

CERTIFICATE OF ANALYSIS

Work Order : EM2203091

: Dept for Environment & Water

Contact : Mr FRANK MANGERUCA

Address : GPO BOX 2834

ADELAIDE SA, AUSTRALIA 5001

Telephone : ---

Client

Project : HCHB - Phase 1

 Order number
 : ---

 C-O-C number
 : ---

 Sampler
 : ---

 Site
 : ---

Quote number : AD/052/20 V2

No. of samples received : 22

No. of samples analysed : 22

Page : 1 of 12

Laboratory : Environmental Division Melbourne

Contact : Kieren Burns

Address : 4 Westall Rd Springvale VIC Australia 3171

Telephone : +61881625130

Date Samples Received : 24-Feb-2022 12:27

Date Analysis Commenced : 24-Feb-2022

Issue Date : 09-Mar-2022 12:06



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
Ankit Joshi	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
Samantha Smith	Assistant Laboratory Manager	WRG Subcontracting, Springvale, VIC

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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.
- EP005:EP002:It is recognised that total organic carbon is less than dissolved organic carbon for samples EM2203091 #4. However, the difference is within experimental variation of the methods.
- EP002:EP005:It is recognised that total organic carbon is less than dissolved organic carbon for samples EM2203091 #1. However, the difference is within experimental variation of the methods.
- EP008, Chlorophylla- standard does not contained Pheophytin-a standard.
- EP008B- LOR raised for various samples due to samples matrix.
- EP008/EP008B, Invalidated results for sample #22 due to sample not recieved.
- EA015H: EM2203091 #1-3, #7-9, #13-14, #17-19: TDS by method EA-015 may bias high due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.
- EA015H: EM2203091 #10-12: TDS by method EA-015 may bias high due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.
- EK067G: EM2203091 #8 Poor duplicate precision for Total phosphorus due to sample heterogeneity. Confirmed by re-extraction and re-analysis.
- EP002: EM2203091 #2 Poor matrix spike recovery for dissolved mercury due to sample matrix. Insufficient sample provided to confirmed by re-extraction and re-analysis.
- EP005:EP002:It is recognised that total organic carbon is less than dissolved organic carbon for samples EM2203091 #21. However, the difference is within experimental variation of the methods.
- 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.
- Algal Count (BM010) has been performed by ALS Water Resources Group, NATA Accreditation no. 992, Site no. 989.

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Dissolved Organic Carbon

EP005: Total Organic Carbon (TOC)

1

mg/L

14

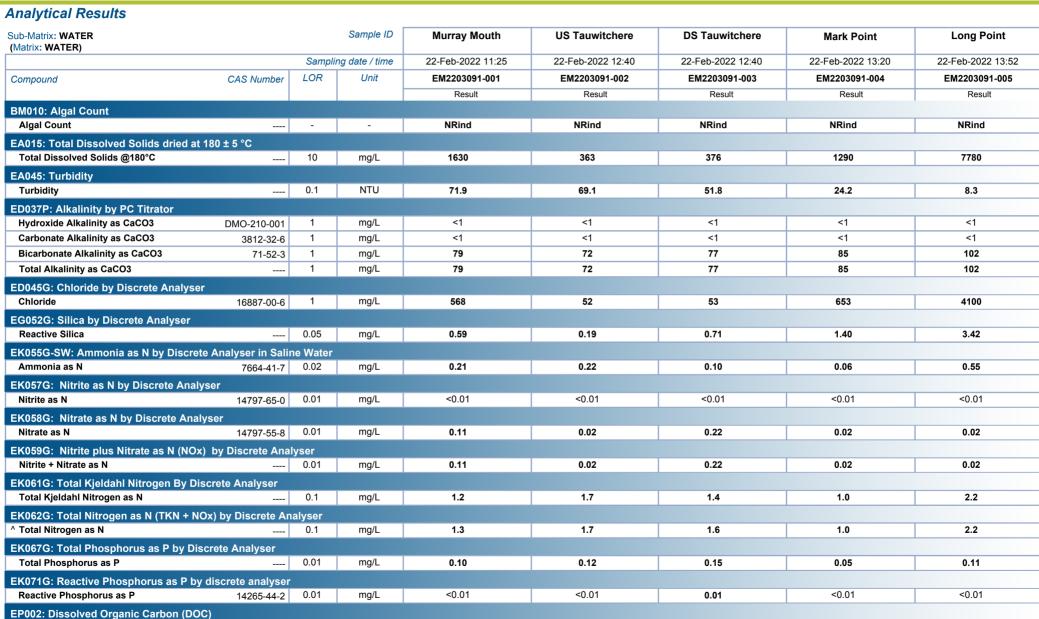
11

9

12

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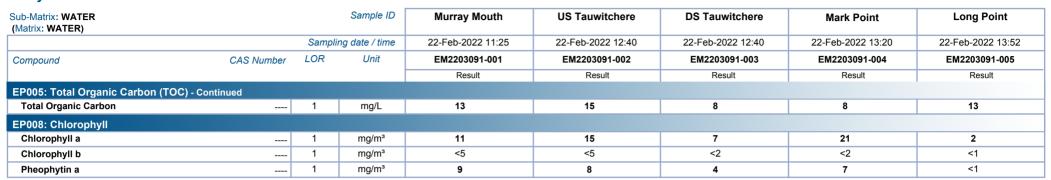




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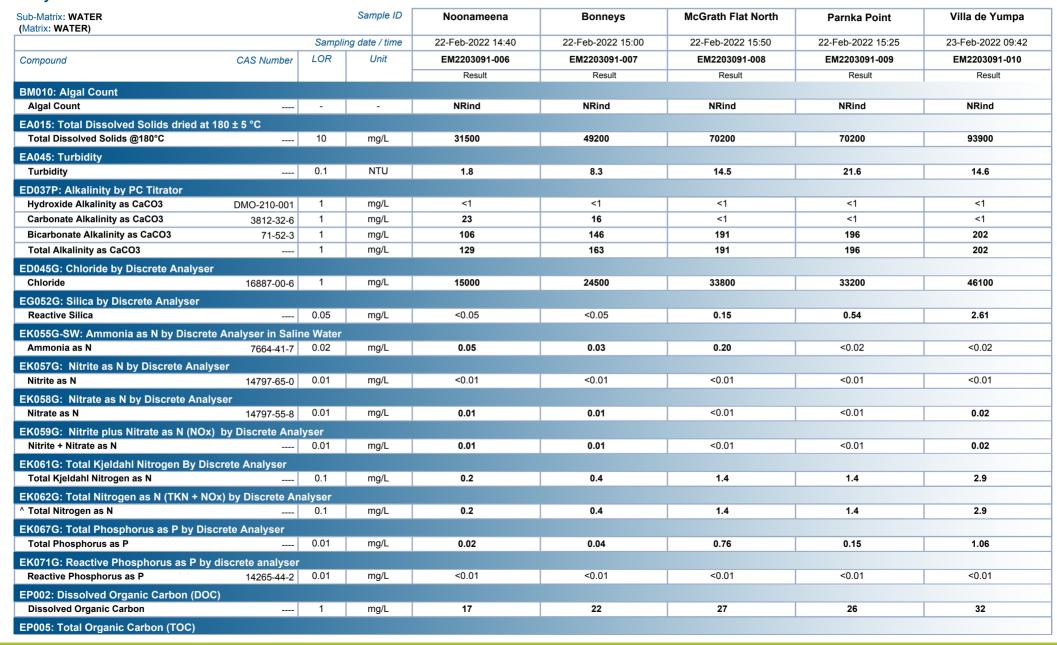




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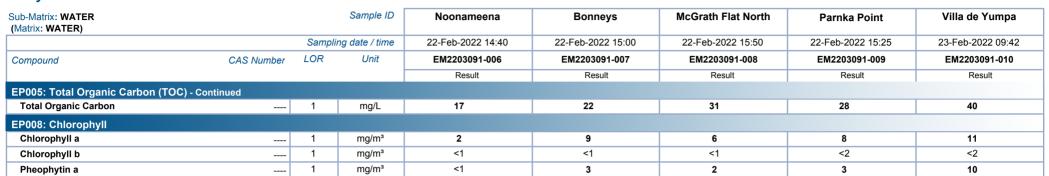




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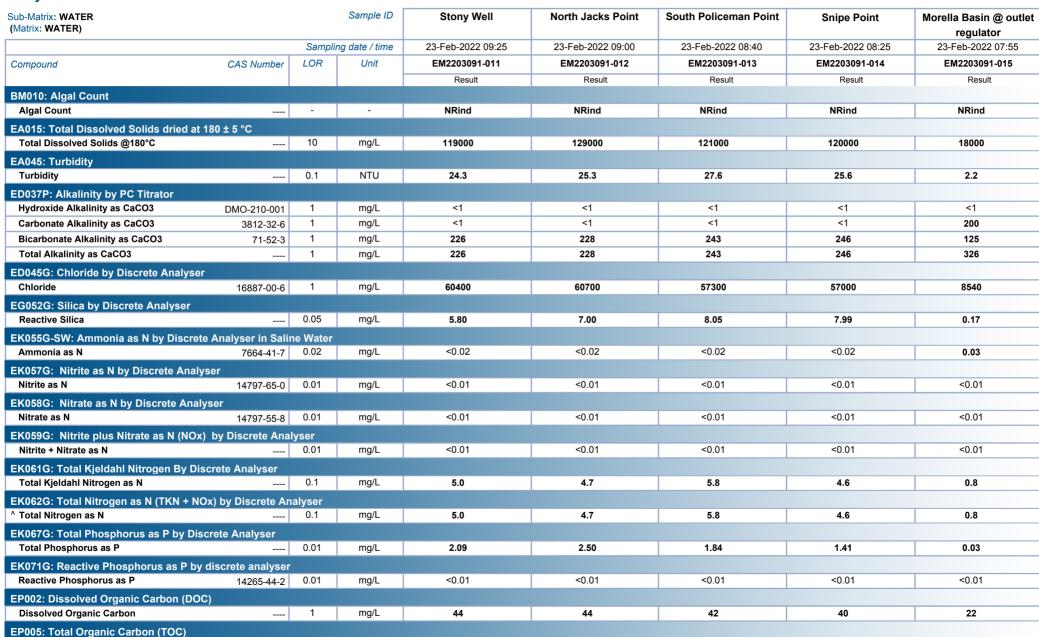




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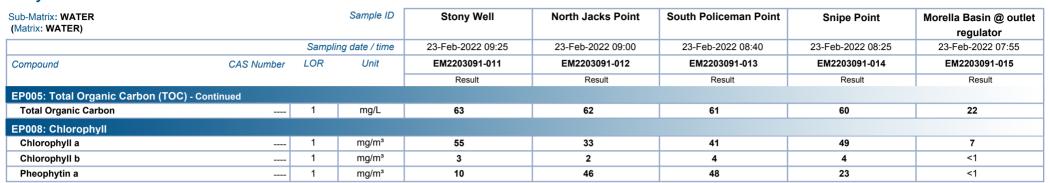




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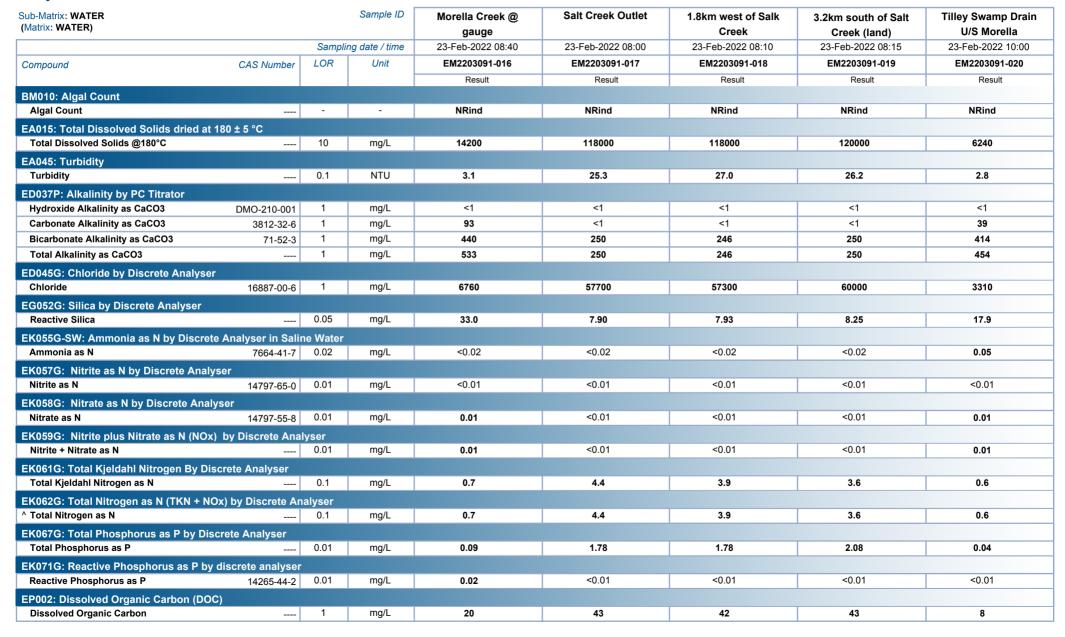




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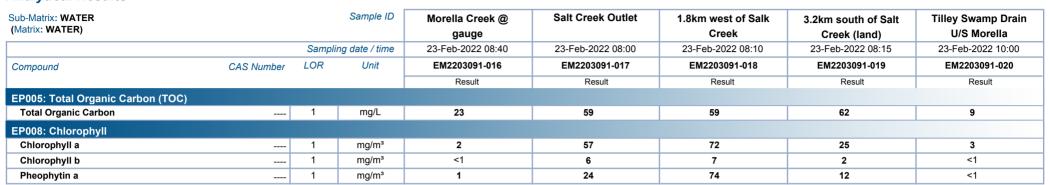




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Project



BM010: Algal Count Algal Count EA015: Total Dissolved Solids dried at 180 ± 5 °C Total Dissolved Solids @180°C EA045: Turbidity Turbidity Turbidity ED037P: Alkalinity by PC Titrator Hydroxide Alkalinity as CaC03 Carbonate Alkalinity as CaC03 Bicarbonate Alkalinity as CaC03 Bicarbonate Alkalinity as CaC03 ED045G: Chloride by Discrete Analyser Chloride Chlor	r LOR 10 0.1 1 1 1 6 1 3 1 1 6 1 0.05 Iline Water		23-Feb-2022 09:25 EM2203091-021 Result NRind 6140 6.0 <1 36 420 456 3170 19.3	23-Feb-2022 09:40 EM2203091-022 Result NRind 6040 4.6 <1 36 419 456 3210		
BM010: Algal Count Algal Count EA015: Total Dissolved Solids dried at 180 ± 5 °C Total Dissolved Solids @180°C EA045: Turbidity Turbidity ED037P: Alkalinity by PC Titrator Hydroxide Alkalinity as CaC03 Carbonate Alkalinity as CaC03 Bicarbonate Alkalinity as CaC03 Total Alkalinity as CaC03 ED045G: Chloride by Discrete Analyser Chloride Chloride Chloride CH055G-SW: Ammonia as N by Discrete Analyser in Sammonia as N Total Alkalinity as N by Discrete Analyser Nitrite as N N T664-41- EK057G: Nitrite as N by Discrete Analyser Nitrite as N N 14797-65- EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser Nitrite + Nitrate as N Nitrite + Nitrate as N EK061G: Total Kjeldahl Nitrogen By Discrete Analyser Total Kjeldahl Nitrogen as N	10 0.1 1 1 1 6 1 3 1 1 6 1 0.05	mg/L mg/L mg/L mg/L mg/L mg/L mg/L	Result NRind 6140 6.0 <1 36 420 456 3170	Result NRind 6040 4.6 <1 36 419 456 3210		
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Total Dissolved Solids @180°C	- 0.1 1 1 6 1 3 1 - 1 6 1 - 0.05	mg/L mg/L mg/L mg/L mg/L mg/L	6.0 <1 36 420 456	4.6 <1 36 419 456 3210		
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Turbidity ED037P: Alkalinity by PC Titrator Hydroxide Alkalinity as CaCO3 DMO-210-00 Carbonate Alkalinity as CaCO3 3812-32- Bicarbonate Alkalinity as CaCO3 71-52- Total Alkalinity as CaCO3 ED045G: Chloride by Discrete Analyser Chloride 16887-00- EG052G: Silica by Discrete Analyser Reactive Silica EK055G-SW: Ammonia as N by Discrete Analyser in Sammonia as N 7664-41- EK057G: Nitrite as N by Discrete Analyser Nitrite as N 14797-65- EK058G: Nitrate as N by Discrete Analyser Nitrate as N 14797-55- EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser Nitrite + Nitrate as N EK061G: Total Kjeldahl Nitrogen By Discrete Analyser Total Kjeldahl Nitrogen as N	1 1 6 1 3 1 1 1 0.05	mg/L mg/L mg/L mg/L mg/L mg/L	<1 36 420 456	<1 36 419 456		
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Hydroxide Alkalinity as CaCO3 Carbonate Alkalinity as CaCO3 Bicarbonate Alkalinity as CaCO3 Total Kjeldahl Nitrogen By Discrete Analyser Total Kjeldahl Nitrogen as N Total Kjeldahl Nitrogen By Discrete Analyser	6 1 3 1 1 6 1 0.05	mg/L mg/L mg/L mg/L mg/L	36 420 456 3170	36 419 456 3210		
Bicarbonate Alkalinity as CaCO3 Bicarbonate Alkalinity as CaCO3 Total Alkalinity as CaCO3 D045G: Chloride by Discrete Analyser Chloride G052G: Silica by Discrete Analyser Reactive Silica EK055G-SW: Ammonia as N by Discrete Analyser in Standard as N Ammonia as N T664-41- EK057G: Nitrite as N by Discrete Analyser Nitrite as N 14797-65- EK058G: Nitrate as N by Discrete Analyser Nitrate as N Nitrate as N Nitrate as N Nitrate as N Nitrite + Nitrate as N EK061G: Total Kjeldahl Nitrogen By Discrete Analyser Total Kjeldahl Nitrogen as N	6 1 3 1 1 6 1 0.05	mg/L mg/L mg/L mg/L	420 456 3170	419 456 3210		
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Chloride 16887-00- EG052G: Silica by Discrete Analyser Reactive Silica EK055G-SW: Ammonia as N by Discrete Analyser in Sa Ammonia as N 7664-41- EK057G: Nitrite as N by Discrete Analyser Nitrite as N 14797-65- EK058G: Nitrate as N by Discrete Analyser Nitrate as N 14797-55- EK059G: Nitrite plus Nitrate as N (NOx) by Discrete A Nitrite + Nitrate as N EK061G: Total Kjeldahl Nitrogen By Discrete Analyser Total Kjeldahl Nitrogen as N	0.05	mg/L				
Chloride 16887-00- EG052G: Silica by Discrete Analyser Reactive Silica	0.05	mg/L				
Reactive Silica	lline Water		19.3	19.4		
Reactive Silica	lline Water		19.3	19.4		
Ammonia as N 7664-41- EK057G: Nitrite as N by Discrete Analyser Nitrite as N 14797-65- EK058G: Nitrate as N by Discrete Analyser Nitrate as N 14797-55- EK059G: Nitrite plus Nitrate as N (NOx) by Discrete A Nitrite + Nitrate as N EK061G: Total Kjeldahl Nitrogen By Discrete Analyser Total Kjeldahl Nitrogen as N	_					
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EK057G: Nitrite as N by Discrete Analyser Nitrite as N 14797-65- EK058G: Nitrate as N by Discrete Analyser Nitrate as N 14797-55- EK059G: Nitrite plus Nitrate as N (NOx) by Discrete A Nitrite + Nitrate as N EK061G: Total Kjeldahl Nitrogen By Discrete Analyser Total Kjeldahl Nitrogen as N		mg/L	0.04	0.06		
Nitrite as N 14797-65- EK058G: Nitrate as N by Discrete Analyser Nitrate as N 14797-55- EK059G: Nitrite plus Nitrate as N (NOx) by Discrete A Nitrite + Nitrate as N EK061G: Total Kjeldahl Nitrogen By Discrete Analyser Total Kjeldahl Nitrogen as N						
EK058G: Nitrate as N by Discrete Analyser Nitrate as N 14797-55- EK059G: Nitrite plus Nitrate as N (NOx) by Discrete A Nitrite + Nitrate as N EK061G: Total Kjeldahl Nitrogen By Discrete Analyser Total Kjeldahl Nitrogen as N	0.01	mg/L	<0.01	<0.01		
Nitrate as N 14797-55- EK059G: Nitrite plus Nitrate as N (NOx) by Discrete A Nitrite + Nitrate as N EK061G: Total Kjeldahl Nitrogen By Discrete Analyser Total Kjeldahl Nitrogen as N						
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete A Nitrite + Nitrate as N EK061G: Total Kjeldahl Nitrogen By Discrete Analyser Total Kjeldahl Nitrogen as N	8 0.01	mg/L	0.02	0.01		
Nitrite + Nitrate as N EK061G: Total Kjeldahl Nitrogen By Discrete Analyser Total Kjeldahl Nitrogen as N	-	···g· _				
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser Total Kjeldahl Nitrogen as N 	_	mg/L	0.02	0.01		
Total Kjeldahl Nitrogen as N	- 0.01	mg/L	0.02	0.01		
	0.1	mg/L	0.7	0.4		
=K062G: Total Nitrogen as N (TKN + NOx) by Discrete .		mg/L	U. 1	0.4		
` Total Nitrogen as N	Analyser 0.1	mg/L	0.7	0.4		
	- 0.1	IIIg/L	U.1	U.4		
EK067G: Total Phosphorus as P by Discrete Analyser Total Phosphorus as P	0.01	ma/l	0.05	0.01		
•		mg/L	0.05	0.01		
EK071G: Reactive Phosphorus as P by discrete analys	_		40.04	40.04		
Reactive Phosphorus as P 14265-44-	2 0.01	mg/L	<0.01	<0.01		
EP002: Dissolved Organic Carbon (DOC)						
Dissolved Organic Carbon EP005: Total Organic Carbon (TOC)	1	mg/L	9	6		

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Dept for Environment & Water Client

HCHB - Phase 1 Project

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	Tilley Swamp Drain Nth outlet	Tilley Swamp Drain Watercourse outlet			
		Samplii	ng date / time	23-Feb-2022 09:25	23-Feb-2022 09:40			
Compound	CAS Number	LOR	Unit	EM2203091-021	EM2203091-022			
				Result	Result			
EP005: Total Organic Carbon (TOC) - Continued								
Total Organic Carbon		1	mg/L	6	6			
EP008: Chlorophyll								
Chlorophyll a		1	mg/m³	5				
Chlorophyll b		1	mg/m³	<1				
Pheophytin a		1	mg/m³	<1				

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

(WATER) EP008: Chlorophyll