

CERTIFICATE OF ANALYSIS

Work Order : **EM2210355**
Client : **Dept for Environment & Water**
Contact : DARCY MORRIS
Address : GPO BOX 2834
 ADELAIDE SA, AUSTRALIA 5001
Telephone : ----
Project : HCHB Monitoring Program
Order number : -
C-O-C number : 38367
Sampler : DARCY MORRIS, ROWLAND BOXALL
Site : HCHB Boat 01062022
Quote number : AD/052/20 V2
No. of samples received : 10
No. of samples analysed : 10

Page : 1 of 7
Laboratory : Environmental Division Melbourne
Contact : Kieren Burns
Address : 4 Westall Rd Springvale VIC Australia 3171
Telephone : +61881625130
Date Samples Received : 03-Jun-2022 11:35
Date Analysis Commenced : 03-Jun-2022
Issue Date : 16-Jun-2022 12:13



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
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Jarwis Nheu	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC



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.

- EK059G: EM2210354 #2, Poor matrix spike recovery for NOx due to matrix effects. Confirmed by re-preparation and re-analysis.
- EP002:EP005:It is recognised that total organic carbon is less than dissolved organic carbon for samples EM2210355 #2. However, the difference is within experimental variation of the methods.
- EK067G: EM2210355 #1,4,5,8 &10 Sample required dilution for total phosphorus due to sample matrix. LOR has been raised accordingly.
- EP008; Chlorophyll-A Standard does not contain Pheophytin
- EG052G: EM2210355-010 Poor matrix spike recovery for reactive silica due to matrix effects.
- EP002: EM2210355 #2 Poor matrix spike recovery for dissolved organic carbon due to sample matrix. Insufficient sample to confirm the results.
- 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.
- Total Algae Count (MB010) is conducted by ALS Scoresby NATA accreditation no. 992, site no. 989.



Analytical Results

Sub-Matrix: MARINE WATER
 (Matrix: WATER)

Sample ID

				Parnka Point Cold, overcast and light wind	Villa De Yumpa Cold, overcast, still	Stoney Well Cold, still, overcast	North Jacks Point Cold, still, overcast	South Policeman Point Cold, still, overcast.
Sampling date / time				02-Jun-2022 11:13	02-Jun-2022 10:43	02-Jun-2022 10:10	02-Jun-2022 10:16	02-Jun-2022 09:25
Compound	CAS Number	LOR	Unit	EM2210355-003	EM2210355-004	EM2210355-005	EM2210355-006	EM2210355-007
				Result	Result	Result	Result	Result
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	25300	38200	56300	77200	71700
EA045: Turbidity								
Turbidity	----	0.1	NTU	12.1	13.6	15.0	8.4	10.1
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	143	159	187	200	201
Total Alkalinity as CaCO3	----	1	mg/L	143	159	187	200	201
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	14000	25600	39800	49200	49600
EG052G: Silica by Discrete Analyser								
Reactive Silica	----	0.05	mg/L	1.16	1.70	3.38	4.62	4.93
EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water								
Ammonia as N	7664-41-7	0.02	mg/L	0.07	0.08	<0.02	0.13	<0.02
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.06	0.03	0.02	0.02	0.02
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.07	0.03	0.02	0.02	0.02
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	4.2	4.2	5.8	5.9	7.0
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	4.3	4.2	5.8	5.9	7.0
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.10	<0.02	<0.02	0.11	0.25
EP002: Dissolved Organic Carbon (DOC)								
Dissolved Organic Carbon	----	1	mg/L	16	21	26	34	35
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	16	24	31	37	38



Analytical Results

Sub-Matrix: MARINE WATER
 (Matrix: WATER)

Sample ID

				Snipe Point Cold, still, overcast	Salt Creek Outlet Cold, still, overcast	1.8km west of Salt Creek Cold, still, overcast	----	----
Sampling date / time				02-Jun-2022 09:07	02-Jun-2022 08:35	02-Jun-2022 08:48	----	----
Compound	CAS Number	LOR	Unit	EM2210355-008	EM2210355-009	EM2210355-010	-----	-----
				Result	Result	Result	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	82500	82400	82200	----	----
EA045: Turbidity								
Turbidity	----	0.1	NTU	9.5	8.4	7.5	----	----
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	204	212	206	----	----
Total Alkalinity as CaCO3	----	1	mg/L	204	212	206	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	52600	53900	53300	----	----
EG052G: Silica by Discrete Analyser								
Reactive Silica	----	0.05	mg/L	5.13	5.56	5.29	----	----
EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water								
Ammonia as N	7664-41-7	0.02	mg/L	<0.02	0.04	0.09	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.02	0.04	0.05	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.02	0.04	0.05	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	6.3	8.6	6.1	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	6.3	8.6	6.2	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	<0.02	0.20	<0.02	----	----
EP002: Dissolved Organic Carbon (DOC)								
Dissolved Organic Carbon	----	1	mg/L	34	38	34	----	----
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	42	45	39	----	----



Analytical Results

Sub-Matrix: SEAWATER
 (Matrix: WATER)

Sample ID

				Murray Mouth land	Mark Point land	Parnka Point Cold, overcast and light wind	Villa De Yumpa Cold, overcast, still	Stoney Well Cold, still, overcast
Sampling date / time				01-Jun-2022 14:38	01-Jun-2022 13:55	02-Jun-2022 11:13	02-Jun-2022 10:43	02-Jun-2022 10:10
Compound	CAS Number	LOR	Unit	EM2210355-001	EM2210355-002	EM2210355-003	EM2210355-004	EM2210355-005
				Result	Result	Result	Result	Result
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	31700	5110	----	----	----
EA045: Turbidity								
Turbidity	----	0.1	NTU	14.3	9.0	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	119	103	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	119	103	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	18500	2990	----	----	----
EG052G: Silica by Discrete Analyser								
Reactive Silica	----	0.05	mg/L	0.34	2.62	----	----	----
EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water								
Ammonia as N	7664-41-7	0.02	mg/L	0.06	0.20	----	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	----	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.06	0.13	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.06	0.13	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	2.5	0.2	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	2.6	0.3	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	<0.02	0.06	----	----	----
EP002: Dissolved Organic Carbon (DOC)								
Dissolved Organic Carbon	----	1	mg/L	4	10	----	----	----
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	4	9	----	----	----
EP008: Chlorophyll								
Chlorophyll a	----	1	mg/m³	4	9	8	11	15



Analytical Results

Sub-Matrix: SEAWATER
 (Matrix: WATER)

Sample ID

				Murray Mouth land	Mark Point land	Parnka Point Cold, overcast and light wind	Villa De Yumpa Cold, overcast, still	Stoney Well Cold, still, overcast
Sampling date / time				01-Jun-2022 14:38	01-Jun-2022 13:55	02-Jun-2022 11:13	02-Jun-2022 10:43	02-Jun-2022 10:10
Compound	CAS Number	LOR	Unit	EM2210355-001	EM2210355-002	EM2210355-003	EM2210355-004	EM2210355-005
				Result	Result	Result	Result	Result
EP008: Chlorophyll - Continued								
Chlorophyll b	----	1	mg/m ³	<1	<1	1	1	2
Pheophytin a	----	1	mg/m ³	4	8	8	9	12



Analytical Results

Sub-Matrix: SEAWATER
 (Matrix: WATER)

Sample ID

				North Jacks Point Cold, still, overcast	South Policeman Point Cold, still, overcast.	Snipe Point Cold, still, overcast	Salt Creek Outlet Cold, still, overcast	1.8km west of Salt Creek Cold, still, overcast
Sampling date / time				02-Jun-2022 10:16	02-Jun-2022 09:25	02-Jun-2022 09:07	02-Jun-2022 08:35	02-Jun-2022 08:48
Compound	CAS Number	LOR	Unit	EM2210355-006	EM2210355-007	EM2210355-008	EM2210355-009	EM2210355-010
				Result	Result	Result	Result	Result
EP008: Chlorophyll								
Chlorophyll a	----	1	mg/m ³	12	21	16	14	12
Chlorophyll b	----	1	mg/m ³	1	2	2	2	1
Pheophytin a	----	1	mg/m ³	12	14	30	10	12

Inter-Laboratory Testing

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

(WATER) EP008: Chlorophyll