TABLE T-10
VOLATILIZATION AND PARTICULATE EMISSION FACTORS
SOIL TO OUTDOOR AIR

Parameter	Value	Units	Reference
Water-filled soil porosity (θw)	2.2E-01	(Lwater-Lsoil)	Default values for Silty Clay (SIC)
Total soil porosity (θ_T)	4.8E-01	(Lpore-Lsoil)	Default values for Silty Clay (SIC)
Air-filled soil porosity (θa)	2.7E-01	(Lair-Lsoil)	Default values for Silty Clay (SIC)
Soil bulk density (Pb)	1.38	g/cm^3	Default values for Silty Clay (SIC)
Fraction organic carbon in soil (foc)	0.002	unitless	Default (USEPA 2002)
Exposure interval (T), recreator / offsite resident	9.5E+08	sec	30 year exposure duration
Exposure interval (T), worker	7.9E+08	sec	25 year exposure duration
Exposure interval (T), trespasser	2.2E+08	sec	7 year exposure duration
Exposure interval (T), rancher	7.9E+08	sec	25 year exposure duration
Inverse of mean conc, Q/C	41.21	(g/m^2-s per kg/m^3)	Calculated for a 10-acre site in Los Angeles (eqn E-2, USEPA 2002)
Q/C_{adj}, offsite resident	65.22	(g/m^2-s per kg/m^3)	Calculated for a 10-acre site in Los Angeles (eqn E-30, USEPA 2002)
Fraction of vegetative cover, G	0.5	unitless	Default (USEPA 2002)
Mean annual windspeed (Um)	3.70	m/s	Average site-specific value
Equivalent threshold value of windspeed at 7m (Ut)	11.32	m/s	Default (USEPA 2002)
Function dependent on Um/Ut (Fx)	2.2E-02	unitless	Site-specific based on annual wind speed
Particulate Emission Factor, PEF	1.1E+10	(m^3/kg)	Estimated for a worker, trespasser, recreator, rancher, and offsite resident
PEF_{adj}, offsite resident	1.7E+10	(m^3/kg)	Estimated for an offiste resident potentially exposed to onsite soils

Note:

Particulate Emission Factor; PEF (USEPA 2002): $PEF = [(Q/C * 3600) / (0.036 * (1-G) * (Um/Ut)^3 * Fx)]$

Chemical	Diffusivity in Air (Dair)	Henry's Law Constant (H')	Diffusivity in Water (Dw)	Soil organic carbon partition coeff (Koc)	Soil-water partition coefficient (Kd)	Apparent Diffusivity (Da)	Worker VF (m^3/kg)	Recreator VF (m^3/kg)	Trespasser VF (m^3/kg)	Rancher VF (m^3/kg)	Offsite Resident[a] VF (m^3/kg)	Offsite Resident[b] VF (m^3/kg)
1,1,1-Trichloroethane	7.8E-02	7.0E-01	8.8E-06	4.9E+01	9.7E-02	5.3E-03	1.0E+03	1.1E+03	5.4E+02	1.0E+03	1.1E+03	1.8E+03
1,1-Dichloroethane	7.4E-02	2.4E-01	1.1E-05	3.2E+01	6.3E-02	2.5E-03	1.5E+03	1.6E+03	7.9E+02	1.5E+03	1.6E+03	2.6E+03
1,1-Dichloroethylene	9.0E-02	1.1E+00	1.0E-05	6.5E+01	1.3E-01	7.3E-03	8.7E+02	9.5E+02	4.6E+02	8.7E+02	9.5E+02	1.5E+03
1,2-Dichloroethene	7.1E-02	3.8E-01	1.2E-05	5.3E+01	1.1E-01	3.0E-03	1.3E+03	1.5E+03	7.1E+02	1.3E+03	1.5E+03	2.3E+03
Acetone	1.2E-01	1.6E-03	1.1E-05	5.7E-01	1.1E-03	4.9E-05	1.1E+04	1.2E+04	5.6E+03	1.1E+04	1.2E+04	1.8E+04

TABLE T-10
VOLATILIZATION AND PARTICULATE EMISSION FACTORS
SOIL TO OUTDOOR AIR

Chemical	Diffusivity in Air (Dair)	Henry's Law Constant (H')	Diffusivity in Water (Dw)	Soil organic carbon partition coeff (Koc)	Soil-water partition coefficient (Kd)	Apparent Diffusivity (Da)	Worker VF (m^3/kg)	Recreator VF (m^3/kg)	Trespasser VF (m^3/kg)	Rancher VF (m^3/kg)	Offsite Resident[a] VF (m^3/kg)	Offsite Resident[b] VF (m^3/kg)
Acetonitrile	1.3E-01	8.2E-04	1.7E-05	1.6E+01	3.1E-02	2.3E-05	1.6E+04	1.7E+04	8.3E+03	1.6E+04	1.7E+04	2.7E+04
Acrolein	1.1E-01	1.8E-04	1.1E-05	5.2E-01	1.0E-03	5.9E-06	3.1E+04	3.3E+04	1.6E+04	3.1E+04	3.3E+04	5.3E+04
Anthracene	3.2E-02	4.6E-03	7.7E-06	2.3E+04	4.7E+01	1.2E-07	2.1E+05	2.3E+05	1.1E+05	2.1E+05	2.3E+05	3.7E+05
Benzene	8.8E-02	2.3E-01	9.8E-06	6.6E+01	1.3E-01	2.3E-03	1.6E+03	1.7E+03	8.3E+02	1.6E+03	1.7E+03	2.7E+03
Carbon disulfide	1.0E-01	6.1E-01	1.0E-05	5.2E+01	1.0E-01	6.3E-03	9.4E+02	1.0E+03	5.0E+02	9.4E+02	1.0E+03	1.6E+03
Chloroform	1.0E-01	1.5E-01	1.0E-05	4.7E+01	9.4E-02	2.1E-03	1.6E+03	1.8E+03	8.5E+02	1.6E+03	1.8E+03	2.8E+03
Diisopropyl ether	6.8E-02	1.6E-01	7.2E-06	6.5E+01	1.3E-01	1.3E-03	2.1E+03	2.3E+03	1.1E+03	2.1E+03	2.3E+03	3.6E+03
Ethylbenzene	7.5E-02	3.2E-01	7.8E-06	3.6E+02	7.3E-01	9.6E-04	2.4E+03	2.6E+03	1.3E+03	2.4E+03	2.6E+03	4.2E+03
Fluorene	6.1E-02	3.2E-03	7.9E-06	1.4E+04	2.8E+01	2.6E-07	1.4E+05	1.6E+05	7.6E+04	1.4E+05	1.6E+05	2.5E+05
Freon 113 (1,1,2-trichloro-1,2,2-trifluo	7.8E-02	2.2E+01	8.2E-06	1.3E+03	2.6E+00	9.2E-03	7.7E+02	8.5E+02	4.1E+02	7.7E+02	8.5E+02	1.3E+03
Isopropanol	8.0E-02	8.8E-06	9.3E-06	6.9E+00	1.4E-02	1.2E-06	6.8E+04	7.5E+04	3.6E+04	6.8E+04	7.5E+04	1.2E+05
Methyl ethyl ketone	8.1E-02	1.9E-03	9.8E-06	1.9E+00	3.8E-03	3.8E-05	1.2E+04	1.3E+04	6.4E+03	1.2E+04	1.3E+04	2.1E+04
Methyl isobutyl ketone (MIBK)	7.5E-02	5.7E-03	7.8E-06	1.3E+02	2.7E-01	3.8E-05	1.2E+04	1.3E+04	6.4E+03	1.2E+04	1.3E+04	2.1E+04
Methylcyclopentane	9.9E-02	1.5E+01	8.5E-06	1.5E+02	2.9E-01	1.7E-02	5.8E+02	6.3E+02	3.0E+02	5.8E+02	6.3E+02	1.0E+03
Methylene chloride	1.0E-01	9.1E-02	1.2E-05	1.2E+01	2.3E-02	1.7E-03	1.8E+03	1.9E+03	9.4E+02	1.8E+03	1.9E+03	3.1E+03
Naphthalene	5.9E-02	2.0E-02	7.5E-06	1.5E+03	3.1E+00	1.4E-05	2.0E+04	2.2E+04	1.1E+04	2.0E+04	2.2E+04	3.5E+04
Phenanthrene	6.0E-02	4.2E-05	7.5E-06	1.2E+04	2.4E+01	9.6E-09	7.6E+05	8.3E+05	4.0E+05	7.6E+05	8.3E+05	1.3E+06
Propanal	1.0E-01	4.4E-03	1.1E-05	2.2E+00	4.4E-03	1.1E-04	7.2E+03	7.8E+03	3.8E+03	7.2E+03	7.8E+03	1.2E+04
Tert-Butyl alcohol (TBA)	8.5E-02	3.0E-03	9.1E-06	4.2E+00	8.4E-03	5.9E-05	9.7E+03	1.1E+04	5.1E+03	9.7E+03	1.1E+04	1.7E+04
Tetrachloroethylene	7.2E-02	7.6E-01	8.2E-06	1.6E+02	3.1E-01	3.4E-03	1.3E+03	1.4E+03	6.8E+02	1.3E+03	1.4E+03	2.2E+03
Tetrahydrofuran	9.4E-02	5.8E-03	9.9E-06	3.7E+00	7.5E-03	1.2E-04	6.7E+03	7.3E+03	3.5E+03	6.7E+03	7.3E+03	1.2E+04
Toluene	8.7E-02	2.8E-01	8.6E-06	1.4E+02	2.8E-01	1.8E-03	1.7E+03	1.9E+03	9.2E+02	1.7E+03	1.9E+03	3.0E+03
Trichloroethylene	7.9E-02	4.3E-01	9.1E-06	9.3E+01	1.9E-01	3.0E-03	1.4E+03	1.5E+03	7.2E+02	1.4E+03	1.5E+03	2.4E+03
Vinyl chloride	1.1E-01	1.1E+00	1.2E-06	1.9E+01	3.7E-02	1.1E-02	7.1E+02	7.8E+02	3.8E+02	7.1E+02	7.8E+02	1.2E+03

Notes:

Volatilization Factor; VF (USEPA 2002): $VF = Q/C * ((3.14 * Da * T)^{1/2} * 10^{-4})/(2 * Pb * Da)$

a) VFs derived for a hypothetical offsite resident potentilly exposed to offsite soil/offsite sediment

b) VFs derived for a hypothetical offsite resident potentilly exposed to onsite soil/onsite sediment