



# Preservation Table

## Samples Containers, Preservation, and Holding Times

Note: This list is not inclusive of all of the services offered by BAL

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### Waters/Aqueous

Parameter	Matrix	Method	Volume	Container	Preservation	Holding Time
Filtration, Ultra-trace	Water	SOP #BAL-0301	Various	Various	0-4 °C and dark immediately	<b>48 hours</b>
Trace Metals	Water	EPA 1638 Mod (ICP-MS)	40 mL	125-mL HDPE	HNO <sub>3</sub> in lab to pH < 2 within 14 days of collection	6 months
Trace Metals	Brackish or Seawater	EPA 1640, Modified	1 L (or 2 x 1 L for QC)	1 L HDPE	HNO <sub>3</sub> to 0.2% in lab within 14 days of collection	6 months
Trace Metals	Brackish or Seawater	EPA 1640, Modified	125 mL	Acid-cleaned and pre-tested 125-mL HDPE or FLPE	HNO <sub>3</sub> in lab within 14 days of collection (closed-vessel digestion in the original sample bottle)	6 months
Selenium	Brackish or Seawater	EPA 1640, Modified	125 mL	125-mL FLPE	0.1% HNO <sub>3</sub> in lab within 14 days of collection	6 months
As Species	Water	EPA 1632	125 mL	125 mL HDPE	0-4 °C, dark, and HCl to pH < 2 at collection (HCl provided in bottle)	28 days
As Species, dissolved	Natural Waters	IC-ICP-MS (SOP #BAL-4100/4101)	5 mL	125 mL HDPE	Field-filtration recommended, especially for samples with high levels of solids; collect in bottles pre-preserved with EDTA/acetic acid solution; minimal headspace; keep dark; 0-4 °C	28 days
As Species, dissolved	Landfill leachates or anoxic waters	IC-ICP-MS (SOP #BAL-4100/4101)	2 x 6-mL	2 x 6-mL Vacutainer	Field-filtration recommended, especially for samples with high levels of solids; collect in vacutainers pre-preserved with EDTA; minimal headspace; keep dark; 0-4 °C	<b>14 days</b>

**Waters/Aqueous (continued)**

Parameter	Matrix	Method	Volume	Container	Preservation	Holding Time
Br, I, or Cl (total)	Water	FI-ICP-DRC-MS	125mL	HDPE	Preserve to pH > 9 upon reception	6 months
Br Speciation	Water	IC-ICP-MS	125 mL	125-mL amber HDPE bottle	Store at 4 °C at lab	28 days
CN, Total	Water	SOP #BAL-4491	125 mL	125-mL HDPE bottle	Pre-preserved containers with NaOH to pH > 10. Ship and store at lab at 0-4 °C	<b>14 days</b>
CN Speciation	Water	SOP #BAL-4492	125 mL	125-mL amber HDPE bottle	Pre-preserved containers with NaOH to pH > 10. Ship at 0-4 °C and store frozen at lab at ≤ -15 °C	<b>14 days</b>
Cr(VI), dissolved	Water (except drinking water)	IC-ICP-MS (SOP #BAL-4300)	125 mL	125-mL HDPE	Field-filtration required; container preserved with NH <sub>4</sub> OH/(NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub> buffer to pH > 9.0 - 9.5; zero headspace; keep dark; keep at ≤ 6 °C without freezing during shipment; store refrigerated at lab	28 days
Cr(VI), dissolved	Drinking Water	IC-ICP-MS (SOP #BAL-4300)	125 mL	125-mL HDPE	Container preserved with NH <sub>4</sub> OH/(NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub> buffer to pH > 8; zero headspace; keep dark; keep at ≤ 25 °C during shipment; store refrigerated at lab	<b>14 days</b>
Fe(II) and Fe(Reducible)	Water	SM 3500 B	40 mL	2 x40-mL glass	0-4 °C, dark, and preservative at collection (HCl, provided in vial)	<b>2 days for Fe(II)</b>
Hg, Total	Water	EPA 1631E (CV-AFS)	125 mL	FLPE or glass bottle w/FP-lined lids	BrCl in lab within 28 days of collection (oxidation in the original sample bottle)	90 days
Hg, Methyl	Fresh Water	EPA 1630	250 mL	FLPE or glass bottle w/ FP-lined lids	0-4 °C and dark immediately; HCl to 0.4% in lab within 48 hrs of collection	6 months

**Waters/Aqueous (continued)**

Parameter	Matrix	Method	Volume	Container	Preservation	Holding Time
Hg, Methyl	Saline Water	EPA 1630	250 mL	FLPE or glass bottle w/ FLPE-lined lids	0-4 °C and dark immediately; H <sub>2</sub> SO <sub>4</sub> to 0.2% within 48 hrs of collection	6 months
Hg(II), MeHg, EtHg	Fresh Water	IC-CV-ICP-MS (SOP #BAL-4701)	10 mL	40-mL glass vial	Field-filtration is preferable. 0-4 °C and dark immediately; HCl to 0.4% within 48 hrs of collection	6 months
Mn Speciation	Water	RP-ICP-MS	125 mL	HDPE	Anoxic field-filtration required; Store at 4 °C at lab	<b>14 days</b>
Noble Metals (Au, Pd, Pt)	Water	EPA 1638 Mod (ICP-MS)	40 mL	125-mL HDPE	HCl + HNO <sub>3</sub> (3% + 1%) in lab upon receipt (closed-vessel digestion in the original sample bottle)	28 days
Os	Water	EPA 1638 Mod (ICP-MS)	40 mL	125-mL HDPE	1% HCl	6 months
Pb Speciation	Water	RP-ICP-MS	125 mL	250-mL amber glass bottle	Store at 4 °C at lab	<b>14 days</b>
Se Species, dissolved	Water	IC-ICP-MS (SOP #BAL-4200)	5 mL	125 mL HDPE	Field-filtration preferred; Filter with 0.45um syringe filter, 0-4 °C; cryofreeze in lab at -80°C	1 year cryofrozen
Se Species, volatile, dissolved	Water	IC-ICP-MS (SOP #BAL-4291)	125 mL	125 mL amber glass bottle	Pre-preserved containers with 10% (v/v) isopropanol. Store at 4 C at lab.	28 days
Tl Speciation	Water	RP-ICP-DRC-MS	125 mL	HDPE	0-4 °C, dark, and preservative at collection (DTPA in H <sub>3</sub> PO <sub>4</sub> )	<b>14 days</b>
V Speciation	Water	RP-ICP-DRC-MS	125 mL	HDPE	0-4 °C, dark, and preservative at collection (EDTA)	<b>14 days</b>
W and Si	Water	EPA 1638 Mod (ICP-MS)	125 mL	HDPE (don't use glass)	HF + HNO <sub>3</sub> in lab within 14 days of collection	6 months

## Soil/Sediment

Parameter	Matrix	Method	Volume	Container	Preservation	Holding Time
Total Metals	Dry Sed/Soil	Various	10 g	4-oz. glass or plastic wide mouth jars	N/A (Room Temp OK)	1 year
Metal Species	Dry Sed/Soil	Various	10 g	4-oz. glass or plastic wide mouth jars	N/A (Room Temp OK)	1 year
Total Metals	Wet Sed/Soil	Various	20 g	4-oz. glass or plastic wide mouth jars	0-4 °C during shipment; ≤ 4 °C in lab	1 year
Metal Species [except Cr(VI)]	Wet Sed/Soil	Various	20 g	4-oz. glass or plastic wide mouth jars	If possible, place on dry ice or freeze immediately following collection. Otherwise, maintain a temperature of 0-4 °C following collection and during shipping, and ship ASAP (within 48 hours) to the lab; store at -15 °C.	<b>7 days to freeze;</b> 1 year to analyze
Cr(VI)	Wet AND Dry Sed/Soil	SW 3060A/ IC-ICP-MS	20 g	4-oz. HDPE wide mouth jars	0-4 °C and field moist until analysis	30 days
Pb , V, and Tl Speciation	Wet Sed/Soil	In-House	4 oz	4-oz. glass wide mouth jars	0-4 °C during shipment; ≤ 4 °C in lab	1 year

**Tissue/Food**

Parameter	Matrix	Method	Volume	Container	Preservation	Holding Time
Total Metals	Dry Tissue	Various	10 g	4-oz. glass or plastic wide mouth jars	Room Temp recommended	1 year
As Species	Dry Tissue	EPA 1632, Modified	10 g	4-oz. glass or plastic wide mouth jars	Room Temp recommended	2 years
Metal Species (other than As by 1632)	Dry Tissue	Various	10 g	4-oz. glass or plastic wide mouth jars	Room Temp recommended	1 year
As Species	Wet Tissue	EPA 1632	10 g	4-oz. glass or plastic wide mouth jars, zip-type plastic bags, or plastic wrap	0-4 °C during shipment; ≤ -18 °C in lab	2 years
Total Metals or Species (other than As by 1632)	Wet Tissue	Various	10 g	4-oz. glass or plastic wide mouth jars, zip-type plastic bags, or plastic wrap	0-4 °C during shipment; ≤ -15 °C in lab	1 year
Big 4 (As, Cd, Hg, Pb)	Food/ Supplement	AOAC 2015.01 Mod.	10 g	Various	As normally stored.	N/A
As Species, dissolved	Juice & Juice Concentrate	IC-ICP-MS	5 mL	Various	Juice: Refrigerate at 0 - 4 °C; then freeze after opening Concentrates: Refrigerate or freeze	28 days
As Species, dissolved	Wine	Various	Various	Client-provided	Room temp if unopened; Refrigerate at 0 - 4 °C after opening	1 year

## Biomonitoring

Parameter	Matrix	Method	Volume	Container	Preservation	Holding Time
Total Metals & Metal Species	Whole Blood	Various	6 mL	6-mL royal blue top K2-EDTA Vacutainer	0-4 °C during shipment; ≤ -15 °C in lab	1 year
Total Metals & Metal Species	Plasma/ Serum	Various	6 mL	6-mL royal blue top Vacutainer with clot activator	Separation from whole blood must occur prior to adding sample to vial by the client, 0-4 °C during shipment; ≤ -15 °C in lab	1 year
Hg	Urine	EPA 1631, Modified	90 mL	Polyethylene urine specimen container	0-4 °C during shipment; 0-4 °C in lab or ≤ -15 °C in lab	28 days (1yr if frozen)
ICP-MS Metals	Urine	ICP-MS	90 mL	Polyethylene urine specimen container or 20 - 40 mL vials	0-4 °C during shipment; 0-4 °C in lab or ≤ -15 °C in lab	28 days (1yr if frozen)
As, Cr, Se Speciation	Urine	IC-ICP-MS	90 mL	Polyethylene urine specimen container or 20 - 40 mL vials	0-4 °C during shipment; ≤ -15 °C in lab	1 year if frozen
Total Metals & Metal Species	Hair, Nails, Feathers	Various	100 mg	Zip-type plastic bag	Dark, room temp or on ice	1 year

## Air & Natural Gas

Parameter	Matrix	Method	Volume	Container	Preservation	Holding Time
Hg	Natural Gas/Land Fill Gas	ASTM D6350	1.5 L	Gold Traps, capped tightly	Ambient temp OK, keep dark	28 days
Hg	Ambient Air	IO-5	20 L	Gold Traps, capped tightly	Ambient temp OK, keep dark	28 days
Hg	Air/Stack Gas	324/1631	2 L	IC Traps, capped tightly	Ambient temp OK, keep dark	28 days

## Passive Samplers

Parameter	Matrix	Method	Volume	Container	Preservation	Holding Time
Metals	DGT Units	Various	1 unit	Plastic bag	A few drops of 0.01 NaCl solution; check weekly to ensure probes stay moist	6-month shelf life for DGT product