

DIRECT EXPOSURE CRITERIA

Substance	Residential (mg/kg)	Industrial/Commercial (mg/kg)
Acetone	7,800	10,000
Benzene	2.5	200
Bromodichloromethane	10	92
Bromoform	81	720
Bromomethane	0.8	2900
Carbon tetrachloride	1.5	44
Chlorobenzene	210	10,000
Chloroform	1.2	940
Dibromochloromethane	7.6	68
1,2- Dibromo-3-chloropropane (DBCP)	0.5	4.1
1,1-Dichloroethane	920	10,000
1,2-Dichloroethane	0.9	63
1,1-Dichloroethene	0.2	9.5
cis-1,2-Dichloroethene	630	10,000
Trans-1,2-Dichloroethene	1,100	10,000
1,2-Dichloropropane	1.9	84

DIRECT EXPOSURE CRITERIA

Substance	Residential (mg/kg)	Industrial/Commercial (mg/kg)
Ethylbenzene	71	10,000
Ethylene dibromide (EDB)	0.01	0.07
Isopropyl benzene	27	10,000
Methyl ethyl ketone	10,000	10,000
Methyl isobutyl ketone	1200	10,000
Methyl tertiary-butyl ether (MTBE)	390	10,000
Methylene chloride	45	760
Styrene	13	190
1,1,1,2-Tetrachloroethane	2.2	220
1,1,2,2-Tetrachloroethane	1.3	29
Tetrachloroethene	12	110
Toluene	190	10,000
1,1,1-Trichloroethane	540	10,000
1,1,2-Trichloroethane	3.6	100
Trichloroethene	13	520
Vinyl chloride	0.02	3.0

DIRECT EXPOSURE CRITERIA		
Substance	Residential (mg/kg)	Industrial/Commercial (mg/kg)
Xylenes (Total)	110	10,000
Semivolatiles		
Acenaphthene	43	10,000
Acenaphthylene	23	10,000
Anthracene	35	10,000
Benzo(a)anthracene	0.9	7.8
Benzo(a)pyrene ^a	0.4	0.8
Benzo(b)fluoranthene	0.9	7.8
Benzo(g,h,i)perylene	0.8	10,000
Benzo(k)fluoranthene	0.9	78
1,1-Biphenyl	0.8	10,000
Bis(2-ethylhexyl)phthalate	46	410
Bis(2-chloroethyl)ether	0.6	5.2
Bis(2-chloroisopropyl)ether	9.1	82
4-Chloroaniline (p-)	310	8200
2-Chlorophenol	50	10,000

DIRECT EXPOSURE CRITERIA		
Substance	Residential (mg/kg)	Industrial/Commercial (mg/kg)
Chrysene	0.4	780
Dibenzo(a,h)anthracene ^a	0.4	0.8
1,2-Dichlorobenzene (o-DCB)	510	10,000
1,3-Dichlorobenzene (m-DCB)	430	10,000
1,4-Dichlorobenzene (p-DCB)	27	240
3,3-Dichlorobenzidine	1.4	13
2,4-Dichlorophenol	30	6,100
2,4-Dimethyl phenol	1,400	10,000
Diethyl phthalate	340	10,000
Dimethyl phthalate	1,900	10,000
2,4-Dinitrophenol	160	4,100
2,4-Dinitrotoluene	0.9	8.4
Fluoranthene	20	10,000
Fluorene	28	10,000
Hexachlorobenzene	0.4	3.6
Hexachlorobutadiene	8.2	73

DIRECT EXPOSURE CRITERIA		
Substance	Residential (mg/kg)	Industrial/Commercial (mg/kg)
Hexachloroethane	46	410
Indeno(1,2,3-cd)pyrene	0.9	7.8
2-Methyl naphthalene	123	10,000
Naphthalene	54	10,000
Pentachlorophenol	5.3	48
Phenanthrene	40	10,000
Phenol	6,000	10,000
Pyrene	13	10,000
1,2,4-Trichlorobenzene	96	10,000
2,4,5-Trichlorophenol	330	10,000
2,4,6-Trichlorophenol	58	520
Pesticides/PCBs		
Chlordane	0.5	4.4
Dieldrin	0.04	0.4
Polychlorinated biphenyls (PCBs) ^b	10	10

DIRECT EXPOSURE CRITERIA		
Substance	Residential (mg/kg)	Industrial/Commercial (mg/kg)
Inorganics		
Antimony	10	820
Arsenic ^c	7.0	7.0
Barium	5,500	10,000
Beryllium ^c	1.5	1.5
Cadmium	39	1,000
Chromium III (Trivalent)	1,400	10,000
Chromium VI (Hexavalent)	390	10,000
Copper	3,100	10,000
Cyanide	200	10,000
Lead ^d	150	500
Manganese	390	10,000
Mercury	23	610
Nickel	1,000	10,000
Selenium	390	10,000
Silver	200	10,000

DIRECT EXPOSURE CRITERIA		
Substance	Residential (mg/kg)	Industrial/Commercial (mg/kg)
Thallium	5.5	140
Vanadium	550	10,000
Zinc	6,000	10,000
<p>^a Estimated quantitation limits.</p>		
<p>^b Direct Exposure Criteria for PCBs consistent with the Toxic Substance Control Act (TSCA)</p>		
<p>^c Background Levels of Priority Pollutant Metals In Rhode Island Soils, T. O'Connor, RIDEM – Standard set @ statistical 95% upper confidence limit of natural background data across State. For arsenic, see also § 1.13 of this Part.</p>		
<p>^d Direct Exposure Criteria for Lead consistent with the Rhode Island Department of Health Lead Poisoning Prevention regulations, 216-RICR-50-15-3</p>		

3. Table 2

LEACHABILITY CRITERIA		
Substance	GA Leachability (mg/kg except as otherwise noted)	GB Leachability (mg/kg)
Volatile Organics		
Benzene	0.2	4.3

LEACHABILITY CRITERIA		
Carbon tetrachloride	0.4	5.0
Chlorobenzene	3.2	100
1,2-Dichloroethane	0.1	2.3
1,1-Dichloroethene	0.7	0.7
cis-1,2-Dichloroethene	1.7	60
Trans-1,2-Dichloroethene	3.3	92
1,2-Dichloropropane	0.1	70
Ethylbenzene	27	62
Ethylene dibromide (EDB)	5E-04	-
Methyl-tertiary-butyl-ether (MTBE)	0.9	100
Styrene	2.9	64
Tetrachloroethene	0.1	4.2
Toluene	32	54
1,1,1-Trichloroethane	11	160
1,1,2-Trichloroethane	0.1	-
Trichloroethene	0.2	20
Vinyl chloride	0.3	-
Xylenes	540	-

LEACHABILITY CRITERIA		
Semivolatiles		
Benzo(a)pyrene	240	-
Dichlorobenzene (all isomers)	41	-
Diethylhexyl phthalate	120	-
Napthalene	0.8	-
Pentachlorophenol	7.1	-
1,2,4-Trichlorobenzene	140	-
Pesticides/PCBs		
Chlordane	1.4	-
Polychlorinated biphenyls (PCBs) ^a	10.0	10.0
Inorganics		
Antimony (TCLP/SPLP)	0.05	-
Barium (TCLP/SPLP)	23	
Beryllium (TCLP/SPLP)	0.03	
Cadmium (TCLP/SPLP)	0.03	-
Chromium (TCLP/SPLP)	1.1	-
Cyanide (TCLP/SPLP)	2.4	-
Lead (TCLP/SPLP)	0.04	-

LEACHABILITY CRITERIA		
Mercury (TCLP/SPLP)	0.02	-
Nickel (TCLP/SPLP)	1	-
Selenium (TCLP/SPLP)	0.6	-
Thallium (TCLP/SPLP)	0.005	-
"-"	No Method 1 GB Leachability Criteria promulgated	
^a	Leachability criteria for PCBs consistent with the Toxic Substance Control Act (TSCA)	

D. Method 2 Soil Objectives

1. Method 2 allows for the consideration of limited site-specific information to modify Method 1 Soil Objectives or to calculate soil objectives for Hazardous Substances not listed in Table 1 or 2, §§ 1.9.2(C)(2) or (3) of this Part. For the purposes of these regulations, a Method 2 Soil Objective shall refer to any soil objective which addresses site-specific conditions established pursuant to this Part and in accordance with the appropriate information presented in §§ 1.17 and 1.18 of this Part.
2. The Department reserves the right to require the development of Method 2 Soil Objectives based on complicated conditions at a Contaminated-Site, including, but not limited to potential adverse impacts to adjacent surface water bodies or other potential impacts to human health and/or the environment.
3. Method 2 Soil Objectives shall be consistent with §§ 1.9.1, and 1.9.2(B) of this Part and shall meet all of the following conditions in §§ 1.9.2(D)(3)(a) through (d) of this Part listed below:
 - a. Direct Exposure Criteria shall only be developed under Method 2 for those Hazardous Substances which are not specified under Method 1 in Table 1, § 1.9.2(C)(2) of this Part. Method 2 Direct Exposure Criteria shall be developed using the default assumptions provided in § 1.17 of this Part. The chemical-specific inputs used to develop the Method 2 Direct Exposure Criteria are subject to the approval of the Director for each proposed application;

subject to the GA Groundwater Objectives listed in Table 3, § 1.9.3(F)(4) of this Part, and the Department's Groundwater Quality Rules, [Part 150-05-3](#) of this Title.

3. Method 1 GB Groundwater Objectives:

Groundwater which is classified as a GB area is presumed not suitable for use as a current or potential source of drinking water, and is subject to the GB Groundwater Objectives listed in Table 4, § 1.9.3(F)(5) of this Part.

4. Table 3: GA Groundwater Objectives

GA Groundwater Objectives	
Substance	GA Groundwater Objective (mg/l)
Volatile Organics	
Benzene	0.005
Carbon tetrachloride	0.005
Chlorobenzene	0.1
1,2-Dibromo-3-chloropropane (DBCP)	0.0002
1,2-Dichloroethane	0.005
1,1-Dichloroethene	0.007
cis-1,2-Dichloroethene	0.07
trans-1,2-Dichloroethene	0.1
1,2-Dichloropropane	0.005
Ethylbenzene	0.7
Ethylene dibromide (EDB)	0.00005

Methyl tertiary-butyl ether (MTBE)	0.04
Methylene chloride	0.005
Styrene	0.1
Tetrachloroethene	0.005
Toluene	1
1,1,1-Trichloroethane	0.2
1,1,2-Trichloroethane	0.005
Trichloroethene (TCE)	0.005
Trihalomethanes (Total)	0.08
Vinyl chloride	0.002
Xylenes (Total)	10
Semivolatiles	
Benzo(a)pyrene	0.0002
o-Dichlorobenzene	0.6
m-Dichlorobenzene	0.6
p-Dichlorobenzene	0.075
Diethylhexyl phthalate	0.006
Hexachlorobenzene	0.001

Naphthalene	0.10
Pentachlorophenol	0.001
1,2,4-Trichlorobenzene	0.07
Pesticides/PCBs	
Chlordane	0.002
Polychlorinated biphenyls (PCBs)	0.0005
Inorganics	
Antimony	0.006
Arsenic	0.01
Barium	2
Beryllium	0.004
Cadmium	0.005
Chromium (Total)	0.1
Cyanide	0.2
Lead	0.015
Mercury	0.002
Nickel	0.1
Selenium	0.05
Thallium	0.002

5. Table 4: GB Groundwater Objectives

GB Groundwater Objectives	
Substance	GB Groundwater Objective (mg/l)
Benzene	0.14
Carbon Tetrachloride	0.07
Chlorobenzene	3.2
1,2-Dibromo-3-chloropropane (DBCP)	0.002
1,2-Dichloroethane	0.11
1,1-Dichloroethene	0.007
cis-1,2-Dichloroethene	2.4
trans-1,2-Dichloroethene	2.8
1,2-Dichloropropane	3.0
Ethylbenzene	1.6
Styrene	2.2
Methyl Tertiary-Butyl Ether (MTBE)	5.0
Tetrachloroethene	0.15
Toluene	1.7
1,1,1-Trichloroethane	3.1

Trichloroethene	0.54
Vinyl Chloride	0.002

G. Method 2 GB Groundwater Objectives:

1. Method 2 allows for the consideration of limited site-specific information to modify Method 1 GB Groundwater Objectives or to calculate GB Groundwater Objectives for Hazardous Substances in groundwater not listed in Table 4, § 1.9.3(F)(5) of this Part, but which have the potential to volatilize. For the purposes of these regulations, a Method 2 GB Groundwater Objective shall refer to any groundwater objective which has addressed site-specific conditions pursuant to this rule and in accordance with the appropriate information presented in § 1.19 of this Part. The Department reserves the right to require the development of Method 2 GB Groundwater Objectives based on complicated conditions at the Contaminated-Site such as potential adverse impacts to adjacent surface water bodies, potential adverse impacts to surrounding GA/GAA areas or other potential impacts to human health and/or the environment.
2. Method 2 GB Groundwater Objectives may be developed for Hazardous Substances which do not have promulgated Method 1 GB Groundwater Objectives listed in Table 4, § 1.9.3(F)(5) of this Part, or when conditions at the Contaminated-Site deviate significantly from the conservative assumptions used to calculate the Method 1 GB Groundwater Objectives as discussed in § 1.19 of this Part, provided that the resulting Method 2 GB Groundwater Objective is based on detailed site-specific information.
3. Method 2 GB Groundwater Objectives shall be consistent with §§ 1.9.1 and 1.9.3(D) of this Part and shall meet all of the following conditions in §§ 1.9.3(G)(3)(a) through (d) of this Part listed below.
 - a. The Method 2 GB Groundwater Objective shall be based, at a minimum, on the following:
 - (1) A scientifically acceptable volatilization model such as that described in § 1.19 of this Part; or
 - (2) Transport and fate modeling that incorporates site-specific information on the Hazardous Substances, hydrogeological conditions at the Contaminated-Site, current and reasonably foreseeable building conditions, and which demonstrates that contamination will not infiltrate to indoor air and result in

5. Table 5: Upper Concentration Limits for GB Groundwater

Upper Concentration Limits for GB Groundwater	
Substance	GB Groundwater UCL (mg/l)
Benzene	18
Chlorobenzene	56
1,2-Dichloroethane	670
1,1-Dichloroethene	23
cis-1,2-Dichloroethene	69
trans-1,2-Dichloroethene	79
1,2-Dichloropropane	140
Ethylbenzene	16
Styrene	50
Toluene	21
1,1,1-Trichloroethane	68
Trichloroethene	87

1.9.8 Points of Compliance:

A. Points of Compliance for Soils:

1. The points of compliance for soils are points where the soil objectives established under §§ 1.9.2 or 1.9.4 of this Part shall be attained. For soil objectives based on direct exposure to humans engaged in residential or industrial/commercial activities, the point of compliance shall be established in the soils throughout the Contaminated-Site, except as otherwise specified in § 1.9.2(B)(1) of this Part (General Requirements for