GLADSTONE
REGIONAL COUNCIL

ABN: 27 330 979 106

DRINKING WATER QUALITY MANAGEMENT PLAN REPORT

2022-23

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
E. coli	*Escherichia coli*, 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 1099 drinking water samples tested free of *E. coli*.

The microbial, chemical and physical testing program involved approximately 12,023 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 2022-23 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, 2022-23

Scheme	Suspected Illness	Discoloured water	Taste and Odour	Other	Total
Lake Awoonga	2	18	10	3	33
Agnes Water/1770	0	1	1	1	3
Miriam Vale	0	0	0	0	0
Bororen	0	0	1	0	1
Total	**2**	**19**	**12**	**4**	**37**

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 2022-2023, there were no confirmed cases of illness arising from the water supply system. The two suspected illness complaints were investigated, but microbiological samples were clear. One customer complaint for suspected illness coincides with a discoloured water complaint, which reported orange water. The orange water was proved to be an internal plumbing issue. Two more odour complaints relate to the same customer.

Discoloured water

A total of 19 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.

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 where required, undertakes response actions (for example checking of chlorine results or flushing in the reticulation system).

Investigation of each of the 12 taste and odour complaints found no evidence of public health risks. Most taste and odour complaints come from chlorine which may vary throughout the year and/or other operational changes (i.e. setpoint increase). Some taste complaints were received after works in the area and coincided with cloudy water which was caused by air in the line.

Other

There were 4 complaints for various other reasons such as mineral content, unusually reacting pool chemicals and scale/discolouration of laundry. In all cases information was provided and water testing did not show anything unusual.

6. Findings and recommendations of the DWQMP auditor

There was no regular audit of the DWQMP in 2022-23.

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

There was no review of the DWQMP in 2022-23.

8. Actions taken to implement the DWQMP

Actions taken by GRC to implement the DWQMP in 2022-23 included:

- Refinement of the EnviroSys water quality management system configuration, troubleshooting, and optimisation.
- 4 x Drinking Water Stakeholder Technical Group (formally Drinking Water Stakeholder Committee) meetings held including attendees from Gladstone Area Water Board and Queensland Health
- Ongoing collaboration with GAWB regarding investigations and improvements to manage increased chlorine decay in Lake Awoonga scheme

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. Where the number of sample results is lower than the number of samples required, this is typically due to unavoidable reasons such as reservoirs being taken offline for maintenance, or sample sites being inaccessible.

Verification monitoring results - Lake Awoonga - Reticulation System – 2022-23

Parameter	Unit	Samples required	Sample Results	Guideline Value*	Minimum	Average	Maximum	Non-compliances*
Aluminium - Total	mg/L	76	76		0.03	0.06	0.31	0
Antimony - Total	mg/L	19	19	0.003	<	<	<	0
Arsenic - Total	mg/L	19	19	0.01	<	<	<	0
Barium - Total	mg/L	19	19	2	0.013	0.01	0.016	0
Boron - Total	mg/L	19	19	4	<	<	0.07	0
Bromate	mg/L	76	76	0.02	<	<	0.006	0
Bromide	mg/L	76	76		<	0.03	0.06	0
Bromodichloromethane	µg/L	88	88	250	9	24.64	41	0
Bromoform	µg/L	88	88	250	<	<	8	0
Cadmium - Total	mg/L	19	19	0.002	<	<	<	0
Chlorate	mg/L	88	88	0.8^	0.04	0.14	0.357	0
Chloride	mg/L	76	76		32	38.04	46	0
Chlorine (free)	mg/L	790	853		0	0.71	4.9	0
Chloroform	µg/L	88	88	250	7	30.44	58	0
Chromium - Total	mg/L	19	19	0.05	<	<	0.002	0
Copper - Total	mg/L	19	38	2	<	0.00	0.019	0
Dibromochloromethane	µg/L	88	88	250	8	18.07	31	0
E. coli	MPN/100mL	790	836	0	<	<		0
Electrical Conductivity	µS/cm	790	853		282	322.2	448	0
Fluoride	mg/L	76	76	1.5	<	<	0.1	0
Heterotrophic Plate Count	CFU/mL	478	451		<	16.35	300	0
Iron - Total	mg/L	76	76		<	<	0.32	0
Lead - Total	mg/L	19	19	0.01	<	<	<	0
Manganese - Dissolved	mg/L	76	152	0.5	<	<	0.003	0
Manganese - Total	mg/L	76	152	0.5	<	<	0.004	0
Mercury - Total	mg/L	19	19	0.001	<	<	<	0
Molybdenum - Total	mg/L	19	19	0.05	<	<	<	0
Nickel - Total	mg/L	19	19	0.02	<	<	<	0
Nitrate as NO_3^-	mg/L	76	76	50	0.06	0.11	0.16	0
Nitrite NO_2	mg/L	76	76	3	<	<	<	0
pH	pH units	790	854		6.93	7.36	8.68	0
Phosphate PO_4	mg/L	76	76		<	<	<	0
Selenium - Total	mg/L	19	19	0.01	<	<	<	0
Sulfate as SO_4^{2-}	mg/L	76	76		27	28.83	32	0
Temperature	°C	790	852		0.84	24.97	33.5	0
Total Alkalinity (as CaCO3)	mg/L	76	76		60	72.68	96	0
Total Coliforms (Colilert)	MPN/100mL	790	836		<	<	8	0
Total Hardness (as CaCO3)	mg/L	76	76		75	89.46	112	0
Trihalomethanes Total	µg/L	88	88	250	24	73.38	122	0
True Colour	HU	790	853		<	<	5	0
Turbidity (NTU)	NTU	790	854		0.017	0.17	1.23	0
Zinc - Total	mg/L	19	19		<	<	0.015	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 – 2022-23

Parameter[#]	Unit	Samples required	Sample Results	Guideline Value*	Minimum	Average	Maximum	Non-compliances*
Aluminium - Total	mg/L	24	24		<	0.02	0.06	0
Antimony - Total		1	1	0.003	<	<	<	0
Arsenic - Total		1	1	0.01	<	<	<	0
Barium - Total		1	1	2	0.017	0.02	0.017	0
Boron - Total		1	1	4	<	<	<	0
Bromate	mg/L	4	5	0.02	<	<	<	0
Bromide	mg/L	4	5		0.035	0.12	0.162	0
Bromodichloromethane	µg/L	8	7	250	6	8.43	13	0
Bromoform	µg/L	8	7	250	9	11.57	19	0
Cadmium - Total		1	1	0.002	<	<	<	0
Chlorate	mg/L	8	8	0.8^	0.123	0.22	0.287	0
Chloride	mg/L	4	5		128	134	144	0
Chlorine (free)	mg/L	52	48		0.94	1.39	1.73	0
Chloroform	µg/L	8	7	250	<	<	6	0
Chromium - Total		1	1	0.05	<	<	<	0
Copper - Total		1	2	2	<	<	<	0
Dibromochloromethane	µg/L	8	7	250	14	18	27	0
E. coli	MPN/100mL	52	53	0	<	<	<	0
Electrical Conductivity	µS/cm	24	26		373	765.58	806	0
Fluoride	mg/L	4	5	1.5	<	<	0.1	0
Heterotrophic Plate Count (22°C)	CFU/mL	26	22		<	1.5	19	0
Iron - Total	mg/L	24	24		<	<	<	0
Lead - Total	mg/L	1	1	0.01	<	<	<	0
Manganese - Dissolved	mg/L	24	48	0.5	<	<	0.002	0
Manganese - Total	mg/L	24	48	0.5	0.001	0.001	0.018	0
Mercury - Total	mg/L	1	1	0.001	<	<	<	0
Molybdenum - Total	mg/L	1	1	0.05	<	<	<	0
Nickel - Total	mg/L	1	1	0.02	<	<	<	0
Nitrate as NO3	mg/L	4	5	50	<	<	0.02	0
Nitrite as NO2	mg/L	4	5	3	<	<	<	0
Pesticides	µg/L	1	1	Various	<	<	<	0
pH	pH units	24	26		7.17	7.3	7.59	0
Phosphate as PO4	mg/L	4	5		<	<	<	0
Selenium	mg/L	1	1		<	<	<	0
Sulfate as SO4	mg/L	4	5		2	2.8	3	0
Temperature	°C	24	26		17.5	24.12	29.1	0
Total Alkalinity (CaCO3)	mg/L	24	26		199	217.54	252	0
Total Coliforms (Colilert)	MPN/100mL	52	53		<	<	<	0
Total Hardness (CaCO3)	mg/L	24	24		276	295.25	327	0
Trihalomethanes Total	µg/L	8	7	250	29	38.86	65	0
True Colour	HU	24	26		<	<	4	0
Turbidity (NTU)	NTU	24	26		0.03	0.16	0.36	0
Zinc - Total	mg/L	1	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 – 2022-23

Parameter#	Unit	Samples Required	Samples Results	Guideline Value*	Minimum	Average	Maximum	Non-compliances*
Aluminium - Total	mg/L	52	39		<	0.01	0.05	0
Antimony - Total		2	2	0.003	<	<	<	0
Arsenic - Total		2	2	0.01	<	<	<	0
Barium - Total		2	2	2	0.029	0.03	0.03	0
Boron - Total		2	2	4	<	<	<	0
Bromate	mg/L	8	7	0.02	<	<	0.007	0
Bromide	mg/L	8	7		0.025	0.06	0.101	0
Bromodichloromethane	µg/L	20	17	250	6	28.41	55	0
Bromoform	µg/L	20	17	250	<	5.82	17	0
Cadmium - Total		2	2	0.002	<	<	<	0
Chlorate	mg/L	20	18	0.8^	0.104	0.29	0.691	0
Chloride	mg/L	8	7		89	109.86	150	0
Chlorine (free)	mg/L	74	80		0.02	1.08	1.94	0
Chloroform	µg/L	20	17	250	<	25.26	76	0
Chromium - Total		2	2	0.05	<	<	<	0
Copper - Total		2	4	2	0.003	0.01	0.011	0
Dibromochloromethane	µg/L	20	17	250	10	28.12	64	0
E. coli	MPN/100mL	88	96	0	<	<	<	0
Electrical Conductivity	µS/cm	74	80		404	581.38	848	0
Fluoride	mg/L	8	7	1.5	<	<	0.1	0
Heterotrophic Plate Count (22°C)	CFU/mL	62	66		<	15.95	300	0
Iron - Total	mg/L	52	39		<	<	<	0
Lead - Total	mg/L	2	2	0.01	<	<	<	0
Manganese - Dissolved	mg/L	52	78	0.5	<	<	0.003	0
Manganese - Total	mg/L	52	78	0.5	<	<	0.003	0
Mercury - Total	mg/L	2	2	0.001	<	<	<	0
Molybdenum - Total	mg/L	2	2	0.05	<	<	<	0
Nickel - Total	mg/L	2	2	0.02	<	<	<	0
Nitrate as NO3	mg/L	8	7	50	0.13	0.17	0.2	0
Nitrite as NO2	mg/L	8	7	3	<	<	0.025	0
Pesticides	µg/L	1	1	Various	<	<	<	0
pH	pH units	74	80		6.94	7.24	7.87	0
Phosphate as PO4	mg/L	8	7		<	<	0.01	0
Sulfate as SO4	mg/L	8	2		<	<	<	0
Selenium	mg/L	2	2		<	<	<	0
Temperature	°C	74	80		16.8	24.32	29.1	0
Total Alkalinity (CaCO3)	mg/L	52	39		79	128.72	185	0
Total Coliforms (Colilert)	MPN/100mL	88	95		<	<	<	0
Total Hardness (CaCO3)	mg/L	52	39		84	127.44	183	0
Trihalomethanes Total	µg/L	20	17	250	16	86.	154	0
True Colour	HU	74	80		<	<	3	0
Turbidity (NTU)	NTU	74	80		0.02	0.16	0.34	0
Zinc - Total	mg/L	2	2		<	0.01	0.013	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 - Agnes Water/1770 - Reticulation System – 2022-23

Parameter[#]	Unit	Samples Required	Sample Results	Guideline Value	Minimum	Average	Maximum	Non-compliances*
Aluminium - Total	mg/L	16	14		0.02	0.04	0.05	0
Antimony		4	3	0.003	<	<	<	0
Arsenic		4	3	0.01	<	<	<	0
Barium		4	3	2	0.005	0.01	0.01	0
Boron		4	3	4	0.27	0.5	0.65	0
Bromate	mg/L	16	15	0.02	<	<	<	0
Bromide	mg/L	16	15		0.081	0.17	0.247	0
Cadmium		4	3	0.002	<	<	<	0
Chlorate	mg/L	16	15	0.8^	0.04	0.1	0.17	0
Chloride	mg/L	16	15		68	85.4	109	0
Chlorine (free)	mg/L	112	114		0.15	0.71	1.21	0
Chromium		4	3	0.05	<	<	<	0
Copper		4	6	2	0.001	0.00	0.002	0
E. coli	MPN/100mL	112	114	0	<	<	<	0
Electrical Conductivity	µS/cm	112	114		313	394.88	650	0
Fluoride	mg/L	16	15	1.5	<	<	0.1	0
Heterotrophic Plate Count (22°C)	CFU/mL	52	44		<	114.83	300	0
Iron - Total	mg/L	16	14		<	<	0.07	0
Lead		4	3	0.01	<	<	<	0
Manganese - Dissolved	mg/L	16	30	0.5	<	<	<	0
Manganese - Total	mg/L	16	28	0.5	<	0.0	0.004	0
Mercury		4	3	0.001	<	<	<	0
Molybdenum		4	3	0.05	<	<	<	0
Nickel - Total		4	3	0.02	<	<	<	0
Nitrate as NO3	mg/L	16	15	50	0.13	0.24	0.89	0
Nitrite as NO2	mg/L	16	15	3	<	<	<	0
pH	pH units	112	114		7.22	7.61	8.01	0
Phosphate as PO4	mg/L	16	15		<	0.01	0.05	0
Selenium	mg/L	4	3	0.01	<	<	<	0
Sulfate as SO4	mg/L	16	15		2	4.27	16	0
Temperature	°C	112	114		7.41	25.42	32.2	0
Total Alkalinity (CaCO3)	mg/L	16	15		46	54.2	62	0
Total Coliforms (Colilert)	MPN/100mL	112	114		<	<	<	0
Total Hardness (CaCO3)	mg/L	16	15		56	63.07	81	0
True Colour	HU	112	114		<	<	3	0
Turbidity (NTU)	NTU	112	114		0.02	0.16	0.55	0
Zinc		4	3		<	0.01	0.012	0

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

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