Sampling and analysis

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As a condition of Discharge Authorisation, we may require customers to collect samples of their trade waste discharges for laboratory analysis. The results are used when assessing compliance with permitted discharge quality. They are also used when calculating billing amounts for discharges subject to volume and load based charges.

Adequate discharge quality data is also important for:

- commissioning of pre-treatment devices
- identifying production or pre-treatment performance problems
- performance benchmarking/ waste minimisation etc.

This guideline sets out the typical protocols required for customers required to sample their discharges to the sewerage system.

Sample collection

- Sample collection is in line with the principles set down in Australian and New Zealand Standard *AS/NZS 5667. 1 & 10:1998 Water quality – Sampling – Guidance on sampling of waste waters*.
- Unless otherwise specified within a trade waste permit, samples are:
    - Flow proportional 24hr composites with a minimum of 52 sub samples as required for charging purposes.
    - Grab or composite samples (as appropriate) for compliance purposes.
    - Taken from the outlet of an effective pre-treatment device or at source, to avoid the dilution factor.
- A Field Sampling Report is a record or how and when a sample was collected. *Appendix A* is a sample report that may be used.
- Where we do not collect these samples, a Field Sampling Report must accompany the laboratory analysis results, when reported to SA Water.

Protocol for collecting compliance and charging samples

Where a Discharge Authorisation has new sampling requirements, we will collect samples of customer discharges for the first six months (at the customer's cost), or until enough data is collected to establish typical discharge performance values. After this time, customers may choose to retain our sampling service, engage a competent third party contractor to do this, or collect their own trade waste samples (self-sampling) under the following conditions:

- The customer must notify us at least two months before the intended start of contractor or self-sampling. The customer must supply a draft copy of a sampling procedure for our consideration. This should include all the details below:
    - sample preservation methods
    - a step by step procedure for taking samples
    - the intended laboratory for analysis

    - contractor details (if applicable)
    - the method for ensuring that samples are a true representation of discharges
- If approved for contractor or self-sampling, we will carry out a handover procedure, or parallel sampling with the customer or contractor (at the customer's cost). This continues until we are satisfied the customer/contractor can collect and deliver truly representative samples in accordance with the approved procedure.
- We will, from time to time, at our expense, collect duplicate sample splits or perform parallel sample collection and analysis, for quality control purposes.
- We may, at our discretion, prohibit companies engaging self/third party sampling, in the event the company or its contractor is:
    - misrepresenting samples, or
    - collecting samples not in accordance with permit and/or accompanying sampling procedure (as agreed), or
    - exceeding maximum holding times (as outlined in sample preparation section of this guideline).

In these instances, it is at our discretion whether self/third party sampling will be considered again in the future, and under what conditions.

Sample handling / analysis

The table on the following pages summarises acceptable handling and analysis methods and handling for trade waste samples. Analysis method codes are from *Standard Methods for the Examination of Water and Wastewater, 22nd Edition.* APHA, AWWA, WEF, 2012. ISBN: 978-0-87553-013-0.

Parameter	Method	Preservation	Container	Maximum holding time	Air gap required?
Aluminium	3125 or 3120B or 3111D	Refrigerate. If >24 hrs acidify with nitric acid to pH 1-2	600ml acid washed Glass or plastic	1 month	No
Ammonia	4500 – NH3 B or C or D or F or G or H	Refrigerate Field filter (.45 micron) cellulose acetate membrane and refrigerate Filter as above but freeze	100ml minimum Glass, Polythene or PET	6 hours 24 hours 1 month	No No Yes
Arsenic	3113B or 3120B or 3125	Refrigerate. If >24 hrs acidify with nitric acid to pH 1-2	100ml minimum Glass, Polythene or PET	1 month	No
Barium	3125 or 3120B or 3111D	Refrigerate. If >24 hrs acidify with nitric acid to pH 1-2	100ml minimum Glass, Polythene or PET	1 month	No
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)	6200 B or C	Refrigerate. Acidify with hydrochloric acid to pH 1-2	Glass, solvent washed with PTFE cap liner (50ml min)	14 days	No
Biochemical oxygen demand (BOD)	5210B	Refrigerate	1000ml minimum Glass, Polythene or PET	24 hours	No
Boron	3125 or 3120B	Refrigerate. If >24 hrs acidify with nitric acid to pH 1-2	100ml minimum Glass, Polythene or PET	1 month	No
Cadmium	3125 or 3120B or 3113B or 3111B	Refrigerate. If >24 hrs acidify with nitric acid to pH 1-2	100ml minimum Glass, Polythene or PET	1 month	No
Chlorinated hydrocarbons	6200 B or C	Refrigerate + reducing agent	Glass, solvent washed with PTFE cap liner (50ml min)	14 days	No
Chlorine (total available)	Field test on-site within 5 mins of collecting sample. Use a DPD-colorimetric test kit (preferred) or laboratory analysis				

Parameter	Method	Preservation	Container	Maximum holding time	Air gap required?
Chlorine (total available)	4500-Cl B or C	Refrigerate, avoid sunlight	100ml Polythene or PET	<2hrs	No
Chromium (hexavalent)	3500-Cr B or C	Refrigerate. If >24 hrs acidify with nitric acid to pH 1-2	100ml minimum Glass, Polythene or PET	1 month	No
Chromium (total)	3125 or 3120B or 3111B or 3113B	Refrigerate. If >24 hrs acidify with nitric acid to pH 1-2	100ml minimum Glass, Polythene or PET	1 month	No
Copper	3125 or 3120B or 3111B or 3113B	Refrigerate. If >24 hrs acidify with nitric acid to pH 1-2	100ml minimum Glass, Polythene or PET	1 month	No
Cyanide	4500-CN G or E	Add ascorbic acid until chlorine not present. Refrigerate	250ml Glass, Polythene or PET	24 hours	No
Flammable/explosive substances	Measure in-situ using an approved LEL meter				
Formaldehyde	Modified NIOSH 3500	Refrigerate	50ml minimum glass, solvent washed with PTFE cap liner	15 days	No
Grease / oil	5520D	Refrigerate	Glass 1000ml min	24 hours	Yes
Iron	3125 or 3120B or 3111B or 3113B	Refrigerate. If >24 hrs acidify with nitric acid to pH 1-2	100ml minimum Glass, Polythene or PET	1 month	No
Lead	3125 or 3120B or 3111B or 3113B	Refrigerate. If >24 hrs acidify with nitric acid to pH 1-2	100ml minimum Glass, Polythene or PET	1 month	No
Manganese	3125 or 3120B or 3111B or 3113B	Refrigerate. If >24 hrs acidify with nitric acid to pH 1-2	100ml minimum Glass, Polythene or PET	1 month	No

Parameter	Method	Preservation	Container	Maximum holding time	Air gap required?
Mercury	3112B or if required 3125	Refrigerate. If >24 hrs acidify with nitric acid to pH 1-2	100ml minimum Glass, Polythene or PET	1 month	No
Molybdenum	3125 or 3120B or 3111B or 3113B	Refrigerate. If >24 hrs acidify with nitric acid to pH 1-2	100ml minimum Glass, Polythene or PET	1 month	No
Nickel	3125 or 3120B or 3111B or 3113B	Refrigerate. If >24 hrs acidify with nitric acid to pH 1-2	100ml minimum Glass, Polythene or PET	1 month	No
Organochlorine pesticides	6410B, 6630C	Refrigerate	1000ml minimum Tinted glass	7 days	Yes
Organophosphorus pesticides	6410B	Refrigerate	1000ml minimum Tinted glass	7 days	Yes
Phenolic Compounds	6410B or 6420B	Refrigerate	1000ml minimum tinted glass	24 hours	No
Polynuclear Aromatic Hydrocarbons (PAHs)	6440B or 6410B	Refrigerate	1000ml minimum tinted glass	7 days	Yes
Silver	3125 or 3120B or 3111B or 3113B	Refrigerate. If >24 hrs acidify with nitric acid to pH 1-2	100ml minimum Glass, Polythene or PET	1 month	No
Sulphate	4500-SO_4^{2-} D, E & F	Refrigerate	500ml Glass, polythene or PET	7 days	No
Sulphide (total)	4500S^{2-} B, C, D or E	Refrigerate. Add 4 drops Zinc Acetate (2M) and 4 drops NaOH (2M) per 100ml of sample.	500ml Glass, polythene or PET	24 hours	No
Suspended solids	2540D&E	Refrigerate	Any container that prohibits material adhering to container walls	24 hours	Yes

Parameter	Method	Preservation	Container	Maximum holding time	Air gap required?
Tin	3111B or 3113B or 3125(if required)	Refrigerate. If >24 hrs acidify with nitric acid to pH 1-2	100ml minimum Glass, Polythene or PET	1 month	No
Total dissolved solids (TDS)	2510B#	Refrigerate	500ml minimum polythene or PET	24 hours	No
Total Kjeldahl Nitrogen (TKN)	4500-N (org B o r C)	Refrigerate Freeze	Glass, PE or PET (min 100ml)	24 hours 1 month	No Yes
Total Petroleum Hydrocarbons (TPH)	USEPA8260B or USEPA8015	Refrigerate	1000ml minimum tinted glass container	14 days	Yes
Total Phosphorus	4500-P B.4, 4500-P E ,4500P-I, 4500-P F	Refrigerate Freeze	200ml minimum Glass, Polythene or PET	6 hours 1 month	No Yes
Zinc	3125 or 3120B or 3111B or 3113B	Refrigerate. If >24 hrs acidify with nitric acid to pH 1-2	100ml minimum Glass, Polythene or PET	1 month	No

- Refrigeration means maintaining temperature as low as practicable during collection and transit to the laboratory, e.g. in a refrigerator or in "esky" insulated cooler with ice water. Samples should not be frozen, unless specifically approved by SA Water.
- All analysis must be done by a laboratory that has NATA certification (or other quality assurance system acceptable to SA Water) for the required analytical methods.

Appendix A: example field sampling report

Discharging company:		Authorisation number:
Sampling location:		
Sample start date and time:	Sample finish date and time:	No. of sub-samples:
Sample collection time:	Sample preservation method:	
Production information (what activities are producing trade waste during this sampling period)		
Was production typical during this sampling period?	Yes / No	If no, give details
Was the sampling at the permitted location and in accordance with permit requirements?	Yes / No	If no, give details, including the SA Water officer who agreed to this variation.
Sample delivery to laboratory date and time (if manually dropped off):		
General Comments:		
Sampling Person and Company Name:		Sampling Person Signature: