

CERTIFICATE OF ANALYSIS

Work Order : **EW2003794**
Client : **WINGECARRIBEE SHIRE COUNCIL**
Contact : Helen Harrison
Address : PO BOX 141
 MOSSVALE NSW
 AUSTRALIA
Telephone : ----
Project : RRC Quarterly
Order number : ----
C-O-C number : ----
Sampler : Glenn Davies
Site : ----
Quote number : WO/067/12
No. of samples received : 6
No. of samples analysed : 6

Page : 1 of 5
Laboratory : Environmental Division NSW South Coast
Contact : Tyler Anderson
Address : 1/19 Ralph Black Dr, North Wollongong 2500
 4/13 Geary Pl, North Nowra 2541
 Australia NSW Australia
Telephone : +61 2 8784 8555
Date Samples Received : 21-Aug-2020 15:43
Date Analysis Commenced : 21-Aug-2020
Issue Date : 31-Aug-2020 12:03



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Glenn Davies	Environmental Services Representative	Laboratory - Wollongong, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- **Analytical work for this work order will be conducted at ALS Sydney.**
- The MB for EG020T has been analysed on the run and all results are less than the LOR. Due to a software issue which is under investigation, the MB results aren't uploaded
- TDS by method EA-015 may bias high for various samples due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.
- EN055: Ionic Balance out of acceptable limits for sample EW2003794-#001 due to analytes not quantified in this report.
- pH performed by ALS Wollongong via in-house method EA005FD and EN67 PK.
- Electrical conductivity performed by ALS Wollongong via in-house method EA010FD and EN67 PK.
- Sampling and groundwater depth measurements completed by ALS Wollongong via inhouse sampling method EN/67.11 Groundwater Sampling.
- Sampling completed by ALS Wollongong in accordance with in-house sampling method EN/67.6 Rivers and Streams.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Client sample ID

				Point 1 MW1B (Front Gate)	Point 2 MW06 (Car Park)	Point 3 MW7 (South of Pond)	Point 5 SW01 (Upstream Stormwater)	Point 6 SW02 (Holding Pond)
Client sampling date / time				21-Aug-2020 09:25	21-Aug-2020 10:20	21-Aug-2020 09:40	21-Aug-2020 10:40	21-Aug-2020 10:00
Compound	CAS Number	LOR	Unit	EW2003794-001	EW2003794-002	EW2003794-003	EW2003794-004	EW2003794-005
				Result	Result	Result	Result	Result
EA005FD: Field pH								
pH	----	0.1	pH Unit	5.4	4.7	4.7	7.6	8.0
EA010FD: Field Conductivity								
Electrical Conductivity (Non Compensated)	----	1	µS/cm	2260	294	2030	2620	524
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	1910	242	1370	----	377
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	----	----	----	26	13
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	12	28	9	----	----
Total Alkalinity as CaCO3	----	1	mg/L	12	28	9	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	342	14	<1	----	56
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	241	65	660	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	185	<1	3	----	----
Magnesium	7439-95-4	1	mg/L	55	3	32	----	----
Sodium	7440-23-5	1	mg/L	138	54	365	----	----
Potassium	7440-09-7	1	mg/L	72	<1	<1	----	----
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	----	----	----	----	0.37
Copper	7440-50-8	0.001	mg/L	----	----	----	----	0.008
Lead	7439-92-1	0.001	mg/L	----	----	----	----	0.002
Zinc	7440-66-6	0.005	mg/L	----	----	----	----	0.042
Iron	7439-89-6	0.05	mg/L	----	----	----	----	0.42
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.71	0.07	0.01	0.05	0.34
EK086: Sulfite as SO3 2-								
Sulfite as SO3 2-	14265-45-3	2	mg/L	----	----	----	----	<2



Analytical Results

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 (Matrix: WATER)

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Client sampling date / time				21-Aug-2020 09:25	21-Aug-2020 10:20	21-Aug-2020 09:40	21-Aug-2020 10:40	21-Aug-2020 10:00
Compound	CAS Number	LOR	Unit	EW2003794-001	EW2003794-002	EW2003794-003	EW2003794-004	EW2003794-005
				Result	Result	Result	Result	Result
EN055: Ionic Balance								
∅ Total Anions	----	0.01	meq/L	14.2	2.68	18.8	----	----
∅ Total Cations	----	0.01	meq/L	21.6	2.60	18.6	----	----
∅ Ionic Balance	----	0.01	%	20.8	----	0.37	----	----
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	45	9	4	34	16
EP030: Biochemical Oxygen Demand (BOD)								
Biochemical Oxygen Demand	----	2	mg/L	----	----	----	2	2
QWI-EN 67.11 Sampling of Groundwaters								
Depth	----	0.01	m	1.85	1.65	1.74	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID		Point 7 SW03 (Polishing Pond)	----	----	----	----
Client sampling date / time			21-Aug-2020 09:50		----	----	----	----	
Compound	CAS Number	LOR	Unit	EW2003794-006	-----	-----	-----	-----	
				Result	----	----	----	----	
EA005FD: Field pH									
pH	----	0.1	pH Unit	8.2	----	----	----	----	
EA010FD: Field Conductivity									
Electrical Conductivity (Non Compensated)	----	1	µS/cm	1490	----	----	----	----	
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L	103	----	----	----	----	
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L	0.10	----	----	----	----	
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L	36	----	----	----	----	
EP030: Biochemical Oxygen Demand (BOD)									
Biochemical Oxygen Demand	----	2	mg/L	6	----	----	----	----	