

CERTIFICATE OF ANALYSIS

Work Order : **EM2011705**
Client : **Dept of Environment, Water & Natural Resources**
Contact : Mr FRANK MANGERUCA
Address : GPO BOX 2834
ADELAIDE SA, AUSTRALIA 5001
Telephone : ----
Project : HCHB
Order number : ----
C-O-C number : ----
Sampler : , JOSHUA CASTLE
Site : ----
Quote number : AD/052/20 V2
No. of samples received : 19
No. of samples analysed : 19

Page : 1 of 10
Laboratory : Environmental Division Melbourne
Contact : Kieren Burns
Address : 4 Westall Rd Springvale VIC Australia 3171
Telephone : +61881625130
Date Samples Received : 08-Jul-2020 10:45
Date Analysis Commenced : 08-Jul-2020
Issue Date : 15-Jul-2020 14:00



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. 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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Arenie Vijayaratham	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Ashesh Patel	Senior Chemist	Sydney Inorganics, Smithfield, NSW
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Samantha Smith	Laboratory Coordinator	WRG Subcontracting, 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 Contact 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.

- EP002, EP005: EM2011705 It is recognised that total organic carbon is less than dissolved organic carbon for samples#1 and #5. However, the difference is within experimental variation of the methods.
- EP008, Chlorophyll-a standard does not contained Pheophytin-a standard.
- NR - Reported in separate COA
- Algal Count (BM010) is conducted by ALS Scoresby NATA accreditation no. 992, site no. 989.

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	Murray Mouth	US Tauwitschere	DS Tauwitschere	Mark Point	Long Point
Client sampling date / time				07-Jul-2020 15:50	07-Jul-2020 14:40	07-Jul-2020 14:40	07-Jul-2020 14:00	07-Jul-2020 13:05	
Compound	CAS Number	LOR	Unit	EM2011705-001	EM2011705-002	EM2011705-003	EM2011705-004	EM2011705-005	
				Result	Result	Result	Result	Result	
BM010: Algal Count									
Algal Count	----	-	-	NR	NR	NR	NR	NR	
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L	39800	926	6750	31700	39000	
EA045: Turbidity									
Turbidity	----	0.1	NTU	2.6	41.7	36.5	2.6	3.0	
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	120	107	111	139	148	
Total Alkalinity as CaCO3	----	1	mg/L	120	107	111	139	148	
EG052G: Silica by Discrete Analyser									
Reactive Silica	----	0.05	mg/L	<0.05	0.41	0.47	0.70	0.35	
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L	0.09	0.02	0.04	0.09	0.19	
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	<0.01	<0.01	<0.01	0.01	0.03	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	<0.01	0.02	0.04	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.4	1.8	1.8	1.0	1.2	
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L	0.4	1.8	1.8	1.0	1.2	
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L	0.07	0.02	0.16	0.10	0.10	
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	
EP002: Dissolved Organic Carbon (DOC)									
Dissolved Organic Carbon	----	1	mg/L	4	9	9	9	11	
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L	3	12	9	9	10	
EP008: Chlorophyll									



Analytical Results

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

Client sample ID

				Murray Mouth	US Tauwitchere	DS Tauwitchere	Mark Point	Long Point
Client sampling date / time				07-Jul-2020 15:50	07-Jul-2020 14:40	07-Jul-2020 14:40	07-Jul-2020 14:00	07-Jul-2020 13:05
Compound	CAS Number	LOR	Unit	EM2011705-001	EM2011705-002	EM2011705-003	EM2011705-004	EM2011705-005
				Result	Result	Result	Result	Result
EP008: Chlorophyll - Continued								
Chlorophyll a	----	1	mg/m ³	1	19	18	12	4
Chlorophyll b	----	1	mg/m ³	<1	<1	<1	2	<1
Pheophytin a	----	1	mg/m ³	<1	5	6	3	1

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	Noonameena	Bonneys	McGrath Flat North	Parnka Point	Villa de Yumpa
Client sampling date / time				07-Jul-2020 11:55	07-Jul-2020 11:30	07-Jul-2020 10:30	07-Jul-2020 10:40	07-Jul-2020 10:10	
Compound	CAS Number	LOR	Unit	EM2011705-006	EM2011705-007	EM2011705-008	EM2011705-009	EM2011705-010	
				Result	Result	Result	Result	Result	
BM010: Algal Count									
Algal Count	----	-	-	NR	NR	NR	NR	NR	
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L	42800	57200	71900	78300	77000	
EA045: Turbidity									
Turbidity	----	0.1	NTU	1.6	4.5	8.8	7.8	6.6	
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	164	177	194	196	200	
Total Alkalinity as CaCO3	----	1	mg/L	164	177	194	196	200	
EG052G: Silica by Discrete Analyser									
Reactive Silica	----	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L	0.04	0.04	0.02	0.01	0.01	
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	<0.01	<0.01	<0.01	<0.01	<0.01	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.2	1.9	2.8	2.9	2.8	
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L	1.2	1.9	2.8	2.9	2.8	
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L	0.15	0.33	0.89	1.14	0.96	
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
EP002: Dissolved Organic Carbon (DOC)									
Dissolved Organic Carbon	----	1	mg/L	13	18	24	17	27	
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L	14	18	28	23	25	
EP008: Chlorophyll									



Analytical Results

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

Client sample ID

				Noonameena	Bonneys	McGrath Flat North	Parnka Point	Villa de Yumpa
Client sampling date / time				07-Jul-2020 11:55	07-Jul-2020 11:30	07-Jul-2020 10:30	07-Jul-2020 10:40	07-Jul-2020 10:10
Compound	CAS Number	LOR	Unit	EM2011705-006	EM2011705-007	EM2011705-008	EM2011705-009	EM2011705-010
				Result	Result	Result	Result	Result
EP008: Chlorophyll - Continued								
Chlorophyll a	----	1	mg/m ³	4	2	6	4	6
Chlorophyll b	----	1	mg/m ³	<1	<1	2	<1	<1
Pheophytin a	----	1	mg/m ³	<1	2	<1	<1	2

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	Stony Well	North Jacks Point	South Policeman Point	Snipe Point	Morella Creek @ gauge
Client sampling date / time				07-Jul-2020 09:50	07-Jul-2020 09:20	07-Jul-2020 09:00	07-Jul-2020 08:45	07-Jul-2020 08:40	
Compound	CAS Number	LOR	Unit	EM2011705-011	EM2011705-012	EM2011705-013	EM2011705-014	EM2011705-016	
				Result	Result	Result	Result	Result	
BM010: Algal Count									
Algal Count	----	-	-	NR	NR	NR	NR	NR	
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L	75000	85800	87800	85600	11300	
EA045: Turbidity									
Turbidity	----	0.1	NTU	7.2	6.0	6.6	7.5	2.4	
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	88	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	208	215	219	215	290	
Total Alkalinity as CaCO3	----	1	mg/L	208	215	219	215	377	
EG052G: Silica by Discrete Analyser									
Reactive Silica	----	0.05	mg/L	<0.05	0.07	0.51	0.74	13.7	
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.06	0.02	0.02	0.07	
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	<0.01	<0.01	<0.01	<0.01	<0.01	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	3.2	3.4	3.4	3.9	1.4	
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L	3.2	3.4	3.4	3.9	1.4	
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L	1.80	1.65	1.48	2.37	0.04	
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
EP002: Dissolved Organic Carbon (DOC)									
Dissolved Organic Carbon	----	1	mg/L	28	30	30	30	12	
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L	33	36	36	37	16	
EP008: Chlorophyll									



Analytical Results

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

Client sample ID

				Stony Well	North Jacks Point	South Policeman Point	Snipe Point	Morella Creek @ gauge
Client sampling date / time				07-Jul-2020 09:50	07-Jul-2020 09:20	07-Jul-2020 09:00	07-Jul-2020 08:45	07-Jul-2020 08:40
Compound	CAS Number	LOR	Unit	EM2011705-011	EM2011705-012	EM2011705-013	EM2011705-014	EM2011705-016
				Result	Result	Result	Result	Result
EP008: Chlorophyll - Continued								
Chlorophyll a	----	1	mg/m ³	5	9	12	18	4
Chlorophyll b	----	1	mg/m ³	<1	1	1	2	<1
Pheophytin a	----	1	mg/m ³	1	5	7	9	2



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Client sample ID

				Salt Creek Outlet	1.8km west of Salt Creek	3.2km south of Salt Creek (land)	Tilley Swamp Drain U/S Morella	----
Client sampling date / time				07-Jul-2020 08:00	07-Jul-2020 08:25	07-Jul-2020 08:10	07-Jul-2020 09:15	----
Compound	CAS Number	LOR	Unit	EM2011705-017	EM2011705-018	EM2011705-019	EM2011705-020	-----
				Result	Result	Result	Result	----
BM010: Algal Count								
Algal Count	----	-	-	NR	NR	NR	NR	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	87300	88900	89400	6980	----
EA045: Turbidity								
Turbidity	----	0.1	NTU	6.3	7.6	6.7	2.4	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	64	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	221	216	210	354	----
Total Alkalinity as CaCO3	----	1	mg/L	221	216	210	418	----
EG052G: Silica by Discrete Analyser								
Reactive Silica	----	0.05	mg/L	0.78	0.76	0.42	10.1	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.02	0.02	0.03	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	0.02	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01	0.23	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	<0.01	0.25	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	3.6	4.1	3.9	0.6	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	3.6	4.1	3.9	0.8	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	2.04	2.38	2.94	0.03	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
EP002: Dissolved Organic Carbon (DOC)								
Dissolved Organic Carbon	----	1	mg/L	31	31	32	2	----
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	40	37	38	3	----



Analytical Results

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

Client sample ID

				Salt Creek Outlet	1.8km west of Salt Creek	3.2km south of Salt Creek (land)	Tilley Swamp Drain U/S Morella	----
Client sampling date / time				07-Jul-2020 08:00	07-Jul-2020 08:25	07-Jul-2020 08:10	07-Jul-2020 09:15	----
Compound	CAS Number	LOR	Unit	EM2011705-017	EM2011705-018	EM2011705-019	EM2011705-020	-----
				Result	Result	Result	Result	----
EP008: Chlorophyll								
Chlorophyll a	----	1	mg/m ³	15	14	12	1	----
Chlorophyll b	----	1	mg/m ³	1	<1	<1	<1	----
Pheophytin a	----	1	mg/m ³	2	3	1	<1	----