



CERTIFICATE OF ANALYSIS

Work Order	: EW2301924	Page	: 1 of 5
Client	: WINGECARRIBEE SHIRE COUNCIL	Laboratory	: Environmental Division NSW South Coast
Contact	: Resource	Contact	: Aneta Prosaroski
Address	: PO BOX 141 MOSSVALE NSW AUSTRALIA	Address	: 1/19 Ralph Black Dr, North Wollongong 2500 NSW Australia
Telephone	: ----	Telephone	: 02 42253125
Project	: RRC Quarterly	Date Samples Received	: 01-May-2023 14:12
Order number	: 00254161	Date Analysis Commenced	: 01-May-2023
C-O-C number	: ----	Issue Date	: 16-Jun-2023 12:53
Sampler	: , Robert DaLio		
Site	: ----		
Quote number	: WO/067/12		
No. of samples received	: 6		
No. of samples analysed	: 6		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. 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.

Signatories	Position	Accreditation Category
Aneta Prosaroski	Environmental Services Representative	Laboratory - Wollongong, NSW
Ankit Joshi	Senior Chemist - Inorganics	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 Contract 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.**
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO₂ and Fluoride to the Anions.
- TDS by method EA-015 may bias high due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.
- 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 Via Bailer Method.
- All field analysis performed by ALS Wollongong were completed at the time of sampling.
- Sampling completed by ALS Wollongong in accordance with in-house sampling method EN/67.4 Lakes and Reservoirs
- Sample collection of Ground Waters by in-house EN67 where the “surface layer of the aquifer was sampled”.
- 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)

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)
Sampling date / time				01-May-2023 10:15	01-May-2023 09:05	01-May-2023 09:43	01-May-2023 09:25	01-May-2023 10:05
Compound	CAS Number	LOR	Unit	EW2301924-001	EW2301924-002	EW2301924-003	EW2301924-004	EW2301924-005
				Result	Result	Result	Result	Result
EA005FD: Field pH								
pH	----	0.1	pH Unit	5.4	4.7	4.9	7.2	7.9
EA010FD: Field Conductivity								
Electrical Conductivity (Non Compensated)	----	1	µS/cm	1930	328	2050	545	360
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	1370	215	1070	----	221
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	----	----	----	40	32
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	35	13	3	----	----
Total Alkalinity as CaCO3	----	1	mg/L	35	13	3	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	226	19	<1	----	27
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	228	74	600	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	121	<1	11	----	----
Magnesium	7439-95-4	1	mg/L	46	2	20	----	----
Sodium	7440-23-5	1	mg/L	132	55	317	----	----
Potassium	7440-09-7	1	mg/L	30	<1	<1	----	----
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	----	----	----	----	0.72
Copper	7440-50-8	0.001	mg/L	----	----	----	----	0.005
Lead	7439-92-1	0.001	mg/L	----	----	----	----	0.003
Zinc	7440-66-6	0.005	mg/L	----	----	----	----	0.031
Iron	7439-89-6	0.05	mg/L	----	----	----	----	0.73
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.18	0.09	0.15	0.80	0.86
EK086: Sulfite as SO3 2-								
Sulfite as SO3 2-	14265-45-3	2	mg/L	----	----	----	----	<2



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

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				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)
Sampling date / time				01-May-2023 10:15	01-May-2023 09:05	01-May-2023 09:43	01-May-2023 09:25	01-May-2023 10:05
Compound	CAS Number	LOR	Unit	EW2301924-001	EW2301924-002	EW2301924-003	EW2301924-004	EW2301924-005
				Result	Result	Result	Result	Result
EN055: Ionic Balance								
∅ Total Anions	----	0.01	meq/L	11.8	2.74	17.0	----	----
∅ Total Cations	----	0.01	meq/L	16.3	2.56	16.0	----	----
∅ Ionic Balance	----	0.01	%	16.0	----	3.04	----	----
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	36	11	6	13	9
EP030: Biochemical Oxygen Demand (BOD)								
Biochemical Oxygen Demand	----	2	mg/L	----	----	----	4	<2
QWI-EN 67.11 Sampling of Groundwaters								
Depth	----	0.01	m	2.90	1.76	1.87	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	Point 7 SW03 (Polishing Pond)	----	----	----	----
Sampling date / time			01-May-2023 09:57	----	----	----	----	
Compound	CAS Number	LOR	Unit	EW2301924-006	-----	-----	-----	-----
				Result	----	----	----	----
EA005FD: Field pH								
pH	----	0.1	pH Unit	8.5	----	----	----	----
EA010FD: Field Conductivity								
Electrical Conductivity (Non Compensated)	----	1	µS/cm	767	----	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	76	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.05	----	----	----	----
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	22	----	----	----	----
EP030: Biochemical Oxygen Demand (BOD)								
Biochemical Oxygen Demand	----	2	mg/L	4	----	----	----	----

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (Biology).

- (WATER) EP005: Total Organic Carbon (TOC)
- (WATER) EK055G: Ammonia as N by Discrete Analyser
- (WATER) ED045G: Chloride by Discrete Analyser
- (WATER) ED041G: Sulfate (Turbidimetric) as SO4 2- by DA
- (WATER) ED037P: Alkalinity by PC Titrator
- (WATER) ED093F: Dissolved Major Cations
- (WATER) EA015: Total Dissolved Solids dried at 180 ± 5 °C
- (WATER) EN055: Ionic Balance
- (WATER) EP030: Biochemical Oxygen Demand (BOD)
- (WATER) EA025: Total Suspended Solids dried at 104 ± 2°C
- (WATER) EK086: Sulfite as SO3 2-
- (WATER) EG020T: Total Metals by ICP-MS