are available, they should be used.

(21) For screening, assume a trench 4 ft deep, 3 ft wide, 30 ft long and an air exchange rate of 60/hr. The air exchange rate is based on the assumption that the wind speed in the trench is a small fraction of the ground wind speed and that it could take up to 1 minute for a contaminant to be cleared from the trench air space.

TABLE 6-6
GROUNDWATER TO OUTDOOR AIR
SHALLOW GROUNDWATER - COMBINED ON-SITE
SOUTHWEST PROPERTIES, WELLS G&H SUPERFUND SITE, OPERABLE UNIT 2
Murphy Waste Oil

	GW EPC	GW Temp.	GW Temp.	Henry's Law Constant at ref. temp.	Henry's Law Reference Temp.	Normal Boiling Point	Enthalpy of vaporization at T_S	Critical Temp.	constant	Enthalpy of vaporization at T_S	Gas Constant	Henry's Law Constant at T_S	Gas Constant	Henry's Law Constant
	Cw	T_S	T'_S	H_R	T_R	T_B	$\Delta H_{v,a}$	T_C	n	$\Delta H_{v,TS}$	R_c	H_{TS}	R	H'_{TS}
Units:	µg/L	°C	K	atm-m³/mol	K	K	cal/mol	K	unitless	cal/mol	cal/mol-K	atm-m³/mol	m³-atm/mol-K	unitless
Formula:	Input	(10 for screening)	(T_S + 273.15)	lookup	(lookup+273.15)	lookup	lookup	lookup	(Note 7)	(Note 8)		(Note 9)		H_{TS} / (R * T_S)
Analyte														
1,1,1-Trichloroethane	1.5E+02	1.00E+01	2.83E+02	1.72E-02	2.98E+02	3.47E+02	7.14E+03	5.45E+02	3.55E-01	7.88E+03	1.99E+00	1.72E-02	8.21E-05	7.40E-01
Trichloro-1,2,2-triflouroethane, 1,1	1.5E+01	1.00E+01	2.83E+02	5.17E-01	2.98E+02	3.21E+02	1.33E+03	4.81E+02	3.77E-01	1.44E+03	1.99E+00	5.17E-01	8.21E-05	2.23E+01
1,1,2-Trichloroethane	4.0E-01	1.00E+01	2.83E+02	9.12E-04	2.98E+02	3.86E+02	8.32E+03	6.02E+02	3.59E-01	9.57E+03	1.99E+00	9.12E-04	8.21E-05	3.93E-02
1,1-Dichloroethane	2.2E+02	1.00E+01	2.83E+02	5.61E-03	2.98E+02	3.31E+02	6.90E+03	5.23E+02	3.52E-01	7.45E+03	1.99E+00	5.61E-03	8.21E-05	2.41E-01
1,1-Dichloroethene	9.0E+00	1.00E+01	2.83E+02	2.61E-02	2.98E+02	3.05E+02	6.25E+03	5.76E+02	3.00E-01	6.39E+03	1.99E+00	2.61E-02	8.21E-05	1.12E+00
1,2,4-Trichlorobenzene	ND	1.00E+01	2.83E+02	1.42E-03	2.98E+02	4.86E+02	1.05E+04	7.25E+02	3.80E-01	1.32E+04	1.99E+00	1.42E-03	8.21E-05	6.11E-02
1,2-Dichlorobenzene	1.0E+00	1.00E+01	2.83E+02	1.90E-03	2.98E+02	4.54E+02	9.70E+03	7.05E+02	3.60E-01	1.17E+04	1.99E+00	1.90E-03	8.21E-05	8.18E-02
1,3-Dichlorobenzene	ND	1.00E+01	2.83E+02	4.70E-03	2.98E+02	4.46E+02	1.24E+03	6.84E+02	3.67E-01	1.50E+03	1.99E+00	4.70E-03	8.21E-05	2.02E-01
1,4-Dichlorobenzene	ND	1.00E+01	2.83E+02	2.43E-03	2.98E+02	4.47E+02	9.27E+03	6.85E+02	3.67E-01	1.12E+04	1.99E+00	2.43E-03	8.21E-05	1.05E-01
Butanone, 2- (MEK)	6.0E+00	1.00E+01	2.83E+02	5.60E-05	2.98E+02	3.53E+02	1.31E+03	5.29E+02	3.77E-01	1.49E+03	1.99E+00	5.60E-05	8.21E-05	2.41E-03
Acetone	3.5E+01	1.00E+01	2.83E+02	3.88E-05	2.98E+02	3.29E+02	6.96E+03	5.08E+02	3.63E-01	7.56E+03	1.99E+00	3.88E-05	8.21E-05	1.67E-03
Benzene	1.6E+01	1.00E+01	2.83E+02	5.55E-03	2.98E+02	3.53E+02	7.34E+03	5.62E+02	3.49E-01	8.12E+03	1.99E+00	5.55E-03	8.21E-05	2.39E-01
Methyl bromide	1.0E+00	1.00E+01	2.83E+02	6.24E-03	2.98E+02	2.77E+02	5.71E+03	4.67E+02	3.22E-01	5.65E+03	1.99E+00	6.24E-03	8.21E-05	2.69E-01
Carbon disulfide	3.0E+00	1.00E+01	2.83E+02	3.02E-02	2.98E+02	3.19E+02	6.39E+03	5.52E+02	3.12E-01	6.68E+03	1.99E+00	3.02E-02	8.21E-05	1.30E+00
Chlorobenzene	1.0E+00	1.00E+01	2.83E+02	3.71E-03	2.98E+02	4.05E+02	8.41E+03	6.32E+02	3.58E-01	9.80E+03	1.99E+00	3.71E-03	8.21E-05	1.60E-01
Ethyl Chloride	5.0E+01	1.00E+01	2.83E+02	1.09E-02	2.98E+02	2.85E+02	1.36E+03	4.28E+02	3.77E-01	1.37E+03	1.99E+00	1.09E-02	8.21E-05	4.69E-01
Chloroform	ND	1.00E+01	2.83E+02	3.66E-03	2.98E+02	3.34E+02	6.99E+03	5.36E+02	3.45E-01	7.55E+03	1.99E+00	3.66E-03	8.21E-05	1.58E-01
cis-1,2-Dichloroethene	1.9E+03	1.00E+01	2.83E+02	4.07E-03	2.98E+02	3.34E+02	7.19E+03	5.44E+02	3.38E-01	7.73E+03	1.99E+00	4.07E-03	8.21E-05	1.75E-01
Cyclohexane	8.0E+00	1.00E+01	2.83E+02	2.00E+00	2.98E+02	3.54E+02	1.31E+03	5.31E+02	3.77E-01	1.49E+03	1.99E+00	2.00E+00	8.21E-05	8.61E+01
Ethylbenzene	2.3E+01	1.00E+01	2.83E+02	7.88E-03	2.98E+02	4.09E+02	8.50E+03	6.17E+02	3.75E-01	1.02E+04	1.99E+00	7.88E-03	8.21E-05	3.39E-01
Isopropylbenzene	2.0E+00	1.00E+01	2.83E+02	1.47E-02	2.98E+02	4.25E+02	1.26E+03	6.31E+02	3.83E-01	1.54E+03	1.99E+00	1.47E-02	8.21E-05	6.33E-01
Methylcyclohexane	7.0E+00	1.00E+01	2.83E+02	4.23E-01	2.98E+02	3.74E+02	1.30E+03	5.61E+02	3.77E-01	1.51E+03	1.99E+00	4.23E-01	8.21E-05	1.82E+01
Methyl-Tertiary-Butyl Ether	ND	1.00E+01	2.83E+02	5.87E-04	2.98E+02	3.28E+02	1.32E+03	4.97E+02	3.73E-01	1.45E+03	1.99E+00	5.87E-04	8.21E-05	2.53E-02
Methylene chloride	9.0E+01	1.00E+01	2.83E+02	2.19E-03	2.98E+02	3.13E+02	6.71E+03	5.10E+02	3.38E-01	7.03E+03	1.99E+00	2.19E-03	8.21E-05	9.43E-02
Tetrachloroethene	7.0E+00	1.00E+01	2.83E+02	1.84E-02	2.98E+02	3.94E+02	8.29E+03	6.20E+02	3.55E-01	9.55E+03	1.99E+00	1.84E-02	8.21E-05	7.92E-01
Toluene	5.2E+01	1.00E+01	2.83E+02	6.64E-03	2.98E+02	3.84E+02	7.93E+03	5.92E+02	3.64E-01	9.15E+03	1.99E+00	6.64E-03	8.21E-05	2.86E-01
trans-1,2-Dichloroethene	2.8E+01	1.00E+01	2.83E+02	9.39E-03	2.98E+02	3.21E+02	6.72E+03	5.17E+02	3.44E-01	7.14E+03	1.99E+00	9.39E-03	8.21E-05	4.04E-01
Trichloroethene	4.2E+01	1.00E+01	2.83E+02	1.03E-02	2.98E+02	3.60E+02	7.51E+03	5.44E+02	3.74E-01	8.56E+03	1.99E+00	1.03E-02	8.21E-05	4.43E-01
Vinyl Chloride	6.0E+02	1.00E+01	2.83E+02	2.71E-02	2.98E+02	2.59E+02	5.25E+03	4.32E+02	3.28E-01	5.00E+03	1.99E+00	2.71E-02	8.21E-05	1.17E+00
Xylenes	1.1E+02	1.00E+01	2.83E+02	6.73E-06	2.98E+02	4.17E+02	1.26E+03	6.16E+02	3.85E-01	1.54E+03	1.99E+00	6.73E-06	8.21E-05	2.90E-04
Acetophenone	ND	1.00E+01	2.83E+02	1.02E-05	2.98E+02	4.75E+02	1.21E+03	7.13E+02	3.77E-01	1.52E+03	1.99E+00	1.02E-05	8.21E-05	4.39E-04
Naphthalene	2.5E+01	1.00E+01	2.83E+02	4.83E-04	2.98E+02	4.91E+02	1.04E+04	7.48E+02	3.70E-01	1.29E+04	1.99E+00	4.83E-04	8.21E-05	2.08E-02
2-Methylnaphthalene	1.1E+01	1.00E+01	2.83E+02	1.01E-03	2.98E+02	5.14E+02	1.17E+03	7.61E+02	3.84E-01	1.51E+03	1.99E+00	1.01E-03	8.21E-05	4.36E-02
2,4,5-Trichlorophenol	#N/A	1.00E+01	2.83E+02	4.34E-06	2.98E+02	5.26E+02	1.30E+04	7.59E+02	3.97E-01	1.73E+04	1.99E+00	4.34E-06	8.21E-05	1.87E-04
1,1'-Biphenyl	5.0E-01	1.00E+01	2.83E+02	3.03E-04	2.98E+02	5.29E+02	1.15E+03	7.94E+02	3.77E-01	1.47E+03	1.99E+00	3.03E-04	8.21E-05	1.30E-02
Acenaphthylene	ND	1.00E+01	2.83E+02	2.80E-04	2.98E+02	5.53E+02	1.12E+03	7.92E+02	4.01E-01	1.51E+03	1.99E+00	2.80E-04	8.21E-05	1.21E-02
Acenaphthene	5.0E-01	1.00E+01	2.83E+02	1.55E-04	2.98E+02	5.51E+02	1.22E+04	8.03E+02	3.91E-01	1.61E+04	1.99E+00	1.55E-04	8.21E-05	6.67E-03
Fluorene	5.0E-01	1.00E+01	2.83E+02	6.37E-05	2.98E+02	5.70E+02	1.27E+04	8.70E+02	3.69E-01	1.62E+04	1.99E+00	6.37E-05	8.21E-05	2.74E-03
Phenanthrene	1.0E+01	1.00E+01	2.83E+02	1.30E-04	2.98E+02	6.13E+02	1.06E+03	8.69E+02	4.06E-01	1.48E+03	1.99E+00	1.30E-04	8.21E-05	5.59E-03
Anthracene	2.0E-01	1.00E+01	2.83E+02	6.51E-05	2.98E+02	6.15E+02	1.31E+04	8.73E+02	4.05E-01	1.84E+04	1.99E+00	6.51E-05	8.21E-05	2.80E-03
C9-C18 Aliphatics	3.1E+03	1.00E+01	2.83E+02	1.65E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.65E+00	8.21E-05	7.10E+01
C11-C22 Aromatics	1.2E+03	1.00E+01	2.83E+02	7.17E-04	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	7.17E-04	8.21E-05	3.09E-02
C5-C8 Aliphatics	2.6E+02	1.00E+01	2.83E+02	1.30E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.30E+00	8.21E-05	5.58E+01
C9-C10 Aromatics	2.0E+02	1.00E+01	2.83E+02	7.92E-03	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	7.92E-03	8.21E-05	3.41E-01
C9-C12 Aliphatics	9.6E+01	1.00E+01	2.83E+02	1.56E+00	2.98E+02	NA	NA	NA	NA	NA	1.99E+00	1.56E+00	8.21E-05	6.71E+01

TABLE 6-6 (continued)
GROUNDWATER TO OUTDOOR AIR
SHALLOW GROUNDWATER - COMBINED ON-SITE

	Conversion Factor m^3 to L	Source Vapor Conc.	Depth below grade to bottom of trench	Depth below grade to water table	Source Trench Separation	SCS soil type directly above water table	SCS soil type in vadose zone	Capillary zone mean particle diameter	Thickness of capillary zone	Diffusivity in air	Diffusivity in water	Vadose zone soil total porosity
	Conv01	C_{source}	L_T	L_{WT}	L_T	ST_{WT}	ST_v	D_{cz}	L_{cz}	D_a	D_w	n_v
Units:	L/m^3	$\mu g/m^3$	cm	cm	cm	unitless	unitless	cm	cm	cm^2/s	cm^2/s	cm^3/cm^3
Formula:		C_w*H'_{TS}*Conv01	(120 (4') for screening)	(Note 3)	L_{WT} - L_T	(Note 10)	(Note 11)	lookup	(Note 12)	lookup	lookup	(0.43 for screening)
Analyte												
1,1,1-Trichloroethane	1.00E+03	1.11E+05	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.80E-02	8.80E-06	4.30E-01
Trichloro-1,2,2-triflouroethar	1.00E+03	3.34E+05	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	2.88E-02	8.07E-06	4.30E-01
1,1,2-Trichloroethane	1.00E+03	1.57E+01	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.80E-02	8.80E-06	4.30E-01
1,1-Dichloroethane	1.00E+03	5.31E+04	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.42E-02	1.05E-05	4.30E-01
1,1-Dichloroethene	1.00E+03	1.01E+04	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	9.00E-02	1.04E-05	4.30E-01
1,2,4-Trichlorobenzene	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	3.00E-02	8.23E-06	4.30E-01
1,2-Dichlorobenzene	1.00E+03	8.18E+01	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	6.90E-02	7.90E-06	4.30E-01
1,3-Dichlorobenzene	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	4.14E-02	8.85E-06	4.30E-01
1,4-Dichlorobenzene	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	6.90E-02	7.90E-06	4.30E-01
Butanone, 2- (MEK)	1.00E+03	1.45E+01	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	8.08E-02	9.80E-06	4.30E-01
Acetone	1.00E+03	5.84E+01	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	1.24E-01	1.14E-05	4.30E-01
Benzene	1.00E+03	3.82E+03	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	8.80E-02	9.80E-06	4.30E-01
Methyl bromide	1.00E+03	2.69E+02	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.28E-02	1.21E-05	4.30E-01
Carbon disulfide	1.00E+03	3.90E+03	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	1.04E-01	1.00E-05	4.30E-01
Chlorobenzene	1.00E+03	1.60E+02	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.30E-02	8.70E-06	4.30E-01
Ethyl Chloride	1.00E+03	2.35E+04	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	2.71E-01	1.15E-05	4.30E-01
Chloroform	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	1.04E-01	1.00E-05	4.30E-01
cis-1,2-Dichloroethene	1.00E+03	3.33E+05	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.36E-02	1.13E-05	4.30E-01
Cyclohexane	1.00E+03	6.89E+05	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	8.00E-02	9.00E-06	4.30E-01
Ethylbenzene	1.00E+03	7.80E+03	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.50E-02	7.80E-06	4.30E-01
Isopropylbenzene	1.00E+03	1.27E+03	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	6.50E-02	7.83E-06	4.30E-01
Methylcyclohexane	1.00E+03	1.27E+05	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	9.86E-02	8.52E-06	4.30E-01
Methyl-Tertiary-Butyl Ether	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	1.02E-01	1.05E-05	4.30E-01
Methylene chloride	1.00E+03	8.48E+03	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	1.01E-01	1.17E-05	4.30E-01
Tetrachloroethene	1.00E+03	5.54E+03	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.20E-02	8.20E-06	4.30E-01
Toluene	1.00E+03	1.49E+04	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	8.70E-02	8.60E-06	4.30E-01
trans-1,2-Dichloroethene	1.00E+03	1.13E+04	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.07E-02	1.19E-05	4.30E-01
Trichloroethene	1.00E+03	1.86E+04	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.90E-02	9.10E-06	4.30E-01
Vinyl Chloride	1.00E+03	7.00E+05	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	1.06E-01	1.23E-06	4.30E-01
Xylenes	1.00E+03	3.19E+01	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.69E-02	8.44E-06	4.30E-01
Acetophenone	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	6.00E-02	8.73E-06	4.30E-01
Naphthalene	1.00E+03	5.20E+02	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	5.90E-02	7.50E-06	4.30E-01
2-Methylnaphthalene	1.00E+03	4.80E+02	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	4.84E-02	7.75E-06	4.30E-01
2,4,5-Trichlorophenol	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	2.91E-02	7.03E-06	4.30E-01
1,1'-Biphenyl	1.00E+03	6.52E+00	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	4.04E-02	8.15E-06	4.30E-01
Acenaphthylene	1.00E+03	ND	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	4.43E-02	7.44E-06	4.30E-01
Acenaphthene	1.00E+03	3.34E+00	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	4.21E-02	7.69E-06	4.30E-01
Fluorene	1.00E+03	1.37E+00	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	3.63E-02	7.88E-06	4.30E-01
Phenanthrene	1.00E+03	5.59E+01	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	3.30E-02	7.47E-06	4.30E-01
Anthracene	1.00E+03	5.60E-01	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	3.24E-02	7.74E-06	4.30E-01
C9-C18 Aliphatics	1.00E+03	2.20E+08	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.00E-02	5.00E-06	4.30E-01
C11-C22 Aromatics	1.00E+03	3.70E+04	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	6.00E-02	1.00E-05	4.30E-01
C5-C8 Aliphatics	1.00E+03	1.44E+07	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	8.00E-02	1.00E-05	4.30E-01
C9-C10 Aromatics	1.00E+03	6.82E+04	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.00E-02	1.00E-05	4.30E-01
C9-C12 Aliphatics	1.00E+03	6.44E+06	1.20E+02	1.21E+02	1.00E+00	LS	LS	4.00E-02	1.88E+01	7.00E-02	1.00E-05	4.30E-01

TABLE 6-6 (continued)
GROUNDWATER TO OUTDOOR AIR
SHALLOW GROUNDWATER - COMBINED ON-SITE

	Vadose zone soil water-filled porosity	Vadose zone soil air-filled porosity	Vadose zone Effective Diffusion Coeff.	Capillary zone soil total porosity	Capillary zone residual soil water content	Capillary zone saturated soil water content	Capillary zone van Genuchten shape parameter	Capillary zone soil water-filled porosity	Capillary zone soil air-filled porosity	Capillary zone Effective Diffusion Coeff.	Total Overall Effective Diffusion Coeff.
	θ_{wzv}	θ_{azv}	D_v^{eff}	n_{cz}	θ_{rcz}	θ_{scz}	M_{cz}	θ_{wzcz}	θ_{azcz}	D_{cz}^{eff}	D_T^{eff}
Units:	cm^3/cm^3	cm^3/cm^3	cm^2/s	cm^3/cm^3	cm^3/cm^3	cm^3/cm^3	unitless	cm^3/cm^3	cm^3/cm^3	cm^2/s	cm^2/s
Formula:	(0.3 for screening)	$n_v - \theta_{wzv}$	(Note 13)	(0.43 for screening)	lookup	lookup	lookup	(Note 15)	$n_{cz} - \theta_{wzcz}$	(Note 14)	(Note 4)
Analyte											
1,1,1-Trichloroethane	3.00E-01	1.30E-01	4.74E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	5.20E-04	-6.99E-04
Trichloro-1,2,2-triflouroethar	3.00E-01	1.30E-01	1.75E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	1.92E-04	-2.56E-04
1,1,2-Trichloroethane	3.00E-01	1.30E-01	4.95E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	5.40E-04	-8.43E-04
1,1-Dichloroethane	3.00E-01	1.30E-01	4.54E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.98E-04	-6.84E-04
1,1-Dichloroethene	3.00E-01	1.30E-01	5.46E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	6.00E-04	-8.03E-04
1,2,4-Trichlorobenzene	3.00E-01	1.30E-01	1.95E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	2.12E-04	-3.64E-04
1,2-Dichlorobenzene	3.00E-01	1.30E-01	4.28E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.69E-04	-6.73E-04
1,3-Dichlorobenzene	3.00E-01	1.30E-01	2.55E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	2.80E-04	-3.94E-04
1,4-Dichlorobenzene	3.00E-01	1.30E-01	4.26E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.67E-04	-6.59E-04
Butanone, 2- (MEK)	3.00E-01	1.30E-01	8.89E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	9.21E-04	2.56E-03
Acetone	3.00E-01	1.30E-01	1.42E-03	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	1.47E-03	3.54E-03
Benzene	3.00E-01	1.30E-01	5.37E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	5.90E-04	-8.05E-04
Methyl bromide	3.00E-01	1.30E-01	4.46E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.89E-04	-6.73E-04
Carbon disulfide	3.00E-01	1.30E-01	6.31E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	6.93E-04	-9.27E-04
Chlorobenzene	3.00E-01	1.30E-01	4.48E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.91E-04	-6.81E-04
Ethyl Chloride	3.00E-01	1.30E-01	1.64E-03	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	1.81E-03	-2.42E-03
Chloroform	3.00E-01	1.30E-01	6.37E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	6.98E-04	-9.61E-04
cis-1,2-Dichloroethene	3.00E-01	1.30E-01	4.52E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.96E-04	-6.93E-04
Cyclohexane	3.00E-01	1.30E-01	4.85E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	5.33E-04	-7.09E-04
Ethylbenzene	3.00E-01	1.30E-01	4.57E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	5.02E-04	-6.79E-04
Isopropylbenzene	3.00E-01	1.30E-01	3.95E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.34E-04	-5.84E-04
Methylcyclohexane	3.00E-01	1.30E-01	5.98E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	6.57E-04	-8.74E-04
Methyl-Tertiary-Butyl Ether	3.00E-01	1.30E-01	6.61E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	7.21E-04	-1.20E-03
Methylene chloride	3.00E-01	1.30E-01	6.24E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	6.84E-04	-9.74E-04
Tetrachloroethene	3.00E-01	1.30E-01	4.37E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.80E-04	-6.45E-04
Toluene	3.00E-01	1.30E-01	5.30E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	5.82E-04	-7.90E-04
trans-1,2-Dichloroethene	3.00E-01	1.30E-01	4.31E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.74E-04	-6.45E-04
Trichloroethene	3.00E-01	1.30E-01	4.81E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	5.28E-04	-7.13E-04
Vinyl Chloride	3.00E-01	1.30E-01	6.42E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	7.06E-04	-9.40E-04
Xylenes	3.00E-01	1.30E-01	3.33E-03	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	3.26E-03	2.36E-03
Acetophenone	3.00E-01	1.30E-01	2.32E-03	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	2.27E-03	1.70E-03
Naphthalene	3.00E-01	1.30E-01	3.93E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.27E-04	-9.08E-04
2-Methylnaphthalene	3.00E-01	1.30E-01	3.11E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	3.39E-04	-5.54E-04
2,4,5-Trichlorophenol	3.00E-01	1.30E-01	3.87E-03	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	3.74E-03	2.32E-03
1,1'-Biphenyl	3.00E-01	1.30E-01	3.06E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	3.28E-04	-1.28E-03
Acenaphthylene	3.00E-01	1.30E-01	3.29E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	3.53E-04	-1.20E-03
Acenaphthene	3.00E-01	1.30E-01	3.68E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	3.89E-04	4.25E-02
Fluorene	3.00E-01	1.30E-01	5.02E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	5.12E-04	8.01E-04
Phenanthrene	3.00E-01	1.30E-01	3.31E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	3.45E-04	1.51E-03
Anthracene	3.00E-01	1.30E-01	4.67E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.76E-04	6.96E-04
C9-C18 Aliphatics	3.00E-01	1.30E-01	4.24E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.66E-04	-6.21E-04
C11-C22 Aromatics	3.00E-01	1.30E-01	3.95E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.30E-04	-7.79E-04
C5-C8 Aliphatics	3.00E-01	1.30E-01	4.85E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	5.33E-04	-7.09E-04
C9-C10 Aromatics	3.00E-01	1.30E-01	4.27E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.69E-04	-6.38E-04
C9-C12 Aliphatics	3.00E-01	1.30E-01	4.24E-04	4.30E-01	5.70E-02	4.10E-01	5.61E-01	2.96E-01	1.34E-01	4.66E-04	-6.21E-04

TABLE 6-6 (continued)
GROUNDWATER TO OUTDOOR AIR
SHALLOW GROUNDWATER - COMBINED ON-SITE

	Area of Trench Below Grade	Trench Ventilation Rate	Pressure Diff. between soil & enclosed space	Vadose zone soil saturated hydraulic conductivity	Conversion Factor hr to s	Viscosity of water at 10°C	Viscosity of water at system temp.	Density of water	Acceleration due to gravity	Vadose zone soil intrinsic permeability	Vadose zone residual soil water content	Vadose zone effective total fluid saturation
Units:	A_B cm^2	Q_{trench} cm^3/s	ΔP $g/cm\text{-}s^2$	$K_{s,v}$ cm/hr	Conv02 s/hr	$\mu_{w,10}$ g/cm-s	μ_w g/cm-s	ρ_w g/cm^3	g cm/s^2	$k_{s,v}$ cm^2	$\theta_{r,v}$ cm^3/cm^3	S_w unitless
Formula:	(Note 2)	(Note 21)	(40 for screening)	lookup			(Note 16)	(0.999 for screening)		(Note 17)	lookup	(Note 18)
Analyte												
1,1,1-Trichloroethane	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Trichloro-1,2,2-triflouroethar	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
1,1,2-Trichloroethane	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
1,1-Dichloroethane	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
1,1-Dichloroethene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
1,2,4-Trichlorobenzene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
1,2-Dichlorobenzene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
1,3-Dichlorobenzene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
1,4-Dichlorobenzene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Butanone, 2- (MEK)	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Acetone	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Benzene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Methyl bromide	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Carbon disulfide	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Chlorobenzene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Ethyl Chloride	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Chloroform	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
cis-1,2-Dichloroethene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Cyclohexane	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Ethylbenzene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Isopropylbenzene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Methylcyclohexane	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Methyl-Tertiary-Butyl Ether	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Methylene chloride	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Tetrachloroethene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Toluene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
trans-1,2-Dichloroethene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Trichloroethene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Vinyl Chloride	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Xylenes	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Acetophenone	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Naphthalene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
2-Methylnaphthalene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
2,4,5-Trichlorophenol	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
1,1'-Biphenyl	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Acenaphthylene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Acenaphthene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Fluorene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Phenanthrene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
Anthracene	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
C9-C18 Aliphatics	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
C11-C22 Aromatics	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
C5-C8 Aliphatics	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
C9-C10 Aromatics	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01
C9-C12 Aliphatics	3.29E+05	1.70E+05	4.00E+01	1.46E+01	3.60E+03	1.31E-02	1.31E-02	9.99E-01	9.81E+02	5.41E-08	5.70E-02	6.51E-01

TABLE 6-6 (continued)
GROUNDWATER TO OUTDOOR AIR
SHALLOW GROUNDWATER - COMBINED ON-SITE

	Vadose zone van Genuchten shape parameter	Vadose zone soil relative air permeability	Vadose zone soil effective vapor permeability	Thickness of soil between soilgas & trench	Vapor viscosity at avg. soil temp.	Avg. Vapor Flow Rate Into trench	Infinite Source Attenuation Coeff.	Infinite Source Trench Conc.
	M_v	k_{rg}	k_v	L_{soil}	μ_{TS}	Q_{soil}	α	C_{trench}
Units:	unitless	unitless	cm^2	cm	g/cm-s	cm^3/s	unitless	$\mu g/m^3$
Formula:	lookup	(Note 19)	(Note 20)	(1 for screening)	0.00018*(T's/298.15)^0.5	(Note 5)	(Note 6)	$C_{source} * \alpha$
Analyte								
1,1,1-Trichloroethane	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	2.4E-03
Trichloro-1,2,2-trifluoroethar	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	7.1E-03
1,1,2-Trichloroethane	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	3.3E-07
1,1-Dichloroethane	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	1.1E-03
1,1-Dichloroethene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	2.1E-04
1,2,4-Trichlorobenzene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
1,2-Dichlorobenzene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	1.7E-06
1,3-Dichlorobenzene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
1,4-Dichlorobenzene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
Butanone, 2- (MEK)	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	3.1E-07
Acetone	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	1.2E-06
Benzene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	8.1E-05
Methyl bromide	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	5.7E-06
Carbon disulfide	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	8.3E-05
Chlorobenzene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	3.4E-06
Ethyl Chloride	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	5.0E-04
Chloroform	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
cis-1,2-Dichloroethene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	7.1E-03
Cyclohexane	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	1.5E-02
Ethylbenzene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	1.7E-04
Isopropylbenzene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	2.7E-05
Methylcyclohexane	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	2.7E-03
Methyl-Tertiary-Butyl Ether	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
Methylene chloride	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	1.8E-04
Tetrachloroethene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	1.2E-04
Toluene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	3.1E-04
trans-1,2-Dichloroethene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	2.4E-04
Trichloroethene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	3.9E-04
Vinyl Chloride	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	1.5E-02
Xylenes	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	6.8E-07
Acetophenone	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
Naphthalene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	1.1E-05
2-Methylnaphthalene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	1.0E-05
2,4,5-Trichlorophenol	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
1,1'-Biphenyl	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	1.4E-07
Acenaphthylene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	N/A
Acenaphthene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	7.1E-08
Fluorene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	2.9E-08
Phenanthrene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	1.2E-06
Anthracene	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	1.2E-08
C9-C18 Aliphatics	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	4.7E+00
C11-C22 Aromatics	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	7.8E-04
C5-C8 Aliphatics	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	3.1E-01
C9-C10 Aromatics	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	1.4E-03
C9-C12 Aliphatics	5.61E-01	2.92E-01	1.58E-08	1.00E+00	1.75E-04	3.60E-03	2.12E-08	1.4E-01

TABLE 6-6 (continued)
GROUNDWATER TO OUTDOOR AIR
SHALLOW GROUNDWATER - COMBINED ON-SITE

Notes:

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

(1) Assumed equivalent to D_i^{eff} of soil layer i in contact with the floor

(2) For screening, assume a trench 4 ft deep, 3 ft wide, and 30 ft long.

(3) Depth to water table minus depth to bottom of floor must be > thickness of capillary fringe, which is based on the soil type (typ. around 30 cm). Use 121 cm for screening purposes.

(4) $D_T^{eff} = L_T / ((L_{WT} - L_{cz} - L_F) / D_s^{eff}) + (L_{cz} / D_{cz}^{eff}))$

(5) $Q_{soil} = \Delta P * k_v * L_{soil} / \mu_{TS}$; not from above reference

(6) $\alpha = [D_T^{eff} * A_B / (Q_{trench} * L_T)] / [(D_T^{eff} * A_B / (Q_{soil} * L_T)) + 1]$; assumes no resistance (Peclet number is infinite)

(7) A function of the ratio T_B/T_C:

T_B/T_C	Π
<0.57	0.30
0.57-0.71	$0.74(T_B/T_C)-0.116$
>0.71	0.41

(8) $\Delta H_{vTS} = \Delta H_{vB} * [(1-T_B/T_C)/(1-T_B/T_C)]^{\Pi}$

(9) $H_{TS} = EXP[-\Delta H_{vTS}/R_c * (1/T_S - 1/T_R)] * H_R$

(10) Refer to 12 SCS soil types - use SC for screening.

(11) Refer to 12 SCS soil types - use SCL for screening.

(12) $L_{cz} = 0.15 / (0.2 * D_{cz})$

(13) $D_v^{eff} = D_a * (\theta_{wv}^{3.33}/n_v^2) + (D_w/H'_{TS})(\theta_{wvz}^{3.33}/n_v^2)$

(14) $D_{cz}^{eff} = D_a * (\theta_{wvz}^{3.33}/n_{cz}^2) + (D_w/H'_{TS})(\theta_{wvz}^{3.33}/n_{cz}^2)$

(15) $\theta_{wvz} = \theta_{t,cz} - ((\theta_{t,cz} - \theta_{t,cz})/(2^{M_{cz}}))$, where the value 2 in the formula is used for screening, but may be refined based on soil parameters (see USEPA, 1999).

(16) $\mu_w = \mu_{w,18} * (T'_S / 283.15)^{0.5}$

(17) $k_{t,v} = K_{s,v} * 1/Conv02 * \mu_w / (\rho_w * g)$

(18) $S_w = (\theta_{w,v} - \theta_{t,v}) / (n_v - \theta_{t,v})$

(19) $k_{rg} = (1 - S_w)^{b,d} * (1 - S_w^{1/M\eta})^{2M\eta}$

(20) $k_v = k_{t,v} * k_{rg}$; note that the model is very sensitive to this parameter and if site-specific values are available, they should be used.

(21) For screening, assume a trench 4 ft deep, 3 ft wide, 30 ft long and an air exchange rate of 60/hr. The air exchange rate is based on the assumption that the wind speed in the trench is a small fraction of the ground wind speed and that it could take up to 1 minute for a contaminant to be cleared from the trench air space.