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CRM: A reference material characterized by a metrologically valid procedure for one or more specified properties, accompanied by a reference material certificate that provides the value of the specified property, its associated uncertainty, and a statement of metrological traceability.

A complete listing of ERA's CRMs can be found on our Scope of Accreditation for general requirements for competence of reference material producers available at www.eraqc.com/AboutERA/Accreditations.

PT: A Proficiency Test (PT) is an analysis of what is often referred to as a blind sample or a sample with unknown concentrations of analytes for the purpose of evaluating a laboratory's analytical performance.

QR: Similar to a Proficiency Test, a QuiK Response (QR) is a sample with unknown concentrations. However, unlike a scheduled PT, QR is on-demand and available at any time. Plus, your results are returned within two business days. QuiK Response can be used as a bilateral PT as referenced in the IUPAC/CITAC guide: Selection and use of PT schemes for a limited number of participants – chemical analytical labs.

RM: A material, sufficiently homogeneous and stable with respect to one or more specified properties, which has been established to be fit for its intended use in a measurement process.

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Q All Waters ERA Air & Emissions PTs open quarterly. Quarterly months are January, April, July, and October.

Volatiles

Volatiles in Gas Cylinder*

RM** Cat. #1100	PT Cat. #1000	Q	QR Cat. #1100QR
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One pressurized gas cylinder containing 87 L of gas at 1500 psig (103 bar) for use with EPA methods TO-14, TO-15, or other applicable methods. Contains at least 10 analytes, randomly selected from the list below, at 2-50 ppbv (4-100 ppbv) for Total Xylenes.

Acetone	1,1-Dichloroethane	Styrene
Benzene	1,2-Dichloroethane	1,1,2,2-Tetrachloroethane
Benzyl chloride	1,1-Dichloroethylene	Tetrachloroethylene
Bromodichloromethane	cis-1,2-Dichloroethylene	Toluene
Bromoform	trans-1,2-Dichloroethylene	Trichloroethene
Bromomethane	1,2-Dichloropropane	1,2,4-Trichlorobenzene
1,3-Butadiene	cis-1,3-Dichloropropylene	1,1,1-Trichloroethane
2-Butanone (MEK)	trans-1,3-Dichloropropylene	1,1,2-Trichloroethane
Methyl tert-butyl ether (MTBE)	1,2-Dichlorotetrafluoroethane	Trichlorofluoromethane
Carbon disulfide	(Freon 114)	(Freon 11)
Carbon tetrachloride	Ethyl acetate	Trichlorotrifluoromethane
Chlorobenzene	Ethylbenzene	(Freon 113)
Chlorodibromomethane	p-Ethyltoluene	1,2,4-Trimethylbenzene
Chloroethane	n-Heptane	1,3,5-Trimethylbenzene
Chloroform	Hexachlorobutadiene	Vinyl bromide
Chloromethane	n-Hexane	Vinyl chloride
Cyclohexane	2-Hexanone	Xylenes, total
1,2-Dibromoethane (EDB)	Isopropyl alcohol	m&p-Xylene
1,2-Dichlorobenzene	Methylene chloride	o-Xylene
1,3-Dichlorobenzene	Methyl methacrylate	
1,4-Dichlorobenzene	4-Methyl-2-pentanone (MIBK)	
Dichlorodifluoromethane (Freon 12)	Methyl tert-butyl ether (MTBE)	
	Propylene	

*Volatiles in Gas Cylinder ships as dangerous goods.

** Reference Material (RM)

Volatiles on Sorbent

CRM Cat. #1101	PT Cat. #1001	Q	QR Cat. #1101QR
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One 2 mL flame-sealed ampule for spiking client-specific sorbent. Use with EPA Methods TO-17, 0030, 0031, or other applicable methods. Contains at least 24 analytes, randomly selected from the list below, at 50–2000 ng/sample (200–3000 ng/sample for Total Xylenes) after preparation.

Acetone	1,1-Dichloropropene	Methylene chloride
Acetonitrile	1,2-Dibromo-3-chloropropane (DBCP)	4-Methyl-2-pentanone (MIBK)
Acrolein	1,2-Dibromoethane (EDB)	Naphthalene
Acrylonitrile	Dibromomethane	Nitrobenzene
Benzene	1,2-Dichlorobenzene	n-Propylbenzene
Bromobenzene	1,3-Dichlorobenzene	Styrene
Bromochloromethane	1,4-Dichlorobenzene	1,1,2-Tetrachloroethane
Bromodichloromethane	Dichlorodifluoromethane (Freon 12)	1,1,2,2-Tetrachloroethane
Bromoform	1,1-Dichloroethane	Tetrachloroethene
Bromomethane	1,2-Dichloroethane	Toluene
2-Butanone (MEK)	1,1-Dichloroethene	1,2,3-Trichlorobenzene
n-Butylbenzene	1,1-Dichloroethane	1,2,4-Trichlorobenzene
sec-Butylbenzene	cis-1,2-Dichloroethene	1,1,1-Trichloroethane
tert-Butylbenzene	trans-1,2-Dichloroethene	1,1,2-Trichloroethane
Carbon disulfide	1,2-Dichloropropane	Trichloroethylene
Carbon tetrachloride	cis-1,3-Dichloropropene	Trichlorofluoromethane
Chlorobenzene	trans-1,3-Dichloropropene	1,2,3-Trichloropropane
Chlorodibromomethane	Ethylbenzene	1,2,4-Trimethylbenzene
Chloroethane	Hexachlorobutadiene	1,3,5-Trimethylbenzene
2-Chloroethyl vinyl ether	Hexachloroethane	Vinyl acetate
Chloroform	2-Hexanone	Vinyl chloride
Chloromethane	Isopropylbenzene	Xylenes, total
2-Chlorotoluene	4-Isopropyltoluene	m&p-Xylene
4-Chlorotoluene	Methyl tert-butyl ether (MTBE)	o-Xylene
1,3-Dichloropropane		
2,2-Dichloropropane		

Semivolatiles

Semivolatiles on Polyurethane Foam

CRM Cat. #1110	PT Cat. #1010	Q	QR Cat. #1110QR
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Two 2 mL flame-sealed ampules plus one polyurethane foam. Use with EPA Method 0010, or other applicable methods. Contains at least 42 analytes, randomly selected from the list below, at 10–225 µg/sample (200–1000 µg/sample for Benzidine) after preparation.

Acenaphthene	1,3-Dichlorobenzene	N-Nitroso-di-n-propylamine
Acenaphthylene	1,4-Dichlorobenzene	2,2'-Oxybis(1-chloropropane)
Aniline	3,3'-Dichlorobenzidine	Pentachlorobenzene
Anthracene	Diethyl phthalate	Phenanthrene
Benzidine	Dimethyl phthalate	Pyrene
Benzo(a)anthracene	2,4-Dinitrotoluene	Pyridine
Benzo(b)fluoranthene	2,6-Dinitrotoluene	o-Toluidine
Benzo(k)fluoranthene	Di-n-octyl phthalate	1,2,4,5-Tetrachlorobenzene
Benzo(g,h,i)perylene	Fluoranthene	1,2,4-Trichlorobenzene
Benzo(a)pyrene	Fluorene	Benzoic Acid
Benzyl alcohol	Hexachlorobenzene	4-Chloro-3-methylphenol
4-Bromophenyl phenyl ether	Hexachlorobutadiene	2-Chlorophenol
Butyl benzyl phthalate	Hexachlorocyclopentadiene	2,4-Dichlorophenol
Carbazole	Hexachloroethane	2,6-Dichlorophenol
4-Chloroaniline	Indeno(1,2,3-cd)pyrene	2,4-Dimethylphenol
Bis(2-chloroethoxy)methane	Isophorone	2,4-Dinitrophenol
Bis(2-chloroethyl)ether	Naphthalene	2-Methyl-4,6-dinitrophenol
Bis(2-ethylhexyl)phthalate	2-Methylnaphthalene	2-Methylphenol (o-Cresol)
1-Chloronaphthalene	Naphthalene	4-Methylphenol (p-Cresol)
2-Chloronaphthalene	2-Nitroaniline	2-Nitrophenol
4-Chlorophenyl phenyl ether	3-Nitroaniline	4-Nitrophenol
Chrysene	4-Nitroaniline	Pentachlorophenol
Dibenz(a,h)anthracene	Nitrobenzene	Phenol
Dibenzofuran	N-Nitrosodiethylamine	2,3,4,6-Tetrachlorophenol
Di-n-butyl phthalate	N-Nitrosodimethylamine	2,4,5-Trichlorophenol
1,2-Dichlorobenzene	(NDMA)	2,4,6-Trichlorophenol
	N-Nitrosodiphenylamine	

Organochlorine Pesticides on Polyurethane Foam

CRM Cat. #1111	PT Cat. #1011	Q	QR Cat. #1111QR
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One 2 mL flame-sealed ampule plus one polyurethane foam. Use with EPA Methods TO-04A, TO-10A, or other applicable methods. Contains at least 16 analytes, randomly selected from the list below, at 1–20 µg/sample after preparation.

Aldrin	4,4'-DDD	Endrin
alpha-BHC	4,4'-DDE	Endrin aldehyde
beta-BHC	4,4'-DDT	Endrin ketone
delta-BHC	Dieldrin	Heptachlor
gamma-BHC (Lindane)	Endosulfan I	Heptachlor epoxide (beta)
alpha-Chlordane	Endosulfan II	Methoxychlor
gamma-Chlordane	Endosulfan sulfate	

Brian Stringer
Principal Proficiency Testing
Technical Specialist



PCBs on Polyurethane Foam

CRM Cat. #1112	PT Cat. #1012	Q	QR Cat. #1112QR
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One 2 mL flame-sealed ampule plus one polyurethane foam. Use with EPA Methods TO-04A, TO-10A, or other applicable methods. Contains one aroclor, randomly selected from the list below, at 2–10 µg/sample after preparation.

Aroclor 1016	Aroclor 1242	Aroclor 1260
Aroclor 1221	Aroclor 1248	
Aroclor 1232	Aroclor 1254	

PAHs on Polyurethane Foam

CRM Cat. #1113	PT Cat. #1013	Q	QR Cat. #1113QR
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One 2 mL flame-sealed ampule plus one polyurethane foam. Use with EPA Method TO-13A, or other applicable methods. Contains at least 13 analytes, randomly selected from the list below, at 10–200 µg/sample after preparation.

Acenaphthene	Benzo(g,h,i)perylene	Indeno(1,2,3-cd)pyrene
Acenaphthylene	Benzo(a)pyrene	1-Methylnaphthalene
Anthracene	Chrysene	2-Methylnaphthalene
Benzo(a)anthracene	Dibenz(a,h)anthracene	Naphthalene
Benzo(b)fluoranthene	Fluoranthene	Phenanthrene
Benzo(k)fluoranthene	Fluorene	Pyrene

Aldehydes & Ketones on Sorbent

CRM Cat. #1114	PT Cat. #1014	Q	QR Cat. #1114QR
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One 2 mL flame-sealed ampule to be spiked onto sorbent. Use with EPA Method TO-11A, or other applicable methods. Contains at least four analytes, randomly selected from the list below, at 0.5–10 µg/sample after preparation.

Acetaldehyde	Crotonaldehyde	Propionaldehyde (Propanal)
Acetone	2,5-Dimethylbenzaldehyde	o-Tolualdehyde
Benzaldehyde	Formaldehyde	m-Tolualdehyde
2-Butanone (MEK)	Hexaldehyde (Hexanal)	p-Tolualdehyde
Butyraldehyde (Butanal)	Isovaleraldehyde	Valeraldehyde (Pentanal)

CRM – Certified Reference Material
PT – Proficiency Testing
QR – Quik Response
RM – Reference Material

Q All Waters ERA Air & Emissions PTs open quarterly. Quarterly months are January, April, July, and October.



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Senior Proficiency Testing
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Metals

Metals on Filter Paper

CRM Cat. #1125	PT Cat. #1025	Q	QR Cat. #1125QR
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One filter paper sample packaged in a 50 mm polystyrene petri dish containing a single 47 mm tissue quartz filter ready for use with EPA Method 29 or other applicable methods.

Antimony.....	25–250 µg/filter
Arsenic.....	20–250 µg/filter
Barium.....	20–250 µg/filter
Beryllium.....	10–250 µg/filter
Cadmium.....	10–250 µg/filter
Chromium.....	15–250 µg/filter
Cobalt.....	10–250 µg/filter
Copper.....	10–250 µg/filter
Lead.....	20–350 µg/filter
Manganese.....	10–250 µg/filter
Nickel.....	20–250 µg/filter
Phosphorus.....	10–250 µg/filter
Selenium.....	20–250 µg/filter
Silver.....	30–250 µg/filter
Thallium.....	30–250 µg/filter
Zinc.....	20–250 µg/filter

Metals in Impinger Solution

CRM Cat. #1126	PT Cat. #1026	Q	QR Cat. #1126QR
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One impinger solution sample packaged in a 15 mL screw-top vial containing approximately 14 mL of standard concentrate for use with EPA Method 29, or other applicable methods.

Antimony.....	0.25–20 µg/mL
Arsenic.....	0.2–20 µg/mL
Barium.....	0.15–25 µg/mL
Beryllium.....	0.05–20 µg/mL
Cadmium.....	0.1–20 µg/mL
Chromium.....	0.2–20 µg/mL
Cobalt.....	0.1–25 µg/mL
Copper.....	0.2–20 µg/mL
Lead.....	0.2–20 µg/mL
Manganese.....	0.1–20 µg/mL
Nickel.....	0.15–30 µg/mL
Phosphorus.....	0.15–25 µg/mL
Selenium.....	0.15–25 µg/mL
Silver.....	0.5–20 µg/mL
Thallium.....	0.15–25 µg/mL
Zinc.....	0.15–25 µg/mL

Mercury on Filter Paper

CRM Cat. #1127	PT Cat. #1027	Q	QR Cat. #1127QR
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One 2 mL flame-sealed ampule containing approximately 2 mL of standard concentrate and a 50 mm polystyrene petri dish containing a single 47 mm glass fiber filter. Sample is ready for use with EPA Method 29, or other applicable methods.

Mercury.....	1–75 µg/filter
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Mercury in Impinger Solution

CRM Cat. #1128	PT Cat. #1028	Q	QR Cat. #1128QR
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One impinger solution sample packaged in a 15 mL screw-top vial containing approximately 14 mL of standard concentrate for use with EPA Methods 29, 101a, or other applicable methods.

Mercury.....	0.9–200 ng/mL
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Lead on Filter Paper

CRM Cat. #1129	PT Cat. #1029	Q	QR Cat. #1129QR
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One filter paper sample packaged in a 50 mm polystyrene petri dish containing a single 47 mm tissue quartz filter spiked with lead ready-for-use with EPA Method 12 or other applicable methods.

Lead.....	20–350 µg/filter
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Lead in Impinger Solution

CRM Cat. #1130	PT Cat. #1030	Q	QR Cat. #1130QR
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One impinger solution sample packaged in a 15 mL screw top vial containing approximately 14 mL of standard concentrate for use with EPA Method 12, or other applicable methods.

Lead.....	0.2–120 µg/mL
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Chromium on Filter Paper

CRM Cat. #1131	PT Cat. #1031	Q	QR Cat. #1131QR
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One filter paper sample packaged in a 50 mm polystyrene petri dish containing a single 47 mm fiber film filter for use with CARB Method 425, or other applicable methods.

Total chromium.....	1–20 µg/filter
Hexavalent chromium.....	1–20 µg/filter

Hexavalent Chromium in Impinger Solution

CRM Cat. #1132	PT Cat. #1032	Q	QR Cat. #1132QR
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One impinger solution sample packaged in a 15 mL screw top vial containing approximately 14 mL of standard concentrate for use with EPA Method 0061/7199, or other applicable methods.

Hexavalent chromium.....	45–880 µg/L
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Inorganics

Hydrogen Halides & Halogens in Impinger Solution

CRM Cat. #1140	PT Cat. #1040	Q	QR Cat. #1140QR
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Two impinger solution samples packaged in 15 mL screw-top vials containing approximately 14 mL of standard concentrate for use with EPA Methods 26, 26a, or other applicable methods.

Total halides.....	15-1500 mg/L
Total halogens.....	10-200 mg/L
Hydrogen chloride.....	5-500 mg/L
Hydrogen fluoride.....	5-500 mg/L
Hydrogen bromide.....	5-500 mg/L
Bromine.....	5-100 mg/L
Chlorine.....	5-100 mg/L

Fluoride in Impinger Solution

CRM Cat. #1141	PT Cat. #1041	Q	QR Cat. #1141QR
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One impinger solution sample packaged in a 15 mL screw-top vial containing approximately 14 mL of standard concentrate for use with EPA Methods 13a, 13b, 14, or other applicable methods.

Fluoride.....	1-50 mg/dscm
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Nitrogen Oxide in Impinger Solution

CRM Cat. #1142	PT Cat. #1042	Q	QR Cat. #1142QR
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One impinger solution sample packaged in a 15 mL screw-top vial containing approximately 14 mL of standard concentrate for use with EPA Method 7, or other applicable methods.

Oxides of nitrogen (NOx).....	100-2000 mg/dscm
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Sulfur Dioxide in Impinger Solution

CRM Cat. #1143	PT Cat. #1043	Q	QR Cat. #1143QR
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One impinger solution sample packaged in a 15 mL screw-top vial containing approximately 14 mL of standard concentrate for use with EPA Method 6 and Method 8, or other applicable methods.

Sulfur dioxide.....	50-2000 mg/dscm
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Sulfuric Acid & Sulfur Dioxide in Impinger Solution

CRM Cat. #1144	PT Cat. #1044	Q	QR Cat. #1144QR
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One impinger solution sample packaged in a 15 mL screw top vial containing approximately 14 mL of standard concentrate for use with EPA Method 8, or other applicable methods.

Sulfuric acid.....	5-150 mg/dscm
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Ammonia in Impinger Solution

CRM Cat. #1145	PT Cat. #1045	Q	QR Cat. #1145QR
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One impinger solution sample packaged in a 15 mL screw-top vial containing approximately 14 mL of standard concentrate for use with EPA CTM 027, or other applicable methods.

Ammonium.....	0.1-10 mg/L
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Particulate Matter on Filter Paper

CRM Cat. #1150	PT Cat. #1050	Q	QR Cat. #1150QR
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One filter paper sample packaged in a 50 mm polystyrene petri dish containing a single 47 mm tissue quartz filter ready for use with EPA Methods 5, 5A, 5B, 5D, 5F, or other applicable methods.

Particulate matter.....	50-600 mg/filter
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Particulate Matter in Impinger Solution

CRM Cat. #1151	PT Cat. #1051	Q	QR Cat. #1151QR
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One impinger solution sample packaged in a 250 mL polyethylene bottle containing approximately 250 mL of standard ready for use with EPA Methods 5, 5A, 5B, 5D, 5F, or other applicable methods.

Particulate matter.....	140-675 mg/L
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Learn more about Air & Emissions products