Drinking Water Quality Management Plan (DWQMP) report

2019-20

Maranoa Regional Council

SPID: 494

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Roma QLD 4455
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Glossary of terms

ADWG 2004	Australian Drinking Water Guidelines (2004). Published by the National Health and Medical Research Council of Australia
ADWG 2011	Australian Drinking Water Guidelines (2011). Published by the National Health and Medical Research Council of Australia
E. coli	*Escherichia coli*, a bacterium which is considered to indicate the presence of faecal contamination and therefore potential health risk
HACCP	Hazard Analysis and Critical Control Points certification for protecting drinking water quality
mg/L	Milligrams per litre
NTU	Nephelometric Turbidity Units
MPN/100mL	Most probable number per 100 millilitres
CFU/100mL	Colony forming units per 100 millilitres
<	Less than
>	Greater than

1. Introduction

This report documents the performance of Maranoa Regional Council's drinking water service with respect to water quality and performance in implementing the actions detailed in the drinking water quality management plan (DWQMP) as required under the *Water Supply (Safety and Reliability) Act 2008* (the Act).

The report assists the Regulator to determine whether the approved DWQMP and any approval conditions have been complied with and provides a mechanism for providers to report publicly on their performance in managing drinking water quality.

This template has been prepared in accordance with the *Water Industry Regulatory Reform – drinking water quality management plan report factsheet* published by the Department of Energy and Water Supply, Queensland, accessible at www.dews.qld.gov.au.

2. Actions taken to implement the DWQMP

Operational limits have been set and are monitored by field crews. Verification monitoring is also carried out by our laboratory staff on a routine basis. Results that are out of operational limits are referred to supervisors for corrective action.

Progress in implementing the risk management improvement program

Refer to the Appendices for a summary of progress in implementing each of the Improvement Program actions.

Key Improvement items are tagged for capital upgrade consideration each financial year, or applied for when suitable external funding becomes available. Operational improvements are conducted within existing operational budgets based on their priority.

Revisions made to the operational monitoring program to assist in maintaining the compliance with water quality criteria[1] in verification monitoring.

The current approved plan is in effect with copies dispatched to all operational staff, and regular discussion with field staff to make them aware of the requirements under the plan.

Amendments made to the DWQMP

This year the amendments proposed to be made to the plan involve updating the organizational structure, updating the risk management matrix with current processes and procedures and updating operational data.

3. Compliance with water quality criteria for drinking water

The water quality criteria mean health guideline values in the most current Australian Drinking Water Guidelines, as well as the standards in the Public Health Regulation 2005.

Amby

Parameter	Unit	Limit	No of Samples	No of Non-conforming	Max
E. coli	MPN/100mL	<1	50	0	0
coliforms	MPN/100mL	N/A	50	N/A	
pH	pH	6.5 – 8.5	45		8.8
Chlorine (Free)	mg/L	< 5.0	19	0	2.2
Chlorine (Total)	mg/L	< 5.0	19	0	2.5

Injune

Parameter	Unit	Limit	No of Samples	No of Non-conforming	Max
E. coli	MPN/100mL	<1	92	0	0
coliforms	MPN/100mL	N/A	92	N/A	
pH	pH	6.5 – 8.5	90		8.75
Chlorine (Free)	mg/L	< 5.0	76	0	1.1
Chlorine (Total)	mg/L	< 5.0	76	0	1.5

Jackson

Parameter	Unit	Limit	No of Samples	No of Non-conforming	Max
E. coli	MPN/100mL	<1	30	0	0
coliforms	MPN/100mL	N/A	30	N/A	
pH	pH	6.5 – 8.5	25		8.7
Chlorine (Free)	mg/L	< 5.0	24	0	0.6
Chlorine (Total)	mg/L	< 5.0	24	0	0.65

Mitchell

Parameter	Unit	Limit	No of Samples	No of Non-conforming	Max
E. coli	MPN/100mL	<1	104	0	0
coliforms	MPN/100mL	N/A	104	N/A	
pH	pH	6.5 – 8.5	99		9.12
Chlorine (Free)	mg/L	< 5.0	22	0	3.5
Chlorine (Total)	mg/L	< 5.0	22	0	4.3

Muckadilla

Parameter	Unit	Limit	No of Samples	No of Non-conforming	Max
E. coli	MPN/100mL	<1	40	0	0
coliforms	MPN/100mL	N/A	40	N/A	
pH	pH	6.5 – 8.5	22		8.9
Chlorine (Free)	mg/L	< 5.0	22	0	1.64
Chlorine (Total)	mg/L	< 5.0	22	0	1.83

Mungallala

Parameter	Unit	Limit	No of Samples	No of Non-conforming	Max
E. coli	MPN/100mL	<1	37	0	0
coliforms	MPN/100mL	N/A	37	N/A	
pH	pH	6.5 – 8.5	33		8.2
Chlorine (Free)	mg/L	< 5.0	15	0	1.8
Chlorine (Total)	mg/L	< 5.0	15	0	2.0

Roma

Parameter	Unit	Limit	No of Samples	No of Non-conforming	Max
E. coli	MPN/100mL	<1	901	0	0
coliforms	MPN/100mL	N/A	901	N/A	
pH	pH	6.5 – 8.5	620		9.1
Chlorine (Free)	mg/L	< 5.0	646	0	2.8
Chlorine (Total)	mg/L	< 5.0	646	0	3.5

Surat

Parameter	Unit	Limit	No of Samples	No of Non-conforming	Max
E. coli	MPN/100mL	<1	78	0	0
coliforms	MPN/100mL	N/A	78	N/A	
pH	pH	6.5 – 8.5	75		8.01
Chlorine (Free)	mg/L	< 5.0	75	0	3.0
Chlorine (Total)	mg/L	< 5.0	75	0	3.4

Wallumbilla

Parameter	Unit	Limit	No of Samples	No of Non-conforming	Max
E. coli	MPN/100mL	<1	57	0	0
coliforms	MPN/100mL	N/A	57	N/A	
pH	pH	6.5 – 8.5	51		8.5
Chlorine (Free)	mg/L	< 5.0	51	0	1.6
Chlorine (Total)	mg/L	< 5.0	51	0	2.1

Yuleba

Parameter	Unit	Limit	No of Samples	No of Non-conforming	Max
E. coli	MPN/100mL	<1	50	0	0
coliforms	MPN/100mL	N/A	50	N/A	
pH	pH	6.5 – 8.5	48		9.1
Chlorine (Free)	mg/L	< 5.0	42	0	1.1
Chlorine (Total)	mg/L	< 5.0	42	0	2.1

4. Notifications to the Regulator under sections 102 and 102A of the Act

This financial year there was one instance where the Regulator was notified under sections 102 or 102A of the Act.

On 30/08/2019 there was a Chlorine overdosing incident due to a faulty chlorine probe at Roma Bore 19. During the investigation, the was a reading of 10.5mg/L found at the Bore 19 reservoir.

There were no reported health affects to the community and the inspection interval of chlorine probs was reduced to limit the risk of a repeat incident.

5. Customer complaints related to water quality

Maranoa Regional Council is required to report on the number of complaints, general details of complaints, and the responses undertaken.

Throughout the year the following complaints about water quality were received:

Table 1 - complaints about water quality, (including per 1,000 customers)

# Complaints (# per 1,000 customers)	Suspected Illness	Discoloured water	Taste and odour	Total
Amby	0 (0.0)	0 (0.0)	**1 (20.0)**	**1 (20.0)**
Injune	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Jackson	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mitchell	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Muckadilla	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mungallala	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Roma	**4 (0.56)**	**6 (0.84)**	**4 (0.56)**	**14 (1.95)**
Surat	0 (0.0)	0 (0.0)	**1 (2.0)**	**1 (2.0)**
Wallumbilla	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Yuleba	0 (0.0)	0 (0.0)	**2 (7.14)**	**2 (7.14)**
Total	**4 (0.41)**	**6 (0.62)**	**8 (0.82)**	**18 (1.85)**

Suspected Illness

Complaints are sometimes received from customers who suspect their water may be associated with an illness they are experiencing. Maranoa Regional Council investigates each complaint relating to alleged illness from our water quality, typically by testing the customers meter tap and closest reticulation sampling point for the presence of *E. coli*.

During 2019/20, there were no confirmed cases of illness arising from the water supply system. With the reports that were received being for skin irritation attributed to chlorine disinfection in the towns. Chlorine levels were tested and found to be within acceptable limits and could not be adjusted lower without compromising chlorine residual in further segments of the network.

Discoloured water

In 2019/20, 6 customer complaints were received all from within Roma. As per standard procedure the areas were flushed to remove the dirty water and to achieve detectable chlorine residuals. These incidents often happen after network breaks or main repairs.

Taste and odour

The taste and odour complaints received are typically related to the smell of sulphur in the water supply bores. Once reported by customers or detected by our employees, Maranoa Regional Council investigates the issue to devise a prompt resolution, which may include flushing the reticulation. Investigation of each complaint found no public health risks, for either microbiological or chemical parameters. These odour complaints reoccur annually and coincide with hotter water being drawn up by the bores due to higher demand during summer.

There was a reportable incident that was related taste and odour, please refer to section 4 of this report.

6. Findings and recommendations of the DWQMP auditor

The next DWQMP audit is due before 25 June 2021. Currently working with the Qldwater - DASBAC group to align audit dates for Maranoa and neighbouring Council's.

7. Outcome of the review of the DWQMP and how issues raised have been addressed

A review of the DWQMP was conducted following the external audit by Viridis Consultants in 2019. The purpose of the review was to ensure that the DWQMP remains relevant, having regard to the operation of the drinking water service. The review was conducted by:

- Graham Sweetlove (Manager – WS&G)
- Michael Seville (Team Coordinator – WS&G)

The review made the following findings:

- Update staff structure
- Incorporate the recommendations of the Auditor's report
- Update the RMIP completed items, and add newly identified items.
- Updated contact listing (staff, external, regulatory and suppliers)
- Refresher training of field staff and their knowledge of the DWQMP

Issues raised by the 2019 audit review have been largely addressed, with only minor updates required for 2020 report.

Appendix A – Summary of compliance with water quality criteria

The results from the verification monitoring program have been compared against the levels of the water quality criteria specified by the Regulator in the *Water Quality and Reporting Guideline for a Drinking Water Service*.
The reported statistics do not include results derived from repeat samples, or from emergency or investigative samples undertaken in response to an elevated result.

Table 2 - Verification monitoring results

Scheme name	Scheme component	Parameter	Frequency of sampling	Total No. samples collected	Laboratory name
Amby	Bore	Standard Chemical & Heavy Metals	Annual	1	QHFSS
Injune	Bores	Standard Chemical & Heavy Metals	Annual	3	QHFSS
Jackson	Bore	Standard Chemical & Heavy Metals	Annual	1	QHFSS
Mitchell	Bores	Standard Chemical & Heavy Metals	Annual	2	QHFSS
Muckadilla	Bore	Standard Chemical & Heavy Metals	Annual	1	QHFSS
Mungallala	Bore	Standard Chemical & Heavy Metals	Annual	1	QHFSS
Roma	Bores	Standard Chemical & Heavy Metals	Annual	13	QHFSS
Surat	River	Standard Chemical, Heavy Metals, THMs and Pesticides	Annual	1	QHFSS
Wallumbilla	Bore	Standard Chemical & Heavy Metals	Annual	1	QHFSS
Yuleba	Bore	Standard Chemical & Heavy Metals	Annual	1	QHFSS

Heavy Metals Analysis

		Aluminium	Arsenic	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Nickel	Zinc
Unit		**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**
Limit of Reporting		**0.003**	**0.0001**	**0.0001**	**0.0001**	**0.001**	**0.005**	**0.0001**	**0.0001**	**0.0001**	**0.001**
Health Limit		**N/A**	**0.01**	**0.002**	**0.05**	**2**	**N/A**	**0.01**	**0.5**	**0.02**	**N/A**
Aesthetic Limit		**0.2**	**N/A**	**N/A**	**N/A**	**1**	**0.3**	**N/A**	**0.1**	**N/A**	**3**
Amby	Bore 1	0.007	<0.0002	<0.0002	<0.0002	<0.002	0.12	<0.0002	0.028	<0.0002	0.003
Injune	Bore 2	<0.003	<0.0001	<0.0001	<0.0001	<0.001	0.25	0.0002	0.0089	<0.0001	0.015
	Bore 3	<0.003	<0.0001	<0.0001	<0.0001	<0.001	1.3	<0.0001	0.029	<0.0001	0.006
	Bore 4	<0.003	<0.0001	<0.0001	<0.0001	0.001	0.17	0.0003	0.0066	<0.0001	0.003
Jackson	Bore 1	0.003	<0.0001	<0.0001	<0.0001	0.002	0.17	0.0002	0.0064	<0.0001	0.005
Mitchell	Bore 1	0.04	0.0014	<0.0001	<0.0001	0.001	0.008	<0.0001	0.0027	<0.0001	<0.001
	Bore 2	0.04	0.001	<0.0001	<0.0001	0.001	0.008	<0.0001	0.0024	0.0002	0.001
Muckadilla	Bore 1	0.013	0.0001	<0.0001	<0.0001	<0.001	0.027	<0.0001	0.0085	<0.0001	<0.001
Mungallala	Bore 1	<0.003	<0.0001	<0.0001	<0.0001	<0.001	0.73	<0.0001	0.074	<0.0001	0.002
Roma	Bore 2	0.007	0.0001	<0.0001	0.0002	0.002	0.32	0.001	0.011	0.0001	0.078
	Bore 3	0.032	0.0001	<0.0001	0.002	0.055	1.7	0.0031	0.013	0.0005	0.71
	Bore 7	0.009	0.0003	<0.0001	0.0001	0.02	0.44	0.0006	0.017	0.0003	0.022
	Bore 9	<0.003	<0.0001	<0.0001	<0.0002	0.003	1.6	0.0007	0.11	0.0004	0.013
	Bore 11	<0.003	0.0001	<0.0001	0.0001	0.002	0.18	0.0001	0.0084	<0.0001	0.001
	Bore 12	0.007	0.0002	<0.0001	<0.0001	0.082	0.02	0.0016	0.0046	<0.0001	0.013
	Bore 13	0.006	0.0001	<0.0001	0.0003	0.042	4.4	0.0029	0.076	0.0005	0.006
	Bore 14	<0.003	0.0002	<0.0001	0.0001	0.007	0.29	0.0009	0.014	<0.0001	0.021
	Bore 15	0.008	0.0001	<0.0001	<0.0001	<0.001	0.015	<0.0001	0.0065	<0.0001	0.002
	Bore 17	0.008	0.0002	<0.0001	<0.0001	0.003	0.024	0.0001	0.0081	<0.0001	0.002
	Bore 18	0.007	0.0002	<0.0001	<0.0001	0.038	0.02	0.0022	0.0077	<0.0001	0.004
	Bore 19	0.008	<0.0001	<0.0001	<0.0001	0.002	0.011	0.0003	0.0078	<0.0001	0.001
	Bore 20	0.17	0.0008	<0.0001	0.0011	<0.001	8.0	0.0025	0.22	0.0023	5.4

Surat	Treated	0.008	0.0005	<0.0001	0.0001	0.002	0.01	0.0002	0.0033	0.0008	0.01
Wallumbilla	Bore 1	<0.003	<0.0001	<0.0001	<0.0001	0.005	0.024	0.0002	0.0066	<0.0001	0.004
Yuleba	Bore 1	0.006	0.0002	<0.0001	<0.0001	0.004	0.041	0.0004	0.0033	<0.0001	0.006

Standard Chemical Analysis – Mitchell Standpipe Bore

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

CLIENT : (HMARAN)
Maranoa Regional Council
PO Box 42
MITCHELL QLD 4465

ATTN: Carolina Avancena

Laboratory Reference : SSP0069475
Client Order No. : SEVILLE_M
Date Received : 01-Apr-2020
Laboratory Number : 20NA2921
Batch No : 355-34

Client Reference : **MIT1**
Date Sampled : **30-Mar-2020**
Sample Source : **Bore**
Sample Point : **Mitchell Bore**
Further Information: : **Stand Pipe bore**

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment : **Untreated**

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	**604**		
18226	pH	at 22°C	**8.99**		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	**2.8**		200
18209	Temporary Hardness*	mg $CaCO_3$/L	**2.8**		
18208	Alkalinity	mg $CaCO_3$/L	**203**		
18209	Residual Alkalinity*	meq/L	**4.0**		
18195	Silica	mg/L	**29**		80
18209	Total Dissolved Ions*	mg/L	**445**		
18209	Total Dissolved Solids*	mg/L	**366**		600
18206	True Colour	Hazen	**<1**		15
18212	Turbidity	NTU	**<1**		5
18209	pH Sat.* (calc. for $CaCO_3$)		**9.1**		
18209	Saturation Index*		**-0.1**		
18209	Mole Ratio*		**0.8**		
18209	Sodium Absorpt. Ratio*		**35**		
18209	Figure of Merit Ratio*		**0.0**		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	**140**		180
18195	Potassium	mg/L	**0.48**		
18195	Calcium	mg/L	**1.1**		
18195	Magnesium	mg/L	**< 0.03**		
18209	Hydrogen*	mg/L	**0.0**		
	ANIONS				
18209	Bicarbonate*	mg/L	**213**		
18209	Carbonate*	mg/L	**17**		
18209	Hydroxide*	mg/L	**0.2**		
35047	Chloride	mg/L	**58**		250
35047	Fluoride	mg/L	**0.24**	1.5	
35047	Nitrate	mg/L	**< 0.05**	50	
35047	Sulphate	mg/L	**18**	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	**< 0.01**		0.3
18195	Manganese	mg/L	**0.002**	0.5	0.1
18195	Zinc	mg/L	**< 0.06**		3
18195	Aluminium	mg/L	**0.04**		0.2
18195	Boron	mg/L	**0.05**	4	
18195	Copper	mg/L	**< 0.003**	2	1

Notes: * parameter is derived from calculation.
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
'-' not determined

Lab use Only: TE 1083.00 TC 6.03 TA 6.08 Imb 0.05 A I/C 0.56

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
The water does not comply with the Australian Drinking Water Guidelines 2011 for pH.

NATA Accredited Laboratory 41 Accredited for compliance with ISO/IEC 17025 - Testing

Mathew Pilial
Laboratory Technician, Inorganic Chemistry
01-May-2020

20NA2921

Standard Chemical Analysis – Mitchell Tower Bore

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

CLIENT : (HMARAN)
Maranoa Regional Council
PO Box 42
MITCHELL QLD 4465

ATTN: Carolina Avancena

Laboratory Reference	: SSP0069475
Client Order No.	: SEVILLE_M
Date Received	: 01-Apr-2020
Laboratory Number	: 20NA2922
Batch No	: 355-35

Client Reference	: **MIT2**
Date Sampled	: **30-Mar-2020**
Sample Source	: **Bore**
Sample Point	: **Mitchell Bore**
Further Information:	: **Tower bore**

Submitting Authority	: **Maranoa Regional Council**
Reason for Analysis	: **Compliance**
Water Treatment	: **Untreated**

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	**589**		
18226	pH	at 22°C	**9.05**		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	**2.7**		200
18209	Temporary Hardness*	mg $CaCO_3$/L	**2.7**		
18208	Alkalinity	mg $CaCO_3$/L	**212**		
18209	Residual Alkalinity*	meq/L	**4.2**		
18195	Silica	mg/L	**29**		80
18209	Total Dissolved Ions*	mg/L	**447**		
18209	Total Dissolved Solids*	mg/L	**360**		600
18206	True Colour	Hazen	**<1**		15
18212	Turbidity	NTU	**<1**		5
18209	pH Sat.* (calc. for $CaCO_3$)		**9.1**		
18209	Saturation Index*		**0.0**		
18209	Mole Ratio*		**0.7**		
18209	Sodium Absorpt. Ratio*		**35**		
18209	Figure of Merit Ratio*		**0.0**		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	**140**		180
18195	Potassium	mg/L	**0.41**		
18195	Calcium	mg/L	**1.1**		
18195	Magnesium	mg/L	**< 0.03**		
18209	Hydrogen*	mg/L	**0.0**		
	ANIONS				
18209	Bicarbonate*	mg/L	**227**		
18209	Carbonate*	mg/L	**15**		
18209	Hydroxide*	mg/L	**0.2**		
35047	Chloride	mg/L	**50**		250
35047	Fluoride	mg/L	**0.20**	1.5	
35047	Nitrate	mg/L	**< 0.05**	50	
35047	Sulphate	mg/L	**18**	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	**< 0.01**		0.3
18195	Manganese	mg/L	**0.002**	0.5	0.1
18195	Zinc	mg/L	**< 0.06**		3
18195	Aluminium	mg/L	**0.03**		0.2
18195	Boron	mg/L	**0.05**	4	
18195	Copper	mg/L	**< 0.003**	2	1

Notes: * parameter is derived from calculation.
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
'-' not determined

Lab use Only: TE 1065.00 TC 5.94 TA 6.02 Imb 0.09 A I/C 0.56

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
The water does not comply with the Australian Drinking Water Guidelines 2011 for pH.

NATA Accredited Laboratory 41 Accredited for compliance with ISO/IEC 17025 - Testing

20NA2922

Mathew Pillai
Laboratory Technician, Inorganic Chemistry
01-May-2020

Enquiries Mathew Pillai 39 Kessels Road PO Box 594 Phone (+61) 1800 900 FSS (377)

Standard Chemical Analysis – Amby Bore 1

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

CLIENT : (HMARAN)
Maranoa Regional Council
PO Box 42
MITCHELL QLD 4465

ATTN: Carolina Avancena

Laboratory Reference	: SSP0069475
Client Order No.	: SEVILLE_M
Date Received	: 01-Apr-2020
Laboratory Number	: 20NA2926
Batch No	: 355-39

Client Reference	: **AMB1**
Date Sampled	: **30-Mar-2020**
Sample Source	: **Bore**
Sample Point	: **Amby Bore**
Further Information:	:

Submitting Authority	: **Maranoa Regional Council**
Reason for Analysis	: **Compliance**
Water Treatment	: **Untreated**

Method		Units	Result	Guidelines ** Health	Aesthetic
18320	Conductivity @ 25°C	µs/cm	**2290**		
18226	pH	at 22°C	**8.22**		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	**38**		200
18209	Temporary Hardness*	mg $CaCO_3$/L	**38**		
18208	Alkalinity	mg $CaCO_3$/L	**145**		
18209	Residual Alkalinity*	meq/L	**2.1**		
18195	Silica	mg/L	**17**		80
18209	Total Dissolved Ions*	mg/L	**1390**		
18209	Total Dissolved Solids*	mg/L	**1320**		600
18206	True Colour	Hazen	**<1**		15
18212	Turbidity	NTU	**<1**		5
18209	pH Sat.* (calc. for $CaCO_3$)		**8.2**		
18209	Saturation Index*		**0.1**		
18209	Mole Ratio*		**2.6**		
18209	Sodium Absorpt. Ratio*		**34**		
18209	Figure of Merit Ratio*		**0.0**		

Method		Units	Result	Guidelines ** Health	Aesthetic
	CATIONS				
18195	Sodium	mg/L	**470**		180
18195	Potassium	mg/L	**2.0**		
18195	Calcium	mg/L	**15**		
18195	Magnesium	mg/L	**0.18**		
18209	Hydrogen*	mg/L	**0.0**		
	ANIONS				
18209	Bicarbonate*	mg/L	**173**		
18209	Carbonate*	mg/L	**1.8**		
18209	Hydroxide*	mg/L	**0.0**		
35047	Chloride	mg/L	**470**		250
35047	Fluoride	mg/L	**0.10**	1.5	
35047	Nitrate	mg/L	**< 0.25**	50	
35047	Sulphate	mg/L	**260**	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	**0.04**		0.3
18195	Manganese	mg/L	**0.025**	0.5	0.1
18195	Zinc	mg/L	**< 0.06**		3
18195	Aluminium	mg/L	**< 0.03**		0.2
18195	Boron	mg/L	**0.15**	4	
18195	Copper	mg/L	**< 0.003**	2	1

Notes: * parameter is derived from calculation.
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
'-' not determined

Lab use Only: TE 9629.00 TC 21.42 TA 21.41 Imb 0.01 A I/C 0.57

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
The water does not comply with the Australian Drinking Water Guidelines 2011 for Chloride, Sodium, Sulphate and Total Dissolved Solids.

NATA Accredited Laboratory 41 Accredited for compliance with ISO/IEC 17025 - Testing

20NA2926

Mathew Pillai
Laboratory Technician, Inorganic Chemistry
01-May-2020

Standard Chemical Analysis – Mungallala Bore 1

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

CLIENT : (HMARAN)
Maranoa Regional Council
PO Box 42
MITCHELL QLD 4465

ATTN: Carolina Avancena

Laboratory Reference : SSP0069475
Client Order No. : SEVILLE_M
Date Received : 01-Apr-2020
Laboratory Number : 20NA2924
Batch No : 355-37

Client Reference : **MUN1**
Date Sampled : **30-Mar-2020**
Sample Source : **Bore**
Sample Point : **Mungallalla Bore**
Further Information :

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment : **Untreated**

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	**705**		
18226	pH	at 22°C	**7.20**		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	**95**		200
18209	Temporary Hardness*	mg $CaCO_3$/L	**95**		
18208	Alkalinity	mg $CaCO_3$/L	**116**		
18209	Residual Alkalinity*	meq/L	**0.4**		
18195	Silica	mg/L	**23**		80
18209	Total Dissolved Ions*	mg/L	**467**		
18209	Total Dissolved Solids*	mg/L	**418**		600
18206	True Colour	Hazen	**<1**		15
18212	Turbidity	NTU	**1**		5
18209	pH Sat.* (calc. for $CaCO_3$)		**7.9**		
18209	Saturation Index*		**-0.7**		
18209	Mole Ratio*		**3.1**		
18209	Sodium Absorpt. Ratio*		**4.7**		
18209	Figure of Merit Ratio*		**0.4**		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	**110**		180
18195	Potassium	mg/L	**6.4**		
18195	Calcium	mg/L	**32**		
18195	Magnesium	mg/L	**4.1**		
18209	Hydrogen*	mg/L	**0.0**		
	ANIONS				
18209	Bicarbonate*	mg/L	**142**		
18209	Carbonate*	mg/L	**0.1**		
18209	Hydroxide*	mg/L	**0.0**		
35047	Chloride	mg/L	**92**		250
35047	Fluoride	mg/L	**0.11**	1.5	
35047	Nitrate	mg/L	**< 0.05**	50	
35047	Sulphate	mg/L	**85**	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	**< 0.01**		0.3
18195	Manganese	mg/L	**0.072**	0.5	0.1
18195	Zinc	mg/L	**< 0.06**		3
18195	Aluminium	mg/L	**< 0.03**		0.2
18195	Boron	mg/L	**0.07**	4	
18195	Copper	mg/L	**< 0.003**	2	1

Notes: * parameter is derived from calculation.
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
'-' not determined

Lab use Only: TE 1200.00 TC 6.68 TA 6.70 Imb 0.01 A I/C 0.56

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
The water complies with Australian Drinking Water Guidelines 2011 for the parameters tested.

NATA Accredited Laboratory 18

20NA2924

Mathew Pillai
Laboratory Technician, Inorganic Chemistry
01-May-2020

Standard Chemical Analysis – Injune Bore 2

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

CLIENT : (HMARAN)
Maranoa Regional Council
PO Box 42
MITCHELL QLD 4465

ATTN: Carolina Avancena

Laboratory Reference : SSP0069011
Client Order No. : Seville_M
Date Received : 04-Mar-2020
Laboratory Number : 20NA2027
Batch No : 347-05

Client Reference : **INJ1**
Date Sampled : **02-Mar-2020**
Sample Source : **Bore**
Sample Point : **Injune Bore 2**
Further Information: :

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment : **Untreated**

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	338		
18226	pH	at 21°C	7.59		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	6.0		200
18209	Temporary Hardness*	mg $CaCO_3$/L	6.0		
18208	Alkalinity	mg $CaCO_3$/L	152		
18209	Residual Alkalinity*	meq/L	2.9		
18195	Silica	mg/L	15		80
18209	Total Dissolved Ions*	mg/L	292		
18209	Total Dissolved Solids*	mg/L	213		600
18206	True Colour	Hazen	2		15
18212	Turbidity	NTU	<1		5
18209	pH Sat.* (calc. for $CaCO_3$)		8.9		
18209	Saturation Index*		-1.3		
18209	Mole Ratio*		1.8		
18209	Sodium Absorpt. Ratio*		15		
18209	Figure of Merit Ratio*		0.0		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	82		180
18195	Potassium	mg/L	0.86		
18195	Calcium	mg/L	2.4		
18195	Magnesium	mg/L	< 0.03		
18209	Hydrogen*	mg/L	0.0		
	ANIONS				
18209	Bicarbonate*	mg/L	184		
18209	Carbonate*	mg/L	0.4		
18209	Hydroxide*	mg/L	0.0		
35047	Chloride	mg/L	15		250
35047	Fluoride	mg/L	0.10	1.5	
35047	Nitrate	mg/L	< 0.05	50	
35047	Sulphate	mg/L	5.9	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	0.16		0.3
18195	Manganese	mg/L	0.002	0.5	0.1
18195	Zinc	mg/L	< 0.06		3
18195	Aluminium	mg/L	< 0.03		0.2
18195	Boron	mg/L	< 0.02	4	
18195	Copper	mg/L	< 0.003	2	1

Notes: * parameter is derived from calculation.
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
'-' not determined

Lab use Only: TE 642.00 TC 3.73 TA 3.59 Imb 0.14 A I/C 0.59

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
The water complies with Australian Drinking Water Guidelines 2011 for the parameters tested.

NATA Accredited Laboratory 41 Accredited for compliance with ISO/IEC 17025 - Testing

20NA2027

N. Goldthorpe

Nigel Goldthorpe
Senior Laboratory Technician, Inorganic Chemistry
08-Apr-2020

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Standard Chemical Analysis – Injune Bore 3

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

CLIENT : (HMARAN)
Maranoa Regional Council
PO Box 42
MITCHELL QLD 4465

ATTN: Carolina Avancena

Laboratory Reference	: SSP0069011
Client Order No.	: Seville_M
Date Received	: 04-Mar-2020
Laboratory Number	: 20NA2028
Batch No	: 347-06

Client Reference	: **INJ2**
Date Sampled	: **02-Mar-2020**
Sample Source	: **Bore**
Sample Point	: **Injune Bore 3**
Further Information:	:

Submitting Authority	: **Maranoa Regional Council**
Reason for Analysis	: **Compliance**
Water Treatment	: **Untreated**

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	**342**		
18226	pH	at 21°C	**7.44**		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	**8.8**		200
18209	Temporary Hardness*	mg $CaCO_3$/L	**8.8**		
18208	Alkalinity	mg $CaCO_3$/L	**151**		
18209	Residual Alkalinity*	meq/L	**2.8**		
18195	Silica	mg/L	**15**		80
18209	Total Dissolved Ions*	mg/L	**293**		
18209	Total Dissolved Solids*	mg/L	**215**		600
18206	True Colour	Hazen	**18**		15
18212	Turbidity	NTU	**1**		5
18209	pH Sat.* (calc. for $CaCO_3$)		**8.8**		
18209	Saturation Index*		**-1.3**		
18209	Mole Ratio*		**2.0**		
18209	Sodium Absorpt. Ratio*		**12**		
18209	Figure of Merit Ratio*		**0.0**		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	**82**		180
18195	Potassium	mg/L	**1.2**		
18195	Calcium	mg/L	**3.5**		
18195	Magnesium	mg/L	**0.04**		
18209	Hydrogen*	mg/L	**0.0**		
	ANIONS				
18209	Bicarbonate*	mg/L	**184**		
18209	Carbonate*	mg/L	**0.3**		
18209	Hydroxide*	mg/L	**0.0**		
35047	Chloride	mg/L	**17**		250
35047	Fluoride	mg/L	**0.09**	1.5	
35047	Nitrate	mg/L	**< 0.05**	50	
35047	Sulphate	mg/L	**6.0**	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	**0.80**		0.3
18195	Manganese	mg/L	**0.024**	0.5	0.1
18195	Zinc	mg/L	**< 0.06**		3
18195	Aluminium	mg/L	**< 0.03**		0.2
18195	Boron	mg/L	**< 0.02**	4	
18195	Copper	mg/L	**< 0.003**	2	1

Notes: * parameter is derived from calculation.
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
V not determined

Lab use Only: TE 666.00 TC 3.76 TA 3.63 Imb 0.13 A I/C 0.58

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
The water does not comply with the Australian Drinking Water Guidelines 2011 for Colour and Iron.

NATA Accredited Laboratory 41 Accredited for compliance with ISO/IEC 17025 - Testing

20NA2028

N. Goldthorpe

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08-Apr-2020

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Standard Chemical Analysis – Injune Bore 4

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

CLIENT : (HMARAN)
Maranoa Regional Council
PO Box 42
MITCHELL QLD 4465

ATTN: Carolina Avancena

Laboratory Reference	: SSP0069011
Client Order No.	: Seville_M
Date Received	: 04-Mar-2020
Laboratory Number	: 20NA2029
Batch No	: 347-07

Client Reference	: **INJ3**
Date Sampled	: **02-Mar-2020**
Sample Source	: **Bore**
Sample Point	: **Injune Bore 4**
Further Information:	:

Submitting Authority	: **Maranoa Regional Council**
Reason for Analysis	: **Compliance**
Water Treatment	: **Untreated**

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	**339**		
18226	pH	at 21°C	**7.51**		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	**7.1**		200
18209	Temporary Hardness*	mg $CaCO_3$/L	**7.1**		
18208	Alkalinity	mg $CaCO_3$/L	**153**		
18209	Residual Alkalinity*	meq/L	**2.9**		
18195	Silica	mg/L	**16**		80
18209	Total Dissolved Ions*	mg/L	**294**		
18209	Total Dissolved Solids*	mg/L	**215**		600
18206	True Colour	Hazen	**3**		15
18212	Turbidity	NTU	**1**		5
18209	pH Sat.* (calc. for $CaCO_3$)		**8.8**		
18209	Saturation Index*		**-1.3**		
18209	Mole Ratio*		**1.9**		
18209	Sodium Absorpt. Ratio*		**13**		
18209	Figure of Merit Ratio*		**0.0**		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	**83**		180
18195	Potassium	mg/L	**0.90**		
18195	Calcium	mg/L	**2.8**		
18195	Magnesium	mg/L	**0.04**		
18209	Hydrogen*	mg/L	**0.0**		
	ANIONS				
18209	Bicarbonate*	mg/L	**185**		
18209	Carbonate*	mg/L	**0.3**		
18209	Hydroxide*	mg/L	**0.0**		
35047	Chloride	mg/L	**16**		250
35047	Fluoride	mg/L	**0.09**	1.5	
35047	Nitrate	mg/L	**< 0.05**	50	
35047	Sulphate	mg/L	**6.2**	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	**0.16**		0.3
18195	Manganese	mg/L	**0.004**	0.5	0.1
18195	Zinc	mg/L	**< 0.06**		3
18195	Aluminium	mg/L	**< 0.03**		0.2
18195	Boron	mg/L	**< 0.02**	4	
18195	Copper	mg/L	**< 0.003**	2	1

Notes: * parameter is derived from calculation.
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
'-' not determined

Lab use Only: TE 648.00 TC 3.77 TA 3.62 Imb 0.14 A I/C 0.59

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
The water complies with Australian Drinking Water Guidelines 2011 for the parameters tested.

NATA Accredited Laboratory 41 Accredited for compliance with ISO/IEC 17025 - Testing.

20NA2029

Nigel Goldthorpe
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08-Apr-2020

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Standard Chemical Analysis – Jackson Bore 1

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

CLIENT : (HMARAN)
Maranoa Regional Council
PO Box 42
MITCHELL QLD 4465

ATTN: Carolina Avancena

Laboratory Reference : SSP0069184
Client Order No. : 2652
Date Received : 13-Mar-2020
Laboratory Number : 20NA2320
Batch No : 349-10

Client Reference : **JAC1**
Date Sampled : **11-Mar-2020**
Sample Source : **Bore**
Sample Point : **Jackson Bore**
Further Information :

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment : **Untreated**

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	**1720**		
18226	pH	at 21°C	**8.46**		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	**5.1**		200
18209	Temporary Hardness*	mg $CaCO_3$/L	**5.1**		
18208	Alkalinity	mg $CaCO_3$/L	**570**		
18209	Residual Alkalinity*	meq/L	**11**		
18195	Silica	mg/L	**16**		80
18209	Total Dissolved Ions*	mg/L	**1310**		
18209	Total Dissolved Solids*	mg/L	**991**		600
18206	True Colour	Hazen	**5**		15
18212	Turbidity	NTU	**<1**		5
18209	pH Sat.* (calc. for $CaCO_3$)		**8.5**		
18209	Saturation Index*		**0.0**		
18209	Mole Ratio*		**1.4**		
18209	Sodium Absorpt. Ratio*		**78**		
18209	Figure of Merit Ratio*		**0.0**		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	**400**		180
18195	Potassium	mg/L	**1.2**		
18195	Calcium	mg/L	**1.8**		
18195	Magnesium	mg/L	**0.16**		
18209	Hydrogen*	mg/L	**0.0**		
	ANIONS				
18209	Bicarbonate*	mg/L	**667**		
18209	Carbonate*	mg/L	**14**		
18209	Hydroxide*	mg/L	**0.0**		
35047	Chloride	mg/L	**230**		250
35047	Fluoride	mg/L	**0.84**	1.5	
35047	Nitrate	mg/L	**< 0.1**	50	
35047	Sulphate	mg/L	**< 0.4**	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	**0.14**		0.3
18195	Manganese	mg/L	**0.003**	0.5	0.1
18195	Zinc	mg/L	**< 0.06**		3
18195	Aluminium	mg/L	**< 0.03**		0.2
18195	Boron	mg/L	**1.2**	4	
18195	Copper	mg/L	**< 0.003**	2	1

Notes: * parameter is derived from calculation.
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
'-' not determined

Lab use Only: TE 2974.00 TC 17.71 TA 17.79 Imb 0.08 A I/C 0.57

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
The water does not comply with the Australian Drinking Water Guidelines 2011 for Sodium and Total Dissolved Solids.

NATA Accredited Laboratory 41 Accredited for compliance with ISO/IEC 17025 - Testing

20NA2320

Mathew Pillai
Laboratory Technician, Inorganic Chemistry
14-Apr-2020

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Standard Chemical Analysis – Muckadilla Bore 1

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

CLIENT : (HMARAN)
Maranoa Regional Council
PO Box 42
MITCHELL QLD 4465

ATTN: Carolina Avancena

Laboratory Reference	: SSP0069184
Client Order No.	: 2652
Date Received	: 13-Mar-2020
Laboratory Number	: 20NA2330
Batch No	: 349-20

Client Reference	: **MUC1**
Date Sampled	: **12-Mar-2020**
Sample Source	: **Bore**
Sample Point	: **Muckadilla Bore**
Further Information:	:

Submitting Authority	: **Maranoa Regional Council**
Reason for Analysis	: **Compliance**
Water Treatment	: **Untreated**

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	**699**		
18226	pH	at 21°C	**8.81**		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	**3.0**		200
18209	Temporary Hardness*	mg $CaCO_3$/L	**3.0**		
18208	Alkalinity	mg $CaCO_3$/L	**281**		
18209	Residual Alkalinity*	meq/L	**5.5**		
18195	Silica	mg/L	**22**		80
18209	Total Dissolved Ions*	mg/L	**564**		
18209	Total Dissolved Solids*	mg/L	**425**		600
18206	True Colour	Hazen	**<1**		15
18212	Turbidity	NTU	**<1**		5
18209	pH Sat.* (calc. for $CaCO_3$)		**9.0**		
18209	Saturation Index*		**-0.2**		
18209	Mole Ratio*		**0.8**		
18209	Sodium Absorpt. Ratio*		**42**		
18209	Figure of Merit Ratio*		**0.0**		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	**170**		180
18195	Potassium	mg/L	**0.83**		
18195	Calcium	mg/L	**1.2**		
18195	Magnesium	mg/L	**< 0.03**		
18209	Hydrogen*	mg/L	**0.0**		
	ANIONS				
18209	Bicarbonate*	mg/L	**316**		
18209	Carbonate*	mg/L	**13**		
18209	Hydroxide*	mg/L	**0.1**		
35047	Chloride	mg/L	**45**		250
35047	Fluoride	mg/L	**0.13**	1.5	
35047	Nitrate	mg/L	**< 0.05**	50	
35047	Sulphate	mg/L	**20**	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	**0.03**		0.3
18195	Manganese	mg/L	**0.008**	0.5	0.1
18195	Zinc	mg/L	**< 0.06**		3
18195	Aluminium	mg/L	**< 0.03**		0.2
18195	Boron	mg/L	**0.06**	4	
18195	Copper	mg/L	**0.004**	2	1

Notes: * parameter is derived from calculation.
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
'-' not determined

Lab use Only: TE 1266.00 TC 7.34 TA 7.31 Imb 0.03 A I/C 0.58

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
The water does not comply with the Australian Drinking Water Guidelines 2011 for pH.

NATA Accredited Laboratory 41 Accredited for compliance with ISO/IEC 17025 - Testing

20NA2330

Mathew Pillai
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14-Apr-2020

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Standard Chemical Analysis – Roma Bore 2

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

CLIENT : (HMARAN)
Maranoa Regional Council
PO Box 42
MITCHELL QLD 4465

ATTN: Carolina Avancena

Laboratory Reference : SSP0069184
Client Order No. : 2652
Date Received : 13-Mar-2020
Laboratory Number : 20NA2332
Batch No : 349-22

Client Reference : **ROM1**
Date Sampled : **11-Mar-2020**
Sample Source : **Bore**
Sample Point : **Roma Bore 2**
Further Information: :

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment : **Untreated**

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	**988**		
18226	pH	at 21°C	**8.85**		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	**3.6**		200
18209	Temporary Hardness*	mg $CaCO_3$/L	**3.6**		
18208	Alkalinity	mg $CaCO_3$/L	**341**		
18209	Residual Alkalinity*	meq/L	**6.7**		
18195	Silica	mg/L	**17**		80
18209	Total Dissolved Ions*	mg/L	**755**		
18209	Total Dissolved Solids*	mg/L	**578**		600
18206	True Colour	Hazen	**<1**		15
18212	Turbidity	NTU	**<1**		5
18209	pH Sat.* (calc. for $CaCO_3$)		**8.8**		
18209	Saturation Index*		**0.0**		
18209	Mole Ratio*		**1.0**		
18209	Sodium Absorpt. Ratio*		**52**		
18209	Figure of Merit Ratio*		**0.0**		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	**230**		180
18195	Potassium	mg/L	**0.86**		
18195	Calcium	mg/L	**1.4**		
18195	Magnesium	mg/L	**< 0.03**		
18209	Hydrogen*	mg/L	**0.0**		
	ANIONS				
18209	Bicarbonate*	mg/L	**382**		
18209	Carbonate*	mg/L	**17**		
18209	Hydroxide*	mg/L	**0.1**		
35047	Chloride	mg/L	**91**		250
35047	Fluoride	mg/L	**0.46**	1.5	
35047	Nitrate	mg/L	**< 0.05**	50	
35047	Sulphate	mg/L	**34**	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	**< 0.01**		0.3
18195	Manganese	mg/L	**0.005**	0.5	0.1
18195	Zinc	mg/L	**< 0.06**		3
18195	Aluminium	mg/L	**< 0.03**		0.2
18195	Boron	mg/L	**0.22**	4	
18195	Copper	mg/L	**< 0.003**	2	1

Notes: * parameter is derived from calculation.
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
- not determined

Lab use Only: TE 1730.00 TC 10.06 TA 10.11 Imb 0.06 A I/C 0.57

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
The water does not comply with the Australian Drinking Water Guidelines 2011 for Sodium and pH.

NATA Accredited Laboratory 41 Accredited for compliance with ISO/IEC 17025 - Testing

20NA2332

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14-Apr-2020

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Standard Chemical Analysis – Roma Bore 3

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

CLIENT : (HMARAN)
Maranoa Regional Council
PO Box 42
MITCHELL QLD 4465

ATTN: Carolina Avancena

Laboratory Reference : SSP0070190
Client Order No. : 2652
Date Received : 29-May-2020
Laboratory Number : 20NA4566
Batch No : 372-11

Client Reference : **ROM_13**
Date Sampled : **27-May-2020**
Sample Source : **Bore**
Sample Point : **Roma Bore 3**
Further Information: :

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment : **Untreated**

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	**987**		
18226	pH	at 21°C	**8.88**		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	**3.2**		200
18209	Temporary Hardness*	mg $CaCO_3$/L	**3.2**		
18208	Alkalinity	mg $CaCO_3$/L	**442**		
18209	Residual Alkalinity*	meq/L	**8.8**		
18195	Silica	mg/L	**16**		80
18209	Total Dissolved Ions*	mg/L	**830**		
18209	Total Dissolved Solids*	mg/L	**590**		600
18206	True Colour	Hazen	**2**		15
18212	Turbidity	NTU	**1**		5
18209	pH Sat.* (calc. for $CaCO_3$)		**8.8**		
18209	Saturation Index*		**0.1**		
18209	Mole Ratio*		**0.8**		
18209	Sodium Absorpt. Ratio*		**59**		
18209	Figure of Merit Ratio*		**0.0**		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	**240**		180
18195	Potassium	mg/L	**0.61**		
18195	Calcium	mg/L	**1.2**		
18195	Magnesium	mg/L	**0.05**		
18209	Hydrogen*	mg/L	**0.0**		
	ANIONS				
18209	Bicarbonate*	mg/L	**503**		
18209	Carbonate*	mg/L	**18**		
18209	Hydroxide*	mg/L	**0.1**		
35047	Chloride	mg/L	**62**		250
35047	Fluoride	mg/L	**2.2**	1.5	
35047	Nitrate	mg/L	**< 0.05**	50	
35047	Sulphate	mg/L	**< 0.2**	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	**0.03**		0.3
18195	Manganese	mg/L	**0.004**	0.5	0.1
18195	Zinc	mg/L	**< 0.06**		3
18195	Aluminium	mg/L	**< 0.03**		0.2
18195	Boron	mg/L	**0.09**	4	
18195	Copper	mg/L	**0.007**	2	1

Notes: * parameter is derived from calculation.
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
'-' not determined

Lab use Only: TE 1788.00 TC 10.65 TA 10.70 Imb 0.05 A I/C 0.58

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
The water does not comply with the Australian Drinking Water Guidelines 2011 for Fluoride, Sodium and pH.

NATA Accredited Laboratory 41 Accredited for compliance with ISO/IEC 17025 - Testing.

20NA4566

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25-Jun-2020

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Standard Chemical Analysis – Roma Bore 7

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

CLIENT : (HMARAN)
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PO Box 42
MITCHELL QLD 4465

ATTN: Carolina Avancena

Laboratory Reference : SSP0070190
Client Order No. : 2652
Date Received : 29-May-2020
Laboratory Number : 20NA4567
Batch No : 372-12

Client Reference : **ROM_14**
Date Sampled : **27-May-2020**
Sample Source : **Bore**
Sample Point : **Roma Bore 7**
Further Information :

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment : **Untreated**

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	**1010**		
18226	pH	at 21°C	**8.59**		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	**13**		200
18209	Temporary Hardness*	mg $CaCO_3$/L	**13**		
18208	Alkalinity	mg $CaCO_3$/L	**305**		
18209	Residual Alkalinity*	meq/L	**5.8**		
18195	Silica	mg/L	**19**		80
18209	Total Dissolved Ions*	mg/L	**763**		
18209	Total Dissolved Solids*	mg/L	**602**		600
18206	True Colour	Hazen	**7**		15
18212	Turbidity	NTU	**1**		5
18209	pH Sat.* (calc. for $CaCO_3$)		**8.4**		
18209	Saturation Index*		**0.2**		
18209	Mole Ratio*		**1.2**		
18209	Sodium Absorpt. Ratio*		**28**		
18209	Figure of Merit Ratio*		**0.0**		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	**230**		180
18195	Potassium	mg/L	**0.91**		
18195	Calcium	mg/L	**4.3**		
18195	Magnesium	mg/L	**0.44**		
18209	Hydrogen*	mg/L	**0.0**		
	ANIONS				
18209	Bicarbonate*	mg/L	**353**		
18209	Carbonate*	mg/L	**9.0**		
18209	Hydroxide*	mg/L	**0.1**		
35047	Chloride	mg/L	**94**		250
35047	Fluoride	mg/L	**0.18**	1.5	
35047	Nitrate	mg/L	**0.11**	50	
35047	Sulphate	mg/L	**71**	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	**0.23**		0.3
18195	Manganese	mg/L	**0.009**	0.5	0.1
18195	Zinc	mg/L	**< 0.06**		3
18195	Aluminium	mg/L	**< 0.03**		0.2
18195	Boron	mg/L	**0.13**	4	
18195	Copper	mg/L	**0.015**	2	1

Notes: * parameter is derived from calculation.
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
\- not determined

Lab use Only: TE 1767.00 TC 10.23 TA 10.25 Imb 0.01 A I/C 0.58

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
The water does not comply with the Australian Drinking Water Guidelines 2011 for Sodium and pH.

NATA Accredited Laboratory 61 Accredited for compliance with ISO/IEC 17025 - Testing

20NA4567

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25-Jun-2020

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Standard Chemical Analysis – Roma Bore 9

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

CLIENT : (HMARAN)
Maranoa Regional Council
PO Box 42
MITCHELL QLD 4465

ATTN: Carolina Avancena

Laboratory Reference : SSP0069184
Client Order No. : 2652
Date Received : 13-Mar-2020
Laboratory Number : 20NA2333
Batch No : 349-23

Client Reference : **ROM2**
Date Sampled : **11-Mar-2020**
Sample Source : **Bore**
Sample Point : **Roma Bore 9**
Further Information: :

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment : **Untreated**

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	**1200**		
18226	pH	at 21°C	**8.96**		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	**5.5**		200
18209	Temporary Hardness*	mg $CaCO_3$/L	**5.5**		
18208	Alkalinity	mg $CaCO_3$/L	**324**		
18209	Residual Alkalinity*	meq/L	**6.4**		
18195	Silica	mg/L	**18**		80
18209	Total Dissolved Ions*	mg/L	**864**		
18209	Total Dissolved Solids*	mg/L	**703**		600
18206	True Colour	Hazen	**1**		15
18212	Turbidity	NTU	**2**		5
18209	pH Sat.* (calc. for $CaCO_3$)		**8.7**		
18209	Saturation Index*		**0.2**		
18209	Mole Ratio*		**1.0**		
18209	Sodium Absorpt. Ratio*		**50**		
18209	Figure of Merit Ratio*		**0.0**		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	**270**		180
18195	Potassium	mg/L	**0.97**		
18195	Calcium	mg/L	**1.8**		
18195	Magnesium	mg/L	**0.23**		
18209	Hydrogen*	mg/L	**0.0**		
	ANIONS				
18209	Bicarbonate*	mg/L	**353**		
18209	Carbonate*	mg/L	**21**		
18209	Hydroxide*	mg/L	**0.1**		
35047	Chloride	mg/L	**130**		250
35047	Fluoride	mg/L	**0.24**	1.5	
35047	Nitrate	mg/L	**< 0.05**	50	
35047	Sulphate	mg/L	**82**	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	**0.01**		0.3
18195	Manganese	mg/L	**0.007**	0.5	0.1
18195	Zinc	mg/L	**0.17**		3
18195	Aluminium	mg/L	**< 0.03**		0.2
18195	Boron	mg/L	**0.24**	4	
18195	Copper	mg/L	**< 0.003**	2	1

Notes: * parameter is derived from calculation.
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
'-' not determined

Lab use Only: TE 2062.00 TC 11.07 TA 11.96 Imb 0.01 A I/C 0.57

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
The water does not comply with the Australian Drinking Water Guidelines 2011 for Sodium, Total Dissolved Solids and pH.

NATA Accredited Laboratory 45 Accredited for compliance with ISO/IEC 17025 - Testing.

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14-Apr-2020

20NA2333

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Standard Chemical Analysis – Roma Bore 11

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

CLIENT : (HMARAN)
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PO Box 42
MITCHELL QLD 4465

ATTN: Carolina Avancena

Laboratory Reference : SSP0069184
Client Order No. : 2652
Date Received : 13-Mar-2020
Laboratory Number : 20NA2334
Batch No : 349-24

Client Reference : **ROM3**
Date Sampled : **11-Mar-2020**
Sample Source : **Bore**
Sample Point : **Roma Bore 11**
Further Information: :

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment : **Untreated**

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	**1860**		
18226	pH	at 21°C	**8.67**		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	**39**		200
18209	Temporary Hardness*	mg $CaCO_3$/L	**39**		
18208	Alkalinity	mg $CaCO_3$/L	**341**		
18209	Residual Alkalinity*	meq/L	**6.0**		
18195	Silica	mg/L	**17**		80
18209	Total Dissolved Ions*	mg/L	**1290**		
18209	Total Dissolved Solids*	mg/L	**1110**		600
18206	True Colour	Hazen	**<1**		15
18212	Turbidity	NTU	**2**		5
18209	pH Sat.* (calc. for $CaCO_3$)		**7.9**		
18209	Saturation Index*		**0.8**		
18209	Mole Ratio*		**1.5**		
18209	Sodium Absorpt. Ratio*		**28**		
18209	Figure of Merit Ratio*		**0.0**		

Notes: * parameter is derived from calculation.
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
'-' not determined

Lab use Only: TE 3140.00 TC 18.43 TA 18.38 Imb 0.06 A I/C 0.59

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	**410**		180
18195	Potassium	mg/L	**1.7**		
18195	Calcium	mg/L	**12**		
18195	Magnesium	mg/L	**2.1**		
18209	Hydrogen*	mg/L	**0.0**		
	ANIONS				
18209	Bicarbonate*	mg/L	**391**		
18209	Carbonate*	mg/L	**12**		
18209	Hydroxide*	mg/L	**0.1**		
35047	Chloride	mg/L	**250**		250
35047	Fluoride	mg/L	**0.29**	1.5	
35047	Nitrate	mg/L	**< 0.15**	50	
35047	Sulphate	mg/L	**220**	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	**0.05**		0.3
18195	Manganese	mg/L	**0.012**	0.5	0.1
18195	Zinc	mg/L	**< 0.06**		3
18195	Aluminium	mg/L	**< 0.03**		0.2
18195	Boron	mg/L	**0.44**	4	
18195	Copper	mg/L	**< 0.003**	2	1

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
The water does not comply with the Australian Drinking Water Guidelines 2011 for Sodium, Total Dissolved Solids and pH.

NATA Accredited Laboratory 45 Accredited for compliance with ISO/IEC 17025 - Testing

20NA2334

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14-Apr-2020

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Standard Chemical Analysis – Roma Bore 12

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

CLIENT : (HMARAN)
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PO Box 42
MITCHELL QLD 4465

ATTN: Carolina Avancena

Laboratory Reference : SSP0069184
Client Order No. : 2652
Date Received : 13-Mar-2020
Laboratory Number : 20NA2335
Batch No : 349-25

Client Reference : **ROM4**
Date Sampled : **11-Mar-2020**
Sample Source : **Bore**
Sample Point : **Roma Bore 12**
Further Information: :

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment : **Untreated**

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	**977**		
18226	pH	at 21°C	**8.87**		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	**5.0**		200
18209	Temporary Hardness*	mg $CaCO_3$/L	**5.0**		
18208	Alkalinity	mg $CaCO_3$/L	**335**		
18209	Residual Alkalinity*	meq/L	**6.6**		
18195	Silica	mg/L	**19**		80
18209	Total Dissolved Ions*	mg/L	**747**		
18209	Total Dissolved Solids*	mg/L	**579**		600
18206	True Colour	Hazen	**<1**		15
18212	Turbidity	NTU	**<1**		5
18209	pH Sat.* (calc. for $CaCO_3$)		**8.8**		
18209	Saturation Index*		**0.1**		
18209	Mole Ratio*		**0.9**		
18209	Sodium Absorpt. Ratio*		**44**		
18209	Figure of Merit Ratio*		**0.0**		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	**230**		180
18195	Potassium	mg/L	**0.82**		
18195	Calcium	mg/L	**1.6**		
18195	Magnesium	mg/L	**0.23**		
18209	Hydrogen*	mg/L	**0.0**		
	ANIONS				
18209	Bicarbonate*	mg/L	**367**		
18209	Carbonate*	mg/L	**20**		
18209	Hydroxide*	mg/L	**0.1**		
35047	Chloride	mg/L	**86**		250
35047	Fluoride	mg/L	**0.18**	1.5	
35047	Nitrate	mg/L	**< 0.05**	50	
35047	Sulphate	mg/L	**44**	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	**0.02**		0.3
18195	Manganese	mg/L	**0.005**	0.5	0.1
18195	Zinc	mg/L	**< 0.06**		3
18195	Aluminium	mg/L	**< 0.03**		0.2
18195	Boron	mg/L	**0.12**	4	
18195	Copper	mg/L	**0.093**	2	1

Notes: * parameter is derived from calculation.
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
'-' not determined

Lab use Only: TE 1720.00 TC 10.00 TA 10.04 Imb 0.04 A I/C 0.57

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
The water does not comply with the Australian Drinking Water Guidelines 2011 for Sodium and pH.

NATA Accredited Laboratory 41 Accredited for compliance with ISO/IEC 17025 - Testing.

20NA2335

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Standard Chemical Analysis – Roma Bore 13

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

CLIENT : (HMARAN)
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ATTN: Carolina Avancena

Laboratory Reference : SSP0069184
Client Order No. : 2652
Date Received : 13-Mar-2020
Laboratory Number : 20NA2324
Batch No : 349-14

Client Reference : **ROM5**
Date Sampled : **11-Mar-2020**
Sample Source : **Bore**
Sample Point : **Roma Bore 13**
Further Information: :

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment : **Untreated**

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	1470		
18226	pH	at 21°C	8.97		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	10		200
18209	Temporary Hardness*	mg $CaCO_3$/L	10		
18208	Alkalinity	mg $CaCO_3$/L	303		
18209	Residual Alkalinity*	meq/L	5.8		
18195	Silica	mg/L	7.8		80
18209	Total Dissolved Ions*	mg/L	986		
18209	Total Dissolved Solids*	mg/L	828		600
18206	True Colour	Hazen	3		15
18212	Turbidity	NTU	10		5
18209	pH Sat.* (calc. for $CaCO_3$)		8.6		
18209	Saturation Index*		0.4		
18209	Mole Ratio*		1.3		
18209	Sodium Absorpt. Ratio*		44		
18209	Figure of Merit Ratio*		0.0		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	320		180
18195	Potassium	mg/L	1.2		
18195	Calcium	mg/L	2.7		
18195	Magnesium	mg/L	0.83		
18209	Hydrogen*	mg/L	0.0		
	ANIONS				
18209	Bicarbonate*	mg/L	325		
18209	Carbonate*	mg/L	21		
18209	Hydroxide*	mg/L	0.2		
35047	Chloride	mg/L	230		250
35047	Fluoride	mg/L	0.25	1.5	
35047	Nitrate	mg/L	< 0.1	50	
35047	Sulphate	mg/L	83	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	0.05		0.3
18195	Manganese	mg/L	0.010	0.5	0.1
18195	Zinc	mg/L	< 0.06		3
18195	Aluminium	mg/L	< 0.03		0.2
18195	Boron	mg/L	0.26	4	
18195	Copper	mg/L	0.015	2	1

Notes: * parameter is derived from calculation.
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
\- not determined

Lab use Only: TE 2461.00 TC 14.24 TA 14.28 Imb 0.02 A I/C 0.56

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
The water does not comply with the Australian Drinking Water Guidelines 2011 for Sodium, Total Dissolved Solids, Turbidity and pH.

NATA Accredited Laboratory 41 Accredited for compliance with ISO/IEC 17025 - Testing.

20NA2324

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Standard Chemical Analysis – Roma Bore 14

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

CLIENT : (HMARAN)
Maranoa Regional Council
PO Box 42
MITCHELL QLD 4465

ATTN: Carolina Avancena

Laboratory Reference : SSP0069184
Client Order No. : 2652
Date Received : 13-Mar-2020
Laboratory Number : 20NA2325
Batch No : 349-15

Client Reference : **ROM6**
Date Sampled : **11-Mar-2020**
Sample Source : **Bore**
Sample Point : **Roma Bore 14**
Further Information: :

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment : **Untreated**

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	**1660**		
18226	pH	at 21°C	**8.61**		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	**9.9**		200
18209	Temporary Hardness*	mg $CaCO_3$/L	**9.9**		
18208	Alkalinity	mg $CaCO_3$/L	**513**		
18209	Residual Alkalinity*	meq/L	**10**		
18195	Silica	mg/L	**14**		80
18209	Total Dissolved Ions*	mg/L	**1260**		
18209	Total Dissolved Solids*	mg/L	**973**		600
18206	True Colour	Hazen	**2**		15
18212	Turbidity	NTU	**<1**		5
18209	pH Sat.* (calc. for $CaCO_3$)		**8.2**		
18209	Saturation Index*		**0.4**		
18209	Mole Ratio*		**1.3**		
18209	Sodium Absorpt. Ratio*		**54**		
18209	Figure of Merit Ratio*		**0.0**		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	**390**		180
18195	Potassium	mg/L	**1.3**		
18195	Calcium	mg/L	**3.8**		
18195	Magnesium	mg/L	**0.12**		
18209	Hydrogen*	mg/L	**0.0**		
	ANIONS				
18209	Bicarbonate*	mg/L	**591**		
18209	Carbonate*	mg/L	**17**		
18209	Hydroxide*	mg/L	**0.1**		
35047	Chloride	mg/L	**210**		250
35047	Fluoride	mg/L	**0.72**	1.5	
35047	Nitrate	mg/L	**< 0.1**	50	
35047	Sulphate	mg/L	**48**	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	**0.13**		0.3
18195	Manganese	mg/L	**0.041**	0.5	0.1
18195	Zinc	mg/L	**< 0.06**		3
18195	Aluminium	mg/L	**< 0.03**		0.2
18195	Boron	mg/L	**1.2**	4	
18195	Copper	mg/L	**0.008**	2	1

Notes: * parameter is derived from calculation.
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
'-' not determined

Lab use Only: TE 2868.00 TC 17.28 TA 17.07 Imb 0.22 A I/C 0.58

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
The water does not comply with the Australian Drinking Water Guidelines 2011 for Sodium, Total Dissolved Solids and pH.

NATA Accredited Laboratory 41 Accredited for compliance with ISO/IEC 17025 - Testing.

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14-Apr-2020

20NA2325

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Standard Chemical Analysis – Roma Bore 15

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

CLIENT : (HMARAN)
Maranoa Regional Council
PO Box 42
MITCHELL QLD 4465

ATTN: Carolina Avancena

Laboratory Reference	: SSP0069184
Client Order No.	: 2652
Date Received	: 13-Mar-2020
Laboratory Number	: 20NA2326
Batch No	: 349-16

Client Reference	: **ROM7**
Date Sampled	: **11-Mar-2020**
Sample Source	: **Bore**
Sample Point	: **Roma Bore 15**
Further Information:	:

Submitting Authority	: **Maranoa Regional Council**
Reason for Analysis	: **Compliance**
Water Treatment	: **Untreated**

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	**904**		
18226	pH	at 21°C	**8.82**		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	**3.2**		200
18209	Temporary Hardness*	mg $CaCO_3$/L	**3.2**		
18208	Alkalinity	mg $CaCO_3$/L	**359**		
18209	Residual Alkalinity*	meq/L	**7.1**		
18195	Silica	mg/L	**18**		80
18209	Total Dissolved Ions*	mg/L	**722**		
18209	Total Dissolved Solids*	mg/L	**537**		600
18206	True Colour	Hazen	**1**		15
18212	Turbidity	NTU	**<1**		5
18209	pH Sat.* (calc. for $CaCO_3$)		**8.8**		
18209	Saturation Index*		**0.0**		
18209	Mole Ratio*		**0.8**		
18209	Sodium Absorpt. Ratio*		**52**		
18209	Figure of Merit Ratio*		**0.0**		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	**220**		180
18195	Potassium	mg/L	**0.83**		
18195	Calcium	mg/L	**1.2**		
18195	Magnesium	mg/L	**0.03**		
18209	Hydrogen*	mg/L	**0.0**		
	ANIONS				
18209	Bicarbonate*	mg/L	**399**		
18209	Carbonate*	mg/L	**19**		
18209	Hydroxide*	mg/L	**0.1**		
35047	Chloride	mg/L	**66**		250
35047	Fluoride	mg/L	**0.19**	1.5	
35047	Nitrate	mg/L	**< 0.05**	50	
35047	Sulphate	mg/L	**19**	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	**0.03**		0.3
18195	Manganese	mg/L	**0.006**	0.5	0.1
18195	Zinc	mg/L	**< 0.06**		3
18195	Aluminium	mg/L	**< 0.03**		0.2
18195	Boron	mg/L	**0.15**	4	
18195	Copper	mg/L	**< 0.003**	2	1

Notes: * parameter is derived from calculation.
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
'-' not determined

Lab use Only: TE 1616.00 TC 9.48 TA 9.45 Imb 0.03 A I/C 0.57

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
The water does not comply with the Australian Drinking Water Guidelines 2011 for Sodium and pH.

NATA Accredited Laboratory 45 Accredited for compliance with ISO/IEC 17025 - Testing

20NA2326

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Standard Chemical Analysis – Roma Bore 17

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

CLIENT : (HMARAN)
Maranoa Regional Council
PO Box 42
MITCHELL QLD 4465

ATTN: Carolina Avancena

Laboratory Reference : SSP0069184
Client Order No. : 2652
Date Received : 13-Mar-2020
Laboratory Number : 20NA2327
Batch No : 349-17

Client Reference : **ROM8**
Date Sampled : **11-Mar-2020**
Sample Source : **Bore**
Sample Point : **Roma Bore 17**
Further Information: :

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment : **Untreated**

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	**979**		
18226	pH	at 21°C	**8.86**		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	**3.4**		200
18209	Temporary Hardness*	mg $CaCO_3$/L	**3.4**		
18208	Alkalinity	mg $CaCO_3$/L	**321**		
18209	Residual Alkalinity*	meq/L	**6.3**		
18195	Silica	mg/L	**20**		80
18209	Total Dissolved Ions*	mg/L	**745**		
18209	Total Dissolved Solids*	mg/L	**582**		600
18206	True Colour	Hazen	**<1**		15
18212	Turbidity	NTU	**<1**		5
18209	pH Sat.* (calc. for $CaCO_3$)		**8.9**		
18209	Saturation Index*		**0.0**		
18209	Mole Ratio*		**1.0**		
18209	Sodium Absorpt. Ratio*		**54**		
18209	Figure of Merit Ratio*		**0.0**		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	**230**		180
18195	Potassium	mg/L	**0.87**		
18195	Calcium	mg/L	**1.3**		
18195	Magnesium	mg/L	**< 0.03**		
18209	Hydrogen*	mg/L	**0.0**		
	ANIONS				
18209	Bicarbonate*	mg/L	**357**		
18209	Carbonate*	mg/L	**16**		
18209	Hydroxide*	mg/L	**0.1**		
35047	Chloride	mg/L	**87**		250
35047	Fluoride	mg/L	**0.16**	1.5	
35047	Nitrate	mg/L	**< 0.05**	50	
35047	Sulphate	mg/L	**54**	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	**0.03**		0.3
18195	Manganese	mg/L	**0.007**	0.5	0.1
18195	Zinc	mg/L	**< 0.06**		3
18195	Aluminium	mg/L	**< 0.03**		0.2
18195	Boron	mg/L	**0.09**	4	
18195	Copper	mg/L	**< 0.003**	2	1

Notes: * parameter is derived from calculation.
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
'-' not determined

Lab use Only: TE 1720.00 TC 9.96 TA 10.00 Imb 0.04 A I/C 0.57

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
The water does not comply with the Australian Drinking Water Guidelines 2011 for Sodium and pH.

NATA Accredited Laboratory 41 Accredited for compliance with ISO/IEC 17025 - Testing

20NA2327

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Standard Chemical Analysis – Roma Bore 18

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

CLIENT : (HMARAN)
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MITCHELL QLD 4465

ATTN: Carolina Avancena

Laboratory Reference : SSP0069184
Client Order No. : 2652
Date Received : 13-Mar-2020
Laboratory Number : 20NA2328
Batch No : 349-18

Client Reference : **ROM9**
Date Sampled : **11-Mar-2020**
Sample Source : **Bore**
Sample Point : **Roma Bore 18**
Further Information: :

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment : **Untreated**

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	**790**		
18226	pH	at 21°C	**8.80**		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	**3.2**		200
18209	Temporary Hardness*	mg $CaCO_3$/L	**3.2**		
18208	Alkalinity	mg $CaCO_3$/L	**322**		
18209	Residual Alkalinity*	meq/L	**6.4**		
18195	Silica	mg/L	**18**		80
18209	Total Dissolved Ions*	mg/L	**639**		
18209	Total Dissolved Solids*	mg/L	**473**		600
18206	True Colour	Hazen	**1**		15
18212	Turbidity	NTU	**<1**		5
18209	pH Sat.* (calc. for $CaCO_3$)		**8.9**		
18209	Saturation Index*		**-0.1**		
18209	Mole Ratio*		**0.8**		
18209	Sodium Absorpt. Ratio*		**46**		
18209	Figure of Merit Ratio*		**0.0**		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	**190**		180
18195	Potassium	mg/L	**0.75**		
18195	Calcium	mg/L	**1.2**		
18195	Magnesium	mg/L	**< 0.03**		
18209	Hydrogen*	mg/L	**0.0**		
	ANIONS				
18209	Bicarbonate*	mg/L	**363**		
18209	Carbonate*	mg/L	**15**		
18209	Hydroxide*	mg/L	**0.1**		
35047	Chloride	mg/L	**49**		250
35047	Fluoride	mg/L	**0.17**	1.5	
35047	Nitrate	mg/L	**< 0.05**	50	
35047	Sulphate	mg/L	**23**	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	**< 0.01**		0.3
18195	Manganese	mg/L	**0.008**	0.5	0.1
18195	Zinc	mg/L	**< 0.06**		3
18195	Aluminium	mg/L	**< 0.03**		0.2
18195	Boron	mg/L	**0.06**	4	
18195	Copper	mg/L	**0.085**	2	1

Notes: * parameter is derived from calculation.
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
'-' not determined

Lab use Only: TE 1424.00 TC 8.26 TA 8.30 Imb 0.04 A I/C 0.98

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
The water does not comply with the Australian Drinking Water Guidelines 2011 for Sodium and pH.

NATA Accredited Laboratory 45 Accredited for compliance with ISO/IEC 17025 - Testing

20NA2328

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Standard Chemical Analysis – Roma Bore 19

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

CLIENT : (HMARAN)
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MITCHELL QLD 4465

ATTN: Carolina Avancena

Laboratory Reference : SSP0069184
Client Order No. : 2652
Date Received : 13-Mar-2020
Laboratory Number : 20NA2329
Batch No : 349-19

Client Reference : **ROM10**
Date Sampled : **11-Mar-2020**
Sample Source : **Bore**
Sample Point : **Roma Bore 19**
Further Information: :

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment : **Untreated**

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	777		
18226	pH	at 21°C	8.87		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	2.7		200
18209	Temporary Hardness*	mg $CaCO_3$/L	2.7		
18208	Alkalinity	mg $CaCO_3$/L	336		
18209	Residual Alkalinity*	meq/L	6.6		
18195	Silica	mg/L	18		80
18209	Total Dissolved Ions*	mg/L	640		
18209	Total Dissolved Solids*	mg/L	468		600
18206	True Colour	Hazen	<1		15
18212	Turbidity	NTU	<1		5
18209	pH Sat.* (calc. for $CaCO_3$)		8.9		
18209	Saturation Index*		-0.1		
18209	Mole Ratio*		0.6		
18209	Sodium Absorpt. Ratio*		50		
18209	Figure of Merit Ratio*		0.0		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	190		180
18195	Potassium	mg/L	0.73		
18195	Calcium	mg/L	1.0		
18195	Magnesium	mg/L	< 0.03		
18209	Hydrogen*	mg/L	0.0		
	ANIONS				
18209	Bicarbonate*	mg/L	374		
18209	Carbonate*	mg/L	17		
18209	Hydroxide*	mg/L	0.1		
35047	Chloride	mg/L	45		250
35047	Fluoride	mg/L	0.17	1.5	
35047	Nitrate	mg/L	< 0.05	50	
35047	Sulphate	mg/L	14	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	< 0.01		0.3
18195	Manganese	mg/L	0.007	0.5	0.1
18195	Zinc	mg/L	< 0.06		3
18195	Aluminium	mg/L	< 0.03		0.2
18195	Boron	mg/L	0.06	4	
18195	Copper	mg/L	0.009	2	1

Notes: * parameter is derived from calculation.
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
'-' not determined

Lab use Only: TE 1409.00 TC 8.25 TA 8.27 Imb 0.02 A I/C 0.58

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
The water does not comply with the Australian Drinking Water Guidelines 2011 for Sodium and pH.

NATA Accredited Laboratory 61 Accredited for compliance with ISO/IEC 17025 - Testing

20NA2329

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Standard Chemical Analysis – Roma Bore 19

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

CLIENT : (HMARAN)
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PO Box 42
MITCHELL QLD 4465

ATTN: Carolina Avancena

Laboratory Reference	: SSP0069184
Client Order No.	: 2652
Date Received	: 13-Mar-2020
Laboratory Number	: 20NA2336
Batch No	: 349-26

Client Reference	: **ROM11**
Date Sampled	: **11-Mar-2020**
Sample Source	: **Bore**
Sample Point	: **Roma Bore 20**
Further Information:	:

Submitting Authority	: **Maranoa Regional Council**
Reason for Analysis	: **Compliance**
Water Treatment	: **Untreated**

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	**1410**		
18226	pH	at 21°C	**9.23**		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	**5.3**		200
18209	Temporary Hardness*	mg $CaCO_3$/L	**5.3**		
18208	Alkalinity	mg $CaCO_3$/L	**525**		
18209	Residual Alkalinity*	meq/L	**10**		
18195	Silica	mg/L	**1.7**		80
18209	Total Dissolved Ions*	mg/L	**1060**		
18209	Total Dissolved Solids*	mg/L	**800**		600
18206	True Colour	Hazen	**1**		15
18212	Turbidity	NTU	**47**		5
18209	pH Sat.* (calc. for $CaCO_3$)		**8.5**		
18209	Saturation Index*		**0.7**		
18209	Mole Ratio*		**0.6**		
18209	Sodium Absorpt. Ratio*		**62**		
18209	Figure of Merit Ratio*		**0.0**		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	**330**		180
18195	Potassium	mg/L	**2.4**		
18195	Calcium	mg/L	**2.0**		
18195	Magnesium	mg/L	**0.08**		
18209	Hydrogen*	mg/L	**0.0**		
	ANIONS				
18209	Bicarbonate*	mg/L	**523**		
18209	Carbonate*	mg/L	**58**		
18209	Hydroxide*	mg/L	**0.3**		
35047	Chloride	mg/L	**150**		250
35047	Fluoride	mg/L	**1.8**	1.5	
35047	Nitrate	mg/L	**< 0.05**	50	
35047	Sulphate	mg/L	**0.4**	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	**0.01**		0.3
18195	Manganese	mg/L	**0.005**	0.5	0.1
18195	Zinc	mg/L	**< 0.06**		3
18195	Aluminium	mg/L	**< 0.03**		0.2
18195	Boron	mg/L	**0.23**	4	
18195	Copper	mg/L	**< 0.003**	2	1

Notes: * parameter is derived from calculation.
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
'-' not determined

Lab use Only: TE 2503.00 TC 14.48 TA 14.76 Imb 0.28 A I/C 0.56

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
The water does not comply with the Australian Drinking Water Guidelines 2011 for Fluoride, Sodium, Total Dissolved Solids, Turbidity and pH.

NATA Accredited Laboratory 61 Accredited for compliance with ISO/IEC 17025 - Testing

20NA2336

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Standard Chemical Analysis – Surat River

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

CLIENT : (HMARAN)
Maranoa Regional Council
PO Box 42
MITCHELL QLD 4465

ATTN: C. Avancena

Laboratory Reference : SSP0068787
Client Order No. : Seville_M
Date Received : 19-Feb-2020
Laboratory Number : 20NA1545
Batch No : 340-18

Client Reference : **SUR3**
Date Sampled : **17-Feb-2020**
Sample Source : **River**
Sample Point : **Surat River**
Further Information: :

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment : **Untreated**

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	132		
18226	pH	at 22°C	6.84		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	28		200
18209	Temporary Hardness*	mg $CaCO_3$/L	28		
18208	Alkalinity	mg $CaCO_3$/L	48		
18209	Residual Alkalinity*	meq/L	0.4		
18195	Silica	mg/L	15		80
18209	Total Dissolved Ions*	mg/L	103		
18209	Total Dissolved Solids*	mg/L	88		600
18206	True Colour	Hazen	111		15
18212	Turbidity	NTU	1580		5
18209	pH Sat.* (calc. for $CaCO_3$)		9.0		
18209	Saturation Index*		-2.1		
18209	Mole Ratio*		2.9		
18209	Sodium Absorpt. Ratio*		1.1		
18209	Figure of Merit Ratio*		0.9		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	14		180
18195	Potassium	mg/L	4.1		
18195	Calcium	mg/L	6.1		
18195	Magnesium	mg/L	3.2		
18209	Hydrogen*	mg/L	0.0		
	ANIONS				
18209	Bicarbonate*	mg/L	59		
18209	Carbonate*	mg/L	0.0		
18209	Hydroxide*	mg/L	0.0		
35047	Chloride	mg/L	10		250
35047	Fluoride	mg/L	0.15	1.5	
35047	Nitrate	mg/L	3.4	50	
35047	Sulphate	mg/L	3.1	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	0.33		0.3
18195	Manganese	mg/L	0.004	0.5	0.1
18195	Zinc	mg/L	< 0.06		3
18195	Aluminium	mg/L	0.47		0.2
18195	Boron	mg/L	0.04	4	
18195	Copper	mg/L	0.052	2	1

Notes: * parameter is derived from calculation.
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
'-' not determined

Lab use Only: TE 1955.00 TC 1.28 TA 1.38 Imb 0.09 A I/C 0.56

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
The water does not comply with the Australian Drinking Water Guidelines 2011 for Aluminium, Colour, Iron and Turbidity.
Fine particles (< 0.45 micrometre) may cause elevated metal and true colour results.

NATA Accredited Laboratory 41 Accredited for compliance with ISO/IEC 17025 - Testing

20NA1545

R J Lee

Robert Lee
Laboratory Technician, Inorganic Chemistry
09-Mar-2020

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Standard Chemical Analysis – Wallumbilla Bore 1

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

CLIENT : (HMARAN)
Maranoa Regional Council
PO Box 42
MITCHELL QLD 4465

Laboratory Reference : SSP0069184
Client Order No. : 2652
Date Received : 13-Mar-2020
Laboratory Number : 20NA2319
Batch No : 349-09

ATTN: Carolina Avancena

Client Reference : **WAL2**
Date Sampled : **11-Mar-2020**
Sample Source : **Bore**
Sample Point : **Wallumbilla Bore 1**
Further Information: :

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment : **Untreated**

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	**1540**		
18226	pH	at 21°C	**8.61**		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	**7.4**		200
18209	Temporary Hardness*	mg $CaCO_3$/L	**7.4**		
18208	Alkalinity	mg $CaCO_3$/L	**558**		
18209	Residual Alkalinity*	meq/L	**11**		
18195	Silica	mg/L	**14**		80
18209	Total Dissolved Ions*	mg/L	**1210**		
18209	Total Dissolved Solids*	mg/L	**898**		600
18206	True Colour	Hazen	**2**		15
18212	Turbidity	NTU	**<1**		5
18209	pH Sat.* (calc. for $CaCO_3$)		**8.4**		
18209	Saturation Index*		**0.2**		
18209	Mole Ratio*		**1.2**		
18209	Sodium Absorpt. Ratio*		**59**		
18209	Figure of Merit Ratio*		**0.0**		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	**370**		180
18195	Potassium	mg/L	**1.2**		
18195	Calcium	mg/L	**2.4**		
18195	Magnesium	mg/L	**0.36**		
18209	Hydrogen*	mg/L	**0.0**		
	ANIONS				
18209	Bicarbonate*	mg/L	**641**		
18209	Carbonate*	mg/L	**19**		
18209	Hydroxide*	mg/L	**0.1**		
35047	Chloride	mg/L	**170**		250
35047	Fluoride	mg/L	**0.42**	1.5	
35047	Nitrate	mg/L	**< 0.05**	50	
35047	Sulphate	mg/L	**7.2**	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	**0.02**		0.3
18195	Manganese	mg/L	**0.006**	0.5	0.1
18195	Zinc	mg/L	**< 0.06**		3
18195	Aluminium	mg/L	**< 0.03**		0.2
18195	Boron	mg/L	**0.58**	4	
18195	Copper	mg/L	**0.013**	2	1

Notes: * parameter is derived from calculation.
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
'-' not determined

Lab use Only: TE 2695.00 TC 16.14 TA 16.14 Imb 0.00 A I/C 0.57

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
The water does not comply with the Australian Drinking Water Guidelines 2011 for Sodium, Total Dissolved Solids and pH.

NATA Accredited Laboratory 41 Accredited for compliance with ISO/IEC 17025 - Testing.

20NA2319

Mathew Pillai
Laboratory Technician, Inorganic Chemistry
14-Apr-2020

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Standard Chemical Analysis – Yuleba Bore 1

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

CLIENT : (HMARAN)
Maranoa Regional Council
PO Box 42
MITCHELL QLD 4465

ATTN: Carolina Avancena

Laboratory Reference	: SSP0069184
Client Order No.	: 2652
Date Received	: 13-Mar-2020
Laboratory Number	: 20NA2322
Batch No	: 349-12

Client Reference	: **YUL1**	Submitting Authority	: **Maranoa Regional Council**
Date Sampled	: **11-Mar-2020**	Reason for Analysis	: **Compliance**
Sample Source	: **Bore**	Water Treatment	: **Untreated**
Sample Point	: **Yuleba Bore**		
Further Information:	:		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	**1520**		
18226	pH	at 21°C	**8.69**		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	**3.9**		200
18209	Temporary Hardness*	mg $CaCO_3$/L	**3.9**		
18208	Alkalinity	mg $CaCO_3$/L	**494**		
18209	Residual Alkalinity*	meq/L	**9.8**		
18195	Silica	mg/L	**18**		80
18209	Total Dissolved Ions*	mg/L	**1150**		
18209	Total Dissolved Solids*	mg/L	**881**		600
18206	True Colour	Hazen	**2**		15
18212	Turbidity	NTU	**<1**		5
18209	pH Sat.* (calc. for $CaCO_3$)		**8.6**		
18209	Saturation Index*		**0.0**		
18209	Mole Ratio*		**1.2**		
18209	Sodium Absorpt. Ratio*		**78**		
18209	Figure of Merit Ratio*		**0.0**		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	**360**		180
18195	Potassium	mg/L	**1.1**		
18195	Calcium	mg/L	**1.5**		
18195	Magnesium	mg/L	**0.08**		
18209	Hydrogen*	mg/L	**0.0**		
	ANIONS				
18209	Bicarbonate*	mg/L	**562**		
18209	Carbonate*	mg/L	**20**		
18209	Hydroxide*	mg/L	**0.1**		
35047	Chloride	mg/L	**180**		250
35047	Fluoride	mg/L	**0.41**	1.5	
35047	Nitrate	mg/L	**< 0.1**	50	
35047	Sulphate	mg/L	**23**	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	**0.01**		0.3
18195	Manganese	mg/L	**0.003**	0.5	0.1
18195	Zinc	mg/L	**< 0.06**		3
18195	Aluminium	mg/L	**< 0.03**		0.2
18195	Boron	mg/L	**0.45**	4	
18195	Copper	mg/L	**< 0.003**	2	1

Notes: * parameter is derived from calculation.
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
'-' not determined

Lab use Only: TE 2630.00 TC 15.59 TA 15.59 Imb 0.00 A I/C 0.57

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
The water does not comply with the Australian Drinking Water Guidelines 2011 for Sodium, Total Dissolved Solids and pH.

NATA Accredited Laboratory 44 Accredited for compliance with ISO/IEC 17025 - Testing

20NA2322

Mathew Pillai
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14-Apr-2020

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Table 3 - Reticulation *E. coli* verification monitoring

Drinking water scheme: Amby

Year	*2019-20*											
Month	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*
No. of samples collected	4	4	4	4	4	4	6	4	4	4	4	4
No. of samples collected in which *E. coli* is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	54	54	54	54	54	54	56	56	54	50	50	50
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2005* (the regulation) requires that 98 per cent of samples taken in a 12 month period should contain no *E. Coli*. This requirement is refered to as the 'annual value' in Schedule 3A of the regulation.

This requirement comes into effect once you have 12 months data and should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Drinking water scheme: Injune

Year	*2019-20*											
Month	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*
No. of samples collected	8	7	8	8	8	7	8	8	7	8	7	8
No. of samples collected in which *E. coli* is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	93	92	92	92	93	92	92	92	91	92	92	92
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2005* (the regulation) requires that 98 per cent of samples taken in a 12 month period should contain no *E. Coli*. This requirement is refered to as the 'annual value' in Schedule 3A of the regulation.

This requirement comes into effect once you have 12 months data and should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Drinking water scheme: Jackson

Year	*2019-20*											
Month	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*
No. of samples collected	3	2	3	3	2	2	3	2	2	4	2	2
No. of samples collected in which *E. coli* is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	27	27	28	29	29	29	30	30	28	30	30	30
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2005* (the regulation) requires that 98 per cent of samples taken in a 12 month period should contain no *E. Coli*. This requirement is refered to as the 'annual value' in Schedule 3A of the regulation.

This requirement comes into effect once you have 12 months data and should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Drinking water scheme: Mitchell

Year	*2019-20*											
Month	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*
No. of samples collected	10	8	8	9	8	7	10	9	8	9	9	9
No. of samples collected in which *E. coli* is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	124	123	122	120	119	117	108	105	104	104	104	104
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2005* (the regulation) requires that 98 per cent of samples taken in a 12 month period should contain no *E. Coli*. This requirement is refered to as the 'annual value' in Schedule 3A of the regulation.

This requirement comes into effect once you have 12 months data and should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Drinking water scheme: Muckadilla

Year	*2019-20*											
Month	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*
No. of samples collected	3	2	3	4	3	3	5	4	4	3	3	3
No. of samples collected in which *E. coli* is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	27	27	28	30	31	32	35	35	37	38	39	40
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2005* (the regulation) requires that 98 per cent of samples taken in a 12 month period should contain no *E. Coli*. This requirement is refered to as the 'annual value' in Schedule 3A of the regulation.

This requirement comes into effect once you have 12 months data and should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Drinking water scheme: Mungallala

Year	*2019-20*											
Month	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*
No. of samples collected	3	2	3	4	3	3	4	3	2	4	3	3
No. of samples collected in which *E. coli* is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	35	34	35	36	36	36	37	37	36	37	37	37
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2005* (the regulation) requires that 98 per cent of samples taken in a 12 month period should contain no *E. Coli*. This requirement is refered to as the 'annual value' in Schedule 3A of the regulation.

This requirement comes into effect once you have 12 months data and should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Drinking water scheme: Roma

Year	*2019-20*											
Month	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*
No. of samples collected	72	77	80	75	80	68	81	70	76	79	71	72
No. of samples collected in which *E. coli* is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	902	899	909	907	919	905	901	897	902	901	900	901
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2005* (the regulation) requires that 98 per cent of samples taken in a 12 month period should contain no *E. Coli*. This requirement is refered to as the 'annual value' in Schedule 3A of the regulation.

This requirement comes into effect once you have 12 months data and should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Drinking water scheme: Surat

Year	*2019-20*											
Month	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*
No. of samples collected	6	8	5	6	7	5	10	8	7	5	6	5
No. of samples collected in which *E. coli* is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	65	68	68	69	71	71	73	76	78	78	78	78
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2005* (the regulation) requires that 98 per cent of samples taken in a 12 month period should contain no *E. Coli*. This requirement is refered to as the 'annual value' in Schedule 3A of the regulation.

This requirement comes into effect once you have 12 months data and should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Drinking water scheme: Wallumbilla

Year	*2019-20*											
Month	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*
No. of samples collected	5	5	4	6	5	4	5	4	5	6	4	4
No. of samples collected in which *E. coli* is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	53	52	52	54	55	55	56	56	55	57	57	57
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2005* (the regulation) requires that 98 per cent of samples taken in a 12 month period should contain no *E. Coli*. This requirement is refered to as the 'annual value' in Schedule 3A of the regulation.

This requirement comes into effect once you have 12 months data and should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Drinking water scheme: Yuleba

Year	*2019-20*											
Month	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*
No. of samples collected	5	4	4	4	4	3	5	4	4	5	4	5
No. of samples collected in which *E. coli* is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	50	50	50	50	50	49	50	50	49	50	50	51
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2005* (the regulation) requires that 98 per cent of samples taken in a 12 month period should contain no *E. Coli*. This requirement is refered to as the 'annual value' in Schedule 3A of the regulation.

This requirement comes into effect once you have 12 months data and should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Appendix B – Implementation of the DWQMP Risk Management Improvement Program

Table 4 – Progress against the risk management improvement program in the approved DWQMP

Item No.	Scheme Component / Sub-component	Action(s)	Target date/s	Status as at Dec 2020	(If implementing these actions will take longer than anticipated, please provide detail, as it may affect the approved DWQMP)
	All Towns	*Network Modelling Software Purchased, allowing for easier modelling of future upgrades and demands in the towns*	*On-going*	*On-going*	
	All Towns – Water Quality	*Update flushing Procedure and program*	*Complete*	*Complete*	
	All Towns	*New SCADA System*	*June 2020*	*In Progress*	
	Surat	*New Bore*	*Complete*	*In Progress*	
	Yuleba	*New Bore*	*Complete*	*In Progress*	
	Amby, Mungallala, Wallumbilla	*Install Generators*	*Complete*	*Complete*	
	Wallumbilla - Supply	*New Bore*	*Complete*	*Complete*	
	Mitchell - Supply	*New Bore*	*On-going*	*In Progress*	
	Roma – Supply	*New Bore*	*February 2020*	*Complete*	
	Roma - Storage	*New treated reservoir*	*May 2020*	*In Progress*	
	Yuleba - Storage	*New reservoir constructed*	*May 2020*	*In Progress*	