



GLADSTONE REGIONAL COUNCIL

ABN: 27 330 979 106

DRINKING WATER QUALITY MANAGEMENT PLAN REPORT

2020-21

SPID: 483

Gladstone Regional Council
101 Goondoon Street
GLADSTONE 4680

07 4970 0700
jane.doran@gladstone.qld.gov.au



Glossary of terms

ADWG 2011	Australian Drinking Water Guidelines (2011). Published by the National Health and Medical Research Council of Australia
CFU/mL	Colony forming units per millilitre
<i>E. coli</i>	<i>Escherichia coli</i> , a bacterium which is considered to indicate the presence of faecal contamination and therefore potential health risk
DRDMW	Department of Regional Development, Manufacturing and Water
GAWB	Gladstone Area Water Board
GRC	Gladstone Regional Council
HU	Hazen Units
mg/L	Milligrams per litre
MPN/100mL	Most probable number per 100 millilitres
NTU	Nephelometric Turbidity Units
WTP	Water Treatment Plant
<	Less than
>	Greater than



1. Introduction

This report documents the performance of Gladstone Regional Council's (GRC) drinking water service with respect to water quality, and implementation of 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.

2. Overview of Operations

The Gladstone Regional Council provides water to its residents through four water schemes:

- **Lake Awoonga Scheme.** Under this scheme the Gladstone Area Water Board (GAWB) collects and treats raw water harvested from the Lake Awoonga Dam. The water is treated through a conventional water treatment plant before being sold to Gladstone Regional Council at a number of reservoir and supply points throughout Gladstone, Boyne Island, Tannum Sands Calliope and Mt Larcom. GRC distributes the water to approximately 22,282 connections.
- **Bororen Scheme.** GRC sources water from two production bores located to the west of Lagoon Creek within the Baffle Creek catchment. The groundwater is treated at the Bororen Water Treatment Plant (WTP) and disinfected before being reticulated to 80 connections within the Bororen Township.
- **Miriam Vale Scheme.** GRC usually sources water from Baffle Creek (~80%) and the Thornes Road bore. The water is mixed and treated through a conventional treatment process and disinfected before being reticulated to approximately 192 connections.
- **Agnes Water/1770 Scheme.** GRC sources water from seawater and groundwater bores along Springs Road. The seawater is treated through a reverse osmosis desalination plant, and the bore water is treated through an ultrafiltration plant. Disinfected water is supplied to approximately 1057 connections within the townships of Agnes Water and 1770. The treatment plant is operated and maintained under contract by Trility Pty Ltd.

GRC manages drinking water quality through an approved Drinking Water Quality Management Plan (DWQMP). This ensures that water supplied to its 23,611 total connections, which represents an estimated population of approximately 61,400 people, is safe and public health is maintained.

3. Compliance with water quality criteria for drinking water

A summary of water quality performance over the four schemes is summarised in Appendix A.

GRC have produced a consistent and safe water supply that meet the requirements set by the *Public Health Regulation 2018* for drinking water with 100% of the 953 drinking water samples tested free of *E. coli*.

The microbial, chemical and physical testing program involved approximately 12,322 individual tests undertaken on drinking water samples. None of these test results exceeded a health guideline value in the Australian Drinking Water Guidelines 2011.



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

There were no instances during 2020-21 where the Regulator was notified under sections 102 or 102A of the Act.

5. Customer complaints related to water quality

Gladstone 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 Relating to Water Quality, 2020-21

Scheme	Suspected Illness	Discoloured water	Taste and Odour	Other	Total
Lake Awoonga	3	12	9	0	24
Agnes Water/1770	0	0	0	2	2
Miriam Vale	0	0	0	0	0
Bororen	0	0	0	1	1
Total	3	12	9	3	27

Suspected Illness

Gladstone Regional Council investigates each complaint relating to alleged illness from the water supply, typically by conducting *E. coli* analysis from the source tap and monitoring the levels of free chlorine present in the water.

During 2020-2021, there were no confirmed cases of illness arising from the water supply system. The three suspected illness complaints were either related to chlorine sensitivity and/or on-site plumbing issues.

Discoloured water

A total of 12 customer complaints were received related to discoloured water. In response to discoloured water complaints, Council staff flush the relevant mains until the water runs clear.

Council staff also contacts the customer to advise them of the actions taken. Council proactively flushes mains on a routine basis in areas with a history of discoloured water complaints. This has reduced the number of complaints received over time.

It is standard practice for Council to flush mains after breaks and in response to abnormal water quality sample results and low residual free chlorine.

Taste and odour

Gladstone Regional Council investigates taste and odour complaints and devise plans for prompt resolution, which may include flushing in the reticulation system. Investigation of each complaint found no public health risks. The taste and odour complaints are possibly due to variations in chlorine concentration throughout the year and/or other operational changes (i.e. setpoint increase).

6. Findings and recommendations of the DWQMP auditor

No DWQMP audits were required or undertaken in 2020-21.



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

The DWQMP was not reviewed in 2020-21, however an amendment arising from the previous review in early 2020 was ultimately submitted in September 2020 and approved in December 2020. Please refer to the 2019-20 DWQMP Report for more information on the 2020 DWQMP Review, and to the section below for additional actions taken in 2020-21.

8. Actions taken to implement the DWQMP

Actions taken by GRC to implement the DWQMP in 2020-21 included:

- Initiated the development of a new Water Quality and Environmental Management System (database to house verification monitoring data)
- Updated the Safe Work Method Statement for Disinfection of Tools
- Initiated the development of a new Drinking Water Asset Commissioning Procedure
- Field staff provided “Exact Meters” (handheld chlorine and pH test kits) and training provided
- Requested GAWB adjust chlorine set points at Water Treatment Plants to assist with increased chlorine decay in Lake Awoonga scheme
- Miriam Vale WTP – seasonal chlorine dosing implemented to improve chlorine residual in reticulation in warmer months
- Miriam Vale WTP – insulation installed around sodium hypochlorite storage tank
- Bororen WTP - turbidity analyser replaced
- Strategic review undertaken looking at water quality analysers and preferred supplier recommended for future analyser replacements
- Improvements to ClearSCADA data logging to collect and retain higher resolution of data points
- Weekly WTP performance / issues reports - internal reporting process implemented
- 4 x Drinking Water Technical Committee meetings held including attendees from Gladstone Area Water Board and Queensland Health
- Investigations underway into alternative water sources for Miriam Vale (for future times when Baffle Creek source may be unavailable)



Appendix A – Summary of compliance with water quality criteria

The results from the verification monitoring program have been compared against the regulatory water quality criteria, and summarised in the following tables.

Verification monitoring results - Lake Awoonga - Reticulation System – 2020-21

Parameter	Unit of Measure	Sample Results	Guideline Value*	Minimum	Average	Maximum	Non-compliances*
Alkalinity	mg/L as CaCO ₃	76		62	71	85	0
Aluminium	mg/L	76		0.03	0.064	0.15	0
Antimony	mg/L	17	0.003	<	<	<	0
Arsenic	mg/L	17	0.01	<	<	0.001	0
Barium	mg/L	17	2	0.01	0.012	0.013	0
Boron	mg/L	17	4	<	<	<	0
Bromate	mg/L	64	0.02	<	<	<	0
Bromide	mg/L	64		<	0.023	0.075	0
Bromodichloromethane	mg/L	76	0.25	0.009	0.021	0.036	0
Cadmium	mg/L	17	0.002	<	<	<	0
Chlorate	mg/L	82	0.8 [^]	0.043	0.193	0.668	0
Chloride	mg/L	64		29	35	94	0
Chromium	mg/L	17	0.05	<	<	0.002	0
Copper	mg/L	17	2	<	0.003	0.028	0
Dibromochloromethane	mg/L	76	0.25	0.01	0.018	0.053	0
<i>E. coli</i>	mpn/100mL	714	0	<	<	<	0
Electrical Conductivity	µS/cm	715		276	316	511	0
Fluoride	mg/L	64	1.5	<	0.07	0.2	0
Free Chlorine	mg/L	715	5	<	0.89	2.3	0
HPC	cfu/mL	404		<	8	>300	0
Insoluble Manganese	mg/L	76	0.5	<	<	0.002	0
Iron	mg/L	76		<	0.014	0.21	0
Lead	mg/L	17	0.01	<	<	<	0
Mercury	mg/L	17	0.001	<	<	<	0
Molybdenum	mg/L	17	0.05	<	<	<	0
Nickel	mg/L	17	0.02	<	<	0.001	0
Nitrate	mg/L	64	50	<	0.076	0.14	0
Nitrite	mg/L	64	3	<	<	<	0
pH		715		6.6	7.4	9.0	0
Phosphate	mg/L	64		<	<	0.04	0
Selenium	mg/L	17	0.01	<	<	<	0
Soluble Manganese	mg/L	76	0.5	<	0.001	0.06	0
Sulfate	mg/L	63		26	29	32	0
Temperature	°C	714		16.9	26.0	33.2	0
Total Coliforms	mpn/100mL	714		<	<	2	0
Total Hardness	mg/L as CaCO ₃	76		75	86	110	0
Total Trihalomethanes	mg/L	76	0.25	0.022	0.063	0.122	0
Tribromomethane	mg/L	76	0.25	<	0.001	0.029	0
Trichloromethane	mg/L	76	0.25	<	0.025	0.06	0
True Colour	HU	715		<	<	7	0
Turbidity	NTU	715		<	0.11	0.71	0
Zinc	mg/L	17		<	0.002	0.017	0

*Guideline values and non-compliances refer to the regulatory water quality criteria (i.e. health based limits) but not aesthetic limits

[^] A guideline value of 0.8mg/L for chlorate has been implemented under GRC's DWQMP as per guidance from QLD Health

< symbol denotes that the number is below the limit of reporting for the test. In all cases, the limits of reporting are below the ADWG health (and aesthetic) guideline values.



Verification monitoring results - Bororen – Treated Water / Reticulation System – 2020-21

Parameter	Unit of Measure	Sample Results	Guideline Value*	Minimum	Average	Maximum	Non-compliances*
Alkalinity	mg/L as CaCO ₃	24		86	210	225	0
Aluminium	mg/L	73		<	0.02	0.23	0
Antimony	mg/L	1	0.003	<	<	<	0
Arsenic	mg/L	1	0.01	<	<	<	0
Barium	mg/L	1	2	0.018	0.018	0.018	0
Boron	mg/L	1	4	<	<	<	0
Bromate	mg/L	4	0.02	<	<	<	0
Bromide	mg/L	4		0.118	0.134	0.15	0
Bromodichloromethane	mg/L	8	0.25	<	0.007	0.013	0
Cadmium	mg/L	1	0.002	<	<	<	0
Chlorate	mg/L	8	0.8^	0.18	0.26	0.33	0
Chloride	mg/L	4		131	137	142	0
Chromium	mg/L	1	0.05	<	<	<	0
Copper	mg/L	1	2	<	<	<	0
Dibromochloromethane	mg/L	8	0.25	0.012	0.016	0.021	0
<i>E. coli</i>	mpn/100mL	39	0	<	<	<	0
Electrical Conductivity	µS/cm	122		791	845	945	0
Fluoride	mg/L	4	1.5	<	0.05	0.1	0
Free Chlorine	mg/L	120	5	0.6	1.3	1.8	0
HPC	cfu/mL	16		<	1	6	0
Insoluble Manganese	mg/L	24	0.5	<	0.008	0.04	0
Iron	mg/L	122		<	0.02	0.07	0
Lead	mg/L	1	0.01	<	<	<	0
Mercury	mg/L	1	0.001	<	<	<	0
Molybdenum	mg/L	1	0.05	<	<	<	0
Nickel	mg/L	1	0.02	<	<	<	0
Nitrate	mg/L	4	50	<	0.01	0.02	0
Nitrite	mg/L	4	3	<	<	<	0
Pesticides	mg/L	1		<	<	<	0
pH		122		7.0	7.4	7.9	0
Phosphate	mg/L	4		<	0.002	0.01	0
Selenium	mg/L	1	0.01	<	<	<	0
Soluble Manganese	mg/L	122	0.5	<	0.004	0.04	0
Sulfate	mg/L	4		3	3	4	0
Temperature	°C	122		18.6	24.1	28.9	0
Total Coliforms	mpn/100mL	39		<	<	<	0
Total Hardness	mg/L as CaCO ₃	24		103	291	321	0
Total Trihalomethanes	mg/L	8	0.25	0.025	0.036	0.048	0
Tribromomethane	mg/L	8	0.25	0.01	0.015	0.019	0
Trichloromethane	mg/L	8	0.25	<	<	<	0
True Colour	HU	122		<	1.4	13	0
Turbidity	NTU	122		<	0.11	0.42	0
Zinc	mg/L	1		<	<	<	0

*Guideline values and non-compliances refer to the regulatory water quality criteria (i.e. health based limits) but not aesthetic limits

^ A guideline value of 0.8mg/L for chlorate has been implemented under GRC's DWQMP as per guidance from QLD Health

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Verification monitoring results - Miriam Vale – Treated Water / Reticulation System – 2020-21

Parameter	Unit of Measure	Guideline Value*	Sample Results	Minimum	Average	Maximum	Non-compliances*
Alkalinity	mg/L as CaCO ₃		49	63	92	212	0
Aluminium	mg/L		94	<	0.014	0.08	0
Antimony	mg/L	0.003	2	<	<	<	0
Arsenic	mg/L	0.01	2	<	<	<	0
Barium	mg/L	2	2	0.024	0.025	0.026	0
Boron	mg/L	4	2	<	<	<	0
Bromate	mg/L	0.02	8	<	<	<	0
Bromide	mg/L		8	0.029	0.062	0.103	0
Bromodichloromethane	mg/L	0.25	21	0.01	0.02	0.034	0
Cadmium	mg/L	0.002	2	<	<	<	0
Chlorate	mg/L	0.8^	21	0.059	0.29	0.78	0
Chloride	mg/L		8	31	113	182	0
Chromium	mg/L	0.05	2	<	<	<	0
Copper	mg/L	2	1	0.003	0.003	0.003	0
Dibromochloromethane	mg/L	0.25	21	0.012	0.031	0.056	0
<i>E. coli</i>	mpn/100mL	0	90	<	<	<	0
Electrical Conductivity	µS/cm		161	289	580	945	0
Fluoride	mg/L	1.5	8	<	0.025	0.1	0
Free Chlorine	mg/L	5	160	<	0.91	1.7	0
HPC	cfu/mL		68	<	35	>300	0
Insoluble Manganese	mg/L	0.5	50	<	0.001	0.007	0
Iron	mg/L		131	<	0.012	0.16	0
Lead	mg/L	0.01	2	<	<	<	0
Mercury	mg/L	0.001	2	<	<	<	0
Molybdenum	mg/L	0.05	2	<	<	<	0
Nickel	mg/L	0.02	2	<	<	<	0
Nitrate	mg/L	50	8	0.04	0.058	0.07	0
Nitrite	mg/L	3	8	<	<	<	0
Pesticides	mg/L		1	<	<	<	0
pH			161	6.8	7.2	7.8	0
Phosphate	mg/L		8	<	<	<	0
Selenium	mg/L	0.01	2	<	<	<	0
Soluble Manganese	mg/L	0.5	131	<	0.002	0.03	0
Sulfate	mg/L		8	3	10	29	0
Temperature	°C		161	18.6	24.4	32.4	0
Total Coliforms	mpn/100mL		90	<	<	<	0
Total Hardness	mg/L as CaCO ₃		50	74	115	321	0
Total Trihalomethanes	mg/L	0.25	21	0.035	0.079	0.133	0
Tribromomethane	mg/L	0.25	21	<	0.012	0.034	0
Trichloromethane	mg/L	0.25	21	<	0.014	0.029	0
True Colour	HU		159	<	<	22	0
Turbidity	NTU		161	0.01	0.09	0.32	0
Zinc	mg/L		2	<	<	<	0

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Verification monitoring results - Agnes Water/1770 - Reticulation System – 2020-21

Parameter	Unit of Measure	Guideline Value	Sample Results	Minimum	Average	Maximum	Non-compliances*
Alkalinity	mg/L as CaCO ₃		16	31	46	62	0
Aluminium	mg/L		16	0.02	0.05	0.08	0
Antimony	mg/L	0.003	4	<	<	<	0
Arsenic	mg/L	0.01	4	<	<	<	0
Barium	mg/L	2	4	0.005	0.006	0.006	0
Boron	mg/L	4	4	0.67	0.70	0.75	0
Bromate	mg/L	0.02	16	<	<	<	0
Bromide	mg/L		16	0.21	0.39	0.59	0
Cadmium	mg/L	0.002	4	<	<	<	0
Chloride	mg/L		16	93	134	177	0
Chromium	mg/L	0.05	4	<	<	<	0
Copper	mg/L	2	4	<	0.002	0.005	0
<i>E. coli</i>	mpn/100mL	0	110	<	<	<	0
Electrical Conductivity	µS/cm		112	381	516	675	0
Fluoride	mg/L	1.5	16	<	<	<	0
Free Chlorine	mg/L	5	112	0.52	0.95	1.2	0
HPC	cfu/mL		51	<	57	>300	0
Insoluble Manganese	mg/L	0.5	16	<	0.003	0.007	0
Iron	mg/L		16	<	0.004	0.06	0
Lead	mg/L	0.01	4	<	<	<	0
Mercury	mg/L	0.001	4	<	<	<	0
Molybdenum	mg/L	0.05	4	<	<	<	0
Nickel	mg/L	0.02	4	<	<	<	0
Nitrate	mg/L	50	16	<	0.06	0.18	0
Nitrite	mg/L	3	16	<	<	<	0
pH			112	6.7	7.9	8.4	0
Phosphate	mg/L		16	<	<	<	0
Selenium	mg/L	0.01	4	<	<	<	0
Soluble Manganese	mg/L	0.5	16	<	<	<	0
Sulfate	mg/L		16	2	3	8	0
Temperature	°C		112	19.2	25.9	31.4	0
Total Coliforms	mpn/100mL		107	<	<	<	0
Total Hardness	mg/L as CaCO ₃		16	40	50	58	0
True Colour	HU		112	<	<	11	0
Turbidity	NTU		112	0.02	0.14	0.58	0
Zinc	mg/L		4	<	0.008	0.014	0

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