Table A – Residential Closure Levels

Contaminant[1,21]	CAS	Soil									Groundwater				
		Soil Attenuation Capacity	Soil Saturation (Csat)[2]	Construction[4]		Soil Direct		Migration to GW		Default Closure Level	Ground Water Solubility	MCL	Residential		Default Closure Level
		mg/kg	mg/kg	mg/kg				mg/kg		mg/kg	mg/l-	mg/l	mg/l		mg/l
Acenaphthene	83-32-9	6000/2000		50000	NC	9500	NC	130	NC	130	4.2		0.46	NC	0.46
Acenaphthylene	208-96-8	6000/2000		5900	NC	1100	NC	18	NC	18	3.9		0.071	NC	0.071
Acetochlor	34256-82-1	6000/2000		18000	NC	3700	NC	8.1	NC	8.1	220		0.73	NC	0.73
Acetone (2-Propanone)	67-64-1	6000/2000	200000	230000	NC	35000	NC	28	NC	28	1000000		6.9	NC	6.9
Acrolein[5]	107-02-8	6000/2000	50000	3.5	NC	0.5	NC	0.00027	NC	0.00027	210000		0.000055	NC	0.000055
Aldrin	309-00-2	6000/2000		27	NC	0.25	C	4.9	C	0.25	0.18		0.00005	C	0.00005
Anthracene[22]	120-12-7	6000/2000		250000	NC	47000	NC	**2700**	**NC**	**2000**	0.043		2.3	NC	**2.3**
Antimony and compounds[6]	7440-36-0	10000		460	NC	140	NC	5.4	MCL	5.4		0.006	0.015	NC	0.006
Arsenic[3 6 17]	7440-38-2	10000		320	NC	3.9	NC	5.8	MCL	3.9		0.01	0.00057	C	0.01
Atrazine	1912-24-9	6000/2000		2800	C	19	C	0.048	MCL	0.048	35	0.003	0.0039	C	0.003
Barium[6]	7440-39-3	10000		220000	NC	63000	NC	1600	MCL	1600		2	7.3	NC	2
Benzene	71-43-2	6000/2000	590	560	NC	8.4	C	0.034	MCL	0.034	1800	0.005	0.0055	C	0.005
Benzo(a)anthracene	56-55-3	6000/2000		790	C	5	C	19	C	5	0.0094		0.0012	C	0.0012
Benzo(a)pyrene	50-32-8	6000/2000		79	C	0.5	C	8.2	MCL	0.5	0.0016	0.0002	0.00012	C	0.0002
Benzo(b)fluoranthene	205-99-2	6000/2000		790	C	5	C	57	C	5	0.0015		0.0012	C	0.0012
Benzo(k)fluoranthene[22]	207-08-9	6000/2000		7900	C	50	C	**570**	**C**	**50**	0.0008		0.012	C	**0.012**
Benzoic acid[6]	65-85-0	6000/2000		1000000	NC	730000	NC	590	NC	590	3500		150	NC	150
Benzyl Alcohol	100-51-6	6000/2000	8800	270000	NC	55000	NC	48	NC	48	40000		11	NC	11
Beryllium and compounds[9]	7440-41-7	10000		2300	NC	680	NC	63	MCL	63		0.004	0.073	NC	0.004
Bis(2-chloro-1-methylethyl) ether	108-60-1	6000/2000	550	5200	C	30	C	0.027	C	0.027	1700		0.0042	C	0.0042
Bis(2-Chloroethyl)ether[5]	111-44-4	6000/2000	4000	280	C	1.6	C	0.0007	C	0.0007	17000		0.00015	C	0.00015
Bis(2-chloroisopropyl)ether[23]	**39638-32-9**														
Bis(2-ethylhexyl)phthalate	117-81-7	6000/2000	10000	18000	NC	300	C	3600	MCL	300	0.34	0.006	0.061	C	0.006
Bromodichloromethane[7]	75-27-4	6000/2000	2100	2100	C	10	C	0.51	MCL	0.51	6700	0.08	0.0029	C	0.08
Bromoform(tribromomethane)[7]	75-25-2	6000/2000	1200	7700	NC	280	C	0.6	MCL	0.6	3100	0.08	0.11	C	0.08
n-Butanol	71-36-3	6000/2000	16000	2700	NC	380	NC	16	NC	16	74000		3.6	NC	3.6
Butylbenzylphthalate[2 14]	85-68-7	6000/2000	310	180000	NC	37000	NC	6200	S	310	2.7		7.3	NC	2.7
Cadmium[3 6]	7440-43-9	10000		590	NC	12	NC	7.5	MCL	7.5		0.005	0.018	NC	0.005
Carbazole	86-74-8	6000/2000		31000	C	210	C	5.9	C	5.9	7.5		0.043	C	0.043
Carbon disulfide	75-15-0	6000/2000	480	6200	NC	900	NC	10	NC	10	1200		1.3	NC	1.3
Carbon tetrachloride	56-23-5	6000/2000	520	38	NC	3.3	C	0.066	MCL	0.066	790	0.005	0.0026	C	0.005
Chlordane	12789-03-6	6000/2000		510	NC	17	C	9.6	MCL	9.6	0.056	0.002	0.0024	C	0.002
p-Chloroaniline[6]	106-47-8	6000/2000		3600	NC	730	NC	0.97	NC	0.97	5300		0.15	NC	0.15
Chlorobenzene	108-90-7	6000/2000	310	2600	NC	380	NC	1.3	MCL	1.3	470	0.1	0.13	NC	0.1
Chloroethane	75-00-3	6000/2000	3000	16000	C	80	C	0.65	C	0.65	5700		0.062	C	0.062
Chloroform[7 10]	67-66-3	6000/2000	2300	650	C	3	C	0.47	MCL	0.47	7900	0.08	0.0028	C	0.08
2-Chloronapthalene	91-58-7	6000/2000		71000	NC	15000	NC	42	NC	42	12		0.61	NC	0.61
2-Chlorophenol[6]	95-57-8	6000/2000	22000	2200	NC	360	NC	0.75	NC	0.75	22000		0.038	NC	0.038

Table A – Residential Closure Levels

Contaminant[1,21]	CAS	Soil									Groundwater				
		Soil Attenuation Capacity	Soil Saturation (Csat)[2]	Construction[4]		Soil Direct		Migration to GW		Default Closure Level	Ground Water Solubility	MCL	Residential		Default Closure Level
		mg/kg	mg/kg	mg/kg				mg/kg		mg/kg	mg/l-	mg/l	mg/l		mg/l
Chromium III [6]	16065-83-1	10000		1000000	NC	520000	NC	1000000	MCL	10000		0.1	55	NC	0.1
Chromium VI [6 12]	18540-29-9	10000		3400	NC	430	C	38	MCL	38		0.1	0.11	NC	0.1
Chrysene [22]	218-01-9	6000/2000		79000	C	500	C	**1900**	**C**	**500**	0.0016		0.12	C	**0.12**
Copper [6]	7440-50-8	10000		46000	NC	14000	NC	920	MCL	920		1.3	1.5	NC	1.3
Cyanide, Free [13]	57-12-5	6000/2000		23000	NC	6900	NC	0.94	MCL	0.94	1000000	0.2	0.73	NC	0.2
Cyclohexane [2]	110-82-7	6000/2000	69	51000	NC	7200	NC	330	NC	69	55		13	NC	13
DDD	72-54-8	6000/2000		2200	NC	28	C	140	C	28	0.09		0.0035	C	0.0035
DDE	72-55-9	6000/2000		2200	C	20	C	450	C	20	0.12		0.0025	C	0.0025
DDT	50-29-3	6000/2000		540	NC	20	C	260	C	20	0.025		0.0025	C	0.0025
Dibenzo(a,h)anthracene	53-70-3	6000/2000		79	C	0.5	C	18	C	0.5	0.0025		0.00012	C	0.00012
Dibenzofuran	132-64-9	6000/2000		1800	NC	370	NC	4.9	NC	4.9	3.1		0.015	NC	0.015
1,2-Dibromoethane	106-93-4	6000/2000	1400	59	C	0.3	C	0.00034	MCL	0.00034	4300	5E-05	0.000086	C	0.00005
Dibutyl phthalate [2]	84-74-2	6000/2000	760	89000	NC	18000	NC	5000	NC	760	11		3.6	NC	3.6
1,2-Dichlorobenzene	95-50-1	6000/2000	220	18000	NC	2800	NC	17	MCL	17	160	0.6	0.48	NC	0.6
1,3-Dichlorobenzene	541-73-1	6000/2000	230	2200	NC	420	NC	2.3	NC	2.3	160		0.08	NC	0.08
1,4-Dichlorobenzene	106-46-7	6000/2000		8000	C	42	C	2.2	MCL	2.2	74	0.075	0.008	C	0.075
3,3-Dichlorobenzidine	91-94-1	6000/2000		1400	C	9.5	C	0.062	C	0.062	3.1		0.0019	C	0.0019
1,1-Dichloroethane	75-34-3	6000/2000	1400	8600	NC	1300	NC	5.6	NC	5.6	5100		0.99	NC	0.99
1,2-Dichloroethane	107-06-2	6000/2000	2000	150	NC	3.7	C	0.024	MCL	0.024	8500	0.005	0.002	C	0.005
1,1-Dichloroethylene	75-35-4	6000/2000	930	2200	NC	310	NC	0.058	MCL	0.058	2200	0.007	0.43	NC	0.007
cis-1,2-Dichloroethylene	156-59-2	6000/2000	1000	750	NC	110	NC	0.4	MCL	0.4	3500	0.07	0.077	NC	0.07
trans-1,2-Dichloroethylene	156-60-5	6000/2000	2100	1200	NC	180	NC	0.68	MCL	0.68	6300	0.1	0.15	NC	0.1
2,4-Dichlorophenol [6]	120-83-2	6000/2000		2700	NC	550	NC	1.1	NC	1.1	4500		0.11	NC	0.11
2,4-Dichlorophenoxyacetic acid (2,4-D)	94-75-7	6000/2000		9100	NC	2000	NC	0.35	MCL	0.35	680	0.07	0.36	NC	0.07
1,2-Dichloropropane	78-87-5	6000/2000	830	99	NC	4.5	C	0.03	MCL	0.03	2800	0.005	0.0026	C	0.005
1,3-Dichloropropene	542-75-6	6000/2000	1000	290	NC	9.5	C	0.04	C	0.04	2800		0.0056	C	0.0056
Dieldrin	60-57-1	6000/2000		39	C	0.27	C	0.046	C	0.046	0.2		0.000053	C	0.000053
Diethylphthalate	84-66-2	6000/2000	840	710000	NC	150000	NC	450	NC	450	1100		29	NC	29
N,N Dimethylformamide	68-12-2	6000/2000	200000	26000	NC	4000	NC	15	NC	15	1000000		3.6	NC	3.6
2,4-Dimethylphenol [6]	105-67-9	6000/2000		18000	NC	3700	NC	9	NC	9	7900		0.73	NC	0.73
Dimethylphthalate [2]	131-11-3	6000/2000	1100	1000000	NC	1000000	NC	2000	NC	1100	4000		360	NC	360
2,4-Dinitrophenol [6]	51-28-5	6000/2000		1800	NC	370	NC	0.29	NC	0.29	2800		0.073	NC	0.073
Dinitrotoluene mixture	25321-14-6	6000/2000		890	NC	6.3	C	0.0091	C	0.0091	230		0.0013	C	0.0013
Di-n-octyl phthalate [14]	117-84-0	6000/2000	3300	36000	NC	7300	NC	67000	S	2000	0.02		1.5	NC	0.02
Endosulfan	115-29-7	6000/2000		5300	NC	1100	NC	20	NC	20	0.51		0.22	NC	0.22
Endrin	72-20-8	6000/2000		270	NC	55	NC	0.99	MCL	0.99	0.25	0.002	0.011	NC	0.002
Ethyl acetate	141-78-6	6000/2000	25000	290000	NC	46000	NC	44	NC	44	80000		6.9	NC	6.9
Ethylbenzene	100-41-4	6000/2000	160	29000	NC	4600	NC	13	MCL	13	170	0.7	1.6	NC	0.7

Table A – Residential Closure Levels

Contaminant[1,21]	CAS	Soil									Groundwater				
		Soil Attenuation Capacity	Soil Saturation (Csat)[2]	Construction[4]		Soil Direct		Migration to GW		Default Closure Level	Ground Water Solubility	MCL	Residential		Default Closure Level
		mg/kg	mg/kg	mg/kg				mg/kg		mg/kg	mg/l-	mg/l	mg/l		mg/l
Ethylene glycol[24]	**107-21-1**	**6000/2000**	**200000**	**1000000**	**NC**	**270000**	**NC**	**290**	**NC**	**290**	**1000000**		**73**	**NC**	**73**
Fluoranthene [22]	206-44-0	6000/2000		33000	NC	6300	NC	**6300**	**NC**	**2000**	0.21		1.5	NC	**1.5**
Fluorene	86-73-7	6000/2000		33000	NC	6300	NC	170	NC	170	2		0.31	NC	0.31
alpha-HCH(alpha-BHC)	319-84-6	6000/2000		120	C	0.99	C	0.0072	C	0.0072	2		0.00014	C	0.00014
beta-HCH(beta-BHC)	319-85-7	6000/2000		200	NC	3.3	C	0.026	C	0.026	0.24		0.00047	C	0.00047
gamma-HCH(Lindane)	58-89-9	6000/2000		310	NC	4.8	C	0.0094	MCL	0.0094	6.8	0.0002	0.00066	C	0.0002
Heptachlor	76-44-8	6000/2000		140	C	0.93	C	23	MCL	0.93	0.18	0.0004	0.00019	C	0.0004
Heptachlor epoxide	1024-57-3	6000/2000		12	NC	0.47	C	0.67	MCL	0.47	0.2	0.0002	0.000094	C	0.0002
Hexachloro-1,3-butadiene	87-68-3	6000/2000	350	270	NC	55	C	24	C	24	3.2		0.011	C	0.011
Hexachlorobenzene	118-74-1	6000/2000		390	C	2.7	C	2.2	MCL	2.2	6.2	0.001	0.00053	C	0.001
Hexachlorocyclopentadiene	77-47-4	6000/2000	720	5300	NC	1100	NC	400	MCL	400	1.8	0.05	0.22	NC	0.05
Hexachloroethane	67-72-1	6000/2000		660	NC	120	NC	2.8	NC	2.8	50		0.036	NC	0.036
n-Hexane	110-54-3	6000/2000	100	1200	NC	170	NC	120	NC	100	9.5		0.54	NC	0.54
Indeno(1,2,3-cd)pyrene [22]	193-39-5	6000/2000		790	C	5	C	**160**	**C**	**5**	0.000022		0.0012	C	**0.0012**
Isophorone	78-59-1	6000/2000	3500	180000	NC	4500	C	5.3	C	5.3	12000		0.9	C	0.9
Isopropylbenzene (Cumene)	98-82-8	6000/2000	42	9900	NC	1400	NC	11	NC	11	61		0.83	NC	0.83
Lead[8]	7439-92-1	10000		970	NC	400	NC	81	MCL	81		0.015	0.015	NC	0.015
Mercury and compounds[9 20]	7487-94-7	10000		340	NC	100	NC	2.1	MCL	2.1	69000	0.002	0.011	NC	0.002
Methoxychlor	72-43-5	6000/2000		4400	NC	910	NC	160	MCL	160	0.045	0.04	0.18	NC	0.04
Methyl bromide (bromomethane)	74-83-9	6000/2000	3700	69	NC	9.9	NC	0.052	NC	0.052	15000		0.011	NC	0.011
Methyl ethyl ketone (MEK)	78-93-3	6000/2000	28000	260000	NC	44000	NC	35	NC	35	140000		8.4	NC	8.4
Methyl tertiary butyl ether (MTBE)[16]	1634-04–4	6000/2000	11000	65000	C	350	C	0.18	C	0.18	48000		0.04	C	0.04
4-Methyl-2-pentanone (MIBK)	108-10-1	6000/2000	8700	64000	NC	12000	NC	20	NC	20	19000		2.2	NC	2.2
Methylene chloride	75-09-2	6000/2000	3000	22000	C	120	C	0.023	MCL	0.023	13000	0.005	0.063	C	0.005
2-Methylnaphthalene	91-57-6	6000/2000		3300	NC	630	NC	3.1	NC	3.1	25		0.031	NC	0.031
3-Methylphenol (m-cresol)[6]	108-39-4	6000/2000	6100	44000	NC	9100	NC	9.8	NC	9.8	23000		1.8	NC	1.8
4-Methylphenol (p-cresol)[6]	106-44-5	6000/2000		4400	NC	910	NC	1.1	NC	1.1	22000		0.18	NC	0.18
2-Methylphenol(o-cresol)[6]	95-48-7	6000/2000		39000	NC	7500	NC	14	NC	14	26000		1.8	NC	1.8
Metolachlor	51218-45-2	6000/2000	420	130000	NC	27000	NC	86	NC	86	530		5.5	NC	5.5
Naphthalene	91-20-3	6000/2000		17000	NC	3200	NC	0.7	NC	0.7	31		0.0083	NC	0.0083
Nickel, soluble salts[6]	various	10000		23000	NC	6900	NC	950	NC	950			0.73	NC	0.73
2-Nitroaniline	88-74-4	6000/2000		2700	NC	550	NC	0.67	NC	0.67	1500		0.11	NC	0.11
Nitrobenzene	98-95-3	6000/2000	690	440	NC	91	NC	0.028	NC	0.028	2100		0.0043	NC	0.0043
N-Nitrosodi-n-propylamine[5 6]	621-64-7	6000/2000	2500	89	C	0.61	C	0.0006	C	0.0006	9900		0.00012	C	0.00012
N-Nitrosodiphenylamine[6]	86-30-6	6000/2000		18000	NC	870	C	9.7	C	9.7	35		0.17	C	0.17
PCBs (polychlorinated biphenyls)[11]	1336-36-3	6000/2000		16	NC	1.8	C	6.2	MCL	1.8	0.7	0.0005	0.00043	C	0.0005
Pentachlorophenol[6]	87-86-5	6000/2000		3800	C	20	C	0.028	MCL	0.028	2000	0.001	0.0071	C	0.001
Phenanthrene	85-01-8	6000/2000		2500	NC	470	NC	13	NC	13	1.2		0.023	NC	0.023

Table A – Residential Closure Levels

Contaminant[1,21]	CAS	Soil									Groundwater				
		Soil Attenuation Capacity	Soil Saturation (Csat)[2]	Construction[4]		Soil Direct		Migration to GW		Default Closure Level	Ground Water Solubility	MCL	Residential		Default Closure Level
		mg/kg	mg/kg	mg/kg				mg/kg		mg/kg	mg/l-	mg/l	mg/l		mg/l
Phenol [6]	108-95-2	6000/2000		230000	NC	44000	NC	56	NC	56	83000		11	NC	11
n-Propylbenzene	103-65-1	6000/2000	300	10000	NC	1600	NC	36	NC	36	52		0.31	NC	0.31
Propylene glycol monomethyl ether[24]	**107-98-2**	**6000/2000**	**200000**	**440000**	**NC**	**79000**	**NC**	**100**	**NC**	**100**	**1000000**		**26**	**NC**	**26**
Pyrene [22]	129-00-0	6000/2000		25000	NC	4700	NC	**4600**	**NC**	**2000**	0.14		1.1	NC	**1.1**
Selenium [6]	7782-49-2	10000		5700	NC	1700	NC	5.2	MCL	5.2		0.05	0.18	NC	0.05
Silver [6]	7440-22-4	10000		5700	NC	1700	NC	31	NC	31			0.18	NC	0.18
Styrene	100-42-5	6000/2000	550	68000	NC	11000	NC	3.5	MCL	3.5	310	0.1	2	NC	0.1
1,1,1,2-Tetrachloroethane	630-20-6	6000/2000	1200	7400	C	39	C	0.053	C	0.053	3000		0.0069	C	0.0069
1,1,2,2-Tetrachloroethane	79-34-5	6000/2000	1200	960	C	5	C	0.007	C	0.007	3000		0.0009	C	0.0009
Tetrachloroethylene (PCE) [18]	127-18-4	6000/2000	120	660	NC	9.9	C	0.058	MCL	0.058	200	0.005	0.0065	C	0.005
Thallium (and compounds) [6]	7440-28-0	10000		80	NC	24	NC	2.8	MCL	2.8		0.002	0.0026	NC	0.002
Toluene	108-88-3	6000/2000	310	49000	NC	8800	NC	12	MCL	12	530	1	2.4	NC	1
Toxaphene	8001-35-2	6000/2000		560	C	3.9	C	31	MCL	3.9	0.74	0.003	0.00077	C	0.003
1,2,4-Trichlorobenzene	120-82-1	6000/2000	1100	8900	NC	1800	NC	5.3	MCL	5.3	300	0.07	0.0095	NC	0.07
1,1,1-Trichloroethane	71-55-6	6000/2000	640	34000	NC	5000	NC	1.9	MCL	1.9	1300	0.2	3.8	NC	0.2
1,1,2-Trichloroethane	79-00-5	6000/2000	1300	600	NC	9.4	C	0.03	MCL	0.03	4400	0.005	0.0032	C	0.005
Trichloroethylene (TCE) [19]	79-01-6	6000/2000	630	210	NC	4.9	C	0.057	MCL	0.057	1100	0.005	0.0028	C	0.005
Trichlorofluoromethane[24]	**75-69-4**	**6000/2000**	**970**	**6900**	**NC**	**980**	**NC**	**29**	**NC**	**29**	**1100**		**1.7**	**NC**	**1.7**
2,4,5-Trichlorophenol [6]	95-95-4	6000/2000		89000	NC	18000	NC	250	NC	250	1200		3.6	NC	3.6
2,4,6-Trichlorophenol [6]	88-06-2	6000/2000		89	NC	18	NC	0.07	NC	0.07	800		0.0036	NC	0.0036
2,4,5-Trichlorophenoxyacetic acid (2,4,5-T)	93-76-5	6000/2000		8900	NC	1800	NC	2.2	NC	2.2	270		0.36	NC	0.36
1,2,4-Trimethylbenzene	95-63-6	6000/2000	430	920	NC	130	NC	2.5	NC	2.5	57		0.016	NC	0.016
1,3,5-Trimethylbenzene	108-67-8	6000/2000	90	380	NC	54	NC	0.61	NC	0.61	48		0.016	NC	0.016
Vinyl acetate	108-05-4	6000/2000	4200	7600	NC	1100	NC	2.3	NC	2.3	20000		0.55	NC	0.55
Vinyl chloride (chloroethene) [15]	75-01-4	6000/2000	930	**500**	C	1.5	C	0.013	MCL	0.013	2800	0.002	0.00053	C	0.002
Xylene mixed (total)	1330-20-7	6000/2000	170	4800	NC	690	NC	210	MCL	170	160	10	0.27	NC	10
Zinc	7440-66-6	10000		340000	NC	100000	NC	14000	NC	10000			11	NC	11

Footnotes

Bold text indicates that a change has been made from the previous 2006 Appendix 1 table.

1. Note each column in the closure level tables has a "c" or an "nc" next to the value. This designation indicates whether the numerical value is the result of calculation from a carcinogenic endpoint or a noncarcinogenic endpoint. Knowing the carcinogenic or noncarcinogenic designation is necessary when performing additivity. The user should be aware that there are many parameters used to calculate the closure levels, and a given compound may have closure levels that result from either carcinogenic or noncarcinogenic endpoints. Sometimes the endpoints may be different for different closure types. For instance, a direct soil value may have been generated from a carcinogenic endpoint, but the groundwater value may be from a noncarcinogenic endpoint. Most carcinogens are calculated using endpoints from both carcinogenic and noncarcinogenic toxicity information, and the system used to calculate the default closure level selects the lowest endpoint.
2. Certain chemicals that are considered liquids at soil temperatures have calculated soil saturation levels. The soil saturation level, or "Csat" value, is an indicator of the possibility there is free product present. In cases where the Csat value is lower than any other soil calculated value the Csat value becomes the default closure level. If the user does not think free product exists at the site but has concentrations that exceed Csat, but not other closure levels, then they should contact the IDEM site manager in order to verify there is no free product.
3. Residential soil direct contact values for arsenic and cadmium are based on the algorithms that measure the soil-plant-human uptake and not on the algorithms normally used to measure direct contact to surface soil.

4. Construction values are listed as the raw calculated values. When applying construction values to closures, the user should recognize that values for organic chemicals will be capped at the Soil Attenuation Capacity (SAC) value or the Csat, whichever is lower, or at 10,000 mg/kg for metals. Default SAC values are 6000 mg/kg for Direct Contact (surface soil) and 2000 mg/kg for Migration to Groundwater (subsurface soil). It is possible to raise the SAC value based on the organic carbon content in the soil, and the user is referred to the non-default chapter for further information.
5. Acrolein, Bis(2-chloroethyl)ether, and N-Nitroso-di-n-propylamine (as well as other compounds) may not have an analytical method available with a detection limit or quantitation limit that will meet the closure level. Appendix 2 should be consulted for suggested analytical procedures with detection limits that meet or approach meeting closure levels. If analytical methods capable of meeting closure levels for all site contaminants are not available, the IDEM site manager should be contacted to arrange for a conference with an IDEM chemist. Appendix II is currently being updated.
6. Koc and Kd values for ionizing organics and metals will vary depending on pH. If the source area pH is outside the range of 6.0-8.0, then see the discussion in Section A1.0, under Table A, pages A.1-1 and A.1-2. Default closure levels have been calculated using Koc and Kd values at pH 6.8.
7. A "trihalomethane" is an organic compound consisting of a single carbon atom with three "halogen" atoms (bromine, chlorine, fluorine, or iodine) and a hydrogen atom attached. The National Primary Drinking Water Standards now include a "Total Trihalomethane standard" (TTHM MCL) of 0.08 mg/L. Under certain circumstances, i.e., when more than one trihalomethane compound is present on site, the "trihalomethane" standard will apply to bromoform, chloroform and bromodichloromethane. The composite standard may reduce the individual closure levels because the total concentration may not exceed the TTHM MCL.
8. Lead values were calculated using:

The 1994 Integrated Exposure Uptake Biokinetic Model (see EPA/540/R-93/081, PB-963510),

The Methodology for Assessing Risks Associated with Adult Exposure to Lead in Soil SRC-GLD-F0162-209-Draft-7/21/96,

Review of the Methodology for Establishing Risk-Based Remediation Goals for Commercial Areas of the California Gultch Site, USEPA, Technical Review Workgroup for Lead, October 26, 1995 for industrial and construction exposures, and

The Drinking Water Regulation and Health Advisories EPA 822-R-96-001, February, 1996 action levels for residential groundwater and an extrapolation to determine industrial groundwater levels.

The Kd value for lead was taken from Sheppard and Thibault (Default Soil Solid Liquid Partition Coefficients, Kds for Four Major Soil Types: A Compendium, Health Physics Vol 59, No 4, pp 471-482, 1990) for sandy soils and is considered to be applicable anywhere in the state.
9. Closure levels for Beryllium and Mercury must be determined with a site specific pH. Please see the discussion in section A.1.0 under Table A, pages A.1-1 and A.1-2.
10. Chloroform no longer has an Oral Slope Factor; the Oral RfD at 0.01 mg/kg-day is considered to be protective of the carcinogenic endpoint from the oral route.
11. PCBs are assumed to be a mixture and that Aroclor 1016 and 1254 are present.
12. Total Chromium concentrations must be assumed to be 100% Chromium VI unless a species-specific ratio evaluation of Chromium VI to Chromium III is made. The Inhalation Slope Factor used for Chromium VI is from USEPA Region 09 and is based on a review of the available studies and literature.
13. Cyanide values apply to "free" cyanide only. The closure levels are not applicable to copper cyanide and other complexed cyanides. The physical constants used in the calculation of the free cyanide closure levels are based on hydrogen cyanide (non-complexed, ionic cyanide). Total cyanide concentrations may not be representative of, and in fact may over estimate, free cyanide concentrations.
14. Certain compounds have very low solubilities, and the groundwater closure values are defaulted to their respective solubility limits. Concentrations in excess of the solubility limit can be an indicator of the presence of free product. When the solubility limit has been exceeded and the user believes that free product does not exist, then the user should contact the project manager to determine a course of action to verify there is no free product.
15. Vinyl Chloride calculations are based on two different sets of slope factors. Industrial default closure levels use 0.75 $(mg/kg\text{-}d)^{-1}$ for the oral slope factor and 0.016 $(mg/kg\text{-}day)^{-1}$ for the inhalation slope factor. Residential default closure levels use 1.5 $(mg/kg\text{-}d)^{-1}$ for the oral slope factor and 0.031$(mg/kg\text{-}day)^{-1}$ for the inhalation slope factor. The values derived for industrial default closure levels are recommended for lifetime exposure beginning at adulthood. For exposures beginning at birth an additional twofold safety factor is recommended. This has been taken into account when deriving the default closure levels for residential areas. **May 1, 2009 Revision: The construction value for vinyl chloride in the 2006 Appendix 1 DCL tables was calculated incorrectly using the residential slope factors. This revision of the 2006 Appendix 1 Tables includes the corrected construction level, as calculated with the industrial slope factors.**
16. Residential Groundwater value from EPA Drinking Water and Health Advisories, EPA 822-R-04-038, USEPA, Office of Water, Winter 2004.
17. The new federal MCL for arsenic is 0.01mg/L, and is effective January 23, 2006.
18. IDEM is currently investigating the oral slope factor for tetrachloroethylene (PCE). Until IDEM reaches a conclusion, 0.052 $(mg/kg\text{-}day)^{-1}$ will be used as the health protective oral slope factor.
19. May 1, 2009 Revision: OLQ developed and adopted default slope factors for TCE of 0.1 $(mg/kg\text{-}day)^{-1}$ as the residential oral slope factor, 0.034 $(mg/kg\text{-}day)^{-1}$ as the industrial oral slope factor, and 0.054 $(mg/kg\text{-}day)^{-1}$ as the residential inhalation slope factor, 0.018 $(mg/kg\text{-}day)^{-1}$ as the industrial inhalation slope factor, in 2006. The previous 2006 default oral and inhalation slope factors of 0.4 $(mg/kg\text{-}day)^{-1}$, which have been removed from this revised table, may also be used. Please see the 2006 OLQ document "A Regulatory Approach for Deriving Trichloroethylene Cancer Potency Estimates for Use in the Development of Health Based Remediation Closure Levels" on the RISC website for more information.
20. The CAS# for "Mercury and compounds" has been changed to CAS# 7487-94-7. It is assumed that Mercury and compounds does not contain elemental Mercury. If your site contains elemental Mercury, please contact your project manager.

21. May 1, 2009 Revision: OLQ has placed two spreadsheet tools on the RISC website to make the Appendix 1 tables more user friendly. The first is a query system that will allow users to select compounds and receive customized information sheets about those compounds. The second is a calculator that is designed to assist the user in industrial non-default calculations. The programming language used to build these tools has a different rounding system than previously used by OLQ to develop the Appendix 1 values. As a result of using the new rounding system, a few of the compounds have very small differences in values. OLQ considers these changes to be insignificant.
22. May 1, 2009 Revision: In August 2006 RISC Staff determined the default ground waterclosure levels based on solubility for certain PAHs were problematic because the closure levels approached, or were below, analytical method detection limits and decided to use the health protective level as the groundwater default closure level instead.
23. May 1, 2009 Revision: Bis(2-chloroisopropyl)ether data has been removed from the revised 2006 Appendix 1 tables because IRIS has removed the toxicity factors from its database. Please contact your Project Manager for information on bis(2-chloroisopropyl)ether if it is a COC at your site.
24. May 1, 2009 Revision: This compound has been added to the 2006 Appendix 1 tables as a part of the May 1, 2009 revision.

Table A – Industrial Closure Levels

Contaminant[1,21]	CAS	Soil									Ground Water				
		Soil Attenuation Capacity	Soil Saturation (Csat)[2]	Construction[4]		Soil Direct		Migration to GW		Default Closure Level	Ground Water Solubility	MCL	Industrial		Default Closure Level
		mg/kg	mg/kg	mg/kg		mg/kg		mg/kg		mg/kg	mg/l-water	mg/l	mg/l		mg/l
Acenaphthene [22]	83-32-9	6000/2000		50000	NC	24000	NC	**1800**	**C**	**1800**	4.2		6.1	NC	**6.1**
Acenaphthylene	208-96-8	6000/2000		5900	NC	2800	NC	180	NC	180	3.9		0.73	NC	0.73
Acetochlor	34256-82-1	6000/2000		18000	NC	9800	NC	23	NC	23	220		2	NC	2
Acetone (2-Propanone)	67-64-1	6000/2000	200000	230000	NC	51000	NC	370	NC	370	1000000		92	NC	92
Acrolein [5]	107-02-8	6000/2000	50000	3.5	NC	0.64	NC	0.25	NC	0.25	210000		0.051	NC	0.051
Aldrin	309-00-2	6000/2000		27	NC	0.8	C	16	C	0.8	0.18		0.00017	C	0.00017
Anthracene [22]	120-12-7	6000/2000		250000	NC	120000	NC	**36000**	**NC**	**2000**	0.043		31	NC	**31**
Antimony and compounds [6]	7440-36-0	10000		460	NC	620	NC	37	NC	37		0.006	0.041	NC	0.041
Arsenic [3 6 17]	7440-38-2	10000		320	NC	20	C	5.8	MCL	5.8		0.01	0.0019	C	0.01
Atrazine	1912-24-9	6000/2000		2800	C	63	C	0.21	C	0.21	35	0.003	0.013	C	0.013
Barium [6]	7440-39-3	10000		220000	NC	230000	NC	17000	NC	10000		2	20	NC	20
Benzene	71-43-2	6000/2000	590	560	NC	14	C	0.35	C	0.35	1800	0.005	0.052	C	0.052
Benzo(a)anthracene	56-55-3	6000/2000		790	C	15	C	62	C	15	0.0094		0.0039	C	0.0039
Benzo(a)pyrene	50-32-8	6000/2000		79	C	1.5	C	16	C	1.5	0.0016	0.0002	0.00039	C	0.00039
Benzo(b)fluoranthene [22]	205-99-2	6000/2000		790	C	15	C	**190**	**C**	15	0.0015		0.0039	C	**0.0039**
Benzo(k)fluoranthene [22]	207-08-9	6000/2000		7900	C	150	C	**1900**	**C**	**150**	0.0008		0.039	C	**0.039**
Benzoic acid [6]	65-85-0	6000/2000		1000000	NC	1000000	NC	1600	NC	1600	3500		410	NC	410
Benzyl Alcohol	100-51-6	6000/2000	8800	270000	NC	150000	NC	140	NC	140	40000		31	NC	31
Beryllium and compounds [9]	7440-41-7	10000		2300	NC	2900	NC	3200	NC	2300		0.004	0.2	NC	0.2
Bis(2-chloro-1-methylethyl) ether	108-60-1	6000/2000	550	5200	C	61	C	0.26	C	0.26	1700		0.041	C	0.041
Bis(2-Chloroethyl)ether [5]	111-44-4	6000/2000	4000	280	C	3	C	0.012	C	0.012	17000		0.0026	C	0.0026
Bis(2-chloroisopropyl)ether[23]	**39638-32-9**														
Bis(2-ethylhexyl)phthalate	117-81-7	6000/2000	10000	18000	NC	980	C	120000	C	980	0.34	0.006	0.2	C	0.2
Bromodichloromethane [7]	75-27-4	6000/2000	2100	2100	C	17	C	0.51	MCL	0.51	6700	0.08	0.046	C	0.08
Bromoform(tribromomethane) [7]	75-25-2	6000/2000	1200	7700	NC	580	C	2.7	C	2.7	3100	0.08	0.36	C	0.36
n-Butanol	71-36-3	6000/2000	16000	2700	NC	490	NC	44	NC	44	74000		10	NC	10
Butylbenzylphthalate [2 14]	85-68-7	6000/2000	310	180000	NC	98000	NC	6200	S	310	2.7		20	NC	2.7
Cadmium [3 6]	7440-43-9	10000		590	NC	990	NC	77	NC	77		0.005	0.051	NC	0.051
Carbazole	86-74-8	6000/2000		31000	C	690	C	20	C	20	7.5		0.14	C	0.14
Carbon disulfide	75-15-0	6000/2000	480	6200	NC	1200	NC	82	NC	82	1200		10	NC	10
Carbon tetrachloride	56-23-5	6000/2000	520	38	NC	5.2	C	0.29	C	0.29	790	0.005	0.022	C	0.022
Chlordane	12789-03-6	6000/2000		510	NC	68	C	39	C	39	0.056	0.002	0.0082	C	0.0082
p-Chloroaniline [6]	106-47-8	6000/2000		3600	NC	2000	NC	2.7	NC	2.7	5300		0.41	NC	0.41
Chlorobenzene	108-90-7	6000/2000	310	2600	NC	510	NC	27	NC	27	470	0.1	2	NC	2
Chloroethane	75-00-3	6000/2000	3000	16000	C	120	C	10	C	10	5700		0.99	C	0.99
Chloroform [7 10]	67-66-3	6000/2000	2300	650	C	4.7	C	6	NC	4.7	7900	0.08	1	NC	1
2-Chloronapthalene	91-58-7	6000/2000		71000	NC	39000	NC	560	NC	560	12		8.2	NC	8.2
2-Chlorophenol [6]	95-57-8	6000/2000	22000	2200	NC	580	NC	10	NC	10	22000		0.51	NC	0.51

Table A – Industrial Closure Levels

Contaminant[1,21]	CAS	Soil									Ground Water				
		Soil Attenuation Capacity	Soil Saturation (Csat)[2]	Construction[4]		Soil Direct		Migration to GW		Default Closure Level	Ground Water Solubility	MCL	Industrial		Default Closure Level
		mg/kg	mg/kg	mg/kg		mg/kg		mg/kg		mg/kg	mg/l-water	mg/l	mg/l		mg/l
Chromium III[6]	16065-83-1	10000		1000000	NC	1000000	NC	1000000	NC	10000		0.1	150	NC	150
Chromium VI[6 12]	18540-29-9	10000		3400	NC	650	C	120	NC	120		0.1	0.31	NC	0.31
Chrysene[22]	218-01-9	6000/2000		79000	C	1500	C	**6200**	**C**	**1500**	0.0016		0.39	C	**0.39**
Copper[6]	7440-50-8	10000		46000	NC	62000	NC	2900	NC	2900		1.3	4.1	NC	4.1
Cyanide, Free[13]	57-12-5	6000/2000		23000	NC	31000	NC	9.6	NC	9.6	1000000	0.2	2	NC	2
Cyclohexane[2]	110-82-7	6000/2000	69	51000	NC	9300	NC	1400	S	69	55		170	NC	55
DDD	72-54-8	6000/2000		2200	NC	120	C	480	C	120	0.09		0.012	C	0.012
DDE	72-55-9	6000/2000		2200	C	86	C	1500	C	86	0.12		0.0084	C	0.0084
DDT	50-29-3	6000/2000		540	NC	86	C	890	C	86	0.025		0.0084	C	0.0084
Dibenzo(a,h)anthracene	53-70-3	6000/2000		79	C	1.5	C	60	C	1.5	0.0025		0.00039	C	0.00039
Dibenzofuran	132-64-9	6000/2000		1800	NC	980	NC	65	NC	65	3.1		0.2	NC	0.2
1,2-Dibromoethane	106-93-4	6000/2000	1400	59	C	0.49	C	0.0096	C	0.0096	4300	5E-05	0.0014	C	0.0014
Dibutyl phthalate[2]	84-74-2	6000/2000	760	89000	NC	49000	NC	14000	NC	760	11		10	NC	10
1,2-Dichlorobenzene	95-50-1	6000/2000	220	18000	NC	3900	NC	270	NC	220	160	0.6	9.2	NC	9.2
1,3-Dichlorobenzene	541-73-1	6000/2000	230	2200	NC	890	NC	8.9	NC	8.9	160		0.31	NC	0.31
1,4-Dichlorobenzene	106-46-7	6000/2000		8000	C	73	C	3.4	C	3.4	74	0.075	0.12	C	0.12
3,3-Dichlorobenzidine	91-94-1	6000/2000		1400	C	31	C	0.21	C	0.21	3.1		0.0064	C	0.0064
1,1-Dichloroethane	75-34-3	6000/2000	1400	8600	NC	1700	NC	58	NC	58	5100		10	NC	10
1,2-Dichloroethane	107-06-2	6000/2000	2000	150	NC	5.8	C	0.15	C	0.15	8500	0.005	0.031	C	0.031
1,1-Dichloroethylene	75-35-4	6000/2000	930	2200	NC	410	NC	42	NC	42	2200	0.007	5.1	NC	5.1
cis-1,2-Dichloroethylene	156-59-2	6000/2000	1000	750	NC	140	NC	5.8	NC	5.8	3500	0.07	1	NC	1
trans-1,2-Dichloroethylene	156-60-5	6000/2000	2100	1200	NC	230	NC	14	NC	14	6300	0.1	2	NC	2
2,4-Dichlorophenol[6]	120-83-2	6000/2000		2700	NC	1500	NC	3	NC	3	4500		0.31	NC	0.31
2,4-Dichlorophenoxyacetic acid (2,4-D)	94-75-7	6000/2000		9100	NC	5200	NC	5.2	NC	5.2	680	0.07	1	NC	1
1,2-Dichloropropane	78-87-5	6000/2000	830	99	NC	7.2	C	0.25	C	0.25	2800	0.005	0.042	C	0.042
1,3-Dichloropropene	542-75-6	6000/2000	1000	290	NC	16	C	0.2	C	0.2	2800		0.029	C	0.029
Dieldrin	60-57-1	6000/2000		39	C	0.86	C	0.15	C	0.15	0.2		0.00018	C	0.00018
Diethylphthalate	84-66-2	6000/2000	840	710000	NC	390000	NC	1300	NC	840	1100		82	NC	82
N,N Dimethylformamide	68-12-2	6000/2000	200000	26000	NC	5800	NC	42	NC	42	1000000		10	NC	10
2,4-Dimethylphenol[6]	105-67-9	6000/2000		18000	NC	9800	NC	25	NC	25	7900		2	NC	2
Dimethylphthalate[2]	131-11-3	6000/2000	1100	1000000	NC	1000000	NC	5600	NC	1100	4000		1000	NC	1000
2,4-Dinitrophenol[6]	51-28-5	6000/2000		1800	NC	980	NC	0.82	NC	0.82	2800		0.2	NC	0.2
Dinitrotoluene mixture	25321-14-6	6000/2000		890	NC	20	C	0.031	C	0.031	230		0.0042	C	0.0042
Di-n-octyl phthalate[14]	117-84-0	6000/2000	3300	36000	NC	20000	NC	67000	S	2000	0.02		4.1	NC	0.02
Endosulfan	115-29-7	6000/2000		5300	NC	2900	NC	46	S	46	0.51		0.61	NC	0.51
Endrin	72-20-8	6000/2000		270	NC	150	NC	15	NC	15	0.25	0.002	0.031	NC	0.031
Ethyl acetate	141-78-6	6000/2000	25000	290000	NC	69000	NC	590	NC	590	80000		92	NC	92
Ethylbenzene	100-41-4	6000/2000	160	29000	NC	6800	NC	200	NC	160	170	0.7	10	NC	10

Table A – Industrial Closure Levels

Contaminant[1,21]	CAS	Soil									Ground Water				
		Soil Attenuation Capacity	Soil Saturation (Csat)[2]	Construction[4]		Soil Direct		Migration to GW		Default Closure Level	Ground Water Solubility	MCL	Industrial		Default Closure Level
		mg/kg	mg/kg	mg/kg		mg/kg		mg/kg		mg/kg	mg/l-water	mg/l	mg/l		mg/l
Ethylene glycol[24]	**107-21-1**	**6000/2000**	**200000**	**1000000**	**NC**	**570000**	**NC**	**830**	**NC**	**830**	**1000000**		**200**	**NC**	**200**
Fluoranthene [22]	206-44-0	6000/2000		33000	NC	16000	NC	**18000**	**NC**	**2000**	0.21		4.1	NC	**4.1**
Fluorene [22]	86-73-7	6000/2000		33000	NC	16000	NC	**2300**	**NC**	**2000**	2		4.1	NC	**4.1**
alpha-HCH(alpha-BHC)	319-84-6	6000/2000		120	C	4	C	0.024	C	0.024	2		0.00045	C	0.00045
beta-HCH(beta-BHC)	319-85-7	6000/2000		200	NC	12	C	0.086	C	0.086	0.24		0.0016	C	0.0016
gamma-HCH(Lindane)	58-89-9	6000/2000		310	NC	19	C	0.1	C	0.1	6.8	0.0002	0.0022	C	0.0022
Heptachlor	76-44-8	6000/2000		140	C	2.9	C	36	C	2.9	0.18	0.0004	0.00064	C	0.00064
Heptachlor epoxide	1024-57-3	6000/2000		12	NC	1.5	C	1	C	1	0.2	0.0002	0.00031	C	0.00031
Hexachloro-1,3-butadiene	87-68-3	6000/2000	350	270	NC	150	NC	66	NC	66	3.2		0.031	NC	0.031
Hexachlorobenzene	118-74-1	6000/2000		390	C	8.6	C	3.9	C	3.9	6.2	0.001	0.0018	C	0.0018
Hexachlorocyclopentadiene	77-47-4	6000/2000	720	5300	NC	2900	NC	4900	NC	720	1.8	0.05	0.61	NC	0.61
Hexachloroethane	67-72-1	6000/2000		660	NC	240	NC	7.7	NC	7.7	50		0.1	NC	0.1
n-Hexane	110-54-3	6000/2000	100	1200	NC	220	NC	2100	S	100	9.5		61	NC	9.5
Indeno(1,2,3-cd)pyrene [22]	193-39-5	6000/2000		790	C	15	C	**540**	**C**	**15**	0.000022		0.0039	C	**0.0039**
Isophorone	78-59-1	6000/2000	3500	180000	NC	14000	C	18	C	18	12000		3	C	3
Isopropylbenzene (Cumene)	98-82-8	6000/2000	42	9900	NC	1900	NC	140	NC	42	61		10	NC	10
Lead[8]	7439-92-1	10000		970	NC	1300	NC	230		230		0.015	0.042	NC	0.042
Mercury and compounds[9 20]	7487-94-7	10000		340	NC	470	NC	32	NC	32	69000	0.002	0.031	NC	0.031
Methoxychlor[14]	72-43-5	6000/2000		4400	NC	2500	NC	180	S	180	0.045	0.04	0.51	NC	0.045
Methyl bromide (bromomethane)	74-83-9	6000/2000	3700	69	NC	13	NC	0.7	NC	0.7	15000		0.14	NC	0.14
Methyl ethyl ketone (MEK)	78-93-3	6000/2000	28000	260000	NC	70000	NC	250	NC	250	140000		61	NC	61
Methyl tertiary butyl ether (MTBE)[16]	1634-04–4	6000/2000	11000	65000	C	650	C	3.2	C	3.2	48000		0.72	C	0.72
4-Methyl-2-pentanone (MIBK)	108-10-1	6000/2000	8700	64000	NC	29000	NC	75	NC	75	19000		8.2	NC	8.2
Methylene chloride	75-09-2	6000/2000	3000	22000	C	200	C	1.8	C	1.8	13000	0.005	0.38	C	0.38
2-Methylnaphthalene	91-57-6	6000/2000		3300	NC	1600	NC	42	NC	42	25		0.41	NC	0.41
3-Methylphenol (m-cresol)[6]	108-39-4	6000/2000	6100	44000	NC	25000	NC	28	NC	28	23000		5.1	NC	5.1
4-Methylphenol (p-cresol)[6]	106-44-5	6000/2000		4400	NC	2500	NC	3	NC	3	22000		0.51	NC	0.51
2-Methylphenol(o-cresol)[6]	95-48-7	6000/2000		39000	NC	17000	NC	39	NC	39	26000		5.1	NC	5.1
Metolachlor	51218-45-2	6000/2000	420	130000	NC	74000	NC	240	NC	240	530		15	NC	15
Naphthalene	91-20-3	6000/2000		17000	NC	8000	NC	170	NC	170	31		2	NC	2
Nickel, soluble salts[6]	various	10000		23000	NC	31000	NC	2700	NC	2700			2	NC	2
2-Nitroaniline	88-74-4	6000/2000		2700	NC	1500	NC	1.9	NC	1.9	1500		0.31	NC	0.31
Nitrobenzene	98-95-3	6000/2000	690	440	NC	250	NC	0.34	NC	0.34	2100		0.051	NC	0.051
N-Nitrosodi-n-propylamine[5 6]	621-64-7	6000/2000	2500	89	C	2	C	0.002	C	0.002	9900		0.00041	C	0.00041
N-Nitrosodiphenylamine[6]	86-30-6	6000/2000		18000	NC	2800	C	32	C	32	35		0.58	C	0.58
PCBs (polychlorinated biphenyls)[11]	1336-36-3	6000/2000		16	NC	5.3	C	18	C	5.3	0.7	0.0005	0.0014	C	0.0014
Pentachlorophenol[6]	87-86-5	6000/2000		3800	C	54	C	0.66	C	0.66	2000	0.001	0.024	C	0.024
Phenanthrene	85-01-8	6000/2000		2500	NC	1200	NC	170	NC	170	1.2		0.31	NC	0.31

Table A – Industrial Closure Levels

Contaminant[1,21]	CAS	Soil									Ground Water				
		Soil Attenuation Capacity	Soil Saturation (Csat)[2]	Construction[4]		Soil Direct		Migration to GW		Default Closure Level	Ground Water Solubility	MCL	Industrial		Default Closure Level
		mg/kg	mg/kg	mg/kg		mg/kg		mg/kg		mg/kg	mg/l-water	mg/l	mg/l		mg/l
Phenol [6]	108-95-2	6000/2000		230000	NC	96000	NC	160	NC	160	83000		31	NC	31
n-Propylbenzene	103-65-1	6000/2000	300	10000	NC	2200	NC	480	NC	300	52		4.1	NC	4.1
Propylene glycol monomethyl ether[24]	**107-98-2**	**6000/2000**	**200000**	**440000**	**NC**	**150000**	**NC**	**290**	**NC**	**290**	**1000000**		**72**	**NC**	**72**
Pyrene [22]	129-00-0	6000/2000		25000	NC	12000	NC	**13000**	**NC**	**2000**	0.14		3.1	NC	**3.1**
Selenium [6]	7782-49-2	10000		5700	NC	7800	NC	53	NC	53		0.05	0.51	NC	0.51
Silver [6]	7440-22-4	10000		5700	NC	7800	NC	87	NC	87			0.51	NC	0.51
Styrene	100-42-5	6000/2000	550	68000	NC	16000	NC	720	NC	550	310	0.1	20	NC	20
1,1,1,2-Tetrachloroethane	630-20-6	6000/2000	1200	7400	C	67	C	0.85	C	0.85	3000		0.11	C	0.11
1,1,2,2-Tetrachloroethane	79-34-5	6000/2000	1200	960	C	8.7	C	0.11	C	0.11	3000		0.014	C	0.014
Tetrachloroethylene (PCE) [18]	127-18-4	6000/2000	120	660	NC	16	C	0.64	C	0.64	200	0.005	0.055	C	0.055
Thallium (and compounds) [6]	7440-28-0	10000		80	NC	110	NC	10	NC	10		0.002	0.0072	NC	0.0072
Toluene	108-88-3	6000/2000	310	49000	NC	16000	NC	96	NC	96	530	1	8.2	NC	8.2
Toxaphene	8001-35-2	6000/2000		560	C	12	C	31	MCL	12	0.74	0.003	0.0026	C	0.003
1,2,4-Trichlorobenzene	120-82-1	6000/2000	1100	8900	NC	4900	NC	77	NC	77	300	0.07	1	NC	1
1,1,1-Trichloroethane	71-55-6	6000/2000	640	34000	NC	6700	NC	280	NC	280	1300	0.2	29	NC	29
1,1,2-Trichloroethane	79-00-5	6000/2000	1300	600	NC	15	C	0.3	C	0.3	4400	0.005	0.05	C	0.05
Trichloroethylene (TCE) [19]	79-01-6	6000/2000	630	210	NC	24	C	0.35	NC	0.35	1100	0.005	0.031	NC	0.031
Trichlorofluoromethane[24]	**75-69-4**	**6000/2000**	**970**	**6900**	**NC**	**1300**	**NC**	**540**	**NC**	**540**	**1100**		**31**	**NC**	**31**
2,4,5-Trichlorophenol [6]	95-95-4	6000/2000		89000	NC	49000	NC	690	NC	690	1200		10	NC	10
2,4,6-Trichlorophenol [6]	88-06-2	6000/2000		89	NC	49	NC	0.2	NC	0.2	800		0.01	NC	0.01
2,4,5-Trichlorophenoxyacetic acid (2,4,5-T)	93-76-5	6000/2000		8900	NC	4900	NC	6.1	NC	6.1	270		1	NC	1
1,2,4-Trimethylbenzene	95-63-6	6000/2000	430	920	NC	170	NC	780	NC	170	57		5.1	NC	5.1
1,3,5-Trimethylbenzene	108-67-8	6000/2000	90	380	NC	68	NC	190	NC	68	48		5.1	NC	5.1
Vinyl acetate	108-05-4	6000/2000	4200	7600	NC	1400	NC	430	NC	430	20000		100	NC	100
Vinyl chloride (chloroethene) [15]	75-01-4	6000/2000	930	**500**	C	6.4	C	0.027	C	0.027	2800	0.002	0.004	C	0.004
Xylene mixed (total)	1330-20-7	6000/2000	170	4800	NC	890	NC	430	NC	170	160	10	20	NC	20
Zinc	7440-66-6	10000		340000	NC	470000	NC	38000	NC	10000			31	NC	31

Footnotes

Bold text indicates that a change has been made from the previous 2006 Appendix 1 table.

1. Note each column in the closure level tables has a “c” or an “nc” next to the value. This designation indicates whether the numerical value is the result of calculation from a carcinogenic endpoint or a noncarcinogenic endpoint. Knowing the carcinogenic or noncarcinogenic designation is necessary when performing additivity. The user should be aware that there are many parameters used to calculate the closure levels, and a given compound may have closure levels that result from either carcinogenic or noncarcinogenic endpoints. Sometimes the endpoints may be different for different closure types. For instance, a direct soil value may have been generated from a carcinogenic endpoint, but the groundwater value may be from a noncarcinogenic endpoint. Most carcinogens are calculated using endpoints from both carcinogenic and noncarcinogenic toxicity information, and the system used to calculate the default closure level selects the lowest endpoint.
2. Certain chemicals that are considered liquids at soil temperatures have calculated soil saturation levels. The soil saturation level, or “Csat” value, is an indicator of the possibility there is free product present. In cases where the Csat value is lower than any other soil calculated value the Csat value becomes the default closure level. If the user does not think free product exists at the site but has concentrations that exceed Csat, but not other closure levels, then they should contact the IDEM site manager in order to verify there is no free product.
3. Residential soil direct contact values for arsenic and cadmium are based on the algorithms that measure the soil-plant-human uptake and not on the algorithms normally used to measure direct contact to surface soil.

4. Construction values are listed as the raw calculated values. When applying construction values to closures, the user should recognize that values for organic chemicals will be capped at the Soil Attenuation Capacity (SAC) value or the Csat, whichever is lower, or at 10,000 mg/kg for metals. Default SAC values are 6000 mg/kg for Direct Contact (surface soil) and 2000 mg/kg for Migration to Groundwater (subsurface soil). It is possible to raise the SAC value based on the organic carbon content in the soil, and the user is referred to the non-default chapter for further information.
5. Acrolein, Bis(2-chloroethyl)ether, and N-Nitroso-di-n-propylamine (as well as other compounds) may not have an analytical method available with a detection limit or quantitation limit that will meet the closure level. Appendix 2 should be consulted for suggested analytical procedures with detection limits that meet or approach meeting closure levels. If analytical methods capable of meeting closure levels for all site contaminants are not available, the IDEM site manager should be contacted to arrange for a conference with an IDEM chemist. Appendix II is currently being updated.
6. Koc and Kd values for ionizing organics and metals will vary depending on pH. If the source area pH is outside the range of 6.0-8.0, then see the discussion in Section A1.0, under Table A, pages A.1-1 and A.1-2. Default closure levels have been calculated using Koc and Kd values at pH 6.8.
7. A "trihalomethane" is an organic compound consisting of a single carbon atom with three "halogen" atoms (bromine, chlorine, fluorine, or iodine) and a hydrogen atom attached. The National Primary Drinking Water Standards now include a "Total Trihalomethane standard" (TTHM MCL) of 0.08 mg/L. Under certain circumstances, i.e., when more than one trihalomethane compound is present on site, the "trihalomethane" standard will apply to bromoform, chloroform and bromodichloromethane. The composite standard may reduce the individual closure levels because the total concentration may not exceed the TTHM MCL.
8. Lead values were calculated using:

The 1994 Integrated Exposure Uptake Biokinetic Model (see EPA/540/R-93/081, PB-963510),

The Methodology for Assessing Risks Associated with Adult Exposure to Lead in Soil SRC-GLD-F0162-209-Draft-7/21/96,

Review of the Methodology for Establishing Risk-Based Remediation Goals for Commercial Areas of the California Gultch Site, USEPA, Technical Review Workgroup for Lead, October 26, 1995 for industrial and construction exposures, and

The Drinking Water Regulation and Health Advisories EPA 822-R-96-001, February, 1996 action levels for residential groundwater and an extrapolation to determine industrial groundwater levels.

The Kd value for lead was taken from Sheppard and Thibault (Default Soil Solid Liquid Partition Coefficients, Kds for Four Major Soil Types: A Compendium, Health Physics Vol 59, No 4, pp 471-482, 1990) for sandy soils and is considered to be applicable anywhere in the state.
9. Closure levels for Beryllium and Mercury must be determined with a site specific pH. Please see the discussion in section A.1.0 under Table A, pages A.1-1 and A.1-2.
10. Chloroform no longer has an Oral Slope Factor; the Oral RfD at 0.01 mg/kg-day is considered to be protective of the carcinogenic endpoint from the oral route.
11. PCBs are assumed to be a mixture and that Aroclor 1016 and 1254 are present.
12. Total Chromium concentrations must be assumed to be 100% Chromium VI unless a species-specific ratio evaluation of Chromium VI to Chromium III is made. The Inhalation Slope Factor used for Chromium VI is from USEPA Region 09 and is based on a review of the available studies and literature.
13. Cyanide values apply to "free" cyanide only. The closure levels are not applicable to copper cyanide and other complexed cyanides. The physical constants used in the calculation of the free cyanide closure levels are based on hydrogen cyanide (non-complexed, ionic cyanide). Total cyanide concentrations may not be representative of, and in fact may over estimate, free cyanide concentrations.
14. Certain compounds have very low solubilities, and the groundwater closure values are defaulted to their respective solubility limits. Concentrations in excess of the solubility limit can be an indicator of the presence of free product. When the solubility limit has been exceeded and the user believes that free product does not exist, then the user should contact the project manager to determine a course of action to verify there is no free product.
15. Vinyl Chloride calculations are based on two different sets of slope factors. Industrial default closure levels use 0.75 $(mg/kg\text{-}d)^{-1}$ for the oral slope factor and 0.016 $(mg/kg\text{-}day)^{-1}$ for the inhalation slope factor. Residential default closure levels use 1.5 $(mg/kg\text{-}d)^{-1}$ for the oral slope factor and 0.031$(mg/kg\text{-}day)^{-1}$ for the inhalation slope factor. The values derived for industrial default closure levels are recommended for lifetime exposure beginning at adulthood. For exposures beginning at birth an additional twofold safety factor is recommended. This has been taken into account when deriving the default closure levels for residential areas. **May 1, 2009 Revision: The construction value for vinyl chloride in the 2006 Appendix 1 DCL tables was calculated incorrectly using the residential slope factors. This revision of the 2006 Appendix 1 Tables includes the corrected construction level, as calculated with the industrial slope factors.**
16. Residential Groundwater value from EPA Drinking Water and Health Advisories, EPA 822-R-04-038, USEPA, Office of Water, Winter 2004.
17. The new federal MCL for arsenic is 0.01mg/L, and is effective January 23, 2006.
18. IDEM is currently investigating the oral slope factor for tetrachloroethylene (PCE). Until IDEM reaches a conclusion, 0.052 $(mg/kg\text{-}day)^{-1}$ will be used as the health protective oral slope factor.
19. May 1, 2009 Revision: OLQ developed and adopted default slope factors for TCE of 0.1 $(mg/kg\text{-}day)^{-1}$ as the residential oral slope factor, 0.034 $(mg/kg\text{-}day)^{-1}$ as the industrial oral slope factor, and 0.054 $(mg/kg\text{-}day)^{-1}$ as the residential inhalation slope factor, 0.018 $(mg/kg\text{-}day)^{-1}$ as the industrial inhalation slope factor, in 2006. The previous 2006 default oral and inhalation slope factors of 0.4 $(mg/kg\text{-}day)^{-1}$, which have been removed from this revised table, may also be used. Please see the 2006 OLQ document "A Regulatory Approach for Deriving Trichloroethylene Cancer Potency Estimates for Use in the Development of Health Based Remediation Closure Levels" on the RISC website for more information.
20. The CAS# for "Mercury and compounds" has been changed to CAS# 7487-94-7. It is assumed that Mercury and compounds does not contain elemental Mercury. If your site contains elemental Mercury, please contact your project manager.

21. May 1, 2009 Revision: OLQ has placed two spreadsheet tools on the RISC website to make the Appendix 1 tables more user friendly. The first is a query system that will allow users to select compounds and receive customized information sheets about those compounds. The second is a calculator that is designed to assist the user in industrial non-default calculations. The programming language used to build these tools has a different rounding system than previously used by OLQ to develop the Appendix 1 values. As a result of using the new rounding system, a few of the compounds have very small differences in values. OLQ considers these changes to be insignificant.
22. May 1, 2009 Revision: In August 2006 RISC Staff determined the default groundwater closure levels based on solubility for certain PAHs were problematic because the closure levels approached, or were below, analytical method detection limits and decided to use the health protective level as the groundwater default closure level instead.
23. May 1, 2009 Revision: Bis(2-chloroisopropyl)ether data has been removed from the revised 2006 Appendix 1 tables because IRIS has removed the toxicity factors from its database. Please contact your Project Manager for information on bis(2-chloroisopropyl)ether if it is a COC at your site.
24. May 1, 2009 Revision: This compound has been added to the 2006 Appendix 1 tables as a part of the May 1, 2009 revision.