Drinking Water Quality Management Plan (DWQMP) report

2016/17

Maranoa Regional Council

SPID: 494

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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

An informal internal review of the plan was undertaken after a change of Manager, early in the FY.

The new Manager was brought up to speed with the current plan and the improvement items required to continually improve the networks.

This year the amendments proposed to be made to the plan involve updating the organizational structure, and updating the infrastructure maps of towns where upgrades have been carried out.

[1] Refer to *Water Quality and Reporting Guideline for a Drinking Water Service* for the water quality criteria for drinking water.

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	Samples	Non-Conforming	Max
E. coli	MPN/100mL	<1	31	0	<1
Chlorine (Total)	mg/L	<5	22	0	3.20

Injune

Parameter	Unit	Limit	Samples	Non-Conforming	Max
E. coli	MPN/100mL	<1	88	0	<1
Chlorine (Total)	mg/L	<5	5	0	0.76

Jackson

Parameter	Unit	Limit	Samples	Non-Conforming	Max
E. coli	MPN/100mL	<1	20	0	<1
Chlorine (Total)	mg/L	<5	20	0	0.90

Mitchell

Parameter	Unit	Limit	Samples	Non-Conforming	Max
E. coli	MPN/100mL	<1	71	0	<1
Chlorine (Total)	mg/L	<5	14	0	3.40

Muckadilla

Parameter	Unit	Limit	Samples	Non-Conforming	Max
E. coli	MPN/100mL	<1	24	0	<1
Chlorine (Total)	mg/L	<5	24	0	1.10

Mungallala

Parameter	Unit	Limit	Samples	Non-Conforming	Max
E. coli	MPN/100mL	<1	26	0	<1
Chlorine (Total)	mg/L	<5	8	0	0.86

Roma

Parameter	Unit	Limit	Samples	Non-Conforming	Max
E. coli	MPN/100mL	<1	705	0	<1
Chlorine (Total)	mg/L	<5	705	0	2.61

Surat

Parameter	Unit	Limit	Samples	Non-Conforming	Max
E. coli	MPN/100mL	<1	90	0	<1
Chlorine (Total)	mg/L	<5	90	0	2.10

Wallumbilla

Parameter	Unit	Limit	Samples	Non-Conforming	Max
E. coli	MPN/100mL	<1	40	0	<1
Chlorine (Total)	mg/L	<5	40	0	1.62

Yuleba

Parameter	Unit	Limit	Samples	Non-Conforming	Max
E. coli	MPN/100mL	<1	40	0	<1
Chlorine (Total)	mg/L	<5	40	0	1.80

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

This financial year there were no instances where the Regulator was notified under sections 102 or 102A of the Act.

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 1000 customers)

	Suspected Illness	Discoloured water	Taste and odour	Total
Amby	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
Injune	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
Jackson	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
Mitchell	0 (0.00)	1 (1.70)	0 (0.00)	1 (1.70)
Muckadilla	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
Mungallala	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
Roma	0 (0.00)	4 (1.16)	6 (1.74)	10 (2.90)
Surat	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
Wallumbilla	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
Yuleba	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
Total	**0 (0.00)**	**5 (1.00)**	**6 (1.20)**	**11 (2.20)**

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 tap and closest reticulation sampling point for the presence of *E. coli*.

During 2016/17, 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 2016/17, 5 customer complaints were received from within the towns of Mitchell and Roma. As per standard procedure the areas were flushed to remove the dirty water and to achieve detectable chlorine residuals.

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.

6. Findings and recommendations of the DWQMP auditor

Maranoa Regional Council engaged Viridis Consultants to conduct a regular audit of the DWQMP during June 2017, covering the time period from 2016/17. The purpose of the audit was to verify the accuracy of the monitoring and performance data provided to the Regulator; assess compliance with the DWQMP; and to assess the relevance of the DWQMP in relation to the service provided. A summary of, and recommendations from, the Audit report are included below:

- *Ensure bore and reservoir inspections are undertaken, records maintained and that potential for water and vermin ingress is prevented.*
- *Chlorine and pH should always be measured when sampling E. coli, if it is a chlorinated water.*
- *Investigate high turbidities at bores INJ02 and MUN01.*
- *Ensure verification monitoring for E. coli is undertaken as described in the plan.*
- *The risk improvement items in relation to the management of the Surat WTP filtration must be actioned as soon as possible. Filtered water turbidity should not be above 1 NTU where Chlorine disinfection is used. As protozoa is a hazard the target turbidity should be <0.2 NTU from individual filters and not above 0.5 NTU at any time.*

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. 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)*
- *Ben Godford (Team Coordinator – WS&G)*

The review made the following findings:

- *Update staff structure*
- *Update scheme details and diagrams, due to projects being completed*
- *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)*
- *Updated records management to reflect changes to systems utilised*
- *Amend Operating Limits of Surat WTP*
- *Refresher training of field staff and their knowledge of the DWQMP*
- *Amendments to the Plan are currently under assessment by the Regulator, subject to an information requirement notice.*

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	2	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	9	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**	**0.0100**	**0.0020**	**0.0500**	**2.000**	**N/A**	**0.0100**	**0.5000**	**0.0200**	**N/A**
Aesthetic Limit		**0.200**	**N/A**	**N/A**	**N/A**	**1.000**	**0.300**	**N/A**	**0.1000**	**N/A**	**3.000**
Amby	Bore 1	0.004	<0.0001	<0.0001	<0.0001	0.007	0.150	<0.0001	0.0210	<0.0001	0.002
Injune	Bore 2	0.003	<0.0001	<0.0001	<0.0001	0.054	0.130	0.0009	0.0061	<0.0001	0.016
	Bore 3	<0.003	<0.0001	<0.0001	<0.0001	0.007	0.310	0.0003	0.0110	<0.0001	0.005
Jackson	Bore 1	0.005	<0.0001	<0.0001	<0.0001	0.008	0.180	<0.0001	0.0056	<0.0001	0.003
Mitchell	Bore 1	0.045	0.0012	<0.0001	<0.0001	0.005	0.006	0.0002	0.0020	<0.0001	0.002
	Bore 2	0.041	0.0014	<0.0001	<0.0001	0.012	<0.005	0.0007	0.0022	<0.0001	0.012
Muckadilla	Bore 1	0.018	<0.0001	<0.0001	<0.0001	0.005	0.026	0.0003	0.0054	0.0002	0.008
Mungallala	Bore 1	<0.003	<0.0001	<0.0001	<0.0001	0.004	0.230	<0.0001	0.0470	0.0002	0.003
Roma	Bore 3	0.004	<0.0001	<0.0001	<0.0001	0.007	0.440	<0.0001	0.0290	<0.0001	0.009
	Bore 9	0.003	0.0002	<0.0001	<0.0001	0.007	0.300	0.0002	0.0140	0.0002	0.030
	Bore 11	0.008	0.0002	<0.0001	<0.0001	0.005	0.047	<0.0001	0.0055	<0.0001	<0.001
	Bore 13	0.009	<0.0001	<0.0001	<0.0001	0.005	0.008	<0.0001	0.0069	<0.0001	<0.001
	Bore 14	0.010	<0.0001	<0.0001	<0.0001	0.006	0.020	<0.0001	0.0081	<0.0001	0.003
	Bore 15	0.009	<0.0001	<0.0001	<0.0001	0.004	0.006	<0.0001	0.0058	<0.0001	<0.001
	Bore 16	0.011	0.0003	<0.0001	<0.0001	0.006	0.012	<0.0001	0.0052	<0.0001	0.002
	Bore 17	0.012	0.0002	<0.0001	<0.0001	0.007	<0.005	<0.0001	0.0064	<0.0001	0.002
	Bore 18	0.011	0.0002	<0.0001	<0.0001	0.006	0.018	0.0006	0.0080	<0.0001	0.002
Surat	Treated	0.014	0.0002	<0.0001	<0.0001	0.014	0.008	0.0003	0.0014	0.0010	0.004
Wallumbilla	Bore 1	0.004	<0.0001	<0.0001	<0.0001	0.008	0.031	<0.0001	0.0067	<0.0001	0.002
Yuleba	Bore 1	0.006	0.0002	<0.0001	<0.0001	0.010	0.043	<0.0001	0.0030	<0.0001	0.003

Standard Chemical Analysis – Amby Bore 1

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

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

ATTN: B Godford

Laboratory Reference : SSP0056704
Client Order No. : GODFORD_B
Date Received : 08-Sep-2017
Laboratory Number : 17NA9899
Batch No : 048-28

Client Reference : **AM_TR**
Date Sampled : **30-Aug-2017**
Sample Source : **Reticulated**
Sample Point : **Amby Retic**
Further Information :

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment : **Chlorinated**
Scheme/Job/Survey :
Sampler :

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	**2170**		
18226	pH	at 22°C	**8.37**		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	**36**		200
18209	Temporary Hardness*	mg $CaCO_3$/L	**36**		
18208	Alkalinity	mg $CaCO_3$/L	**138**		
18209	Residual Alkalinity*	meq/L	**2.0**		
18195	Silica	mg/L	**17**		80
18209	Total Dissolved Ions*	mg/L	**1320**		
18209	Total Dissolved Solids*	mg/L	**1260**		600
18206	True Colour	Hazen	**2**		15
18212	Turbidity	NTU	**<1**		5
18209	pH Sat.* (calc. for $CaCO_3$)		**8.2**		
18209	Saturation Index*		**0.2**		
18209	Mole Ratio*		**2.5**		
18209	Sodium Absorpt. Ratio*		**33**		
18209	Figure of Merit Ratio*		**0.0**		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	**460**		180
18195	Potassium	mg/L	**1.9**		
18195	Calcium	mg/L	**14**		
18195	Magnesium	mg/L	**0.2**		
18209	Hydrogen*	mg/L	**0.0**		
	ANIONS				
18209	Bicarbonate*	mg/L	**164**		
18209	Carbonate*	mg/L	**2.3**		
18209	Hydroxide*	mg/L	**0.0**		
18204	Chloride	mg/L	**420**		250
18204	Fluoride	mg/L	**< 0.25**	1.5	
18204	Nitrate	mg/L	**< 2.5**	50	
18204	Sulphate	mg/L	**270**	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	**0.01**		0.3
18195	Manganese	mg/L	**<0.01**	0.5	0.1
18195	Zinc	mg/L	**<0.01**		3
18195	Aluminium	mg/L	**<0.05**		0.2
18195	Boron	mg/L	**0.14**	4	
18195	Copper	mg/L	**<0.03**	2	1

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

Lab use Only: TE 3517.00 TC 20.59 TA 20.11 Imb 0.49 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.

Unsuitable for irrigation (IC, IL). Consult DPI.
Suitable for all stock.

NATA Accredited Laboratory 401 Accredited for compliance with ISO/IEC 17025.

17NA9899

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29-Sep-2017

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Standard Chemical Analysis – Injune Bore 2

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

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

ATTN: B Godford

Laboratory Reference : SSP0056704
Client Order No. : GODFORD_B
Date Received : 08-Sep-2017
Laboratory Number : 17NA9882
Batch No : 048-11

Client Reference : **INJUNE_BORE_2**
Date Sampled : **31-Aug-2017**
Sample Source : **Bore**
Sample Point : **Injune Bore 2**
Further Information: : **Raw**

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment :
Scheme/Job/Survey :
Sampler :

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	**341**		
18226	pH	at 22°C	**8.12**		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	**6.1**		200
18209	Temporary Hardness*	mg $CaCO_3$/L	**6.1**		
18208	Alkalinity	mg $CaCO_3$/L	**152**		
18209	Residual Alkalinity*	meq/L	**2.9**		
18195	Silica	mg/L	**16**		80
18209	Total Dissolved Ions*	mg/L	**291**		
18209	Total Dissolved Solids*	mg/L	**215**		600
18206	True Colour	Hazen	**3**		15
18212	Turbidity	NTU	**<1**		5
18209	pH Sat.* (calc. for $CaCO_3$)		**8.9**		
18209	Saturation Index*		**-0.8**		
18209	Mole Ratio*		**1.2**		
18209	Sodium Absorpt. Ratio*		**14**		
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	**0.9**		
18195	Calcium	mg/L	**2.4**		
18195	Magnesium	mg/L	**< 0.1**		
18209	Hydrogen*	mg/L	**0.0**		
	ANIONS				
18209	Bicarbonate*	mg/L	**182**		
18209	Carbonate*	mg/L	**1.9**		
18209	Hydroxide*	mg/L	**0.0**		
18204	Chloride	mg/L	**16**		250
18204	Fluoride	mg/L	**0.08**	1.5	
18204	Nitrate	mg/L	**<0.5**	50	
18204	Sulphate	mg/L	**7**	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	**0.12**		0.3
18195	Manganese	mg/L	**<0.01**	0.5	0.1
18195	Zinc	mg/L	**0.01**		3
18195	Aluminium	mg/L	**<0.05**		0.2
18195	Boron	mg/L	**<0.02**	4	
18195	Copper	mg/L	**<0.03**	2	1

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

Lab use Only: TE 650.00 TC 3.72 TA 3.62 Imb 0.09 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 complies with Australian Drinking Water Guidelines 2011 for the parameters tested.
Unsuitable for irrigation (IL). Consult DPI.
Suitable for all stock.

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

17NA9882

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Standard Chemical Analysis – Injune Bore 3

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

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

ATTN: B Godford

Laboratory Reference : SSP0056704
Client Order No. : GODFORD_B
Date Received : 08-Sep-2017
Laboratory Number : 17NA9883
Batch No : 048-12

Client Reference : **INJUNE_BORE_3**
Date Sampled : **31-Aug-2017**
Sample Source : **Bore**
Sample Point : **Injune Bore 3**
Further Information: : **Raw**

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment :
Scheme/Job/Survey :
Sampler :

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	369		
18226	pH	at 22°C	8.05		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	8.7		200
18209	Temporary Hardness*	mg $CaCO_3$/L	8.7		
18208	Alkalinity	mg $CaCO_3$/L	155		
18209	Residual Alkalinity*	meq/L	2.9		
18195	Silica	mg/L	16		80
18209	Total Dissolved Ions*	mg/L	306		
18209	Total Dissolved Solids*	mg/L	227		600
18206	True Colour	Hazen	5		15
18212	Turbidity	NTU	<1		5
18209	pH Sat.* (calc. for $CaCO_3$)		8.7		
18209	Saturation Index*		-0.7		
18209	Mole Ratio*		1.5		
18209	Sodium Absorpt. Ratio*		13		
18209	Figure of Merit Ratio*		0.0		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	86		180
18195	Potassium	mg/L	1.2		
18195	Calcium	mg/L	3.4		
18195	Magnesium	mg/L	< 0.1		
18209	Hydrogen*	mg/L	0.0		
	ANIONS				
18209	Bicarbonate*	mg/L	187		
18209	Carbonate*	mg/L	1.2		
18209	Hydroxide*	mg/L	0.0		
18204	Chloride	mg/L	20		250
18204	Fluoride	mg/L	0.09	1.5	
18204	Nitrate	mg/L	<0.5	50	
18204	Sulphate	mg/L	7	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	0.22		0.3
18195	Manganese	mg/L	0.01	0.5	0.1
18195	Zinc	mg/L	<0.01		3
18195	Aluminium	mg/L	<0.05		0.2
18195	Boron	mg/L	<0.02	4	
18195	Copper	mg/L	<0.03	2	1

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

Lab use Only: TE 693.00 TC 3.94 TA 3.83 Imb 0.11 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 complies with Australian Drinking Water Guidelines 2011 for the parameters tested.
Unsuitable for irrigation (IL). Consult DPI.
Suitable for all stock.

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

17NA9883

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27-Sep-2017

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Standard Chemical Analysis – Jackson Bore 1

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

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

ATTN: B Godford

Laboratory Reference : SSP0056704
Client Order No. : GODFORD_B
Date Received : 08-Sep-2017
Laboratory Number : 17NA9888
Batch No : 048-17

Client Reference : **JR**
Date Sampled : **14-Aug-2017**
Sample Source : **Reticulated**
Sample Point : **Jackson Retic**
Further Information: :

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment : **Chlorinated**
Scheme/Job/Survey :
Sampler :

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	**1790**		
18226	pH	at 22°C	**8.66**		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	**6.2**		200
18209	Temporary Hardness*	mg $CaCO_3$/L	**6.2**		
18208	Alkalinity	mg $CaCO_3$/L	**567**		
18209	Residual Alkalinity*	meq/L	**11**		
18195	Silica	mg/L	**16**		80
18209	Total Dissolved Ions*	mg/L	**1350**		
18209	Total Dissolved Solids*	mg/L	**1030**		600
18206	True Colour	Hazen	**5**		15
18212	Turbidity	NTU	**<1**		5
18209	pH Sat.* (calc. for $CaCO_3$)		**8.4**		
18209	Saturation Index*		**0.3**		
18209	Mole Ratio*		**1.3**		
18209	Sodium Absorpt. Ratio*		**74**		
18209	Figure of Merit Ratio*		**0.0**		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	**420**		180
18195	Potassium	mg/L	**1.3**		
18195	Calcium	mg/L	**2.1**		
18195	Magnesium	mg/L	**0.2**		
18209	Hydrogen*	mg/L	**0.0**		
	ANIONS				
18209	Bicarbonate*	mg/L	**647**		
18209	Carbonate*	mg/L	**21**		
18209	Hydroxide*	mg/L	**0.1**		
18204	Chloride	mg/L	**250**		250
18204	Fluoride	mg/L	**0.82**	1.5	
18204	Nitrate	mg/L	**< 1**	50	
18204	Sulphate	mg/L	**< 2**	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	**0.15**		0.3
18195	Manganese	mg/L	**<0.01**	0.5	0.1
18195	Zinc	mg/L	**<0.01**		3
18195	Aluminium	mg/L	**<0.05**		0.2
18195	Boron	mg/L	**1.2**	4	
18195	Copper	mg/L	**<0.03**	2	1

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

Lab use Only: TE 3091.00 TC 18.60 TA 18.39 Imb 0.21 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.
Unsuitable for irrigation (IC, IL). Consult DPI.
Suitable for all stock.

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

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27-Sep-2017

17NA9888

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Standard Chemical Analysis – Mitchell Bore 1

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

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

ATTN: B Godford

Laboratory Reference : SSP0056704
Client Order No. : GODFORD_B
Date Received : 08-Sep-2017
Laboratory Number : 17NA9879
Batch No : 048-08

Client Reference : **MIT_BORE_1**
Date Sampled : **30-Aug-2017**
Sample Source : **Bore**
Sample Point : **Mitchell Bore 1**
Further Information: :

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment :
Scheme/Job/Survey :
Sampler :

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	**593**		
18226	pH	at 22°C	**9.12**		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	**204**		
18209	Residual Alkalinity*	meq/L	**4.0**		
18195	Silica	mg/L	**30**		80
18209	Total Dissolved Ions*	mg/L	**438**		
18209	Total Dissolved Solids*	mg/L	**362**		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*		**37**		
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	**0.4**		
18195	Calcium	mg/L	**1.1**		
18195	Magnesium	mg/L	**< 0.1**		
18209	Hydrogen*	mg/L	**0.0**		
	ANIONS				
18209	Bicarbonate*	mg/L	**209**		
18209	Carbonate*	mg/L	**19**		
18209	Hydroxide*	mg/L	**0.2**		
18204	Chloride	mg/L	**51**		250
18204	Fluoride	mg/L	**0.19**	1.5	
18204	Nitrate	mg/L	**<0.5**	50	
18204	Sulphate	mg/L	**19**	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	**<0.01**		0.3
18195	Manganese	mg/L	**<0.01**	0.5	0.1
18195	Zinc	mg/L	**0.01**		3
18195	Aluminium	mg/L	**<0.05**		0.2
18195	Boron	mg/L	**0.05**	4	
18195	Copper	mg/L	**<0.03**	2	1

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

Lab use Only: TE 1068.00 TC 6.07 TA 5.93 Imb 0.14 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.
Unsuitable for irrigation (IL). Consult DPI.
Suitable for all stock.

NATA Accredited Laboratory 61 Accredited for compliance with ISO/IEC 17025.

17NA9879

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Standard Chemical Analysis – Mitchell Bore 2

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

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

ATTN: B Godford

Laboratory Reference : SSP0056704
Client Order No. : GODFORD_B
Date Received : 08-Sep-2017
Laboratory Number : 17NA9880
Batch No : 048-09

Client Reference : **MIT_BORE_2**
Date Sampled : **30-Aug-2017**
Sample Source : **Bore**
Sample Point : **Mitchell Bore 2**
Further Information: : **Raw**

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment :
Scheme/Job/Survey :
Sampler :

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	**607**		
18226	pH	at 22°C	**9.08**		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	**2.9**		200
18209	Temporary Hardness*	mg $CaCO_3$/L	**2.9**		
18208	Alkalinity	mg $CaCO_3$/L	**204**		
18209	Residual Alkalinity*	meq/L	**4.0**		
18195	Silica	mg/L	**30**		80
18209	Total Dissolved Ions*	mg/L	**450**		
18209	Total Dissolved Solids*	mg/L	**370**		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*		**0.8**		
18209	Sodium Absorpt. Ratio*		**36**		
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	**0.5**		
18195	Calcium	mg/L	**1.2**		
18195	Magnesium	mg/L	**< 0.1**		
18209	Hydrogen*	mg/L	**0.0**		
	ANIONS				
18209	Bicarbonate*	mg/L	**216**		
18209	Carbonate*	mg/L	**16**		
18209	Hydroxide*	mg/L	**0.2**		
18204	Chloride	mg/L	**57**		250
18204	Fluoride	mg/L	**0.22**	1.5	
18204	Nitrate	mg/L	**<0.5**	50	
18204	Sulphate	mg/L	**19**	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	**<0.01**		0.3
18195	Manganese	mg/L	**<0.01**	0.5	0.1
18195	Zinc	mg/L	**<0.01**		3
18195	Aluminium	mg/L	**<0.05**		0.2
18195	Boron	mg/L	**0.04**	4	
18195	Copper	mg/L	**<0.03**	2	1

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

Lab use Only: TE 1090.00 TC 6.20 TA 6.08 Imb 0.12 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.
Unsuitable for irrigation (IL). Consult DPI.
Suitable for all stock.

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

17NA9880

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Standard Chemical Analysis – Muckadilla Bore 1

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

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

ATTN: B Godford

Laboratory Reference : SSP0056704
Client Order No. : GODFORD_B
Date Received : 08-Sep-2017
Laboratory Number : 17NA9900
Batch No : 048-29

Client Reference : **MUCK_BORE_1**
Date Sampled : **30-Aug-2017**
Sample Source : **Bore**
Sample Point : **Muckadilla Bore**
Further Information: :

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment : **Chlorinated**
Scheme/Job/Survey :
Sampler :

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	710		
18226	pH	at 22°C	8.88		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	431		600
18206	True Colour	Hazen	3		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*		43		
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	0.8		
18195	Calcium	mg/L	1.2		
18195	Magnesium	mg/L	< 0.1		
18209	Hydrogen*	mg/L	0.0		
	ANIONS				
18209	Bicarbonate*	mg/L	305		
18209	Carbonate*	mg/L	18		
18209	Hydroxide*	mg/L	0.1		
18204	Chloride	mg/L	47		250
18204	Fluoride	mg/L	0.12	1.5	
18204	Nitrate	mg/L	<0.5	50	
18204	Sulphate	mg/L	20	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	0.01		0.3
18195	Manganese	mg/L	<0.01	0.5	0.1
18195	Zinc	mg/L	<0.01		3
18195	Aluminium	mg/L	<0.05		0.2
18195	Boron	mg/L	0.05	4	
18195	Copper	mg/L	<0.03	2	1

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

Lab use Only: TE 1288.00 TC 7.52 TA 7.36 Imb 0.16 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 pH.
Unsuitable for irrigation (IB, IL). Consult DPI.
Suitable for all stock.

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

17NA9900

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Standard Chemical Analysis – Mungallala Bore 1

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

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

ATTN: B Godford

Laboratory Reference : SSP0056704
Client Order No. : GODFORD_B
Date Received : 08-Sep-2017
Laboratory Number : 17NA9901
Batch No : 048-30

Client Reference : **MUNG_BORE_1**
Date Sampled : **30-Aug-2017**
Sample Source : **Bore**
Sample Point : **Mungallala Bore**
Further Information: :

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment :
Scheme/Job/Survey :
Sampler :

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	596		
18226	pH	at 22°C	7.78		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	73		200
18209	Temporary Hardness*	mg $CaCO_3$/L	73		
18208	Alkalinity	mg $CaCO_3$/L	129		
18209	Residual Alkalinity*	meq/L	1.1		
18195	Silica	mg/L	32		80
18209	Total Dissolved Ions*	mg/L	415		
18209	Total Dissolved Solids*	mg/L	367		600
18206	True Colour	Hazen	8		15
18212	Turbidity	NTU	<1		5
18209	pH Sat.* (calc. for $CaCO_3$)		7.9		
18209	Saturation Index*		-0.2		
18209	Mole Ratio*		2.3		
18209	Sodium Absorpt. Ratio*		4.9		
18209	Figure of Merit Ratio*		0.3		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	97		180
18195	Potassium	mg/L	4.7		
18195	Calcium	mg/L	25		
18195	Magnesium	mg/L	2.6		
18209	Hydrogen*	mg/L	0.0		
	ANIONS				
18209	Bicarbonate*	mg/L	156		
18209	Carbonate*	mg/L	0.6		
18209	Hydroxide*	mg/L	0.0		
18204	Chloride	mg/L	66		250
18204	Fluoride	mg/L	0.09	1.5	
18204	Nitrate	mg/L	<0.5	50	
18204	Sulphate	mg/L	63	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	0.02		0.3
18195	Manganese	mg/L	0.04	0.5	0.1
18195	Zinc	mg/L	<0.01		3
18195	Aluminium	mg/L	<0.05		0.2
18195	Boron	mg/L	0.06	4	
18195	Copper	mg/L	<0.03	2	1

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

Lab use Only: TE 1053.00 TC 5.78 TA 5.76 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 complies with Australian Drinking Water Guidelines 2011 for the parameters tested.
Marginal quality for irrigation (IK). Consult DPI.
Suitable for all stock.

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

17NA9901

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Standard Chemical Analysis – Roma Bore 3

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

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

ATTN: B Godford

Laboratory Reference : SSP0056704
Client Order No. : GODFORD_B
Date Received : 08-Sep-2017
Laboratory Number : 17NA9891
Batch No : 048-20

Client Reference : **BORE_3**
Date Sampled : **30-Aug-2017**
Sample Source : **Bore**
Sample Point : **Roma Bore 3**
Further Information: : **Raw**

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment :
Scheme/Job/Survey :
Sampler :

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	**2630**		
18226	pH	at 22°C	**8.65**		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	**15**		200
18209	Temporary Hardness*	mg $CaCO_3$/L	**15**		
18208	Alkalinity	mg $CaCO_3$/L	**293**		
18209	Residual Alkalinity*	meq/L	**5.5**		
18195	Silica	mg/L	**15**		80
18209	Total Dissolved Ions*	mg/L	**1590**		
18209	Total Dissolved Solids*	mg/L	**1430**		600
18206	True Colour	Hazen	**2**		15
18212	Turbidity	NTU	**<1**		5
18209	pH Sat.* (calc. for $CaCO_3$)		**8.3**		
18209	Saturation Index*		**0.4**		
18209	Mole Ratio*		**2.0**		
18209	Sodium Absorpt. Ratio*		**62**		
18209	Figure of Merit Ratio*		**0.0**		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	**560**		180
18195	Potassium	mg/L	**2.0**		
18195	Calcium	mg/L	**5.8**		
18195	Magnesium	mg/L	**0.1**		
18209	Hydrogen*	mg/L	**0.0**		
	ANIONS				
18209	Bicarbonate*	mg/L	**337**		
18209	Carbonate*	mg/L	**9.6**		
18209	Hydroxide*	mg/L	**0.1**		
18204	Chloride	mg/L	**630**		250
18204	Fluoride	mg/L	**0.90**	1.5	
18204	Nitrate	mg/L	**< 2.5**	50	
18204	Sulphate	mg/L	**42**	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	**0.07**		0.3
18195	Manganese	mg/L	**0.03**	0.5	0.1
18195	Zinc	mg/L	**<0.01**		3
18195	Aluminium	mg/L	**<0.05**		0.2
18195	Boron	mg/L	**1.5**	4	
18195	Copper	mg/L	**<0.03**	2	1

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

Lab use Only: TE 4206.00 TC 24.58 TA 24.58 Imb 0.00 A I/C 0.54

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, Total Dissolved Solids and pH.
Unsuitable for irrigation (IC, IL). Consult DPI.
Suitable for all stock.

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

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27-Sep-2017

17NA9891

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Standard Chemical Analysis – Roma Bore 9

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

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

ATTN: B Godford

Laboratory Reference : SSP0056704
Client Order No. : GODFORD_B
Date Received : 08-Sep-2017
Laboratory Number : 17NA9892
Batch No : 048-21

Client Reference : **BORE_9**
Date Sampled : **30-Aug-2017**
Sample Source : **Bore**
Sample Point : **Roma Bore 9**
Further Information: : **Raw**

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment :
Scheme/Job/Survey :
Sampler :

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	1910		
18226	pH	at 22°C	8.56		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	16		200
18209	Temporary Hardness*	mg $CaCO_3$/L	16		
18208	Alkalinity	mg $CaCO_3$/L	486		
18209	Residual Alkalinity*	meq/L	9.4		
18195	Silica	mg/L	15		80
18209	Total Dissolved Ions*	mg/L	1380		
18209	Total Dissolved Solids*	mg/L	1110		600
18206	True Colour	Hazen	2		15
18212	Turbidity	NTU	<1		5
18209	pH Sat.* (calc. for $CaCO_3$)		8.0		
18209	Saturation Index*		0.5		
18209	Mole Ratio*		1.5		
18209	Sodium Absorpt. Ratio*		48		
18209	Figure of Merit Ratio*		0.0		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	440		180
18195	Potassium	mg/L	1.5		
18195	Calcium	mg/L	5.8		
18195	Magnesium	mg/L	0.3		
18209	Hydrogen*	mg/L	0.0		
	ANIONS				
18209	Bicarbonate*	mg/L	560		
18209	Carbonate*	mg/L	16		
18209	Hydroxide*	mg/L	0.1		
18204	Chloride	mg/L	280		250
18204	Fluoride	mg/L	0.70	1.5	
18204	Nitrate	mg/L	< 1	50	
18204	Sulphate	mg/L	77	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	0.05		0.3
18195	Manganese	mg/L	0.01	0.5	0.1
18195	Zinc	mg/L	<0.01		3
18195	Aluminium	mg/L	<0.05		0.2
18195	Boron	mg/L	1.3	4	
18195	Copper	mg/L	<0.03	2	1

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

Lab use Only: TE 3243.00 TC 19.43 TA 19.17 Imb 0.25 A I/C 0.67

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, Total Dissolved Solids and pH.
Unsuitable for irrigation (IC, IL). Consult DPI.
Suitable for all stock.

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

17NA9892

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27-Sep-2017

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Standard Chemical Analysis – Roma Bore 11

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

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

ATTN: B Godford

Laboratory Reference : SSP0056704
Client Order No. : GODFORD_B
Date Received : 08-Sep-2017
Laboratory Number : 17NA9878
Batch No : 048-07

Client Reference : **BORE_11**
Date Sampled : **30-Aug-2017**
Sample Source : **Bore**
Sample Point : **Roma Bore 11**
Further Information: : **Raw**

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment :
Scheme/Job/Survey :
Sampler :

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	**1180**		
18226	pH	at 22°C	**8.84**		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	**4.5**		200
18209	Temporary Hardness*	mg $CaCO_3$/L	**4.5**		
18208	Alkalinity	mg $CaCO_3$/L	**369**		
18209	Residual Alkalinity*	meq/L	**7.3**		
18195	Silica	mg/L	**19**		80
18209	Total Dissolved Ions*	mg/L	**895**		
18209	Total Dissolved Solids*	mg/L	**704**		600
18206	True Colour	Hazen	**1**		15
18212	Turbidity	NTU	**<1**		5
18209	pH Sat.* (calc. for $CaCO_3$)		**8.7**		
18209	Saturation Index*		**0.2**		
18209	Mole Ratio*		**1.0**		
18209	Sodium Absorpt. Ratio*		**57**		
18209	Figure of Merit Ratio*		**0.0**		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	**280**		180
18195	Potassium	mg/L	**1.0**		
18195	Calcium	mg/L	**1.7**		
18195	Magnesium	mg/L	**< 0.1**		
18209	Hydrogen*	mg/L	**0.0**		
	ANIONS				
18209	Bicarbonate*	mg/L	**412**		
18209	Carbonate*	mg/L	**19**		
18209	Hydroxide*	mg/L	**0.1**		
18204	Chloride	mg/L	**120**		250
18204	Fluoride	mg/L	**0.23**	1.5	
18204	Nitrate	mg/L	**<0.5**	50	
18204	Sulphate	mg/L	**62**	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	**0.02**		0.3
18195	Manganese	mg/L	**<0.01**	0.5	0.1
18195	Zinc	mg/L	**<0.01**		3
18195	Aluminium	mg/L	**<0.05**		0.2
18195	Boron	mg/L	**0.22**	4	
18195	Copper	mg/L	**<0.03**	2	1

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

Lab use Only: TE 2052.00 TC 12.34 TA 12.01 Imb 0.33 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.
Unsuitable for irrigation (IB, IL). Consult DPI.
Suitable for all stock.

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

17NA9878

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Standard Chemical Analysis – Roma Bore 13

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

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

ATTN: B Godford

Laboratory Reference : SSP0056704
Client Order No. : GODFORD_B
Date Received : 08-Sep-2017
Laboratory Number : 17NA9876
Batch No : 048-05

Client Reference : **BORE_13**
Date Sampled : **30-Aug-2017**
Sample Source : **Bore**
Sample Point : **Roma Bore 13**
Further Information: : **Raw**

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment :
Scheme/Job/Survey :
Sampler :

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	883		
18226	pH	at 22°C	8.91		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	3.3		200
18209	Temporary Hardness*	mg $CaCO_3$/L	3.3		
18208	Alkalinity	mg $CaCO_3$/L	332		
18209	Residual Alkalinity*	meq/L	6.6		
18195	Silica	mg/L	18		80
18209	Total Dissolved Ions*	mg/L	683		
18209	Total Dissolved Solids*	mg/L	529		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*		0.5		
18209	Sodium Absorpt. Ratio*		51		
18209	Figure of Merit Ratio*		0.0		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	210		180
18195	Potassium	mg/L	0.8		
18195	Calcium	mg/L	1.3		
18195	Magnesium	mg/L	< 0.1		
18209	Hydrogen*	mg/L	0.0		
	ANIONS				
18209	Bicarbonate*	mg/L	338		
18209	Carbonate*	mg/L	33		
18209	Hydroxide*	mg/L	0.2		
18204	Chloride	mg/L	65		250
18204	Fluoride	mg/L	0.16	1.5	
18204	Nitrate	mg/L	<0.5	50	
18204	Sulphate	mg/L	31	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	<0.01		0.3
18195	Manganese	mg/L	<0.01	0.5	0.1
18195	Zinc	mg/L	<0.01		3
18195	Aluminium	mg/L	<0.05		0.2
18195	Boron	mg/L	0.09	4	
18195	Copper	mg/L	<0.03	2	1

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

Lab use Only: TE 1576.00 TC 9.35 TA 9.14 Imb 0.21 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.
Unsuitable for irrigation (IB, IL). Consult DPI.
Suitable for all stock.

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

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Standard Chemical Analysis – Roma Bore 14

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

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

ATTN: B Godford

Laboratory Reference : SSP0056704
Client Order No. : GODFORD_B
Date Received : 08-Sep-2017
Laboratory Number : 17NA9895
Batch No : 048-24

Client Reference : **BORE_14**
Date Sampled : **30-Aug-2017**
Sample Source : **Bore**
Sample Point : **Roma Bore 14**
Further Information: : **Raw**

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment :
Scheme/Job/Survey :
Sampler :

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	810		
18226	pH	at 22°C	8.87		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	333		
18209	Residual Alkalinity*	meq/L	6.6		
18195	Silica	mg/L	18		80
18209	Total Dissolved Ions*	mg/L	657		
18209	Total Dissolved Solids*	mg/L	488		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*		0.7		
18209	Sodium Absorpt. Ratio*		49		
18209	Figure of Merit Ratio*		0.0		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	200		180
18195	Potassium	mg/L	0.8		
18195	Calcium	mg/L	1.2		
18195	Magnesium	mg/L	< 0.1		
18209	Hydrogen*	mg/L	0.0		
	ANIONS				
18209	Bicarbonate*	mg/L	368		
18209	Carbonate*	mg/L	18		
18209	Hydroxide*	mg/L	0.1		
18204	Chloride	mg/L	50		250
18204	Fluoride	mg/L	0.17	1.5	
18204	Nitrate	mg/L	<0.5	50	
18204	Sulphate	mg/L	21	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	<0.01		0.3
18195	Manganese	mg/L	<0.01	0.5	0.1
18195	Zinc	mg/L	<0.01		3
18195	Aluminium	mg/L	<0.05		0.2
18195	Boron	mg/L	0.08	4	
18195	Copper	mg/L	<0.03	2	1

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

Lab use Only: TE 1464.00 TC 8.65 TA 8.52 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 Sodium and pH.
Unsuitable for irrigation (IB, IL). Consult DPI.
Suitable for all stock.

NATA Accredited Laboratory 61 Accredited for compliance with ISO/IEC 17025.

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17NA9895

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Standard Chemical Analysis – Roma Bore 15

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

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

ATTN: B Godford

Laboratory Reference : SSP0056704
Client Order No. : GODFORD_B
Date Received : 08-Sep-2017
Laboratory Number : 17NA9877
Batch No : 048-06

Client Reference : **BORE_15**
Date Sampled : **30-Aug-2017**
Sample Source : **Bore**
Sample Point : **Roma Bore 15**
Further Information: : **Raw**

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment :
Scheme/Job/Survey :
Sampler :

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	**890**		
18226	pH	at 22°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	**359**		
18209	Residual Alkalinity*	meq/L	**7.1**		
18195	Silica	mg/L	**19**		80
18209	Total Dissolved Ions*	mg/L	**719**		
18209	Total Dissolved Solids*	mg/L	**535**		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*		**0.7**		
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	**0.9**		
18195	Calcium	mg/L	**1.2**		
18195	Magnesium	mg/L	**< 0.1**		
18209	Hydrogen*	mg/L	**0.0**		
	ANIONS				
18209	Bicarbonate*	mg/L	**398**		
18209	Carbonate*	mg/L	**20**		
18209	Hydroxide*	mg/L	**0.1**		
18204	Chloride	mg/L	**63**		250
18204	Fluoride	mg/L	**0.17**	1.5	
18204	Nitrate	mg/L	**<0.5**	50	
18204	Sulphate	mg/L	**19**	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	**<0.01**		0.3
18195	Manganese	mg/L	**<0.01**	0.5	0.1
18195	Zinc	mg/L	**<0.01**		3
18195	Aluminium	mg/L	**<0.05**		0.2
18195	Boron	mg/L	**0.12**	4	
18195	Copper	mg/L	**<0.03**	2	1

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

Lab use Only: TE 1600.00 TC 9.52 TA 9.36 Imb 0.16 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.
Unsuitable for irrigation (IB, IL). Consult DPI.
Suitable for all stock.

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

17NA9877

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Standard Chemical Analysis – Roma Bore 16

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

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

ATTN: B Godford

Laboratory Reference : SSP0056704
Client Order No. : GODFORD_B
Date Received : 08-Sep-2017
Laboratory Number : 17NA9894
Batch No : 048-23

Client Reference : **BORE_16**
Date Sampled : **30-Aug-2017**
Sample Source : **Bore**
Sample Point : **Roma Bore 16**
Further Information: : **Raw**

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment :
Scheme/Job/Survey :
Sampler :

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	**1020**		
18226	pH	at 22°C	**8.89**		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	**4.2**		200
18209	Temporary Hardness*	mg $CaCO_3$/L	**4.2**		
18208	Alkalinity	mg $CaCO_3$/L	**312**		
18209	Residual Alkalinity*	meq/L	**6.1**		
18195	Silica	mg/L	**19**		80
18209	Total Dissolved Ions*	mg/L	**753**		
18209	Total Dissolved Solids*	mg/L	**597**		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*		**1.0**		
18209	Sodium Absorpt. Ratio*		**49**		
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	**0.9**		
18195	Calcium	mg/L	**1.6**		
18195	Magnesium	mg/L	**< 0.1**		
18209	Hydrogen*	mg/L	**0.0**		
	ANIONS				
18209	Bicarbonate*	mg/L	**344**		
18209	Carbonate*	mg/L	**18**		
18209	Hydroxide*	mg/L	**0.1**		
18204	Chloride	mg/L	**93**		250
18204	Fluoride	mg/L	**0.17**	1.5	
18204	Nitrate	mg/L	**<0.5**	50	
18204	Sulphate	mg/L	**66**	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	**<0.01**		0.3
18195	Manganese	mg/L	**<0.01**	0.5	0.1
18195	Zinc	mg/L	**<0.01**		3
18195	Aluminium	mg/L	**<0.05**		0.2
18195	Boron	mg/L	**0.14**	4	
18195	Copper	mg/L	**<0.03**	2	1

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

Lab use Only: TE 1772.00 TC 10.07 TA 10.25 Imb 0.18 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.
Unsuitable for irrigation (IB, IL). Consult DPI.
Suitable for all stock.

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

17NA9894

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Standard Chemical Analysis – Roma Bore 17

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

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

ATTN: B Godford

Laboratory Reference : SSP0056704
Client Order No. : GODFORD_B
Date Received : 08-Sep-2017
Laboratory Number : 17NA9893
Batch No : 048-22

Client Reference : **BORE_17**
Date Sampled : **30-Aug-2017**
Sample Source : **Bore**
Sample Point : **Roma Bore17**
Further Information: : **Raw**

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment :
Scheme/Job/Survey :
Sampler :

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	951		
18226	pH	at 22°C	8.33		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	300		
18209	Residual Alkalinity*	meq/L	5.9		
18195	Silica	mg/L	20		80
18209	Total Dissolved Ions*	mg/L	727		
18209	Total Dissolved Solids*	mg/L	568		600
18206	True Colour	Hazen	<1		15
18212	Turbidity	NTU	<1		5
18209	pH Sat.* (calc. for $CaCO_3$)		8.9		
18209	Saturation Index*		-0.5		
18209	Mole Ratio*		1.4		
18209	Sodium Absorpt. Ratio*		51		
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	0.9		
18195	Calcium	mg/L	1.3		
18195	Magnesium	mg/L	< 0.1		
18209	Hydrogen*	mg/L	0.0		
	ANIONS				
18209	Bicarbonate*	mg/L	354		
18209	Carbonate*	mg/L	5.7		
18209	Hydroxide*	mg/L	0.0		
18204	Chloride	mg/L	87		250
18204	Fluoride	mg/L	0.15	1.5	
18204	Nitrate	mg/L	<0.5	50	
18204	Sulphate	mg/L	62	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	<0.01		0.3
18195	Manganese	mg/L	<0.01	0.5	0.1
18195	Zinc	mg/L	<0.01		3
18195	Aluminium	mg/L	<0.05		0.2
18195	Boron	mg/L	0.09	4	
18195	Copper	mg/L	<0.03	2	1

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

Lab use Only: TE 1669.00 TC 9.53 TA 9.73 Imb 0.20 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.
Unsuitable for irrigation (IB, IL). Consult DPI.
Suitable for all stock.

NATA Accredited Laboratory 61 Accredited for compliance with ISO/IEC 17025.

17NA9893

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Standard Chemical Analysis – Roma Bore 18

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

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

ATTN: B Godford

Laboratory Reference : SSP0056704
Client Order No. : GODFORD_B
Date Received : 08-Sep-2017
Laboratory Number : 17NA9890
Batch No : 048-19

Client Reference : **BORE_18**
Date Sampled : **30-Aug-2017**
Sample Source : **Bore**
Sample Point : **Roma Bore 18**
Further Information: : **Raw**

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment :
Scheme/Job/Survey :
Sampler :

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	**793**		
18226	pH	at 22°C	**8.91**		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	**637**		
18209	Total Dissolved Solids*	mg/L	**478**		600
18206	True Colour	Hazen	**2**		15
18212	Turbidity	NTU	**<1**		5
18209	pH Sat.* (calc. for $CaCO_3$)		**8.9**		
18209	Saturation Index*		**0.0**		
18209	Mole Ratio*		**0.6**		
18209	Sodium Absorpt. Ratio*		**47**		
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	**0.8**		
18195	Calcium	mg/L	**1.3**		
18195	Magnesium	mg/L	**< 0.1**		
18209	Hydrogen*	mg/L	**0.0**		
	ANIONS				
18209	Bicarbonate*	mg/L	**350**		
18209	Carbonate*	mg/L	**21**		
18209	Hydroxide*	mg/L	**0.1**		
18204	Chloride	mg/L	**48**		250
18204	Fluoride	mg/L	**0.15**	1.5	
18204	Nitrate	mg/L	**<0.5**	50	
18204	Sulphate	mg/L	**23**	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	**<0.01**		0.3
18195	Manganese	mg/L	**<0.01**	0.5	0.1
18195	Zinc	mg/L	**<0.01**		3
18195	Aluminium	mg/L	**<0.05**		0.2
18195	Boron	mg/L	**0.06**	4	
18195	Copper	mg/L	**<0.03**	2	1

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

Lab use Only: TE 1433.00 TC 8.48 TA 8.28 Imb 0.20 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.
Unsuitable for irrigation (IB, IL). Consult DPI.
Suitable for all stock.

NATA Accredited Laboratory 41 Accredited for compliance with ISO/IEC 17025.
17NA9890

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Standard Chemical Analysis – Surat Treated Water

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

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

ATTN: B Godford

Laboratory Reference : SSP0056704
Client Order No. : GODFORD_B
Date Received : 08-Sep-2017
Laboratory Number : 17NA9874
Batch No : 048-03

Client Reference : **SURAT_TREAT**
Date Sampled : **29-Aug-2017**
Sample Source : **River**
Sample Point : **Surat**

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment : **Treated**
Scheme/Job/Survey :
Sampler :

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	246		
18226	pH	at 22°C	7.75		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	63		200
18209	Temporary Hardness*	mg $CaCO_3$/L	63		
18208	Alkalinity	mg $CaCO_3$/L	69		
18209	Residual Alkalinity*	meq/L	0.1		
18195	Silica	mg/L	16		80
18209	Total Dissolved Ions*	mg/L	167		
18209	Total Dissolved Solids*	mg/L	140		600
18206	True Colour	Hazen	3		15
18212	Turbidity	NTU	<1		5
18209	pH Sat.* (calc. for $CaCO_3$)		8.4		
18209	Saturation Index*		-0.7		
18209	Mole Ratio*		2.3		
18209	Sodium Absorpt. Ratio*		1.2		
18209	Figure of Merit Ratio*		1.3		

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
	CATIONS				
18195	Sodium	mg/L	22		180
18195	Potassium	mg/L	5.1		
18195	Calcium	mg/L	15		
18195	Magnesium	mg/L	5.9		
18209	Hydrogen*	mg/L	0.0		
	ANIONS				
18209	Bicarbonate*	mg/L	84		
18209	Carbonate*	mg/L	0.3		
18209	Hydroxide*	mg/L	0.0		
18204	Chloride	mg/L	28		250
18204	Fluoride	mg/L	0.11	1.5	
18204	Nitrate	mg/L	1.7	50	
18204	Sulphate	mg/L	4	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	<0.01		0.3
18195	Manganese	mg/L	<0.01	0.5	0.1
18195	Zinc	mg/L	<0.01		3
18195	Aluminium	mg/L	<0.05		0.2
18195	Boron	mg/L	0.04	4	
18195	Copper	mg/L	<0.03	2	1

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

Lab use Only: TE 447.00 TC 2.35 TA 2.30 Imb 0.05 A I/C 0.51

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.
Suitable for irrigation of all crops except tobacco.
Suitable for all stock.

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

17NA9874

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Standard Chemical Analysis – Wallumbilla Bore 1

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

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

ATTN: B Godford

Laboratory Reference : SSP0056704
Client Order No. : GODFORD_B
Date Received : 08-Sep-2017
Laboratory Number : 17NA9886
Batch No : 048-15

Client Reference : **WB_1**
Date Sampled : **14-Aug-2017**
Sample Source : **Bore**
Sample Point : **Wallumbilla Bore 1**
Further Information: : **Raw**

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment :
Scheme/Job/Survey :
Sampler :

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	1530		
18226	pH	at 22°C	8.70		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	6.6		200
18209	Temporary Hardness*	mg $CaCO_3$/L	6.6		
18208	Alkalinity	mg $CaCO_3$/L	557		
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	896		600
18206	True Colour	Hazen	2		15
18212	Turbidity	NTU	<1		5
18209	pH Sat.* (calc. for $CaCO_3$)		8.4		
18209	Saturation Index*		0.3		
18209	Mole Ratio*		1.2		
18209	Sodium Absorpt. Ratio*		63		
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	2.3		
18195	Magnesium	mg/L	0.2		
18209	Hydrogen*	mg/L	0.0		
	ANIONS				
18209	Bicarbonate*	mg/L	642		
18209	Carbonate*	mg/L	18		
18209	Hydroxide*	mg/L	0.1		
18204	Chloride	mg/L	170		250
18204	Fluoride	mg/L	0.39	1.5	
18204	Nitrate	mg/L	<0.5	50	
18204	Sulphate	mg/L	7	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	0.03		0.3
18195	Manganese	mg/L	<0.01	0.5	0.1
18195	Zinc	mg/L	<0.01		3
18195	Aluminium	mg/L	<0.05		0.2
18195	Boron	mg/L	0.56	4	
18195	Copper	mg/L	<0.03	2	1

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

Lab use Only: TE 2682.00 TC 16.21 TA 16.03 Imb 0.18 A IC 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.
Unsuitable for irrigation (IC, IL). Consult DPI.
Suitable for all stock.

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

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Standard Chemical Analysis – Yuleba Bore 1

Queensland Government

Forensic and Scientific Services
HealthSupport Queensland

CERTIFICATE OF ANALYSIS

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

ATTN: B Godford

Laboratory Reference : SSP0056704
Client Order No. : GODFORD_B
Date Received : 08-Sep-2017
Laboratory Number : 17NA9887
Batch No : 048-16

Client Reference : **YR**
Date Sampled : **14-Aug-2017**
Sample Source : **Reticulated**
Sample Point : **Yuleba Retic**
Further Information: :

Submitting Authority : **Maranoa Regional Council**
Reason for Analysis : **Compliance**
Water Treatment : **Chlorinated**
Scheme/Job/Survey :
Sampler :

Method		Units	Result	Guidelines ** Health	Guidelines ** Aesthetic
18320	Conductivity @ 25°C	µs/cm	**1560**		
18226	pH	at 22°C	**8.75**		6.5 - 8.5
18209	Total Hardness*	mg $CaCO_3$/L	**4.3**		200
18209	Temporary Hardness*	mg $CaCO_3$/L	**4.3**		
18208	Alkalinity	mg $CaCO_3$/L	**522**		
18209	Residual Alkalinity*	meq/L	**10**		
18195	Silica	mg/L	**17**		80
18209	Total Dissolved Ions*	mg/L	**1190**		
18209	Total Dissolved Solids*	mg/L	**910**		600
18206	True Colour	Hazen	**1**		15
18212	Turbidity	NTU	**<1**		5
18209	pH Sat.* (calc. for $CaCO_3$)		**8.6**		
18209	Saturation Index*		**0.2**		
18209	Mole Ratio*		**1.1**		
18209	Sodium Absorpt. Ratio*		**77**		
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	**1.5**		
18195	Magnesium	mg/L	**0.1**		
18209	Hydrogen*	mg/L	**0.0**		
	ANIONS				
18209	Bicarbonate*	mg/L	**588**		
18209	Carbonate*	mg/L	**24**		
18209	Hydroxide*	mg/L	**0.1**		
18204	Chloride	mg/L	**190**		250
18204	Fluoride	mg/L	**0.54**	1.5	
18204	Nitrate	mg/L	**< 1**	50	
18204	Sulphate	mg/L	**17**	500	250
	OTHER DISSOLVED ELEMENTS				
18195	Iron	mg/L	**0.03**		0.3
18195	Manganese	mg/L	**<0.01**	0.5	0.1
18195	Zinc	mg/L	**<0.01**		3
18195	Aluminium	mg/L	**<0.05**		0.2
18195	Boron	mg/L	**0.59**	4	
18195	Copper	mg/L	**<0.03**	2	1

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

Lab use Only: TE 2714.00 TC 16.12 TA 16.23 Imb 0.11 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.
Unsuitable for irrigation (IC, IL). Consult DPI.
Suitable for all stock.

NATA Accredited Laboratory 49 Accredited for compliance with ISO/IEC 17025.

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THM Analysis – Surat Potable Water

Sample Description					Surat
Method	**Trihalomethanes**	**Health Value**	**Units**	**Reporting Limit**	**17KE6870**
28017	Chloroform		µg/L	1	**91**
28017	Bromodichloromethane		µg/L	1	**28**
28017	Dibromochloromethane		µg/L	1	**6**
28017	Bromoform		µg/L	1	< 1
28017	Total Trihalomethanes	250	µg/L	4	**120**

Pesticide Analysis (Surat River)

Method	Organochlorine Pesticides	Health Value	Units	Reporting Limit	17KE6869	17KE6870
16315	Aldrin	0.3	µg/L	0.1	< 0.2	< 0.2
16315	Dieldrin	0.3	µg/L	0.1	< 0.2	< 0.2
16315	Total Aldrin & Dieldrin	0.3	µg/L	0.2	< 0.4	< 0.4
16315	Chlordane cis	2	µg/L	0.1	< 0.2	< 0.2
16315	Chlordane trans	2	µg/L	0.1	< 0.2	< 0.2
16315	Total Chlordane	2	µg/L	0.2	< 0.4	< 0.4
16315	Chlordene		µg/L	0.1	< 0.2	< 0.2
16315	Chlordene epoxide		µg/L	0.1	< 0.2	< 0.2
16315	Chlordene-1-hydroxy		µg/L	0.1	< 0.2	< 0.2
16315	Chlordene-1-hydroxy-2,3-epoxide		µg/L	0.1	< 0.2	< 0.2
16315	DDD (pp)	9	µg/L	0.1	< 0.2	< 0.2
16315	DDE (pp)	9	µg/L	0.1	< 0.2	< 0.2
16315	DDT (op)	9	µg/L	0.1	< 2.0	< 1.9
16315	DDT (pp)	9	µg/L	0.1	< 2.0	< 1.9
16315	Total DDT	9	µg/L	0.4	< 4.7	< 4.7
16315	DDD (op)		µg/L	0.1	< 0.2	< 0.2
16315	DDE (op)		µg/L	0.1	< 0.2	< 0.2
16315	Dicofol	4	µg/L	1.5	< 2.9	< 2.9
16315	α-Endosulfan	20	µg/L	0.5	< 1	< 1
16315	β-Endosulfan	20	µg/L	0.1	< 0.2	< 0.2
16315	Endosulfan sulfate	20	µg/L	0.1	< 0.2	< 0.2
16315	Total Endosulfan	20	µg/L	0.7	< 1.4	< 1.4
16315	Endosulfan ether		µg/L	0.1	< 0.2	< 0.2
16315	Endosulfan lactone		µg/L	0.5	< 1	< 1

Method	Organochlorine Pesticides (cont.)	Health Value	Units	Reporting Limit	17KE6869	17KE6870
16315	Endrin		µg/L	0.2	< 0.4	< 0.4
16315	Endrin aldehyde		µg/L	0.1	< 0.2	< 0.2
16315	HCB		µg/L	0.2	< 0.4	< 0.4
16315	α-HCH		µg/L	0.1	< 0.2	< 0.2
16315	β-HCH		µg/L	0.1	< 0.2	< 0.2
16315	δ-HCH		µg/L	0.1	< 0.2	< 0.2
16315	Heptachlor	0.3	µg/L	0.1	< 0.2	< 0.2
16315	Heptachlor epoxide	0.3	µg/L	0.1	< 0.2	< 0.2
16315	Total Heptachlor	0.3	µg/L	0.2	< 0.4	< 0.4
16315	Lindane (γ-HCH)	10	µg/L	0.1	< 0.2	< 0.2
16315	Methoxychlor	300	µg/L	0.1	< 0.2	< 0.2
16315	Nonachlor cis		µg/L	0.1	< 0.2	< 0.2
16315	Nonachlor trans		µg/L	0.1	< 0.2	< 0.2
16315	Oxychlordane	2	µg/L	0.1	< 0.2	< 0.2

Method	Organophosphate Pesticides	Health Value	Units	Reporting Limit	17KE6869	17KE6870
16315	Azinphos-ethyl		µg/L	0.1	< 0.2	< 0.2
16315	Azinphos-methyl	30	µg/L	0.1	< 0.2	< 0.2
16315	Bromophos-ethyl	10	µg/L	0.1	< 0.2	< 0.2
16315	Cadusafos		µg/L	0.1	< 0.2	< 0.2
16315	Carbophenothion	0.5	µg/L	0.1	< 0.2	< 0.2
16315	Chlorfenvinphos	2	µg/L	0.1	< 0.2	< 0.2
16315	Chlorpyrifos	10	µg/L	0.1	< 0.2	< 0.2
16315	Chlorpyrifos-methyl		µg/L	0.1	< 0.2	< 0.2
16315	Chlorpyrifos oxon		µg/L	0.1	< 0.2	< 0.2
16315	Coumaphos		µg/L	0.1	< 0.2	< 0.2
16315	Demeton-O-methyl		µg/L	0.1	< 0.2	< 0.2
16315	Demeton-S		µg/L	0.1	< 0.2	< 0.2
16315	Demeton-S-methyl		µg/L	0.1	< 0.2	< 0.2
16315	Diazinon	4	µg/L	0.1	< 0.2	< 0.2
16315	Dichlorvos	5	µg/L	0.1	< 0.2	< 0.2
16315	Dimethoate	7	µg/L	0.1	< 0.2	< 0.2
16315	Omethoate	1	µg/L	0.2	< 0.4	< 0.4
16315	Total Dimethoate	7	µg/L	0.3	< 0.6	< 0.6
16315	Dioxathion		µg/L	0.1	< 0.2	< 0.2
16315	Disulfoton	4	µg/L	0.1	< 0.2	< 0.2
16315	Ethion	4	µg/L	0.1	< 0.2	< 0.2
16315	Ethoprophos	1	µg/L	0.1	< 0.2	< 0.2
16315	Etrimphos		µg/L	0.1	< 0.2	< 0.2
16315	Famphur		µg/L	0.1	< 0.2	< 0.2
16315	Fenamiphos	0.5	µg/L	0.1	< 0.2	< 0.2
16315	Fenchlorphos	30	µg/L	0.1	< 0.2	< 0.2
16315	Fenitrothion	7	µg/L	0.1	< 0.2	< 0.2
16315	Fenthion-ethyl		µg/L	0.1	< 0.2	< 0.2
16315	Fenthion (methyl)	7	µg/L	0.1	< 0.2	< 0.2

Method	Organophosphate Pesticides (cont.)	Health Value	Units	Reporting Limit	17KE6869	17KE6870
16315	Isofenphos		µg/L	0.1	< 0.2	< 0.2
16315	Malathion (Maldison)	70	µg/L	0.1	< 0.2	< 0.2
16315	Methidathion	6	µg/L	0.1	< 0.2	< 0.2
16315	Mevinphos	5	µg/L	0.1	< 0.2	< 0.2
16315	Monocrotophos	2	µg/L	0.1	< 0.2	< 0.2
16315	Oxydemeton-methyl		µg/L	0.2	< 0.4	< 0.4
16315	Parathion (ethyl)	20	µg/L	0.1	< 0.2	< 0.2
16315	Parathion-methyl	0.7	µg/L	0.1	< 0.2	< 0.2
16315	Phorate		µg/L	0.1	< 0.2	< 0.2
16315	Phosmet		µg/L	0.1	< 0.2	< 0.2
16315	Phosphamidon		µg/L	0.1	< 0.2	< 0.2
16315	Pirimiphos-methyl	90	µg/L	0.1	< 0.2	< 0.2
16315	Profenofos	0.3	µg/L	0.1	< 0.2	< 0.2
16315	Prothiofos		µg/L	0.1	< 0.2	< 0.2
16315	Pyrazophos	20	µg/L	0.1	< 0.2	< 0.2
16315	Sulprofos	10	µg/L	0.1	< 0.2	< 0.2
16315	Temephos	400	µg/L	0.1	< 2.0	< 1.9
16315	Terbufos	1	µg/L	0.1	< 0.2	< 0.2
16315	Tetrachlorvinphos	100	µg/L	0.1	< 0.2	< 0.2

Method	Herbicides by LCMS	Health Value	Units	Reporting Limit	17KE6869	17KE6870
16315	Ametryn	70	µg/L	0.01	< 0.02	< 0.02
16315	Atrazine	20	µg/L	0.01	**0.15**	**0.15**
16315	Bromacil	400	µg/L	0.01	< 0.02	< 0.02
16315	Desethyl Atrazine		µg/L	0.01	**0.04**	**0.04**
16315	Desisopropyl Atrazine		µg/L	0.02	< 0.04	< 0.04
16315	Diuron	20	µg/L	0.01	**0.06**	< 0.02
16315	Fluometuron	70	µg/L	0.02	< 0.04	< 0.04
16315	Hexazinone	400	µg/L	0.01	< 0.02	< 0.02
16315	Imidacloprid		µg/L	0.01	< 0.02	< 0.02
16315	Metolachlor	300	µg/L	0.01	**0.37**	**0.38**
16315	Prometryn		µg/L	0.01	< 0.02	< 0.02
16315	Simazine	20	µg/L	0.01	< 0.02	< 0.02
16315	Tebuthiuron		µg/L	0.01	**0.06**	**0.06**
16315	Terbutryn	400	µg/L	0.01	< 0.02	< 0.02

Method	Herbicides by GCMS	Health Value	Units	Reporting Limit	17KE6869	17KE6870
16315	Amitraz	9	µg/L	0.1	< 0.2	< 0.2
16315	3,4-Dichloroaniline		µg/L	0.1	< 0.2	< 0.2
16315	Diclofop-methyl	5	µg/L	0.1	< 0.2	< 0.2
16315	Fluazifop-butyl		µg/L	0.1	< 0.2	< 0.2
16315	Haloxyfop-2-etotyl	1	µg/L	0.1	< 0.2	< 0.2
16315	Haloxyfop-methyl	1	µg/L	0.1	< 0.2	< 0.2
16315	Metribuzin	70	µg/L	0.1	< 0.2	< 0.2
16315	Molinate	4	µg/L	0.1	< 0.2	< 0.2
16315	Oxyfluorfen		µg/L	0.1	< 0.2	< 0.2
16315	Pendimethalin	400	µg/L	0.1	< 0.2	< 0.2
16315	Propanil	700	µg/L	0.1	< 0.2	< 0.2
16315	Propazine	50	µg/L	0.1	< 0.2	< 0.2
16315	Terbuthylazine	10	µg/L	0.1	< 0.2	< 0.2
16315	Triallate		µg/L	0.1	< 0.2	< 0.2
16315	Trifluralin	90	µg/L	0.1	< 0.2	< 0.2

Method	Other Pesticides	Health Value	Units	Reporting Limit	17KE6869	17KE6870
16315	Benalaxyl		µg/L	0.1	< 0.2	< 0.2
16315	Bendiocarb		µg/L	0.1	< 0.2	< 0.2
16315	Bitertanol		µg/L	0.1	< 0.2	< 0.2
16315	Captan	400	µg/L	0.1	< 2.0	< 1.9
16315	Carbaryl	30	µg/L	0.1	< 0.2	< 0.2
16315	DEET		µg/L	0.1	< 0.2	< 0.2
16315	Dimethomorph		µg/L	0.2	< 0.4	< 0.4
16315	Fipronil	0.7	µg/L	0.1	< 0.2	< 0.2
16315	Flutriafol		µg/L	0.1	< 0.2	< 0.2
16315	Furalaxyl		µg/L	0.1	< 0.2	< 0.2
16315	Metalaxyl		µg/L	0.1	< 0.2	< 0.2
16315	Methoprene		µg/L	0.1	< 0.2	< 0.2
16315	Oxadiazon		µg/L	0.1	< 0.2	< 0.2
16315	Piperonyl butoxide	600	µg/L	0.1	< 0.2	< 0.2
16315	Pirimicarb	7	µg/L	0.2	< 0.4	< 0.4
16315	Praziquantel		µg/L	0.1	< 0.2	< 0.2
16315	Procymidone		µg/L	0.1	< 0.2	< 0.2
16315	Propargite	7	µg/L	0.1	< 0.2	< 0.2
16315	Propiconazole	100	µg/L	0.1	< 0.2	< 0.2
16315	Propoxur		µg/L	0.1	< 0.2	< 0.2
16315	Rotenone		µg/L	0.1	< 2.0	< 1.9
16315	Tebuconazole		µg/L	0.1	< 0.2	< 0.2
16315	Tetradifon		µg/L	0.1	< 0.2	< 0.2
16315	Thiabendazole		µg/L	0.2	< 0.4	< 0.4
16315	Triadimefon	90	µg/L	0.1	< 0.2	< 0.2
16315	Triadimenol		µg/L	0.1	< 0.2	< 0.2
16315	Total Triadimefon	90	µg/L	0.3	< 0.6	< 0.6
16315	Vinclozolin		µg/L	0.1	< 0.2	< 0.2

Method	Synthetic Pyrethroids	Health Value	Units	Reporting Limit	17KE6869	17KE6870
16315	Bifenthrin		µg/L	0.1	< 0.2	< 0.2
16315	Bioresmethrin	100	µg/L	0.1	< 0.2	< 0.2
16315	Cyfluthrin	50	µg/L	0.1	< 0.2	< 0.2
16315	Cyhalothrin		µg/L	0.1	< 0.2	< 0.2
16315	Cypermethrin	200	µg/L	0.1	< 0.2	< 0.2
16315	Deltamethrin	40	µg/L	0.1	< 0.2	< 0.2
16315	Fenvalerate	60	µg/L	0.1	< 0.2	< 0.2
16315	Fluvalinate		µg/L	0.1	< 0.2	< 0.2
16315	Permethrin	200	µg/L	0.1	< 0.2	< 0.2
16315	Phenothrin		µg/L	0.1	< 0.2	< 0.2
16315	Tetramethrin		µg/L	0.1	< 0.2	< 0.2
16315	Transfluthrin		µg/L	0.1	< 0.2	< 0.2

Method	Other Compounds	Units	Reporting Limit	17KE6869	17KE6870
16315	Benzenesulfonanilide	µg/L	0.2	< 0.4	< 0.4
16315	1H-Benzotriazole	µg/L	0.7	< 1.4	< 1.4
16315	1H-Benzotriazole, 1-methyl	µg/L	0.1	< 0.2	< 0.2
16315	1H-Benzotriazole, 5-methyl	µg/L	0.2	< 0.4	< 0.4
16315	2-Benzyl-4-chlorophenol	µg/L	0.2	< 0.4	< 0.4
16315	4-Chloro-3,5-dimethylphenol	µg/L	0.1	< 0.2	< 0.2
16315	2,4-Di-t-butylphenol	µg/L	0.1	< 0.2	< 0.2
16315	2,6-Di-t-butylphenol	µg/L	0.3	< 0.2	< 0.2
16315	2,6-Di-t-butyl-p-cresol (BHT)	µg/L	0.1	< 0.2	< 0.2
16315	Galaxolide	µg/L	0.1	< 0.2	< 0.2
16315	Icaridin	µg/L	0.1	< 0.2	< 0.2
16315	Moclobemide	µg/L	1	< 2.0	< 1.9
16315	Musk Ketone	µg/L	0.1	< 0.2	< 0.2
16315	Musk Xylene	µg/L	0.1	< 0.2	< 0.2
16315	N-Butylbenzenesulfonamide	µg/L	0.1	< 0.2	< 0.2
16315	N-Butyltoluenesulfonamide	µg/L	0.1	< 0.2	< 0.2
16315	Tonalid	µg/L	0.1	< 0.2	< 0.2
16315	Triclosan	µg/L	0.1	< 0.2	< 0.2
16315	Triclosan methyl ether	µg/L	0.1	< 0.2	< 0.2
16315	Tri-n-butyl phosphate	µg/L	0.1	< 0.2	< 0.2
16315	Triethyl phosphate	µg/L	0.1	< 0.2	< 0.2
16315	Tris(chloroethyl) phosphate	µg/L	0.1	< 0.2	< 0.2
16315	Tris(chloropropyl) phosphate isomers	µg/L	0.1	< 0.2	< 0.2
16315	Tris(dichloropropyl) phosphate	µg/L	0.1	< 0.2	< 0.2

Table 3 - Reticulation *E. coli* verification monitoring

Drinking water scheme: Amby

Year	***2016/17***											
Month	***July***	***Aug***	***Sept***	***Oct***	***Nov***	***Dec***	***Jan***	***Feb***	***Mar***	***Apr***	***May***	***June***
No. of samples collected	3	2	2	2	2	2	2	2	2	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	47	45	43	41	39	37	35	33	31	31	31	31
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	*2016/17*											
Month	***July***	***Aug***	***Sept***	***Oct***	***Nov***	***Dec***	***Jan***	***Feb***	***Mar***	***Apr***	***May***	***June***
No. of samples collected	5	8	8	8	8	8	8	8	6	7	7	7
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	95	95	87	87	87	87	87	87	85	85	85	88
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	*2016/17*											
Month	***July***	***Aug***	***Sept***	***Oct***	***Nov***	***Dec***	***Jan***	***Feb***	***Mar***	***Apr***	***May***	***June***
No. of samples collected	2	1	1	1	1	2	2	2	2	2	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	24	23	22	21	20	20	20	20	20	20	20	20
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	*2016/17*											
Month	***July***	***Aug***	***Sept***	***Oct***	***Nov***	***Dec***	***Jan***	***Feb***	***Mar***	***Apr***	***May***	***June***
No. of samples collected	6	6	5	6	6	6	6	6	6	6	6	6
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	109	106	111	100	106	93	92	89	83	80	74	71
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	*2016/17*											
Month	***July***	***Aug***	***Sept***	***Oct***	***Nov***	***Dec***	***Jan***	***Feb***	***Mar***	***Apr***	***May***	***June***
No. of samples collected	2	2	2	2	2	2	2	2	2	2	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	20	20	22	20	22	22	24	24	24	24	22	24
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	*2016/17*											
Month	***July***	***Aug***	***Sept***	***Oct***	***Nov***	***Dec***	***Jan***	***Feb***	***Mar***	***Apr***	***May***	***June***
No. of samples collected	2	2	2	2	2	2	2	2	2	2	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	36	32	34	30	29	28	27	26	26	26
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	*2016/17*											
Month	***July***	***Aug***	***Sept***	***Oct***	***Nov***	***Dec***	***Jan***	***Feb***	***Mar***	***Apr***	***May***	***June***
No. of samples collected	65	67	44	65	52	49	42	74	67	52	69	59
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	255	311	346	402	443	482	512	556	605	637	684	705
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	*2016/17*											
Month	***July***	***Aug***	***Sept***	***Oct***	***Nov***	***Dec***	***Jan***	***Feb***	***Mar***	***Apr***	***May***	***June***
No. of samples collected	5	5	5	5	5	15	5	15	15	5	5	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	69	69	69	69	66	73	70	80	90	90	90	90
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	*2016/17*											
Month	***July***	***Aug***	***Sept***	***Oct***	***Nov***	***Dec***	***Jan***	***Feb***	***Mar***	***Apr***	***May***	***June***
No. of samples collected	4	2	2	2	2	4	4	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	48	46	44	42	40	40	40	40	40	40	40	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: Yuleba

Year	*2016/17*											
Month	***July***	***Aug***	***Sept***	***Oct***	***Nov***	***Dec***	***Jan***	***Feb***	***Mar***	***Apr***	***May***	***June***
No. of samples collected	4	2	2	2	2	4	4	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	48	46	44	42	40	40	40	40	40	40	40	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).

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 2017	(If implementing these actions will take longer than anticipated, please provide detail, as it may affect the approved DWQMP)
	Surat	*Filter Media Replacement*	*December 2016*	*Complete*	
	Surat	*Clarifier Upgrade & Tank Replacement*	*June 2017*	*Installed undergoing final commissioning*	
	Roma	*Hydrogeological Assessment*	*March 2017*	*Complete*	
	Roma	*Reservoir Sealing*	*June 2017*	*Complete*	