ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2220017**	Page	: 1 of 3
Client	: **WARRUMBUNGLE SHIRE COUNCIL**	Laboratory	: Environmental Division Sydney
Contact		Contact	: Customer Services ES
Address	: John Street Coonabarabran	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: 0268492000	Telephone	: +61-2-8784 8555
Project	: Coolah STP - EPL 4445	Date Samples Received	: 08-Jun-2022 09:02
Order number	: 33943	Date Analysis Commenced	: 10-Jun-2022
C-O-C number	: ----	Issue Date	: 24-Jun-2022 17:15
Sampler	:		
Site	: ----		
Quote number	: EN/333		
No. of samples received	: 2		
No. of samples analysed	: 2		

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
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
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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.

- ALS is not NATA accredited for the analysis of Exchangeable Cations on Alkaline Soils when performed under ALS Method ED006.
- ED007 and ED008: When Exchangeable Al is reported from these methods, it should be noted that Rayment & Lyons (2011) suggests Exchange Acidity by 1M KCl - Method 15G1 (ED005) is a more suitable method for the determination of exchange acidity (H+ + Al3+).
- 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: SOIL (Matrix: SOIL)			Sample ID	Soil Sample - Ingram's Paddock	Soil Sample - RLPB Paddock	----	----	----
			Sampling date / time	07-Jun-2022 13:15	07-Jun-2022 13:15	----	----	----
Compound	CAS Number	LOR	Unit	ES2220017-001	ES2220017-002	--------	--------	--------
				Result	Result	----	----	----
EA006: Sodium Adsorption Ratio (SAR)								
ø Sodium Adsorption Ratio	----	0.01	-	13.4	2.49	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	26.1	31.9	----	----	----
ED006: Exchangeable Cations on Alkaline Soils								
Exchangeable Calcium	----	0.2	meq/100g	14.4	15.0	----	----	----
Exchangeable Magnesium	----	0.2	meq/100g	11.0	11.9	----	----	----
Exchangeable Potassium	----	0.2	meq/100g	1.6	2.9	----	----	----
Exchangeable Sodium	----	0.2	meq/100g	4.3	0.3	----	----	----
Cation Exchange Capacity	----	0.2	meq/100g	31.3	30.2	----	----	----
Exchangeable Sodium Percent	----	0.2	%	13.8	1.2	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	2.4	2.9	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	1480	2410	----	----	----
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	1480	2410	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	2	mg/kg	1200	1340	----	----	----

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry) 18958 (Biology).

(SOIL) EA006: Sodium Adsorption Ratio (SAR)