

RECOMMENDED PRESERVATION & HOLDING TIMES (RHT) FOR WATERS

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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 $\leq 6^{\circ}\text{C}$	14 d	APHA / ISO
AOX	G	500 ml	pH <2 (HNO ₃) + Cool to $\leq 6^{\circ}\text{C}$ + Dark	3 d	AS
BOD	P/G	500 ml	Cool to $\leq 6^{\circ}\text{C}$	2 d / 1 month frozen	APHA / ISO
Bromide	P/G	50 ml	Cool to $\leq 6^{\circ}\text{C}$	28 d	ISO
Bromate	P	100 ml	Cool to $\leq 6^{\circ}\text{C}$ 50mg/L EDA	28 d	ISO
Carbon - TOC/DOC	P/G	50 ml	pH <2 (H ₂ SO ₄ or HCl) + Cool to $\leq 6^{\circ}\text{C}$	28 d	APHA
Carbon - TOC/DOC	P/G	50 ml	Cool to $\leq 6^{\circ}\text{C}$ + Dark	28 d	USEPA
Carbon Dioxide (free + total)	P	500ml	Cool to $\leq 6^{\circ}\text{C}$ (field measurement preferred)	15 min	APHA
Chlorine-Residual	P/G	20 ml	Analyse immediately	15 min	APHA
Chlorite ⁹ /Chlorate	P	100 ml	Cool to $\leq 6^{\circ}\text{C}$ 50mg/L EDA	14/28 d	USEPA
Chloride	P/G	100 ml	Nil	28 d	APHA
COD	P/G	100 ml	pH <2 (H ₂ SO ₄) + Cool to $\leq 6^{\circ}\text{C}$	28 d / 6m	APHA / ISO
Colour	P/G	100 ml	Cool to $\leq 6^{\circ}\text{C}$ + Dark	2 d / 5 d	APHA / ISO
Conductivity	P/G	100 ml	Cool to $\leq 6^{\circ}\text{C}$	28 d	USEPA
Cyanides/Cyanates	P/G	100 ml	pH (>12 NaOH) + Cool to $\leq 6^{\circ}\text{C}$ + Dark	14 d	APHA
Dust Deposition	G (Winchester)	4L	Copper Sulphate (10mL)	30 d	AS
Ferrous Iron	P/G	100 ml	Filter, pH <2 (HCl), no headspace	1 d / 7 d	AS / ISO
Fluoride	P (not PTFE)	50 ml	Nil	28 d	AS
Formaldehyde	Vial	2x40mL	Cool to $\leq 6^{\circ}\text{C}$	7 d / 14 d	ISO / USEPA
Hexavalent Cr	P/G	100 ml	Filter, cool to $\leq 6^{\circ}\text{C}$	1 d	AS
Hexavalent Cr	P/G	100 ml	Filter, pH 8-9.5 (NaOH) + Cool to $\leq 6^{\circ}\text{C}$	28 d	USEPA m1636 / APHA
Iodide/Iodine [all forms of Iodine]	P/G	50 ml	Cool to $\leq 6^{\circ}\text{C}$	28 d	APHA / in house
MBAS - Surfactants	G	100 ml	Cool to $\leq 6^{\circ}\text{C}$ / EDTA	2 d / 28d	APHA / ISO
Metals (inc. Cations)	P	50 ml	pH <2 (HNO ₃)	6 m	USEPA / APHA
Mercury	P	50 ml	pH <2 (HNO ₃)	28 d	USEPA/ APHA
Metals (inc. Cations)	P	50ml	Nil – Orange label bottle for airfreight will be lab acidified in <14days	6 m	USEPA / APHA
Mercury	P	50ml	Nil – Orange label bottle for airfreight will be lab acidified in <14days	28 d	USEPA/ APHA
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 $\leq 6^{\circ}\text{C}$	28 d	APHA
N – Ammonia	P/G	20 ml	Site filter & freeze	28 d	ISO
N – Nitrate + Nitrite	P/G	20 ml	Cool to $\leq 6^{\circ}\text{C}$	2 d	APHA
N – Nitrate + Nitrite	P/G	20 ml	Site filter & cool to $\leq 6^{\circ}\text{C}$	4 d	ISO
N – Nitrate	P/G	20 ml	Filter on site & freeze	28 d	ISO
N – Nitrite	P/G	20 ml	Filter on site & freeze	8 d	ISO
N – Total and N-TKN	P/G	100 ml	pH <2 (H ₂ SO ₄) + Cool to $\leq 6^{\circ}\text{C}$	28 d	APHA
N – Total and N-TKN	P/G	100 ml	Freeze	28 d	ISO
Oil & Grease	G	500 ml	pH <2 (H ₂ SO ₄ or HCl) + Cool to $\leq 6^{\circ}\text{C}$	28 d	APHA
Perchlorate	P	100 mL	Cool to $\leq 6^{\circ}\text{C}$	28 d	USEPA
pH	P/G	100 ml	Cool to $\leq 6^{\circ}\text{C}$ (field measurement preferred)	15min / 6 hrs / 1 d	APHA / AS / ISO
Perchlorate	P	100 ml	Cool to $\leq 6^{\circ}\text{C}$ 50mg/L EDA (or unpreserved) [®]	14/28 d	USEPA
Phenolics - total	P/G	100 ml	pH <2 (H ₂ SO ₄) + Cool to $\leq 6^{\circ}\text{C}$	28 d	APHA
Phosphorus - total	P/G	50 ml	pH <2 (HNO ₃)	28 d	APHA

Test	Bottle	Volume	Preservation (Bottles are colour coded, see labels)	RHT	Reference
INORGANICS, METALS AND PHYSICAL TESTS (continued)					
Phosphate as P	P/G	20 ml	Filter & Cool to $\leq 6^{\circ}\text{C}$ / Filter & Freeze	2d / 28 d	APHA / AS / ISO
Reactive Silica	P/G	250ml	Cool to $\leq 6^{\circ}\text{C}$ & Filter (preferably on site)	28 d	APHA
Settleable Solids	P	1000ml	none	2 d	APHA
Speciated Arsenic	P	125 ml	Field filter, pH <2 (few drops of HCl) + Cool to $\leq 6^{\circ}\text{C}$	ASAP, 28 d max	USEPA
Specific Gravity	P	50 ml	Cool to $\leq 6^{\circ}\text{C}$	2 d	AS / APHA
Sugar	P/G	100 ml	Cool to $\leq 6^{\circ}\text{C}$	7 d	N/A
Sulphate	P/G	100 ml	Cool to $\leq 6^{\circ}\text{C}$	28 d	APHA
Sulphite	P/G	100 ml	1ml EDTA/100ml (2.5g EDTA to 100ml)	2 d	AS / ISO
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 $\leq 6^{\circ}\text{C}$ (potable water only)	7 d	AS
Tannins and Lignins	P/G	100 ml	Cool to $\leq 6^{\circ}\text{C}$	7 d	AS
Thiocyanate (SCN ⁻)	P	100 ml	pH <2 (HNO ₃)	28 d	APHA
Thiosulphate	P/G	100 ml	Cool to $\leq 6^{\circ}\text{C}$	28 d	As per other Anions
TSS or TDS	P/G	200 ml	Cool to $\leq 6^{\circ}\text{C}$	7 d / 1 d	APHA / ISO
Turbidity	P/G	50 ml	Store in Dark	2 d	APHA
TVSS	P	200ml	Cool to $\leq 6^{\circ}\text{C}$	1 d / 7d	USEPA / APHA
ORGANICS - VOLATILE					
BTEX+ TRH C ₆ -C ₉ (or TRH C ₆ -C ₁₀)	Vial	2 x 40ml	pH <2 (H ₂ SO ₄ or HCl) or Sodium Bisulphate (NaHSO ₄)** + Cool to $\leq 6^{\circ}\text{C}$	14 d	USEPA / AS
Haloacetic Acids	Vial	2 x 40ml	Sodium Bisulphate (NaHSO ₄) + Cool to $\leq 6^{\circ}\text{C}$	14 d	USEPA
Trihalomethanes (THMs)	Vial	2 x 40ml	pH <2 (H ₂ SO ₄ or HCl) or Sodium Bisulphate (NaHSO ₄) + Cool to $\leq 6^{\circ}\text{C}$	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 $\leq 6^{\circ}\text{C}$	1 d	USEPA
VOCs (incl C ₁ -C ₄ + Methane, 1,4 Dioxane, Alcohols and Glycols)	Vial	2 x 40ml	pH <2 (H ₂ SO ₄ or HCl) or Sodium Bisulphate (NaHSO ₄)** + Cool to $\leq 6^{\circ}\text{C}$ <i>Vials for Epichlorohydrin must be unpreserved+ add Sodium Thiosulphate if sample is chlorinated</i>	7 d / 14 d	ISO / USEPA / AS
ORGANICS – SEMI VOLATILE					
Dioxins/Furans	G	2 x 250 ml	Cool to $\leq 6^{\circ}\text{C}$ (20mg sodium thiosulphate if residual chlorine)	30 d *	USEPA
Diuron	G	500 ml	Cool to $\leq 6^{\circ}\text{C}$	7 d	USEPA
Explosives/Volatile Fatty Acids	G	200 ml (or 2 x 40 ml VFAs)	Cool to $\leq 6^{\circ}\text{C}$	7 d	USEPA
Glyphosate family//Acrylamide	P/G	100 ml	Cool to $\leq 6^{\circ}\text{C}$ + Sodium Thiosulphate	14 d / 7 d	APHA / USEPA
Diquat/Paraquat	P	500 ml	Cool to $\leq 6^{\circ}\text{C}$	7 d	USEPA
Illicit Drugs	G	100mL	Cool to $\leq 6^{\circ}\text{C}$	7 d (estimate)	In house recommendation
Pesticides or PCBs *	G	2x100 ml [^]	Cool to $\leq 6^{\circ}\text{C}$	7 d *	USEPA / ISO
Organometallics	G	500 ml	Cool to $\leq 6^{\circ}\text{C}$, dark	7 d	ISO/USEPA
PBDEs	G	2x250 ml	Cool to $\leq 6^{\circ}\text{C}$, dark	7 d	USEPA
Per- and Polyfluoroalkyl Substances (PFAS))	P	2x60mL	Cool to $\leq 6^{\circ}\text{C}$ (suitable for std/low level/trace PFAS)	14 d / 28 d	USEPA / ASTM / ISO
Pharmaceuticals/ Hormones	G	2x100mL	Cool to $\leq 6^{\circ}\text{C}$	7d (estimate)	In house recommendation
Phenols – Speciated	G	2x100 ml [^]	Cool to $\leq 6^{\circ}\text{C}$	7 d *	USEPA
Phenoxy Herbs	G	2x250 ml [^]	Cool to $\leq 6^{\circ}\text{C}$	7 d *	USEPA
Phenoxy Herbs	G	2x100 ml [^]	pH <2 (H ₂ SO ₄ or HCl) + Cool to $\leq 6^{\circ}\text{C}$	14 d *	ISO
PAHs or Phthalates	G	2x100 ml [^]	Cool to $\leq 6^{\circ}\text{C}$	7 d *	USEPA
SVOCs including – OCPs, OPPs, PCBs, PAHs, Phthalates + TRH (C ₁₀ -C ₄₀)	G	2x100 ml [^] (100ml minimum)	Cool to $\leq 6^{\circ}\text{C}$	7 d *	USEPA
TRH (C ₁₀₋₄₀)	G	2x100 ml [^]	pH <2 (H ₂ SO ₄ or HCl) + Cool to $\leq 6^{\circ}\text{C}$	28 d *	ISO

Test	Bottle	Volume	Preservation (Bottles are colour coded, see labels)	RHT	Reference
MICROBIOLOGICAL and ALGAE					
Acid Producing or Denitrifying Bacteria	P/G (Sterile)	100 ml	Cool to $\leq 6^{\circ}\text{C}$ + Sodium Thiosulphate	1 d	AS
Amoeba	P (Sterile)	250mL	Room Temperature e.g. $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$ ideally + Sodium Thiosulphate	3d	AS
Legionella	P (Sterile)	100mL	Cool to $\leq 6^{\circ}\text{C}$ + Sodium Thiosulphate	2d	AS
Heterotrophic Plate Count	P (Sterile)	100mL	Cool to $\leq 6^{\circ}\text{C}$ + Sodium Thiosulphate	1d	APHA
TT.coli/E.coli, T.coli, Faecal. Enterococci, Pseudo, Clostridium	P (Sterile)	100mL (each)	Cool to $\leq 6^{\circ}\text{C}$ + Sodium Thiosulphate	1d	AS
Chlorophyll-a, b, c & Phaeophytin	P/G	500 ml	Cool $\leq 6^{\circ}\text{C}$ + Dark or Filter/ Freeze	2 d / 28 d	APHA
Micro/Algae in natural water	P (Sterile)	250-500ml	Cool to $\leq 6^{\circ}\text{C}$	1 d	AS
Micro/Algae in tap water	P (Sterile)	250-500ml	Cool to $\leq 6^{\circ}\text{C}$ + Sodium Thiosulphate	1 d	AS
Iron Related Bacteria	P (Sterile)	100ml	Sterile, Sodium Thiosulphate + Cool to $\leq 6^{\circ}\text{C}$. No headspace	1 d	AS
Sulphate Reducing Bacteria	P (Sterile)	100ml	Sterile, NO Sodium Thiosulphate + Cool to $\leq 6^{\circ}\text{C}$. 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 ($\text{C}_{10}\text{-C}_{36}$ or $\text{C}_{10}\text{-C}_{40}$) – 7 days if treated as semi-volatile.
- ** Use Sodium Bisulphate where Dangerous Goods restrictions apply (or can use Sodium Thiosulphate).
- ^ An absolute minimum volume of 100mL for SVOC analysis is required. Where low/trace levels are required 2 x 250mL is recommended.
- § Chlorite is sub-contracted.
- @ Perchlorate can be unpreserved if Oxyhalides are not 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).

SVOC/svTRH – A third bottle (100mL or 250mL for low level analysis) is preferred for SVOC waters to allow for confirmation (if required) and QC sample analysis (duplicates and spikes).

For specialised and/or boutique Organics, please contact the laboratory directly if recommended THTs are not clear from the information above.

For dissolved metals (such as ground waters) samples should be $0.45\mu\text{m}$ filtered into a HNO_3 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 HNO_3 preserved bottle. For total recoverable metals that are not field preserved, Envirolab will sub sample from the unpreserved bottle on receipt and acidify with HNO_3 prior to sample digestion.

For Ferrous Iron (Fe^{2+}) samples should be $0.45\mu\text{m}$ filtered into a HCl preserved bottle. Discrepancies may occur if not field filtered.

For Hexavalent Chromium (Cr^{6+}) samples should be $0.45\mu\text{m}$ 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 Envirolab Customer Service for other options.

References:

- AS = Australian Standard 5667.1:1998 Water Quality Sampling or latest version
- APHA = Standard Methods for the Examination of Water & Wastewater, Latest Edition
- ISO = ISO 5667.3 or ISO 13395 latest versions
- USEPA = USEPA SW846 or latest version
- NEPM = Schedule B(3) 2013 or latest version

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

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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 jar	Nil	N/A	NEPM
ASS /AVS	Bag	100 g	Remove air and freeze (Ziplock Bag)	<24 hr [#]	QASSMAC
Bromide / Iodide**	P/G	20 g	Cool to ≤6°C	28 d	NEPM
Cation Exchange Capacity	G	50 g	Cool to ≤6°C	28 d	NEPM
Carbon – TOC	G	20 g	Cool to ≤6°C, no headspace	28 d	NEPM
Chloride	P/G	20 g	Cool to ≤6°C	28 d	NEPM
Clay	P/G/Bag	200 g	Nil	Not Determined	--
Conductivity	P/G	20 g	Cool to ≤6°C	7 d	NEPM
Cyanates	P/G	20 g	Cool to ≤6°C, dark	1 d	In House
Cyanides	P/G	20 g	Cool to ≤6°C, dark	14 d	NEPM
Explosives	G	20 g	Cool to ≤6°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	N/A
Fluoride	P/G	20 g	Cool to ≤6°C	28 d	NEPM
Hexavalent Cr	P/G	20 g	Cool to ≤6°C	28 d	USEPA
LEAF 1313 (variable pH)	P/G	1-2kg	Cool to ≤6°C	As per analyte of interest	USEPA
LEAF 1314 (column test)	P/G	2-3kg	Cool to ≤6°C	As per analyte of interest	USEPA
LEAF 1315 (monolith test)	P/G	2-3kg	Cool to ≤6°C	As per analyte of interest	USEPA
LEAF 1316 (variable L/S ratio)	P/G	2-5kg	Cool to ≤6°C	As per analyte of interest	USEPA
Metals (except CrVI, Hg)	P/G	20 g	Cool to ≤6°C	6 m	USEPA
Mercury	P/G	20 g	Cool to ≤6°C	28 d	USEPA
Moisture	P/G	20 g	Cool to ≤6°C	14 d	NEPM
Nutrients – Ammonia, TKN, TP	G	20 g	Cool to ≤6°C	28 d	USEPA
Nutrients – TN, Nitrate, Nitrite, Phosphate	G	20 g	Cool to ≤6°C	7 d	In house recommendation
pH	P/G	20 g	Cool to ≤6°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 ≤6°C	28 d	NEPM
SPOCAS	P	100 g	Remove air and freeze (Ziplock Bag)	<24 hr [#]	QASSMAC
Sulphide	P/G	20 g	Cool to ≤6°C + 2M Zn acetate to cover	7 d	NEPM
TCLP	P/G	100 g	Cool to ≤6°C	As per analyte of interest	--
Thiocyanates	P/G	20 g	Cool to ≤6°C, dark	14 d	In House
ORGANICS – SEMI VOLATILE					
Dioxins and Furans	G	250 g	Cool to ≤6°C, dark	30 d	NEPM
Herbicides	G	20 g	Cool to ≤6°C	14 d	USEPA
Illicit Drugs	G	50g	Cool to ≤6°C	28 d (estimate)	In house
Organotins	G	20 g	Cool to ≤6°C	14 d	NODG
OC/OP's	G	20 g	Cool to ≤6°C	14 d	USEPA
PAH's / PBDEs	G	20 g	Cool to ≤6°C	14 d	USEPA
PCB's	G	20 g	Cool to ≤6°C, dark	28 d	USEPA
Per- and Polyfluoroalkyl Substances (PFAS inc PFOS/PFOA/PFHxS)	P	20 g	Cool to ≤6°C	60 d / 28 d <i>Longer holding times have been reported</i>	USEPA / ASTM
Phenols – Speciated (inc Coal Tar)	G	20 g	Cool to ≤6°C	14 d	USEPA
SVOC's	G	20 g	Cool to ≤6°C	14 d	USEPA
TRH (C ₁₀₋₄₀) and Speciated	G	20 g	Cool to ≤6°C	14 d	USEPA

Test	Jar	Qty	Preservation	RHT	Reference
SOILS (cont.)					
ORGANICS - VOLATILE					
BTEX+C ₆ -C ₁₀	G	20 g	Cool to ≤6°C, no headspace	14 d	USEPA
zHE TCLP	P/G	100 g	--	As per analytes of interest	--
TRH (C ₆₋₉ or C ₆₋₁₀)	G	20 g	Cool to ≤6°C, no headspace	14 d	USEPA
VOCs / VHCS / THMs / VACs /1, 4 Dioxane / Alcohols / Glycols	G	20 g	Cool to ≤6°C, no headspace	14 d *	USEPA / NEPM
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/CrS should be supplied in its own plastic bag, air removed and frozen if possible or delivered to the laboratory within 24hrs of sampling.
- * Less for vinyl chloride, styrene, 2-chloroethyl vinyl ether (7 days)
- Leachate Environmental Assessment Framework (LEAF) quantities can be project specific, please contact the laboratory for advice.
- ** Some analytes e.g. Iodide do not have recommended holding times, hence holding times for similar analytes may have been recommended.

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

Soil samples for agricultural tests can be collected in zip lock plastic bags or glass jars, the literature suggests that there is evidence that field moist soils can be kept at ≤6°C for days or weeks before any change in nutrient cations and anions. Air-drying and/or freezing will assist in reducing the potential for biological transformation. Hence analysis should typically occur within two weeks of sampling.

RECOMMENDED PRESERVATION & HOLDING TIMES (RHT) FOR AIR

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Determination	Container	Preservation	RHT	Reference
Acid Gases/Mists (HCl, HNO ₃ , H ₂ SO ₄ , H ₃ PO ₄ , HBr)	Sorbent / Filter	Cool, ≤6°C	21 d sorbents / 28 d filters	NIOSH 7903 (sorbents) / NIOSH 7907-7908 (filters)
Ammonia	Sorbent / Filter	Cool, ≤6°C	21 d sorbents / 14 d filters	NIOSH / best practice
Diesel Particulates	Filter	Ambient	180 d	NIOSH 5040
Fluoride	Filter / Impinger	Cool, ≤6°C	28 d/best practice	NIOSH 7906/USEPA m13b
Halogens (Br ₂ /Cl ₂)	Sorbent	Cool, ≤6°C	30 d	NIOSH 6011
NO/NO ₂	Sorbent	Cool, ≤6°C	7 d	NIOSH 6014
Hydrogen Cyanide	Sorbent	Cool, ≤6°C	14 d (sorbent) / ASAP best practice (passive)	NIOSH 6010/OSHA 1015
Hydrogen Sulphide (or see Sulphur Compounds below)	Sorbent	Cool, ≤6°C	30 d	NIOSH 6013
Sulphur Dioxide – SO ₂	Filter/Sorbent	Cool, ≤6°C	30 d (best practice)	NIOSH 6004
SO _x by USEPA m6, 8	Impinger	Cool, ≤6°C	30 d	USEPA m6 & m8
Metals general (includes CrVI)	Filters / Sorbents	Cool, ≤6°C	180 d (14 d for CrVI)	NIOSH 7303 (Metals) / NIOSH 7600 (Cr6+)
Metals by USEPA m29	Filters / Impingers	Cool, ≤6°C	180 d (best practice)	USEPA m29
Formaldehyde	Sorbents	Cool, ≤6°C	35 d	NIOSH 2016
Organic Vapours (includes Radiello)	Sorbents	Cool, ≤6°C	30 d (best practice)	OSHA/NIOSH
Volatile Organics* by EPA TO-15	Canister	Ambient	30 d	TO-15
Volatile Organics* by EPA TO-15, modified	Air Sampling (Tedlar) bag	Ambient/Dark	72 hrs	TO-15
Volatile Organics* by EPA TO-17 (includes Radiello)	Sorbent tube	Cool, ≤6°C	30 d	TO-17
Air Petroleum Hydrocarbons by APH method	Canister	Ambient	30 d	Air-Phase Petroleum Hydrocarbons (APH), 2009 & TO-15
Air Petroleum Hydrocarbons by APH method (includes Radiello)	Sorbent tube	Ambient	30 d	Air-Phase Petroleum Hydrocarbons (APH), 2009 & TO-15
Air Petroleum Hydrocarbons by APH method	Air Sampling (Tedlar) bag	Ambient/Dark	72 hrs	Air-Phase Petroleum Hydrocarbons (APH), 2009 & TO-15
Gases by ASTM1945, ASTM1946 & EPA 3c modified as listed below (includes C1-C6)	Canister	Ambient	30 d	ASTM1945, ASTM1946 & EPA 3c
Gases by ASTM1945, ASTM1946 & EPA 3c modified as listed below (includes C1-C6)	Air Sampling (Tedlar) bag	Ambient	72 hrs	ASTM1945, ASTM1946 & EPA 3c
Reduced Sulphur Compounds *	Air Sampling (Tedlar) bag	Ambient	24 hrs	ASTM D5504
Reduced Sulphur Compounds *	Canister (Silico treated)	Ambient	72 hrs	ASTM D5504
Aldehydes and Ketones	Sorbent tube	Cool, ≤6°C	14 d	USEPA TO-11A
Determination	Container	Preservation	RHT	Reference
Polynuclear Aromatic Hydrocarbons	PUF/XAD	Cool, ≤6°C	7 d (or 14d*)	USEPA TO-13A
Organochlorine Pesticides and PCBs	PUF	Cool, ≤6°C	7 d	USEPA TO-4A USEPA TO-10A
Dioxins/Furans	XAD	Cool, ≤6°C	30 d	In house recommendation

* 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 ASTM1945, ASTM1946 & EPA 3c includes CH₄, CO, CO₂, He, H₂, N₂, O₂ and >20 C₂-C₆ Aliphatic Hydrocarbons

Canadian government laboratory reported stability for up to 14 days for PAHs

Some references have become obsolete (e.g. some NIOSH methods) and are therefore indicative only.

For particular sorbents and/or samplers (e.g. SKC, Radiello, 3M and Waterloo Membrane Samplers), please see manufacturer specific information, generally available online.

RECOMMENDED PRESERVATION & HOLDING TIMES (RHT) FOR BIOLOGICAL SAMPLES

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MELBOURNE: (03) 9763 2500 SYDNEY: (02) 9910 6200 PERTH: (08) 9317 2505 NEWCASTLE: (02) 4902 9231

ADELAIDE: (08) 7087 6800 BRISBANE: (07) 3266 9532 DARWIN: 0477 012 027

Test	Container	Quantity	Preservation	RHT	Reference
BLOOD/PLASMA/SERUM					
PFAS/TOPA	Serum Separating Tube (SST)	1 x 8mL SST gold cap [1 x 4mL purple cap with anti-coagulant]	Cool to ≤6°C SST for Serum [K ₂ EDTA (blood only – non-routine request)]	2 months	USEPA (adopted draft soil criteria)
URINE					
Creatinine	Urine jars	20mL specimen jar	Filter, Cool to ≤6°C / freeze	6 days / 6 months	Thermo paper
Metals					
Metals including Mercury	Urine jars	20mL specimen jar	Cool to ≤6°C	28	NIOSH
Speciated Arsenic	Urine jars	20mL specimen jar	Filter, Cool to ≤6°C / freeze	2 months	*Reference Paper
Organics					
BTEX Metabolites e.g. S-PMA	Urine jars	20mL specimen jar	Cool to ≤6°C/frozen, dark	7/30 days	NIOSH
Hexane Metabolites e.g. 2,5-HD	Urine jars	20mL specimen jar	Cool to ≤6°C/frozen, dark	7/30 days	NIOSH
PAH Metabolites e.g. 1-HP	Urine jars	20mL specimen jar	Cool to ≤6°C/frozen, dark	7/30 days	NIOSH
Phenoxy Acid Herbicides	Urine jars	20mL specimen jar	Cool to ≤6°C/frozen, dark	7/30 days	NIOSH
Speciated Phenols	Urine jars	20mL specimen jar	Cool to ≤6°C/frozen, dark	7/30 days	NIOSH
VOC Metabolites e.g. Mandelic acid	Urine jars	20mL specimen jar	Cool to ≤6°C/frozen, dark	7/30 days	NIOSH

References:

- * Sample Preparation and Storage Can Change Arsenic Speciation in Human Urine – Feldmann et al Clinical Chemistry 45, No. 11, 1999

RECOMMENDED PRESERVATION & HOLDING TIMES (RHT) FOR ILLICIT/LICIT DRUGS and DRUG METABOLITES on SWABS and WATERS

Test	Container	Quantity	Preservation	RHT	Reference
SWABS					
Methamphetamine and three precursors: MDMA, Ephedrine and Pseudoephedrine Other analyse available e.g. Cocaine, Heroin, Fentanyl, Cannabinoids.	Swab kit – 50mL tube	2 swabs per 100cm ²	Cool to ≤6°C	30 days	NIOSH
GENERAL WATERS					
Full suite Illicit/Licit drugs and drug metabolites	Glass Amber	250mL	Cool to ≤6°C	3 days	In house
POTABLE WATERS (where chlorine likely present)					
Full suite Illicit/Licit drugs and drug metabolites	Glass Amber	250mL	Cool to ≤6°C + Sodium Thiosulfate to 80mg/L	3 days	In house