

RECOMMENDED PRESERVATION & HOLDING TIMES (RHT) FOR WATERS

Web: www.envirolab.com.au

ADELAIDE: (08) 7087 6800
MELBOURNE: (03) 9763 2500

BRISBANE: (07) 3266 9532
SYDNEY: (02) 9910 6200

DARWIN: 0477 012 027
PERTH: (08) 9317 2505

Test	Bottle	Volume	Preservation (Bottles are colour coded, see labels)	RHT	Reference
INORGANICS, METALS AND PHYSICAL TESTS					
Alkalinity / Acidity	P/G	100 ml	Cool to ≤6°C	14 d	APHA
AOX	G	500 ml	pH <2 (HNO ₃) + Cool to ≤6°C + Dark	3 d	AS
BOD	P/G	500 ml	Cool to ≤6°C	2 d / 1 month frozen	APHA / ISO
Bromide/Bromate	P/G	50 ml	Cool to ≤6°C + Dark	28 d	AS
Carbon - TOC/DOC	P/G	50 ml	pH <2 (H ₂ SO ₄ or HCl) + Cool to ≤6°C	28 d	APHA
Carbon - TOC/DOC	P/G	50 ml	Cool to ≤6°C + Dark	28 d	USEPA
Carbon Dioxide (free + total)	P	500ml	Cool to ≤6°C (field measurement preferred)	15 min	APHA
Chlorine-Residual	P/G	20 ml	Analyse immediately	15 min	APHA
Chlorate/Chlorite	P/G	100 ml	pH 10±0.5 (NaOH), dark	7 d	ISO
Chloride	P/G	100 ml	Nil	28 d	APHA
COD	P/G	100 ml	pH <2 (H ₂ SO ₄) + Cool to ≤6°C	28 d / 6m	APHA / ISO
Colour	P/G	100 ml	Cool to ≤6°C + Dark	2 d / 5 d	APHA / ISO
Conductivity	P/G	20 ml	Cool to ≤6°C	28 d	USEPA
Cyanides	P/G	100 ml	pH (>12 NaOH) + Cool to ≤6°C + Dark	14 d	APHA
Dust Deposition	G (Winchester)	4L	Copper Sulphate	30 d	AS
Ferrous Iron	P/G	100 ml	Filter, pH <2 (HCl), no headspace	1 d / 7 d	AS / ISO5667.3
Fluoride	P (not PTFE)	20 ml	Nil	28 d	AS
Formaldehyde	Vial	2x40mL	Cool to ≤6°C	14 d	USEPA
Hexavalent Cr	P/G	100 ml	Filter, cool to ≤6°C	1 d	AS / APHA
Hexavalent Cr	P/G	100 ml	Filter, pH 8-9.5 (NaOH) + Cool to ≤6°C	28 d	USEPA m1636 / APHA
Iodide/Iodine	P/G	50 ml	Cool to ≤6°C	28 d	AS
MBAS - Surfactants	G	100 ml	Cool to ≤6°C	2 d	APHA
Metals (inc Cations)	P/G	50 ml	pH <2 (HNO ₃)	6 m	USEPA
Mercury	P/G	50 ml	pH <2 (HNO ₃)	28 d	USEPA
Anions/Cations/Nutrients/ Physical Tests	P/G	500 ml	Anions (F, Cl, SO ₄ ²⁻ , Alkalinity), Cations (Ca, K, Mg, Na), Nutrients (NO _x , NH ₃ , o-PO ₄), EC/pH, TDS and TSS can be analysed from one 500mL unpreserved sample.	See individual tests	See individual tests
N – Ammonia	P/G	20 ml	pH <2 (H ₂ SO ₄) + Cool to 4°C	28 d	APHA
N – Ammonia	P/G	20 ml	Site filter & cool / Site filter & freeze	1d / 28 d	AS / ISO
N – Nitrate + Nitrite	P/G	20 ml	Cool to ≤6°C / Filter on site & cool to ≤6°C	2 d / 4 d	APHA / ISO
N – Nitrate	P/G	20 ml	Filter on site & freeze	28 d	AS
N – TKN	P/G	100 ml	pH <2 (H ₂ SO ₄) + Cool to ≤6°C	28 d	APHA
N – Total and N-TKN	P/G	100 ml	Freeze	6 m	ISO
Oil & Grease	G	500 ml	pH <2 (H ₂ SO ₄ or HCl) + Cool to ≤6°C	28 d	APHA
pH	P/G	20 ml	Cool to ≤6°C (field measurement preferred)	15min / 6 hrs / 1d	APHA / AS / ISO
Phenols - total	P/G	250 ml	pH <2 (H ₂ SO ₄) + Cool to ≤6°C	28 d	APHA
Phosphorus - Total	P/G	50 ml	pH <2 (HNO ₃)	28 d	APHA
Phosphorus - Total	P/G	50 ml	Freeze	28 d	AS
Phosphate as P	P/G	20 ml	Filter & Cool to ≤6°C / Filter & Freeze	2d / 28 d	APHA / AS
Settleable Solids	P	1000ml	none	1 d	APHA
Speciated Arsenic	P	125 ml	Field filter, pH <2 (H ₂ SO ₄ or HCl) + Cool to ≤6°C	ASAP, 28 d max	USEPA
Specific Gravity	P	50 ml	Cool to ≤6°C	2 d	AS / APHA
Sugar	P/G	100 ml	none	N/A	N/A
Sulphate	P/G	100 ml	Cool to ≤6°C	28 d	APHA

Test	Bottle	Volume	Preservation (Bottles are colour coded, see labels)	RHT	Reference
INORGANICS, METALS AND PHYSICAL TESTS (continued)					
Sulphite	P/G	100 ml	1ml EDTA/100ml (2.5g EDTA to 100ml)	2 d	AS
Sulphide (total)	P/G	100 ml	Cool + add 4 drops 2N Zinc Acetate/NaOH/100ml	7 d	APHA / ISO
Sulphide (diss)	P	100 ml	Filter & add 10ml Cu 2,4 DMP	12 hrs	AS
Sulphide (low level)	P	100 ml	pH 8-9.5 (NaOH) + Cool to ≤6°C (potable water only)	7 d	AS
TSS or TDS	P/G	200 ml	Cool to ≤6°C	7 d / 2 d	APHA / ISO
Turbidity	P/G	50 ml	Store in Dark	2 d	APHA
TVSS	P	200ml	Cool to ≤6°C	1 d	USEPA
Xanthates (PAX)	G	500 ml	Cool to ≤6°C	1 d	ANZECC
ORGANICS - VOLATILE					
BTEX+C ₆ -C ₉ (or C ₆ -C ₁₀)	Vial	2 x 40ml	pH <2 (H ₂ SO ₄ or HCl) or Sodium Bisulphate (NaHSO ₄)** + Cool to ≤6°C	14 d	USEPA / AS
Haloacetic Acids	Vial	2 x 40ml	pH <2, Sodium Bisulphate (NaHSO ₄) + Cool to ≤6°C	14 d	USEPA
TRH (C ₆₋₉) (or C ₆ -C ₁₀)	Vial	2 x 40ml	pH <2 (H ₂ SO ₄ or HCl) + Cool to ≤6°C	14 d	USEPA
Trihalomethanes (THMs)	Vial	2 x 40ml	pH <2 (H ₂ SO ₄ or HCl) or Sodium Bisulphate (NaHSO ₄) + Cool to ≤6°C	14 d	USEPA
VOCs (Brominated)	Vial	2 x 40 ml	pH <2 (H ₂ SO ₄ or HCl) or Sodium Bisulphate (NaHSO ₄)** + Cool to ≤6°C	1 d	USEPA / AS
VOCs (incl C ₁ -C ₄ + Methane, 1,4 Dioxane)	Vial	2 x 40ml	pH <2 (H ₂ SO ₄ or HCl) or Sodium Bisulphate (NaHSO ₄)** + Cool to ≤6°C	7 d / 14 d	ISO / USEPA / AS
ORGANICS – SEMI VOLATILE					
Dioxins/Furans	G	2000 ml	Cool to ≤6°C + 0.008% Na ₂ S ₂ O ₃	30 d *	USEPA
Diuron	G	500 ml	Cool to ≤6°C	7 d	USEPA
Explosives	G	500 ml	Cool to ≤6°C	7 d	USEPA
Glyphosate	P/G	100 ml	Cool to ≤6°C + Sodium Thiosulphate	14 d	APHA / USEPA
Diquat/Paraquat	P	500 ml	Cool to ≤6°C	7 d	USEPA
Herbicides	G	1000 ml	Cool to ≤6°C	7 d *	USEPA
OCPs / OPPs or PCBs *	G	500 ml	Cool to ≤6°C	7 d *	USEPA
Organotins	G	500 ml	Cool to ≤6°C, dark	7 d	ISO
Perfluorinated Alkylated Substances (PFAS inc PFOS/PFOA)	<i>No Teflon liner to be used</i>	(std level) 250mL (low level)		14 d / 28 d	USEPA / ASTM
				<i>Longer holding times have been reported</i>	
Phenols – Species	G	500 ml	Cool to ≤6°C	7 d *	USEPA
Phenoxy Herbs	G	500 ml	Cool to ≤6°C	7 d *	USEPA
Phenoxy Herbs	G	500 ml	pH <2 (H ₂ SO ₄ or HCl) + Cool to ≤6°C	14 d *	ISO
PAHs or Phthalates	G	500 ml	Cool to ≤6°C	7 d *	USEPA
SVOCs including – OCPs, OPPs, PCBs, PAHs, Phthalates + TRH (C ₁₀ -C ₄₀)	G	500 ml ^A	Cool to ≤6°C	7 d *	USEPA
TRH (C ₁₀₋₄₀)	G	500 ml ^A	pH <2 (H ₂ SO ₄ or HCl) + Cool to ≤6°C	28 d *	ISO
MICROBIOLOGICAL and ALGAE					
Acid Producing Bacteria	P/G	250 ml	Cool to ≤6°C (no Sodium Thiosulphate) leave air space / freeze	1 d / 28 d	AS
Amoeba	P (Sterile)	500mL	Room Temperature	1 d	AS
Chlorophyll-a, b, c & Phaeophytin	P/G	500 ml	Cool ≤6°C + Dark or Filter/ Freeze	2 d / 28 d	APHA
Micro/Algae in natural water	P (Sterile)	250-500ml	Cool to ≤6°C	1 d	AS
Micro/Algae in tap water	P (Sterile)	250-500ml	Cool to ≤6°C + Sodium Thiosulphate	1 d	AS
Sulphate Reducing Bacteria	P	250 ml	Sterile, NO Sodium Thiosulphate + Cool to ≤6°C . No headspace	1 d	AS
RADIOLOGICAL					
Radiochem – Gross Alpha/Beta	P	200 mL	pH <2 HNO ₃	30 d	ISO
Radiochem – Gross Alpha/Beta	P	1000 ml	none	7 d	ISO
Radiochem – Radium 226 + 228	P	1000 ml	pH <2 (HNO ₃)	1 m	ISO

P/G: Plastic/Glass respectively

Water Comments:

* Dioxins – 30 days till extraction. 45 days after extraction. * Semi-volatiles – 7 days till extraction, 40 days after extraction.

* THM's – add 10% thiosulfate if residual chlorine present. * TRH (C₁₀-C₃₆ or C₁₀-C₄₀) – 7 days if treated as semi-volatile.

** Use Sodium Bisulphate where Dangerous Goods restrictions apply.

^ An absolute minimum volume of 100mL for SVOC analysis is required.

VOC/vTRH/THM – A third vial is preferred for VOC waters to allow for confirmation (if required) and QC sample analysis (duplicates and spikes).

For dissolved metals (such as ground waters) samples should be 0.45µm filtered into a HNO₃ preserved bottle. For dissolved metals that are not field filtered and acidified, Envirolab will filter on receipt from an unpreserved sample container then acidify. There will be a filtration charge and some elements may be affected by this process. For total recoverable metals (such as surface waters) samples should be placed unfiltered into a HNO₃ preserved bottle. For total recoverable metals that are not field preserved, Envirolab will sub sample from the unpreserved bottle on receipt and acidify with HNO₃.

For Ferrous Iron (Fe²⁺) samples should be 0.45µm filtered into a HCl preserved bottle. Discrepancies may occur if not field filtered.

For Hexavalent Chromium (Cr⁶⁺) samples should be 0.45µm filtered into a NaOH preserved bottle. Discrepancies may occur if not field filtered.

The above preservation techniques have been chosen by the Envirolab Group as suitable for most situations. There are other preservation techniques available – please contact David Springer on 02 9910 6200 for other options.

References:

AS = Australian Standard 5667.1:1998 Water Quality Sampling

APHA = Standard Methods for the Examination of Water & Wastewater, Latest Edition

ISO = ISO 5667.3 2012

USEPA = USEPA SW846

NEPM = Schedule B(3) 2013

RECOMMENDED PRESERVATION & HOLDING TIMES (RHT) FOR SOILS AND SEDIMENTS

Web: www.envirolab.com.au

ADELAIDE: (08) 7087 6800
MELBOURNE: (03) 9763 2500

BRISBANE: (07) 3266 9532
SYDNEY: (02) 9910 6200

DARWIN: 0477 012 027
PERTH: (08) 9317 2505

Test	Jar	Quantity	Preservation	RHT	Reference
INORGANICS, METALS AND PHYSICAL TESTS					
AMD	Bag	1-2 kg	Nil	N/A	-
Asbestos	Bag	50 g	Nil	N/A	AS4964
Asbestos (WA guidelines)	Bag	500 mL	Nil	N/A	NEPM
ASS	Bag	100 g	Remove air and freeze (Ziplock Bag)	<24 hr	QASSMAC
AVS	Bag	100 g	Remove air and freeze (Ziplock Bag)	<24 hr	QASSMAC
Bromide	P/G	20 g	Cool to $\leq 6^{\circ}\text{C}$	28 d	NEPM
Cation Exchange Capacity	G	50 g	Cool to $\leq 6^{\circ}\text{C}$	28 d	NEPM
Carbon – TOC	G	20 g	Cool to $\leq 6^{\circ}\text{C}$, no headspace	28 d	NEPM
Chloride	P/G	20 g	Cool to $\leq 6^{\circ}\text{C}$	28 d	NEPM
Clay	P/G/Bag	200 g	Nil	Not Determined	--
Conductivity	P/G	20 g	Cool to $\leq 6^{\circ}\text{C}$	7 d	NEPM
Cyanides	P/G	20 g	Cool to $\leq 6^{\circ}\text{C}$, dark	14 d	NEPM
Explosives	G	20 g	Cool to $\leq 6^{\circ}\text{C}$	14 d	USEPA
Field Peroxide	Bag	100 g	Remove air and freeze (Ziplock Bag)	<24 hr	QASSMAC
Foreign Material	Bag	6 kg	Nil	N/A	NEPM
Fluoride	P/G	20 g	Cool to $\leq 6^{\circ}\text{C}$	28 d	NEPM
Hexavalent Cr	P/G	20 g	Cool to $\leq 6^{\circ}\text{C}$	28 d	USEPA
Metals (except CrVI, Hg)	P/G	20 g	Cool to $\leq 6^{\circ}\text{C}$	6 m	USEPA
Mercury	P/G	20 g	Cool to $\leq 6^{\circ}\text{C}$	28 d	USEPA
Moisture	P/G	20 g	Cool to $\leq 6^{\circ}\text{C}$	14 d	NEPM
Nutrients – Ammonia, TKN, TP	G	20 g	Cool to $\leq 6^{\circ}\text{C}$	28 d	USEPA
Nutrients – TN, Nitrate, Nitrite, Phosphate	G	20 g	Cool to $\leq 6^{\circ}\text{C}$	7 d	-
pH	P/G	20 g	Cool to $\leq 6^{\circ}\text{C}$	7 d	NEPM
Particle size Distribution (PSD)	Bag	1 kg (sand/clay), 2 kg (gravel)	Nil	None	-
Sulphate	P/G	20 g	Cool to $\leq 6^{\circ}\text{C}$	28 d	NEPM
SPOCAS	P	100 g	Remove air and freeze (Ziplock Bag)	<24 hr	QASSMAC
Sulphide	P/G	20 g	Cool to $\leq 6^{\circ}\text{C}$ + 2M Zn acetate to cover	7 d	NEPM
TCLP	P/G	100 g	--	As per analyte of interest	--
ORGANICS – SEMI VOLATILE					
Dioxins and Furans	G	250 g	Cool to $\leq 6^{\circ}\text{C}$, dark	30 d	NEPM
Herbicides	G	20 g	Cool to $\leq 6^{\circ}\text{C}$	14 d	USEPA
Organotins	G	20 g	Cool to $\leq 6^{\circ}\text{C}$	14 d	NODG
OC/OP's	G	20 g	Cool to $\leq 6^{\circ}\text{C}$	14 d	USEPA
PAH's	G	20 g	Cool to $\leq 6^{\circ}\text{C}$	14 d	USEPA
PCB's	G	20 g	Cool to $\leq 6^{\circ}\text{C}$, dark	28 d	USEPA
Perfluorinated Alkylated Substances (PFAS inc PFOS/PFOA)	P	20 g	Cool to $\leq 6^{\circ}\text{C}$	60 d / 28 d <i>Longer holding times have been reported</i>	USEPA / ASTM
Phenols - Speciated	G	20 g	Cool to $\leq 6^{\circ}\text{C}$	14 d	USEPA
SVOC's	G	20 g	Cool to $\leq 6^{\circ}\text{C}$	14 d	USEPA
TCLP	P/G	100 g	--	As per analyte of interest	--
TRH (C ₁₀₋₄₀) and Speciated	G	20 g	Cool to $\leq 6^{\circ}\text{C}$	14 d	USEPA
ORGANICS - VOLATILE					
BTEX+C ₆ -C ₁₀	G	20 g	Cool to $\leq 6^{\circ}\text{C}$, no headspace	14 d	USEPA
TCLP	P/G	100 g	--	As per analyte of interest	--

Test	Jar	Qty	Preservation	RHT	Reference
TRH (C ₆₋₉)	G	20 g	Cool to ≤6°C, no headspace	14 d	USEPA
VOCs / VHCs / THMs / VACs /1, 4 Dioxane	G	20 g	Cool to ≤6°C, no headspace	14 d *	USEPA / NEPM
SOILS (cont.)					
MICROBIOLOGICAL					
Micro (E.Coli, FC, TC etc.)	P (sterile)	125 g	Cool to ≤6°C	<24 hr	USEPA
SEDIMENTS					
Elutriate Testing	P/G	100-500 g (depending on analytes) + supply of 5L of seawater	Cool to ≤6°C, dark, airtight	14 d	NAGD
Metals (except for Hg)	P/G	20 g	Cool to ≤6°C / freeze for extended storage	6 months	NAGD/NODG
Metals – Hg only			Cool to ≤6°C/ freeze for extended storage	28 d	NAGD/NODG
Organics (e.g. PCB's, Pesticides, PAH and TBT)	G	20 g	Cool to ≤6°C, dark/ freeze for extended storage	14 d	NAGD/NODG

P/G: Plastic/Glass respectively

250mL jar ≈ 350-420g

125mL jar ≈ 175-210g

Soil Comments:

- One 250ml size jar will cover most determinations in soil (extra is preferable for sizing tests e.g. Clay determination).
- Asbestos should be sampled in its own plastic bag and should be about 1 large handful or about 40g.
- SPOCAS should be supplied in its own plastic bag, air removed and frozen if possible.
- * Less for vinyl chloride, styrene, 2-chloroethyl vinyl ether (7 days)

Sediment Comments:

- Where samples are to be subsampled or homogenised in the lab, they should be stored at 2-8°C in the dark and transported to the laboratory within 72 hours (preferably 24 hours) of collection (NODG 2002)
- For sediment samples containing TBT, mercury and other volatiles for chemical analysis, freezing to below -10°C within 12 hours of collection, and before their despatch in a well-insulated cooler, improves laboratory storage life (NODG 2002).

References:

- USEPA = USEPA SW846
- NEPM = Schedule B(3) 2013
- NODG = National Ocean Disposal Guidelines 2002
- NAGD = National Assessment Guidelines for Dredging 2009

RECOMMENDED PRESERVATION & HOLDING TIMES (RHT) FOR AIR

Web: www.envirolab.com.au

ADELAIDE: (08) 7087 6800
MELBOURNE: (03) 9763 2500

BRISBANE: (07) 3266 9532
SYDNEY: (02) 9910 6200

DARWIN: 0477 012 027
PERTH: (08) 9317 2505

Determination	Container	Preservation	RHT
Acid Gases/Mists (HCl, HNO ₃ , H ₂ SO ₄ , H ₃ PO ₄ , HBr)	Sorbent / Filter	Cool, ≤6°C	21 d
Ammonia	Sorbent / Filter	Cool, ≤6°C	14 d
Diesel Particulates by NIOSH method	Filter	Ambient	30 d
Fluoride by NIOSH methods	Filter / Impinger	Cool, ≤6°C	30 d
Halogens (Br ₂ /Cl ₂) by NIOSH method	Sorbent / Filter	Cool, ≤6°C	30 d
NO/NO ₂ by NIOSH method	Sorbent	Cool, ≤6°C	7 d
Hydrogen Cyanide by NIOSH method	Sorbent	Cool, ≤6°C	14 d
Hydrogen Sulphide by NIOSH method (or see Sulfur Compounds below)	Sorbent	Cool, ≤6°C	30 d
SO _x by NIOSH & USEPA m6, 8	Impinger / Filter	Cool, ≤6°C	30 d
Metals general (includes CrVI)	Filters / Sorbents	Cool, ≤6°C	30 d (14 d for CrVI)
Metals by USEPA m29	Filters / Impingers	Cool, ≤6°C	30 d
Formaldehyde by NIOSH method	Sorbents	Ambient	21 d
Organic Vapours by OSHA method	Sorbents	Cool, ≤6°C	30 d
Volatile Organics* by EPA TO-15	Canister	Ambient	30 d
Volatile Organics* by EPA TO-15, modified	Air Sampling (Tedlar) bag	Ambient/Dark	72 hrs
Volatile Organics* by EPA TO-17	Sorbent tube	Cool, ≤6°C	28 d
Air Petroleum Hydrocarbons by APH method	Canister	Ambient	30 d
Air Petroleum Hydrocarbons by APH method	Sorbent tube	Ambient	28 d
Air Petroleum Hydrocarbons by APH method	Air Sampling (Tedlar) bag	Ambient	72 hrs
Gases by ATSM1945, ASTM1946 & EPA 3c modified as listed below (includes C1-C6)	Canister	Ambient	30 d
Gases by ATSM1945, ASTM1946 & EPA 3c modified as listed below (includes C1-C6)	Air Sampling (Tedlar) bag	Ambient	72 hrs
Reduced Sulfur Compounds *	Air Sampling (Tedlar) bag	Ambient	24 hrs
Reduced Sulfur Compounds *	Canister (Silico treated)	Ambient	72 hrs
Aldehydes by EPA TO-11A	Sorbent tube	Cool, ≤6°C	14 d
Polynuclear Aromatic Hydrocarbons by EPA TO-13A	PUF/XAD	Cool, ≤6°C	7 d
Organochlorine Pesticides and PCBs by EPA TO-4A/TO-10A	PUF	Cool, ≤6°C	7 d
Dioxins/Furans by method 23	XAD	Cool, ≤6°C	30 d

* Analyte integrity may be affected by high humidity, particularly for oxygenated and reduced sulphur compounds.

As air sampling bags have a short recommended holding period it is advisable the laboratory is contacted prior to sampling to ensure analysis occurs within the recommended holding time.

Air Sampling (Tedlar) bags should be partially filled when shipped by air freight

Gases by ATSM1945, ASTM1946 & EPA 3c includes CH₄, CO, CO₂, He, H₂, N₂, O₂ and >20 C₂-C₆ Aliphatic Hydrocarbons