

QUALITY CONTROL REPORT

Work Order	: EM2218950	Page	: 1 of 7
Client	: Dept for Environment & Water	Laboratory	: Environmental Division Melbourne
Contact	: DARCY MORRIS	Contact	: Kieren Burns
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Project	: HCHB Monitoring Program	Date Samples Received	: 30-Sep-2022
Order number	: -	Date Analysis Commenced	: 01-Oct-2022
C-O-C number	: 38348	Issue Date	: 10-Oct-2022
Sampler	: Bryce Drechsler, DARCY MORRIS		
Site	: HCBC Land 28/29th September		
Quote number	: AD/052/20 V2		
No. of samples received	: 11		
No. of samples analysed	: 11		



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
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Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
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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	Morella Basin @ outlet regulator	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	Tilley Swamp Drain D/S Nth Outlet	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	6040	6210	2.8	0% - 20%
EM2218952-008	Anonymous	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: 4612979)									
EM2218950-001	US Tauwichee	EA045: Turbidity	----	0.1	NTU	95.9	102	6.2	0% - 20%
EM2218950-010	3.2km south of Salt Creek (land)	EA045: Turbidity	----	0.1	NTU	18.3	15.8	14.7	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4622617)									
EM2218950-001	US Tauwichee	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%

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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	Tilley Swamp Drain Watercourse Outlet	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	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%
ED045G: Chloride by Discrete Analyser (QC Lot: 4613154)									
EM2218950-009	Morella Creek @ gauge	ED045G: Chloride	16887-00-6	1	mg/L	4160	4150	0.3	0% - 20%
EM2218950-001	US Tauwitschere	ED045G: Chloride	16887-00-6	1	mg/L	79	77	3.1	0% - 20%
EG052G: Silica by Discrete Analyser (QC Lot: 4613153)									
EM2218950-011	Tilley Swamp Drain Watercourse Outlet	EG052G: Reactive Silica	----	0.05	mg/L	13.8	13.2	5.0	0% - 20%
EM2218950-001	US Tauwitschere	EG052G: Reactive Silica	----	0.05	mg/L	0.20	0.21	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 4613152)									
EM2218950-005	Bonneys	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM2218933-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.03	0.03	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	Morella Basin @ outlet regulator	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: 4612982)									
EM2218791-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.2	0.2	0.0	No Limit
EM2218933-004	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	4.8	5.7	15.8	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 4612984)									
EM2218950-010	3.2km south of Salt Creek (land)	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	3.5	4.1	14.9	No Limit
EM2218952-008	Anonymous	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: 4612981)									
EM2218791-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM2218933-004	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.13	<0.10	29.1	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 4612983)									
EM2218950-010	3.2km south of Salt Creek (land)	EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.10	<0.10	0.0	No Limit
EM2218952-008	Anonymous	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	US Tauwitschere	EP002: Dissolved Organic Carbon	----	1	mg/L	8	8	0.0	No Limit
EM2218950-010	3.2km south of Salt Creek (land)	EP002: Dissolved Organic Carbon	----	1	mg/L	28	27	0.0	0% - 20%
EP005: Total Organic Carbon (TOC) (QC Lot: 4618608)									
EM2218950-001	US Tauwitschere	EP005: Total Organic Carbon	----	1	mg/L	7	8	14.6	No Limit



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: 4618608) - continued									
EM2218950-010	3.2km south of Salt Creek (land)	EP005: Total Organic Carbon	----	1	mg/L	35	36	0.0	0% - 20%



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
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: 4612979)								
EA045: Turbidity	----	0.1	NTU	<0.1	40 NTU	102	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
ED045G: Chloride by Discrete Analyser (QCLot: 4613154)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	109	85.0	115
				<1	1000 mg/L	108	85.0	122
EG052G: Silica by Discrete Analyser (QCLot: 4613153)								
EG052G: Reactive Silica	----	0.05	mg/L	<0.05	5 mg/L	101	78.9	118
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4613152)								
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
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4612982)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	105	70.0	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: 4612981)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	111	71.9	114
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
EP002: Dissolved Organic Carbon (DOC) (QCLot: 4618607)								
EP002: Dissolved Organic Carbon	----	1	mg/L	<1	100 mg/L	96.2	83.0	115

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	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
ED045G: Chloride by Discrete Analyser (QCLot: 4613154)							
EM2218950-002	DS Tauwitschere	ED045G: Chloride	16887-00-6	400 mg/L	108	70.0	142
EG052G: Silica by Discrete Analyser (QCLot: 4613153)							
EM2218950-002	DS Tauwitschere	EG052G: Reactive Silica	----	5 mg/L	103	80.0	120
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4613152)							
EM2218933-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	93.8	80.0	114
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
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4612982)							
EM2218791-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	95.8	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4612984)							
EM2218950-011	Tilley Swamp Drain Watercourse Outlet	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	105	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4612981)							
EM2218791-002	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	97.1	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4612983)							
EM2218950-011	Tilley Swamp Drain Watercourse Outlet	EK067G: Total Phosphorus as P	----	1 mg/L	101	70.0	130
EP002: Dissolved Organic Carbon (DOC) (QCLot: 4618607)							
EM2218950-002	DS Tauwitschere	EP002: Dissolved Organic Carbon	----	500 mg/L	94.2	75.0	117
EP005: Total Organic Carbon (TOC) (QCLot: 4618608)							



Sub-Matrix: WATER

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP005: Total Organic Carbon (TOC) (QCLot: 4618608) - continued							
EM2218950-002	DS Tauwitchenere	EP005: Total Organic Carbon	----	500 mg/L	93.0	76.6	125