CERTIFICATE OF ANALYSIS

Work Order	: **EW2402003**	Page	: 1 of 5
Amendment	: **1**		
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	: 02-May-2024 15:31
Order number	: 00264991	Date Analysis Commenced	: 02-May-2024
C-O-C number	: ----	Issue Date	: 07-Jun-2024 09:56
Sampler	: Robert DaLio		
Site	: ----		
Quote number	: EW23WINSHI0002		
No. of samples received	: 6		
No. of samples analysed	: 6		

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, 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*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Robert DaLio	Sampler	Laboratory - Wollongong, 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.
- Ionic Balance out of acceptable limits for sample 1 due to analytes not quantified in this report.
- Amendment (07/06/2024): This report has been amended following the addition of reports
- pH performed by ALS Wollongong via in-house method EA005FD and EN67 PK.
- Sampling and sample data supplied by ALS Wollongong.
- Electrical conductivity performed by ALS Wollongong via in-house method EA010FD and EN67 PK.
- Sampling completed as per FWI-EN001 Groundwater Sampling.
- Sampling and groundwater depth measurements completed by ALS Wollongong via inhouse sampling method EN/67.11 Groundwater Sampling Via Method.
- Sampling completed as per FWI-EN002 Surface Water Sampling.
- Field tests completed on day of sampling/receipt.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: WATER
(Matrix: WATER)

Compound	CAS Number	LOR	Unit	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		02-May-2024 11:40	02-May-2024 10:35	02-May-2024 11:00	02-May-2024 10:47	02-May-2024 11:25
					EW2402003-001	EW2402003-002	EW2402003-003	EW2402003-004	EW2402003-005
					Result	Result	Result	Result	Result
EA005FD: Field pH									
pH	----	0.1	pH Unit		5.6	4.7	5.3	8.4	8.2
EA010FD: Field Conductivity									
Electrical Conductivity (Non Compensated)	----	1	µS/cm		3850	303	1790	284	332
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		2770	202	1040	----	196
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		----	----	----	1020	10
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		39	14	20	----	----
Total Alkalinity as CaCO3	----	1	mg/L		39	14	20	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		166	13	<1	----	17
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		711	70	552	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		174	<1	12	----	----
Magnesium	7439-95-4	1	mg/L		85	2	23	----	----
Sodium	7440-23-5	1	mg/L		320	48	253	----	----
Potassium	7440-09-7	1	mg/L		39	<1	1	----	----
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		----	----	----	----	0.16
Copper	7440-50-8	0.001	mg/L		----	----	----	----	0.001
Lead	7439-92-1	0.001	mg/L		----	----	----	----	<0.001
Zinc	7440-66-6	0.005	mg/L		----	----	----	----	<0.005

Analytical Results

Sub-Matrix: WATER
(Matrix: WATER)

Compound	CAS Number	LOR	Unit	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	02-May-2024 11:40	02-May-2024 10:35	02-May-2024 11:00	02-May-2024 10:47	02-May-2024 11:25
					EW2402003-001	EW2402003-002	EW2402003-003	EW2402003-004	EW2402003-005
					Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS - Continued									
Iron	7439-89-6	0.05	mg/L		----	----	----	----	0.41
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		0.43	0.07	0.51	0.15	0.04
EK086: Sulfite as SO3 2-									
Sulfite as SO3 2-	14265-45-3	2	mg/L		----	----	----	----	<2
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		24.3	2.52	16.0	----	----
ø Total Cations	----	0.01	meq/L		30.6	2.25	13.5	----	----
ø Ionic Balance	----	0.01	%		11.5	----	8.30	----	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		24	7	5	17	12
EP030: Biochemical Oxygen Demand (BOD)									
Biochemical Oxygen Demand	----	2	mg/L		----	----	----	3	6
QWI-EN 67.11 Sampling of Groundwaters									
Depth	----	0.01	m		3.50	2.34	2.37	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	Point 7 SW03 (Polishing Pond)	----	----	----	----
			Sampling date / time	02-May-2024 11:15	----	----	----	----
Compound	CAS Number	LOR	Unit	EW2402003-006	--------	--------	--------	--------
				Result	----	----	----	----
EA005FD: Field pH								
pH	----	0.1	pH Unit	**8.8**	**----**	**----**	**----**	**----**
EA010FD: Field Conductivity								
Electrical Conductivity (Non Compensated)	----	1	µS/cm	**618**	**----**	**----**	**----**	**----**
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	**45**	**----**	**----**	**----**	**----**
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.02**	**----**	**----**	**----**	**----**
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