

QUALITY CONTROL REPORT

Work Order	: EM2021368	Page	: 1 of 6
Client	: Dept for Environment & Water	Laboratory	: Environmental Division Melbourne
Contact	: Mr FRANK MANGERUCA	Contact	: Kieren Burns
Address	: GPO BOX 2834 ADELAIDE SA, AUSTRALIA 5001	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +61881625130
Project	: HCHB	Date Samples Received	: 02-Dec-2020
Order number	: ----	Date Analysis Commenced	: 02-Dec-2020
C-O-C number	: ----	Issue Date	: 09-Dec-2020
Sampler	: JC		
Site	: ----		
Quote number	: AD/052/20 V2		
No. of samples received	: 19		
No. of samples analysed	: 19		



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	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Arenie Vijayaratham	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Nikki Stepniewski	Senior Inorganic Instrument 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

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**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 3401049)									
EM2018514-009	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	98400	106000	7.89	0% - 20%
EM2021277-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	4060	4020	0.792	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 3401052)									
EM2021368-013	Mark Point	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	18600	17800	4.90	0% - 20%
EM2021388-004	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	142	134	5.82	0% - 50%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 3402705)									
EM2021368-001	Stony Well	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	87300	90700	3.90	0% - 20%
EM2021392-002	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	85	87	2.32	No Limit
EA045: Turbidity (QC Lot: 3397459)									
EM2021368-001	Stony Well	EA045: Turbidity	----	0.1	NTU	28.8	29.0	0.692	0% - 20%
EM2021368-010	Murray Mouth	EA045: Turbidity	----	0.1	NTU	5.3	5.3	0.00	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 3401213)									
EM2021368-002	North Jacks Point	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	251	256	2.16	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	251	256	2.16	0% - 20%
EM2021368-012	DS Tauwitschere	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	94	93	0.00	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	94	93	0.00	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 3397357)									
EM2021368-009	Tilley Swamp Drain U/S Morella	ED045G: Chloride	16887-00-6	1	mg/L	5360	5300	1.02	0% - 20%
EM2021368-001	Stony Well	ED045G: Chloride	16887-00-6	1	mg/L	48800	48900	0.0759	0% - 20%

Page : 3 of 6
 Work Order : EM2021368
 Client : Dept for Environment & Water
 Project : HCHB



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG052G: Silica by Discrete Analyser (QC Lot: 3397354)									
EM2021368-011	US Tauwiche	EG052G: Reactive Silica	----	0.05	mg/L	<0.05	<0.05	0.00	No Limit
EM2021368-001	Stony Well	EG052G: Reactive Silica	----	0.05	mg/L	1.22	1.23	0.00	0% - 20%
EK055G-SW: Ammonia as N by Discrete Analyser in Sea Water (QC Lot: 3399817)									
EM2021368-001	Stony Well	EK055G-SW: Ammonia as N	7664-41-7	0.02	mg/L	<0.02	<0.02	0.00	No Limit
EM2021368-010	Murray Mouth	EK055G-SW: Ammonia as N	7664-41-7	0.02	mg/L	<0.02	<0.02	0.00	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 3397355)									
EM2021368-010	Murray Mouth	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EM2021368-001	Stony Well	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 3399816)									
EM2021368-001	Stony Well	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EM2021368-010	Murray Mouth	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 3401834)									
EM2021368-001	Stony Well	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	4.2	4.2	0.00	0% - 20%
EM2021368-010	Murray Mouth	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.3	0.4	40.1	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 3401833)									
EM2021368-001	Stony Well	EK067G: Total Phosphorus as P	----	0.01	mg/L	3.94	3.89	1.30	0% - 20%
EM2021368-010	Murray Mouth	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.10	0.07	26.2	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 3397356)									
EM2021368-010	Murray Mouth	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EM2021368-001	Stony Well	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EP002: Dissolved Organic Carbon (DOC) (QC Lot: 3398341)									
EM2021368-001	Stony Well	EP002: Dissolved Organic Carbon	----	1	mg/L	49	49	0.00	0% - 20%
EM2021368-010	Murray Mouth	EP002: Dissolved Organic Carbon	----	1	mg/L	6	6	0.00	No Limit
EP005: Total Organic Carbon (TOC) (QC Lot: 3398340)									
EM2021368-001	Stony Well	EP005: Total Organic Carbon	----	1	mg/L	47	49	2.48	0% - 20%
EM2021368-010	Murray Mouth	EP005: Total Organic Carbon	----	1	mg/L	6	6	0.00	No Limit

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 Spike (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				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) LowHigh	
Method: Compound	CAS Number	LOR	Unit	Result				
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 3401049)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	95.2	91.0	110
				<10	293 mg/L	101	91.0	110
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 3401052)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	98.3	91.0	110
				<10	293 mg/L	99.6	91.0	110
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 3402705)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	97.1	91.0	110
				<10	293 mg/L	108	91.0	110
EA045: Turbidity (QCLot: 3397459)								
EA045: Turbidity	----	0.1	NTU	<0.1	40 NTU	101	88.1	110
ED037P: Alkalinity by PC Titrator (QCLot: 3401213)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	99.3	85.0	116
ED045G: Chloride by Discrete Analyser (QCLot: 3397357)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	96.3	85.0	115
				<1	1000 mg/L	94.4	85.0	122
EG052G: Silica by Discrete Analyser (QCLot: 3397354)								
EG052G: Reactive Silica	----	0.05	mg/L	<0.05	5 mg/L	86.6	78.9	118
EK055G-SW: Ammonia as N by Discrete Analyser in Sea Water (QCLot: 3399817)								
EK055G-SW: Ammonia as N	7664-41-7	0.02	mg/L	<0.02	0.5 mg/L	109	81.1	124
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3397355)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	97.8	90.9	112
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3399816)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	103	90.0	117
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3401834)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	95.4	70.0	117
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3401833)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	2.21 mg/L	106	71.9	114
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 3397356)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	108	92.7	119
EP002: Dissolved Organic Carbon (DOC) (QCLot: 3398341)								
EP002: Dissolved Organic Carbon	----	1	mg/L	<1	100 mg/L	91.2	83.0	115
EP005: Total Organic Carbon (TOC) (QCLot: 3398340)								

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED045G: Chloride by Discrete Analyser (QCLot: 3397357)							
EM2021368-002	North Jacks Point	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	142
EG052G: Silica by Discrete Analyser (QCLot: 3397354)							
EM2021368-002	North Jacks Point	EG052G: Reactive Silica	----	5 mg/L	87.9	80.0	120
EK055G-SW: Ammonia as N by Discrete Analyser in Sea Water (QCLot: 3399817)							
EM2021368-002	North Jacks Point	EK055G-SW: Ammonia as N	7664-41-7	0.5 mg/L	91.7	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3397355)							
EM2021368-002	North Jacks Point	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	98.6	80.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3399816)							
EM2021368-002	North Jacks Point	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	79.1	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3401834)							
EM2021368-002	North Jacks Point	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	92.6	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3401833)							
EM2021368-002	North Jacks Point	EK067G: Total Phosphorus as P	----	1 mg/L	# Not Determined	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 3397356)							
EM2021368-002	North Jacks Point	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	105	79.0	123
EP002: Dissolved Organic Carbon (DOC) (QCLot: 3398341)							
EM2021368-002	North Jacks Point	EP002: Dissolved Organic Carbon	----	100 mg/L	103	75.0	117
EP005: Total Organic Carbon (TOC) (QCLot: 3398340)							



Sub-Matrix: WATER

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP005: Total Organic Carbon (TOC) (QCLot: 3398340) - continued							
EM2021368-002	North Jacks Point	EP005: Total Organic Carbon	----	100 mg/L	99.0	76.6	125