



CERTIFICATE OF ANALYSIS 230015

Client Details

Client	ABCO Water Systems
Attention	Tony Van Der Mey and Murray Brown
Address	PO Box 1131, KELMSCOTT DC, WA, 6997

Sample Details

Your Reference	<u>Water Analysis</u>
Number of Samples	3 Waters
Date samples received	19/07/2019
Date completed instructions received	19/07/2019

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	29/07/2019
Date of Issue	31/07/2019
Reissue Details	This report replaces R00 created on 25/07/2019 due to: Correction in Result Data
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Results Approved By

Heram Halim, Operations Manager
Jessica Jones, Microbiology Supervisor

Authorised By

Michael Kubiak, Laboratory Manager

Client Reference: Water Analysis

Miscellaneous Inorganics				
Our Reference			230015-1	230015-2
Your Reference	UNITS	PQL	Raw Sewage	Treated Effluent
Date Sampled			18/07/2019	18/07/2019
Type of sample			Water	Water
Date prepared	-		19/07/2019	19/07/2019
Date analysed	-		19/07/2019	19/07/2019
BOD	mg/L	5	380	31
Total Suspended Solids	mg/L	5	310	5
Total Phosphorus	mg/L	0.05	12	4.8
Total Nitrogen	mg/L	0.1	87	8.9

Client Reference: Water Analysis

Microbiological Testing			
Our Reference			230015-3
Your Reference	UNITS	PQL	Potable Water
Date Sampled			18/07/2019
Type of sample			Water
Date testing started	-		19/07/2019
Date testing completed	-		21/07/2019
Faecal Enterococci	cfu/100mL	1	<1
Thermotolerant Coliforms	cfu/100mL	1	<1
E.coli	cfu/100mL	1	<1

Client Reference: Water Analysis

Method ID	Methodology Summary
INORG-019	Suspended Solids - determined gravimetrically by filtration of the sample. The samples are dried at 104+/-5oC.
INORG-091	BOD - Analysed in accordance with APHA latest edition 5210 D.
INORG-110	Total Nitrogen by high temperature catalytic combustion with chemiluminescence detection. Dissolved/Total Carbon and Dissolved/Total Organic and Inorganic Carbon by high temperature catalytic combustion with NDIR
METALS-020	Metals in soil and water by ICP-OES.
MICRO-001	E. Coli: Microbial Water Analysis - in accordance with MICRO-001 (AS4276.7-2007). Recommended maximums based on NHMRC and ARMC Australian Drinking Water Guidelines.
MICRO-001	Faecal Enterococci: Microbial Water Analysis - in accordance with MICRO-001 (ISO 7899-2:2000).
MICRO-001	Thermotolerant Coliforms: Microbial Water Analysis - in accordance with MICRO-001 (AS4276.7-2007). Recommended maximums based on NHMRC and ARMC Australian Drinking Water Guidelines.

Client Reference: Water Analysis

QUALITY CONTROL: Miscellaneous Inorganics				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			19/07/2019	[NT]	[NT]	[NT]	[NT]	19/07/2019	[NT]
Date analysed	-			19/07/2019	[NT]	[NT]	[NT]	[NT]	19/07/2019	[NT]
BOD	mg/L	5	INORG-091	<5	[NT]	[NT]	[NT]	[NT]	89	[NT]
Total Suspended Solids	mg/L	5	INORG-019	<5	[NT]	[NT]	[NT]	[NT]	103	[NT]
Total Phosphorus	mg/L	0.05	METALS-020	<0.05	[NT]	[NT]	[NT]	[NT]	95	[NT]
Total Nitrogen	mg/L	0.1	INORG-110	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]

Client Reference: Water Analysis

QUALITY CONTROL: Microbiological Testing				Duplicate			Spike Recovery %			
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date testing started	-			19/07/2019	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Date testing completed	-			21/07/2019	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Faecal Enterococci	cfu/100mL	1	MICRO-001	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Thermotolerant Coliforms	cfu/100mL	1	MICRO-001	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
E.coli	cfu/100mL	1	MICRO-001	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from "2018 TLVs and BEIs", as published by ACGIH (where available).

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) a

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.