

CERTIFICATE OF ANALYSIS

Work Order : **EM2213883**
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 : 40286
Sampler : DARCY MORRIS, ROWLAND BOXALL
Site : 20.07.22 - HCBC Land
Quote number : AD/052/20 V2
No. of samples received : 12
No. of samples analysed : 12

Page : 1 of 9
Laboratory : Environmental Division Melbourne
Contact : Kieren Burns
Address : 4 Westall Rd Springvale VIC Australia 3171
Telephone : +61881625130
Date Samples Received : 22-Jul-2022 11:25
Date Analysis Commenced : 22-Jul-2022
Issue Date : 02-Aug-2022 14:02



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
Dian Dao	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Jarwis Nheu	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Nikki Stepniewski	Senior Inorganic Instrument 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.

- EP008, Chlorophyll-a standard does not contained Pheophytin-a standard.
- EP008, LOR raised for Chlorophyll-b due to sample matrix.
- 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

				Long Point	Noonameena	Bonneys	McGrath Flat North	3.2km south of Salt Creek (land)
Sampling date / time				20-Jul-2022 03:07	20-Jul-2022 03:39	20-Jul-2022 03:55	20-Jul-2022 04:24	21-Jul-2022 08:42
Compound	CAS Number	LOR	Unit	EM2213883-003	EM2213883-004	EM2213883-005	EM2213883-006	EM2213883-010
				Result	Result	Result	Result	Result
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	21200	31800	36900	60500	77200
EA045: Turbidity								
Turbidity	----	0.1	NTU	11.7	7.0	6.4	13.9	13.7
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	26	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	121	131	117	179	194
Total Alkalinity as CaCO3	----	1	mg/L	121	131	143	179	194
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	10500	14800	15700	28800	35600
EG052G: Silica by Discrete Analyser								
Reactive Silica	----	0.05	mg/L	4.02	1.60	0.16	1.95	2.34
EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water								
Ammonia as N	7664-41-7	0.02	mg/L	0.14	0.10	0.13	<0.02	<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	0.08	0.06	0.01	<0.01	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.08	0.06	0.01	<0.01	<0.01
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.6	2.6	1.2	3.2	3.5
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	1.7	2.7	1.2	3.2	3.5
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.23	0.11	0.20	0.12	0.14
EP002: Dissolved Organic Carbon (DOC)								
Dissolved Organic Carbon	----	1	mg/L	16	19	19	28	33
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	16	19	20	34	42



Analytical Results

Sub-Matrix: SURFACE WATER
 (Matrix: WATER)

Sample ID

				US Tauwitschere	DS Tauwitschere	Long Point	Noonameena	Bonneys
Sampling date / time				20-Jul-2022 01:35	20-Jul-2022 01:33	20-Jul-2022 03:07	20-Jul-2022 03:39	20-Jul-2022 03:55
Compound	CAS Number	LOR	Unit	EM2213883-001	EM2213883-002	EM2213883-003	EM2213883-004	EM2213883-005
				Result	Result	Result	Result	Result
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	314	464	----	----	----
EA045: Turbidity								
Turbidity	----	0.1	NTU	116	94.5	----	----	----
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	83	85	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	83	85	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	104	201	----	----	----
EG052G: Silica by Discrete Analyser								
Reactive Silica	----	0.05	mg/L	4.90	4.78	----	----	----
EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water								
Ammonia as N	7664-41-7	0.02	mg/L	0.12	0.16	----	----	----
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	0.02	0.04	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.02	0.04	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.3	1.4	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	1.3	1.4	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.14	0.15	----	----	----
EP002: Dissolved Organic Carbon (DOC)								
Dissolved Organic Carbon	----	1	mg/L	14	13	----	----	----
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	19	15	----	----	----
EP008: Chlorophyll								
Chlorophyll a	----	1	mg/m³	25	27	4	3	2
Chlorophyll b	----	1	mg/m³	<4	<4	<1	<1	<1



Analytical Results

Sub-Matrix: SURFACE WATER
 (Matrix: WATER)

Sample ID

				US Tauwitchere	DS Tauwitchere	Long Point	Noonameena	Bonneys
Sampling date / time				20-Jul-2022 01:35	20-Jul-2022 01:33	20-Jul-2022 03:07	20-Jul-2022 03:39	20-Jul-2022 03:55
Compound	CAS Number	LOR	Unit	EM2213883-001	EM2213883-002	EM2213883-003	EM2213883-004	EM2213883-005
				Result	Result	Result	Result	Result
EP008: Chlorophyll - Continued								
Pheophytin a	----	1	mg/m ³	13	10	3	2	3



Analytical Results

Sub-Matrix: SURFACE WATER
 (Matrix: WATER)

Sample ID

				McGrath Flat North	Tilley Swamp Drain D/S Nth Outlet	Morella Basin @ outlet regulator	Morella Creek @ gauge	3.2km south of Salt Creek (land)
Sampling date / time				20-Jul-2022 04:24	21-Jul-2022 10:47	21-Jul-2022 09:34	21-Jul-2022 09:16	21-Jul-2022 08:42
Compound	CAS Number	LOR	Unit	EM2213883-006	EM2213883-007	EM2213883-008	EM2213883-009	EM2213883-010
				Result	Result	Result	Result	Result
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	----	5310	7710	8050	----
EA045: Turbidity								
Turbidity	----	0.1	NTU	----	2.2	5.1	5.0	----
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	77	57	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	----	383	302	326	----
Total Alkalinity as CaCO3	----	1	mg/L	----	383	379	384	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	----	2690	4160	4330	----
EG052G: Silica by Discrete Analyser								
Reactive Silica	----	0.05	mg/L	----	12.8	16.3	16.7	----
EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water								
Ammonia as N	7664-41-7	0.02	mg/L	----	0.02	0.15	0.10	----
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	----	0.51	<0.01	0.01	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	----	0.52	<0.01	0.01	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	----	0.4	1.0	1.1	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	----	0.9	1.0	1.1	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	----	<0.01	0.02	0.02	----
EP002: Dissolved Organic Carbon (DOC)								
Dissolved Organic Carbon	----	1	mg/L	----	8	11	13	----
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	----	10	15	16	----
EP008: Chlorophyll								
Chlorophyll a	----	1	mg/m³	8	<1	4	4	12
Chlorophyll b	----	1	mg/m³	<1	<1	<1	<1	<1



Analytical Results

Sub-Matrix: SURFACE WATER
 (Matrix: WATER)

Sample ID

				McGrath Flat North	Tilley Swamp Drain D/S Nth Outlet	Morella Basin @ outlet regulator	Morella Creek @ gauge	3.2km south of Salt Creek (land)
Sampling date / time				20-Jul-2022 04:24	21-Jul-2022 10:47	21-Jul-2022 09:34	21-Jul-2022 09:16	21-Jul-2022 08:42
Compound	CAS Number	LOR	Unit	EM2213883-006	EM2213883-007	EM2213883-008	EM2213883-009	EM2213883-010
				Result	Result	Result	Result	Result
EP008: Chlorophyll - Continued								
Pheophytin a	----	1	mg/m ³	3	<1	3	<1	3



Analytical Results

Sub-Matrix: SURFACE WATER
 (Matrix: WATER)

Sample ID

				Tilley Swamp Drain U/S Morella	Tilley Swamp Drain Watercourse Outlet	----	----	----
Sampling date / time				21-Jul-2022 11:09	21-Jul-2022 11:01	----	----	----
Compound	CAS Number	LOR	Unit	EM2213883-011	EM2213883-012	-----	-----	-----
				Result	Result	----	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	5420	5320	----	----	----
EA045: Turbidity								
Turbidity	----	0.1	NTU	2.4	4.9	----	----	----
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	385	380	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	385	380	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	2690	2760	----	----	----
EG052G: Silica by Discrete Analyser								
Reactive Silica	----	0.05	mg/L	12.5	13.2	----	----	----
EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water								
Ammonia as N	7664-41-7	0.02	mg/L	<0.02	0.10	----	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	0.02	0.02	----	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.48	0.50	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.50	0.52	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.4	0.5	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	0.9	1.0	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	----	----	----
EP002: Dissolved Organic Carbon (DOC)								
Dissolved Organic Carbon	----	1	mg/L	8	5	----	----	----
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	11	6	----	----	----
EP008: Chlorophyll								
Chlorophyll a	----	1	mg/m³	<1	<1	----	----	----
Chlorophyll b	----	1	mg/m³	<1	<1	----	----	----



Analytical Results

Sub-Matrix: **SURFACE WATER**
 (Matrix: **WATER**)

Sample ID

				Tilley Swamp Drain U/S Morella	Tilley Swamp Drain Watercourse Outlet	----	----	----
Sampling date / time				21-Jul-2022 11:09	21-Jul-2022 11:01	----	----	----
Compound	CAS Number	LOR	Unit	EM2213883-011	EM2213883-012	-----	-----	-----
				Result	Result	----	----	----
EP008: Chlorophyll - Continued								
Pheophytin a	----	1	mg/m ³	<1	<1	----	----	----

Inter-Laboratory Testing

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

(WATER) EP008: Chlorophyll