



SCOPE OF ACCREDITATION TO ISO/IEC GUIDE 34:2009

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REFERENCE MATERIAL PRODUCER

Valid To: September 30, 2012

Certificate Number: 1539.03

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this Reference Material Producer for the production of certified reference materials and reference materials of the following categories:

Category A4: Environmental Reference Materials

<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix <sup>(1)</sup></u>	<u>Measurement Technique(s)</u>
<b>Coliforms</b>		<b>Waste water, Potable Water</b>	<b>MPN, Membrane Filtration</b>
Total Coliform, MF	20 to 2400 CFU/100 mL		
Total Coliform, MPN	20 to 2400 MPN/100 mL		
Fecal Coliform, MF	20 to 2400 CFU/100 mL		
Fecal Coliform, MPN	20 to 2400 MPN/100 mL		
<b>Enterococci</b>		<b>Waste water</b>	<b>MPN, Membrane Filtration</b>
Enterococci, MF	20 to 1000 CFU/100 mL		
Enterococci, MPN	20 to 1000 MPN/100 mL		
Fecal Streptococcus (MF)	20 to 1000 CFU/100 mL		
Fecal Streptococcus (MPN)	20 to 1000 MPN/100 mL		
<b>Minerals</b>		<b>Waste water</b>	<b>Titration</b>
Alkalinity, total (CaCO <sub>3</sub> )	10 to 120 mg/L		IC
Chloride	35 to 275 mg/L		IC
Fluoride	0.3 to 4 mg/L		ICP
Potassium	4.0 to 40 mg/L		ICP
Sodium	6.0 to 100 mg/L		ICP
Specific conductance (25°C)	200 to 930 μmhos/cm		<b>Conductivity</b>

<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
Sulfate	5.0 to 125 mg/L		meter
Total dissolved solids	140 to 650 mg/L		IC
Total solids	140 to 675 mg/L		Gravimetric
<b>Hardness</b>		<b>Waste water</b>	
Calcium	3.5 to 110 mg/L		ICP
Calcium hardness as CaCO <sub>3</sub>	8.7 to 275 mg/L		Calc.
Hardness, total (CaCO <sub>3</sub> )	17 to 440 mg/L		Calc.
Magnesium	2.0 to 40 mg/L		ICP
Non-filterable residue	23 to 100 mg/L		Gravimetric
<b>pH</b>		<b>Waste water</b>	
pH	5.0 to 10 units		pH meter
<b>Solids</b>		<b>Waste water</b>	
Total Solids	140 to 675 mg/L		Gravimetric
Dissolved Solids	140 to 650 mg/L		Gravimetric
Suspended Solids	23 to 100 mg/L		Gravimetric
Settleable Solids	5 to 100 mL/L		Imhoff cone
Volatile Solids	100 to 500 mg/L		Gravimetric
<b>Simple Nutrients</b>		<b>Waste water</b>	
Ammonia as N	0.65 to 19 mg/L		Electrode
Nitrate as N	0.25 to 40 mg/L		IC
Nitrate plus nitrite as N	0.25 to 40 mg/L		IC
Orthophosphate as P	0.5 to 5.5 mg/L		IC
<b>Complex Nutrients</b>		<b>Waste water</b>	
Total Kjeldahl-Nitrogen	1.5 to 35 mg/L		Electrode
Total phosphorus	0.5 to 10 mg/L		ICP
<b>Nitrite</b>		<b>Waste water</b>	
Nitrite as N	0.4 to 4.0 mg/L		IC
<b>Oil &amp; Grease</b>		<b>Waste water</b>	
Oil & grease	20 to 100 mg/L		Gravimetric
<b>Demand</b>		<b>Waste water</b>	
5-day BOD	15 to 250 mg/L		Calculated
Carbonaceous BOD	15 to 250 mg/L		Calculated
COD	30 to 250 mg/L		Spec.
TOC	6.0 to 100 mg/L		TOC meter

*Peter Almy*

<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
<b>Trace Metals</b>		<b>Waste water</b>	<b>ICP/ICP-MS</b>
Aluminum	200 to 4000 µg/L		
Antimony	95 to 900 µg/L		
Arsenic	70 to 900 µg/L		
Barium	100 to 2500 µg/L		
Beryllium	8 to 900 µg/L		
Boron	800 to 2000 µg/L		
Cadmium	8 to 750 µg/L		
Chromium, total	17 to 1000 µg/L		
Cobalt	28 to 1000 µg/L		
Copper	40 to 900 µg/L		
Iron	200 to 4000 µg/L		
Lead	70 to 3000 µg/L		
Manganese	70 to 4000 µg/L		
Molybdenum	60 to 600 µg/L		
Nickel	80 to 3000 µg/L		
Selenium	90 to 2000 µg/L		
Silver	26 to 600 µg/L		
Strontium	30 to 300 µg/L		
Thallium	60 to 900 µg/L		
Vanadium	55 to 2000 µg/L		
Zinc	100 to 2000 µg/L		
<b>Flame AA Trace Metals</b>		<b>Water</b>	<b>ICP/ICP-MS</b>
Aluminum	800 to 16,000 mg/L		
Antimony	380 to 3,600 mg/L		
Arsenic	280 to 3,600 mg/L		
Barium	400 to 10,000 mg/L		
Beryllium	32 to 3,600 mg/L		
Boron	3200 to 8,000 mg/L		
Cadmium	32 to 3,000 mg/L		
Chromium	68 to 4,000 mg/L		
Cobalt	112 to 4,000 mg/L		
Copper	160 to 3,600 mg/L		
Iron	800 to 16,000 mg/L		
Lead	280 to 12,000 mg/L		
Manganese	280 to 16,000 mg/L		
Molybdenum	240 to 2,400 mg/L		
Nickel	320 to 12,000 mg/L		
Selenium	360 to 8,000 mg/L		
Silver	104 to 2,400 mg/L		
Strontium	120 to 1,200 mg/L		



<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
Thallium	240 to 3,600 mg/L		
Vanadium	220 to 8,000 mg/L		
Zinc	400 to 8,000 mg/L		
<b>Flame AA Cations</b>		<b>Water</b>	<b>ICP</b>
Calcium	10 to 200 mg/L		
Magnesium	10 to 200 mg/L		
Potassium	5 to 100 mg/L		
Sodium	10 to 250 mg/L		
<b>Ion Chromatography (Anions)</b>		<b>Water</b>	<b>IC</b>
Bromide	0.2 to 20 mg/L		
Chloride	0.2 to 20 mg/L		
Fluoride	0.1 to 10 mg/L		
Nitrate as N	0.2 to 20 mg/L		
Phosphate as P	0.5 to 30 mg/L		
Sulfate	0.5 to 30 mg/L		
<b>Mercury</b>		<b>Waste water</b>	<b>CVAA</b>
Mercury	2.0 to 30 µg/L		
<b>Low-Level Mercury</b>		<b>Waste water</b>	<b>CVAA</b>
Mercury	1 to 100 ng/L		
<b>Hexavalent Chromium</b>		<b>Waste water</b>	<b>Spec.</b>
Chromium VI	45 to 880 µg/L		
<b>Tin &amp; Titanium</b>		<b>Waste water</b>	<b>ICP/ICP-MS</b>
Tin	1000 to 5000 µg/L		
Titanium	80 to 300 µg/L		
<b>High Level Aluminum</b>		<b>Waste water</b>	<b>ICP</b>
Aluminum	0.1 to 1 mg/L		
<b>Uranium</b>		<b>Waste water</b>	<b>ICP/ICP-MS</b>
Uranium	25 to 200 µg/L		
<b>Acidity</b>		<b>Waste water</b>	<b>Titration</b>
Acidity	650 to 1800 mg/L		
<b>Boron</b>		<b>Waste water</b>	<b>ICP/ICP-MS</b>
Boron	0.8 to 2.0 mg/L		



<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
<b>Bromide</b> Bromide	1.0 to 10 mg/L	Waste water	IC
<b>Total Residual Chlorine</b> Total Residual Chlorine	0.5 to 3.0 mg/L	Waste water	Titration
<b>Low-Level Total Residual Chlorine</b> Residual Chlorine	20 to 250 µg/L	Waste water	Titration
<b>Color</b> Color	10 to 75 Color Units	Waste water	ICP
<b>Total Cyanide</b> Total cyanide	0.1 to 1 mg/L	Waste water	Spec.
<b>Total Organic Halides (TOX)</b> Total Organic Halides (TOX)	300 to 1500 µg/L	Waste water	HPLC
<b>Total Phenolics</b> Total Phenolics (4AAP)	0.06 to 5 mg/L	Waste water	4AAP
<b>Silica</b> Silica as SiO <sub>2</sub>	50 to 250 mg/L	Waste water	ICP
<b>Sulfide</b> Sulfide	1.0 to 10 mg/L	Waste water	Titration
<b>Surfactants-MBAS</b> Surfactants (MBAS)	0.2 to 1.0 mg/L	Waste water	Spec
<b>Turbidity</b> Turbidity	1.0 to 20 NTU	Waste water	Turbidimeter
<b>Volatiles</b> Acetone Acetonitrile Acrolein Acrylonitrile Benzene Bromodichloromethane Bromoform Bromomethane	5 to 200 µg/L 5 to 200 µg/L 5 to 200 µg/L 5 to 200 µg/L 8.0 to 120 µg/L 8.0 to 115 µg/L 11 to 100 µg/L 20 to 100 µg/L	Waste water	GC/MS

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<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
2-Butanone (MEK)	5 to 200 µg/L		
Carbon disulfide	5 to 200 µg/L		
Carbontetrachloride	10 to 140 µg/L		
Chlorobenzene	10 to 120 µg/L		
Chlorodibromomethane	11 to 140 µg/L		
Chloroethane	20 to 100 µg/L		
2-Chloroethylvinylether	5 to 200 µg/L		
Chloroform	12 to 95 µg/L		
Chloromethane	20 to 10 µg/L		
1,2-Dibromo-3-chloropropane (DBCP)	5 to 200 µg/L		
1,2-Dibromoethane (EDB)	5 to 200 µg/L		
Dibromomethane	5 to 200 µg/L		
1,2-Dichlorobenzene	8.0 to 100 µg/L		
1,3-Dichlorobenzene	9.0 to 125 µg/L		
1,4-Dichlorobenzene	8.0 to 115 µg/L		
Dichlorodifluoromethane	5 to 200 µg/L		
1,1-Dichloroethane	15 to 150 µg/L		
1,2-Dichloroethane	10 to 150 µg/L		
1,1-Dichloroethene	11 to 120 µg/L		
cis-1,2-Dichloroethene	15 to 150 µg/L		
trans-1,2-Dichloroethene	10 to 150 µg/L		
1,2-Dichloropropane	10 to 150 µg/L		
cis-1,3-Dichloropropene	15 to 100 µg/L		
trans-1,3-Dichloropropene	8.0 to 90 µg/L		
Ethylbenzene	9.0 to 100 µg/L		
Hexachlorobutadiene	50 to 180 µg/L		
2-Hexanone	20 to 150 µg/L		
Methylene Chloride	10 to 125 µg/L		
4-Methyl-2-pentanone (MIBK)	20 to 200 µg/L		
Methyl-tert-butylether (MTBE)	15 to 100 µg/L		
Naphthalene	30 to 190 µg/L		
Styrene	20 to 100 µg/L		
1,1,1,2-Tetrachloroethane	5 to 200 µg/L		
1,1,2,2-Tetrachloroethane	10 to 150 µg/L		
Tetrachloroethene	10 to 150 µg/L		
Toluene	7.0 to 100 µg/L		
1,2,4-Trichlorobenzene	35 to 180 µg/L		
1,1,1-Trichloroethane	10 to 90 µg/L		
1,1,2-Trichloroethane	25 to 150 µg/L		
Trichloroethene	10 to 95 µg/L		
Trichlorofluoromethane (Freon 11)	20 to 100 µg/L		
1,2,3-Trichloropropane	5 to 200 µg/L		

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<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
Vinyl acetate	5 to 200 µg/L		
Vinyl chloride	20 to 100 µg/L		
Xylenes, total	20 to 300 µg/L		
<b>Base/Neutrals</b>		<b>Waste water</b>	<b>GC</b>
Acenaphthene	10 to 200 µg/L		
Acenaphthylene	10 to 200 µg/L		
Aniline	10 to 200 µg/L		
Anthracene	10 to 200 µg/L		
Benzidine	200 to 1000 µg/L		
Benzo(a)anthracene	10 to 200 µg/L		
Benzo(b)fluoranthene	20 to 125 µg/L		
Benzo(k)fluoranthene	25 to 200 µg/L		
Benzo(g,h,i)perylene	20 to 200 µg/L		
Benzo(a)pyrene	20 to 160 µg/L		
Benzyl alcohol	10 to 200 µg/L		
4-Bromophenyl-phenylether	20 to 200 µg/L		
Butylbenzylphthalate	50 to 200 µg/L		
Carbazole	10 to 200 µg/L		
4-Chloroaniline	10 to 200 µg/L		
Bis(2-chloroethoxy)methane	10 to 200 µg/L		
Bis(2-chloroethyl)ether	10 to 200 µg/L		
Bis(2-chloroisopropyl)ether	30 to 200 µg/L		
Bis(2-ethylhexyl)phthalate	20 to 200 µg/L		
1-Chloronaphthalene	10 to 200 µg/L		
2-Chloronaphthalene	20 to 200 µg/L		
4-Chlorophenyl-phenylether	25 to 200 µg/L		
Chrysene	10 to 200 µg/L		
Dibenz(a,h)anthracene	20 to 100 µg/L		
Dibenzofuran	30 to 125 µg/L		
Di-n-butylphthalate	40 to 180 µg/L		
1,2-Dichlorobenzene	30 to 150 µg/L		
1,3-Dichlorobenzene	30 to 150 µg/L		
1,4-Dichlorobenzene	30 to 150 µg/L		
3,3'-Dichlorobenzidine	60 to 200 µg/L		
Diethyl phthalate	65 to 170 µg/L		
Dimethyl phthalate	100 to 180 µg/L		
2,4-Dinitrotoluene	20 to 190 µg/L		
2,6-Dinitrotoluene	20 to 190 µg/L		
Di-n-octylphthalate	40 to 190 µg/L		
Fluoranthene	30 to 190 µg/L		
Fluorene	30 to 190 µg/L		
Hexachlorobenzene	20 to 190 µg/L		

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<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
Hexachlorobutadiene	50 to 180 µg/L		
Hexachlorocyclopentadiene	100 to 225 µg/L		
Hexachloroethane	50 to 190 µg/L		
Indeno(1,2,3-cd)pyrene	30 to 125 µg/L		
Isophorone	30 to 140 µg/L		
2-Methylnaphthalene	30 to 190µg/L		
Naphthalene	30 to 190 µg/L		
2-Nitroaniline	10 to 200 µg/L		
3-Nitroaniline	10 to 200 µg/L		
4-Nitroaniline	10 to 200 µg/L		
Nitrobenzene	20 to 190 µg/L		
N-Nitrosodiethylamine	10 to 200 µg/L		
N-Nitrosodimethylamine (NDMA)	75 to 200 µg/L		
N-Nitrosodiphenylamine	30 to 200 µg/L		
N-Nitroso-di-n-propylamine	30 to 140 µg/L		
Pentachlorobenzene	10 to 200 µg/L		
Phenanthrene	30 to 140 µg/L		
Pyrene	30 to 200 µg/L		
Pyridine	10 to 200 µg/L		
o-Toluidine	10 to 200 µg/L		
1,2,4,5-Tetrachlorobenzene	10 to 200 µg/L		
1,2,4-Trichlorobenzene	35 to 180 µg/L		
<b>Acids</b>		<b>Waste water</b>	<b>HPLC</b>
Benzoic Acid	30 to 200 µg/L		
4-Chloro-3-methylphenol	30 to 200 µg/L		
2-Chlorophenol	30 to 200 µg/L		
2,4-Dichlorophenol	40 to 190 µg/L		
2,6-Dichlorophenol	40 to 190 µg/L		
2,4-Dimethylphenol	65 to 200 µg/L		
2,4-Dinitrophenol	100 to 180 µg/L		
2-Methyl-4,6-dinitrophenol	60 to 200 µg/L		
2-Methylphenol (o-Cresol)	50 to 200 µg/L		
4-Methylphenol (p-Cresol)	50 to 200 µg/L		
2-Nitrophenol	50 to 190 µg/L		
4-Nitrophenol	100 to 180 µg/L		
Pentachlorophenol	55 to 200 µg/L		
Phenol	100 to 200 µg/L		
2,3,4,6-Tetrachlorophenol	30 to 200 µg/L		
2,4,5-Trichlorophenol	50 to 200 µg/L		
2,4,6-Trichlorophenol	50 to 200 µg/L		

**Low-Level Nitroaromatics &**

**Waste water**

**HPLC**



<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
<b>Nitramines</b>			
4-Amino-2,6-dinitrotoluene	1.0 to 20 µg/L		
2-Amino-4,6-dinitrotoluene	1.0 to 20 µg/L		
1,3-Dinitrobenzene	1.0 to 20 µg/L		
2,4-Dinitrotoluene	1.0 to 20 µg/L		
2,6-Dinitrotoluene	1.0 to 20 µg/L		
HMX	1.0 to 20 µg/L		
Nitrobenzene	1.0 to 20 µg/L		
2-Nitrotoluene	1.0 to 20 µg/L		
3-Nitrotoluene	1.0 to 20 µg/L		
4-Nitrotoluene	1.0 to 20 µg/L		
RDX	1.0 to 20 µg/L		
Tetryl	1.0 to 20 µg/L		
1,3,5-Trinitrobenzene	1.0 to 20 µg/L		
2,4,6-Trinitrotoluene	1.0 to 20 µg/L		
<b>Low-Level PAHs</b>		<b>Waste water</b>	<b>HPLC</b>
Acenaphthene	2.0 to 10 µg/L		
Acenaphthylene	2.0 to 10 µg/L		
Anthracene	0.5 to 2.0 µg/L		
Benzo(a)anthracene	0.3 to 2.0 µg/L		
Benzo(b)fluoranthene	0.3 to 2.0 µg/L		
Benzo(k)fluoranthene	0.3 to 2.0 µg/L		
Benzo(g,h,i)perylene	0.3 to 2.0 µg/L		
Benzo(a)pyrene	0.5 to 2.0 µg/L		
Chrysene	0.3 to 2.0 µg/L		
Dibenz(a,h)anthracene	0.5 to 2.0 µg/L		
Fluoranthene	0.3 to 2.0 µg/L		
Fluorene	2.0 to 10 µg/L		
Indeno(1,2,3-cd)pyrene	0.5 to 2.0 µg/L		
Naphthalene	2.0 to 10 µg/L		
Phenanthrene	0.3 to 2.0 µg/L		
Pyrene	0.3 to 2.0 µg/L		
<b>Chlorinated Acid Herbicides</b>		<b>Waste water</b>	<b>HPLC</b>
Acifluorfen	2 to 10 µg/L		
Bentazon	2 to 10 µg/L		
Chloramben	2 to 10 µg/L		
2,4-D	2 to 10 µg/L		
2,4-DB	2 to 10 µg/L		
DCPA	2 to 10 µg/L		
Dalapon	2 to 10 µg/L		
Dicamba	2 to 10 µg/L		



<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
3,5-Dichlorobenzoic acid	2 to 10 µg/L		
Dichlorprop	2 to 10 µg/L		
Dinoseb	2 to 10 µg/L		
MCPA	10 to 100 µg/L		
MCPP	10 to 100 µg/L		
4-Nitrophenol	2 to 10 µg/L		
Pentachlorophenol	2 to 10 µg/L		
Picloram	2 to 10 µg/L		
2,4,5-T	2 to 10 µg/L		
2,4,5-TP (Silvex)	2 to 10 µg/L		
<b>PCBs in Water</b>		<b>Waste water</b>	<b>GC</b>
Aroclor 1016	3.8 to 13 µg/L		
Aroclor 1221	1 to 15 µg/L		
Aroclor 1232	1.4 to 4 µg/L		
Aroclor 1242	3.8 to 13 µg/L		
Aroclor 1248	1.5 to 5.5 µg/L		
Aroclor 1254	1.7 to 5.5 µg/L		
Aroclor 1260	1.6 to 5 µg/L		
<b>Organochlorine Pesticides</b>		<b>Waste water</b>	<b>GC</b>
Aldrin	0.5 to 15.0 µg/L		
alpha-BHC	2.0 to 15 µg/L		
beta-BHC	2.0 to 15 µg/L		
delta-BHC	2.0 to 15 µg/L		
gamma-BHC (Lindane)	2.0 to 15 µg/L		
alpha-Chlordane	1.0 to 9.8 µg/L		
gamma-Chlordane	1.2 to 7.8 µg/L		
DDD (4,4)	2.0 to 10.0 µg/L		
DDE (4,4)	2.0 to 10.0 µg/L		
DDT (4,4)	1.0 to 10 µg/L		
Dieldrin	1.0 to 13 µg/L		
Endosulfan I	4.0 to 17 µg/L		
Endosulfan II	4.0 to 20 µg/L		
Endosulfan sulfate	2.0 to 20 µg/L		
Endrin	2.0 to 20 µg/L		
Endrin aldehyde	4.0 to 20 µg/L		
Endrin ketone	2.0 to 10 µg/L		
Heptachlor	1.0 to 10 µg/L		
Heptachlor Epoxide (beta)	1.0 to 10 µg/L		
Methoxychlor	2.0 to 15 µg/L		
<b>Chlordane</b>		<b>Waste water</b>	<b>GC</b>

*Peter Abney*

<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
Chlordane (total)	3.0 to 25 µg/L		
<b>Toxaphene</b>		<b>Waste water</b>	<b>GC</b>
Toxaphene	20 to 100 µg/L		
<b>Carbamate Pesticides</b>		<b>Waste water</b>	<b>HPLC</b>
Aldicarb	5 to 200 µg/L		
Aldicarb sulfone	5 to 200 µg/L		
Aldicarb sulfoxide	5 to 200 µg/L		
Baygon	5 to 200 µg/L		
Carbaryl	5 to 200 µg/L		
Carbofuran	5 to 200 µg/L		
Diuron	5 to 200 µg/L		
3-Hydroxycarbofuran	5 to 200 µg/L		
Methiocarb	5 to 200 µg/L		
Methomyl	5 to 200 µg/L		
Oxamyl (vydate)	5 to 200 µg/L		
Propham	5 to 200 µg/L		
<b>Nitrogen Pesticides</b>		<b>Waste water</b>	<b>GC</b>
Alachlor	2 to 20 µg/L		
Atrazine	2 to 20 µg/L		
Bromacil	2 to 20 µg/L		
Butachlor	2 to 20 µg/L		
Butylate	2 to 20 µg/L		
Cyanazine	2 to 20 µg/L		
Deethyl atrazine	2 to 20 µg/L		
Deisopropyl atrazine	2 to 20 µg/L		
EPTC (Eptam)	2 to 20 µg/L		
Metolachlor	2 to 20 µg/L		
Metribuzin	2 to 20 µg/L		
Napropamide	2 to 20 µg/L		
Prometon	2 to 20 µg/L		
Prometryn	2 to 20 µg/L		
Propachlor	2 to 20 µg/L		
Simazine	2 to 20 µg/L		
Trifluralin	2 to 20 µg/L		
<b>Organophosphorus Pesticides (OPP)</b>		<b>Waste water</b>	<b>GC</b>
Azinphos methyl	3.6 to 13.8 µg/L		
Carbophenothion	2 to 20 µg/L		
Chlorpyrifos	2 to 20 µg/L		

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<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
Demeton-O	2 to 20 µg/L		
Demeton-S	2 to 20 µg/L		
Diazinon	2.0 to 15 µg/L		
Dichlorvos	2 to 20 µg/L		
Dimethoate	2 to 20 µg/L		
Dioxathion	2 to 20 µg/L		
Disulfoton	2.0 to 15 µg/L		
Ethion	2 to 20 µg/L		
Ethoprop	2 to 20 µg/L		
Ethyl parathion	3.0 to 20 µg/L		
Famphur	2 to 20 µg/L		
Fonofos	2 to 20 µg/L		
Malathion	2.0 to 20 µg/L		
Methyl parathion	2 to 20 µg/L		
Phorate	2 to 20 µg/L		
Phosmet	2 to 20 µg/L		
Ronnel	2 to 20 µg/L		
Stirophos	2 to 20 µg/L		
Terbufos	2 to 20 µg/L		
<b>BTEX &amp; MTBE in Water</b>		<b>Waste water</b>	<b>GC</b>
Benzene	8 to 120 µg/L		
Ethylbenzene	9 to 100 µg/L		
Toluene	7 to 100 µg/L		
Xylenes, total	20 to 300 µg/L		
Methyl-tert-butylether (MTBE)	15 to 100 µg/L		
<b>Gasoline Range Organics (GRO) in Water</b>		<b>Waste water</b>	<b>GC</b>
Gasoline Range Organics (GRO)	200 to 4,000 µg/L		
Benzene in GRO	1 to 1,000 µg/L		
Ethylbenzene in GRO	1 to 1,000 µg/L		
Toluene in GRO	1 to 1,000 µg/L		
Xylenes, total, in GRO	1 to 1,000 µg/L		
<b>Diesel Range Organics (DRO) in Water</b>		<b>Waste water</b>	<b>GC</b>
Diesel Range Organics	500 to 4,000 µg/L		
<b>TPH in Water</b>		<b>Waste water</b>	<b>Gravimetric</b>
Total Petroleum Hydrocarbons	20 to 170 mg/L		
<b>Massachusetts VPH in Water</b>		<b>Waste water</b>	<b>GC</b>



<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
Total Hydrocarbons as VPH	200 to 4,000 µg/L		
C <sub>5</sub> -C <sub>8</sub> Aliphatic Hydrocarbons	2 to 2,000 µg/L		
C <sub>9</sub> -C <sub>12</sub> Aliphatic Hydrocarbons	2 to 2,000 µg/L		
C <sub>9</sub> -C <sub>10</sub> Aromatic Hydrocarbons	2 to 2,000 µg/L		
Benzene in VPH	1 to 1,000 µg/L		
Ethylbenzene in VPH	1 to 1,000 µg/L		
Methyl-tert-butylether (MTBE) in VPH	1 to 1,000 µg/L		
Naphthalene in VPH	1 to 1,000 µg/L		
Toluene in VPH	1 to 1,000 µg/L		
o-Xylene in VPH	1 to 1,000 µg/L		
m&p-Xylene in VPH	1 to 1,000 µg/L		
Xylenes, total in VPH	1 to 1,000 µg/L		
<b>Massachusetts EPH in Water</b>		<b>Waste water</b>	<b>GC</b>
Total Hydrocarbons as EPH	500 to 4,000 µg/L		
C <sub>9</sub> -C <sub>18</sub> Aliphatic Hydrocarbons	10 to 3,200 µg/L		
C <sub>19</sub> -C <sub>36</sub> Aliphatic Hydrocarbons	10 to 3,200 µg/L		
C <sub>11</sub> -C <sub>22</sub> Aromatic Hydrocarbons	10 to 3,200 µg/L		
Acenaphthene in EPH	1 to 40 µg/L		
Acenaphthylene in EPH	1 to 40 µg/L		
Anthracene in EPH	1 to 40 µg/L		
Benzo(a)anthracene in EPH	1 to 40 µg/L		
Benzo(b)fluoranthene in EPH	1 to 40 µg/L		
Benzo(k)fluoranthene in EPH	1 to 40 µg/L		
Benzo(g,h,i)perylene in EPH	1 to 40 µg/L		
Benzo(a)pyrene in EPH	1 to 40 µg/L		
Chrysene in EPH	1 to 40 µg/L		
Dibenz(a,h)anthracene in EPH	1 to 40 µg/L		
Fluoranthene in EPH	1 to 40 µg/L		
Fluorene in EPH	1 to 40 µg/L		
Indeno(1,2,3-cd)pyrene in EPH	1 to 40 µg/L		
2-Methylnaphthalene in EPH	1 to 40 µg/L		
Naphthalene in EPH	1 to 40 µg/L		
Phenanthrene in EPH	1 to 40 µg/L		
Pyrene in EPH	1 to 40 µg/L		
<b>Texas Low-Level Fuels (TPH) in Water</b>		<b>Waste water</b>	<b>GC</b>
No. 2 Diesel	1 to 10 mg/L		
Unleaded gasoline	1 to 10 mg/L		
Total petroleum hydrocarbons	5 to 10 mg/L		

*Peter Abney*

<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
<b>Texas High-Level Fuels (TPH) in Water</b>		<b>Waste water</b>	<b>GC</b>
No. 2 Diesel	5 to 100 mg/L		
Unleaded gasoline	5 to 100 mg/L		
Total petroleum hydrocarbons	20 to 100 mg/L		
<b>Washington TPH in Water</b>		<b>Waste water</b>	<b>Gravimetric</b>
HEM	5 to 100 mg/L		
SGT-HEM	5 to 100 mg/L		
<b>Wisconsin GRO/PVOC in Water</b>		<b>Waste water</b>	<b>GC</b>
GRO	200 to 600 µg/L		
Benzene	20 to 75 µg/L		
Ethylbenzene	20 to 75 µg/L		
Methyl tert-butyl ether	20 to 75 µg/L		
Toluene	20 to 75 µg/L		
1,2,4-Trimethylbenzene	20 to 75 µg/L		
1,3,5-Trimethylbenzene	20 to 75 µg/L		
m&p-Xylene	40 to 130 µg/L		
o-Xylene	20 to 75 µg/L		
Xylenes, total	60 to 150 µg/L		
Naphthalene	20 to 75 µg/L		
<b>Wisconsin DRO in Water</b>		<b>Waste water</b>	<b>GC</b>
DRO	200 to 600 µg/L		
<b>WS Coliform MicrobE™</b>		<b>Potable water</b>	<b>Colilert</b>
Total Coliform	Presence/Absence +/-		
Fecal Coliform/E.Coli	Presence/Absence +/-		
<b>Heterotrophic Plate Count</b>		<b>Potable water</b>	<b>Pour Plate and MPN</b>
Heterotrophic Plate Count	5 to 500 CFU/mL		
<b>SourceWatR™ E. coli</b>		<b>Potable water</b>	<b>Membrane Filtration and MPN</b>
<i>E. coli</i>	10 to 300 CFU/100 mL		
<b>Hardness</b>		<b>Potable water</b>	<b>Calculated Calculated ICP ICP</b>
Total Hardness as CaCO <sub>3</sub>	83 to 307 mg/L		
Calcium Hardness as CaCO <sub>3</sub>	75 to 375 mg/L		
Calcium	30 to 90 mg/L		
Magnesium	2.0 to 20.0 mg/L		



<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
Sodium	12 to 24 mg/L		ICP
<b>Inorganics</b>		<b>Potable water</b>	
Alkalinity (as CaCO <sub>3</sub> )	25 to 200 mg/L		<b>Titration</b>
Chloride	5 to 100 mg/L		<b>IC</b>
Fluoride	1 to 8 mg/L		<b>IC</b>
Nitrate as N	3 to 10 mg/L		<b>IC</b>
Nitrate plus Nitrite as N	3.5 to 9.0 mg/L		<b>IC</b>
Potassium	10 to 40 mg/L		<b>ICP</b>
Specific Conductance	250 to 2500 µmhos		<b>Conductivity meter</b>
Sulfate	5 to 500 mg/L		<b>IC</b>
Total Filterable Residue	200 to 450 mg/L		<b>gravimetric</b>
<b>pH</b>		<b>Potable water</b>	<b>pH meter</b>
pH	5 to 10 units		
<b>Metals</b>		<b>Potable water</b>	<b>ICP/ICP-MS</b>
Aluminum	130 to 2500 µg/L		
Antimony	6 to 50 µg/L		
Arsenic	5 to 50 µg/L		
Barium	500 to 3000 µg/L		
Beryllium	1 to 10 µg/L		
Boron	800 to 2000 µg/L		
Cadmium	2 to 50 µg/L		
Chromium	10 to 200 µg/L		
Copper	50 to 2000 µg/L		
Iron	100 to 1800 µg/L		
Lead	5 to 100 µg/L		
Manganese	40 to 900 µg/L		
Molybdenum	15 to 130 µg/L		
Nickel	10 to 500 µg/L		
Selenium	10 to 100 µg/L		
Silver	20 to 300 µg/L		
Thallium	2 to 10 µg/L		
Vanadium	315 to 2500 µg/L		
Zinc	400 to 2500 µg/L		
<b>Mercury</b>		<b>Potable water</b>	<b>CVAA</b>
Mercury	0.5 to 10 µg/L		
<b>Hexavalent Chromium</b>		<b>Potable water</b>	<b>Spec.</b>

*Peter Almyer*

<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
Chromium (VI)	5 to 50 µg/L		
<b>Uranium</b>		<b>Potable water</b>	<b>ICP/ICP-MS</b>
Uranium	3 to 104 µg/L		
<b>Vanadium</b>		<b>Potable water</b>	<b>ICP/ICP-MS</b>
Vanadium	12.4 to 13.9 µg/L		
<b>Bromide, Bromate &amp; Chlorate</b>		<b>Potable water</b>	<b>IC</b>
Bromate	7 to 50 µg/L		
Bromide	75 to 500 µg/L		
Chlorate	60 to 180 µg/L		
<b>Chlorite</b>		<b>Potable water</b>	<b>IC</b>
Chlorite	100 to 1000 µg/L		
<b>Nitrite</b>		<b>Potable water</b>	<b>IC</b>
Nitrite as N	0.4 to 2 mg/L		
<b>o-Phosphate Nutrients</b>		<b>Potable water</b>	<b>IC</b>
ortho-Phosphate as P	0.5 to 5.5 mg/L		
<b>Residual Chlorine</b>		<b>Potable water</b>	<b>Titration</b>
Free Residual Chlorine	0.5 to 3.0 mg/L		
Total Residual Chlorine	0.5 to 3.0 mg/L		
<b>Cyanide</b>		<b>Potable water</b>	<b>Spec.</b>
Cyanide	0.1 to 0.5 mg/L		
<b>Organic Carbon</b>		<b>Potable water</b>	
Dissolved Organic Carbon (DOC)	1.2 to 4.9 mg/L		
Total Organic Carbon	1.2 to 4.9 mg/L		<b>TOC meter</b>
<b>Perchlorate</b>		<b>Potable water</b>	<b>IC</b>
Perchlorate	4 to 20 µg/L		
<b>Silica</b>		<b>Potable water</b>	<b>ICP</b>
Silica as SiO <sub>2</sub>	5 to 50 mg/L		
<b>Surfactants-MBAS</b>		<b>Potable water</b>	<b>Spec.</b>
MBAS	0.05 to 1.0 mg/L		
<b>Corrosivity</b>		<b>Potable water</b>	<b>Calculated</b>



<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
Corrosivity	-4 to +4 s.i. units		
<b>Turbidity</b>		<b>Potable water</b>	<b>Turbidity meter</b>
Turbidity	0.5 to 8 NTU		
<b>UV 254 Absorbance</b>		<b>Potable water</b>	<b>Spec.</b>
UV 254 Absorbance	0.02 to 0.7 cm-1		
<b>Gasoline Additives</b>		<b>Potable water</b>	<b>GC</b>
T-amylmethylether (TAME)	5 to 50 µg/L		
tert-Butyl alcohol	5 to 50 µg/L		
Ethyl-t-butylether (ETBE)	5 to 50 µg/L		
Di-isopropylether (DIPE)	5 to 50 µg/L		
Methyl-tert-butylether (MTBE)	5 to 50 µg/L		
Trichlorotrifluoroethane (Freon 113)	5 to 50 µg/L		
Trichlorofluoromethane (Freon 11)	5 to 50 µg/L		
<b>Halomethanes (THMs)</b>		<b>Potable water</b>	<b>GC</b>
Bromodichloromethane	10 to 50 µg/L		
Bromoform	10 to 50 µg/L		
Chlorodibromomethane	10 to 50 µg/L		
Chloroform	10 to 50 µg/L		
<b>Regulated Volatiles</b>		<b>Potable water</b>	<b>GC</b>
Benzene	2.5 to 20 µg/L		
Carbon Tetrachloride	2.5 to 20 µg/L		
Chlorobenzene	2 to 50 µg/L		
1,2-Dichlorobenzene	5 to 50 µg/L		
1,4-Dichlorobenzene	2.5 to 20 µg/L		
1,2-Dichloroethane	2 to 20 µg/L		
1,1-Dichloroethylene	2 to 20 µg/L		
Cis-1,2-Dichloroethylene	2 to 50 µg/L		
Trans-1,2-Dichloroethylene	2 to 50 µg/L		
Dichloromethane (Methylene Chloride)	5 to 50 µg/L		
1,2-Dichloropropane	2.5 to 20 µg/L		
Ethylbenzene	2 to 20 µg/L		
Styrene	2 to 20 µg/L		
Tetrachloroethylene	2 to 20 µg/L		
Toluene	2 to 20 µg/L		
1,2,4-Trichlorobenzene	2 to 20 µg/L		

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<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
1,1,1-Trichloroethane	2 to 20 µg/L		
1,1,2-Trichloroethane	2 to 20 µg/L		
Trichloroethylene	2 to 20 µg/L		
Vinyl Chloride	1 to 50 µg/L		
Total Xylenes	2 to 50 µg/L		
<b>Unregulated Volatiles</b>		<b>Potable water</b>	<b>GC</b>
Bromobenzene	5 to 50 µg/L		
Bromochloromethane	5 to 50 µg/L		
Bromomethane	5 to 50 µg/L		
n-Butylbenzene	5 to 50 µg/L		
Sec-Butylbenzene	5 to 50 µg/L		
tert-Butylbenzene	5 to 50 µg/L		
Chloroethane	5 to 50 µg/L		
Chloromethane	5 to 50 µg/L		
2-Chlorotoluene	5 to 50 µg/L		
4-Chlorotoluene	5 to 50 µg/L		
Dibromomethane	5 to 50 µg/L		
1,3-Dichlorobenzene	5 to 50 µg/L		
Dichlorodifluoromethane	5 to 50 µg/L		
1,1-Dichloroethane	5 to 50 µg/L		
1,3-Dichloropropane	5 to 50 µg/L		
2,2-Dichloropropane	5 to 50 µg/L		
1,1-Dichloropropene	5 to 50 µg/L		
Cis-1,3-Dichloropropene	5 to 50 µg/L		
Trans-1,3-Dichloropropene	5 to 50 µg/L		
Hexachlorobutadiene	5 to 50 µg/L		
Isopropylbenzene	5 to 50 µg/L		
4-Isopropyltoluene	5 to 50 µg/L		
Methyl-tert-butylether (MTBE)	5 to 50 µg/L		
Naphthalene	2 to 50 µg/L		
n-Propylbenzene	5 to 50 µg/L		
1,1,1,2-Tetrachloroethane	5 to 50 µg/L		
1,1,2,2-Tetrachloroethane	5 to 50 µg/L		
1,2,3-Trichlorobenzene	5 to 50 µg/L		
Trichlorofluoromethane	5 to 50 µg/L		
1,2,3-Trichloropropane	5 to 50 µg/L		
1,2,4-Trimethylbenzene	5 to 50 µg/L		
1,3,5-Trimethylbenzene	5 to 50 µg/L		
<b>Chloral Hydrate</b>		<b>Potable water</b>	<b>GC</b>
Chloral Hydrate	4 to 30 µg/L		

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<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
<b>Haloacetic Acids (HAA)</b>		<b>Potable water</b>	<b>HPLC</b>
Bromochloroacetic Acid	10 to 50 µg/L		
Dibromoacetic Acid	10 to 50 µg/L		
Dichloroacetic Acid	10 to 50 µg/L		
Monobromoacetic Acid	10 to 50 µg/L		
Monochloroacetic Acid	10 to 50 µg/L		
Trichloroacetic Acid	10 to 50 µg/L		
<b>Dioxin</b>		<b>Potable water</b>	<b>GC</b>
2,3,7,8-Tetrachloro-dibenzodioxin	25 to 80 pg/L		
<b>PCBs</b>		<b>Potable water</b>	<b>GC</b>
PCBs as decachlorobiphenyl	0.5 to 5 µg/L		
Aroclor 1016	0.26 to 2.6 µg/L		
Aroclor 1221	0.19 to 1.9 µg/L		
Aroclor 1232	0.23 to 2.3 µg/L		
Aroclor 1242	0.26 to 2.6 µg/L		
Aroclor 1248	0.3 to 3 µg/L		
Aroclor 1254	0.33 to 3.3 µg/L		
Aroclor 1260	0.36 to 3.6 µg/L		
<b>Regulated Semivolatiles #1</b>		<b>Potable water</b>	<b>HPLC</b>
Acenaphthene	1 to 10 µg/L		
Acenaphthylene	1 to 10 µg/L		
Anthracene	1 to 10 µg/L		
Benzo(a)anthracene	1 to 10 µg/L		
Benzo(b)fluoranthene	1 to 10 µg/L		
Benzo(k)fluoranthene	1 to 10 µg/L		
Benzo(g,h,i)perylene	1 to 10 µg/L		
Benzo(a)pyrene	0.2 to 2.5 µg/L		
Butylbenzylphthalate	10 to 50 µg/L		
Chrysene	1 to 10 µg/L		
Dibenz(a,h)anthracene	1 to 10 µg/L		
Di-n-butylphthalate	10 to 50 µg/L		
Diethylphthalate	10 to 50 µg/L		
Dimethylphthalate	10 to 50 µg/L		
Di-n-octylphthalate	10 to 50 µg/L		
bis(2-Ethylhexyl) Adipate	8 to 50 µg/L		(GC)
bis(2-Ethylhexyl) Phthalate	9 to 50 µg/L		
Fluoranthene	1 to 10 µg/L		
Fluorene	1 to 10 µg/L		

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<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
Indeno(1,2,3-cd)pyrene	1 to 10 µg/L		
Naphthalene	2 to 50 µg/L		
Phenanthrene	1 to 10 µg/L		
Pyrene	1 to 10 µg/L		
<b>Chlorinate Acid Herbicides</b>		<b>Potable water</b>	<b>HPLC</b>
Acifluorfen	15 to 50 µg/L		
Bentazon	10 to 140 µg/L		
Chloramben	20 to 100 µg/L		
2,4-D	5 to 150 µg/L		
2,4-DB	15 to 100 µg/L		
DCPA	20 to 100 µg/L		
Dalapon	10 to 150 µg/L		
Dicamba	5 to 100 µg/L		
3,5-Dichlorobenzoic acid	10 to 100 µg/L		
Dichlorprop	10 to 100 µg/L		
Dinoseb	6 to 50 µg/L		
4-Nitrophenol	5 to 150 µg/L		
Pentachlorophenol	1 to 100 µg/L		
Picloram	10 to 70 µg/L		
2,4,5-T	10 to 100 µg/L		
2,4,5-TP (Silvex)	5 to 150 µg/L		
<b>Regulated Semivolatiles #2 Herbicides</b>		<b>Potable water</b>	<b>HPLC</b>
Diquat	8 to 40 µg/L		
Endothall	90 to 500 µg/L		
Glyphosate	375 to 800 µg/L		
Paraquat	8 to 100 µg/L		
<b>Pesticides</b>		<b>Potable water</b>	<b>GC</b>
Alachlor	2 to 20 µg/L		
Aldrin	0.4 to 2 µg/L		
Atrazine	3 to 30 µg/L		
Bromacil	2 to 20 µg/L		
Butachlor	8 to 80 µg/L		
Diazinon	0.1 to 100 µg/L		
Dieldrin	0.5 to 3 µg/L		
Endrin	0.1 to 5 µg/L		
Heptachlor	0.4 to 5 µg/L		
Heptachlor Epoxide (beta)	0.2 to 5 µg/L		
Hexachlorobenzene	0.5 to 4 µg/L		
Hexachlorocyclopentadiene	2 to 30 µg/L		

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<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
Lindane	0.2 to 5 µg/L		
Methoxychlor	10 to 100 µg/L		
Metolachlor	8 to 80 µg/L		
Metribuzin	2 to 60 µg/L		
Molinate (ordram)	5 to 50 µg/L		
Prometon	0.1 to 100 µg/L		
Propachlor	1 to 4 µg/L		
Simazine	4 to 40 µg/L		
Trifluralin	1.0 to 5 µg/L		
<b>Carbamate/Carbamoxyloxime Pesticides</b>		<b>Potable water</b>	<b>HPLC</b>
Aldicarb	15 to 50 µg/L		
Aldicarb Sulfone	19 to 50 µg/L		
Aldicarb Sulfoxide	15 to 50 µg/L		
Baygon	30 to 140 µg/L		
Carbaryl	20 to 100 µg/L		
Carbofuran	15 to 150 µg/L		
3-Hydroxycarbofuran	15 to 75 µg/L		
Methiocarb	30 to 140 µg/L		
Methomyl	15 to 90 µg/L		
Oxamyl (Vydate)	30 to 80 µg/L		
<b>Chlordane</b>		<b>Potable water</b>	<b>GC</b>
Chlordane (technical)	2 to 20 µg/L		
<b>Toxaphene</b>		<b>Potable water</b>	<b>GC</b>
Toxaphene (total)	3 to 20 µg/L		
<b>EDB/DBCP/TCP</b>		<b>Potable water</b>	<b>GC</b>
1,2-Dibromo-3-chloropropane (DBCP)	0.1 to 2 µg/L		
Ethylene Dibromide (EDB)	0.2 to 2 µg/L		
1,2,3-Trichloropropane	0.2 to 2.0 µg/L		
<b>Metals in Soil</b>		<b>Soil</b>	<b>ICP/ICP-MS</b>
Aluminum	1,000 to 25,000		
Antimony	80 to 300 mg/kg		
Arsenic	40 to 400 mg/kg		
Barium	100 to 1,000 mg/kg		
Beryllium	40 to 400 mg/kg		
Boron	80 to 200 mg/kg		
Cadmium	40 to 400 mg/kg		

*Peter Abney*

<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
Calcium	1,500 to 25,000 mg/kg		
Chromium	40 to 400 mg/kg		
Cobalt	40 to 400 mg/kg		
Copper	40 to 400 mg/kg		
Iron	1,000 to 50,000 mg/kg		
Lead	40 to 400 mg/kg		
Magnesium	1,200 to 25,000 mg/kg		
Manganese	100 to 2,000 mg/kg		
Mercury	1 to 35 mg/kg		
Molybdenum	30 to 300 mg/kg		
Nickel	40 to 500 mg/kg		
Potassium	1,400 to 25,000 mg/kg		
Selenium	40 to 400 mg/kg		
Silver	20 to 100 mg/kg		
Sodium	150 to 15,000 mg/kg		
Strontium	40 to 400 mg/kg		
Thallium	40 to 400 mg/kg		
Tin	75 to 250 mg/kg		
Titanium	10 to 2,000 mg/kg		
Vanadium	40 to 400 mg/kg		
Zinc	100 to 1,000 mg/kg		
<b>Hexavalent Chromium in Soil</b>		<b>Soil</b>	<b>Spec.</b>
Chromium VI	40 to 300 mg/kg		
<b>TCLP Metals in Soil</b>		<b>Soil</b>	<b>ICP</b>
Antimony	0.2 to 20 mg/L		
Arsenic	0.5 to 40 mg/L		
Barium	0.5 to 500 mg/L		
Beryllium	0.1 to 5 mg/L		
Cadmium	0.5 to 5 mg/L		
Chromium	0.5 to 50 mg/L		
Lead	0.5 to 150 mg/L		
Mercury	0.1 to 10 mg/L		
Nickel	0.5 to 20 mg/L		
Selenium	0.5 to 10 mg/L		
Silver	0.2 to 40 mg/L		
Zinc	0.5 to 30 mg/L		
<b>Metals in SewageSludG™</b>		<b>Sludge</b>	<b>ICP/ICP-MS</b>
Aluminum	1,000 to 50,000		
Antimony	80 to 300 mg/kg		

*Peter Abney*

<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
Arsenic	50 to 400 mg/kg		
Barium	250 to 2,000 mg/kg		
Beryllium	30 to 200 mg/kg		
Cadmium	40 to 300 mg/kg		
Calcium	5,000 to 70,000 mg/kg		
Chromium	40 to 300 mg/kg		
Cobalt	5 to 50 mg/kg		
Copper	40 to 1,000 mg/kg		
Iron	1,000 to 50,000 mg/kg		
Lead	50 to 250 mg/kg		
Magnesium	1,200 to 25,000 mg/kg		
Manganese	100 to 2,000 mg/kg		
Mercury	1 to 50 mg/kg		
Molybdenum	5 to 250 mg/kg		
Nickel	40 to 250 mg/kg		
Potassium	1,400 to 25,000 mg/kg		
Selenium	50 to 250 mg/kg		
Silver	50 to 250 mg/kg		
Sodium	150 to 15,000 mg/kg		
Strontium	200 to 2,000 mg/kg		
Thallium	50 to 250 mg/kg		
Vanadium	5 to 250 mg/kg		
Zinc	70 to 1,500 mg/kg		
<b>Anions in Soil</b>		<b>Soil</b>	<b>IC</b>
Bromide	10 to 200 mg/Kg		
Chloride	25 to 2,000 mg/Kg		
Fluoride	25 to 500 mg/Kg		
Nitrate as N	25 to 500 mg/Kg		
Phosphate as P	25 to 500 mg/Kg		
Sulfate	25 to 2,000 mg/Kg		
<b>Cyanide in Soil</b>		<b>Soil</b>	<b>Spec.</b>
Total Cyanide	5 to 500 mg/kg		
<b>Nutrients in Soil</b>		<b>Soil</b>	
Ammonia as N	100 to 5,000 mg/Kg		<b>Electrode</b>
Total Kjeldahl Nitrogen	100 to 5,000 mg/Kg		<b>Electrode</b>
Total Organic Carbon	1,000 to 15,000 mg/Kg		<b>Titration</b>
Total Phosphorus	100 to 5,000 mg/Kg		<b>ICP</b>
<b>Corrosivity/pH in Soil</b>		<b>Soil</b>	
Corrosivity (pH)	2 to 12 S.U.		<b>Meter</b>



<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
<b>Ignitability/Flash Point</b>		<b>Soil</b>	
Flash point/Ignitability	100 to 200 °F		<b>Pensky-Martens cup</b>
<b>Volatiles in Soil</b>		<b>Soil</b>	<b>GC</b>
Acetone	160 to 400 µg/kg		
Acetonitrile	200 to 1,000 µg/kg		
Acrolein	20 to 200 µg/kg		
Benzene	20 to 200 µg/kg		
Bromobenzene	40 to 200 µg/kg		
Bromodichloromethane	20 to 200 µg/kg		
Bromoform	20 to 200 µg/kg		
Bromomethane	80 to 200 µg/kg		
2-Butanone (MEK)	160 to 400 µg/kg		
tert-Butyl methyl ether (MTBE)	20 to 200 µg/kg		
Carbon disulfide	20 to 200 µg/kg		
Carbon tetrachloride	20 to 200 µg/kg		
Chlorobenzene	20 to 200 µg/kg		
Chlorodibromomethane	20 to 200 µg/kg		
Chloroethane	80 to 200 µg/kg		
2-Chloroethylvinylether	20 to 200 µg/kg		
Chloroform	20 to 200 µg/kg		
Chloromethane	80 to 200 µg/kg		
1,2-Dibromo-3-chloropropane (DBCP)	40 to 200 µg/kg		
1,2-Dibromoethane (EDB)	40 to 200 µg/kg		
Dibromomethane	20 to 200 µg/kg		
1,2-Dichlorobenzene	20 to 200 µg/kg		
1,3-Dichlorobenzene	20 to 200 µg/kg		
1,4-Dichlorobenzene	20 to 200 µg/kg		
Dichlorodifluoromethane	80 to 200 µg/kg		
1,1-Dichloroethane	20 to 200 µg/kg		
1,2-Dichloroethane	20 to 200 µg/kg		
1,1-Dichloroethylene	40 to 200 µg/kg		
cis-1,2-Dichloroethylene	40 to 200 µg/kg		
trans-1,2-Dichloroethylene	40 to 200 µg/kg		
1,2-Dichloropropane	20 to 200 µg/kg		
cis-1,3-Dichloropropylene	40 to 200 µg/kg		
trans-1,3-Dichloropropylene	40 to 200 µg/kg		
Ethylbenzene	20 to 200 µg/kg		
2-Hexanone	160 to 400 µg/kg		
Isopropyl benzene	40 to 200 µg/kg		

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<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
Methylene chloride	20 to 200 µg/kg		
4-Methyl-2-pentanone (MIBK)	80 to 200 µg/kg		
Naphthalene	40 to 200 µg/kg		
Styrene	40 to 200 µg/kg		
1,1,1,2-Tetrachloroethane	20 to 200 µg/kg		
1,1,2,2-Tetrachloroethane	20 to 200 µg/kg		
Tetrachloroethene	20 to 200 µg/kg		
Toluene	20 to 200 µg/kg		
1,2,4-Trichlorobenzene	40 to 200 µg/kg		
1,1,1-Trichloroethane	20 to 200 µg/kg		
1,1,2-Trichloroethane	20 to 200 µg/kg		
Trichloroethylene	20 to 200 µg/kg		
Trichlorofluoromethane (Freon 11)	80 to 200 µg/kg		
1,2,3-Trichloropropane	40 to 200 µg/kg		
Vinyl acetate	20 to 200 µg/kg		
Vinyl chloride	80 to 200 µg/kg		
Xylenes, total	40 to 200 µg/kg		

**Ready-to-Use VOAs in Soil**

Acetone	4,000 to 20,000 µg/kg		
Acetonitrile	1,000 to 15,000 µg/kg		
Acrolein	1,000 to 15,000 µg/kg		
Benzene	1,000 to 10,000 µg/kg		
Bromobenzene	2,000 to 10,000 µg/kg		
Bromodichlormethane	1,000 to 10,000 µg/kg		
Bromoform	1,000 to 10,000 µg/kg		
Bromomethane	2,000 to 10,000 µg/kg		
2-Butanone (MEK)	4,000 to 20,000 µg/kg		
tert-Butyl methyl ether (MTBE)	2,000 to 10,000 µg/kg		
Carbon disulfide	1,000 to 15,000 µg/kg		
Carbon tetrachloride	1,000 to 10,000 µg/kg		
Chlorobenzene	1,000 to 10,000 µg/kg		
Chlorodibromomethane	1,000 to 10,000 µg/kg		
Chloroethane	2,000 to 10,000 µg/kg		
2-Chloroethylvinylether	1,000 to 15,000 µg/kg		
Chloroform	1,000 to 10,000 µg/kg		
Chloromethane	2,000 to 10,000 µg/kg		
1,2-Dibromo-3chloropropane (DBCP)	2,000 to 10,000 µg/kg		
1,2-Dibromoethane (EDB)	2,000 to 10,000 µg/kg		
Dibromomethane	2,000 to 10,000 µg/kg		
1,2-Dichlorobenzene	1,000 to 10,000 µg/kg		
1,3-Dichlorobenzene	1,000 to 10,000 µg/kg		

**Soil**

**GC**

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<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
1,4-Dichlorobenzene	1,000 to 10,000 µg/kg		
Dichlorodifluoromethane	2,000 to 10,000 µg/kg		
1,1-Dichloroethane	1,000 to 10,000 µg/kg		
1,2-Dichloroethane	1,500 to 10,000 µg/kg		
1,1-Dichloroethylene	2,000 to 10,000 µg/kg		
cis-1,2-Dichloroethylene	2,000 to 10,000 µg/kg		
trans-1,2-Dichloroethylene	2,000 to 10,000 µg/kg		
1,2-Dichloropropane	2,000 to 10,000 µg/kg		
cis-1,3-Dichloropropylene	2,000 to 10,000 µg/kg		
trans-1,2-Dichloropropylene	2,000 to 10,000 µg/kg		
Ethylbenzene	1,000 to 10,000 µg/kg		
2-Hexanone	8,000 to 20,000 µg/kg		
Hexachlorobutadiene	1,500 to 15,000 µg/kg		
Hexachloroethane	1,500 to 15,000 µg/kg		
Isopropylbenzene	2,000 to 10,000 µg/kg		
Methylene chloride	1,000 to 10,000 µg/kg		
4-Methyl-2-pentanone (MIBK)	4,000 to 20,000 µg/kg		
Naphthalene	2,000 to 10,000 µg/kg		
Nitrobenzene	1,500 to 15,000 µg/kg		
Styrene	2,000 to 10,000 µg/kg		
1,1,1,2-Tetrachloroethane	1,000 to 10,000 µg/kg		
1,1,2,2-Tetrachloroethane	1,500 to 10,000 µg/kg		
Tetrachloroethylene	1,000 to 10,000 µg/kg		
Toluene	1,000 to 10,000 µg/kg		
1,2,4-Trichlorobenzene	2,000 to 10,000 µg/kg		
1,1,1-Trichloroethane	1,000 to 10,000 µg/kg		
1,1,2-Trichloroethane	1,000 to 10,000 µg/kg		
Trichloroethene	1,000 to 10,000 µg/kg		
Trichlorofluoromethane (Freon 11)	2,000 to 10,000 µg/kg		
1,2,3-Trichloropropane	1,500 to 10,000 µg/kg		
Vinyl acetate	1,000 to 15,000 µg/kg		
Vinyl chloride	2,000 to 10,000 µg/kg		
Xylenes, total	2,000 to 20,000 µg/kg		
<b>Nitroaromatics &amp; Nitramines in</b>			
<b>Soil</b>		<b>Soil</b>	<b>HPLC</b>
4-Amino-2,6-dinitrotoluene	1,500 to 15,000 µg/kg		
2-Amino-4,6-dinitrotoluene	1,500 to 15,000 µg/kg		
1,3-Dinitrobenzene	1,500 to 15,000 µg/kg		
2,4-Dinitrotoluene	1,500 to 15,000 µg/kg		
2,6-Dinitrotoluene	1,500 to 15,000 µg/kg		
HMX	1,500 to 15,000 µg/kg		
Nitrobenzene	1,500 to 15,000 µg/kg		

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<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
2-Nitrotoluene	1,500 to 15,000 µg/kg		
3-Nitrotoluene	1,500 to 15,000 µg/kg		
4-Nitrotoluene	1,500 to 15,000 µg/kg		
RDX	1,500 to 15,000 µg/kg		
Tetryl	1,500 to 15,000 µg/kg		
1,3,5-Trinitrobenzene	1,500 to 15,000 µg/kg		
2,4,6-Trinitrotoluene	1,500 to 15,000 µg/kg		
<b>Low-Level PAHs in Soil</b>		<b>Soil</b>	<b>HPLC</b>
Acenaphthene	150 to 1,000 µg/kg		
Acenaphthylene	150 to 1,000 µg/kg		
Anthracene	100 to 1,000 µg/kg		
Benzo(a)anthracene	50 to 500 µg/kg		
Benzo(b)fluoranthene	50 to 500 µg/kg		
Benzo(k)fluoranthene	50 to 500 µg/kg		
Benzo(g,h,i)perylene	100 to 1,000 µg/kg		
Benzo(a)pyrene	50 to 500 µg/kg		
Chrysene	50 to 500 µg/kg		
Dibenz(a,h)anthracene	50 to 500 µg/kg		
Fluoranthene	100 to 1,000 µg/kg		
Fluorene	50 to 500 µg/kg		
Indeno(1,2,3-cd)pyrene	50 to 500 µg/kg		
Naphthalene	150 to 1,000 µg/kg		
Phenanthrene	100 to 1,000 µg/kg		
Pyrene	50 to 500 µg/kg		
<b>Base/Neutrals &amp; Acids in Soil</b>		<b>Soil</b>	<b>Base/Neutrals by GC and Acids by HPLC</b>
Acenaphthene	1,000 to 12,000 µg/kg		
Acenaphthylene	1,000 to 12,000 µg/kg		
Aniline	500 to 15,000 µg/kg		
Anthracene	1,000 to 12,000 µg/kg		
Benzoic acid	500 to 15,000 µg/kg		
Benzo(a)anthracene	1,000 to 12,000 µg/kg		
Benzo(b)fluoranthene	1,000 to 12,000 µg/kg		
Benzo(k)fluoranthene	1,000 to 12,000 µg/kg		
Benzo(g,h,i)perylene	1,000 to 12,000 µg/kg		
Benzo(a)pyrene	1,000 to 12,000 µg/kg		
Benzyl alcohol	500 to 15,000 µg/kg		
Bis(2-chloroethyl)ether	1,500 to 15,000 µg/kg		
Bis(2-chloroisopropyl)ether	1,500 to 15,000 µg/kg		
Bis(2-chloroethoxy)methane	1,500 to 15,000 µg/kg		

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<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
Bis(2-ethylhexyl)phthalate	1,500 to 15,000 µg/kg		
4-Bromophenyl-phenylether	1,500 to 15,000 µg/kg		
Butylbenzylphthalate	1,500 to 15,000 µg/kg		
Carbazole	500 to 15,000 µg/kg		
4-Chloroaniline	500 to 15,000 µg/kg		
4-Chloro-3-methylphenol	1,500 to 15,000 µg/kg		
1-Chloronaphthalene	500 to 15,000 µg/kg		
2-Chloronaphthalene	1,000 to 10,000 µg/kg		
2-Chlorophenol	1,500 to 15,000 µg/kg		
4-Chlorophenyl-phenylether	1,500 to 15,000 µg/kg		
Chrysene	1,000 to 12,000 µg/kg		
Dibenz(a,h)anthracene	1,000 to 12,000 µg/kg		
Dibenzofuran	1,500 to 15,000 µg/kg		
Di-n-butylphthalate	1,500 to 15,000 µg/kg		
1,2-Dichlorobenzene	1,500 to 15,000 µg/kg		
1,3-Dichlorobenzene	1,500 to 15,000 µg/kg		
1,4-Dichlorobenzene	1,500 to 15,000 µg/kg		
2,4-Dichlorophenol	1,500 to 15,000 µg/kg		
2,6-Dichlorophenol	1,500 to 15,000 µg/kg		
Diethylphthalate	1,500 to 15,000 µg/kg		
2,4-Dimethylphenol	3,000 to 15,000 µg/kg		
Dimethylphthalate	1,500 to 15,000 µg/kg		
2,4-Dinitrophenol	3,000 to 15,000 µg/kg		
2,4-Dinitrotoluene	1,500 to 15,000 µg/kg		
2,6-Dinitrotoluene	1,500 to 15,000 µg/kg		
Di-n-octylphthalate	1,500 to 15,000 µg/kg		
Fluoranthene	1,000 to 12,000 µg/kg		
Fluorene	1,000 to 12,000 µg/kg		
Hexachlorobenzene	1,500 to 15,000 µg/kg		
Hexachlorobutadiene	1,500 to 15,000 µg/kg		
Hexachlorocyclopentadiene	1,500 to 15,000 µg/kg		
Hexachloroethane	1,500 to 15,000 µg/kg		
Indeno(1,2,3-cd)pyrene	1,000 to 12,000 µg/kg		
Isophorone	1,500 to 15,000 µg/kg		
2-Methyl-4,6-Dinitrophenol	3,000 to 15,000 µg/kg		
2-Methylnaphthalene	1,000 to 12,000 µg/kg		
2-Methylphenol	3,000 to 15,000 µg/kg		
4-Methylphenol	3,000 to 15,000 µg/kg		
Naphthalene	1,000 to 12,000 µg/kg		
2-Nitroaniline	500 to 15,000 µg/kg		
3-Nitroaniline	500 to 15,000 µg/kg		
4-Nitroaniline	500 to 15,000 µg/kg		
Nitrobenzene	1,500 to 15,000 µg/kg		

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<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
2-Nitrophenol	3,000 to 15,000 µg/kg		
4-Nitrophenol	3,000 to 15,000 µg/kg		
N-Nitroso-dimethylamine	1,500 to 15,000 µg/kg		
N-Nitroso-diphenylamine	1,500 to 15,000 µg/kg		
N-Nitroso-di-n-propylamine	1,500 to 15,000 µg/kg		
Pentachlorophenol	3,000 to 15,000 µg/kg		
Phenanthrene	1,000 to 12,000 µg/kg		
Phenol	1,500 to 15,000 µg/kg		
Pyrene	1,000 to 12,000 µg/kg		
Pyridine	500 to 15,000 µg/kg		
1,2,4-Trichlorobenzene	1,500 to 15,000 µg/kg		
2,4,5-Trichlorophenol	1,500 to 15,000 µg/kg		
2,4,6-Trichlorophenol	1,500 to 15,000 µg/kg		
<b>Organochlorine Pesticides in Soil</b>		<b>Soil</b>	<b>GC</b>
Aldrin	50 to 500 µg/kg		
alpha-BHC	50 to 500 µg/kg		
beta-BHC	50 to 500 µg/kg		
delta-BHC	50 to 500 µg/kg		
gamma-BHC (Lindane)	50 to 500 µg/kg		
alpha-Chlordane	50 to 500 µg/kg		
gamma-Chlordane	50 to 500 µg/kg		
4,4-DDD	50 to 500 µg/kg		
4,4-DDE	50 to 500 µg/kg		
4,4'-DDT	50 to 500 µg/kg		
Dieldrin	50 to 500 µg/kg		
Endosulfan I	50 to 500 µg/kg		
Endosulfan II	50 to 500 µg/kg		
Endosulfan sulfate	50 to 500 µg/kg		
Endrin	50 to 500 µg/kg		
Endrin aldehyde	50 to 500 µg/kg		
Endrin ketone	50 to 500 µg/kg		
Heptachlor	50 to 500 µg/kg		
Heptachlor epoxide	50 to 500 µg/kg		
Methoxychlor	50 to 500 µg/kg		
<b>Chlordane in Soil</b>		<b>Soil</b>	<b>GC</b>
Chlordane (total)	200 to 1,000 µg/kg		
<b>Toxaphene in Soil</b>		<b>Soil</b>	<b>GC</b>
Toxaphene	200 to 2,000 µg/kg		

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<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
<b>Carbamate Pesticides in Soil</b>		<b>Soil</b>	<b>HPLC</b>
Aldicarb	250 to 2,500 µg/kg		
Aldicarb sulfone	250 to 2,500 µg/kg		
Aldicarb sulfoxide	250 to 2,500 µg/kg		
Carbaryl	250 to 2,500 µg/kg		
Carbofuran	250 to 2,500 µg/kg		
Dioxacarb	250 to 2,500 µg/kg		
Diuron	250 to 2,500 µg/kg		
3-Hydroxycarbofuran	250 to 2,500 µg/kg		
Methiocarb	250 to 2,500 µg/kg		
Methomyl	250 to 2,500 µg/kg		
Oxamyl	250 to 2,500 µg/kg		
Promecarb	250 to 2,500 µg/kg		
Propham	250 to 2,500 µg/kg		
Propoxur (Baygon)	250 to 2,500 µg/kg		
<b>Organophosphorus Pesticides (OPP) in Soil</b>		<b>Soil</b>	<b>HPLC</b>
Azinphos-methyl (Guthion)	100 to 1,000 µg/kg		
Chlorpyrifos	100 to 1,000 µg/kg		
Demeton-O	100 to 1,000 µg/kg		
Demeton-S	100 to 1,000 µg/kg		
Diazinon	100 to 1,000 µg/kg		
Dichlorvos (DDVP)	100 to 1,000 µg/kg		
Disulfoton	100 to 1,000 µg/kg		
Malathion	100 to 1,000 µg/kg		
Parathion, ethyl	100 to 1,000 µg/kg		
Parathion, methyl	100 to 1,000 µg/kg		
Phorate	100 to 1,000 µg/kg		
Ronnel	100 to 1,000 µg/kg		
Stirophos (Tetrachlorovinphos)	100 to 1,000 µg/kg		
<b>Chlorinated Acid Herbicides in Soil</b>		<b>Soil</b>	<b>HPLC</b>
Acifluorfen	100 to 1,000 µg/kg		
Bentazon	100 to 1,000 µg/kg		
Chloramben	100 to 1,000 µg/kg		
2,4-D	100 to 1,000 µg/kg		
2,4-DB	100 to 1,000 µg/kg		
DCPA (Dacthal diacid)			
Dalapon	100 to 2,500 µg/kg		
Dicamba	100 to 1,000 µg/kg		
3,5-Dichlorobenzoic acid	100 to 1,000 µg/kg		

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<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
Dichlorprop	100 to 1,000 µg/kg		
Dinoseb	100 to 1,000 µg/kg		
MCPA	1,000 to 10,000 µg/kg		
MCPP	250 to 10,000 µg/kg		
4-Nitrophenol	100 to 1,000 µg/kg		
Pentachlorophenol	100 to 1,000 µg/kg		
Picloram	100 to 1,000 µg/kg		
2,4,5-T	100 to 1,000 µg/kg		
2,4,5-TP (Silvex)	100 to 1,000 µg/kg		
<b>PCBs in Soil</b>		<b>Soil</b>	<b>GC</b>
Aroclor 1016	1 to 50 mg/kg		
Aroclor 1221	1 to 50 mg/kg		
Aroclor 1232	1 to 50 mg/kg		
Aroclor 1242	1 to 50 mg/kg		
Aroclor 1248	1 to 50 mg/kg		
Aroclor 1254	1 to 50 mg/kg		
Aroclor 1260	1 to 50 mg/kg		
<b>PCBs in Oil</b>		<b>Oil</b>	<b>GC</b>
Aroclor 1016	17 to 50 mg/kg		
Aroclor 1242	17 to 50 mg/kg		
Aroclor 1254	16 to 50 mg/kg		
Aroclor 1260	12 to 50 mg/kg		
<b>BTEX &amp; MTBE in Soil</b>		<b>Soil</b>	<b>GC</b>
Benzene	20 to 200 µg/kg		
Ethylbenzene	20 to 200 µg/kg		
Toluene	20 to 200 µg/kg		
Xylenes, total	40 to 400 µg/kg		
Methyl-tert-butylether (MTBE)	20 to 200 µg/kg		
<b>Gasoline Range Organics (GRO) in Soil</b>		<b>Soil</b>	<b>GC</b>
Gasoline Range Organics (GRO)	100 to 2,000 mg/kg		
Benzene in GRO	0.5 to 400 mg/kg		
Ethylbenzene in GRO	1 to 400 mg/kg		
Toluene in GRO	1 to 400 mg/kg		
Xylenes, total, in GRO	1 to 400 mg/kg		
<b>Diesel Range Organics (DRO) in Soil</b>		<b>Soil</b>	<b>GC</b>
Diesel Range Organics	300 to 3,000 mg/kg		

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<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
<b>TPH in Soil</b> non-Polar Extractable Material (TPH)	300 to 3,000 mg/kg	Soil	Gravimetric
<b>Oil &amp; Grease (O&amp;G) in Soil</b> n-Hexane Extractable Materials (O&G)	300 to 3,000 mg/kg	Soil	Gravimetric
<b>Arizona TPH in Soil</b> No. 2 Diesel (C10-C22) Oil Range Organics (C22-C32) TPH in Soil (C10-C32)	50 to 150 mg/kg 200 to 300 mg/kg 300 to 400 mg/kg	Soil	GC
<b>Massachusetts VPH in Soil</b> Total Hydrocarbons as VPH <sup>a</sup> C <sub>5</sub> -C <sub>8</sub> Aliphatic Hydrocarbons C <sub>9</sub> -C <sub>12</sub> Aliphatic Hydrocarbons C <sub>9</sub> -C <sub>10</sub> Aromatic Hydrocarbons Benzene in VPH Ethylbenzene in VPH Methyl-tert-butylether (MTBE) in VPH Naphthalene in VPH Toluene in VPH o-Xylene in VPH m&p-Xylene in VPH Xylenes, total in VPH	100 to 2,000 mg/kg 1 to 1,000 mg/kg 1 to 1,000 mg/kg 1 to 1,000 mg/kg 0.5 to 500 mg/kg 0.5 to 500 mg/kg 0.5 to 500 mg/kg 0.5 to 500 mg/kg 0.5 to 500 mg/kg 0.5 to 500 mg/kg 0.5 to 500 mg/kg 0.5 to 500 mg/kg	Soil	GC
<b>Massachusetts EPH in Soil</b> Total Hydrocarbons as EPH <sup>a</sup> C <sub>9</sub> -C <sub>18</sub> Aliphatic Hydrocarbons C <sub>19</sub> -C <sub>36</sub> Aliphatic Hydrocarbons C <sub>11</sub> -C <sub>22</sub> Aromatic Hydrocarbons Acenaphthene in EPH Acenaphthylene in EPH Anthracene in EPH Benzo(a)anthracene in EPH Benzo(b)fluoranthene in EPH Benzo(k)fluoranthene in EPH Benzo(g,h,i)perylene in EPH Benzo(a)pyrene in EPH Chrysene in EPH	300 to 3,000 mg/kg 2 to 3,000 mg/kg 2 to 3,000 mg/kg 2 to 3,000 mg/kg 0.2 to 500 mg/kg 0.2 to 500 mg/kg 0.2 to 500 mg/kg 0.2 to 500 mg/kg 0.2 to 500 mg/kg 0.2 to 500 mg/kg 0.2 to 500 mg/kg 0.2 to 500 mg/kg 0.2 to 500 mg/kg 0.2 to 500 mg/kg	Soil	GC

*Peter Abney*

<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
Dibenz(a,h)anthracene in EPH	0.2 to 500 mg/kg		
Fluoranthene in EPH	0.2 to 500 mg/kg		
Fluorene in EPH	0.2 to 500 mg/kg		
Indeno(1,2,3-cd)pyrene in EPH	0.2 to 500 mg/kg		
2-Methylnaphthalene in EPH	0.2 to 500 mg/kg		
Naphthalene in EPH	0.2 to 500 mg/kg		
Phenanthrene in EPH	0.2 to 500 mg/kg		
Pyrene in EPH	0.2 to 500 mg/kg		
<b>Texas Low-Level Fuels (TPH) in Soil</b>		<b>Soil</b>	<b>GC</b>
No. 2 Diesel	20 to 70 mg/kg		
Unleaded gasoline	20 to 70 mg/kg		
Total petroleum hydrocarbons	50 to 100 mg/kg		
<b>Texas High-Level Fuels (TPH) in Soil</b>		<b>Soil</b>	<b>GC</b>
No. 2 Diesel	300 to 15,000 mg/kg		
Unleaded gasoline	300 to 15,000 mg/kg		
Total petroleum hydrocarbons	1,000 to 20,000 mg/kg		
<b>Strontium-89/90</b>		<b>Potable water</b>	<b>Beta-discriminating liquid scintillation counter</b>
Strontium-89	10 to 70 pCi/L		
Strontium-90	2 to 45 pCi/L		
<b>Gamma EmitterS™</b>		<b>Potable water</b>	<b>Gamma Spectrometry</b>
Barium-133	9 to 110 pCi/L		
Cesium-134	10 to 100 pCi/L		
Cesium-137	20 to 240 pCi/L		
Cobalt-60	10 to 120 pCi/L		
Zinc-65	30 to 360 pCi/L		
<b>GroSS™ Alpha/Beta</b>		<b>Potable water</b>	<b>Alpha/Beta-discriminating liquid scintillation counter</b>
Gross Alpha	3 to 75 pCi/L		
Gross Beta	4 to 75 pCi/L		
<b>Iodine-131</b>		<b>Potable water</b>	<b>Beta-discriminating liquid scintillation counter</b>
Iodine-131	1 to 30 pCi/L		
<b>NaturalS™</b>		<b>Potable water</b>	<b>Gamma</b>



<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
Radium-226	1 to 20 pCi/L	Potable water	Spectrometry
Radium-228	1 to 20 pCi/L		
Natural Uranium	2 to 70 pCi/L		
Uranium (mass)	3 to 104 µg/L		
<b>Tritium™</b>			
Tritium	1000 to 32000 pCi/L		ICP/MS or ICP Beta-discriminating liquid scintillation counter
<b>Water Gross Alpha/Beta</b>		Water	Alpha/Beta-discriminating liquid scintillation counter
Gross Alpha (as Thorium-230)	5,000 to 50,000 pCi/L		
Gross Beta (as Cesium-137)	5,000 to 50,000 pCi/L		
<b>Water Tritium™</b>		Water	Beta-discriminating liquid scintillation counter
Tritium	300 to 30,000 pCi/L		
<b>Metals on Filter Paper</b>		Filter Paper	ICP/ICP-MS
Antimony	30 to 1200 µg/filter		
Arsenic	30 to 1200 µg/filter		
Barium	30 to 1200 µg/filter		
Beryllium	30 to 1200 µg/filter		
Cadmium	30 to 1200 µg/filter		
Chromium	30 to 1200 µg/filter		
Cobalt	30 to 1200 µg/filter		
Copper	30 to 1200 µg/filter		
Lead	30 to 1200 µg/filter		
Manganese	30 to 1200 µg/filter		
Nickel	30 to 1200 µg/filter		
Phosphorus	30 to 1200 µg/filter		
Selenium	30 to 1200 µg/filter		
Silver	30 to 1200 µg/filter		
Thallium	30 to 1200 µg/filter		
Zinc	30 to 1200 µg/filter		
<b>Metals in Impinger Solution</b>		Impinger Sol'n	ICP/ICP-MS
Antimony	0.1 to 10 µg/mL		
Arsenic	0.1 to 10 µg/mL		
Barium	0.1 to 10 µg/mL		
Beryllium	0.1 to 10 µg/mL		
Cadmium	0.1 to 10 µg/mL		



<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
Chromium	0.1 to 10 µg/mL		
Cobalt	0.1 to 10 µg/mL		
Copper	0.1 to 10 µg/mL		
Lead	0.1 to 10 µg/mL		
Manganese	0.1 to 10 µg/mL		
Nickel	0.1 to 10 µg/mL		
Phosphorus	0.1 to 10 µg/mL		
Selenium	0.1 to 10 µg/mL		
Silver	0.1 to 10 µg/mL		
Thallium	0.1 to 10 µg/mL		
Zinc	0.1 to 10 µg/mL		
<b>Mercury on Filter Paper</b>		<b>Filter Paper</b>	<b>CVAA</b>
Mercury	0.3 to 9 µg/filter		
<b>Mercury in Impinger Solution</b>		<b>Impinger Sol'n</b>	<b>CVAA</b>
Mercury	1 to 30 ng/mL		
<b>Lead on Filter Paper</b>		<b>Filter Paper</b>	<b>ICP-MS</b>
Lead	25 to 750 µg/filter		
<b>Lead in Impinger Solution</b>		<b>Impinger Sol'n</b>	<b>ICP/ICP-MS</b>
Lead	0.1 to 3 µg/mL		
<b>Chromium on Filter Paper</b>		<b>Filter Paper</b>	<b>ICP</b>
Total Chromium	1 to 20 µg/filter		
Hexavalent Chromium	1 to 20 µg/filter		
<b>Hexavalent Chromium in Impinger Solution</b>		<b>Impinger Sol'n</b>	<b>Spec.</b>
Hexavalent Chromium	50 to 800 µg/L		
<b>Hydrogen Halides &amp; Halogens in Impinger Solution</b>		<b>Impinger Sol'n</b>	<b>IC</b>
Bromine	5 to 100 mg/L		
Chlorine	5 to 100 mg/L		
Hydrogen Fluoride	5 to 100 mg/L		
Hydrogen Chloride	5 to 100 mg/L		
Hydrogen Bromide	5 to 100 mg/L		
Total Halogens	10 to 200 mg/L		
Total Halide	15 to 300 mg/L		
<b>Fluoride in Impinger Solution</b>		<b>Impinger Sol'n</b>	<b>IC</b>



<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix <sup>(1)</sup></u>	<u>Measurement Technique(s)</u>
Fluoride	1 to 50 µg/mL		
<b>Nitrogen Oxide in Impinger Solution</b>		<b>Impinger Sol'n</b>	<b>IC</b>
Nitrogen Oxide	2 to 400 mg/dscm		
<b>Sulfur Dioxide in Impinger Solution</b>		<b>Impinger Sol'n</b>	<b>IC</b>
Sulfur Dioxide	200 to 2400 mg/dscm		
<b>Sulfuric Acid &amp; Sulfur Dioxide in Impinger Solution</b>		<b>Impinger Sol'n</b>	<b>IC</b>
Sulfuric Acid	1 to 120 mg/dscm		
Sulfur Dioxide	1 to 120 mg/dscm		
<b>Ammonia in Impinger Solution</b>		<b>Impinger Sol'n</b>	<b>Electrode-ISE</b>
Ammonia	1 to 50 mg/L		
<b>Particulate Matter on Filter Paper</b>		<b>Filter Paper</b>	<b>Gravimetric</b>
Particulate Matter	50 to 600 mg/filter		
<b>Particulate Matter in Impinger Solution</b>		<b>Impinger Sol'n</b>	<b>Gravimetric</b>
Particulate Matter	140 to 675 mg/L		
<b>Volatiles on Sorbent</b>		<b>Sorbent</b>	<b>GC</b>
Acetone	50 to 2000 ng/sample		
Acetonitrile	50 to 2000 ng/sample		
Acrolein	50 to 2000 ng/sample		
Acrylonitrile	50 to 2000 ng/sample		
Benzene	50 to 2000 ng/sample		
Bromodichloromethane	50 to 2000 ng/sample		
Bromoform	50 to 2000 ng/sample		
Bromomethane	50 to 2000 ng/sample		
2-Butanone (MEK)	50 to 2000 ng/sample		
Carbon disulfide	50 to 2000 ng/sample		
Carbontetrachloride	50 to 2000 ng/sample		
Chlorobenzene	50 to 2000 ng/sample		
Chlorodibromomethane	50 to 2000 ng/sample		
Chloroethane	50 to 2000 ng/sample		
2-Chloroethylvinylether	50 to 2000 ng/sample		
Chloroform	50 to 2000 ng/sample		
Chloromethane	50 to 2000 ng/sample		

*Peter R. Meyer*

<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
1,2-Dibromo-3-chloropropane (DBCP)	50 to 2000 ng/sample		
1,2-Dibromoethane (EDB)	50 to 2000 ng/sample		
Dibromomethane	50 to 2000 ng/sample		
1,2-Dichlorobenzene	50 to 2000 ng/sample		
1,3-Dichlorobenzene	50 to 2000 ng/sample		
1,4-Dichlorobenzene	50 to 2000 ng/sample		
Dichlorodifluoromethane	50 to 2000 ng/sample		
1,1-Dichloroethane	50 to 2000 ng/sample		
1,2-Dichloroethane	50 to 2000 ng/sample		
1,1-Dichloroethene	50 to 2000 ng/sample		
cis-1,2-Dichloroethene	50 to 2000 ng/sample		
trans-1,2-Dichloroethene	50 to 2000 ng/sample		
1,2-Dichloropropane	50 to 2000 ng/sample		
cis-1,3-Dichloropropene	50 to 2000 ng/sample		
trans-1,3-Dichloropropene	50 to 2000 ng/sample		
Ethylbenzene	50 to 2000 ng/sample		
Hexachlorobutadiene	50 to 2000 ng/sample		
2-Hexanone	50 to 2000 ng/sample		
Methylene Chloride	50 to 2000 ng/sample		
4-Methyl-2-pentanone (MIBK)	50 to 2000 ng/sample		
Methyl-tert-butylether (MTBE)	50 to 2000 ng/sample		
Naphthalene	50 to 2000 ng/sample		
Styrene	50 to 2000 ng/sample		
1,1,1,2-Tetrachloroethane	50 to 2000 ng/sample		
1,1,2,2-Tetrachloroethane	50 to 2000 ng/sample		
Tetrachloroethene	50 to 2000 ng/sample		
Toluene	50 to 2000 ng/sample		
1,2,4-Trichlorobenzene	50 to 2000 ng/sample		
1,1,1-Trichloroethane	50 to 2000 ng/sample		
1,1,2-Trichloroethane	50 to 2000 ng/sample		
Trichloroethene	50 to 2000 ng/sample		
Trichlorofluoromethane (Freon 11)	50 to 2000 ng/sample		
1,2,3-Trichloropropane	50 to 2000 ng/sample		
Vinyl acetate	50 to 2000 ng/sample		
Vinyl chloride	50 to 2000 ng/sample		
Xylenes, total	200 to 3000 ng/sample		
<b>Semivolatiles on PUF</b>		<b>PUF</b>	<b>GC</b>
Acenaphthene	10 to 225 µg/sample		
Acenaphthylene	10 to 225 µg/sample		
Aniline	10 to 225 µg/sample		
Anthracene	10 to 225 µg/sample		

*Peter Abney*

<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
Benzidine	200 to 1000 µg/sample		
Benzo(a)anthracene	10 to 225 µg/sample		
Benzo(b)fluoranthene	10 to 225 µg/sample		
Benzo(k)fluoranthene	10 to 225 µg/sample		
Benzo(g,h,i)perylene	10 to 225 µg/sample		
Benzo(a)pyrene	10 to 225 µg/sample		
Benzyl alcohol	10 to 225 µg/sample		
4-Bromophenyl-phenylether	10 to 225 µg/sample		
Butylbenzylphthalate	10 to 225 µg/sample		
Carbazole	10 to 225 µg/sample		
4-Chloroaniline	10 to 225 µg/sample		
Bis(2-chloroethoxy)methane	10 to 225 µg/sample		
Bis(2-chloroethyl)ether	10 to 225 µg/sample		
Bis(2-chloroisopropyl)ether	10 to 225 µg/sample		
Bis(2-ethylhexyl)phthalate	10 to 225 µg/sample		
1-Chloronaphthalene	10 to 225 µg/sample		
2-Chloronaphthalene	10 to 225 µg/sample		
4-Chlorophenyl-phenylether	10 to 225 µg/sample		
Chrysene	10 to 225 µg/sample		
Dibenz(a,h)anthracene	10 to 225 µg/sample		
Dibenzofuran	10 to 225 µg/sample		
Di-n-butylphthalate	10 to 225 µg/sample		
1,2-Dichlorobenzene	10 to 225 µg/sample		
1,3-Dichlorobenzene	10 to 225 µg/sample		
1,4-Dichlorobenzene	10 to 225 µg/sample		
3,3'-Dichlorobenzidine	10 to 225 µg/sample		
Diethyl phthalate	10 to 225 µg/sample		
Dimethyl phthalate	10 to 225 µg/sample		
2,4-Dinitrotoluene	10 to 225 µg/sample		
2,6-Dinitrotoluene	10 to 225 µg/sample		
Di-n-octylphthalate	10 to 225 µg/sample		
Fluoranthene	10 to 225 µg/sample		
Fluorene	10 to 225 µg/sample		
Hexachlorobenzene	10 to 225 µg/sample		
Hexachlorobutadiene	10 to 225 µg/sample		
Hexachlorocyclopentadiene	10 to 225 µg/sample		
Hexachloroethane	10 to 225 µg/sample		
Indeno(1,2,3-cd)pyrene	10 to 225 µg/sample		
Isophorone	10 to 225 µg/sample		
2-Methylnaphthalene	10 to 225 µg/sample		
Naphthalene	10 to 225 µg/sample		
2-Nitroaniline	10 to 225 µg/sample		
3-Nitroaniline	10 to 225 µg/sample		

*Peter Abney*

<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
4-Nitroaniline	10 to 225 µg/sample		
Nitrobenzene	10 to 225 µg/sample		
N-Nitrosodiethylamine	10 to 225 µg/sample		
N-Nitrosodimethylamine (NDMA)	10 to 225 µg/sample		
N-Nitrosodiphenylamine	10 to 225 µg/sample		
N-Nitroso-di-n-propylamine	10 to 225 µg/sample		
Pentachlorobenzene	10 to 225 µg/sample		
Phenanthrene	10 to 225 µg/sample		
Pyrene	10 to 225 µg/sample		
Pyridine	10 to 225 µg/sample		
o-Toluidine	10 to 225 µg/sample		
1,2,4,5-Tetrachlorobenzene	10 to 225 µg/sample		
1,2,4-Trichlorobenzene	10 to 225 µg/sample		
Benzoic Acid	10 to 225 µg/sample		
4-Chloro-3-methylphenol	10 to 225 µg/sample		
2-Chlorophenol	10 to 225 µg/sample		
2,4-Dichlorophenol	10 to 225 µg/sample		
2,6-Dichlorophenol	10 to 225 µg/sample		
2,4-Dimethylphenol	10 to 225 µg/sample		
2,4-Dinitrophenol	10 to 225 µg/sample		
2-Methyl-4,6-dinitrophenol	10 to 225 µg/sample		
2-Methylphenol (o-Cresol)	10 to 225 µg/sample		
4-Methylphenol (p-Cresol)	10 to 225 µg/sample		
2-Nitrophenol	10 to 225 µg/sample		
4-Nitrophenol	10 to 225 µg/sample		
Pentachlorophenol	10 to 225 µg/sample		
Phenol	10 to 225 µg/sample		
2,3,4,6-Tetrachlorophenol	10 to 225 µg/sample		
2,4,5-Trichlorophenol	10 to 225 µg/sample		
2,4,6-Trichlorophenol	10 to 225 µg/sample		

**Organochlorine Pesticides on  
PUF**

Aldrin	0.5 to 20.0 µg/sample		
alpha-BHC	0.5 to 20.0 µg/sample		
beta-BHC	0.5 to 20.0 µg/sample		
delta-BHC	0.5 to 20.0 µg/sample		
gamma-BHC (Lindane)	0.5 to 20.0 µg/sample		
alpha-Chlordane	0.5 to 20.0 µg/sample		
gamma-Chlordane	0.5 to 20.0 µg/sample		
DDD (4,4)	0.5 to 20.0 µg/sample		
DDE (4,4)	0.5 to 20.0 µg/sample		
DDT (4,4)	0.5 to 20.0 µg/sample		

PUF

GC



<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
Dieldrin	0.5 to 20.0 µg/sample		
Endosulfan I	0.5 to 20.0 µg/sample		
Endosulfan II	0.5 to 20.0 µg/sample		
Endosulfan sulfate	0.5 to 20.0 µg/sample		
Endrin	0.5 to 20.0 µg/sample		
Endrin aldehyde	0.5 to 20.0 µg/sample		
Endrin ketone	0.5 to 20.0 µg/sample		
Heptachlor	0.5 to 20.0 µg/sample		
Heptachlor Epoxide (beta)	0.5 to 20.0 µg/sample		
Methoxychlor	0.5 to 20.0 µg/sample		
<b>PCBs on PUF</b>		<b>PUF</b>	<b>GC</b>
Aroclor 1016	1 to 15 µg/sample		
Aroclor 1221	1 to 15 µg/sample		
Aroclor 1232	1 to 15 µg/sample		
Aroclor 1242	1 to 15 µg/sample		
Aroclor 1248	1 to 15 µg/sample		
Aroclor 1254	1 to 15 µg/sample		
Aroclor 1260	1 to 15 µg/sample		
<b>PAHs on PUF</b>		<b>PUF</b>	<b>HPLC</b>
Acenaphthene	10.0 to 200 µg/sample		
Acenaphthylene	10.0 to 200 µg/sample		
Anthracene	10.0 to 200 µg/sample		
Benzo(a)anthracene	10.0 to 200 µg/sample		
Benzo(b)fluoranthene	10.0 to 200 µg/sample		
Benzo(k)fluoranthene	10.0 to 200 µg/sample		
Benzo(g,h,i)perylene	10.0 to 200 µg/sample		
Benzo(a)pyrene	10.0 to 200 µg/sample		
Chrysene	10.0 to 200 µg/sample		
Dibenz(a,h)anthracene	10.0 to 200 µg/sample		
Fluoranthene	10.0 to 200 µg/sample		
Fluorene	10.0 to 200 µg/sample		
Indeno(1,2,3-cd)pyrene	10.0 to 200 µg/sample		
Naphthalene	10.0 to 200 µg/sample		
Phenanthrene	10.0 to 200 µg/sample		
Pyrene	10.0 to 200 µg/sample		
<b>Aldehydes &amp; Ketones on Sorbent</b>		<b>sorbent</b>	<b>HPLC</b>
Acetaldehyde	0.5 to 10 µg/sample		
Acetone	0.5 to 10 µg/sample		
Benzaldehyde	0.5 to 10 µg/sample		
2-Butanone (MEK)	0.5 to 10 µg/sample		

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<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
Butyraldehyde (butanal)	0.5 to 10 µg/sample		
Crotonaldehyde	0.5 to 10 µg/sample		
2,5 Dimethylbenzaldehyde	0.5 to 10 µg/sample		
Formaldehyde	0.5 to 10 µg/sample		
Hexaldehyde (hexanal)	0.5 to 10 µg/sample		
Isovaleraldehyde	0.5 to 10 µg/sample		
Propionaldehyde (propanol)	0.5 to 10 µg/sample		
o-Tolualdehyde	0.5 to 10 µg/sample		
m-Tolualdehyde	0.5 to 10 µg/sample		
p-Tolualdehyde	0.5 to 10 µg/sample		
Valeraldehyde (pentanal)	0.5 to 10 µg/sample		
<b>Certified Reference Materials</b>		<b>Water</b>	
Chemical Oxygen Demand (COD)	1-10000 mg/L		Spec. Electrode
Total Kjeldahl Nitrogen (TKN)	1-10000 mg/L		Spec.
MBAS/LAS Surfactants	1-10000 mg/L		Spec.
Total Dissolved Solids (TDS)	1-10000 mg/L		Gravimetric
Total Suspended Solids (TSS)	1-10000 mg/L		TOC meter
Total Organic Carbon (TOC)	.05-10000 mg/L		TOC meter
Total Inorganic Carbon	.05-10000 mg/L		HPLC
Total Organic Halides (TOX)	1-10000 mg/L		4AAP
Phenol	1 to 10000 mg/L		Titration
Sulfide	1 to 10000 mg/L		Conductivity meter
Conductivity	25-10,000 µmhos/cm		IC
Acetate	1 to 10000 mg/L		Electrode
Ammonia as NH <sub>3</sub>	1 to 10000 mg/L		Electrode
Ammonia as N	1 to 10000 mg/L		IC
Bromate	1 to 10000 mg/L		IC
Bromide	1 to 10000 mg/L		IC
Chlorate	1 to 10000 mg/L		IC
Chloride	1 to 10000 mg/L		IC
Complex Cyanide	1 to 10000 mg/L	(NaOH)	Spec.
Free Cyanide	1 to 10000 mg/L	(NaOH)	IC
Iodide	1 to 10000 mg/L		IC
Fluoride	1 to 10000 mg/L		IC
Nitrate as NO <sub>3</sub>	1 to 10000 mg/L		IC
Nitrate as N	1 to 10000 mg/L		IC
Nitrite as N	1 to 10000 mg/L		IC
Nitrite as NO <sub>2</sub>	1 to 10000 mg/L		IC
Perchlorate	1 to 10000 mg/L		IC
Phosphate as PO <sub>4</sub>	1 to 10000 mg/L		IC
Sulfate	1 to 10000 mg/L		IC

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<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
<b>Individual Metals Calibration</b>		<b>Water</b>	<b>ICP/ICP-MS</b>
Aluminum	1 to 10000 mg/L		
Antimony	1 to 10000 mg/L		
Arsenic	1 to 10000 mg/L		
Barium	1 to 10000 mg/L		
Beryllium	1 to 10000 mg/L		
Bismuth	1 to 10000 mg/L		
Boron	1 to 10000 mg/L		
Cadmium	1 to 10000 mg/L		
Calcium	1 to 10000 mg/L		
Chromium VI	1 to 10000 mg/L		
Chromium, total	1 to 10000 mg/L		
Cobalt	1 to 10000 mg/L		
Copper	1 to 10000 mg/L		
Iron	1 to 10000 mg/L		
Lead	1 to 10000 mg/L		
Lithium	1 to 10000 mg/L		
Magnesium	1 to 10000 mg/L		
Manganese	1 to 10000 mg/L		
Mercury	1 to 10000 mg/L		
Molybdenum	1 to 10000 mg/L		
Nickel	1 to 10000 mg/L		
Phosphorus	1 to 10000 mg/L		
Platinum	1 to 10000 mg/L		
Potassium	1 to 10000 mg/L		
Selenium	1 to 10000 mg/L		
Silica	1 to 10000 mg/L		
Silicon	1 to 10000 mg/L		
Silver	1 to 10000 mg/L		
Sodium	1 to 10000 mg/L		
Strontium	1 to 10000 mg/L		
Thallium	1 to 10000 mg/L		
Tin	1 to 10000 mg/L		
Titanium	1 to 10000 mg/L		
Vanadium	1 to 10000 mg/L		
Yttrium	1 to 10000 mg/L		
Zinc	1 to 10000 mg/L		
<b>ICP-MS Trace Metals Calibration</b>		<b>Water</b>	<b>ICP/ICP-MS</b>
Aluminum	1 to 10000 mg/L		
Antimony	1 to 10000 mg/L		

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<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
Arsenic	1 to 10000 mg/L		
Barium	1 to 10000 mg/L		
Beryllium	1 to 10000 mg/L		
Cadmium	1 to 10000 mg/L		
Chromium	1 to 10000 mg/L		
Cobalt	1 to 10000 mg/L		
Copper	1 to 10000 mg/L		
Iron	1 to 10000 mg/L		
Lead	1 to 10000 mg/L		
Manganese	1 to 10000 mg/L		
Molybdenum	1 to 10000 mg/L		
Nickel	1 to 10000 mg/L		
Selenium	1 to 10000 mg/L		
Silver	1 to 10000 mg/L		
Thallium	1 to 10000 mg/L		
Thorium	1 to 10000 mg/L		
Uranium	1 to 10000 mg/L		
Vanadium	1 to 10000 mg/L		
Zinc	1 to 10000 mg/L		
<b>ICP-MS Major Cations Calibration</b>		<b>Water</b>	<b>ICP/ICP-MS</b>
Calcium	1 to 10000 mg/L		
Magnesium	1 to 10000 mg/L		
Potassium	1 to 10000 mg/L		
Sodium	1 to 10000 mg/L		
<b>ICP-MS Tuning Standard</b>		<b>Water</b>	<b>ICP/ICP-MS</b>
Barium	1 to 10000 mg/L		
Beryllium	1 to 10000 mg/L		
Cerium	1 to 10000 mg/L		
Cobalt	1 to 10000 mg/L		
indium	1 to 10000 mg/L		
Lead	1 to 10000 mg/L		
Lithium	1 to 10000 mg/L		
Magnesium	1 to 10000 mg/L		
Rhodium	1 to 10000 mg/L		
Thallium	1 to 10000 mg/L		
Uranium	1 to 10000 mg/L		
Yttrium	1 to 10000 mg/L		
<b>ICP Trace Metals for Calibration</b>		<b>Water</b>	<b>ICP/ICP-MS</b>

*Peter Abney*

<u>Category and sub-category of Reference Materials</u>	<u>Concentration Range</u>	<u>Test matrix</u> <sup>(1)</sup>	<u>Measurement Technique(s)</u>
Aluminum	1 to 10000 mg/L		
Antimony	1 to 10000 mg/L		
Arsenic	1 to 10000 mg/L		
Barium	1 to 10000 mg/L		
Beryllium	1 to 10000 mg/L		
Bismuth	1 to 10000 mg/L		
Boron	1 to 10000 mg/L		
Cadmium	1 to 10000 mg/L		
Calcium	1 to 10000 mg/L		
Chromium	1 to 10000 mg/L		
Cobalt	1 to 10000 mg/L		
Copper	1 to 10000 mg/L		
Iron	1 to 10000 mg/L		
Lanthanum	1 to 10000 mg/L		
Lead	1 to 10000 mg/L		
Magnesium	1 to 10000 mg/L		
Manganese	1 to 10000 mg/L		
Molybdenum	1 to 10000 mg/L		
Nickel	1 to 10000 mg/L		
Phosphorus	1 to 10000 mg/L		
Potassium	1 to 10000 mg/L		
Selenium	1 to 10000 mg/L		
Sodium	1 to 10000 mg/L		
Strontium	1 to 10000 mg/L		
Tin	1 to 10000 mg/L		
Vanadium	1 to 10000 mg/L		
Zinc	1 to 10000 mg/L		
<b>pH Calibration</b>		<b>Water</b>	<b>pH Meter</b>
pH Buffers	2-12 pH		

(1) Applicable to EPA-approved methods





The American Association for Laboratory Accreditation

World Class Accreditation

# *Accredited Reference Material Producer*

A2LA has accredited

**ERA**

*Arvada, CO*

for technical competence as a

**Reference Material Producer**

This accreditation covers the specific materials listed on the agreed upon scope of accreditation. This producer meets the requirements of ISO Guide 34:2009 *General Requirements for the Competence of Reference Material Producers*, in combination with the relevant requirements of ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories*.

Presented this 23<sup>rd</sup> day of February 2011.



President & CEO  
For the Accreditation Council  
Certificate Number 1539.03  
Valid to September 30, 2012

*For materials to which this accreditation applies, please refer to the reference material producer's Scope of Accreditation.*