Ground Water Cleanup Levels

Table 720-1

Notes on the Development of Method A Cleanup Levels WAC 173-340-720, 740, and 745

The following tables were prepared as part of the rule-making process for the amended MTCA rule adopted February 12, 2001. The information in the tables was used when Ecology developed the Method A Cleanup Levels for the revised regulation.

The tables compile cleanup level calculations for various exposure pathways for both carcinogenic and noncarcinogenic heath effects, applicable state and federal laws, laboratory practical quantitation limits and other relevant information that was used to develop the Method A cleanup levels. While this is useful background information, **the values in these tables are not the adopted rule and should not be used as Method A cleanup levels**. Use the tables, footnotes and accompanying text in the adopted regulation to develop Method A cleanup levels.

NOTE: Some columns in these tables refer to "current" and "proposed" Method A values. "Current" as used in these tables refers to the cleanup levels as they existed prior to the adoption of the February 12, 2001 rule amendments. "Proposed" as used in these tables are the cleanup levels that were adopted on February 12, 2001.

February 9, 2001
November 23, 2004 revision (1)

TO: Interested Persons

FROM: Pete Kmet, Senior Environmental Engineer
Toxics Cleanup Program

SUBJECT: Calculations for Table 720-1
Method A Ground Water Cleanup Levels

Attached are several tables in excel format providing information on the development of the Method A ground water cleanup levels for Table 720-1, WAC 173-340-900.

Table 1: A quick summary providing the Method A ground water cleanup levels and a brief explanation of the reasoning in the development of Method A cleanup values.

Table 2: A detailed compilation of the information considered in the development of Method A ground water cleanup levels. This information includes:

- The federal or state drinking water standard (MCLs) as of February, 2001;
- The standard Method B ground water value for each substance. This is based on the drinking water exposure pathway and includes carcinogen and non-carcinogen cleanup levels where sufficient information was available for these calculations as of February, 2001;
- The practical quantitation limit as of February, 2001;
- The pure substance solubility limit as of February, 2001; and
- Natural background and odor thresholds, where available as of February, 2001

Table 3: Provides the assumptions used for calculating the standard Method B ground water cleanup values for non-carcinogens using equation 720-1 in WAC 173-340-720(4)(b)(iii)(A).

Table 4: Provides the assumptions used for calculating the standard Method B ground water cleanup values for carcinogens using equation 720-2 in WAC 173-340-720(4)(b)(iii)(B) .

(1) This memo and attached excel tables explain the basis for the Method A cleanup levels in the MTCA rule adopted February 12, 2001. The memos and tables have been slightly revised from the originals issued on February 9, 2001 to clarify certain information in response to questions received since issuance of the original memos and tables. The original memos and tables can be found in appendix D of the concise explanatory statement for the February 12, 2001 rule amendments (http://www.ecy.wa.gov/programs/tcp/regs/reg_main.html)

Table 1: Quick Summary -- Basis for Method A Groundwater Table Values

Parameter	CAS No.	1991 Method A ug/l	2001 adopted Method A ug/l	Basis for Proposed Cleanup Level
Arsenic	7440-38-2	5	5	Natr'l bkgd--MCL exceeds allowable risk.
Benzene	71-43-2	5	5	MCL
Benzo(a)Pyrene	50-32-8	none	0.1	MCL adjusted to 1 X 10-5 risk. This can also be used as the total toxic equivalents for all cPAHs. See WAC 173-340-708(8).
Cadmium	7440-43-9	5	5	MCL
T Chromium	7440-47-3	50	50	Method B--based on Chromium VI. If just Cr (III) is present, can use 100 ug/l.
Chromium VI	18540-29-9	none	none	
Chromium III	16065-83-1	none	none	
DDT	50-29-3	0.1	0.3	Method B (current Method A value appears to be in error)
1,2 Dichloroethane	107-06-2	5	5	MCL
Ethylbenzene	100-41-4	30	700	MCL
Ethylene dibromide (EDB)	106-93-4	0.01	0.01	Method B adjusted to PQL--MCL exceeds allowable risk.
Lead	7439-92-1	5	15	MCL
Lindane	58-89-9	0.2	0.2	MCL
Methylene chloride	75-09-2	5	5	MCL
Mercury (inorganic)	7439-97-6	2	2	MCL
MTBE	1634-04-4	none	20	Lower limit of EPA Advisory level
Naphthalenes	91-20-3	none	160	Method B for naphthalene. This is a total of all naphthalene, 1-Methyl naphthalene & 2-Methyl Naphthalene in the water.
PAHs(carcinogenic)(1)	na	0.1	none	Replaced by Benzo(a)Pyrene, above.
PCB mixtures	1336-36-3	0.1	0.1	Method B adjusted to PQL (MCL exceeds MTCA allowable HQ and cancer risk). This is a total for all PCBs.
Tetrachloroethylene (PCE)	127-18-4	5	5	MCL
Toluene	108-88-3	40	1000	MCL
TPH (total)	14280-30-9	1,000	none	Replaced with TPH for specific products.
Gasoline	6842-59-6			
GRO w/o benzene			1,000	Equation 720-3, assuming no benzene is present in gasoline contaminated water.
GRO with benzene			800	Equation 720-3, assuming benzene restored to 5 ug/l.
Diesel			500	Equation 720-3.
Heavy Oils			500	Equation 720-3.
Electrical Insulating Oil			500	Equation 720-3.
1,1,1 Trichloroethane	71-55-6	200	200	MCL
Trichloroethylene	79-01-6	5	5	MCL
Vinyl Chloride	75-01-4	0.2	0.2	MCL adjusted to 1 X 10-5 risk.
Xylene (total)	1330-20-7	20	1000	Not to exceed total TPH for gasoline & aesthetic considerations (odor)
Gross Alpha Particle Act.		15 pCi/l	15 pCi/l	MCL.
Gross Beta Particle Act.		4 mrem/yr	4 mrem/yr	MCL (4 mrem/yr equals 50 pCi/l)
Radium 226 & 228		5 pCi/l	5 pCi/l	MCL
Radium 226		3 pCi/l	3 pCi/l	MCL

Table 2: Summary of Information Used in Developing the Method A Ground Water Values in Table 720-1

Basis for Method A Ground Water Table Values								
					MTCA		Solubility	
Parameter	CAS No.	MCL	Method B	Method B	Risk @ MCL	PQL	Limit	Other
		ug/l (1)	Carc. ug/l (2)	NonC.ug/l (3)	**HQ @ MCL** (4)	ug/l (5)	ug/l (6)	ug/l (7)
Arsenic	7440-38-2	50	0.058	4.8	8.6x10-4/**10**	2 (SW7060)		5 (natr'l bkgd)
Benzene	71-43-2	5	1.5	24	3.3X10-6/**0.21**	1 (SW8260B)	1,750,000	1,100 (odor)
Benzo(a)Pyrene	50-32-8	0.2	0.012		1.7X10-5	0.02 (SW8270C SIM)	1.6	
Cadmium	7440-43-9	5		8.0	**0.62**	0.1 (SW7131)		
T Chromium	7440-47-3	100			**2.1**	5 (SW6010A)		
Chromium VI	18540-29-9	none		48		2 (SW7196)		
Chromium III	16065-83-1	none		24,000		5 (SW6010A)		
DDT	50-29-3	none	0.26	8.0		0.1 (SW8081)	25	
1,2 Dichloroethane	107-06-2	5	0.48		1X10-5	1 (SW8260B)	8,520,000	
Ethylbenzene	100-41-4	700		800	**0.88**	1 (SW8260B)	169,000	120 (odor)
Ethylene dibromide (EDB)	106-93-4	0.05	0.00051		9.7X10-5	0.01 (EPA504.1)	4,000,000	
Lead	7439-92-1	zero/15				2 (SW7421)		5 (natr'l bkgd)
Lindane	58-89-9	0.2	0.067	4.8	3X10-6/**0.04**	0.1 (EPA504.1)	6,800	
Methylene chloride	75-09-2	5	5.8	480	8.6X10-7/**0.1**	1 (SW8260B)	13,000,000	
Mercury (inorganic)	7439-97-6	2		4.8	**0.4**	0.1 (SW7470)		
MTBE	1634-04-4	20-40				1 (SW8260B)	50,000,000	5 - 40 (odor)
Naphthalene	91-20-3	none		160		1 (SW8260B) (10)	31,000	15 (odor)
PAHs(carcinogenic)(8)	na	0.2	0.012		1.7X10-5	0.02 (SW8270C SIM)	1.6	
PCB mixtures(9)	1336-36-3	0.5	0.044	0.32	1.14X10-5/**1.6**	0.1 (SW8082)	12 to 57	

(1) Maximum contaminant level from 40 CFR 141.61 and WAC 246-290-310 except for lead and MTBE. MTBE is an EPA Advisory range.
Lead is the MCL goal of zero and the EPA action level from 40 CFR 141.80 for which no more than 10% of samples can exceed at the tap.
(2) Value calculated using equation 720-2 and cancer potency factor from IRIS or HEAST.
(3) Value calculated using equation 720-1 and reference dose from IRIS or HEAST [Except for benzene which uses a Rfd from the NCEA].
(4) Risk posed by MCL, calculated using equations 720-1 and 720-2. Non carcinogen related values are highlighted with bolding.
(5) From Manchester Laboratory.
(6) Source: EPA Soil Screening Guidance: Technical Background Document. EPA/540/R-95/12B. May, 1996, except EDB and PCB's
from ATSDR Toxicological Profiles; and, MTBE from USGS final draft report on fuel oxygenates, March, 1996
(7) Odor threshold is median of values reported in literature. Background values for As and Pb from PTI, 1989.
(8) The cPAH values shown are based on benzo(a)pyrene.
(9) For PCBs, the noncarcinogenic risk is based on the Rfd for Arochlor 1254. The carcinogenic risk is based on the most potent CPF in IRIS.
(10) Use SW 8270C to measure all three types of naphthalene.

Table 2: Summary of Information Used in Developing the Method A Ground Water Values in Table 720-1

Basis for Method A Ground Water Table Values								
					MTCA		Solubility	
Parameter	CAS No.	MCL	Method B	Method B	Risk @ MCL	PQL	Limit	Other
		ug/l (1)	Carc. ug/l (2)	NonC.ug/l (3)	**HQ @ MCL** (4)	ug/l (5)	ug/l (6)	ug/l (7)
Tetrachloroethylene (PCE)	127-18-4	5	0.86	80	5.8X10-6/**0.06**	1 (SW8260B)	200,000	
Toluene	108-88-3	1,000		1,600	**0.62**	1 (SW8260B)	526,000	500 (odor)
TPH (total)	14280-30-9	none						
Gasoline	6842-59-6	none				250 (NWTPH-Gx)	~100,000	340 (odor)
GRO w/o benzene				1,000				
GRO with benzene				800				
Diesel		none		500		250 (NWTPH-Gx)	<1,000-5,000	200 (odor)
Heavy Oils		none		500		500 (NWTPH-Dx)	<1,000-6,300	500 (odor)
Electrical Insulating Oil		none		500		500 (NWTPH-Dx)	~1,000-1,700	2,500 (odor)
1,1,1 Trichloroethane	71-55-6	200		7200	**0.028**	1 (SW8260B)	1,330,000	
Trichloroethylene	79-01-6	5	4.0		1.3X10-6	1 (SW8260B)	1,100,000	
Vinyl Chloride	75-01-4	2	0.023		8.7X10-5	0.01 (SW8260B SIM)	2,760,000	
Xylene (total)	1330-20-7	10,000		16,000	**0.62**	3 (SW8260B)	176,000	760 (odor)
Gross Alpha Particle Act.		15 pCi/l				4 pCi/l		0.25-3 pCi/l (natr'l bkgd)
Gross Beta Particle Act.		4 mrem/yr				1 pCi/l		3-9 pCi/l (natr'l bkgd)
Radium 226 & 228		5 pCi/l				0.2-0.7 pCi/l		0.3 pCi/l (natr'l bkgd)
Radium 226		3 pCi/l						<0.3 pCi/l (natr'l bkgd)

(1) Maximum contaminant level from 40 CFR 141.61 and WAC 246-290-310.

(2) Value calculated using equation 720-2 and cancer potency factor from IRIS or HEAST.

(3) Value calculated using equation 720-1 and reference dose from IRIS or HEAST. Basis for TPH values is documented in a May 18, 1999 memo by Steve Robb.

Gasoline w/benzene: Based on equation 720-3 using dissolved phase compostion derived with 4 phase model adjusted for benzene being present at the MCL of 5 PPB.

Gasoline w/o benzene: Based on equation 720-3 using dissolved phase composition derived with 4 phase model and assuming no benzene is present in water.

Diesel: Based on equation 720-3 using dissolved phase compostion derived with 4 phase model and in water/diesel partitioning experiment.

Heavy Oil: Based on equation 720-3 using dissolved phase compostion derived with 4 phase model and in water/diesel partitioning experiment.

Mineral Oil: Based on equation 720-3 using dissolved phase compostion derived with 4 phase model and in water/mineral oil partitioning experiment.

(4) Risk posed by MCL, calculated using equations 720-1 and 720-2. Non carcinogen related values are highlighted with bolding.

(5) PQLs from Manchester Laboratory, except radionuclides from Ecology's Nuclear Waste Program.

(6) Source: EPA Soil Screening Guidance: Technical Background Document. EPA/540/R-95/12B. May, 1996, except TPH from various sources. The value for total xylenes is a weighted average of m, o & p xylene based on gasoline composition data from TPH Criteria Working Group--Vol. 2 (May, 1998).

(7) Odor threshold is median of values reported in literature. Background for radionuclides from Ecology's Nuclear Waste Program.

Table 2: Summary of Information Used in Developing the Method A Ground Water Values in Table 720-1

Parameter	1991 Method A ug/l	2001 adopted Method A ug/l	Basis for Proposed Cleanup Level
Arsenic	5	5	Natr'l bkgd--MCL exceeds allowable risk.
Benzene	5	5	MCL
Benzo(a)Pyrene	none	0.1	Method B cleanup level for B(a)P. The total toxic equivalents of all cPAHs cannot exceed this value. See WAC 173-340-708(1).
Cadmium	5	5	MCL
T Chromium	50	50	Method B--based on Chromium VI.
Chromium VI	none	none	
Chromium III	none	none	
DDT	0.1	0.3	Method B (current Method A value appears to be in error)
1,2 Dichloroethane	5	5	MCL
Ethylbenzene	30	700	MCL
Ethylene dibromide (EDB)	0.01	0.01	Method B adjusted to PQL--MCL exceeds allowable risk.
Lead	5	15	MCL
Lindane	0.2	0.2	MCL
Methylene chloride	5	5	MCL
Mercury (inorganic)	2	2	MCL
MTBE	none	20	Lower limit of EPA Advisory level
Naphthalene(s)	none	160	Method B for naphthalene. This is a total of all naphthalene, 1-Methyl naphthalene & 2-Methyl Naphthalene in the water.
PAHs (carcinogenic)	0.1	none	Replaced by Benzo(a)Pyrene, above.
PCB mixtures	0.1	0.1	Method B adjusted to PQL (MCL exceeds MTCA allowable HQ and cancer risk). This is a total for all PCBs.

Table 2: Summary of Information Used in Developing the Method A Ground Water Values in Table 720-1

		2001	
	1991	adopted	Basis for
Parameter	Method A	Method A	Proposed
	ug/l	ug/l	Cleanup Level
Tetrachloroethylene (PCE)	5	5	MCL
Toluene	40	1,000	MCL
TPH (total)	1,000	none	Replaced with TPH for specific products.
Gasoline			
GRO w/o benzene		1,000	Equation 720-3.
GRO with benzene		800	Equation 720-3.
Diesel		500	Equation 720-3.
Heavy Oils		500	Equation 720-3.
Electrical Insulating Oil		500	Equation 720-3.
1,1,1 Trichloroethane	200	200	MCL
Trichloroethylene	5	5	MCL
Vinyl Chloride	0.2	0.2	MCL adjusted to 1 X 10-5 risk.
Xylene (total)	20	1,000	Not to exceed maximum allowable total TPH for gasoline & aesthetic considerations (odor). This is the total of m, o & p xylenes.
Gross Alpha Particle Act.	15 pCi/l	15 pCi/l	MCL. [It is anticipated radionuclide cleanup standards will be subject to future review.]
Gross Beta Particle Act.	4 mrem/yr	4 mrem/yr	MCL (4 mrem/yr equals 50 pCi/l)
Radium 226 & 228	5 pCi/l	5 pCi/l	MCL
Radium 226	3 pCi/l	3 pCi/l	MCL

Table 3: Drinking Water -- Method B Calculations for Noncarcingens

Risk Calculations--Noncarcinogenic Effects of Drinking Water Ingestion

Parameter	CAS No.	Reference Dose (1) (mg/kg-day)	Avg. Body Weight (kg)	Unit Conv. Factor (ug/mg)	Hazard Quotient (unitless)	Drinking H2O Ing. Rate (liter/day)	Inhalation Corr. Factor (unitless)	Drinking H2O Fraction (unitless)	Method B Noncarc(2) (ug/l)	MCL(3) (ug/l)	HQ @ MCL(4) (unitless)
Arsenic	7440-38-2	0.0003	16	1,000	1	1.0	1	1.0	4.8	50	**10**
Benzene	71-43-2	0.003	16	1,000	1	1.0	2	1.0	24	5	0.2
Cadmium	7440-43-9	0.0005	16	1,000	1	1.0	1	1.0	8.0	5	0.6
T Chromium	7440-47-3	not available								100	
Chromium III	16065-83-1	1.5	16	1,000	1	1.0	1	1.0	24,000	none	
Chromium VI	18540-29-9	0.003	16	1,000	1	1.0	1	1.0	48	none	
DDT	50-29-3	0.0005	16	1,000	1	1.0	1	1.0	8.0	none	
1,2 Dichloroethane	107-06-2	not available								5	
Ethylbenzene	100-41-4	0.1	16	1,000	1	1.0	2	1.0	800	700	0.9
Ethylene dibromide (EDB)	106-93-4	not available								0.05	
Lead	7439-92-1	not available								zero / 15	
Lindane	58-89-9	0.0003	16	1,000	1	1.0	1	1.0	4.8	0.2	0.04
Methylene chloride	75-09-2	0.06	16	1,000	1	1.0	2	1.0	480	5	0.01
Mercury (inorganic)	7439-97-6	0.0003	16	1,000	1	1.0	1	1.0	4.8	2	0.4
MTBE	1634-04-4	not available								20-40	
Naphthalene	91-20-3	0.02	16	1,000	1	1.0	2	1.0	160	none	
cPAH Mixtures	na	not available									
Benzo[a]anthracene	56-55-3	not available									
Benzo[b]fluoranthene	205-99-2	not available									
Benzo[k]fluoranthene	207-08-9	not available									
Benzo[a]pyrene	50-32-8	not available								0.2	
Chrysene	218-01-9	not available									
Dibenzo[a,h]anthracene	53-70-3	not available									
Ideno[1,2,3-cd]pyrene	207-08-9	not available									

(1) Source of RfDs is EPA's IRIS database except for benzene which is from EPA's NCEA.

(2) Value calculated using equation 720-1 and default assumptions in that equation.

(3) Maximum contaminant level from 40 CFR 141.61 and WAC 246-290-310. Except for MTBE which is not an MCL but the EPA Advisory range.
For lead, this is the MCL goal of zero and an EPA action level from 40 CFR 141.80, for which no more than 10% of water samples can exceed at the tap.

(4) MCL divided by Method B value. Bolded values indicate MCL exceeds MTCA requirement that HQ not exceed 1.0.

Table 3: Drinking Water -- Method B Calculations for Noncarcingens

Risk Calculations--Noncarcinogenic Effects of Drinking Water Ingestion											
Parameter	CAS No.	Reference Dose (1) (mg/kg-day)	Avg. Body Weight (kg)	Unit Conv. Factor (ug/mg)	Hazard Quotient (unitless)	Drinking H2O Ing. Rate (liter/day)	Inhalation Corr. Factor (unitless)	Drinking H2O Fraction (unitless)	Method B Noncarc(2) (ug/l)	MCL(3) (ug/l)	HQ @ MCL(4) (unitless)
PCB mixtures	1336-36-3	not available								0.5	
High Risk & Persistence		not available									
Low Risk & Persistence		not available									
Lowest Risk & Persistence		not available									
Aroclor 1016	12674-11-2	0.00007	16	1,000	1	1.0	1	1.0	1.1	0.5	0.4
Arochlor 1248	12672-29-6	not available									
Arochlor 1254	11097-69-1	0.00002	16	1,000	1	1.0	1	1.0	0.32	0.5	**1.6**
Arochlor 1260		not available									
Tetrachloroethylene (PCE)	127-18-4	0.01	16	1,000	1	1.0	2	1.0	80	5	0.1
Toluene	108-88-3	0.2	16	1,000	1	1.0	2	1.0	1,600	1,000	0.6
1,1,1 Trichloroethane	71-55-6	0.9	16	1,000	1	1.0	2	1.0	7,200	200	0.03
Trichloroethylene	79-01-6	not available								5	
Vinyl Chloride	75-01-4	not available								2	
Xylenes	1330-20-7	2.0	16	1,000	1	1.0	2	1.0	16,000	10,000	0.6
m-Xylene	108-38-3	not available									
o-xylene	95-47-6	not available									
p-xylene		not available									
Gross Alpha Particle Act.		not available								15 pCi/l	
Gross Beta Particle Act.		not available								4 mrem/yr	
Radium 226 & 228		not available								5 pCi/l	
Radium 226		not available								3 pCi/l	

(1) Source of RfDs is EPA's IRIS database except for 1,1,1 TCE, which is from HEAST

(2) Value calculated using equation 720-1 and default assumptions in that equation.

(3) Maximum contaminant level from 40 CFR 141.61 and WAC 246-290-310.

(4) MCL divided by Method B value. Bolded values indicate MCL exceeds MTCA requirement that HQ not exceed 1.0

Table 4: Drinking Water -- Method B Calculations for Carcingens

Risk Calculations--Carcinogenic Effects of Drinking Water Ingestion													
						Cancer							
		Risk	Avg. Body	Lifetime	Unit Conv.	Potency	Drinking H2O	Duration	Inhalation	Drinking H2O	Method B	MCL(3)	Risk @
Parameter	CAS No.		Weight		Factor	Factor	Ing. Rate	of Exposure	Corr. Factor	Fraction	Carcinogen		MCL(4)
		(unitless)	(kg)	(years)	(ug/mg)	(kg-day/mg)	(liter/day)	(years)	(unitless)	(unitless)	(ug/l)	(ug/l)	(unitless)
Arsenic	7440-38-2	1E-06	70	75	1,000	1.5	2.0	30	1	1.0	0.058	50	**857**
Benzene	71-43-2	1E-06	70	75	1,000	0.029	2.0	30	2	1.0	1.51	5	3.3
Cadmium	7440-43-9					not available						5	
T Chromium	7440-47-3											100	
Chromium III	16065-83-1					not available						none	
Chromium VI	18540-29-9					not available						none	
DDT	50-29-3	1E-06	70	75	1,000	0.34	2.0	30	1	1.0	0.26	none	
1,2 Dichloroethane	107-06-2	1E-06	70	75	1,000	0.091	2.0	30	2	1.0	0.48	5	10
Ethylbenzene	100-41-4					not available						700	
Ethylene dibromide (EDB)	106-93-4	1E-06	70	75	1,000	85	2.0	30	2	1.0	0.00051	0.05	**97**
Lead	7439-92-1					not available						zero / 15	
Lindane	58-89-9	1E-06	70	75	1,000	1.3	2.0	30	1	1.0	0.067	0.2	3.0
Methylene chloride	75-09-2	1E-06	70	75	1,000	0.0075	2.0	30	2	1.0	5.8	5	0.9
Mercury (inorganic)	7439-97-6					not available						2	
MTBE	1634-04-4					not available						20-40	
Naphthalene	91-20-3					not available						none	
cPAH Mixtures	na												
Benzo[a]anthracene	56-55-3					not available							
Benzo[b]fluoranthene	205-99-2					not available							
Benzo[k]fluoranthene	207-08-9					not available							
Benzo[a]pyrene	50-32-8	1E-06	70	75	1,000	7.3	2.0	30	1	1.0	0.012	0.2	**17**
Chrysene	218-01-9					not available							
Dibenzo[a,h]anthracene	53-70-3					not available							
Ideno[1,2,3-cd]pyrene	207-08-9					not available							

(1) Source of Cancer Potency Factor is the oral slope factors from EPA's IRIS database, except for Lindane which is from HEAST.

(2) Value calculated using equation 720-2 and default assumptions in that equation.

(3) Maximum contaminant level from 40 CFR 141.61 & 141.62 and WAC 246-290-310 except for lead and MTBE. MTBE is an EPA Advisory range.
Lead is the MCL goal of zero and the EPA action level from 40 CFR 141.80 for which no more than 10% of samples can exceed at the tap.

(4) MCL divided by Method B value. Bolded values indicate MCL greater than MTCA acceptable risk of 1X10-5 [i.e. >10].

Table 4: Drinking Water -- Method B Calculations for Carcingens

Risk Calculations--Carcinogenic Effects of Drinking Water Ingestion													
						Cancer							
		Risk	Avg. Body	Lifetime	Unit Conv.	Potency	Drinking H2O	Duration	Inhalation	Drinking H2O	Method B	MCL(3)	Risk @
Parameter	CAS No.		Weight		Factor	Factor	Ing. Rate	of Exposure	Corr. Factor	Fraction	Carcinogen		MCL(4)
		(unitless)	(kg)	(years)	(ug/mg)	(kg-day/mg)	(liter/day)	(years)	(unitless)	(unitless)	(ug/l)	(ug/l)	(unitless)
PCB mixtures	1336-36-3											0.5	
High Risk & Persistence		1E-06	70	75	1,000	2.0	2.0	30	1	1.0	0.044	0.5	**11**
Low Risk & Persistence		1E-06	70	75	1,000	0.4	2.0	30	1	1.0	0.22	0.5	2.3
Lowest Risk & Persistence		1E-06	70	75	1,000	0.07	2.0	30	1	1.0	1.25	0.5	0.40
Aroclor 1016	12674-11-2					not available						0.5	
Arochlor 1248	12672-29-6					not available							
Arochlor 1254	11097-69-1					not available						0.5	
Arochlor 1260						not available							
Tetrachloroethylene (PCE)	127-18-4	1E-06	70	75	1,000	0.051	2.0	30	2	1.0	0.86	5	6
Toluene	108-88-3					not available						1,000	
1,1,1 Trichloroethane	71-55-6					not available						200	
Trichloroethylene	79-01-6	1E-06	70	75	1,000	0.011	2.0	30	2	1.0	4.0	5	1.3
Vinyl Chloride	75-01-4	1E-06	70	75	1,000	1.9	2.0	30	2	1.0	0.023	2	**87**
Xylenes	1330-20-7					not available						10,000	
m-Xylene	108-38-3					not available							
o-xylene	95-47-6					not available							
p-xylene						not available							
Gross Alpha Particle Act.						not available						15 pCi/l	
Gross Beta Particle Act.						not available						4 mrem/yr	
Radium 226 & 228						not available						5 pCi/l	
Radium 226						not available						3 pCi/l	

(1) Source of Cancer Potency Factor is the oral slope factors from EPA's IRIS database, except for tetrachloroethylene, trichlorothylene and vinyl chloride which are from HEAST.

(2) Value calculated using equation 720-2 and default assumptions in that equation.

(3) Maximum contaminant level from 40 CFR 141.61 and WAC 246-290-310.

(4) MCL divided by Method B value. Bolded values indicate MCL greater than MTCA acceptable risk of 1X10-5 [i.e. >10].