



Drinking Water Quality Management Plan Report

Rockhampton Regional Council

SPID: 493

1 July 2021 to 30 June 2022

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
CaCO ₃	calcium carbonate
CCTV	closed-circuit television
DRDMW	Department of Regional Development, Manufacturing and Water
DWQMP	Drinking Water Quality Management Plan. 2021 approved version
<i>E. coli</i>	<i>Escherichia coli</i> , 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
L	litre
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 WTP	water treatment plant for the Mount Morgan Water Supply Scheme
N/A	not applicable
ND	not detected
NTU	nephelometric turbidity units
PFOA	perfluorooctanoic acid
PFHxS	perfluorohexane sulfonate
PFOS	perfluorooctane sulfonate
PRV	pressure reducing valve
Regulator	the chief executive of the DRDMW is the Regulator under the <i>Water Supply (Safety and Reliability) Act 2008</i>
RMIP	Risk Management Improvement Program
RRC	Rockhampton Regional Council
RRR	Residual Risk Rating
SPID	service provider identification
TCU	true colour units
THM	trihalomethanes
UVT	ultraviolet transmissivity
WPS	water pump station
WSS	Water Supply Scheme
WTP	Water Treatment Plant
µg/L	micrograms per litre
µS/cm	microSiemens per centimetre
<	less than
>	greater than
°C	degree Celcius

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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 2021-22.

RRC thru 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 2021-22 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 2021 to 30 June 2022. 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.

Table 1 Summary of schemes

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

*For this reporting period, Mount Morgan WSS was 100% supplied with tankered water from Gracemere (part of Rockhampton WSS). This was due to the low water levels in the Dee River (No. 7 Dam) and poor raw water quality. The tankered water is delivered on the inlet of Black Street Reservoir for rechlorination and distribution to the reticulation network.

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 12 of the DWQMP details the eight (8) individual risks which were considered to be unacceptable levels of risk as they have a moderate Residual Risk Rating (RRR). It also includes components that have low residual risk ratings (risk numbers R20 and MM22) but require investigative monitoring. The significant progress that has been made during this reporting period to mitigate these risks is discussed in Table 2.

Table 2 Risk management improvement program implementation status

Scheme Name	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	R20	Treatment	No available data on chlorate concentrations	Commence investigative monitoring	December 2022	3-monthly sampling commenced on 22 Nov 2021 with investigative monitoring continued until Oct 2023	Continuing with expected completion in October 2023	Senior Water Quality and Treatment Officer
Rockhampton	R24	Reservoir	Contamination due to animals accessing reservoirs (bacterial pathogen)	Repair and/or replace roof of identified high risk reservoirs: Yaamba Road Reservoir	June 2023	Preliminary planning underway with works included in the 2022-23 capital projects budget Project scoping underway with works included in the 2022-23 capital projects budget	December 2023	Manager Fitzroy River Water
				Athelstane Range Reservoir	June 2023		June 2023	
				Installation of online chlorine analysers in all manually re-chlorinated reservoirs: Forbes Avenue Reservoir	December 2021	Equipment installed. Awaiting for connection to the new electrical switchboard. Unit commissioned and fully operational	In progress with expected completion in January 2023 Completed	Senior Water Quality and Treatment Officer
				Samuel Crescent Reservoir	November 2021			

Table 2 Risk management improvement program implementation status (continued)

Scheme Name	Risk No.	Component	Event/Hazard	Improvement Actions	Target Date	Actions Taken To Date	Status and Revised Target Date	Responsible Officer
Rockhampton	R26	Reservoir	Contamination due to animals accessing reservoirs (viral pathogen)	Repair and/or replace roof of identified high risk reservoirs: Yaamba Road Reservoir	June 2023	Preliminary planning underway with works included in the 2022-23 capital projects budget	December 2023	Manager Fitzroy River Water
Rockhampton	R30	Distribution	Inadequate security against deliberate act of sabotage or terrorism	Identify high risk sites and install CCT at these sites: Glenmore WTP Yaamba Road Reservoir Athelstane Range Reservoir	June 2024 June 2023 June 2024	Part of the scope of the Glenmore WTP electrical upgrade Preliminary planning with works included in the 2022-23 capital projects budget Preliminary planning with works included in the 2022-23 capital projects budget	In progress with expected completion in June 2024 In progress with expected completion in December 2023 In progress with expected completion in June 2024	Process Systems Technician

Table 2 Risk management improvement program implementation status (continued)

Scheme Name	Risk No.	Component	Event/Hazard	Improvement Actions	Target Date	Actions Taken To Date	Status and Revised Target Date	Responsible Officer
Mount Morgan	MM14	Treatment	Lack of effective treatment (viral pathogen)	Perform testing for viruses for further confirmation of process effectiveness	December 2022	Mount Morgan WTP was turned off in April 2021; Testing will commence once the plant is re-commissioned	On hold pending re-commissioning of the Mount Morgan WTP	Senior Water Quality and Treatment Officer
Mount Morgan	MM22	Treatment	No available data on chlorate concentrations	Commence investigative monitoring	December 2022	3-monthly sampling commenced on 22 Nov 2021 with investigative monitoring continued until Oct 2023	Continuing with expected completion in October 2023	Senior Water Quality and Treatment Officer
Mount Morgan	MM27	Reservoir	Contamination due to animals accessing reservoirs (bacterial pathogen)	Roof refurbishment capital upgrade for Black Street Reservoir	June 2023	Funding included in the 2022-23 capital projects budget. Preliminary planning will start when the Mount Morgan WTP is re-commissioned.	December 2023	Manager Fitzroy River Water
Mount Morgan	MM29	Reservoir	Contamination due to animals accessing reservoirs (viral pathogen)	Roof refurbishment capital upgrade for Black Street Reservoir	June 2023	Funding included in the 2022-23 capital projects budget. Preliminary planning will start when the Mount Morgan WTP is re-commissioned.	December 2023	Manager Fitzroy River Water
Mount Morgan	MM34	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	December 2021 June 2022	Unit commissioned and fully operational Equipment purchased. Awaiting for installation schedule.	Completed June 2023	Process Systems Technician

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*. For this reporting period, there were no samples taken that exceeded the water quality criteria, i.e. the health guideline values in the current Australian Drinking Water Guidelines (ADWG) and the standards in the Public Health Regulation 2005.

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.

During this reporting period, the Mount Morgan Water Supply Scheme's water source (Dee River) and alternate water source (Fletchers Creek) were not used and therefore its water quality monitoring results are not incorporated in this section. Mount 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. WTP daily testing results in Table 4 were from samples collected from the outlet of the clear water reservoir (Black St Reservoir).

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 9 samples were collected from Rockhampton raw water source with cell counts from 0 cells/mL to 1,140 cells/mL. Low cyanobacterial cell counts were noted from October 2021 to January 2022 and in April 2022. No potentially toxic cyanobacterial species were recorded during this reporting period. The low cyanobacterial count did not warrant a collection of potable water sample for cyanobacteria cell account and species identification nor was it necessary to perform a cyanobacterial toxin analysis.

Table 3 Rockhampton Water Supply Scheme quality performance – verification monitoring*

Scheme	Parameter	Unit	ADWG health guideline value	No. of samples required to be collected	Total no. of samples collected	No. of non-compliant samples	Minimum	Maximum	Average
WTP	Electrical Conductivity	µS/cm	No Value	12 per year	12	N/A	142	274	233
WTP	Total Dissolved Solids	mg/L	No Value	12 per year	12	N/A	83	151	131
WTP	Colour (True)	PCU	No Value	12 per year	12	N/A	2	2	2
WTP	pH	pH unit	No Value	12 per year	12	N/A	7.38	8.16	7.76
WTP	Turbidity	NTU	No Value	12 per year	12	N/A	<0.1	0.6	0.2
WTP	Alkalinity (Total) as CaCO ₃	mg/L	No Value	12 per year	12	N/A	39	75	58
WTP	Sulfate	mg/L	500 mg/L	12 per year	12	0	2	5	4
WTP	Chloride	mg/L	No Value	12 per year	12	N/A	15	39	30
WTP	Total Hardness as CaCO ₃	mg/L	No Value	12 per year	12	N/A	36	74	58
WTP	Calcium (Total)	mg/L	No Value	12 per year	12	N/A	8	18	14
WTP	Magnesium (Total)	mg/L	No Value	12 per year	12	N/A	4	7	6
WTP	Sodium (Total)	mg/L	No Value	12 per year	12	N/A	11	27	19
WTP	Potassium (Total)	mg/L	No Value	12 per year	12	N/A	4	6	5
WTP	Aluminium (Acid Soluble)	mg/L	No Value	12 per year	12	N/A	<0.005	0.011	0.008
WTP	Copper (Total)	mg/L	2 mg/L	12 per year	12	0	0.001	0.007	0.005
WTP	Lead (Total)	mg/L	0.01 mg/L	12 per year	12	0	<0.001	0.001	<0.001
WTP	Manganese (Total)	mg/L	0.50 mg/L	12 per year	12	0	<0.001	0.002	0.001
WTP	Zinc (Total)	mg/L	No Value	12 per year	12	N/A	<0.005	<0.005	<0.005
WTP	Iron (Total)	mg/L	No Value	12 per year	12	N/A	<0.05	<0.05	<0.05
WTP	Fluoride	mg/L	1.5 mg/L	12 per year	12	0	<0.1	0.2	0.1
WTP	Nitrite (as N)	mg/L	3 mg/L	12 per year	12	0	<0.01	<0.01	<0.01
WTP	Nitrate (as N)	mg/L	50 mg/L	12 per year	12	0	0.06	0.47	0.24
WTP	Chlorate	mg/L	No Value	12 per year	3	N/A	0.015	0.077	0.040
WTP	Chlorite	mg/L	0.8 mg/L	12 per year	3	0	0.005	0.027	0.013
WTP	Total Organic Carbon	mg/L	No Value	4 per year	4	N/A	2	3	3
WTP	THM	µg/L	250 µg/L	4 per year	4	0	30	46	37
WTP	Arsenic (Total)	mg/L	0.01 mg/L	1 per year	1	0	<0.001	<0.001	<0.001
WTP	Barium (Total)	mg/L	2 mg/L	1 per year	1	0	<0.001	<0.001	<0.001
WTP	Beryllium (Total)	mg/L	0.06 mg/L	1 per year	1	0	<0.001	<0.001	<0.001
WTP	Cadmium (Total)	mg/L	0.002 mg/L	1 per year	1	0	<0.0001	<0.0001	<0.0001
WTP	Mercury (Total)	mg/L	0.001 mg/L	1 per year	1	0	<0.0001	<0.0001	<0.0001
WTP	Nickel (Total)	mg/L	0.02 mg/L	1 per year	1	0	<0.001	<0.001	<0.001
WTP	Selenium (Total)	mg/L	0.01 mg/L	1 per year	1	0	<0.01	<0.01	<0.01
WTP	Sum of PFOS + PFHxS	µg/L	0.07 µg/L	1 per year	1	0	<0.01	<0.01	<0.01
WTP	PFOA	µg/L	0.56 µg/L	1 per year	1	0	<0.01	<0.01	<0.01
WTP	<i>Cryptosporidium</i>	oocyst/10L	<1 organism/L	1 per year	1	0	ND	ND	ND
WTP	<i>Giardia</i>	cyst/10L	<1 organism/L	1 per year	1	0	ND	ND	ND
WTP	Chlorine	mg/L	5 mg/L	Daily	365	0	0.72	1.5	1.02
WTP	pH	pH unit	No Value	Daily	365	N/A	7.17	7.93	7.53
WTP	Electrical Conductivity	µS/cm	No Value	Daily	365	N/A	138	335	244
WTP	Turbidity	NTU	No Value	Daily	365	N/A	0.06	0.31	0.16
WTP	Dissolved Oxygen	mg/L	No Value	Daily	365	N/A	5.95	8.86	7.40
WTP	Temperature	°C	No Value	Daily	365	N/A	18.7	29.8	24.3
WTP	Total Dissolved Solids	mg/L	No Value	Daily	365	N/A	71	250	130
WTP	Chlorine	mg/L	5 mg/L	Continuous	N/A	0	0.92	1.23	1.03
WTP	pH	pH unit	No Value	Continuous	N/A	N/A	6.83	7.75	7.56
WTP	Electrical Conductivity	µS/cm	No Value	Continuous	N/A	N/A	128.8	273.1	216.8
WTP	Turbidity	NTU	No Value	Continuous	N/A	N/A	0.10	0.35	0.18
Reticulation	THM	µg/L	250 µg/L	4 per year	4	0	115	163	137
Reticulation	Chlorine	mg/L	5 mg/L	9 per week	468	0	0	2.07	0.71
Reticulation	<i>E. coli</i>	MPN/100ml	0 MPN/100ml	9 per week	468	0	<1	<1	<1

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

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

Scheme	Parameter	Unit	ADWG health guideline value	No. of samples required to be collected	Total no. of samples collected	No. of non-compliant samples	Minimum	Maximum	Average
Source Water	Electrical Conductivity	µS/cm	N/A	12 per year	12	N/A	118	250	214
Source Water	Total Dissolved Solids	mg/L	N/A	12 per year	12	N/A	165	380	271
Source Water	Colour (True)	PCU	N/A	12 per year	12	N/A	25	50	38
Source Water	pH	pH unit	N/A	12 per year	12	N/A	7.21	7.93	7.65
Source Water	Turbidity	NTU	N/A	12 per year	12	N/A	76.6	1330.0	296.1
Source Water	Alkalinity (Total) as CaCO ₃	mg/L	N/A	12 per year	12	N/A	35	80	57
Source Water	Sulphate	mg/L	N/A	12 per year	12	N/A	2	6	4
Source Water	Chloride	mg/L	N/A	12 per year	12	N/A	10	40	25
Source Water	Total Hardness as CaCO ₃	mg/L	N/A	12 per year	12	N/A	25	69	51
Source Water	Calcium (Total)	mg/L	N/A	12 per year	12	N/A	10	17	13
Source Water	Magnesium (Total)	mg/L	N/A	12 per year	12	N/A	6	8	8
Source Water	Sodium (Total)	mg/L	N/A	12 per year	12	N/A	11	26	19
Source Water	Potassium (Total)	mg/L	N/A	12 per year	12	N/A	4	8	6
Source Water	Aluminium (Acid Soluble)	mg/L	N/A	12 per year	12	N/A	<0.01	1.880	0.770
Source Water	Copper (Total)	mg/L	N/A	12 per year	12	N/A	0.005	0.021	0.009
Source Water	Lead (Total)	mg/L	N/A	12 per year	12	N/A	<0.001	0.008	0.003
Source Water	Manganese (Total)	mg/L	N/A	12 per year	12	N/A	0.032	0.348	0.100
Source Water	Zinc (Total)	mg/L	N/A	12 per year	12	N/A	<0.005	0.035	0.017
Source Water	Iron (Total)	mg/L	N/A	12 per year	12	N/A	3.19	15.4	7.7
Source Water	Fluoride	mg/L	N/A	12 per year	12	N/A	<0.1	0.2	0.1
Source Water	Nitrite (as N)	mg/L	N/A	12 per year	12	N/A	<0.01	<0.01	<0.01
Source Water	Nitrate (as N)	mg/L	N/A	12 per year	12	N/A	0.05	0.39	0.22
Source Water	Total Organic Carbon	mg/L	N/A	4 per year	4	N/A	6	7	7
Source Water	Arsenic	mg/L	N/A	1 per year	1	N/A	0.002	0.002	0.002
Source Water	Barium	mg/L	N/A	1 per year	1	N/A	0.064	0.064	0.064
Source Water	Beryllium	mg/L	N/A	1 per year	1	N/A	<0.001	<0.001	<0.001
Source Water	Cadmium	mg/L	N/A	1 per year	1	N/A	<0.0001	<0.0001	<0.0001
Source Water	Mercury	mg/L	N/A	1 per year	1	N/A	<0.0001	<0.0001	<0.0001
Source Water	Nickel	mg/L	N/A	1 per year	1	N/A	0.006	0.006	0.006
Source Water	Selenium	mg/L	N/A	1 per year	1	N/A	<0.01	<0.01	<0.01
Source Water	PFOS + PFHxS	µg/L	N/A	1 per year	1	N/A	<0.01	<0.01	<0.01
Source Water	PFOA	µg/L	N/A	1 per year	1	N/A	<0.01	<0.01	<0.01
Source Water	Pesticides	ug/L	N/A	1 per year	1	N/A	<LOR	<LOR	<LOR
Source Water	<i>Cryptosporidium</i>	oocyst/10L	N/A	1 per year	1	N/A	ND	ND	ND
Source Water	<i>Giardia</i>	cyst/10L	N/A	1 per year	1	N/A	ND	ND	ND
Source Water	pH	pH unit	N/A	Daily	365	N/A	6.89	7.88	7.37
Source Water	Electrical Conductivity	µS/cm	N/A	Daily	365	N/A	93	266	222
Source Water	Turbidity	NTU	N/A	Daily	365	N/A	55	3315	279
Source Water	Dissolved Oxygen	mg/L	N/A	Daily	365	N/A	3.43	8.05	6.14
Source Water	Temperature	°C	N/A	Daily	365	N/A	18.8	30.3	24.2
Source Water	Total Dissolved Solids	mg/L	N/A	Daily	365	N/A	47	172	118
Source Water	pH	pH unit	N/A	Continuous	N/A	N/A	6.64	7.93	7.39
Source Water	Turbidity	NTU	N/A	Continuous	N/A	N/A	50.35	2187.41	279.98

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

Scheme	Parameter	Unit	ADWG health guideline value	No. of samples required to be collected	Total no. of samples collected	No. of non-compliant samples	Minimum	Maximum	Average
WTP	Electrical Conductivity	µS/cm	No Value	12 per year	12	N/A	194	280	252
WTP	Total Dissolved Solids	mg/L	No Value	12 per year	12	N/A	114	190	149
WTP	Colour (True)	PCU	No Value	12 per year	12	N/A	1	5	2
WTP	pH	pH unit	No Value	12 per year	12	N/A	7.63	7.99	7.84
WTP	Turbidity	NTU	No Value	12 per year	12	N/A	<0.1	0.8	0.3
WTP	Alkalinity (Total) as CaCO ₃	mg/L	No Value	12 per year	12	N/A	33	76	59
WTP	Sulphate	mg/L	500 mg/L	12 per year	12	0	3	5	4
WTP	Chloride	mg/L	No Value	12 per year	12	N/A	23	40	33
WTP	Total Hardness as CaCO ₃	mg/L	No Value	12 per year	12	N/A	48	79	62
WTP	Calcium (Total)	mg/L	No Value	12 per year	12	N/A	11	20	15
WTP	Magnesium (Total)	mg/L	No Value	12 per year	12	N/A	5	8	7
WTP	Sodium (Total)	mg/L	No Value	12 per year	12	N/A	15	26	22
WTP	Potassium (Total)	mg/L	No Value	12 per year	12	N/A	4	7	5
WTP	Aluminium (Acid Soluble)	mg/L	No Value	12 per year	12	N/A	0.009	0.030	0.024
WTP	Copper (Total)	mg/L	2 mg/L	12 per year	12	0	<0.001	0.004	0.002
WTP	Lead (Total)	mg/L	0.01 mg/L	12 per year	12	0	<0.001	<0.001	<0.001
WTP	Manganese (Total)	mg/L	0.50 mg/L	12 per year	12	0	<0.001	0.002	0.002
WTP	Zinc (Total)	mg/L	No Value	12 per year	12	N/A	<0.005	0.016	0.011
WTP	Iron (Total)	mg/L	No Value	12 per year	12	N/A	<0.05	<0.05	<0.05
WTP	Fluoride	mg/L	1.5 mg/L	12 per year	12	0	<0.1	0.20	0.13
WTP	Nitrite (as N)	mg/L	3 mg/L	12 per year	12	0	<0.01	<0.01	<0.01
WTP	Nitrate (as N)	mg/L	50 mg/L	12 per year	12	0	0.08	0.42	0.27
WTP	Total Organic Carbon	mg/L	No Value	4 per year	4	N/A	1	4	3
WTP	THM	µg/L	250 µg/L	4 per year	4	0	95	130	111
WTP	Arsenic	mg/L	0.01 mg/L	1 per year	1	0	<0.001	<0.001	<0.001
WTP	Barium	mg/L	2 mg/L	1 per year	1	0	0.04	0.04	0.04
WTP	Beryllium	mg/L	0.06 mg/L	1 per year	1	0	<0.001	<0.001	<0.001
WTP	Cadmium	mg/L	0.002 mg/L	1 per year	1	0	<0.0001	<0.0001	<0.0001
WTP	Cyanide	mg/L	0.08	1 per year	1	0	<0.004	<0.004	<0.004
WTP	Mercury	mg/L	0.001 mg/L	1 per year	1	0	<0.0001	<0.0001	<0.0001
WTP	Nickel	mg/L	0.02 mg/L	1 per year	1	0	<0.001	<0.001	<0.001
WTP	Selenium	mg/L	0.01 mg/L	1 per year	1	0	<0.01	<0.01	<0.01
WTP	<i>Cryptosporidium</i>	oocyst/10L	<1 organism/L	1 per year	1	0	ND	ND	ND
WTP	<i>Giardia</i>	cyst/10L	<1 organism/L	1 per year	1	0	ND	ND	ND
WTP	Chlorine	mg/L	5 mg/L	Daily	363	0	0.51	1.52	0.99
WTP	pH	pH unit	No Value	Daily	364	N/A	6.84	7.96	7.52
WTP	Electrical Conductivity	µS/cm	No Value	Daily	362	N/A	190	610	265
WTP	Turbidity	NTU	No Value	Daily	364	N/A	0.09	0.61	0.19
WTP	Colour (True)	mg/L	No Value	Daily	290	N/A	0	9	0.08
WTP	Dissolved Oxygen	mg/L	No Value	Daily	364	N/A	7.17	9.68	8.30
WTP	Temperature	°C	No Value	Daily	364	N/A	15.7	30.8	23.9
WTP	UVT	%	No Value	Daily	316	N/A	79.2	97.2	90.8
WTP	Chlorine	mg/L	5 mg/L	Continuous	online	0	0.8	1.28	0.97
WTP	pH	pH unit	No Value	Continuous	online	N/A	7.38	7.64	7.51
WTP	Electrical Conductivity	µS/cm	No Value	Continuous	online	N/A	219.51	385.81	291.06
WTP	Turbidity	NTU	No Value	Continuous	online	N/A	0.19	1.09	0.35
Reticulation	THM	µg/L	250 µg/L	4 per year	0	0	94	143	122
Reticulation	Chlorine	mg/L	5 mg/L	3 per week	156	0	0	1.82	0.67
Reticulation	<i>E. coli</i>	MPN/100ml	0 MPN/100ml	3 per week	156	0	<1	<1	<1

*A few daily testings were not performed either due to unavailability of equipment, operator error or faulty unit. Testing of colour was not performed daily instead, the Operators conduct visual checks to determine if further testing is required. This testing frequency will be reviewed and the DWQMP will be updated accordingly.

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

Drinking water scheme: <u>Rockhampton Water Supply Scheme</u>												
Year	2021 to 2022											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	36	45	36	36	45	36	36	45	36	36	45	36
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	468	468	468	468	468	468	468	477	468	468	468	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	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
<u>CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE</u>												
The <i>Public Health Regulation 2005</i> (the regulation) requires that 98 per cent of samples taken in a 12 month period should contain no <i>E. Coli</i> . 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).												

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

Drinking water scheme: <u>Mount Morgan Water Supply Scheme</u>												
Year	2021 to 2022											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	12	15	12	12	15	12	12	15	12	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	156	156	156	156	156	156	159	156	156	156	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
<u>CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE</u>												
<p>The <i>Public Health Regulation 2005</i> (the regulation) requires that 98 per cent of samples taken in a 12 month period should contain no <i>E. Coli</i>. This requirement is referred to as the 'annual value' in Schedule 3A of the regulation.</p> <p>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).</p>												

5 Incidents reported to the Regulator

For this reporting period, there were no incidents or events reported to the Regulator as required under Sections 102 or 102A of the *Water Supply (Safety and Reliability) Act 2008*.

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.

Table 7 Customer complaints about water quality

Scheme	Health concern	Taste and/or odour	Appearance and/or discoloured water	Total
Rockhampton	0	13	19	32
Mount Morgan	0	1	6	7
Total	0	14	25	39

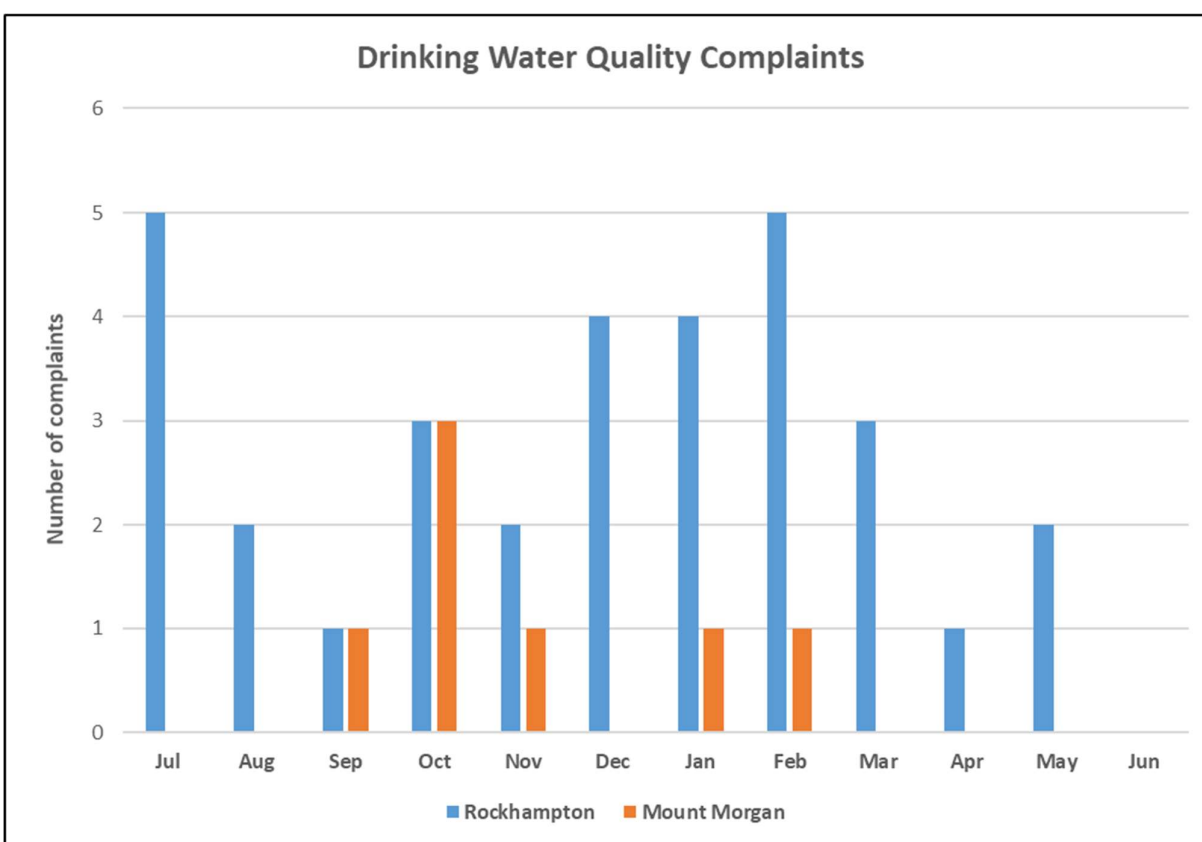


Figure 1 Drinking water quality complaints received between 1 July 2021 and 30 June 2022 for the Rockhampton and Mount Morgan water supply schemes

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 14 customer complaints associated with unfavourable taste and/or odour were received during this reporting period. Thirteen (13) customer complaints were received from the Rockhampton WSS and one customer complaint was received from the 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 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.

Appearance and/or discoloured water

A total of 25 customer complaints associated with appearance and/or discoloured water were received during this reporting period. Nineteen (19) customer complaints were received from the Rockhampton WSS and of these, 3 were due to the presence of air in the water. Six (6) customer complaints were received from Mount Morgan WSS and all are associated with discoloured water.

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

A review of the DWQMP was completed in October 2021. 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:

- Ariane Leyden, Senior Water Quality and Treatment Officer
- Jason Plumb, Manager (Previous) Fitzroy River Water
- Evan Davison, Manager (Acting) Fitzroy River Water

Amendments to the DWQMP were approved by the Regulator in November 2021.

A summary of the outcomes of the review and how issues or changes raised in the review were actioned is provided in this section.

Table 8 DWQMP review outcomes

DWQMP Section	Findings	Outcomes	Status of actions	Responsible Officer
1 Registered service details	All water schemes under LSC that is either fully or partially with drinking water from RRC are not specified. New information is available for populations, connections and average daily demand.	LSC's water supply schemes described or referred to in the DWQMP needs to be specified. Tables on current and anticipated service details need to be updated.	Nerimbera Water Supply Scheme and The Caves Water Supply Scheme have been briefly described Tables on current and anticipated population, number of connections and average daily demand have been updated	Senior Water Quality and Treatment Officer
2 Details of drinking water scheme infrastructure	Provide a brief overview of direct physical link of LSC's water supply schemes to Rockhampton WSS. Minor changes to the summary of infrastructure for the Rockhampton WSS. New information is available on LSC's infrastructure. Minor changes to the schematic and infrastructure for the Mount Morgan WSS including the decommissioning of some WPSs and PRVs. New data on the number of licensed water allocation holders. New emergency or alternative water source for Mount Morgan WSS. Option to dose magnesium oxide at Glenmore WTP. Minor changes to Glenmore WTP process and systems control.	Schematic of Rockhampton WSS needs to be updated to reflect bulk water supply points for LSC's The Caves, Nerimbera and Capricorn Coast Water Supply Schemes. Information needs to be amended. Information needs to be amended. Information needs to be amended. Data needs to be updated. Information needs to be added. Information needs to be added. Information needs to be amended.	Schematic of Rockhampton WSS has been updated. Table on the summary of infrastructure for the Rockhampton WSS has been updated. Existing 2 clear water reservoirs has been added to the table. Capricorn Coast WSS schematic and infrastructure information has been updated. Infrastructure information for The Caves and Nerimbera Water Supply Schemes have been added. The schematic and infrastructure information have been updated. Information has been amended to reflect only one re-chlorination site for this scheme. Data has been updated. Added tankered potable water as an emergency or alternative water source. Process description and schematic representation of the Glenmore WTP have been updated. Process and systems control description of the Glenmore WTP has	Senior Water Quality and Treatment Officer

	<p>Scope of the Glenmore WTP electrical upgrade has been finalised.</p> <p>Potassium permanganate dosing has been decommissioned at Mount Morgan WTP.</p> <p>Minor changes to Mount Morgan WTP process and systems control including the new filling point of tankered potable water.</p> <p>New information on water distribution in the Rockhampton WSS including description of the physical link of LSC's water supply schemes is available.</p> <p>New data is available for water supplied from Rockhampton WSS to Capricorn Coast WSS.</p> <p>New information is available for details of pipeline infrastructure in the Rockhampton and Mount Morgan WSSs.</p> <p>Existing clear water reservoirs at Glenmore WTP must be added to include all potable water storage facilities.</p> <p>New roofing material for North Street Reservoir.</p> <p>Minor changes to target residual chlorine.</p> <p>New information is available on water pump stations including the decommissioning of Ramsay Creek WPS.</p> <p>Minor changes to the stakeholder information.</p>	<p>Overview of the project scope needs to be added.</p> <p>Information needs to be amended.</p> <p>Information needs to be updated.</p> <p>Overview of water distribution in the Rockhampton WSS needs to be updated.</p> <p>Data needs to be updated.</p> <p>Table needs to be updated.</p> <p>Table needs to be updated.</p> <p>Table needs to be updated.</p> <p>Table needs to be updated.</p> <p>Table needs to be updated.</p> <p>Table needs to be updated.</p> <p>Stakeholder information table needs to be updated.</p>	<p>been updated to reflect these changes.</p> <p>Brief overview of the Glenmore WTP electrical upgrade has been added.</p> <p>Process description and schematic representation of the Mount Morgan WTP have been updated.</p> <p>Process and systems control description of the Mount Morgan WTP has been updated to reflect these changes.</p> <p>Water distribution information in the Rockhampton WSS has been updated.</p> <p>Average water supplied from Rockhampton WSS to Capricorn Coast WSS has been updated.</p> <p>Table on the details of pipeline infrastructure has been updated.</p> <p>Table on the details of drinking water reservoirs has been updated.</p> <p>Table on the details of drinking water reservoirs has been updated.</p> <p>Table on reservoir re-chlorination facilities and details of the disinfection system at each site has been updated.</p> <p>Table on details of water pump stations within Drinking Water Supply Schemes has been updated.</p> <p>Table on stakeholder information has been updated.</p>	
3 Catchment and water quality information	New set of data for raw and drinking water quality is available.	Water quality data table, figures and description need to be updated.	New data has been collated. Relevant tables, figures and description have been updated.	Senior Water Quality and Treatment Officer

	<p>New set of data for drinking water quality notifications is available.</p> <p>New set of data for drinking water quality complaints is available.</p>	<p>Drinking water quality notifications description and table need to be updated.</p> <p>Drinking water quality complaints description and table need to be updated.</p>	<p>Description and table have been updated.</p> <p>Description and table have been updated.</p>	
4 Hazard identification	Minor amendment to hazard frequency and critical controls.	Information needs to be updated.	Table has been updated.	Senior Water Quality and Treatment Officer
5 Assessment of risks	<p>Re-assessment of risks were completed. A number of residual risk ratings were updated to moderate and some site-specific risk mitigation measures have been identified including repairing and/or replacement of reservoir roofs, installation of online chlorine monitoring systems, and virus testing.</p> <p>New set of water quality data is available to establish overtime detected concentrations of various water quality parameters.</p> <p>Delivery of tankered water at MMWTP commenced in March 2021. This hazardous event should be assessed for risk and preventative measures identified and implemented.</p> <p>No data is available on chlorate concentrations. Investigative monitoring has been identified as an action to determine concentrations.</p>	<p>The risk assessment tables need to be updated.</p> <p>The risk assessment tables need to be updated.</p> <p>Risk assessment table needs to be revised to include tankered water delivery as a hazardous event.</p> <p>Commence investigative monitoring in the reticulation system to confirm chlorite concentrations.</p>	<p>Risk assessment tables have been updated.</p> <p>Risk assessment tables have been updated.</p> <p>Risk assessment of this hazardous event has been completed and the table has been updated.</p> <p>Investigative monitoring commenced in November 2021 and is expected to be completed by the end of 2023.</p>	Manager FRW / Senior Water Quality and Treatment Officer
6 Managing risks	Some existing risks were re-assessed to have moderate risk residual ratings and proposed actions were identified.	Information needs to be updated.	Table has been updated.	Senior Water Quality and Treatment Officer
7 Operation and maintenance procedure	<p>New operation and maintenance manuals and relevant procedures are available.</p> <p>Minor amendments on the preventative maintenance program.</p>	<p>The operation and maintenance manuals and relevant procedures table needs to be updated.</p> <p>Details on the preventative maintenance program needs to be updated.</p>	<p>Operation and maintenance manuals and relevant procedures table has been updated.</p> <p>Table has been updated.</p>	Manager FRW / Senior Water Quality and Treatment Officer
8 Management of	Minor changes to the drinking water incident	Description and flow chart need to be updated.	Description and flow chart were updated.	Senior Water Quality and

emergencies, incidents or excursions from normal operations	management description and flow chart. Minor amendments to the emergency contact information.	Emergency contact information needs to be updated.	Information has been updated.	Treatment Officer
9 Service wide support – information management	Addition of new information management systems.	New software system needs to be added.	New software system has been added to the table.	Senior Water Quality and Treatment Officer
10 Operational and verification monitoring programs	Minor amendments to the water quality program. Operational monitoring schedule is not current. There are new water quality sampling sites in the distribution system.	Table needs to be updated. Table needs to be amended to reflect the current operational monitoring schedule. New water quality sampling sites need to be added to the list.	Table has been updated. Changes were made and table has been updated. Table has been updated.	Senior Water Quality and Treatment Officer
11 Best practice initiatives	There is an ongoing collaborative work between FRW and CSIRO and DES to better understand the lower Fitzroy River catchment water quality.	This information needs to be added.	Description of collaborative works has been added in the Research and Development Activities section.	Senior Water Quality and Treatment Officer
12 Risk management improvement program	There are new site-specific actions to prevent contamination in reservoirs. Testing for viruses to be scheduled to confirm MMWTP process effectiveness. Chlorate investigative monitoring commenced to determine chlorate concentrations in the distribution system.	Site specific actions need to be added in the RMIP table. Testing schedule as an action needs to be added in the RMIP table. Investigative monitoring as an action needs to be added in the RMIP table.	RMIP table has been updated. RMIP table has been updated. RMIP table has been updated.	Senior Water Quality and Treatment Officer
Appendices	An overview of reservoir water supply zones and sampling points is available. Operating protocol between FRW and LSC for the supply of water services has been amended.	Appendix to be updated to reflect this new information. Appendix needs to be updated to include the amended operating protocol.	Added as new appendix (Appendix D). Appendix E has been updated to reflect the amended operating protocol.	Senior Water Quality and Treatment Officer

8 DWQMP audit findings

No audit was conducted during the reporting period 1 July 2021 to 30 June 2022.

The next regular audit of the DWQMP is scheduled for completion by 31 August 2024. Once completed, these audit findings will be incorporated as appropriate in future revisions of the DWQMP.