



# Recommended Holding Times and Preservations for Water

Version 4, September 2020

Parameter	Container	Preservation	Holding Time	Reference	
<b>GENERAL INORGANICS (METALS, NUTRIENTS, CATIONS, ANIONS, PHYSICAL TESTS)</b>					
Acidity / Alkalinity	P	Chill	14 days	APHA Table 1060:I	
Ammonia Nitrogen	Option 1	H <sub>2</sub> SO <sub>4</sub> to pH<2, Chill	28 days	APHA Table 1060:I	
	Option 2	Chill	1 day	APHA Table 1060:I	
Anions General: Chloride, Sulfate, Fluoride, Bromide	P	Chill	28 days	APHA Table 1060:I	
BOD	P	Chill	2 days	APHA Table 1060:I	
Cations (Ca, Mg, Na & K) and Hardness	Option 1	HNO <sub>3</sub> to pH<2, Chill (Field filter where dissolved cations or hardness required <sup>(2)</sup> )	28 days	AS/NZS 5667.1	
	Option 2	Nil, Chill	7 days	AS/NZS 5667.1	
Carbon Total Organic (TOC)	G	H <sub>2</sub> SO <sub>4</sub> to pH<2, Chill	28 days	APHA Table 1060:I	
Carbon Dissolved Organic (DOC)	G	H <sub>2</sub> SO <sub>4</sub> to pH<2, Field filter <sup>(2)</sup> , Chill	28 days	APHA Table 1060:I	
Chlorophyll a	Option 1	P - Opaque Chill, Store in dark	2 days	APHA Table 1060:I	
	Option 2	N/A Filter, store filtrate frozen in foil (Do not store in a frost free freezer)	28 days		
Chromium VI	P	NaOH, Chill	28 days	USEPA 1669	
COD	P	H <sub>2</sub> SO <sub>4</sub> to pH<2, Chill	28 days	APHA Table 1060:I	
Colour	P	Chill	2 days	APHA Table 1060:I	
Conductivity (EC)	P	Chill	28 days	APHA Table 1060:I	
Cyanide (Total, Free, WAD and Amenable to chlorination) or Cyanate	P - Opaque	NaOH to pH>12, Chill <sup>(1)</sup>	14 days	APHA 1060:I	
Ferrous Iron (Fe <sup>2+</sup> )	P	HCl to pH<2. (ZH), Field filter <sup>(2)</sup> , Chill	7 days	ISO 5667-3:2003	
Formaldehyde	P	Chill	2 days	ASTM D6303-98	
Mercury	Option 1	HNO <sub>3</sub> to pH<2, Chill <sup>(2)</sup>	28 days	APHA Table 1060:I	
	Option 2	Nil – Lab Acidify in <14 days, Chill <sup>(2)</sup>	28 days	USEPA 200.8	
Metals General	Option 1	HNO <sub>3</sub> to pH<2, Chill <sup>(2)</sup>	6 months	APHA Table 1060:I	
	Option 2	Nil - Lab Acidify in <14 days, Chill <sup>(2)</sup>	6 months	USEPA 200.8	
Nitrate Nitrogen	P	<i>Calculation from Nitrite and NOx</i>	2 days	APHA Table 1060:I	
Nitrite Nitrogen	P	Chill	2 days	APHA Table 1060:I	
Nitrogen - Oxidised Nitrogen (NOx)	P	H <sub>2</sub> SO <sub>4</sub> to pH<2, Chill	28 days	APHA Table 1060:I/ AS/NZS 5667.1	
		Chill	2 days		
Nitrogen - Total	P	H <sub>2</sub> SO <sub>4</sub> to pH<2, Chill	28 days	APHA Table 1060:I	
Oil & Grease	G	NaHSO <sub>4</sub> to pH<2, Chill	28 days	APHA Table 1060:I	
Perchlorate	P	Filter to 0.2µm, Requires Headspace, Chill	28 days	USEPA 6850	
pH	P	Nil	6 hours	AS/NZS 5667.18	
Phenols – Total	P	H <sub>2</sub> SO <sub>4</sub> to pH<2, Chill	28 days	APHA Table 1060:I	
Phosphorus – Reactive	P	Chill	2 days	APHA Table 1060:I	
Phosphorus – Total	P	H <sub>2</sub> SO <sub>4</sub> to pH<2, Chill	28 days	AS/NZS 5667.1	
Radionuclides incl' Gross alpha, Gross beta & Radium 226, 228	P	Lab Acidify in <5 days, Chill or HNO <sub>3</sub> to pH<2, Chill	6 months	APHA 7010B	
Solids (TS, TSS, TDS)	P	Chill	7 days	APHA Table 1060:I	
Surfactants (NIS, MBAS)	G	Chill	2 days	AS/NZS 5667.1	
		Chill, submit in 2 days, preserve in Lab	4 days (MBAS) 28 days (NIS)		
Silica	P	Chill	28 days	APHA Table 1060:I	
Sulfide	P	Zn Acetate & NaOH, Chill	7 days	AS/NZS 5667.1	
Sulfide–Dissolved or Unionised Hydrogen Sulfide (UHS)	P	Flocculate sample in NaOH/AlCl <sub>3</sub> bottle before decanting into Zn Acetate & NaOH bottle, Chill	7 days	APHA 4500-S <sup>2</sup> -B	
Sulfite or Thiosulfate	P	EDTA/Zn Acetate, Chill	2 days	AS/NZS 5667.1 & In house	
Speciated Arsenic and Selenium	P	HCl to pH<2, Chill, (Zero Headspace)	28 days	USEPA1632-2001	
Thiocyanate	P	H <sub>2</sub> SO <sub>4</sub> to pH<2, Chill	6 months	APHA 4500CN M	
TKN (Total Kjeldahl Nitrogen)	P	H <sub>2</sub> SO <sub>4</sub> to pH<2, Chill	28 days	APHA Table 1060:I	
Turbidity	P	Store in dark, Chill	2 days	APHA Table 1060:I	
<b>ULTRA TRACE NUTRIENTS ON CLEAN WATER - DRINKING AND SALINE WATERS</b>					
Dissolved Nutrients Ammonia Nitrite Nitrate Oxidised Nitrogen (NOx) Reactive Phosphorus Reactive Silica	Option 1	P	Field filter <sup>(2)</sup> , Chill	1 day (Ammonia & Reactive P) 4 days (Nitrite, Nitrate & NOx) 28 days (Reactive Silica)	AS/ NZS 5667.1:1998 & ISO 5667-3 (2012) & In House
	Option 2	P	Field filter <sup>(2)</sup> , Freeze	4 days (Nitrite & Nitrate) 28 days (Ammonia, Reactive P, NOx & Reactive Silica) <i>NOTE: It is preferable for Reactive Silica to be chilled only.</i>	
Total Nitrogen & Total Phosphorous – (Persulfate Method)	Option 1	P	Chill	1 day	AS/ NZS 5667.1:1998
	Option 2	P	Freeze	28 days	



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Version 4, September 2020

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<b>ORGANICS – SEMIVOLATILE COMPOUNDS (SVOCs)</b>					
Acrylamide	Amber (T)	Chill	7 days	USEPA SW846 8316 1998	
Alkyl phenol Ethoxylates	Amber (T)	Chill	2 days	AS/NZS 5667.1:1998	
		Chill, submit in 2 days, preserve in Lab	7 days	In house	
Carbamates	Amber (T)	Chill	7 days <sup>(3)</sup>	USEPA 632	
Chlorinated Hydrocarbons (SV)	Amber (T)	Chill	7 days <sup>(3)</sup>	USEPA SW846 2007	
Dioxins	Amber (T)	Chill	1 year	USEPA 1613.B	
Explosives	Amber (T)	Chill	7 days <sup>(3)</sup>	USEPA SW846 2007	
Glyphosate	Amber (T)	Chill	14 days	USEPA 547	
Glycols	Vial (TS)	Chill	7 days	USEPA SW846 2007	
Herbicides (Phenoxy Acid)	Amber (T)	Chill	7 days <sup>(3)</sup>	USEPA SW846 2007	
N-Nitrosodimethylamine (NDMA)	Amber (T)	Chill	7 days <sup>(3)</sup>	USEPA 607	
Organophosphorus Pesticides, Organochlorine Pesticides & PCBs	Amber (T)	Chill	7 days <sup>(3)</sup>	USEPA SW846 2007	
Paraquat/Diquat	P	Chill	7 days	USEPA SW846 2007	
Petroleum Hydrocarbons (C <sub>10</sub> -C <sub>40</sub> )	Amber (T)	Chill	7 days <sup>(3)</sup>	USEPA SW846 2007	
PFAS (including PFOS & PFOA)	P (PTFE free)	Chill	6 months	In house – POPs	
Phenols and Phthalate Esters	Amber (T)	Chill	7 days <sup>(3)</sup>	USEPA SW846 2007	
Polyaromatic Hydrocarbons (PAHs)	Amber (T)	Chill	7 days <sup>(3)</sup>	USEPA SW846 2007	
PPCPs	Amber (T)	Chill	7 days <sup>(3)</sup>	AGWR 2008, USEPA 1694	
Synthetic Pyrethroids	Amber (T)	Chill	7 days <sup>(3)</sup>	USEPA SW846-8270D	
Tributyl Tin (TBT)	Amber (T)	Chill	7 days <sup>(3)</sup>	USEPA SW846 2007	
<b>ORGANICS - VOLATILE COMPOUNDS (VOCs) / DISSOLVED GASES</b>					
BTEXN plus TRH/TPH Hydrocarbons (C <sub>6</sub> -C <sub>10</sub> )	Vial (TS)	H <sub>2</sub> SO <sub>4</sub> to pH<2, Chill, (ZH)	14 days	USEPA SW846 2007	
C <sub>1</sub> -C <sub>4</sub> Gases (including Methane)	Vial (TS)	H <sub>2</sub> SO <sub>4</sub> to pH<2, Chill, (ZH)	14 days	USEPA SW846 2007/ NATATTEN.WPD 2002	
Chloroacetic Acids	Vial (TS)	NH <sub>4</sub> Cl, Chill, (ZH)	28 days	USEPA 552.1	
Acrylonitrile, 1,4-Dioxane, Pyridine	Vial (TS)	H <sub>2</sub> SO <sub>4</sub> to pH<2, Chill, (ZH)	14 days	USEPA 603, 1671 & 524.2, USEPA SW846 2007	
Acrolein	Vial (TS)	Chill, (ZH)	3 days	USEPA 603	
		Chill, (ZH), submit in 3 days to preserve in Lab	14 days		
Halo Acetic Acids	Vial (TS)	NH <sub>4</sub> Cl, Chill, (ZH)	28 days	USEPA 552.1	
MIB/Geosmin	Vial (TS)	Chill, (ZH)	3 days	APHA 6040	
VOCs including: Halogenated Aliphatics, Aromatics, Monocyclic Aromatics (MAHs), Trihalomethanes (THMs) and Alcohols	Vial (TS)	H <sub>2</sub> SO <sub>4</sub> to pH<2, Chill, (ZH)	14 days	USEPA SW846 2007	
<b>ALGAE AND MICROBIOLOGICAL TESTS</b>					
Algae Analysis	Option 1	P	Lugols at 1% v/v ratio	6 months	Hotzel and Croome 1999
	Option 2	P	Nil	2 days	Hotzel and Croome 1999
Amoeba including Naegleria fowleri	P (sterile)	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (if chlorinated), Do NOT Chill	4 days	AS 2031-2012	
Cryptosporidium & Giardia	P	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (if chlorinated), Chill	4 days	USEPA 1623	
Endotoxins	PF	Chill	7 days	European Pharmacopoeia 2.6.14 Method C	
General Microbiological Tests (e.g. Faecal coliforms, E-coli, HPC etc)	P (sterile)	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (if chlorinated), Chill	1 day	APHA 9060B	
Legionella	P (sterile)	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (if chlorinated), Chill	2 days	AS3896 - 2008	

## Notes:

1. When samples for cyanide analysis are suspected of containing Sulfide, a pre-treatment bottle (containing Lead Acetate) should be used to remove Sulfide prior to decanting into the 'Cyanide' bottle.
2. Dissolved Metals, Ferrous Iron, DOC and dissolved ultra-trace nutrients should be field filtered using a 0.45µm filter prior to placing in the container.
3. Samples can also be extracted within 7 days and the resulting extracts analysed within 40 days.



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Version 4, September 2020

KEY			
G	Glass	Amber (T)	Amber Glass Bottle with Teflon Lined Lid
(TS)	40mL Vial with Teflon Lined Septum	P	Plastic (Polyethylene)
PF	Pyrogen free sample container	(ZH)	Zero Headspace required

## APPLICABLE LOCATIONS

The bottles, preservation and holding time on the previous pages are for the ALS Environmental operations at the below locations:

### Adelaide

Unit 3, 1 Burma Road  
Pooraka, Adelaide, SA 5095  
P: +61-8-8162-5130  
ALSEnviro.Adelaide@alsglobal.com

### Melbourne

2-4 Westall Road  
Springvale VIC 3171  
P: +61-3-8549-9600  
ALSEnviro.Melbourne@alsglobal.com

### Sydney (Smithfield)

277-289 Woodpark Road  
Smithfield NSW 2164  
P: +61-2-8784-8555  
ALSEnviro.Sydney@alsglobal.com

### Brisbane

2 Byth Street (Corner Byth and Shand St)  
Stafford QLD 4053  
P: +61-7-3243-7222  
ALSEnviro.Brisbane@alsglobal.com

### Mudgee

Unit 1, 29 Sydney Road  
Mudgee NSW 2850  
P: +61-2-6372-6735  
ALSEnviro.Mudgee@alsglobal.com

### Sydney (Crows Nest)

Shop 2, 36 Hume Street  
Crows Nest NSW 2065  
P: +61-2-9437-9978  
ALSEnviro.Sydney@alsglobal.com

### Chinchilla

20B Malduf Street  
Chinchilla QLD 4413  
P: +61-7-4665-5770  
ALSEnviro.Chinchilla@alsglobal.com

### Newcastle

5/585 Maitland Road  
Mayfield West NSW 2304  
P: +61-2-4014-2500  
ALSEnviro.Newcastle@alsglobal.com

### Townsville

13 Carlton Street  
Kirwan QLD 4817  
P: +61-7-4773-0000  
ALSEnviro.Townsville@alsglobal.com

### Darwin

Unit 4, 16 Charlton Court  
Woolner NT 0820  
P: +61-8-8942-2608  
ALSEnviro.Darwin@alsglobal.com

### Nowra

4/13 Geary Place  
North Nowra NSW 2541  
P: +61-2-4423-2063  
ALSEnviro.Nowra@alsglobal.com

### Wollongong

Unit 1, 19 Ralph Black Drive  
North Wollongong NSW 2500  
P: +61-2-4225-3125  
ALSEnviro.Wollongong@alsglobal.com

### Gladstone

46 Callemondah Drive Clinton  
Gladstone QLD 4680  
P: +61-7-4978-7944  
ALSEnviro.Gladstone@alsglobal.com

### Perth

26 Rigali Way  
Wangara WA 6065  
P: +61-8-9406-1301  
ALSEnviro.Perth@alsglobal.com

### Mackay

Unit 2, 20 Caterpillar Drive  
Paget QLD 4740  
P: +61-7-4952-5795  
ALSEnviro.Mackay@alsglobal.com

### Roma

Lot 4, 73 Beaumont Drive  
Roma QLD 4455  
P: +61-7-4622-8978  
ALSEnviro.Roma@alsglobal.com

## Sample Preservation, Chilling and Submission

Care must be taken not to rinse out or spill preservatives during sampling for HSE reasons and to avoid cross contaminating other bottles (e.g., Nitric acid used for metals can contaminate nitrate analysis). Field filtration is mandatory or recommended for many tests and other tests must have exposure to air minimized to avoid analyte losses. Samples should generally chilled to  $\leq 4^{\circ}\text{C}$  or  $\leq 6^{\circ}\text{C}$  (guideline dependent) and transported to the laboratory within 24 hours. ALS recommends placing samples in ice immediately upon sampling for best practice chilling with either repacking into another esky or draining of free water and replacement of ice just prior to dispatch. Chilling overnight in a fridge may also benefit. The post-chilling addition of ice bricks is also recommended where samples are air freighted or dispatched long distance and where couriers will not freight ice. Note that sample containers for Amoeba analysis must not be chilled.

Samples taken from chlorinated water sources require the addition of sodium thiosulfate for microbiological, volatile organics and semi volatile organics. Please advise ALS accordingly to facilitate supply of appropriate containers.

Please note that where possible samples should be submitted to the laboratory with at least half the recommended holding time remaining and it is preferable to avoid submitting holding time critical tests late on Fridays without prior arrangement.

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