



Drinking Water Quality Management Plan Report Rockhampton Regional Council

SPID: 493

1 July 2020 to 30 June 2021

This report has been prepared in accordance with the Drinking Water Quality Management Plan Report Guidance Note.

Definitions and glossary of terms

ADWG	Australian Drinking Water Guidelines (2011). Published by the National Health and Medical Research Council of Australia
Ba/L	Becquerel per litre
	calcium carbonate
CCTV	Closed-circuit television
DNRME	Department of Natural Resources Mines and Energy
DWQMP	Drinking Water Quality Management Plan 2018 approved version
E coli	Escherichia coli a microorganism that may not directly represent a hazard
	to human health, but indicates the presence of recent faecal contamination
Event	means anything that has happened to FRW or FRW's water service that
	has escalated beyond FRW's ability to control and FRW believe, or are
	concerned, that public health may be adversely impacted as a result
FRW	Fitzroy River Water
Glenmore WTP	water treatment plant for the Rockhampton Water Supply Scheme
Incident	means non-compliance with water quality criteria, e.g. exceeding an ADWG
	health guideline value and the standards in the Public Health Regulation
	2005
LOR	limit of resolution
LSC	Livingstone Shire Council
mg/L	milligrams per litre
mg/L Pt-Co	milligrams per litre Platinum Cobalt
ML/d	Megalitres per day
MPN/100ml	most probable number per 100 millilitres
Mount Morgan W	/TP water treatment plant for the Mount Morgan Water Supply Scheme
N/A	Not applicable
NTU	Nephelometric turbidity units
PFOA	perfluorooctanoic acid
PFHxS	perfluorohexane sulfonate
PFOS	perfluorooctane sulfonate
Regulator	the chief executive of the DNRME is the Regulator under the Water Supply
D1 /1D	(Safety and Reliability) Act 2008
RMIP	Risk Management Improvement Program
RRC	Rockhampton Regional Council
RKK	Residual Risk Rating
SPID	service provider identification
ICU	true colour units
WSS	Water Supply Scheme
WIP	Water Treatment Plant
μg/L	micrograms per litre
μ5/cm	
<	less than
>	greater than

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1 Introduction

This is the Drinking Water Quality Management Plan (DWQMP) report for Rockhampton Regional Council (RRC) for the financial year 2020-21.

RRC via its commercial unit Fitzroy River Water (FRW) is a registered service provider with identification (SPID) number 493. RRC is operating under an approved DWQMP to ensure consistent supply of safe, high quality drinking water in order to protect public health. This is done through the proactive identification and minimisation of public health-related risks associated with the production and supply of drinking water.

This DWQMP report includes:

- the activities undertaken over the 2020-21 financial year in operating our drinking water service;
- a drinking water quality summary;
- a summary of our performance in implementing the approved DWQMP.

This report is submitted to the Regulator to fulfil our regulatory requirement, and is also made available to our customers through our website or for inspection upon request at council offices.

2 Summary of schemes operated

This report relates to the drinking water supply schemes which RRC owned and operated from 1 July 2020 to 30 June 2021. Table 1 lists the water supply schemes covered in this report.

The direct physical link of localities within the Livingstone Shire Council (LSC) to the Rockhampton Water Supply Scheme (WSS) means that some LSC communities are partially or fully served by the water infrastructure operated by RRC. Only the performance of water supply schemes for which RRC has ownership, operating and maintenance responsibility, that is, drinking water supplied to RRC ratepayers during this reporting period, is detailed in this report.

Scheme Name	Water Source	Treatment Process	Treatment Capacity	Serviced Population	Towns Supplied
Rockhampton (includes LSC)	Fitzroy River	Pre-oxidation (optional), coagulation, flocculation, sedimentation, filtration, pH correction and disinfection	120 ML/d	78,579 (113,335)	Rockhampton, Gracemere (Yeppoon, The Causeway, Kinka Beach, Zilzie, Emu Park, Keppel Sands, Nerimbera, The Caves, Etna Creek, Glenlee, Glendale, Rockyview, Mount Charlton)
Mount Morgan	Dee River	Coagulation, sedimentation, filtration, pH correction and disinfection	2.6 ML/d	2,930	Mount Morgan, Baree

Table 1 Summary of schemes

3 DWQMP implementation

The actions undertaken to implement the DWQMP are summarised below.

DWQMP updates

FRW staff meet every month to discuss water (and sewerage) issues. This provides the opportunity to refer to the DWQMP and emphasise the importance of using this plan. The monthly meetings are chaired by the Manager Fitzroy River Water.

One of the key agenda items in these monthly meetings is to report on the water quality performance of the two water supply schemes and the overall management of risks to water quality. The monthly meetings also report on the condition of the water sources (Fitzroy River and Dee River) and provide an update on projects and strategies that can directly or indirectly affect water quality.

RMIP implementation

Specific changes or improvements to the drinking water services provided by FRW have occurred via the implementation of the Risk Management Improvement Program (RMIP). Section 6 of the DWQMP details the three individual risks which were considered to be unacceptable levels of risk as they have a moderate Residual Risk Rating (RRR). The significant progress that has been made during this reporting period to mitigate these unacceptable risks is discussed in Table 2.

Scheme Name	Ref / Risk No.	Component	Event/Hazard	Improvement Actions	Target Date	Actions Taken To Date	Status and Revised Target Date	Responsible Officer
Rockhampton	R08	Source	Contamination of raw water with excessive EC or TDS	Continue to lobby the Regulator for tighter water quality limits on mine water discharges	Ongoing (as required)	As this is an ongoing matter, it is anticipated that the action will continue to form part of the RMIP.	Continuing as required	Manager Fitzroy River Water
Rockhampton	R30	Distribution	Inadequate security against deliberate act of sabotage or terrorism	Identify high risk sites and install CCTV at these sites	June 2019	CCTV was installed in one of the identified reservoirs (Rogar Ave reservoir) and an additional unit was installed at Glenmore WTP.	Completed	Manager Fitzroy River Water
Mount Morgan	MM32	Distribution	Inadequate security against deliberate act of sabotage or terrorism	Identify high risk sites and install CCTV at these sites: • Mount Morgan WTP • No. 7 Dam	June 2019 June 2019	Equipment installed. Awaiting for Council's IT unit to complete the installation. Equipment purchased. Scheduled for installation in early 2022.	June 2022 June 2022	Process Technician

Table 2 Risk management improvement program implementation status

4 Verification monitoring – water quality information and summary

This section discusses the compliance with the water quality criteria.

The results from the drinking water verification monitoring program for the period of 1 July 2020 to 30 June 2021 have been compared against the levels of the water quality criteria specified by the Regulator in the Water Quality and Reporting Guidelines for a Drinking Water Service.

The drinking water verification monitoring program for this reporting period was carried out as per Section 10.2 of the DWQMP. The reported statistics presented in Tables 3 to 6 do not include results from repeat samples undertaken in response to an elevated result or from event-related or investigative samples. The fluoride data presented in Tables 3 and 4 are for naturally-occurring fluoride. RRC discontinued fluoridating water on 17 June 2013 in accordance with the *Water Fluoridation Regulation*. No radionuclides testing was conducted for this reporting period.

The one water quality criteria noncompliance detailed in Section 5 of this report was from an investigative, non-standard sampling and thus, is not included in Table 4. There were 28 Mount Morgan raw and potable water samples and one (1) Rockhampton potable water sample collected for taste and odour compounds. These were all investigative, non-standard samples and thus, are not included in Tables 3 and 4.

During this reporting period, the Mount Morgan Water Supply Scheme's alternate water source (Fletchers Creek) was not used and therefore its water quality monitoring results are not incorporated in this section.

Cyanobacteria and cyanobacteria toxin

Due to the significant quantity of data associated with reporting cyanobacteria cell count and species identification and in consideration of the number of permutations associated with sampling events, a detailed cyanobacteria report of all test results is not presented in this report. For this reporting period, a total of 8 samples were collected from Rockhampton raw water source with cell counts from 30 cells/mL to 39,820 cells/mL. Elevated cell counts were noted from December 2020 to January 2021. The relatively low cyanobacterial count for this reporting period did not warrant a collection of potable water sample for cyanobacteria cell account and species identification.

For this reporting period, a total of 18 samples were collected from Mount Morgan raw water source with cell counts from 2,790 cells/ml to 31,320 cells/ml. Elevated cell counts were noted from December 2020 to March 2021. A total of 11 samples were collected from Mount Morgan WTP and of these, 10 samples had very low cyanobacteria detection.

Samples were collected from Mount Morgan raw and potable water for cyanobacteria toxicity testing (microcystin and cylindrospermopsin) on 2 March 2021. No toxins were detected in the potable water sample and very low (5 μ g/L) cylindrospemopsin level was detected in the raw water sample.

				Total no.		No. of			
Scheme	Demonstern	11	No. of samples required	of	ADWG Health	non-			
Component	Parameter	Unit	to be collected	samples	Guideline	compliant	Minimum	Maximum	Average
				collected	Value	samples			
WTP	Electrical Conductivity	μS/cm	12 per year	12	No Value	N/A	210	253	230
WTP	Total Dissolved Solids	mg/L	12 per year	12	No Value	N/A	130	161	141
WTP	Colour (True)	PCU	12 per year	12	No Value	N/A	<2	3	2
WTP	рН	pH unit	12 per year	12	No Value	N/A	7.08	7.88	7.53
WTP	Turbidity	NTU	12 per year	12	No Value	N/A	<0.1	0.6	0.3
WTP	Alkalinity (Total) as CaCO3	mg/L	12 per year	12	No Value	N/A	45	70	58
WTP	Sulfate	mg/L	12 per year	12	500 mg/L	0	<5	5	4
WTP	Chloride	mg/L	12 per year	12	No Value	N/A	25	36	31
WTP	Total Hardness as CaCO3	mg/L	12 per year	12	No Value	N/A	50	79	62
WTP	Calcium (Total)	mg/L	12 per year	12	No Value	N/A	13	16	14
WTP	Magnesium (Total)	mg/L	12 per year	12	No Value	N/A	5	9	7
WTP	Sodium (Total)	mg/L	12 per year	12	No Value	N/A	15	24	20
WTP	Potassium (Total)	mg/L	12 per year	12	No Value	N/A	3	5	3
WTP	Aluminium (Acid Soluble)	mg/L	12 per year	12	No Value	N/A	< 0.005	0.012	0.009
WTP	Copper (Total)	mg/L	12 per year	12	2 mg/L	0	0.001	0.010	0.005
WTP	Lead (Total)	mg/L	12 per year	12	0.01 mg/L	0	< 0.001	0.001	< 0.001
WTP	Manganese (Total)	mg/L	12 per year	12	0.50 mg/L	0	< 0.001	0.006	0.002
WTP	Zinc (Total)	mg/L	12 per year	12	No Value	N/A	<0.005	<0.005	<0.005
WTP	Iron (Total)	mg/L	12 per year	12	No Value	N/A	< 0.005	<0.05	<0.05
WTP	Fluoride	mg/L	12 per vear	12	1.5 mg/L	0	<0.1	0.1	0.1
WTP	Nitrite (as N)	mg/L	12 per year	12	3 mg/L	0	< 0.005	<0.01	<0.01
WTP	Nitrate (as N)	mg/L	12 per vear	12	50 mg/L	0	< 0.01	0.33	0.19
WTP	Chlorate	mg/L	12 per vear	1^	No Value	N/A	0.132	0.132	0.132
WTP	Chlorite	mg/L	12 per vear	1^	0.8 mg/L	0	0.024	0.024	0.024
WTP	Total Organic Carbon	mg/L	4 per vear	4	No Value	N/A	2	6	4
WTP	Trihalomethanes	ug/I	4 per year	4	250 µg/l	0	16.0	40.2	26.3
WTP	Arsenic	mg/l	1 per year: Event related	1	0 01 mg/l	0	<0.001	<0.001	<0.001
WTP	Barium	mg/L	1 per year: Event related	1	2 mg/l	0	<0.001	<0.001	<0.001
WTP	Bervllium	mg/l	1 per year: Event related	1	0.06 mg/l	0	<0.001	<0.001	<0.001
WTP	Cadmium	mg/I	1 per year: Event related	1	0 002 mg/l	0	<0.0001	<0.0001	<0.0001
WTP	Cvanide	mg/L	1 per year: Event related	1	0.08	0	<0.0001	<0.0001	<0.0001
WTP	Mercury	mg/I	1 per year: Event related	1	0.001 mg/l	0	<0.0001	<0.0001	<0.0001
WTP	Nickel	mg/L	1 per year: Event related	1	0.02 mg/l	0	<0.0001	<0.0001	<0.0001
WTP	Selenium	mg/L	1 per year: Event related	1	0.02 mg/L	0	<0.001	<0.001	<0.001
WTP		1116/ L	1 per year: Event related	1	0.07.11g/1	0	<0.01	<0.01	<0.01
WTP		μσ/I	1 per year: Event related	1	0.56 µg/L	0	<0.01	<0.01	<0.01
WTP	Cryptosporidium	0000vst/10	1 per year: Event related	1	<1 organism/I	0	0.01	0.01	0
WTP	Giardia	cvst/10l	1 per year: Event related	1	<1 organism/L	0	0	0	0
	Chlorine	mg/I	Daily	365	5 mg/l	0	0.66	1 37	1
	nu	nH unit	Daily	265	No Valuo	0 NI/A	7.00	7.02	7.40
	Electrical Conductivity	uS/cm	Daily	365	No Value		124	/62	237
		µ3/спі мтн	Daily	303	No Value		0.07	402	237
	Colour (Truo)	ma/L Dt C	Daily	21/1*	No Value	N/A	0.07	0.51	0.13
	Chlorine	mg/LFI-C	Continuous (online)	×14 N/A	5 mg/l	0	0.65	3 1 76	1.02
	nH	nHunit	Continuous (online)	N/A	No Valuo	0 Ν/Λ	6 07	7 70	7 52
	PII		Continuous (online)	N/A	No Value		124	1.19	7.52
		µз/сті мті і	Continuous (online)	N/A	No Value	N/A	124	430	232
Poticulation	Tribalomothanac		A porvoor			0	02.05	1.15	106.10
Reticulation	Chlorino	μg/L mg/l	4 per year	4	200 μg/L E mg/l	0	93.0	1 04	100.2
Reticulation			9 per week; Event related	408		0	U	1.84	0.74
Reticulation	E. COII	IVIPIN/100r	9 per week; Event related	468	U IVIPIN/100ml	U	<1	<1	<1

Table 3 Rockhampton Water Supply Scheme quality performance – verification monitoring

^Chlorate and chlorite samples are collected when the chlorine dioxide facility is operating. The facility is intermittently used depending on the source water quality.

*Testing was not performed daily instead, the Operators conduct visual checks to determine if further testing is required. This testing frequency has been recently reviewed and the DWQMP was updated accordingly.

Table 3	Rockhampton Water Supply Scheme quality performance – verification monitoring
	(continued)

Scheme Component	Parameter	Unit	No. of samples required to be collected	Total no. of samples collected	ADWG Health Guideline Value	No. of non- compliant samples	Minimum	Maximum	Average
Source Water	Electrical Conductivity	μS/cm	12 per year	12	N/A	N/A	188	243	212
Source Water	Total Dissolved Solids	mg/L	12 per year	12	N/A	N/A	138	311	235
Source Water	Colour (True)	PCU	12 per year	12	N/A	N/A	15	80	33
Source Water	рН	pH unit	12 per year	12	N/A	N/A	6.89	7.92	7.52
Source Water	Turbidity	NTU	12 per year	12	N/A	N/A	10.9	456.0	167.2
Source Water	Alkalinity (Total) as CaCO3	mg/L	12 per year	12	N/A	N/A	40	77	59
Source Water	Sulphate	mg/L	12 per year	12	N/A	N/A	4	8	5
Source Water	Chloride	mg/L	12 per year	12	N/A	N/A	18	29	24
Source Water	Total Hardness as CaCO3	mg/L	12 per year	12	N/A	N/A	40	70	53
Source Water	Calcium (Total)	mg/L	12 per year	12	N/A	N/A	10	15	12
Source Water	Magnesium (Total)	mg/L	12 per year	12	N/A	N/A	6	9	8
Source Water	Sodium (Total)	mg/L	12 per year	12	N/A	N/A	15	23	20
Source Water	Potassium (Total)	mg/L	12 per year	12	N/A	N/A	3	6	4
Source Water	Aluminium (Acid Soluble)	mg/L	12 per year	12	N/A	N/A	0.042	0.735	0.376
Source Water	Copper (Total)	mg/L	12 per year	12	N/A	N/A	0.003	0.011	0.007
Source Water	Lead (Total)	mg/L	12 per year	12	N/A	N/A	< 0.001	0.004	0.002
Source Water	Manganese (Total)	mg/L	12 per year	12	N/A	N/A	0.020	0.723	0.174
Source Water	Zinc (Total)	mg/L	12 per year	12	N/A	N/A	< 0.005	0.048	0.018
Source Water	Iron (Total)	mg/L	12 per year	12	N/A	N/A	0.52	12.30	5.09
Source Water	Fluoride	mg/L	12 per year	12	N/A	N/A	<0.1	0.1	0.1
Source Water	Nitrite (as N)	mg/L	12 per year	12	N/A	N/A	< 0.005	< 0.01	< 0.01
Source Water	Nitrate (as N)	mg/L	12 per year	12	N/A	N/A	0.00	31.00	2.75
Source Water	Total Organic Carbon	mg/L	4 per year	4	N/A	N/A	5	8	7
Source Water	Arsenic	mg/L	1 per year; Event related	1	N/A	N/A	< 0.001	< 0.001	< 0.001
Source Water	Barium	mg/L	1 per year; Event related	1	N/A	N/A	0.042	0.042	0.042
Source Water	Beryllium	mg/L	1 per year; Event related	1	N/A	N/A	< 0.001	< 0.001	< 0.001
Source Water	Cadmium	mg/L	1 per year; Event related	1	N/A	N/A	< 0.0001	< 0.0001	< 0.0001
Source Water	Cyanide	mg/L	1 per year; Event related	1	N/A	N/A	< 0.0004	< 0.0004	< 0.0004
Source Water	Mercury	mg/L	1 per year; Event related	1	N/A	N/A	< 0.0001	< 0.0001	< 0.0001
Source Water	Nickel	mg/L	1 per year; Event related	1	N/A	N/A	< 0.001	< 0.001	< 0.001
Source Water	Selenium	mg/L	1 per year; Event related	1	N/A	N/A	<0.01	< 0.01	< 0.01
Source Water	PFOS + PFHxS	μg/L	1 per year; Event related	1	N/A	N/A	<0.01	< 0.01	<0.01
Source Water	PFOA	μg/L	1 per year; Event related	1	N/A	N/A	<0.01	<0.01	<0.01
Source Water	Pesticides	ug/L	1 per year; Event related	1	N/A	N/A	<lor< td=""><td><lor< td=""><td><lor< td=""></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""></lor<></td></lor<>	<lor< td=""></lor<>
Source Water	Cryptosporidium	oocyst/10L	1 per year; Event related	1	N/A	N/A	0	0	0
Source Water	Giardia	cyst/10L	1 per year; Event related	1	N/A	N/A	0	0	0
Source Water	рН	pH unit	Daily	365	No Value	N/A	6.51	8.02	7.41
Source Water	Electrical Conductivity	μS/cm	Daily	365	No Value	N/A	90	420	217
Source Water	Turbidity	NTU	Daily	365	No Value	N/A	6.41	542	168
Source Water	Colour (True)	mg/L Pt-Co	Daily	215*	No Value	N/A	5	134	54
Source Water	рН	pH unit	Continuous (online)	N/A	No Value	N/A	6.13	8.02	7.42
Source Water	Turbidity	NTU	Continuous (online)	N/A	No Value	N/A	7.70	545.33	173.57

*Testing was not performed daily instead, the Operators conduct visual checks to determine if further testing is required. This testing frequency has been recently reviewed and the DWQMP was updated accordingly.

			Total no.	ADW/C Health	No. of				
Scheme	Devementer	11	No. of samples required	of	ADWG Health	non-	Minimum	Maximum	Aueroco
Component	Parameter	Unit	to be collected	samples	Guidenne	compliant	winnimum	Iviaximum	Average
				collected	value	samples			
WTP	Electrical Conductivity	μS/cm	12 per year	12	No Value	N/A	234	605	482
WTP	Total Dissolved Solids	mg/L	12 per year	12	No Value	N/A	145	345	281
WTP	Colour (True)	PCU	12 per year	12	No Value	N/A	<2	3	2
WTP	рН	pH unit	12 per year	12	No Value	N/A	7.38	7.98	7.71
WTP	Turbidity	NTU	12 per year	12	No Value	N/A	0.1	0.6	0.4
WTP	Alkalinity (Total) as CaCO3	mg/L	12 per year	12	No Value	N/A	44	121	96
WTP	Sulphate	mg/L	12 per year	12	500 mg/L	0	4	84	62
WTP	Chloride	mg/L	12 per year	12	No Value	N/A	37	63	48
WTP	Total Hardness as CaCO3	mg/L	12 per year	12	No Value	N/A	53	121	96
WTP	Calcium (Total)	mg/L	12 per year	12	No Value	N/A	13	26	20
WTP	Magnesium (Total)	mg/L	12 per year	12	No Value	N/A	5	15	12
WTP	Sodium (Total)	mg/L	12 per year	12	No Value	N/A	22	81	64
WTP	Potassium (Total)	mg/L	12 per year	12	No Value	N/A	2	5	3
WTP	Aluminium (Acid Soluble)	mg/L	12 per year	12	No Value	N/A	0.018	0.167	0.106
WTP	Copper (Total)	mg/L	12 per year	12	2 mg/L	0	< 0.001	0.007	0.002
WTP	Lead (Total)	mg/L	12 per year	12	0.01 mg/L	0	< 0.001	< 0.001	< 0.001
WTP	Manganese (Total)	mg/L	12 per year	12	0.50 mg/L	0	0.004	0.070	0.019
WTP	Zinc (Total)	mg/L	12 per year	12	No Value	N/A	< 0.005	0.018	0.014
WTP	Iron (Total)	mg/L	12 per year	12	No Value	N/A	<0.05	0.01	<0.05
WTP	Fluoride	mg/L	12 per year	12	1.5 mg/L	0	< 0.1	0.1	<0.1
WTP	Nitrite (as N)	mg/L	12 per year	12	3 mg/L	0	< 0.005	< 0.01	< 0.01
WTP	Nitrate (as N)	mg/L	12 per year	12	50 mg/L	0	0.08	0.25	0.16
WTP	Total Organic Carbon	mg/L	4 per year	4	No Value	N/A	1	10	7
WTP	Trihalomethanes	μg/L	4 per year	4	250 μg/L	0	92.5	138.0	107.9
WTP	Arsenic	mg/L	1 per year; Event related	1	0.01 mg/L	0	< 0.001	< 0.001	< 0.001
WTP	Barium	mg/L	1 per year; Event related	1	2 mg/L	0	0.013	0.013	0.013
WTP	Beryllium	mg/L	1 per year; Event related	1	0.06 mg/L	0	< 0.001	< 0.001	< 0.001
WTP	Cadmium	mg/L	1 per year; Event related	1	0.002 mg/L	0	< 0.0001	< 0.0001	< 0.0001
WTP	Cyanide	mg/L	1 per year; Event related	1	0.08	0	< 0.004	< 0.004	< 0.004
WTP	Mercury	mg/L	1 per year; Event related	1	0.001 mg/L	0	< 0.0001	< 0.0001	< 0.0001
WTP	Nickel	mg/L	1 per year: Event related	1	0.02 mg/L	0	< 0.001	< 0.001	< 0.001
WTP	Selenium	mg/L	1 per year; Event related	1	0.01 mg/L	0	< 0.01	< 0.01	< 0.01
WTP	Cryptosporidium	oocyst/10L	1 per year; Event related	1	<1 organism/L	0	0	0	0
WTP	Giardia	cvst/10L	1 per year: Event related	1	<1 organism/L	0	0	0	0
WTP	Chlorine	mg/L	Daily	365	5 mg/L	0	0.27	1.86	1.00
WTP	рН	pH unit	Daily	365	No Value	N/A	7.02	8.02	7.51
WTP	Electrical Conductivity	uS/cm	Daily	365	No Value	, N/A	221	726	450
WTP	Turbidity	NTU	Daily	365	No Value	, N/A	0.12	0.88	0.36
WTP	Colour (True)	mg/L Pt-Co	Daily	365	No Value	N/A	0	5	0.9
WTP	Chlorine	mg/L	, Continuous (online)	N/A	5 mg/L	0	0.54	1.44	1.05
WTP	ρH	pH unit	Continuous (online)	, N/A	No Value	N/A	6.86	7.74	7.28
WTP	Electrical Conductivity	uS/cm	Continuous (online)	N/A	No Value	N/A	261	735	513
WTP	Turbidity	NTU	Continuous (online)	N/A	No Value	N/A	0.19	0.99	0.34
Reticulation	Trihalomethanes	ug/L	4 per vear	4	250 µg/L	0	94.7	193.0	148.7
Reticulation	Chlorine	mg/L	9 per week: Event related	156	5 mg/L	0	0	1.85	0.58
Reticulation	E. coli	MPN/100ml	9 per week; Event related	156	0 MPN/100ml	0	<1	<1	<1

Table 4 Mount Morgan Water Supply Scheme quality performance – verification monitoring

Scheme Component	Parameter	Unit	No. of samples required to be collected	Total no. of samples collected	ADWG Health Guidelin e Value	No. of non- compliant samples	Minimum	Maximum	Average
Source Water	Electrical Conductivity	μS/cm	12 per year	12	N/A	N/A	310	467	379
Source Water	Total Dissolved Solids	mg/L	12 per year	12	N/A	N/A	190	274	226
Source Water	Colour (True)	PCU	12 per year	12	N/A	N/A	<2	18	13
Source Water	рН	pH unit	12 per year	12	N/A	N/A	7.49	8.79	8.08
Source Water	Turbidity	NTU	12 per year	12	N/A	N/A	6.9	32.4	15.5
Source Water	Alkalinity (Total) as CaCO3	mg/L	12 per year	12	N/A	N/A	89	120	101
Source Water	Sulphate	mg/L	12 per year	12	N/A	N/A	11	22	15
Source Water	Chloride	mg/L	12 per year	12	N/A	N/A	35	58	46
Source Water	Total Hardness as CaCO3	mg/L	12 per year	12	N/A	N/A	87	127	110
Source Water	Calcium (Total)	mg/L	12 per year	12	N/A	N/A	18	26	22
Source Water	Magnesium (Total)	mg/L	12 per year	12	N/A	N/A	11	17	14
Source Water	Sodium (Total)	mg/L	12 per year	12	N/A	N/A	27	46	36
Source Water	Potassium (Total)	mg/L	12 per year	12	N/A	N/A	2	4	3
Source Water	Aluminium (Acid Soluble)	mg/L	12 per year	12	N/A	N/A	0.014	2.390	0.271
Source Water	Copper (Total)	mg/L	12 per year	12	N/A	N/A	0.001	0.009	0.003
Source Water	Lead (Total)	mg/L	12 per year	12	N/A	N/A	< 0.001	0.001	< 0.001
Source Water	Manganese (Total)	mg/L	12 per year	12	N/A	N/A	0.054	0.397	0.142
Source Water	Zinc (Total)	mg/L	12 per year	12	N/A	N/A	< 0.005	0.020	0.010
Source Water	Iron (Total)	mg/L	12 per year	12	N/A	N/A	0.36	2.27	0.84
Source Water	Fluoride	mg/L	12 per year	12	N/A	N/A	0.1	0.2	0.1
Source Water	Nitrite (as N)	mg/L	12 per year	12	N/A	N/A	<0.01	0.03	< 0.01
Source Water	Nitrate (as N)	mg/L	12 per year	12	N/A	N/A	<0.01	0.16	0.06
Source Water	Total Organic Carbon	mg/L	4 per year	4	N/A	N/A	12	15	13
Source Water	Arsenic	mg/L	1 per year; Event related	1	N/A	N/A	< 0.001	<0.001	< 0.001
Source Water	Barium	mg/L	1 per year; Event related	1	N/A	N/A	0.012	0.012	0.012
Source Water	Beryllium	mg/L	1 per year; Event related	1	N/A	N/A	< 0.001	<0.001	< 0.001
Source Water	Cadmium	mg/L	1 per year; Event related	1	N/A	N/A	< 0.0001	< 0.0001	< 0.0001
Source Water	Cyanide	mg/L	1 per year; Event related	1	N/A	N/A	< 0.004	<0.004	< 0.004
Source Water	Mercury	mg/L	1 per year; Event related	1	N/A	N/A	< 0.0001	<0.0001	< 0.0001
Source Water	Nickel	mg/L	1 per year; Event related	1	N/A	N/A	<0.001	<0.001	<0.001
Source Water	Selenium	mg/L	1 per year; Event related	1	N/A	N/A	<0.01	<0.01	<0.01
Source Water	Pesticides	μg/L	1 per year; Event related	1	N/A	N/A	<lor< td=""><td><lor< td=""><td><lor< td=""></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""></lor<></td></lor<>	<lor< td=""></lor<>
Source Water	Cryptosporidium	oocyst/10L	1 per year; Event related	1	N/A	N/A	0	0	0
Source Water	Giardia	cyst/10L	1 per year; Event related	1	N/A	N/A	0	0	0
Source Water	рН	pH unit	Daily	291	No Value	N/A	7.37	8.95	7.87
Source Water	Electrical Conductivity	μS/cm	Daily	291	No Value	N/A	168	497	399
Source Water	Turbidity	NTU	Daily	290*	No Value	N/A	2.92	50.5	8.49
Source Water	Colour (True)	mg/L Pt-Co	Daily	291	No Value	N/A	0	66	15.22
Source Water	рН	pH unit	Continuous (online)	N/A	No Value	N/A	7.07	9.19	7.97
Source Water	Electrical Conductivity	μS/cm	Continuous (online)	N/A	No Value	N/A	88	449	343
Source Water	Turbidity	NTU	Continuous (online)	N/A	No Value	N/A	2.27	41.91	8.08

Table 4 Mount Morgan Water Supply Scheme quality performance – verification monitoring^a (continued)

^aMount Morgan WTP was turned off on 19 April 2021 with the Mount Morgan WSS fully supplied with potable water from Gracemere (part of Rockhampton WSS) from 20 April 2021. All operational (daily, continuous (online)) checks on the raw water quality ceased on 19 April 2021.

*Missed one testing date (4 Dec 2020) as the WTP was not running.

Drinking water scheme:	Rockham	Rockhampton Water Supply Scheme										
10000												
Year					2020	to	2021					
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	20	15	20	20	15	20	20	20	15	20	15	20
No. of samples collected in	36	45	36	36	45	36	30	36	45	30	45	30
which E. coli is detected (i.e.	0	0	0	0	0	0	0	0	0	0	0	0
No. of complex collected in						, v					•	
previous 12 month period	468	477	468	468	477	477	468	468	468	468	477	468
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	VEO	VEO	VEO	VEO	VEO	VEO	VEO	VEO	VEO	VEO	VEO	VEO
	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Table 5 Rockhampton Water Supply Scheme – *E.coli* performance with annual value

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 referred 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:	Mount Mo	organ Wate	er Supply	Scheme								
			100									
Year					2020	to	2021					
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	12	15	12	12	15	12	12	12	15	12	15	12
No. of samples collected in which <i>E. coli</i> 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	156	159	156	156	159	159	156	156	156	156	159	156
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

Table 6 Mount Morgan Water Supply Scheme – *E.coli* performance with annual value

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 referred 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).

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5 Incidents reported to the Regulator

For this reporting period, there was one incident reported to the Regulator as required under Sections 102 Notice of noncompliance with water quality criteria of the *Water Supply (Safety and Reliability) Act 2008*. There was no prescribed incident or event reported to the Regulator as required under Sections 102A Notice of prescribed incident of the *Water Supply (Safety and Reliability) Act 2008*.

Noncompliance with a water quality criteria and corrective and preventative actions taken

Overview of noncompliance: Total trihalomethanes (THM) exceeding the water quality criteria in one of the reticulation samples collected at the Mount Morgan reticulation network

Incident description: As part of an investigative monitoring, samples were collected for total trihalomethanes (THM) analysis on 24 March 2021. Elevated level of THM was recorded in the Creek Street, Baree sample point at 259 μ g/L. The elevated THM was due to the increasing organic levels in No. 7 Dam as the level from this raw water source continues to dwindle along with the significant decrease in daily water demand and longer detention time in the network following the implementation of Level 6 water restrictions.

Corrective and preventative actions: Tankered potable water deliveries from Gracemere (part of Rockhampton WSS) to Mount Morgan WTP was reviewed and increased following the receipt of the noncompliant result on 29 March 2021. Granulated activated carbon was also added on top of the filters to increase the effectiveness of organics and taste and odour removal. In addition, FRW also conducted strategic flushing of trunk and water mains to decrease detention times in the reticulation network, and lowering of the storage levels in the supply reservoirs to promote mixing of water sourced from No. 7 Dam and treated at Mount Morgan WTP and potable water from Gracemere.

The slight THM exceedance was short-lived with succeeding test results across the Mount Morgan WSS had THM levels below the ADWG health value. It is unlikely for the raw water quality to improve unless the catchment receives a significant amount of rainfall in the coming months. On 19 April 2021, Mount Morgan WTP was turned off. From 20 April 2021, Mount Morgan WSS was fully supplied with tankered potable water from Gracemere. The tankered water is delivered on the inlet of Black Street Reservoir for re-chlorination and distribution to the reticulation network.

6 Customer complaints

Rockhampton Regional Council is required to report on the number of drinking water quality complaints, general details of complaints and the responses undertaken.

Table 7 and Figure 1 provide a breakdown of the customer complaints relating to drinking water quality during this reporting period.

Scheme	Health concern	Taste and/or odour	Appearance and/or Discoloured water	Total
Rockhampton	0	5	33	38
Mount Morgan	0	91	15	106
Total	0	96	48	144

 Table 7 Customer complaints about water quality



Figure 1 Drinking water quality complaints received between 1 July 2020 and 30 June 2021 for the Rockhampton and Mount Morgan water supply schemes

Possible health concern

Complaints are sometimes received from customers who suspect their water may be associated with an illness they are experiencing. FRW investigates each complaint relating to alleged illness from the drinking water, typically by testing the customers tap and closest reticulation sampling for the presence of *E. coli* as well as general physico-chemical testing. In addition, FRW liaises periodically with local Queensland Health Officers in order to receive updates on any reports of suspected waterborne disease.

During this reporting period, FRW was not aware of any confirmed cases of illness arising from drinking water supplied from Rockhampton and Mount Morgan water supply schemes.

Taste and/or odour

A total number of 96 customer complaints associated with unfavourable taste and/or odour were received during this reporting period. Five (5) customer complaints were received from the Rockhampton WSS and 91 customer complaints were received from the Mount Morgan WSS.

The vast majority of complaints associated with taste and/or odour were received during the period of poor water quality in the No. 7 Dam as a result of the dwindling water storage levels. Mount Morgan WSS recorded 52 taste and/odour complaints in March and 44 taste and/odour complaints in April. In response to these large number of complaints, FRW took a range of actions including increased tankering of potable water from Gracemere to Mount Morgan WTP, addition of granulated activated carbon at Mount Morgan WTP, flushing of

water mains, supplying of bottled water, public forum, and regular public notifications on the nature and cause of water quality event. Investigation of each complaint found no public health risks.

Appearance and/or discoloured water

A total of 48 customer complaints associated with appearance and/or discoloured water were received during this reporting period. Thirty three (33) customer complaints were received from the Rockhampton WSS and of these, 21 were due to the presence of air in the water. Fifteen (15) customer complaints were received from Mount Morgan WSS.

FRW responded to each complaint by flushing the water mains to clear or refresh the water provided to the customer. Water quality testing was also conducted as appropriate to adjust treatment processes if required and to ensure that water quality was within the expected range for key water quality parameters or to confirm the return to normal high quality water.

7 DWQMP review outcomes

No review was conducted during the reporting period 1 July 2020 to 30 June 2021.

The next internal review of the DWQMP was due in 31 August 2021. The summary of the outcome of the review will be presented in the 1 July 2021 to 30 June 2022 reporting period.

8 DWQMP audit findings

The second regular audit of the DWQMP was completed on 4 August 2020 through the engagement of Bligh Tanner, who are Exemplar Global certified drinking water quality management system auditors. The auditor submitted the audit report to the Regulator on 5 August 2020. The purpose of the audit was to:

- verify whether the monitoring and performance data given to the regulator under the plan is accurate,
- assess the providers compliance with the plan and the conditions, and
- assess the plan's relevance to the water service.

The findings of the audit were that FRW was non-conforming in 3 of the 71 items assessed. A summary of the auditor's findings includes:

- there was no major noncompliance to impact public health
- the operation of the Glenmore WTP was excellent and the water quality is of very high standard
- the plan remains largely relevant to the water schemes, with a few changes required
- a few of the monitoring and performance data provided in the DWQMP reports did not completely reflect the extent of verification monitoring undertaken
- verification monitoring program was not completely implemented as stated in the DWQMP
- the level of risk rated in one of the identified hazards (Risk no. MM12 protozoan pathogens) in the Mount Morgan WSS does not match the risk observed in the audit

• some aspects of the risk register in the DWQMP does not adequately represent risks to drinking water quality and does not document the priorities for risk management.

A number of improvement opportunities made by the auditor have been included in the recent review of the DWQMP. This includes the review and re-wording of the actual frequency of monitoring and performance of some of the parameters and provision of a description as when these parameters will be analysed. The risk register was also reviewed and revised accordingly. Water treatment schematics, water assets lists, and historic water quality data and trends were also updated. Overall, the audit was a positive outcome for FRW, and demonstrates the strong commitment towards providing safe and reliable drinking water for the community.