

QUALITY CONTROL REPORT

Work Order	: EM2218952	Page	: 1 of 7
Client	: Dept for Environment & Water	Laboratory	: Environmental Division Melbourne
Contact	: DARCY MORRIS	Contact	: Kieren Burns
Address	: GPO BOX 2834 ADELAIDE SA, AUSTRALIA 5001	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +61881625130
Project	: HCHB Monitoring Program	Date Samples Received	: 30-Sep-2022
Order number	: -	Date Analysis Commenced	: 30-Sep-2022
C-O-C number	: 38354	Issue Date	: 10-Oct-2022
Sampler	: Bryce Drechsler, DARCY MORRIS		
Site	: HCHB Boat 28/29th September		
Quote number	: AD/052/20 V2		
No. of samples received	: 10		
No. of samples analysed	: 10		



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 Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

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>
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Arenie Vijayaratham	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Narelle Drummond	Laboratory Manager	Townsville Inorganics, Townsville, QLD



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.

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 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
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water (QC Lot: 4613807)									
EM2218797-002	Anonymous	EK055G-SW: Ammonia as N	7664-41-7	0.02	mg/L	0.96	1.03	6.2	0% - 20%
EM2218950-008	Anonymous	EK055G-SW: Ammonia as N	7664-41-7	0.02	mg/L	<0.02	<0.02	0.0	No Limit
EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water (QC Lot: 4613809)									
EM2218952-008	Snipe Point	EK055G-SW: Ammonia as N	7664-41-7	0.02	mg/L	<0.02	<0.02	0.0	No Limit
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 4617634)									
EM2218852-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	5200	5360	3.0	0% - 20%
EM2218998-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	1460	1260	14.2	0% - 20%
EM2219011-005	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	2820	2840	0.6	0% - 20%
EM2219074-002	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	646	649	0.4	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 4619619)									
EM2218950-007	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	6040	6210	2.8	0% - 20%
EM2218952-008	Snipe Point	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	65200	66400	1.9	0% - 20%
EM2219005-009	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	1240	1210	2.1	0% - 20%
EM2219043-004	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	681	642	5.8	0% - 20%
EA045: Turbidity (QC Lot: 4612603)									
EM2218952-001	Murray Mouth	EA045: Turbidity	----	0.1	NTU	119	119	0.0	0% - 20%
EM2218952-010	1.8km west of Salt Creek	EA045: Turbidity	----	0.1	NTU	12.3	14.1	13.6	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4622617)									
EM2218950-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	64	63	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO ₃	----	1	mg/L	64	63	0.0	0% - 20%
EM2218950-011	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit

Page : 3 of 7
 Work Order : EM2218952
 Client : Dept for Environment & Water
 Project : HCHB Monitoring Program



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4622617) - continued									
EM2218950-011	Anonymous	ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	29	32	7.7	0% - 20%
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	380	364	4.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	409	396	3.4	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4622618)									
EM2218952-010	1.8km west of Salt Creek	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	200	206	2.8	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	200	206	2.8	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4612578)									
EM2218952-009	Salt Creek Outlet	ED045G: Chloride	16887-00-6	1	mg/L	37000	37600	1.5	0% - 20%
EM2218952-001	Murray Mouth	ED045G: Chloride	16887-00-6	1	mg/L	224	222	0.7	0% - 20%
EG052G: Silica by Discrete Analyser (QC Lot: 4612576)									
EM2218952-001	Murray Mouth	EG052G: Reactive Silica	----	0.05	mg/L	0.96	0.95	0.0	0% - 50%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 4612577)									
EM2218952-010	1.8km west of Salt Creek	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM2218952-001	Murray Mouth	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 4613808)									
EM2218797-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.14	0.13	7.9	No Limit
EM2218950-008	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 4613810)									
EM2218952-008	Snipe Point	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 4612984)									
EM2218950-010	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	3.5	4.1	14.9	No Limit
EM2218952-008	Snipe Point	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	3.6	3.3	7.0	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 4612983)									
EM2218950-010	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.10	<0.10	0.0	No Limit
EM2218952-008	Snipe Point	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.15	0.14	0.0	No Limit
EP002: Dissolved Organic Carbon (DOC) (QC Lot: 4618607)									
EM2218950-001	Anonymous	EP002: Dissolved Organic Carbon	----	1	mg/L	8	8	0.0	No Limit
EM2218950-010	Anonymous	EP002: Dissolved Organic Carbon	----	1	mg/L	28	27	0.0	0% - 20%
EP002: Dissolved Organic Carbon (DOC) (QC Lot: 4620758)									
EM2218952-007	South Policeman Point	EP002: Dissolved Organic Carbon	----	1	mg/L	28	29	0.0	0% - 20%
EM2219124-006	Anonymous	EP002: Dissolved Organic Carbon	----	1	mg/L	27	26	6.4	0% - 20%
EP005: Total Organic Carbon (TOC) (QC Lot: 4618608)									
EM2218950-001	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	7	8	14.6	No Limit
EM2218950-010	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	35	36	0.0	0% - 20%
EP005: Total Organic Carbon (TOC) (QC Lot: 4620757)									
EM2218952-007	South Policeman Point	EP005: Total Organic Carbon	----	1	mg/L	37	37	0.0	0% - 20%



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP005: Total Organic Carbon (TOC) (QC Lot: 4620757) - continued									
EM2219193-006	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	<1	<1	0.0	No Limit



Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water (QCLot: 4613807)								
EK055G-SW: Ammonia as N	7664-41-7	0.02	mg/L	<0.02	0.5 mg/L	113	81.1	124
EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water (QCLot: 4613809)								
EK055G-SW: Ammonia as N	7664-41-7	0.02	mg/L	<0.02	0.5 mg/L	101	81.1	124
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 4617634)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	105	91.0	110
				<10	2440 mg/L	99.8	81.6	118
				<10	293 mg/L	106	91.0	110
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 4619619)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	100	91.0	110
				<10	2440 mg/L	106	81.6	118
				<10	293 mg/L	103	91.0	110
EA045: Turbidity (QCLot: 4612603)								
EA045: Turbidity	----	0.1	NTU	<0.1	40 NTU	100	88.1	110
ED037P: Alkalinity by PC Titrator (QCLot: 4622617)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	99.6	90.0	110
ED037P: Alkalinity by PC Titrator (QCLot: 4622618)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	97.0	90.0	110
ED045G: Chloride by Discrete Analyser (QCLot: 4612578)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	105	85.0	115
				<1	1000 mg/L	106	85.0	122
EG052G: Silica by Discrete Analyser (QCLot: 4612576)								
EG052G: Reactive Silica	----	0.05	mg/L	<0.05	5 mg/L	99.6	78.9	118
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4612577)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	104	90.9	112
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4613808)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	105	90.0	117
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4613810)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	106	90.0	117
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4612984)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	95.1	70.0	117
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4612983)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	103	71.9	114



Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result			Low	High
EP002: Dissolved Organic Carbon (DOC) (QCLot: 4618607)								
EP002: Dissolved Organic Carbon	----	1	mg/L	<1	100 mg/L	96.2	83.0	115
EP002: Dissolved Organic Carbon (DOC) (QCLot: 4620758)								
EP002: Dissolved Organic Carbon	----	1	mg/L	<1	100 mg/L	103	83.0	115
EP005: Total Organic Carbon (TOC) (QCLot: 4618608)								
EP005: Total Organic Carbon	----	1	mg/L	<1	100 mg/L	95.0	81.2	110
EP005: Total Organic Carbon (TOC) (QCLot: 4620757)								
EP005: Total Organic Carbon	----	1	mg/L	<1	100 mg/L	101	81.2	110
EP008: Chlorophyll (QCLot: 4617062)								
EP008B: Chlorophyll b	----	1	mg/m³	<1	----	----	----	----
EP008: Chlorophyll (QCLot: 4617063)								
EP008B: Chlorophyll b	----	1	mg/m³	<1	----	----	----	----
EP008: Chlorophyll (QCLot: 4617064)								
EP008: Chlorophyll a	----	1	mg/m³	<1	20 mg/m³	94.9	70.0	130
EP008: Pheophytin a	----	1	mg/m³	<1	----	----	----	----
EP008: Chlorophyll (QCLot: 4617065)								
EP008: Chlorophyll a	----	1	mg/m³	<1	20 mg/m³	92.9	70.0	130
EP008: Pheophytin a	----	1	mg/m³	<1	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery (%) MS	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number			Low	High
EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water (QCLot: 4613807)							
EM2218797-005	Anonymous	EK055G-SW: Ammonia as N	7664-41-7	0.5 mg/L	128	70.0	130
EK055G-SW: Ammonia as N by Discrete Analyser in Saline Water (QCLot: 4613809)							
EM2218952-009	Salt Creek Outlet	EK055G-SW: Ammonia as N	7664-41-7	0.5 mg/L	98.9	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4612578)							
EM2218952-002	Mark Point	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	142
EG052G: Silica by Discrete Analyser (QCLot: 4612576)							
EM2218952-002	Mark Point	EG052G: Reactive Silica	----	5 mg/L	100	80.0	120
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4612577)							
EM2218952-002	Mark Point	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	99.6	80.0	114

Page : 7 of 7
 Work Order : EM2218952
 Client : Dept for Environment & Water
 Project : HCHB Monitoring Program



Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4613808)							
EM2218797-005	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	99.1	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4613810)							
EM2218952-009	Salt Creek Outlet	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	85.5	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4612984)							
EM2218950-011	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	105	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4612983)							
EM2218950-011	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	101	70.0	130
EP002: Dissolved Organic Carbon (DOC) (QCLot: 4618607)							
EM2218950-002	Anonymous	EP002: Dissolved Organic Carbon	----	500 mg/L	94.2	75.0	117
EP002: Dissolved Organic Carbon (DOC) (QCLot: 4620758)							
EM2218952-008	Snipe Point	EP002: Dissolved Organic Carbon	----	500 mg/L	106	75.0	117
EP005: Total Organic Carbon (TOC) (QCLot: 4618608)							
EM2218950-002	Anonymous	EP005: Total Organic Carbon	----	500 mg/L	93.0	76.6	125
EP005: Total Organic Carbon (TOC) (QCLot: 4620757)							
EM2218952-008	Snipe Point	EP005: Total Organic Carbon	----	100 mg/L	118	76.6	125