

Certificate of Analysis

Ecoscope Environmental P/L
PO Box 3338
Rockhampton
QLD 4701



NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: Howard Howell

Report 529541-W
 Project name
 Project ID ASW030117
 Received Date Jan 05, 2017

Client Sample ID			RO WATER
Sample Matrix			Water
Eurofins mgt Sample No.			M17-Ja00813
Date Sampled			Jan 03, 2017
Test/Reference	LOR	Unit	
Chloride	1	mg/L	20
Fluoride	0.5	mg/L	< 0.5
Alkalinity (speciated)			
Bicarbonate Alkalinity (as CaCO ₃)	20	mg/L	54
Total Alkalinity (as CaCO ₃)	20	mg/L	54
Alkali Metals			
Calcium	0.5	mg/L	1.0
Magnesium	0.5	mg/L	0.9
Potassium	0.5	mg/L	< 0.5
Sodium	0.5	mg/L	26
Hardness Set			
Hardness mg equivalent CaCO ₃ /L	5	mg/L	5.9
Heavy Metals			
Aluminium	0.05	mg/L	< 0.05
Antimony	0.005	mg/L	< 0.005
Arsenic	0.001	mg/L	< 0.001
Barium	0.02	mg/L	< 0.02
Beryllium	0.001	mg/L	< 0.001
Bismuth	5	mg/L	< 5
Boron	0.05	mg/L	< 0.05
Cadmium	0.0002	mg/L	< 0.0002
Chromium	0.001	mg/L	< 0.001
Cobalt	0.001	mg/L	< 0.001
Copper	0.001	mg/L	< 0.001
Iron	0.05	mg/L	< 0.05
Lead	0.001	mg/L	< 0.001
Manganese	0.005	mg/L	< 0.005
Mercury	0.0001	mg/L	< 0.0001
Molybdenum	0.005	mg/L	< 0.005
Nickel	0.001	mg/L	< 0.001
Selenium	0.001	mg/L	< 0.001
Silver	0.005	mg/L	< 0.005
Thallium	0.005	mg/L	< 0.005
Tin	0.005	mg/L	< 0.005
Titanium	0.005	mg/L	< 0.005

Client Sample ID			RO WATER
Sample Matrix			Water
Eurofins mgt Sample No.			M17-Ja00813
Date Sampled			Jan 03, 2017
Test/Reference	LOR	Unit	
Heavy Metals			
Uranium	0.005	mg/L	< 0.005
Vanadium	0.005	mg/L	< 0.005
Zinc	0.005	mg/L	< 0.005
Extended Metals Suite			
Phosphorus	0.5	mg/L	< 0.5
Silicon	0.5	mg/L	0.7
Sulphur	0.5	mg/L	0.6

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Chloride - Method: LTM-INO-4090 Chloride by Discrete Analyser	Melbourne	Jan 05, 2017	28 Day
Fluoride - Method: LM-LTM-INO-4300 (Fluoride by Ion Chromatography)	Melbourne	Jan 06, 2017	28 Day
Alkalinity (speciated) - Method: APHA 2320 Alkalinity by Titration	Melbourne	Jan 05, 2017	14 Day
Hardness Set			
Calcium - Method: LTM-MET-3010 Alkali Metals, S, Si and P by ICP-AES	Melbourne	Jan 05, 2017	180 Day
Extended Metals Suite - Method: LTM-MET-3040 Metals in Waters by ICP-MS & USEPA 6010 Alkali Metals	Melbourne	Jan 05, 2017	28 Day
Magnesium - Method: LTM-MET-3010 Alkali Metals, S, Si and P by ICP-AES	Melbourne	Jan 05, 2017	180 Day
Hardness mg equivalent CaCO ₃ /L - Method: APHA 2340B Hardness by Calculation	Melbourne	Jan 05, 2017	28 Day

Company Name: Ecoscope Environmental P/L	Order No.: 3611	Received: Jan 5, 2017 8:11 AM
Address: PO Box 3338 Rockhampton QLD 4701	Report #: 529541	Due: Jan 12, 2017
	Phone: 07 4926 0630	Priority: 5 Day
	Fax: 07 4926 0367	Contact Name: Howard Howell
Project Name:		
Project ID: ASW030117		

Eurofins | mgt Analytical Services Manager : Ryan Gilbert

Sample Detail						Bicarbonate Alkalinity (as CaCO3)	Chloride	Fluoride	Total Alkalinity (as CaCO3)	Hardness Set	Extended Metals Suite
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 18217											
External Laboratory											
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID						
1	RO WATER	Jan 03, 2017		Water	M17-Ja00813	X	X	X	X	X	X
Test Counts						1	1	1	1	1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per Kilogram

mg/l: milligrams per litre

ug/l: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100ml: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs 20-130%

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Chloride	mg/L	< 1			1	Pass	
Fluoride	mg/L	< 0.5			0.5	Pass	
Method Blank							
Alkalinity (speciated)							
Bicarbonate Alkalinity (as CaCO ₃)	mg/L	< 20			20	Pass	
Total Alkalinity (as CaCO ₃)	mg/L	< 20			20	Pass	
Method Blank							
Alkali Metals							
Calcium	mg/L	< 0.5			0.5	Pass	
Magnesium	mg/L	< 0.5			0.5	Pass	
Potassium	mg/L	< 0.5			0.5	Pass	
Sodium	mg/L	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Aluminium	mg/L	< 0.05			0.05	Pass	
Antimony	mg/L	< 0.005			0.005	Pass	
Arsenic	mg/L	< 0.001			0.001	Pass	
Barium	mg/L	< 0.02			0.02	Pass	
Beryllium	mg/L	< 0.001			0.001	Pass	
Bismuth	mg/L	< 5			5	Pass	
Boron	mg/L	< 0.05			0.05	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Cobalt	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Iron	mg/L	< 0.05			0.05	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Manganese	mg/L	< 0.005			0.005	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Molybdenum	mg/L	< 0.005			0.005	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Selenium	mg/L	< 0.001			0.001	Pass	
Silver	mg/L	< 0.005			0.005	Pass	
Thallium	mg/L	< 0.005			0.005	Pass	
Tin	mg/L	< 0.005			0.005	Pass	
Titanium	mg/L	< 0.005			0.005	Pass	
Uranium	mg/L	< 0.005			0.005	Pass	
Vanadium	mg/L	< 0.005			0.005	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
Method Blank							
Extended Metals Suite							
Phosphorus	mg/L	< 0.5			0.5	Pass	
Silicon	mg/L	< 0.5			0.5	Pass	
Sulphur	mg/L	< 0.5			0.5	Pass	
LCS - % Recovery							
Chloride	%	101			70-130	Pass	
Fluoride	%	88			70-130	Pass	
LCS - % Recovery							
Alkalinity (speciated)							
Total Alkalinity (as CaCO ₃)	%	98			70-130	Pass	
LCS - % Recovery							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code	
Alkali Metals								
Calcium	%	94			70-130	Pass		
Magnesium	%	102			70-130	Pass		
Potassium	%	89			70-130	Pass		
Sodium	%	87			70-130	Pass		
LCS - % Recovery								
Heavy Metals								
Antimony	%	91			80-120	Pass		
Arsenic	%	96			80-120	Pass		
Barium	%	91			80-120	Pass		
Beryllium	%	95			80-120	Pass		
Bismuth	%	97			80-120	Pass		
Boron	%	109			80-120	Pass		
Cadmium	%	102			80-120	Pass		
Chromium	%	99			80-120	Pass		
Cobalt	%	95			80-120	Pass		
Copper	%	95			80-120	Pass		
Iron	%	89			80-120	Pass		
Lead	%	100			80-120	Pass		
Manganese	%	92			80-120	Pass		
Mercury	%	107			75-125	Pass		
Molybdenum	%	97			80-120	Pass		
Nickel	%	94			80-120	Pass		
Selenium	%	94			80-120	Pass		
Silver	%	97			80-120	Pass		
Thallium	%	99			80-120	Pass		
Tin	%	92			80-120	Pass		
Titanium	%	99			80-120	Pass		
Uranium	%	102			80-120	Pass		
Vanadium	%	100			80-120	Pass		
Zinc	%	94			80-120	Pass		
LCS - % Recovery								
Extended Metals Suite								
Phosphorus	%	93			70-130	Pass		
Silicon	%	80			70-130	Pass		
Sulphur	%	91			70-130	Pass		
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery								
				Result 1				
Chloride	M17-Ja00795	NCP	%	88		70-130	Pass	
Fluoride	M17-Ja00349	NCP	%	88		70-130	Pass	
Spike - % Recovery								
Alkalinity (speciated)								
				Result 1				
Total Alkalinity (as CaCO ₃)	M17-Ja00796	NCP	%	90		70-130	Pass	
Spike - % Recovery								
Alkali Metals								
				Result 1				
Calcium	M17-Ja00926	NCP	%	99		70-130	Pass	
Magnesium	M17-Ja00926	NCP	%	102		70-130	Pass	
Potassium	M17-Ja00926	NCP	%	92		70-130	Pass	
Sodium	M17-Ja00926	NCP	%	108		70-130	Pass	
Spike - % Recovery								
Heavy Metals								
				Result 1				
Antimony	M17-Ja00649	NCP	%	95		70-130	Pass	
Arsenic	M17-Ja00649	NCP	%	96		75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Barium	M17-Ja00649	NCP	%	88			75-125	Pass	
Beryllium	M17-Ja00649	NCP	%	90			75-125	Pass	
Bismuth	M17-Ja00649	NCP	%	95			75-125	Pass	
Boron	M17-Ja00649	NCP	%	78			75-125	Pass	
Cadmium	M17-Ja00649	NCP	%	97			75-125	Pass	
Chromium	M17-Ja00649	NCP	%	95			75-125	Pass	
Cobalt	M17-Ja00649	NCP	%	92			75-125	Pass	
Copper	M17-Ja00649	NCP	%	90			75-125	Pass	
Iron	M17-Ja00649	NCP	%	82			75-125	Pass	
Lead	M17-Ja00649	NCP	%	94			75-125	Pass	
Manganese	M17-Ja00649	NCP	%	74			75-125	Fail	Q08
Molybdenum	M17-Ja00649	NCP	%	95			75-125	Pass	
Nickel	M17-Ja00649	NCP	%	91			75-125	Pass	
Selenium	M17-Ja00649	NCP	%	93			75-125	Pass	
Thallium	M17-Ja00649	NCP	%	92			75-125	Pass	
Tin	M17-Ja00649	NCP	%	92			75-125	Pass	
Titanium	M17-Ja00649	NCP	%	97			75-125	Pass	
Uranium	M17-Ja00649	NCP	%	100			75-125	Pass	
Vanadium	M17-Ja00649	NCP	%	97			75-125	Pass	
Zinc	M17-Ja00649	NCP	%	91			75-125	Pass	
Spike - % Recovery									
Extended Metals Suite				Result 1					
Silicon	M17-Ja00926	NCP	%	82			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Chloride	M17-Ja00776	NCP	mg/L	250	270	4.6	30%	Pass	
Fluoride	M17-Ja00793	NCP	mg/L	0.8	0.8	4.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Alkalinity (speciated)									
Bicarbonate Alkalinity (as CaCO ₃)	M17-Ja01176	NCP	mg/L	150	150	<1	30%	Pass	
Total Alkalinity (as CaCO ₃)	M17-Ja01176	NCP	mg/L	150	150	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Alkali Metals									
Calcium	M17-Ja00486	NCP	mg/L	330	350	5.0	30%	Pass	
Magnesium	M17-Ja00486	NCP	mg/L	3.0	3.1	3.0	30%	Pass	
Potassium	M17-Ja00486	NCP	mg/L	15	15	1.0	30%	Pass	
Sodium	M17-Ja00486	NCP	mg/L	26	26	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Hardness Set									
Hardness mg equivalent CaCO ₃ /L	M17-Ja00486	NCP	mg/L	840	880	4.8	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Heavy Metals									
Antimony	M17-Ja00649	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Arsenic	M17-Ja00649	NCP	mg/L	0.002	0.002	2.0	30%	Pass	
Barium	M17-Ja00649	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Beryllium	M17-Ja00649	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bismuth	M17-Ja00649	NCP	mg/L	< 5	< 5	<1	30%	Pass	
Boron	M17-Ja00649	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Cadmium	M17-Ja00649	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	M17-Ja00649	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cobalt	M17-Ja00649	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	M17-Ja00649	NCP	mg/L	0.003	0.003	2.0	30%	Pass	
Iron	M17-Ja00649	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	

Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Lead	M17-Ja00649	NCP	mg/L	0.011	0.011	<1	30%	Pass
Manganese	M17-Ja00649	NCP	mg/L	0.12	0.12	6.0	30%	Pass
Molybdenum	M17-Ja00649	NCP	mg/L	0.011	0.010	4.0	30%	Pass
Nickel	M17-Ja00649	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Selenium	M17-Ja00649	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Thallium	M17-Ja00649	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass
Tin	M17-Ja00649	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass
Titanium	M17-Ja00649	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass
Uranium	M17-Ja00649	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass
Vanadium	M17-Ja00649	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass
Duplicate								
Extended Metals Suite				Result 1	Result 2	RPD		
Silicon	M17-Ja00926	NCP	mg/L	7.9	7.7	2.0	30%	Pass

Comments
Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference

Authorised By

Ryan Gilbert	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Huong Le	Senior Analyst-Inorganic (VIC)


Glenn Jackson
National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

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