TARGET DETECTION LIMITS AND DESIGNATED ANALYTICAL METHODS

CONTAMINANT	Chemical Abstract Service Number	WATER		SOIL		AIR[1a,,1d]		SOIL GAS[1a, 1d]	
		TDL µg/L	DESIGNATED METHOD	TDL µg/kg	DESIGNATED METHOD	TDL[1b] ppbv	DESIGNATED METHOD[1c1]	TDL[1b] ppbv	DESIGNATED METHOD[1c1]
Acenaphthene	83329	5	8270C 8310	330	8270C 8310	3.30E+01	TO-13A[LF]	1.10E+03	footnote 1c2
Acenaphthylene	208968	5	8270C 8310	330	8270C 8310	5.60E+00	TO-13A[LF]	1.90E+02	footnote 1c2
Acetaldehyde	75070	100	8315A	2,500	8315A	4.90E+00	footnote 1c2	1.60E+02	footnote 1c2
Acetate[2]	71501	100	Ion Chromatography[3]	20,000	Ion Chromatography[3]	Insufficient data to develop criteria			
Acetic Acid	64197	100	Analyze for acetate	20,000	Analyze for acetate	HLC<10^{-5} atm-m^3/mol			
Acetone	67641	50	8260B[4]	1,000	8260B[4]	2.50E+03	TO-15√ TO-17	8.20E+04	TO-15√ TO 17
Acetonitrile	75058	50	8260B 8033 [5]	2,500	8260B[5]	3.50E+01	TO-15	1.20E+03	TO-15
Acetophenone	98862	5	8270C	330	8270C	9.90E+01	TO-13A[LF√]	3.30E+03	footnote 1c2
Acrolein	107028	20	8260B 8316 603	{250}	8260B	8.60E-03	TO-15√ TO17	2.90E-01	TO-15√ TO17
Acrylamide	79061	0.5	8032A 8316 8270C	10	8270C	HLC<10^{-5} atm-m^3/mol			
Acrylic Acid	79107					HLC<10^{-5} atm-m^3/mol			
Acrylonitrile	107131	2	524.2 8260B 8031 8316 603	[{100}]	8260B	1.70E-01	TO-15 TO17	5.80E+00	TO-15 TO17
Alachlor	15972608	1	8081B 8270C 525.2 507	20	8081B 8270C	HLC<10^{-5} atm-m^3/mol			
Aldicarb[6]	116063	2	531.1 8318A	50	8318A	HLC<10^{-5} atm-m^3/mol			
Aldicarb sulfone[6]	1646884	2	531.1 8318A	[200]	8318A	HLC<10^{-5} atm-m^3/mol			
Aldicarb sulfoxide[6]	1646873	2	531.1 8318A	[200]	8318A	HLC<10^{-5} atm-m^3/mol			
Aldrin	309002	[0.01]	8081B	20	8081B	3.50E-04	TO-13A[LF√] TO-4A TO-10A	1.20E-02	footnote 1c2
Aluminum	7429905	50	6000 & 7000 series[7]	1,000	6000 & 7000 series[7]	HLC<10^{-5} atm-m^3/mol			
Ammonia	7664417	25	350.1	1,000	350.1[8]	1.40E+02	NIOSH 3800 6015 6016 OSHA 1D188	4.70E+03	NIOSH 3800 6015 6016 OSHA 1D188
t-Amyl methyl ether (TAME)[9]	994058	5	8260B	250	8260B	1.50E+01	TO 15√ TO17	4.90E+02	TO-15√ TO17
Aniline	62533	4	8270C 8131	[330]	8270C 8131	HLC<10^{-5} atm-m^3/mol			
Anthracene	120127	5	8270C 8310	330	8270C 8131	1.40E+02	TO-13A[LF]	4.50E+03	footnote 1c2
Antimony	7440360	2	6000 & 7000 series[7]	1,000	6000 & 7000 series[7]	HLC<10^{-5} atm-m^3/mol			

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TARGET DETECTION LIMITS AND DESIGNATED ANALYTICAL METHODS

CONTAMINANT	Chemical Abstract Service Number	WATER		SOIL		AIR[1a,,1d]		SOIL GAS[1a, 1d]	
		TDL µg/L	DESIGNATED METHOD	TDL µg/kg	DESIGNATED METHOD	TDL[1b] ppbv	DESIGNATED METHOD[1c1]	TDL[1b] ppbv	DESIGNATED METHOD[1c1]
Arsenic	7440382	5	6000 & 7000 series[7]	2,000	6000 & 7000 series[7]	HLC<10^{-5} atm-m^3/mol			
Asbestos[10]	1332214	7 MFL	100.1	1%	TEM: EPA/600/R-93/116 CARB 435	HLC<10^{-5} atm-m^3/mol			
				1%	PLM: EPA/600/R-93/116 CARB 435				
Atrazine	1912249	3	8141B 8270C 619 507	50	8141B 8270C	HLC<10^{-5} atm-m^3/mol			
Azobenzene	103333	2	8270C	200	8270C	1.10E-01	footnote 1c2	3.70E+00	footnote 1c2
Barium[2]	7440393	100	6000 & 7000 series[7]	1,000	6000 & 7000 series[7]	HLC<10^{-5} atm-m^3/mol			
Benzene	71432	1	8260B 8021B	50	8260B 8021B	9.70E-01	TO-15 TO-17	3.20E+01	TO-15 TO-17
Benzidine	92875	[0.3][11]	605 8270C	[1,000]	8270C	HLC<10^{-5} atm-m^3/mol			
Benzo(a)anthracene	56553	1	8270C 8310	330	8270C 8310	HLC<10^{-5} atm-m^3/mol			
Benzo(b)fluoranthene	205992	1	8270C 8310	330	8720C 8310	Insufficient data to develop criteria			
Benzo(k)fluoranthene	207089	[1]	8270C 8310	330	8270C 8310	HLC<10^{-5} atm-m^3/mol			
Benzo(ghi)perylene	191242	[1]	8270C 8310	330	8270C 8310	HLC<10^{-5} atm-m^3/mol			
Benzo(a)pyrene	50328	0.2	8270C 8310	330	8270C 8310	HLC<10^{-5} atm-m^3/mol			
Benzoic acid	65850	50	8270C	3,300	8270C	HLC<10^{-5} atm-m^3/mol			
Benzyl alcohol	100516	50	8270C	3,300	8270C	HLC<10^{-5} atm-m^3/mol			
Benzyl chloride	100447	5	8260B 8121B	{150}	8260B 8121B	1.00E-01	TO-15 TO-17	3.40E+00	TO-15 TO-17
Beryllium[2]	7440417	[1]	6000 & 7000 series[7]	500	6000 & 7000 series[7]	HLC<10^{-5} atm-m^3/mol			
bis(2-Chloroethoxy)ethane	112265	5	8270C	330	8270C	HLC<10^{-5} atm-m^3/mol			
bis(2-Chloroethyl)ether	111444	1	8270C 8430	100	8270C	1.30E-02	TO 13A[LF]	4.40E-01	footnote 1c2
bis(2-ethylhexyl)phthalate	117817	5	8270C 8061A	330	8270C 8061A	HLC<10^{-5} atm-m^3/mol			
Boron	7440428	300	6000 & 7000 series[7]	8,000	6000 & 7000 series[7]	HLC<10^{-5} atm-m^3/mol			
Bromate	15541454	10	300.0 300.1	200	300.0[12]	HLC<10^{-5} atm-m^3/mol			
Bromobenzene	108861	1	8260B 8021B	100	8260B 8021B	9.30E+00	TO-15$^{\surd}$ TO-17	3.10E+02	TO-15$^{\surd}$ TO17
Bromodichloromethane[13]	75274	1	8260B 8021B	100	8260B 8021B	2.10E-01	TO-15 TO-17	7.10E+00	TO-15 TO-17
Bromoform[13]	75252	1	8260B 8021B	100	8260B 8021B	2.30E+00	TO-15 TO-17	7.60E+01	TO-15 TO-17
Bromomethane	74839	5	8260B 8021B	{200}	8260B 8021B	1.30E+00	TO-15 TO-17	4.30E+01	TO-15 TO-17

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TARGET DETECTION LIMITS AND DESIGNATED ANALYTICAL METHODS

CONTAMINANT	Chemical Abstract Service Number	WATER		SOIL		AIR[1a,,1d]		SOIL GAS[1a, 1d]	
		TDL µg/L	DESIGNATED METHOD	TDL µg/kg	DESIGNATED METHOD	TDL[1b] ppbv	DESIGNATED METHOD[1c1]	TDL[1b] ppbv	DESIGNATED METHOD[1c1]
n-Butanol	71363	800	8260B 8015C	4,400	8260B 8015C [5]	HLC<10^{-5} atm-m^3/mol			
2-Butanone (MEK)	78933	25	8260B 8021B	750	8260B 8021B	1.70E+03	TO-15	5.60E+04	TO-15
n-Butyl acetate	123864	10	8260B	250	8260B	1.50E+03	TO-15√	4.90E+04	T0-15√
t-Butyl alcohol[9]	75650	50	8260B	2,500	8260B	HLC<10^{-5} atm-m^3/mol			
Butyl benzyl phthalate	85687	5	8270C 8061A	330	8270C 8061A	6.18E+02	TO-13A[LF]	2.06E+04	footnote 1c2
n-Butylbenzene	104518	1	8260B 8021B	50	8260B 8021B	5.40E+00	TO-15√ TO-17	1.80E+02	TO-15√ TO-17
sec-Butylbenzene	135988	1	8260B 8021B	50	8260B 8021B	1.10E+00	TO-15 TO-17	3.60E+01	TO-15 TO-17
tert-Butylbenzene	98066	1	8260B 8021B	50	8260B 8021B	1.80E+00	TO-15 TO-17	6.00E+01	TO-15 TO-17
Cadmium[2]	7440439	1	6000 & 7000 series[7]	200	6000 & 7000 series[7]	HLC<10^{-5} atm-m^3/mol			
Camphene	79925					1.40E+01	NIOSH 5039	4.70E+02	NIOSH 5039
Caprolactam	105602	10	8270C	330	8270C	HLC<10^{-5} atm-m^3/mol			
Carbaryl	63252	20	531.1 8318A 8270C	200	8318A 8270C	Insufficient data to develop criteria			
Carbazole	86748	[10]	8270C	330	8270C	HLC<10^{-5} atm-m^3/mol			
Carbofuran	1563662	40	531.1 8318A	200	8318A	HLC<10^{-5} atm-m^3/mol			
Carbon disulfide	75150	5	8260B	250	8260B	2.20E+02	TO-15 TO-17	7.40E+03	TO-15 TO-17
Carbon tetrachloride	56235	1	8260B 8021B	50	8260B 8021B	6.80E-01	TO-15 TO-17	2.30E+01	TO-15 TO-17
Chlordane[14]	57749	0.05	8081B	30	8081B	1.50E-02	TO-4A TO-10A NIOSH 5510 OSHA 67	5.10E-01	NIOSH 5510 OSHA 67
Chloride	16887006	10,000	300.0 300.1 9056 9212 9250 9251 9253	200,000	300.0 9056 9212 9250 9251 9253[12]	HLC<10^{-5} atm-m^3/mol			
Chlorobenzene	108907	1	8260B 8021B	50	8260B 8021B	1.50E+01	TO-15 TO-17	5.00E+02	TO-15 TO-17
p-Chlorobenzene sulfonic acid	98668	10	8321B	200	8321B	Insufficient data to develop criteria			
1-chloro-1,1-difluoroethane	75683					1.20E+04	TO-15√ TO-17	4.00E+05	TO-15√ TO17
Chloroethane	75003	5	8260B 8021B	250	8260B 8021B	3.80E+03	TO-15 TO-17	1.30E+05	TO-15 TO-17
2-Chloroethyl vinyl ether[15]	110758	10	8260B	5,000	8260B	Insufficient data to develop criteria			
Chloroform[13]	67663	1	8260B 8021B	50	8260B 8021B	2.20E+00	TO-15 TO-17	7.30E+01	TO-15 TO-17
Chloromethane	74873	5	8260B 8021B	250	8260B 8021B	2.00E+01	TO-15 TO-17	6.50E+02	TO-15 TO-17

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TARGET DETECTION LIMITS AND DESIGNATED ANALYTICAL METHODS

CONTAMINANT	Chemical Abstract Service Number	WATER		SOIL		AIR[1a,,1d]		SOIL GAS[1a, 1d]	
		TDL µg/L	DESIGNATED METHOD	TDL µg/kg	DESIGNATED METHOD	TDL[1b] ppbv	DESIGNATED METHOD[1c1]	TDL[1b] ppbv	DESIGNATED METHOD[1c1]
4-Chloro-3-methylphenol	59507	5	8270C 8041A	280	8270C 8041A	HLC<10^{-5} atm-m^3/mol			
beta-Chloronaphthalene	91587	5	8270C 8310	330	8270C 8310	Insufficient data to develop criteria			
2-Chlorophenol	95578	10	8270C 8041A	330	8270C 8041A	3.40E+00	TO-13A[LF√]	1.10E+02	footnote 1c2
o-Chlorotoluene	95498	5	8260B 8021B	50	8260B 8021B	1.30E+01	TO-15[√] TO-17	4.50E+02	TO-15[√] TO-17
Chlorpyrifos	2921882	[2]	8081B 8141B	[100]	8081B 8141B	1.38E-01	footnote 1c2	4.61E+00	footnote 1c2
Chromium (total)[16]	7440473	10	6000 & 7000 series[7]	2,000	6000 & 7000 series[7]	HLC<10^{-5} atm-m^3/mol			
Chromium III[16]	16065831	10	6000 & 7000 series[7]	2,000	6000 & 7000 series[7]	HLC<10^{-5} atm-m^3/mol			
Chromium VI[16]	18540299	10	7199 7195 7197 7198 7196A 218.6 SM 3500-Cr B/D/E	2,000	3060A	HLC<10^{-5} atm-m^3/mol			
Chrysene	218019	1	8270C 8310	330	8270C 8310	Insufficient data to develop criteria			
Cobalt	7440484	20	6000 & 7000 series[7]	500	6000 & 7000 series[7]	HLC<10^{-5} atm-m^3/mol			
Copper[2]	7440508	4	6000 & 7000 series[7]	1,000	6000 & 7000 series[7]	HLC<10^{-5} atm-m^3/mol			
Cyanazine	21725462	2	8141B 629	200	8141B	HLC<10^{-5} atm-m^3/mol			
Cyanide [17]	57125	5	OIA 1677 335.1 335.4 9010B 9012A ASTM D6888-09 ASTM D7511-12 ASTM D7284-08e1 Kelada-01 SM 4500-CN F	100	OIA 1677 ASTM D7511-12 ASTM D6888-09 9013A	HLC<10^{-5} atm-m^3/mol			
Cyclohexane	110827	10	8260B	500	8260B	1.70E+03	TO-15[√] TO-17	5.80E+04	TO-15[√] TO-17
Cyclohexanone	108941	50	8260B 8315A	2,500	8260B 8315A	2.47E+02	TO-15[√] TO-17	8.23E+03	TO-15[√] TO-17
Dacthal[18]	1861321	5	8081B 1656 608.2	100	1656 8081B	HLC<10^{-5} atm-m^3/mol			
Dalapon	75990	10	8151A 6640B 552.3	500	8151A	HLC<10^{-5} atm-m^3/mol			
4-4'-DDD	72548	0.1	8081B	20	8081B	HLC<10^{-5} atm-m^3/mol			
4-4'-DDE	72559	0.1	8081B	20	8081B	HLC<10^{-5} atm-m^3/mol			
4-4'-DDT	50293	[0.02]	8081B	20	8081B	HLC<10^{-5} atm-m^3/mol			
Decabromodiphenyl ether	1163195	10	8270C 1614	330	8270 1614	8.84E-01	TO13A[LF]	2.95E+01	footnote 1c2

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		TDL µg/L	DESIGNATED METHOD	TDL µg/kg	DESIGNATED METHOD	TDL[1b] ppbv	DESIGNATED METHOD[1c1]	TDL[1b] ppbv	DESIGNATED METHOD[1c1]
Di-n-butyl phthalate	84742	5	8270C 8061A	330	8270C 8061A	HLC<10^{-5} atm-m^3/mol			
Di(2-ethylhexyl)adipate	103231	5	8270C 8061A	330	8270C 8061A	HLC<10^{-5} atm-m^3/mol			
Di-n-octyl phthalate	117840	5	8270C 8061A	330	8270C 8061A	HLC<10^{-5} atm-m^3/mol			
Diacetone alcohol	123422					HLC<10^{-5} atm-m^3/mol			
Diazinon	333415	1	8141B 507	50	8141B	HLC<10^{-5} atm-m^3/mol			
Dibenzo(a,h)athracene	53703	[2]	8270C 8310	330	8270C 8310	HLC<10^{-5} atm-m^3/mol			
Dibenzofuran	132649	4	8270C	330	8270C	1.40E-02	TO-13A[LF]	4.80E-01	footnote 1c2
1,2-Dibromo-3-chloromethane[13]	124481	5	8260B 8021B	100	8260B 8021B	1.20E-01	TO-15 TO-17	4.10E+00	TO-15 TO-17
Dibromochloropropane	96128	0.2	8011 504.1 8260B 8081B	[{10}]	8260B 8081B	2.10E-02	TO-15√ TO17	6.80E-01	TO-15√ TO17
Dibromomethane	74953	5	8260B 8021B	250	8260B 8021B	Insufficient data to develop criteria			
Dicamba	1918009	1	6640B 8151A	50	8151A	HLC<10^{-5} atm-m^3/mol			
1,2-Dichlorobenzene	95501	1	8260B 8021B 8121B	100	8260B 8021B 8121B	4.90E+01	TO-15 TO-17	1.60E+03	TO-15 TO-17
1,3-Dichlorobenzene	541731	1	8260B 8021B 8121B	100	8260B 8021B 8121B	4.90E-01	TO-15 TO-17	1.60E+01	TO-15 TO-17
1,4-Dichlorobenzene	106467	1	8260B 8021B 8121B	100	8260B 8021B 8121B	6.20E-01	TO-15 TO-17	2.10E+01	TO-15 TO-17
3,3'-Dichlorobenzidine[19]	91941	[0.3]	8270C 605	[2,000]	8270C	HLC<10^{-5} atm-m^3/mol			
Dichlorodifluoromethane	75718	5	8260B 8021B	250	8260B 8021B	9.90E+03	TO-15 TO-17	3.30E+05	TO-15 TO-17
1,1-Dichloroethane	75343	1	8260B 8021B	50	8260B 8021B	1.20E+02	TO-15 TO-17	4.10E+03	TO-15 TO-17
1,2-Dichloroethane	107062	1	8260B 8021B	50	8260B 8021B	2.40E-01	TO-15 TO-17	8.20E+00	TO-15 TO-17
1,1-Dichloroethylene	75354	1	8260B 8021B	50	8260B 8021B	5.00E+01	TO-15 TO-17	1.70E+03	TO-15 TO-17
cis-1,2-Dichloroethylene	156592	1	8260B 8021B	50	8260B 8021B	1.70E+00	TO-15 TO-17	5.80E+01	TO-15 TO-17
trans-1,2-Dichloroethylene	156605	1	8260B 8021B	50	8260B 8021B	1.70E+01	TO-15 TO-17	5.80E+02	TO-15 TO-17
2,6-Dichloro-4-nitroaniline	99309	0.01	608.2			HLC<10^{-5} atm-m^3/mol			
2,4-Dichlorophenol	120832	10	8270C 8041A	330	8270C 8041A	HLC<10^{-5} atm-m^3/mol			
2,4-Dichlorophenoxyacetic acid	94757	10	6640B 8151A	200	8151A	HLC<10^{-5} atm-m^3/mol			
1,2-Dichloropropane	78875	1	8260B 8021B	50	8260B 8021B	8.60E-01	TO-15 TO-17	2.90E+01	TO-15 TO-17
1,3-Dichloropropene[20]	542756	1	8260B 8021B	100	8260B 8021B	1.40E+00	TO-15 TO-17	4.70E+01	TO-15 TO-17

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		TDL µg/L	DESIGNATED METHOD	TDL µg/kg	DESIGNATED METHOD	TDL[1b] ppbv	DESIGNATED METHOD[1c1]	TDL[1b] ppbv	DESIGNATED METHOD[1c1]
Dichlorovos	62737	1	8141B 507	[50]	8141B	HLC<10^{-5} atm-m^3/mol			
Dicyclohexyl phthalate	84617	5	8270C 8061A	330	8270C 8061A	Insufficient data to develop criteria			
Dieldrin	60571	[0.02]	8081B	20	8081B	3.60E-04	TO-4A TO-10A NIOSH S283	1.20E-02	NIOSH S283
Diethyl ether	60297	[5]	8260B 8015C	200	8260B 8015C	3.90E+03	TO-15√ TO17	1.30E+05	TO-15√ TO-17
Diethyl phthalate	84662	5	8270C 8061A	330	8270C 8061A	HLC<10^{-5} atm-m^3/mol			
Diethylene glycol monobutyl ether	112345					HLC<10^{-5} atm-m^3/mol			
Diisopropyl ether[9]	108203	5	8260B	250	8260B	8.50E+01	TO-15√ TO-17	2.80E+03	TO-15√ TO-17
Diisopropylamine	108189					4.80E+01	NIOSH S141	1.60E+03	NIOSH S141
Dimethyl phthalate	131113	5	8270C 8061A	330	8270C 8061A	HLC<10^{-5} atm-m^3/mol			
N,N-Dimethylacetamide	127195					HLC<10^{-5} atm-m^3/mol			
N,N-Dimethylaniline	121697	5	8270C			4.30E-01	NIOSH 2002 OSHA PV2064	1.40E+01	NIOSH 2002 OSHA PV2064
Dimethylformamide	68122					HLC<10^{-5} atm-m^3/mol			
2,4-Dimethylphenol	105679	5	8270C 8041A	330	8270C 8041A	HLC<10^{-5} atm-m^3/mol			
2,6-Dimethylphenol	576261	4	8270C 8041A	[330]	8270C 8041A	HLC<10^{-5} atm-m^3/mol			
3,4-Dimethylphenol	95658	5	8270C 8041A	[330]	8270C 8041A	HLC<10^{-5} atm-m^3/mol			
Dimethylsulfoxide	67685					HLC<10^{-5} atm-m^3/mol			
2,4-Dinitrotoluene	121142	5	8270C 8330A 8095	330	8270C 8330A 8095	HLC<10^{-5} atm-m^3/mol			
Dinoseb	88857	[1]	8151A 8041A 8270C	[200]	8151A 8041A 8270C	HLC<10^{-5} atm-m^3/mol			
1,4-Dioxane[21]	123911	1	8260B 1624	500	8260B	HLC<10^{-5} atm-m^3/mol			
Diquat	85007	20	549			HLC<10^{-5} atm-m^3/mol			
Diuron	330541	1	8321B 8325 632.1	500	8321B	HLC<10^{-5} atm-m^3/mol			
Endosulfan[22]	115297	0.03	8081B	20	8081B	Insufficient data to develop criteria			
Endothall	145733	100	548			HLC<10^{-5} atm-m^3/mol			
Endrin	72208	0.02	8081B	20	8081B	HLC<10^{-5} atm-m^3/mol			
Epichlorohydrin	106898	[5]	8260B	{100}	8260B	2.60E-01	footnote 1c2	8.70E+00	footnote 1c2

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TARGET DETECTION LIMITS AND DESIGNATED ANALYTICAL METHODS

CONTAMINANT	Chemical Abstract Service Number	WATER		SOIL		AIR[1a,,1d]		SOIL GAS[1a, 1d]	
		TDL µg/L	DESIGNATED METHOD	TDL µg/kg	DESIGNATED METHOD	TDL[1b] ppbv	DESIGNATED METHOD[1c1]	TDL[1b] ppbv	DESIGNATED METHOD[1c1]
Ethanol[9]	64175	1,000	8260B 8015C	2,500	8260B 8015C	HLC<10^{-5} atm-m^3/mol			
Ethyl acetate	141786					8.80E+02	TO-15$^{\surd}$ TO-17	2.90E+04	TO-15$^{\surd}$ TO-17
Ethyl tertiary butyl ether (ETBE)[9]	637923	5	8260B	250	8260B	8.80E+01	TO-15$^{\surd}$ TO-17	2.90E+03	TO-15$^{\surd}$ TO-17
Ethylbenzene	100414	1	8260B 8021B	50	8260B 8021B	1.90E+01	TO-15 TO-17	6.40E+02	TO-15 TO-17
Ethylene dibromide (EDB)[23]	106934	0.05	8260B 8011 504.1	[{20}]	8260B	5.60E-03	TO-15 TO-17	1.90E-01	TO-15 TO-17
Ethylene glycol	107211	10,000	8015C 8430	10,000	8015C	HLC<10^{-5} atm-m^3/mol			
Ethylene glycol monobutyl ether	111762					2.66E+03	footnote 1c2	8.88E+04	footnote 1c2
Fluoranthene	206440	1	8270C 8310	330	8270C 8310	1.68E+01	TO-13A^{LF}	5.59E+02	footnote 1c2
Fluorene	86737	5	8270C 8310	330	8270C 8310	2.00E+01	TO-13A^{LF}	6.80E+02	footnote 1c2
Fluorine (soluble fluoride)	7782414	1,000	9214 9056 300.0 300.1	5,000	9214 9056 300.0 [12 24]	HLC<10^{-5} atm-m^3/mol			
Formaldehyde	50000	100	8315A	2,000	8315A	1.61E+00	footnote 1c2	5.38E+01	footnote 1c2
Formic acid[25]	64186	50	Ion Chromatography[3]	20,000	Ion Chromatography[3]	HLC<10^{-5} atm-m^3/mol			
1-Formylpiperidine	2591868					Insufficient data to develop criteria			
Gentian violet	548629					HLC<10^{-5} atm-m^3/mol			
Glyphosate	1071836	100	547 SM 6651	1,000		HLC<10^{-5} atm-m^3/mol			
Heptachlor	76448	[0.01]	8081B	20	8081B	1.30E-03	TO-4A TO-10A	4.30E-02	footnote 1c2
Heptachlor epoxide	1024573	0.01	8081B	20	8081B	HLC<10^{-5} atm-m^3/mol			
n-Heptane	142825					8.50E+02	TO-15$^{\surd}$ TO-17	2.80E+04	TO-15$^{\surd}$ TO-17
Hexabromobenzene	87821	0.02	8081B	100	8081B	Insufficient data to develop criteria			
Hexachlorobenzene (C-66)	118741	0.2	8121B 8270C 8081B	330	8121B 8270C 8081B	4.80E-03	footnote 1c2	1.60E-01	footnote 1c2
Hexachlorobutadiene (C-46)[26]	87683	0.05	8121B 8081B 8260B 8270C	50	8121B 8081B 8260B 8270C	1.10E-01	TO-15 TO-17	3.70E+00	TO-15 TO-17
alpha-Hexachlorocyclohexane	319846	0.05	8121B 8081B	10	8121B 8081B	1.18E-03	footnote 1c2	3.95E-02	footnote 1c2
beta-Hexachlorocyclohexane	319857	0.02	8081B 8121B	20	8081B 8121B	HLC<10^{-5} atm-m^3/mol			
Hexachlorocyclopentadiene (C-56)	77474	25	8270C 8121B	1,000	8270C 8121B	1.80E-02	NIOSH 2518	5.90E-01	NIOSH 2518
Hexachloroethane	67721	5	8270C 8121B	300	8270C 8121B	3.60E-01	NIOSH 1003 OSHA 7	1.20E+01	NIOSH 2518 OSHA 7

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TARGET DETECTION LIMITS AND DESIGNATED ANALYTICAL METHODS

CONTAMINANT	Chemical Abstract Service Number	WATER		SOIL		AIR[1a,,1d]		SOIL GAS[1a, 1d]	
		TDL µg/L	DESIGNATED METHOD	TDL µg/kg	DESIGNATED METHOD	TDL[1b] ppbv	DESIGNATED METHOD[1c1]	TDL[1b] ppbv	DESIGNATED METHOD[1c1]
n-Hexane	110543					2.00E+02	TO-15 TO-17	6.60E+03	TO-15 TO-17
2-Hexanone	591786	50	8260B 8021B	2,500	8260B 8021B	7.40E+00	TO-15√ TO-17	2.50E+02	TO-15√ TO-17
Indeno(1,2,3-cd)pyrene	193395	[2]	8270C 8310	330	8270C 8310	HLC<10^{-5} atm-m^3/mol			
Iron	7439896	200	6000 & 7000 series[7]	5,000	6000 & 7000 series[7]	HLC<10^{-5} atm-m^3/mol			
Isobutyl alcohol	78831	1,000	8260B 8015C	4,400	8260B 8015C	4.90E+02	TO-15√ TO-17√ footnote 1c2	1.63E+04	TO-15√ TO-17√ footnote 1c2
Isophorone	78591	5	8270C	330	8270C	HLC<10^{-5} atm-m^3/mol			
Isopropyl alcohol[14]	67630	400	8260B 8015C	4,400	8260B 8015C	HLC<10^{-5} atm-m^3/mol			
Isopropyl benzene	98828	5	8260B 8021B	250	8260B 8021B	4.90E-01	TO-15√ TO-17	1.60E+01	TO-15√ TO-17
Lead[27]	7439921	3	6000 & 7000 series[7]	10,000	6000 & 7000 series[7]	HLC<10^{-5} atm-m^3/mol			
Lindane	58899	0.03	8081B 8121B	[20]	8081B 8121B	HLC<10^{-5} atm-m^3/mol			
Lithium	7439932	10	6000 & 7000 series[7]	400	6000 & 7000 series[7]	HLC<10^{-5} atm-m^3/mol			
Magnesium	7439954	1,000	6000 & 7000 series[7]	4,000	6000 & 7000 series[7]	HLC<10^{-5} atm-m^3/mol			
Manganese[2]	7439965	50	6000 & 7000 series[7]	1,000	6000 & 7000 series[7]	HLC<10^{-5} atm-m^3/mol			
Mercury[28]	7439976	0.001	245.1 1631E 200.8 245.2 245.7 6000 & 7000 series[7]	[50]	1631E(mod) 200.8 6000 & 7000 series[7]	Insufficient data to develop criteria			
Methane[29]	74828	500	RSKSOP-175	--	--	1.25E+04	8015 modified	1.25E+04	8015 modified
Methanol[9 30]	67561	400	8260B 8015C	4,400	8260B 8015C	2.46E+03	footnote 1c2	8.19E+04	footnote 1c2
Methoxychlor	72435	0.5	8081B	50	8081B	Insufficient data to develop criteria			
2-Methoxyethanol	109864					HLC<10^{-5} atm-m^3/mol			
2-Methyl-4-chlorophenoxyacetic acid	94746	5	6640B 8151A	300	8151A	HLC<10^{-5} atm-m^3/mol			
2-Methyl-4,6-dinitrophenol	534521	[20]	8270C	[830]	8270C	HLC<10^{-5} atm-m^3/mol			
N-Methyl-moropholine	109024					HLC<10^{-5} atm-m^3/mol			
Methyl parathion	2980000	1	8141B	40	8141B	HLC<10^{-5} atm-m^3/mol			
4-Methyl-2-pentanone (MIBK)	108101	50	8260B 8021B	2,500	8260B 8021B	7.30E+02	TO-15 TO-17	2.40E+04	TO-15 TO-17
Methyl-tert-butyl ether (MTBE)[13]	1634044	5	8260B 8015C	250	8260B 8015C	8.20E+02	TO-15 TO-17	2.70E+04	TO-15 TO-17
Methylcyclopentane	96377	50	8260B	2,500	8260B	2.02E+02	footnote 1c2	6.72E+03	footnote 1c2

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TARGET DETECTION LIMITS AND DESIGNATED ANALYTICAL METHODS

CONTAMINANT	Chemical Abstract Service Number	WATER		SOIL		AIR[1a,,1d]		SOIL GAS[1a, 1d]	
		TDL µg/L	DESIGNATED METHOD	TDL µg/kg	DESIGNATED METHOD	TDL[1b] ppbv	DESIGNATED METHOD[1c1]	TDL[1b] ppbv	DESIGNATED METHOD[1c1]
4,4'-Methylene-bis-2-chloroaniline	101144	1	8270C	500	8270C	HLC<10^{-5} atm-m^3/mol			
Methylene chloride	75092	5	8260B 8021B	{100}	8260B 8021B	2.70E+01	TO-15 TO-17	8.80E+02	TO-15 TO-17
2-Methylnaphthalene	91576	5	8270C 8260B 8310	330	8270C 8260B 8310	1.70E+01	TO-15√ TO-17√ TO-13A[LF√] footnote 1c2	5.70E+01	TO-15√ TO-17√ footnote 1c2
Methylphenols[31]	1319773	30	8270C	1,000	8270C	HLC<10^{-5} atm-m^3/mol			
Metolachlor	51218452	10	507 551.1	200		HLC<10^{-5} atm-m^3/mol			
Metribuzin	21087649	0.1	507 551.1 1656	10		Insufficient data to develop criteria			
Mirex	2385855	[0.02]	8081B	50	8081B	Insufficient data to develop criteria			
Molybdenum	7439987	50	6000 & 7000 series[7]	1,000	6000 & 7000 series[7]	HLC<10^{-5} atm-m^3/mol			
Naphthalene	91203	5	8270C 8260B 8310	330	8270C 8260B 8310	4.10E-01	TO-15√ TO-17√ TO 13A[LF] footnote 1c2	1.40E+01	TO-15√ TO-17√ footnote 1c2
Nickel[2]	7440020	20	6000 & 7000 series[7]	1,000	6000 & 7000 series[7]	HLC<10^{-5} atm-m^3/mol			
Nitrate[32]	14797558	100	353.2 300.0 300.1 351.1 351.2 9056	1,000	300.0 9056	HLC<10^{-5} atm-m^3/mol			
Nitrite	14797650	100	353.2 300.0 300.1 9056	1,000	300.0 9056	HLC<10^{-5} atm-m^3/mol			
Nitrobenzene	98953	3	8270C 8330A 8095	[330]	8270C 8330A 8095	1.30E-01	TO-13A[LF√] NIOSH 2005 2017	4.30E+00	NIOSH 2005 2017
2-Nitrophenol	88755	5	8270C 8041A	330	8270C 8041A	HLC<10^{-5} atm-m^3/mol			
n-Nitroso-di-n-propylamine	621647	[5]	8270C 8070A	[330]	8270C 8070A	HLC<10^{-5} atm-m^3/mol			
N-Nitrosodiphenylamine	86306	5	8270C 8070A	330	8270C 8070A	HLC<10^{-5} atm-m^3/mol			
Oxamyl	23135220	100	531.1 8318A	1,000	8318A	HLC<10^{-5} atm-m^3/mol			
Oxo-hexyl acetate	88230357					1.40E+01	footnote 1c2	4.50E+02	footnote 1c2
Pendimethalin	40487421	10	1656	200	1656	HLC<10^{-5} atm-m^3/mol			
Pentachlorobenzene	608935	[5]	8270C 8121B	330	8270C 8121B	Insufficient data to develop criteria			
Pentachloronitrobenzene	82688	20	8270C 8081B	330	8270C 8081B	9.00E-01	footnote 1c2	3.00E+01	footnote 1c2
Pentachlorophenol[2 33]	87865	1	515.1 515.2 6640B 8151A 8041A 8270C	20	8151A 8041A 8270C	HLC<10^{-5} atm-m^3/mol			

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TARGET DETECTION LIMITS AND DESIGNATED ANALYTICAL METHODS

CONTAMINANT	Chemical Abstract Service Number	WATER		SOIL		AIR[1a,,1d]		SOIL GAS[1a, 1d]	
		TDL µg/L	DESIGNATED METHOD	TDL µg/kg	DESIGNATED METHOD	TDL[1b] ppbv	DESIGNATED METHOD[1c1]	TDL[1b] ppbv	DESIGNATED METHOD[1c1]
Pentane	109660	100	8260B	5,000	8260B	6.00E+03	TO-15 TO-17	2.00E+05	TO-15 TO-17
2-Pentene	109682					Insufficient data to develop criteria			
Phenanthrene	85018	2	8270C 8310	330	8270C 8310	1.40E-02	TO-13A[LF]	4.50E-01	footnote 1c2
Phenol	108952	5	8270C 8041A	330	8270C 8041A	HLC<10^{-5} atm-m^3/mol			
Phenytoin	57410	15	8270C	250	8270C	HLC<10^{-5} atm-m^3/mol			
Phosphorus (total)[34]	7723140	10	365.1 365.3 365.4	200	365.1 365.3 365.4	HLC<10^{-5} atm-m^3/mol			
Phthalic acid	88993					HLC<10^{-5} atm-m^3/mol			
Phthalic anhydride	85449					HLC<10^{-5} atm-m^3/mol			
Picloram	1918021	40	6640B 8151A	500	8151A	HLC<10^{-5} atm-m^3/mol			
Piperidine	110894					HLC<10^{-5} atm-m^3/mol			
Polybrominated biphenyls[35]	67774327	0.01	8081B 8082A	50	8081A 8082A	HLC<10^{-5} atm-m^3/mol			
Polychlorinated biphenyls (PCBs)[36]	1336363	[0.2]	8082A 8270C	330	8082A 8270C	3.90E-03	TO-4A TO-10A NIOSH 5503	1.30E-01	NIOSH 5503
PCB dioxin-like congeners[37]	NA		1668		1668	4.40E-08	footnote 1c2	1.50E-06	footnote 1c2
Prometon	1610180	50	507 619	200		HLC<10^{-5} atm-m^3/mol			
Propachlor	1918167	50	8081B	200	8081B	HLC<10^{-5} atm-m^3/mol			
Propazine	139402	100	507 619	2,000		HLC<10^{-5} atm-m^3/mol			
Propionic acid	79094					HLC<10^{-5} atm-m^3/mol			
Propyl alcohol	71238					HLC<10^{-5} atm-m^3/mol			
n-Propylbenzene	103651	1	8260B 8021B	100	8260B 8021B	4.00E+00	TO-15 TO-17	1.30E+02	TO-15 TO-17
Propylene glycol	57556	10,000	8015C 8430	50,000	8015C	HLC<10^{-5} atm-m^3/mol			
Pyrene	129000	5	8270C 8310	330	8270C 8310	1.20E+01	TO-13A[LF]	4.00E+02	footnote 1c2
Pyridine	110861	[20]	8270C 8015C	330	8270C 8015C	1.10E+00	TO-13A[LF]	3.60E+01	footnote 1c2
Selenium	7782492	5	6000 & 7000 series[7]	200	6000 & 7000 series[7]	HLC<10^{-5} atm-m^3/mol			
Silver	7440224	[0.2]	6000 & 7000 series[7]	[100]	6000 & 7000 series[7]	HLC<10^{-5} atm-m^3/mol			
Silvex (2,4,5-TP)	93721	30	6640B 8151A	300	8151A	HLC<10^{-5} atm-m^3/mol			
Simazine	122349	4	8141B 1656 507 525.2 619	80	8141B	HLC<10^{-5} atm-m^3/mol			

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CONTAMINANT	Chemical Abstract Service Number	WATER		SOIL		AIR[1a,,1d]		SOIL GAS[1a, 1d]	
		TDL µg/L	DESIGNATED METHOD	TDL µg/kg	DESIGNATED METHOD	TDL[1b] ppbv	DESIGNATED METHOD[1c1]	TDL[1b] ppbv	DESIGNATED METHOD[1c1]
Sodium	7440235	1,000	6000 & 7000 series[7]	10,000	6000 & 7000 series[7]	HLC<10^{-5} atm-m^3/mol			
Sodium azide	26628228	50	Ion Chromatography[3]	1,500	Ion Chromatography[3]	Insufficient data to develop criteria			
Strontium	7440246	1,000	6000 & 7000 series[7]	5,000	6000 & 7000 series[7]	HLC<10^{-5} atm-m^3/mol			
Styrene	100425	1	8260B 8021B	50	8260B 8021B	1.10E+01	TO-15 TO-17	3.50E+02	TO-15 TO-17
Sulfate	14808798	1,000	375.2 300.0 300.1 9056 9035 9036	50,000	375.2 300.0 [12] 9056 9035 9036	HLC<10^{-5} atm-m^3/mol			
Tebuthiuron	34014181	100	8321B	2,000	8321B	HLC<10^{-5} atm-m^3/mol			
2,3,7,8-Tetrabromodibenzo-p-dioxin	50585416	0.0001	8290A 1613B	0.01	8290A 1613B	HLC<10^{-5} atm-m^3/mol			
1,2,4,5-Tetrachlorobenzene	95943	2	8270C 8121B	330	8270C 8121B	1.10E-01	footnote 1c2	3.80E+00	footnote 1c2
2,3,7,8-Tetrachlorodibenzo-p-dioxin[37]	1746016	[0.00001]	8290A 1613B	0.001	8290A 1613B	HLC<10^{-5} atm-m^3/mol			
1,1,1,2-Tetrachloroethane	630206	1	8260B 8121B	100	8260B 8121B	5.10E-01	TO-15$^{\surd}$ TO-17	1.70E+01	TO-15$^{\surd}$ TO-17
1,1,2,2-Tetrachloroethane	79345	1	8260B 8121B	50	8260B 8121B	6.50E-02	TO-15 TO-17	2.20E+00	TO-15 TO-17
Tetrachloroethylene	127184	1	8260B 8121B	50	8260B 8121B	5.00E+00	TO-15 TO-17	1.70E+02	TO-15 TO-17
Tetrahydrofuran	109999	90	8260B	1,000	8260B	6.00E+00	TO-15$^{\surd}$ TO-17	2.20E+00	TO-15$^{\surd}$ TO-17
Tetranitromethane	509148	100	8260B	[500]	8260B	2.10E-04	NIOSH 3513	7.10E-03	NIOSH 3513
Thallium	7440280	2	6000 & 7000 series[7]	500	6000 & 7000 series[7]	HLC<10^{-5} atm-m^3/mol			
Toluene	108883	1	8260B 8021B	100	8260B 8021B	1.30E+03	TO-15 TO-17	4.40E+04	TO-15 TO-17
p-Toluidine	106490	10	8270C	[660]	8270C	HLC<10^{-5} atm-m^3/mol			
Toxaphene	8001352	[1]	8081B	170	8081B	HLC<10^{-5} atm-m^3/mol			
Triallate	2303175	50	8270C	2,000	8270C	Insufficient data to develop criteria			
Tributylamine	102829					9.10E-01	footnote 1c2	3.00E+01	footnote 1c2
1,2,3-Trichlorobenzene	87616	5	8260B	250	8260B	3.60E+00	TO-15 TO-17	1.20E+02	TO-15 TO-17
1,2,4-Trichlorobenzene	120821	5	8260B 8021B	250	8260B 8021B	5.30E-01	TO-15 TO-17	1.80E+01	TO-15 TO-17
1,1,1-Trichloroethane	71556	1	8260B 8021B	50	8260B 8021B	1.10E+03	TO-15 TO-17	3.60E+04	TO-15 TO-17
1,1,2-Trichloroethane	79005	1	8260B 8021B	50	8260B 8021B	3.00E-01	TO-15 TO-17	9.80E+00	TO-15 TO-17
Trichloroethylene	79016	1	8260B 8021B	50	8260B 8021B	3.70E-01	TO-15 TO-17	1.20E+01	TO-15 TO-17
Trichlorofluoromethane	75694	1	8260B 8021B	100	8260B 8021B	9.90E+03	TO-15 TO-17	3.30E+05	TO-15 TO-17
2,4,5-Trichlorophenol	95954	5	8270C 8041A	330	8270C 8041A	HLC<10^{-5} atm-m^3/mol			

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CONTAMINANT	Chemical Abstract Service Number	WATER		SOIL		AIR[1a,,1d]		SOIL GAS[1a, 1d]	
		TDL µg/L	DESIGNATED METHOD	TDL µg/kg	DESIGNATED METHOD	TDL[1b] ppbv	DESIGNATED METHOD[1c1]	TDL[1b] ppbv	DESIGNATED METHOD[1c1]
2,4,6- Trichlorophenol	88062	4	8270C 8041A	330	8270C 8041A	HLC<10^{-5} atm-m^3/mol			
1,2,3-Trichloropropane	96184	1	8260B 8021B	100	8260B 8021B	4.93E-02	TO-15 TO-17	1.64E+00	TO-15 TO-17
1,1,2-Trichloro-1,2,2-trifluoroethane	76131	1	8260B	250	8260B	2.50E+03	TO-15 TO-17	8.40E+04	TO-15 TO-17
Triethanolamine	102716					HLC<10^{-5} atm-m^3/mol			
Triethylene glycol	112276	4,000	8015C	50,000	8015C	HLC<10^{-5} atm-m^3/mol			
3-Trifluoromethyl-4-nitrophenol	88302	50	8081B	1,000	8081B	HLC<10^{-5} atm-m^3/mol			
Trifluralin	1582098	30	8270C 8081B	200	8270C 8081B	Insufficient data to develop criteria			
2,2,4-Trimethylpentane	540841	50	8260B	2,500	8260B	7.40E+02	TO-15 TO-17	2.50E+04	TO-15 TO-17
2,4,4-Trimethyl-2-pentene	107404					Insufficient data to develop criteria			
1,2,3-Trimethylbenzene	526738	5	8260B	250	8260B	4.40E+01	TO-15 TO-17	1.50E+03	TO-15 TO-17
1,2,4-Trimethylbenzene	95636	1	8260B 8021B	100	8260B 8021B	4.40E+01	TO-15 TO-17	1.50E+03	TO-15 TO-17
1,3,5-Trimethylbenzene	108678	1	8260B 8021B	100	8260B 8021B	4.40E+01	TO-15 TO-17	1.50E+03	TO-15 TO-17
Triphenyl phosphate	115866	10	8141B	500	8141B	HLC<10^{-5} atm-m^3/mol			
tris(2,3-Dibromopropyl)phosphate	126727	[10]	8081B	330	8081B	1.70E-03	footnote 1c2	5.70E-02	footnote 1c2
Urea	57136	400	983.01	20,000	983.01	HLC<10^{-5} atm-m^3/mol			
Vanadium	7440622	4	6000 & 7000 series[7]	1,000	6000 & 7000 series[7]	HLC<10^{-5} atm-m^3/mol			
Vinyl acetate	108054	100	8260B	5,000	8260B	5.60E+01	footnote 1c2	1.90E+03	footnote 1c2
Vinyl chloride	75014	1	8260B 8021B	{40}	8260B 8021B	6.20E-01	TO-15 TO-17	2.10E+01	TO-15 TO-17
White phosphorus	12185103	0.005	7580	1	7580	HLC<10^{-5} atm-m^3/mol			
Xylenes[38]	1330207	3	8260B 8021B	150	8260B 8021B	2.30E+01	TO-15 TO-17	7.60E+02	TO-15 TO-17
Zinc[2]	7440666	50	6000 & 7000 series[7]	1,000	6000 & 7000 series[7]	HLC<10^{-5} atm-m^3/mol			

TOTAL PETROLEUM HYDROCARBONS[39]	Chemical Abstract Service Number	WATER TDL µg/L	SOIL TDL µg/kg	DESIGNATED METHODS
Gasoline Range Organics (GRO)	----	100	10,000	8015C/D [40] GC/MS
Diesel Range Organics (DRO)	----	100	10,000	8015C/D [40] GC/MS
Oil Range Organics (ORO)	----	500	20,000	8015C/D [40] GC/MS

Notations: TDLs in [ ] brackets indicate that the contaminant's TDL is higher than the most restrictive criterion
TDLs in { } brackets indicate the need to consult with the laboratory to determine if the risk-based criterion can be achieved for methanol preserved samples, or whether the low concentration soil procedures of Method 5035 are necessary.

TARGET DETECTION LIMITS AND DESIGNATED ANALYTICAL METHODS

TOTAL PETROLEUM HYDROCARBONS[39]	Chemical Abstract Service Number	WATER TDL µg/L	SOIL TDL µg/kg	DESIGNATED METHODS
Petroleum Hydrocarbon Material	8012951	Method	Method	1664 9071B 8440
Total Recoverable Petroleum Hydrocarbons (TRPH)	----	Method	Method	8440
Screening Methods for Petroleum Hydrocarbons	----	Method	Method	4030-petroleum hydrocarbons 4035-polyaromatic hydrocarbons

WATER CHARACTERISTICS[41]	TDL µg/L	DESIGNATED METHODS
Acute Toxicity	---	Short-Term Methods for Estimating the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms, 5th Edition EPA-821-R-02-012
Biological Oxygen Demand, Total	8,000	SM 5210 B
Biological Oxygen Demand, Carbonaceous	8,000	SM 5210 B
Calcium	1,000	6000-7000 series[7]
Carbon dioxide	----	Field measurement with sampling kit, immediately after sampling
Chemical Oxygen Demand	----	410.4 410.3
Chronic Toxicity	----	Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, 4th Edition EPA-821-R-02-013, with errata sheet
Color	----	SM 2120 B/C/E
Conductance, specific	----	9050A 120.1
Dissolved Oxygen	80	SM 4500-0-G, Field measurement, in-situ [42]
Ferrous Iron	20	Field measurement with sampling kit, immediately after sampling
Hardness	----	SM 2340 B Calculate from separate calcium and magnesium results
Hydrogen	----	Field measurement with sampling kit, immediately after sampling
Organic Carbon	----	415.3 5310 SW-846 9060
Oxygen Reducing Potential (ORP)	----	Field measurement with sampling kit, immediately after sampling
pH	----	9040C
Solids, Total Dissolved	----	SM 2540 C
Sulfide	----	9030B 9034 9215, 376.1, 376.2
Temperature	----	SM 2550 B, Field Measurement, in-situ
Turbidity	----	180.1

SOIL CHARACTERISTICS[43]	DESIGNATED METHODS

Alkalinity	310.2
Particle Size Analysis	ASTM D 421-85(2007) for drying samples, ASTM D 422-63(2007) for particle size distribution Gee and Bauder, 1986
pH	9045D
Soil Texture [44]	ASTM Unified Soil Classification, ASTM D 2488-09a
Dry Soil Bulk Density	ASTM D 2937-10 MOSA Chapter 13, Determine moisture on sub-sample from D 2937-10 using ASTM D 2216-10
Fraction of organic Carbon	Walkley-Black, Total Organic Carbon (TOC) Methods[45]

EXPLOSIVES[46]	**Chemical Abstract Service Number**	**Water TDL µg/L**	**Soil TDL µg/kg**	**Designated Method**
2-Amino-4,6-dinitrotoluene (2-ADNT)	35572782	1	50	8095
4-Amino-2,6-dinitrotoluene (4-ADNT)	1946510	1	50	8095
3,5-Dinitroaniline (3,5-DNA)	618871	1	50	8095
1,3-Dinitrobenzene (1,3-DNB)	99650	1	50	8095
2,4-Dinitrotoluene (2,4-DNT)	121142	1	50	8095
2,6-Dinitrotoluene (2,6-DNT)	606202	1	50	8095
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	121824	1	50	8095
Nitrobenzene (NB)	98953	5	50	8095
Nitroglycerine (NG)	55630	5	50	8095
2-Nitrotoluene (2-NT)	88722	5	50	8095
3-Nitrotoluene (3-NT)	99081	5	50	8095
4-Nitrotoluene (4-NT)	99990	5	50	8095
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	2691410	10	50	8095
Pentaerythritoltetranitrate (PETN)	78115	5	50	8095
1,3,5-Trinitrobenzene (1,3,5-TNB)	99354	1	50	8095
2,4,6-Trinitrophenylmethylnitramine (Tetryl)	479458	1	50	8095
2,4,6-Trinitrotoluene (2,4,6-TNT)	118967	1	50	8095

TARGET DETECTION LIMITS AND DESIGNATED ANALYTICAL METHODS

Note: Source Documents for Designated Methods are listed with the Application of Target Detection Limits and Designated Analytical Methods Resource Materials, Appendix G

Acronyms used:

ASTM: ASTM, International, formerly American Society for Testing Materials

EPA: Environmental Protection Agency

GSI: Groundwater Surface Water Interface

^{LF}: Low Flow.

NIOSH: National Institute for Occupational Safety and Health

OSHA: Occupational Safety and Health Administration

ppbv: parts per billion by volume

TDL: target detection limit

µg/l: micrograms per liter

µg/kg: micrograms per kilogram

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1 a. The AIR and SOIL GAS target detection limits and designated analytical methods address only contaminants with a Henry's law constant greater than or equal to 0.00001 atm-m^3/mol at 25 degree Celsius. The notation "HLC<10^{-5} atm-m^3/mol" is provided for the contaminants that are not likely to volatilize.

b. 1. The Target Detection Limits are established as the residential risk-based screening levels for indoor air and soil gas; unless the designated method's standard reporting limit is at or below the risk-based screening level.

2. The Target Detection Limits are provided in parts per billion by volume (ppbv). Concentrations in air are routinely reported in units of parts per billion by volume (ppbv) or micrograms per cubic meter of air (ug/m^3). **These units are not interchangeable** and require conversion from one to the other.

c. 1. Sample collection for the designated method may need to be modified to achieve a representative sample (e.g., the use of low flow rates, or selection of proper sorbent for contaminant of concern).

2. The Compendium of Methods for Toxic Organic Air Pollutant-Compendium Methods (e.g., TO-4A to TO-17) do not address all contaminants. Where a Compendium Method is not listed, NIOSH and OSHA designated air methods for the individual contaminants are acceptable if the method reporting limit is at or below the risk-based screening levels for the contaminant of concern.

d. The designated methods are based upon a survey of the capabilities of several laboratories. Not every laboratory may be able to perform all methods or to achieve detection limits. It is the responsibility of the party requesting the analysis and using the data to communicate with the chosen laboratory doing the analysis to determine:

1. The laboratory has the capability to analyze for all contaminants by the designated method (e.g., TO-15$^{\surd}$, TO-13A$^{LF\surd}$, where a contaminant may not be included in a laboratory's standard analyte list).

2. If modification of the designated method is necessary to ensure that the reporting limit is at or below the risk-based screening level, and confirmation the modifications are appropriate to achieve a representative sample.

3. If tentatively identified compounds (TICs) may need to be evaluated and reported.

2 To appropriately evaluate the GSI pathway, the hardness and pH of the receiving waters should also be determined by the laboratory. See the cleanup criteria table footnotes [R 299.49(G)] for additional information.

3 The analysis for these contaminants by ion chromatography is not performed routinely by environmental laboratories. Arrangements for laboratories to perform this analysis must be made well in advance of sampling.

4 This is a common laboratory solvent. Cautious review is required of analytical results for laboratory blanks to assess compliance.

5 High temperature purging may be required.

6 Aldicarb sulfone and aldicarb sulfoxide are breakdown products of aldicarb. When aldicarb is analyzed, the analysis should include the breakdown products and results should be compared to the respective criteria.

7 The methods designated for analyses of metals include the methods in SW-846, 6000, and 7000 series and EPA 200 series, and methods approved by the United States Environmental Protection Agency for the Clean Water Act and Safe Drinking Water Act. Total recoverable metals must be measured.

8 Soil ammonia must be distilled from soils. Wet soil is used for ammonia analysis and total solids are determined on a separate aliquot. Standard Methods 4500-NH_3 and EPA Methods 350.2 or 350.3 modified for soils can be used. Results for soil ammonia using extraction procedures are not acceptable.

9 Analysis of the ether oxygenates using high temperature purging (> 60° C) of acidified samples must be avoided.

10 Asbestos in water is reported as millions of fiber per liter greater than 10 microns (MFL), and weight percent (%) in soils. Laboratories certified by various state and federal agencies for asbestos analysis using PLM and TEM should be used when possible.

11 When the GSI and drinking water pathways have been documented to not be relevant, a water TDL of 5 μg/L is sufficient to evaluate the most restrictive benzidine criteria. Specialized techniques, such as ion trap and single/selected ion monitoring, may be needed for determining low levels of this parameter. Method 605, although a U.S. EPA approved method for benzidine that can reach very low levels, is used only by a few laboratories and only by special arrangements. Specialized techniques that confirm the parameter by mass spectrometry are preferred over Method 605 when appropriate reporting limits can be attained.

12 The bottle shake procedure as described in ASTM Neutral Leach Procedure, ASTM D 3987-85, with a minimum ratio of 20:1 extracting volume must be used. See RRD Application of Target Detection Limits and Designated Analytical Methods Resource Materials regarding Soil Leaching Methods for additional information on the appropriate use of ASTM D 3987-85.

13 Concentrations of trihalomethanes; bromodichloromethane, bromoform, chloroform, dibromochloromethane in groundwater are added together to determine compliance with the drinking water standard. Concentrations of trihalomethanes in soils are added to together to determine compliance with the soils protective of drinking water criterion.

14 The results for alpha-chlordane (CAS 5103719) and gamma-chlordane (CAS 5103742), isomers of chlordane, are added together and compared to chlordane criteria.

15 This contaminant is a reactive compound. When it is known a reactive compound exists at a site, specialized sampling and other holding time requirements may apply to obtain reliable representative results.

16 Chromium III is not directly measured. It is assumed that Cr III and hexavalent chromium (Cr VI) are the forms of chromium found in the environment, and concentrations of Cr III can be calculated by subtracting Cr VI results from the total chromium results. Analyses for Cr VI have very short holding times; 24 hours if appropriate preservation procedures are not used. Colorimetric methods such as Method 7196A should not be used for samples with vanadium concentrations greater than ten times the Chromium VI levels or historical data has indicated interferences. All matrixes analyzed by colorimetric methods must be spiked to verify results, as provided in Method 7196. Samples with persistent interferences using colorimetric procedures must be analyzed by an alternate method. In such cases, the methods specified in SW-846 are acceptable as alternate methods. See the cleanup criteria footnotes [R 299.49(H)] for additional information regarding application of Chromium data to criteria.

17 See RRD Application of Target Detection Limits and Designated Analytical Methods Resource Materials, Appendix C, Cyanide Information Materials for background information regarding the designated analytical methods. OIA 1677 and ASTM Method D 6888-9 are methods using flow injection with ligand exchange followed by amperometry and are considered equivalent methods and either may be used to demonstrate compliance with criteria. Methods OIA 1677 or ASTM D 6888-09 are recommended when possible because of the superior method performance and increased reliability of results. Soils must be extracted using SW-846 Method 9013A for determination of total, and available cyanide. The TDL of 100 µg/kg in soils is applicable when the total cyanide method is used with appropriate leaching procedures. A TDL of 200 µg/kg is sufficient for response activities or corrective action when the GSI pathway is appropriately documented to be not relevant.

18 The monoacid (CAS 887547) and diacid (CAS 2136790) breakdown products of dacthal should be analyzed when dacthal is being evaluated in groundwaters using methods 8151A, 515.1, 515.2, or 515.4. Monoacid and diacid are measured as one compound and compared to dacthal criteria.

19 When the GSI pathway has been documented to not be a relevant, a water TDL of 1 µg/L is sufficient to evaluate the most restrictive 3,3'-Dichlorobenzidine criteria. Specialized techniques, such as ion trap and single/selected ion monitoring, may be needed for determining low levels of this parameter. Method 605, although a U.S. EPA approved method for 3,3'-Dichlorobenzidine that reach very low levels, is used only by a few laboratories and only by special arrangements. Specialized techniques that confirm the parameter by mass spectrometry are preferred over Method 605 when appropriate TDLs can be attained.

20 The results for cis-1,3,dichloropropene (CAS 10061015) and trans-1,3,dichloropropene (CAS 10061026), isomers of 1,3,dichloropropene, are added together and compared to 1,3,dichloropropene criteria.

21 High temperature purging and/or isotope dilution techniques have been used for 1.4-Dioxane. Laboratory-specific methods acceptable to reach the low TDLs may be approved by the MDEQ RRD.

22 The results for endosulfan I (CAS 959988) and endosulfan II (CAS 33213659), isomers of endosulfan, are added together and compared to endosulfan criteria.

23 When drinking water has been documented to not be a relevant pathway and groundwater does not vent to a surface water protected as a drinking water source, a water TDL of 5 µg/L and soil TDL of 50 µg/kg are sufficient to evaluate the most restrictive EDB criteria.

24 Distillation procedures must be used if interferences are encountered. Colorimetric methods for the measurement of fluoride cannot be used.

25 Analysis is for formate.

26 When the GSI pathway has been documented to not be a relevant, a water TDL of 10 µg/L and soils TDL of 330 µg/kg are sufficient to evaluate the most restrictive hexachlorobutadiene criterion. Some laboratories have determined hexachlorobutadiene using Methods 8081A and 8011. The use of these methods is acceptable to the RRD if acceptable method performance is documented.

27 Total lead, and both fine and coarse lead fraction analysis may be required. MDEQ Laboratory SOP No 213 provides appropriate procedures for sample preparation. When total lead concentrations directly measured in soil are less than 75 mg/kg, it is not necessary to measure lead in the fine and coarse fractions of soil and the total lead concentrations may be used for comparison to all criteria. When total lead concentrations in soil are equal to or more than 75 mg/kg, the lead concentrations in the fine and coarse fractions must be measured. Alternatively, the lead concentrations may be determined initially in the fine and coarse fractions of the soil and the total lead concentrations calculated for criteria comparison. Fine and coarse lead data must separately be compared to the soil direct contact criteria (DCC)and particulate inhalation criteria (PSIC); total measured or calculated lead data is used for the remaining soil criteria. Because clay soils consist primarily of fine materials, the use of the total lead concentration in clay soils is acceptable for comparison to the DCC and PSIC if the dried soil sample cannot be sieved to separate out any fraction and/or the volume derived from any fraction is too small for analysis (less than one gram), and the field/laboratory data/sampling information adequately documents that the soils are, in fact, composed primarily of clay.

The ASTM Unified Soil Classification, ASTM D 2488-09a should be used for classifying soils. For background information regarding the use of fine and coarse samples see RRD Application of Target Detection Limits and Designated Analytical Methods Resource Materials, Appendix D regarding Evaluating Exposures Due to Lead in Soil.

28 DEQ Policy and Procedure regarding Evaluating Mercury in Groundwater Plumes [No 09-014] establishes an action level of 200 ng/l using US EPA method 245.1. The TDL of 0.001 μg/L and low level mercury analysis (with low level sample collection) applies only when the GSI pathway is relevant and the action level is exceeded. The GSI criterion is a total mercury value and must be compared to total mercury analytical data. If the GSI is documented to not be a relevant pathway, then a reporting limit of 0.2 μg/L is appropriate to evaluate the most restrictive criteria. Species specific analytical methods are not included in this document. Any proposal to use species specific methods requires MDEQ approval.

29 Septum and similar vials with air tight seals may be used for the collection of water samples at the surface and from wells less than twenty feet deep. For deeper wells, samples should be drawn from the wells using bladder pumps and collected in Tedlar bags. The use of bailers is not an acceptable method for sampling dissolved gases from wells. Care must be taken to keep gases dissolved until transferred to a suitable container. For the arrangement of a good sampling mechanism used to retain the pressure and keep gases dissolved, see the field sampling method “Collection of Ground Water Samples for Dissolved Gas Analysis” developed by Isotech Laboratories, Inc., 1308 Parkland Court, Champaign, Illinois 61821-1826, (217-398-3490). Consult the laboratories regarding reporting limits.

30 Methanol is used as a solvent for laboratory standards, hence is not routinely analyzed by environmental laboratories. Special arrangements must be made with the laboratory far in advance of the sample collection to analyze for methanol.

31 The results for 2-methylphenol (CAS 95487), 3-methylphenol (CAS 108394) and 4-methylphenol (CAS 106445), isomers of methylphenol, are added together and compared to methylphenol criteria other than for the GSI pathway. When the GSI has been documented to be a relevant pathway, isomer specific concentrations should be compared to the following water quality standards: 2-methylphenol: 82 μg/L; 3-methylphenol: 71 μg/L; 4-methylphenol: 25 μg/L; 3- and 4- co-eluted concentrations should be compared to 25 μg/L

32 The concentrations of all potential sources of nitrogen in waters must be added together and compared to the nitrate drinking water criteria. The concentrations of all potential sources of nitrogen in soils must be added together and compared to soil criteria protective of drinking water. The Kjeldahl-N, nitrate-N (CAS 14797558) and nitrite-N (CAS 14797650) results must be added together to evaluate the nitrate criteria for soils. Ammonia nitrate-N and nitrite-N, or Kjeldahl-N and nitrate-N andnitrite-N must be measured and their results added together to evaluate nitrate criteria for waters.

33 When the GSI and the drinking water pathways have been documented to not be relevant, a water TDL of 20μg/L and soil TDL of 800 μg/kg are sufficient to evaluate the most restrictive criteria for pentachlorophenol.

34 Soil samples for total phosphorus must be digested using Kjeldahl or similar digestion techniques, See Association of Official Analytical Chemists Microchemical Determination of Phosphorous 957.18.

35 The term “Polybrominated biphenyls” (CAS 67774327) refers to a FireMaster product used in Michigan which contaminated the food supply in the early 1970s. Subsequently, cleanup criteria were established for that product. Two brands of this product were used, FireMaster FF1 and FireMaster BP-6. Each are mixtures of polybrominated biphenyls, the most prevalent being the hexabrominated biphenyl homologues, comprising about 54 to 68% of the mixtures. The compound 2,2’,4,4’,5,5’-hexabromobiphenyl is used for calibrations and quantitation of the FireMaster products in samples.

36 When attempts are not successful to match the patterns of the Aroclor products with the pattern found in a sample, laboratories should report that Aroclor peaks were detected but no matches could be made with any of the common Aroclor products. The list of Aroclors that have been found in Michigan and should be reported if patterns demonstrate they are present, are listed below.

PCB Products Recommended for Analyses			
PCB Product	**CAS**	**PCB Product**	**CAS**
Aroclor 1016	12674112	Aroclor 1254	11097691
Aroclor 1221	11104282	Aroclor 1260	11096825
Aroclor 1232	11141165	Aroclor 1262	37324235
Aroclor 1242	53469219	Aroclor 1268	11100144
Aroclor 1248	12672296		

37 The concentrations of polychlorinated and polybrominated dibenzodioxin and dibenzofuran isomers, and dioxin-like polychlorinated biphenyls (PCB) congeners present at a facility, expressed as an equivalent concentration of 2,3,7,8-tetrachlorodibenzo-p-dioxin based on their relative potency must be added together. Those isomers with non-zero toxicity equivalency factors (TEF) are provided in the table below. The toxicity equivalency of a specific dioxin, furan, or PCB dioxin-like congeners in a sample is calculated by multiplying its concentration by its respective TEF. The toxicity equivalencies must be added together to obtain a total toxic equivalency (TEQ) and the TEQ compared to the criteria for 2,3,7,8-tetrachlorodibenzo-p-dioxin [R 299.5750 footnote (O)].

TOXICITY EQUIVALENT FACTORS FOR DIBENZODIOXINS, DIBENZOFURANS AND DIOXIN-LIKE POLYCHLORINATED BIPHENYLS

Dioxin Isomer	TEF
2,3,7,8-TCDD	1.0
1,2,3,7,8-PeCDD	1.0 (0.5)*
1,2,3,4,7,8-HxCDD	0.1
1,2,3,6,7,8-HxCDD	0.1
1,2,3,7,8,9-HxCDD	0.1
1,2,3,4,6,7,8-HpCDD	0.01
1,2,3,4,6,7,8,9-OCDD	0.0001 (0.001)*

Furan Isomer	TEF
2,3,7,8-TCDF	0.1
1,2,3,7,8-PeCDF	0.05
2,3,4,7,8-PeCDF	0.5
1,2,3,4,7,8-HxCDF	0.1
1,2,3,6,7,8-HxCDF	0.1
1,2,3,7,8,9-HxCDF	0.1
2,3,4,6,7,8-HxCDF	0.1
1,2,3,4,6,7,8-HpCDF	0.01
1,2,3,4,7,8,9-HpCDF	0.01
1,2,3,4,6,7,8,9-OCDF	0.0001 (0.001)*

PCB Congener	TEF
3,3,4,4’-TCB (77)	0.0001
3,4,4’,5-TCB (81)	0.0003
3,3’,4, 4’,5-PeCB (126)	0.1
3,3’4.4’,5,5’-HxCB (169)	0.03
2,3,3’,4,4’,-PeCB (105)	0.00003
2,3,4,4’,5-PeCB (114)	0.00003
2,3’,4,4’,5-PeCB (118)	0.00003
2’,3,4,4’,5-PeCB (123)	0.00003
2,3,3’,4,4’,5-HXCB (156)	0.00003
2,3,3’,4,4’,5’-HXCB (157)	0.00003
2,3’,4,4’,5,5’-HXCB (167)	0.00003
2,3,3’,4,4’,5,5’-HXCB (189)	0.00003

*For comparing groundwater samples to GSI criteria, use the TEF in parentheses and do not include dioxin-like PCB congeners (R 323.1209).

38 The results for m-xylene (CAS 108383), p-xylene (CAS 106423), and o-xylene (CAS 95476), isomers of xylene, are added together and compared to xylene criteria.

39 Cleanup criteria do not presently exist for total petroleum hydrocarbons, see RRD Application of Target Detection Limits and Designated Analytical Methods Resource Materials, Appendix E regarding Measuring Non-Specific Petroleum Hydrocarbons.

40 Extraction procedures and carbon ranges for GRO, DRO, and ORO apply.

41 The listed water characteristics may include Water Quality Standards/GSI criteria, may be a component of the calculation of a water quality standard, may be used as an indicator parameter for groundwater sampling stabilization, or may be used as indicators of natural attenuation of contaminants. See cleanup criteria footnote [R 299.49(EE)] for additional information regarding water quality standards.

42 Field determination of dissolved oxygen is preferred using the membrane electrode method in Standard Methods (SM 4500-O G) or equivalent methods. Carbonaceous Biochemical Oxygen Demand and Ammonia may also be needed in order to evaluate dissolved oxygen appropriately.

43 Cleanup criteria have not been developed for specific soil characteristics, but analysis may be necessary for the application of specific soil criteria (e.g., lead) or as inputs for development of facility-specific or site-specific soil criteria.

44 Soil texture based on particle size and the ASTM Unified Soil Classification. Documentation should be provided that these tests were conducted if total lead concentrations are used instead of fine fraction analysis for clay soils. Field methods may be used as screening tools to establish the possibility of clays. If documentation is required that soils are clays, some soils should be subjected to the ASTM Unified Soil Classification process.

45 Walkley-Black methods measure organic carbon in soils that is easily oxidized after removal of inorganic forms of carbon by acidification and heating. These methods are most appropriate for soils with less than 2% organic matter and should not be used for soils with more than 6% organic matter. See documents that provide the original Walkley–Black method and modifications for details. Methods using ignition may be used for soils with greater than 6% organic matter. Minimum sampling and analysis requirements for TOC methods using ignition include: instrument systems must be used that are capable of quantitatively determining organic carbon in the presence of inorganic forms of carbon; methods must demonstrate capability to remove organic forms prior to measurements for organic carbon; strong acids, such as persulfate and hydrochloric, must be used to remove inorganic forms of carbon; methods that use a mixture of water and soil to simulate an aqueous matrix and then use methods designed for waters and/or wastes are unacceptable; methods that determine by subtracting inorganic carbon measurements from total carbon measurements are unacceptable; organic carbon must be reported as a percentage of the dry weight of the un-acidified samples to the nearest 0.1% unit.

46 Cleanup criteria have not been developed for the listed explosives; however, analysis routinely occurs for federal formerly used defense sites under state oversight.