DRINKING WATER SERVICE ANNUAL REPORT 2022/2023

Service Provider Identification Number	**SP485**
Name	**Gympie Regional Council**
Address	**2 Caledonian Hill** **Gympie QLD 4570**
Telephone	**1300 307 800**
Website	**www.gympie.qld.gov.au**
Local Government Area covered by this plan	**Gympie Regional Council**
Water Supply Schemes covered by this plan	**Amamoor, Cooloola Cove, Goomeri, Gympie, Imbil, Kandanga, Kilkivan and Rainbow Beach**

GYMPIE REGIONAL COUNCIL

Revision	Revision Date	Details	Authorised
0.0	5/12/2023	Draft	Rhonda Otto
1.0	18/12/2023	Approved	Skye Hughes

About this report

The Gympie Regional Council 2022/23 Drinking Water Service Annual Report provides an overview of our operational performance with respect to drinking water quality, and shows how we have been implementing key improvement actions detailed in our approved DWQMP.

This report provides our customers with information about the quality of their drinking water.

This report also informs the regulator on how we complied with our DWQMP and its approval conditions. It also allows us to meet our legislative obligations under the *Water Supply (Safety and Reliability) Act 2008*.

Audience

This report aims to communicate comprehensive information to satisfy the needs of individuals and groups who are affected by, or have an interest in, our activities, including:

- our customers
- the communities we serve
- current and future employees
- government agencies
- other Local Councils and utilities
- business and industry.

Reporting requirements

Under the *Water Supply (Safety and Reliability) Act 2008*, water service providers must prepare a Drinking Water Service Annual Report each financial year. This report must include:

- the actions taken by Gympie Regional Council to implement its DWQMP
- details of Gympie Regional Council's compliance with drinking water quality criteria
- details of any water quality incidents reported to the regulator
- details of any customer complaints related to water service.
- the outcome of any DWQMP Review undertaken
- a summary of DWQMP audit findings and recommendations

Tell us what you think

A copy of this DWQMP report is available to view on Council's website and Town Hall Customer Contact Counter for inspection by the public during office hours on business days. A copy of the report is also available for purchase at a reasonable cost.

If you would like to provide feedback on this report, please contact us via:

Website

www.gympie.qld.gov.au

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Town Hall

2 Caledonian Hill
Gympie QLD 4570
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Chapter 1: About us

What we do

Gympie Regional Council is responsible for delivering drinking water, recycled water and sewerage services to approximately 35,908 customers in the Gympie Region.

Our 6,898km^2 geographical area includes the towns of Amamoor, Cooloola Cove, Tin Can Bay, Goomeri, Gympie, Imbil, Kandanga, Kilkivan and Rainbow Beach.

We provide water services through the management of an extensive network, including:

- 8 water treatment plants
- 16 active reservoirs and 4 offline reservoirs
- 6 pump stations
- 458 kilometres of pipeline.

Our strategic framework

Our vision

Gympie Regional Council has a vision for embracing opportunities, promoting wellbeing and celebrating strong communities.

Our mission

To leave a positive legacy for future generations by embracing progress through good planning and efficient service delivery.

Team Vision

To improve the way we fulfil our obligations and commitments to our community and other stakeholders in the water / wastewater industry.

Team purpose

To provide a reliable and secure water and wastewater service to the community 24/7 and 365 days per year.

Our Corporate Values

Our values are the principles upon which our council serves the community.

Accountability:	We are open, transparent and take responsibility for our actions.
Communication:	We consult with the community, actively listen to and respond to the input of residents, and keep people informed.
Customer Service Focused:	We meet the needs of our community in an efficient and effective manner. We strive to continually improve, show empathy and are environmentally aware in our service delivery.
Integrity:	We act with honesty and respect in all we do and respect all residents, colleagues and visitors.
Teamwork and Collaboration:	We recognise and support everyone's contributions. We are inclusive and contribute respectfully working as a team. We will care for ourselves and others.

Key Response Areas

Over the next five years, Council is committed to achieving its vision through the following key response areas.

1. Community and Environment

Our communities have infrastructure and spaces for living, working, learning, sport and recreation that supports and caters for growth and enables the community to be inclusive, connected and safe. Natural ecosystems are conserved and enhanced and our built environment embraces biodiversity, sustainability and heritage.

2. Infrastructure and Economic Opportunity

Our planning and infrastructure seeks to meet foreseeable future needs to support economic development, community enhancement and residents' wellbeing.

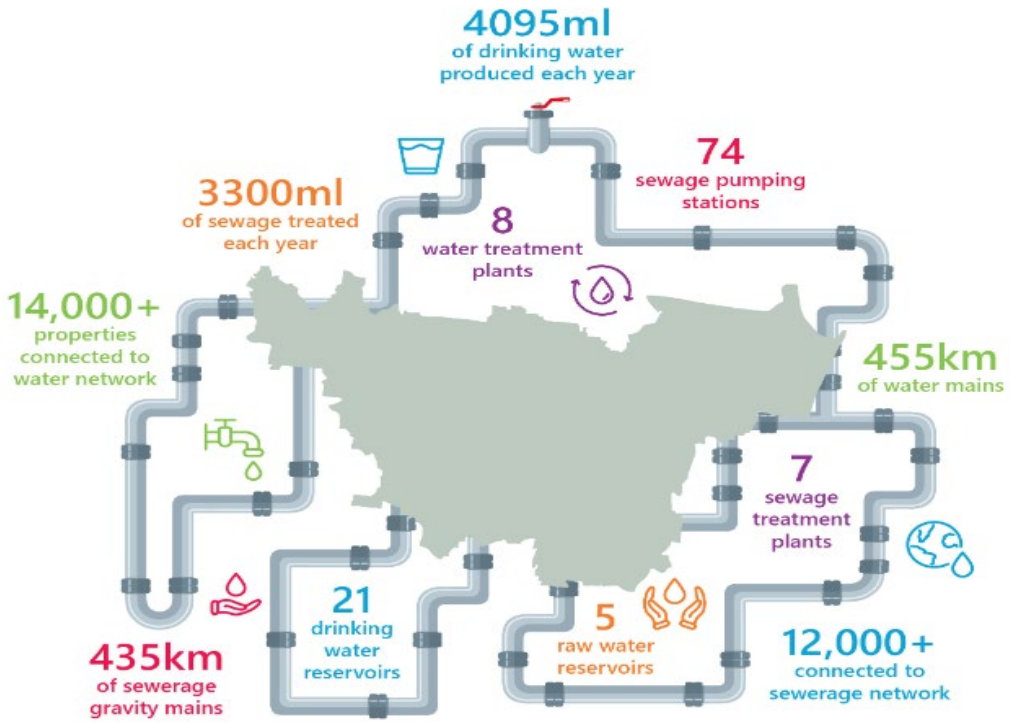
3. Organisation

Gympie Regional Council is an organisation that understands the community, and delivers services efficiently and effectively through highly engaged staff.

NOTE more detail is available in Council's Corporate Plan 2022-2027 at www.gympie.qld.gov.au.

Chapter 2: Our service area

Our system at a glance **figures of drinking water averaged from previous years



Our Network

We supply around 4,021 megalitres of drinking water to approximately 14,921 residential and commercial properties. Drinking water is delivered to our customers via 8 separate network water supply schemes as listed below:

- Amamoor
- Cooloola Cove
- Goomeri
- Gympie
- Imbil
- Kandanga
- Kilkivan
- Rainbow Beach.

The schemes begin at raw water source (surface and groundwater) and include water treatment, water storage, trunk and distribution pipe networks, pumps, chlorination systems and water meters. Gympie is the largest scheme, supplying 66 per cent of the customers.

Scheme Name	Water Source	Treatment processes	Treatment capacity	Towns supplied
Amamoor Water Scheme	Amamoor Creek	Coagulation, pre-oxidation, filtration, UV treatment and chlorine disinfection	0.5 ML/day based on 20-hour operation	Amamoor
Cooloola Cove Water Scheme	Teewah Creek	pH adjustment, Coagulation, flocculation, filtration, chlorine disinfection and fluoridation	3.6ML/day based on 20-hour operation	Cooloola Cove and Tin Can Bay
Goomeri Water Scheme	Kinbombi Off-Stream Pond 1 Kinbombi Off-Stream Pond 2 Bore 1 Bore 2 Bore 4 Bore 5	Coagulation, flocculation, ozone treatment, BAC filter, UV treatment and chlorine disinfection	0.2 ML/day based on 20-hour operation	Goomeri
Gympie Water Scheme	Mary River (3464ML per annum Borumba Dam)	Coagulation, flocculation, filtration, chlorine disinfection and fluoridation	18ML/day based on 20-hour operation	Gympie

Imbil Water Scheme	Yabba Creek (160ML per annum Borumba Dam)	Coagulation, pre-oxidation UV treatment and chlorine disinfection	0.230 ML/day based on 20-hour operation	Imbil
Kandanga Water Scheme	Kandanga Creek	Coagulation, pre-oxidation, UV treatment and chlorine disinfection	0.5 ML/day based on 20-hour operation	Kandanga
Kilkivan Water Scheme	Bore 1 Bore 2 Bore 3 Bore 4 Bore 5	Filtration, reverse osmosis and chlorine disinfection	0.14 ML/day based on 20-hour operation	Kilkivan
Rainbow Beach Water Scheme	4 production bores located within the Cooloola Sand Mass. Bore 1 Bore 3 Bore 4 Bore 5	pH adjustment, filtration, chlorine disinfection	2.52 ML/day based on 20-hour operation	Rainbow Beach

Chapter 3: Drinking water quality performance

Legislative requirements

The supply of safe and reliable drinking water in Queensland is regulated by various state legislation, including the *Water Supply (Safety and Reliability) Act 2008* and the *Public Health Act 2005*.

Under the *Water Supply (Safety and Reliability) Act 2008*, a drinking water service provider may only carry out a registered drinking water service in accordance with an approved Drinking Water Quality Management Plan (DWQMP).

Under the *Public Health Act 2005*, Queensland Health has regulated the standards for drinking water quality related to *E. coli* and fluoride. These standards, together with the health guideline levels in the 'Australian Drinking Water Guidelines 2011' – updated September 2022 (ADWG), have been incorporated under the *Water Supply (Safety and Reliability) Act 2008* as water quality criteria for drinking water in Queensland.

Water quality performance summary

For the 2022/23 reporting period, Gympie Regional Council met the prescribed microbiological standards for all eight drinking water schemes.

Table 1 summarises how our drinking water schemes performed over 1 July 2022 to 30 June 2023, against each category of water quality performance:

Water Quality Performance		
Scheme	**Microbiological**	**Chemical**
Amamoor	✓	✓
Cooloola Cove	✓	✓
Goomeri	✓	✓
Gympie	✓	✓
Imbil	✓	×
Kandanga	✓	✓
Kilkivan	✓	✓
Rainbow Beach	✓	✓

Table 1: Drinking water performance summary: 1 July 2022 – 30 June 2023

Microbiological assessment (*E. coli*)

Over 2022/23 eight drinking water schemes achieved 100 per cent compliance with legislative *E. coli* requirements. The standard for drinking water in Queensland requires no detection of E. coli in 98 per cent of samples collected over a 12 month period. The minimum number of samples required to be taken is detailed in the *Queensland Public Health Regulation 2005 Schedule 3A*.

E. coli water quality compliance details are provided in Appendix A, including the month-by-month performance.

Health-related chemical assessment

We use a risk management approach to drinking water quality which allows us to identify the substances that may pose a risk to public health. The verification monitoring program analyses these substances which are continuously assessed against ADWG health-related limits and operational control triggers.

Seven of the eight water schemes complied with all of the health-related chemical limit values defined in the ADWG. The exceptions were the below levels of trihalomethanes (THMs):

Water supply	Date	THMs (mg/L) range
Imbil	14 December 2022	260

Health assessment water quality compliance details are provided in Appendix B.

Verification monitoring program

To verify that we deliver safe drinking water, Council's Environmental Health Department collects samples from the respective networks and sends the samples to a National Association of Testing Authorities (NATA) accredited laboratory for water analyses. These samples are collected from 31 dedicated sample points across the service region. The water quality data is reviewed and compared against prescribed requirements in the legislation and the ADWG.

Aesthetic assessment

Our routine verification monitoring program is important for us to verify that we provide safe drinking water to our customers. We take advantage of the program to continuously assess non-health related parameters which contribute to the way our water tastes, smells and appears. We aim to meet the ADWG aesthetic guidelines where possible, however providing safe drinking water is our overriding priority.

Chapter 4: Notifying the regulator

Under sections 102 and 102A of the *Water Supply (Safety and Reliability) Act 2008*, Gympie Regional Council is required to immediately inform the Regulator if the quality of water supplied from its drinking water service does not comply with the water quality criteria as specified in the ADWG.

In the event that Gympie Regional Council becomes aware of a reportable incident, we notify the Regulator within the required timeframe.

On detection of a water quality issue, Council will:

- initiate further sampling in the affected zone
- undertake a comprehensive investigation to determine the factors that may have attributed to the event, and
- initiate responsive corrective actions e.g. flushing of water mains.

Reportable events

For the 2022/2023 year the three (3) reportable events were

1. THM exceedance in Imbil water scheme on 14 December 2022 with range of 260 μg/L

Immediate actions:	Commence weekly testing to monitor levels. As a direct filtration treatment plant no immediate actions can be taken to reduce organics in the raw water source
Preventative actions:	Depending on outcome of the chlorine dioxide generator trail at Kandanga Water Treatment Plant, Council will consider the option of installation of a chlorine dioxide generator at the Imbil Water Treatment Plant as a substitute.

2. Blue Green algae bloom event in Kinbombi Storage Pond 1 commencing on 18 January 2023 with samples returning high BGA Total Cells and Biovolume and indicating presences of potentially toxic cells

Immediate actions:	Commence weekly testing to monitor levels. Council investigated options available on the market to dose to control BGA algae bloom in the storage dam.
Preventative actions:	After obtaining Department's approval Council isolated Kimbombi Pond 1 from supplying Goomeri water treatment plant. Commenced dosing pond with EarthTec to manage an excessive BGA bloom whilst preventing release of toxins into the isolated raw water supply.

3. Blue Green algae bloom event in Kinbombi Storage Pond 2 commencing on 31 March 2023 with samples returning high BGA Total Cells and Biovolume and indicating presences of potentially toxic cells

Immediate actions:	Isolated Pond 2 and commenced weekly testing to monitor levels.
Preventative actions:	Commenced dosing pond with EarthTec to manage an excessive BGA bloom whilst preventing release of toxins into the isolated raw water supply.

Chapter 5: Managing water safety

Gympie Regional Council is committed to providing safe, reliable drinking water from source to our customers' tap. We ensure a consistent and reliable supply of high quality and safe drinking water to our customers through a risk management and robust planning approach.

Drinking Water Quality Management Plan

Gympie Regional Council operates with an approved DWQMP that is reviewed every two years.

The current version of Council's DWQMP was approved on 13 September 2022.

The next review is required to be carried out by 4 September 2023.

DWQMP Review Outcomes

The following table describes the review undertaken during 2021-22 leading to the updated Plan approved in September 2022.

Review Component	Findings	Outcomes	Status of actions	Responsible position
Service Description	Scheme populations, connections and water demands required update	DWQMP updated	Complete	Not applicable
Details of infrastructure	Updates required with some changes to water supply schemes	Scheme descriptions, plant process diagrams and scheme maps updated in DWQMP	Complete	Not applicable
Catchment characteristics and water quality	No change	Reviewed additional two years of data from previous plan update	Complete	Not applicable
Hazard identification and risk assessment	Risk assessment reviewed for changes within previous two years	Risk registers updated and included in amended DWQMP	Complete	Not applicable
Documented procedures	Updates of CCP procedures required	Updates included in amended DWQMP	Complete	Not applicable

Information management & records keeping	No changes	Not applicable	Not applicable	Note applicable
Risk Management Improvement Program	RIMP to be updated as per revised risk assessment	Updated RIMP included in amended DWQMP	Complete	Not applicable
Management of incidents & emergencies	Council organisational structure had changed	Plan updated to reflect new organisational structure	Complete	Not applicable
Operational monitoring	Minor changes	Updates included in amended DWQMP	Complete	Not applicable
Verification monitoring	Updated sampling point locations	Updates included in amended DWQMP	Complete	Not applicable
Other	None	Not applicable	Not applicable	Not applicable

DWQMP implementation

Water and wastewater staff were involved in the review of the DWQMP. Updated CCP procedures were distributed to the water treatment plants. The approved plan was discussed with operational staff.

Drinking Water Quality Management Plan audit

As required by the *Water Supply (Safety and Reliability) Act 2008*, Gympie Regional Council is operating its drinking water service under an approved DWQMP. No audit was required or conducted during the relevant financial year 01/07/2022 to 30/06/2023.

The next audit is required to be carried out by 30 June 2025.

Chapter 6: Managing the customer's water quality experience

Customer Service Standards

Gympie Regional Council operates with an approved Customer Services Standards, the latest version was compiled in December 2019, and is reviewed every five years.

Water Quality Complaints

Gympie Regional Council receives various water quality enquiries throughout the year. When a customer is dissatisfied with the efforts of Gympie Regional Council to address a water quality issue and remedial action is required, these enquiries are classified as 'water quality complaints'.

Water quality complaints are captured, recorded and monitored to help identify any trends and possible areas of improvement in the operation, maintenance and management of the Gympie Regional Council water supply network.

There was one water quality complaint received during 2022/23, being in the Cooloola Cove Scheme for the strong smell of chlorine in water. This matter was investigated, the outcome was that the chlorine is dosed high in Cooloola Cove in order to maintain residual in Tin Can Bay. The customer was contacted and advised of the reason, complaint was resolved.

Chapter 7: Risk management approach

The approved DWQMP follows industry best practice in that all water quality hazards have been identified, risk assessed, and where necessary, improvements have been committed to.

The risk management improvement program (RMIP) during this reporting period was the version included with the DWQMP approved in September 2022.

The below dot points and Tables 18 to 26 (Appendix C) outline the progress against this RMIP.

Significant projects undertaken within this year include:

- Water main renewal – completed the replacement of aging water mains in Cogan Street, Rose Street and Cox Road in Gympie.
- Water quality monitoring– new instruments ordered and delivered for the Amamoor, Kandanga and Gympie WTPs. These are being installed in the 2023-24 financial year.
- Chlorine residual monitoring – contract commenced for new chlorine monitoring instrumentation at water reservoirs across the region. The installation and integration with SCADA will be completed in the 2023-24 financial year.

Glossary

<	Less than.
>	Greater than.
ADWG	Australian Drinking Water Guidelines 2011 – updated November 2018 published by the National Health and Medical Research Council of Australia.
Bulk Water	The treated water supplied from the Queensland Bulk Water Authority (Seqwater) to distributor retailers, including Gympie Regional Council.
cfu/100mL	Colony Forming Units per 100 millilitres.
DNRME	Department of Natural Resources Mines and Energy (Queensland Government).
DRDMW	Department of Regional Development Manufacturing and Water (Queensland Government)
Disinfectant	An agent that destroys or inhibits the activity of microorganisms which cause disease. Gympie Regional Council uses chlorine.
DWQMP	Drinking Water Quality Management Plan as required under the *Water Supply (Safety and Reliability) Act 2008*.
E. coli	*Escherichia coli*, a bacterium whose presence in water indicates that the water may be contaminated by faecal matter and therefore there is the potential to cause illness when people drink the water.
km	Kilometre, which is 1,000 metres.
Megalitre (ML)	One million litres.
mg/L	Milligrams per litre.
MPN/100mL	Most Probable Number per 100 millilitres.
Network	An arrangement or system of pipes, pumps and reservoirs used for distributing water.

NTU	Nephelometric Turbidity Unit- a measure of turbidity which is the cloudiness or haziness of water caused by particles that are generally invisible to the naked eye. The measurement of turbidity is a key test of water quality.
Reservoir	A water tower or tank used for the storage of treated water within the water distribution system.
QFSS	Queensland Forensic and Scientific Services, Health Support Queensland.
Scheme	The system distributing drinking water to customers.
Seqwater	Queensland Bulk Water Supply Authority, trading as Seqwater. The bulk drinking water provider for Gympie Regional Council.
SCADA	Supervisory Control and Data Acquisition, which are computer-based control systems for water facilities including WTPs.
Stakeholder	All those who are either affected by or who can affect the activities of an organisation, namely customers, governments, regulators, the media, non-government organisations, local residents and employees.
The Regulator	The Chief Executive of Department of Regional Development Manufacturing and Water (DRDMW); previously Department of Natural Resources Mines and Energy (DNRME).
THMs	Total Trihalomethanes – a group of disinfection by-products that generally form when chlorine is used to disinfect drinking water.
WTP	Water Treatment Plant.

Appendices

Appendix A: Water quality compliance – E. coli

Overall						
Scheme	Number of samples required	Actual number of samples	Number of samples *E.coli* detected	Required performance %	Actual performance %	*E. coli* Compliant
Amamoor	12	24	0	98	100	✓
Cooloola Cove	60	107	0	98	100	✓
Goomeri	12	24	0	98	100	✓
Gympie	96	124	0	98	100	✓
Imbil	12	24	0	98	100	✓
Kandanga	12	24	0	98	100	✓
Kilkivan	12	25	0	98	100	✓
Rainbow Beach	60	96	0	98	100	✓

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.

Drinking water scheme: Amamoor

Year	2022 to 2023											
Month	**July**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**
No. of samples collected	2	2	2	2	2	2	2	2	2	2	2	2
No. of samples collected in which *E. coli* is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	24	24	24	24	24	24	24	24	24	24	24	24
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Drinking water scheme: Cooloola Cove

Year	2022 to 2023											
Month	**July**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**
No. of samples collected	9	9	9	9	10	8	8	8	9	9	10	9
No. of samples collected in which *E. coli* is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	109	109	110	110	111	110	109	108	107	107	107	107
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

Drinking water scheme: Goomeri

Year	*2022 to 2023*											
Month	***July***	***Aug***	***Sept***	***Oct***	***Nov***	***Dec***	***Jan***	***Feb***	***Mar***	***Apr***	***May***	***Jun***
No. of samples collected	2	2	2	2	2	2	2	2	2	2	2	2
No. of samples collected in which *E. coli* is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	24	24	24	24	24	24	24	24	24	24	24	24
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Drinking water scheme: Gympie

Year	*2022 to 2023*											
Month	***July***	***Aug***	***Sept***	***Oct***	***Nov***	***Dec***	***Jan***	***Feb***	***Mar***	***Apr***	***May***	***Jun***
No. of samples collected	10	11	10	12	11	9	9	9	10	11	12	10
No. of samples collected in which *E. coli* is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	128	129	129	130	131	130	128	127	123	124	124	124
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

Drinking water scheme: Imbil

Year	2022 to 2023											
Month	**July**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**
No. of samples collected	2	2	2	2	2	2	2	2	2	2	2	2
No. of samples collected in which *E. coli* is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	24	24	24	24	24	24	24	24	24	24	24	24
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Drinking water scheme: Kandanga

Year	2022 to 2023											
Month	**July**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**
No. of samples collected	2	2	2	2	2	2	2	2	2	2	2	2
No. of samples collected in which *E. coli* is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	24	24	24	24	24	24	24	24	24	24	24	24
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Drinking water scheme: Kilkivan

Year	*2022 to 2023*											
Month	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*
No. of samples collected	2	2	2	2	2	2	2	2	2	2	3	2
No. of samples collected in which *E. coli* is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	24	24	24	24	24	24	24	24	24	24	25	25
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

Drinking water scheme: Rainbow Beach

Year	*2022 to 2023*											
Month	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*
No. of samples collected	8	9	8	8	9	7	7	7	8	8	10	7
No. of samples collected in which *E. coli* is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	97	98	98	98	99	98	97	96	95	95	96	96
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

Appendix B: Water quality compliance – Health Assessment

Table 1 - Amamoor Water Analysis

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
Chlorine Residual	Raw	mg/L	-	-	-	-	-	-	-	-	-
	Treated		D	365	365	0	1.26	4.00	2.41	0.01	WTP
	Reticulation		M	24	24	0	0.65	1.75	1.21		QFSS
Total Trihalomethanes	Raw	ug/L	-							-	-
	Treated		-							-	-
	Reticulation		M	12	12	0	97	220	149		QFSS
E. Coli	Raw	mpn/100mL	-							-	-
	Treated		-							-	-
	Reticulation		M	12	12	0	0	0	0		QFSS
pH	Raw		HY	2	2	0	7.88	7.93	7.91		QFSS
	Treated		W	24	24	0	7.30	7.70	7.55		WTP
	Reticulation		HY	2	2	0	7.91	7.98	7.95		QFSS
Total Hardness	Raw	$mgCaCO_3/L$	HY	2	2	0	182	199	191		QFSS
	Treated		M	24	24	0	112	200	181	1	WTP
	Reticulation		HY	2	2	0	162	197	180		QFSS
Temporary Hardness	Raw	$mgCaCO_3/L$	HY	2	2	0	164	167	166		QFSS
	Treated		HY	2	2	0	164	169	167		QFSS
	Reticulation		HY	2	2	0	149	166	158		QFSS
Alkalinity	Raw	$mgCaCO_3/L$	HY	2	2	0	160	170	165		QFSS
	Treated		HY	2	2	0	160	170	165		QFSS
	Reticulation		HY	2	2	0	150	170	160		QFSS
Residual Alkalinity	Raw	meq/L	HY	2	2	0	0.0	0.0	0.0		QFSS
	Treated		HY	2	2	0	0.0	0.0	0.0		QFSS
	Reticulation		HY	2	2	0	0.0	0.0	0.0		QFSS
Silica	Raw	mg/L	HY	2	2	0	27	29	28		QFSS
	Treated		HY	2	2	0	26	29	28		QFSS
	Reticulation		HY	2	2	0	27	29	28		QFSS
Total Dissolved Ions	Raw	mg/L	HY	2	2	0	341	389	365		QFSS
	Treated		HY	2	2	0	357	396	377		QFSS
	Reticulation		HY	2	2	0	317	396	357		QFSS
Total Dissolved Solids	Raw	mg/L	HY	2	2	0	270	320	295		QFSS
	Treated		HY	2	2	0	280	330	305		QFSS

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
	Reticulation		HY	2	2	0	250	320	285		QFSS
True Colour	Raw	Hazen	HY	2	2	0	8	8	8		QFSS
	Treated		M	24	24	0	1	1	1	1	WTP
	Reticulation		HY	2	2	0	8	8	8		QFSS
Turbidity	Raw	NTU	HY	2	2	0	3	4	4		QFSS
	Treated		D	364	364	0	0	0.22	0.06	0.001	WTP
	Reticulation		HY	2	2	0	1	1	1		QFSS
pH Saturation	Raw		HY	2	2	0	7.8	7.9	7.9		QFSS
	Treated		HY	2	2	0	7.8	7.9	7.9		QFSS
	Reticulation		HY	2	2	0	7.8	8.0	7.9		QFSS
Saturation Index	Raw		HY	2	2	0	0.0	0.0	0.0		QFSS
	Treated		HY	2	2	0	0.0	0.2	0.1		QFSS
	Reticulation		HY	2	2	0	-0.1	0.1	0.0		QFSS
Mole Ratio	Raw		HY	2	2	0	1.9	2.2	2.1		QFSS
	Treated		HY	2	2	0	1.9	2.0	2.0		QFSS
	Reticulation		HY	2	2	0	1.9	2.1	2.0		QFSS
Sodium	Raw	mg/L	HY	2	2	0	28	38	33		QFSS
	Treated		HY	2	2	0	33	42	38		QFSS
	Reticulation		HY	2	2	0	30	41	36		QFSS
Potassium	Raw	mg/L	HY	2	2	0	0.90	1.00	0.95		QFSS
	Treated		HY	2	2	0	0.93	1.10	1.02		QFSS
	Reticulation		HY	2	2	0	0.92	1.10	1.01		QFSS
Calcium	Raw	mg/L	HY	2	2	0	22	26	24		QFSS
	Treated		HY	2	2	0	22	27	25		QFSS
	Reticulation		HY	2	2	0	20	26	23		QFSS
Magnesium	Raw	mg/L	HY	2	2	0	31	32	32		QFSS
	Treated		HY	2	2	0	32	32	32		QFSS
	Reticulation		HY	2	2	0	28	32	30		QFSS
Hydrogen	Raw	mg/L	HY	2	2	0	0.0	0.0	0.0		QFSS
	Treated		HY	2	2	0	0.0	0.0	0.0		QFSS
	Reticulation		HY	2	2	0	0.0	0.0	0.0		QFSS
Bicarbonate	Raw	mg/L	HY	2	2	0	199	201	200		QFSS
	Treated		HY	2	2	0	197	203	200		QFSS

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
	Reticulation		HY	2	2	0	180	199	190		QFSS
Carbonate	Raw	mg/L	HY	2	2	0	0.9	1.0	1.0		QFSS
	Treated		HY	2	2	0	1.1	1.3	1.2		QFSS
	Reticulation		HY	2	2	0	0.9	1.2	1.1		QFSS
Hydroxide	Raw	mg/L	HY	2	2	0	0.0	0.0	0.0		QFSS
	Treated		HY	2	2	0	0.0	0.0	0.0		QFSS
	Reticulation		HY	2	2	0	0.0	0.0	0.0		QFSS
Chloride	Raw	mg/L	HY	2	2	0	44	79	62		QFSS
	Treated		HY	2	2	0	52	83	68		QFSS
	Reticulation		HY	2	2	0	46	83	65		QFSS
Fluoride	Raw	mg/L	HY	2	2	0	0.07	0.08	0.08		QFSS
	Treated		HY	2	2	0	0.06	0.08	0.07		QFSS
	Reticulation		HY	2	2	0	0.06	0.08	0.07		QFSS
Nitrate	Raw	mg/L	HY	2	2	0	0.27	0.39	0.33		QFSS
	Treated		HY	2	2	0	0.28	0.37	0.33		QFSS
	Reticulation		HY	2	2	0	0.35	0.61	0.48		QFSS
Sulphate	Raw	mg/L	HY	2	2	0	12	12	12		QFSS
	Treated		HY	2	2	0	12	12	12		QFSS
	Reticulation		HY	2	2	0	11	12	12		QFSS
Iron	Raw	mg/L	HY	2	2	0	0.01	0.01	0.01		QFSS
	Treated		M	24	24	0	0.000	0.059	0.007	0.001	WTP
	Reticulation		HY	2	2	0	0.01	0.01	0.01		QFSS
Manganese	Raw	mg/L	HY	2	2	0	0.001	0.001	0.001		QFSS
	Treated		M	24	24	0	0.005	0.050	0.037	0.001	WTP
	Reticulation		HY	2	2	0	0.001	0.001	0.001		QFSS
Zinc	Raw	mg/L	HY	2	2	0	0.06	0.06	0.06		QFSS
	Treated		HY	2	2	0	0.06	0.06	0.06		QFSS
	Reticulation		HY	2	2	0	0.06	0.06	0.06		QFSS
Aluminium	Raw	mg/L	HY	2	2	0	0.03	0.03	0.03		QFSS
	Treated		M	24	24	0	0.004	0.094	0.028	0.001	WTP
	Reticulation		HY	2	2	0	0.03	0.03	0.03		QFSS
Boron	Raw	mg/L	HY	2	2	0	0.04	0.04	0.04		QFSS
	Treated		HY	2	2	0	0.04	0.05	0.05		QFSS

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
	Reticulation		HY	2	2	0	0.03	0.04	0.04		QFSS
Copper	Raw	mg/L	HY	2	2	0	0.003	0.006	0.005		QFSS
	Treated		HY	2	2	0	0.003	0.004	0.004		QFSS
	Reticulation		HY	2	2	0	0.009	0.110	0.060		QFSS
Annual Aluminium Metals	Raw	mg/L	Y	1	1	0	0.18	0.18	0.18		QFSS
	Treated		Y	1	1	0	0.011	0.011	0.011		QFSS
	Reticulation		Y	1	1	0	0.11	0.11	0.11		QFSS
Annual Arsenic Metals	Raw	mg/L	Y	1	1	0	0.0011	0.0011	0.0011		QFSS
	Treated		Y	1	1	0	0.0007	0.0007	0.0007		QFSS
	Reticulation		Y	1	1	0	0.0007	0.0007	0.0007		QFSS
Annual Cadmium Metals	Raw	mg/L	Y	1	1	0	0.0001	0.0001	0.0001		QFSS
	Treated		Y	1	1	0	0.0001	0.0001	0.0001		QFSS
	Reticulation		Y	1	1	0	0.0001	0.0001	0.0001		QFSS
Annual Chromium Metals	Raw	mg/L	Y	1	1	0	0.0007	0.0007	0.0007		QFSS
	Treated		Y	1	1	0	0.0002	0.0002	0.0002		QFSS
	Reticulation		Y	1	1	0	0.0002	0.0002	0.0002		QFSS
Annual Copper Metals	Raw	mg/L	Y	1	1	0	0.002	0.002	0.002		QFSS
	Treated		Y	1	1	0	0.003	0.003	0.003		QFSS
	Reticulation		Y	1	1	0	0.011	0.011	0.011		QFSS
Annual Iron Metals	Raw	mg/L	Y	1	1	0	0.19	0.19	0.19		QFSS
	Treated		Y	1	1	0	0.0050	0.0050	0.0050		QFSS
	Reticulation		Y	1	1	0	0.0050	0.0050	0.0050		QFSS
Annual Lead Metals	Raw	mg/L	Y	1	1	0	0.0002	0.0002	0.0002		QFSS
	Treated		Y	1	1	0	0.0001	0.0001	0.0001		QFSS
	Reticulation		Y	1	1	0	0.0004	0.0004	0.0004		QFSS
Annual Manganese Metals	Raw	mg/L	Y	1	1	0	0.082	0.082	0.082		QFSS
	Treated		Y	1	1	0	0.0005	0.0005	0.0005		QFSS
	Reticulation		Y	1	1	0	0.0003	0.0003	0.0003		QFSS
Annual Nickel Metals	Raw	mg/L	Y	1	1	0	0.0031	0.0031	0.0031		QFSS
	Treated		Y	1	1	0	0.0010	0.0010	0.0010		QFSS
	Reticulation		Y	1	1	0	0.0007	0.0007	0.0007		QFSS
Annual Zinc Metals	Raw	mg/L	Y	1	1	0	0.005	0.005	0.005		QFSS
	Treated		Y	1	1	0	0.003	0.003	0.003		QFSS

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
	Reticulation		Y	1	1	0	0.006	0.006	0.006		QFSS

NOTE: QFSS Limit of Reporting not provided to Gympie Regional Council.

Table 2 – Cooloola Cove Water Analysis

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
Chlorine Residual	Raw	mg/L	-	-	-	-	-	-	-	-	-
	Treated		D	364	364	0	1.68	3.49	2.72	0.01	WTP
	Reticulation		W	95	95	0	0.76	2.04	1.51		QFSS
Total Trihalomethanes	Raw	ug/L	-							-	-
	Treated		-							-	-
	Reticulation		M	25	25	0	23	76	46		QFSS
E. Coli	Raw	mpn/100mL	-							-	-
	Treated		M	12	12	0	0	0	0		QFSS
	Reticulation		W	107	107	0	0	0	0		QFSS
pH	Raw		HY	2	2	0	4.63	4.77	4.70		QFSS
	Treated		D	364	364	0	6.70	7.50	7.10	1	WTP
	Reticulation		HY	4	4	0	6.80	7.35	7.07		QFSS
Total Hardness	Raw	$mgCaCO_3/L$	HY	2	2	0	6	6	6		QFSS
	Treated		M	12	12	0	6	10	8	1	WTP
	Reticulation		HY	4	4	0	7	10	9		QFSS
Temporary Hardness	Raw	$mgCaCO_3/L$	HY	2	2	0	1	1	1		QFSS
	Treated		HY	2	2	0	6	7	6		QFSS
	Reticulation		HY	4	4	0	7	10	9		QFSS
Alkalinity	Raw	$mgCaCO_3/L$	HY	2	2	0	1	1	1		QFSS
	Treated		M	12	12	0	32	52	40	1	WTP
	Reticulation		HY	4	4	0	25	40	34		QFSS
Residual Alkalinity	Raw	meq/L	HY	2	2	0	0	0	0		QFSS
	Treated		HY	2	2	0	0.2	0.5	0.4		QFSS
	Reticulation		HY	4	4	0	0.3	0.6	0.5		QFSS
Silica	Raw	mg/L	HY	2	2	0	5	7	6		QFSS
	Treated		HY	4	4	0	4	6	5		QFSS
	Reticulation		HY	2	2	0	4	6	5		QFSS
Total Dissolved Ions	Raw	mg/L	HY	2	2	0	33	38	36		QFSS
	Treated		HY	2	2	0	139	202	171		QFSS
	Reticulation		HY	4	4	0	166	223	198		QFSS
Total Dissolved	Raw	mg/L	HY	2	2	0	37	43	40		QFSS

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
Solids	Treated		HY	2	2	0	140	190	165		QFSS
	Reticulation		HY	4	4	0	160	200	183		QFSS
True Colour	Raw	Hazen	HY	2	2	0	110	270	190		QFSS
	Treated		D	364	364	0	1	1	1	1	WTP
	Reticulation		HY	4	4	0	8	8	8		QFSS
Turbidity	Raw	NTU	HY	2	2	0	1	1	1		QFSS
	Treated		D	364	364	0	0.000	0.111	0.031	0.001	WTP
	Reticulation		HY	4	4	0	1	1	1		QFSS
pH Saturation	Raw		HY	2	2	0	11.4	11.5	11.4		QFSS
	Treated		HY	2	2	0	10.1	10.6	10.4		QFSS
	Reticulation		HY	4	4	0	9.4	10.0	9.7		QFSS
Saturation Index	Raw		HY	2	2	0	-6.8	-6.7	-6.8		QFSS
	Treated		HY	2	2	0	-4.0	-2.9	-3.5		QFSS
	Reticulation		HY	4	4	0	-3.2	-2.1	-2.6		QFSS
Mole Ratio	Raw		HY	2	2	0	6.6	6.7	6.7		QFSS
	Treated		HY	2	2	0	3.0	3.9	3.5		QFSS
	Reticulation		HY	4	4	0	2.7	3.6	3.1		QFSS
Sodium	Raw	mg/L	HY	2	2	0	10	11	10		QFSS
	Treated		HY	2	2	0	43	63	53		QFSS
	Reticulation		HY	4	4	0	61	66	60		QFSS
Potassium	Raw	mg/L	HY	2	2	0	0.31	0.39	0.35		QFSS
	Treated		HY	2	2	0	0.34	0.39	0.37		QFSS
	Reticulation		HY	4	4	0	0.35	0.41	0.38		QFSS
Calcium	Raw	mg/L	HY	2	2	0	0	1	0		QFSS
	Treated		HY	2	2	0	1	1	1		QFSS
	Reticulation		HY	4	4	0	1	3	2		QFSS
Magnesium	Raw	mg/L	HY	2	2	0	1	1	1		QFSS
	Treated		HY	2	2	0	1	1	1		QFSS
	Reticulation		HY	4	4	0	1	1	1		QFSS
Hydrogen	Raw	mg/L	HY	2	2	0	0.0	0.0	0.0	-	QFSS
	Treated		HY	2	2	0	0.0	0.0	0.0		QFSS
	Reticulation		HY	4	4	0	0.0	0.0	0.0		QFSS
Bicarbonate	Raw	mg/L	HY	2	2	0	2	2	2		QFSS

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
	Treated		HY	2	2	0	17	40	29		QFSS
	Reticulation		HY	4	4	0	30	49	41		QFSS
Carbonate	Raw	mg/L	HY	2	2	0	0.0	0.0	0.0		QFSS
	Treated		HY	2	2	0	0.0	0.0	0.0		QFSS
	Reticulation		HY	4	4	0	0.0	0.1	0.1		QFSS
Hydroxide	Raw	mg/L	HY	2	2	0	0.0	0.0	0.0		QFSS
	Treated		HY	2	2	0	0.0	0.0	0.0		QFSS
	Reticulation		HY	4	4	0	0.0	0.0	0.0		QFSS
Chloride	Raw	mg/L	HY	2	2	0	17	20	19		QFSS
	Treated		HY	2	2	0	20	22	21		QFSS
	Reticulation		HY	4	4	0	18	22	20		QFSS
Fluoride	Raw	mg/L	HY	2	2	0	0.02	0.02	0.02		QFSS
	Treated		D	364	364	0	0.04	0.90	0.79	1	WTP
	Reticulation		M	12	12	0	0.62	0.88	0.81		QFSS
Nitrate	Raw	mg/L	HY	2	2	0	0.14	0.18	0.16		QFSS
	Treated		HY	2	2	0	0.08	0.08	0.08		QFSS
	Reticulation		HY	4	4	0	0.05	0.08	0.07		QFSS
Sulphate	Raw	mg/L	HY	2	2	0	1.6	2.3	2.0		QFSS
	Treated		HY	2	2	0	55	76	66		QFSS
	Reticulation		HY	4	4	0	59	85	73		QFSS
Iron	Raw	mg/L	HY	2	2	0	0.07	0.24	0.16		QFSS
	Treated		M	12	12	0	0.02	0.07	0.04	0.01	WTP
	Reticulation		HY	4	4	0	0.01	0.02	0.01		QFSS
Manganese	Raw	mg/L	HY	2	2	0	0.001	0.002	0.002		QFSS
	Treated		M	12	12	0	0.005	0.05	0.046	0.01	WTP
	Reticulation		HY	4	4	0	0.001	0.001	0.001		QFSS
Zinc	Raw	mg/L	HY	2	2	0	0.06	0.06	0.06		QFSS
	Treated		HY	2	2	0	0.06	0.06	0.06		QFSS
	Reticulation		HY	4	4	0	0.06	0.06	0.06		QFSS
Aluminium	Raw	mg/L	HY	2	2	0	0.10	0.26	0.18		QFSS
	Treated		M	12	12	0	0.007	0.096	0.033	0.1	WTP
	Reticulation		HY	4	4	0	0.03	0.03	0.03		QFSS
Boron	Raw	mg/L	HY	2	2	0	0.02	0.02	0.02		QFSS

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
	Treated		HY	2	2	0	0.02	0.02	0.02		QFSS
	Reticulation		HY	4	4	0	0.02	0.02	0.02		QFSS
Copper	Raw	mg/L	HY	2	2	0	0.017	0.032	0.025		QFSS
	Treated		HY	2	2	0	0.003	0.003	0.003		QFSS
	Reticulation		HY	4	4	0	0.003	0.006	0.004		QFSS
Annual Aluminium Metals	Raw	mg/L	Y	1	1	0	0.097	0.097	0.097		QFSS
	Treated		Y	1	1	0	0.045	0.045	0.045		QFSS
	Reticulation		Y	2	2	0	0.015	0.024	0.020		QFSS
Annual Arsenic Metals	Raw	mg/L	Y	1	1	0	0.0001	0.0001	0.0001		QFSS
	Treated		Y	1	1	0	0.0001	0.0001	0.0001		QFSS
	Reticulation		Y	2	2	0	0.0001	0.0001	0.0001		QFSS
Annual Cadmium Metals	Raw	mg/L	Y	1	1	0	0.0001	0.0001	0.0001		QFSS
	Treated		Y	1	1	0	0.0001	0.0001	0.0001		QFSS
	Reticulation		Y	2	2	0	0.0001	0.0001	0.0001		QFSS
Annual Chromium Metals	Raw	mg/L	Y	1	1	0	0.0002	0.0002	0.0002		QFSS
	Treated		Y	1	1	0	0.0001	0.0001	0.0001		QFSS
	Reticulation		Y	2	2	0	0.0001	0.0001	0.0001		QFSS
Annual Copper Metals	Raw	mg/L	Y	1	1	0	0.015	0.015	0.015		QFSS
	Treated		Y	1	1	0	0.001	0.001	0.001		QFSS
	Reticulation		Y	2	2	0	0.003	0.003	0.003		QFSS
Annual Iron Metals	Raw	mg/L	Y	1	1	0	0.091	0.091	0.091		QFSS
	Treated		Y	1	1	0	0.034	0.034	0.034		QFSS
	Reticulation		Y	2	2	0	0.005	0.018	0.012		QFSS
Annual Lead Metals	Raw	mg/L	Y	1	1	0	0.001	0.001	0.001		QFSS
	Treated		Y	1	1	0	0.0001	0.0001	0.0001		QFSS
	Reticulation		Y	2	2	0	0.0001	0.0001	0.0001		QFSS
Annual Manganese Metals	Raw	mg/L	Y	1	1	0	0.0011	0.0011	0.0011		QFSS
	Treated		Y	1	1	0	0.0013	0.0013	0.0013		QFSS
	Reticulation		Y	2	2	0	0.0003	0.0005	0.0004		QFSS
Annual Nickel Metals	Raw	mg/L	Y	1	1	0	0.0001	0.0001	0.0001		QFSS
	Treated		Y	1	1	0	0.0002	0.0002	0.0002		QFSS
	Reticulation		Y	2	2	0	0.0001	0.0001	0.0001		QFSS
Annual Zinc Metals	Raw	mg/L	Y	1	1	0	0.014	0.014	0.014		QFSS

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
	Treated		Y	1	1	0	0.007	0.007	0.007		QFSS
	Reticulation		Y	2	2	0	0.004	0.007	0.006		QFSS

NOTE: QFSS Limit of Reporting not provided to Gympie Regional Council.

Table 3 - Goomeri Water Analysis

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
Chlorine Residual	Raw	mg/L	-	-	-	-	-	-	-	-	-
	Treated		D	365	365	0	0.74	1.85	1.29	0.01	WTP
	Reticulation		M	24	24	0	0.27	1.49	0.95		QFSS
Total Trihalomethanes	Raw	ug/L	-							-	-
	Treated		-							-	-
	Reticulation		M	12	12	0	120	240	173		QFSS
E. Coli	Raw	mpn/100mL	-							-	-
	Treated		-							-	-
	Reticulation		M	24	24	0	0	0	0		QFSS
pH	Raw		HY	11	11	0	7.50	8.94	7.99		QFSS
	Treated		D	365	365	0	7.15	7.80	7.50	1	WTP
	Reticulation		HY	2	2	0	7.99	8.26	8.13		QFSS
Total Hardness	Raw	$mgCaCO_3/L$	HY	11	11	0	228	768	509		QFSS
	Treated		M	154	154	0	168	380	266	1	WTP
	Reticulation		HY	2	2	0	254	256	255		QFSS
Temporary Hardness	Raw	$mgCaCO_3/L$	HY	11	11	0	193	426	342		QFSS
	Treated		HY	2	2	0	214	248	231		QFSS
	Reticulation		HY	2	2	0	215	245	230		QFSS
Alkalinity	Raw	$mgCaCO_3/L$	HY	11	11	0	190	430	342		QFSS
	Treated		M	25	25	0	144	252	198	1	WTP
	Reticulation		HY	2	2	0	220	250	235		QFSS
Residual Alkalinity	Raw	meq/L	HY	11	11	0	0.0	0.0	0.0		QFSS
	Treated		HY	2	2	0	0.0	0.0	0.0		QFSS
	Reticulation		HY	2	2	0	0.0	0.0	0.0		QFSS
Silica	Raw	mg/L	HY	11	11	0	12	56	42		QFSS
	Treated		HY	2	2	0	18	21	20		QFSS
	Reticulation		HY	2	2	0	18	21	20		QFSS
Total Dissolved Ions	Raw	mg/L	HY	11	11	0	521	1270	931		QFSS
	Treated		HY	2	2	0	577	583	580		QFSS
	Reticulation		HY	2	2	0	567	587	577		QFSS
Total Dissolved Solids	Raw	mg/L	HY	11	11	0	410	1100	773		QFSS
	Treated		HY	2	2	0	440	470	455		QFSS

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
	Reticulation		HY	2	2	0	440	480	460		QFSS
True Colour	Raw	Hazen	HY	11	11	0	8	22	10	8	QFSS
	Treated		W	365	365	0	0	8	0	1	WTP
	Reticulation		HY	2	2	0	8	8	8		QFSS
Turbidity	Raw	NTU	HY	11	11	0	1	5	2		QFSS
	Treated		W	365	365	0	0.00	0.90	0.15	0.001	WTP
	Reticulation		HY	2	2	0	1	1	1		QFSS
pH Saturation	Raw		HY	11	11	0	6.6	7.6	7.0		QFSS
	Treated		HY	2	2	0	7.3	7.5	7.4		QFSS
	Reticulation		HY	2	2	0	7.4	7.5	7.5		QFSS
Saturation Index	Raw		HY	11	11	0	0.7	1.4	1.0		QFSS
	Treated		HY	2	2	0	0.6	0.7	0.7		QFSS
	Reticulation		HY	2	2	0	0.5	0.9	0.7		QFSS
Mole Ratio	Raw		HY	11	11	0	1.3	2.6	2.1		QFSS
	Treated		HY	2	2	0	1.9	2.1	2.0		QFSS
	Reticulation		HY	2	2	0	1.7	2.2	2.0		QFSS
Sodium	Raw	mg/L	HY	11	11	0	70	100	86		QFSS
	Treated		HY	2	2	0	68	80	74		QFSS
	Reticulation		HY	2	2	0	68	80	74		QFSS
Potassium	Raw	mg/L	HY	11	11	0	0.33	7.60	2.20		QFSS
	Treated		HY	2	2	0	4.30	5.30	4.80		QFSS
	Reticulation		HY	2	2	0	4.60	5.30	5.00		QFSS
Calcium	Raw	mg/L	HY	11	11	0	38	170	115		QFSS
	Treated		HY	2	2	0	48	57	53		QFSS
	Reticulation		HY	2	2	0	49	57	53		QFSS
Magnesium	Raw	mg/L	HY	11	11	0	27	81	54		QFSS
	Treated		HY	2	2	0	29	33	31		QFSS
	Reticulation		HY	2	2	0	27	32	30		QFSS
Hydrogen	Raw	mg/L	HY	11	11	0	0.0	0.0	0.0		QFSS
	Treated		HY	2	2	0	0.0	0.0	0.0		QFSS
	Reticulation		HY	2	2	0	0.0	0.0	0.0		QFSS
Bicarbonate	Raw	mg/L	HY	11	11	0	211	517	410		QFSS
	Treated		HY	2	2	0	255	300	278		QFSS

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
	Reticulation		HY	2	2	0	259	291	275		QFSS
Carbonate	Raw	mg/L	HY	11	11	0	1.1	12.0	3.6		QFSS
	Treated		HY	2	2	0	1.5	3.1	2.3		QFSS
	Reticulation		HY	2	2	0	1.7	3.4	2.6		QFSS
Hydroxide	Raw	mg/L	HY	11	11	0	0.0	0.1	0.0		QFSS
	Treated		HY	2	2	0	0.0	0.0	0.0		QFSS
	Reticulation		HY	2	2	0	0.0	0.0	0.0		QFSS
Chloride	Raw	mg/L	HY	11	11	0	100	330	225		QFSS
	Treated		HY	2	2	0	110	150	130		QFSS
	Reticulation		HY	2	2	0	110	150	130		QFSS
Fluoride	Raw	mg/L	HY	11	11	0	0.14	0.21	0.18		QFSS
	Treated		HY	2	2	0	0.19	0.21	0.20		QFSS
	Reticulation		HY	2	2	0	0.19	0.19	0.19		QFSS
Nitrate	Raw	mg/L	HY	11	11	0	0.05	18.00	5.31		QFSS
	Treated		HY	2	2	0	1.1	2.4	1.8		QFSS
	Reticulation		HY	2	2	0	2.2	2.5	2.4		QFSS
Sulphate	Raw	mg/L	HY	11	11	0	3.3	46.0	29.5		QFSS
	Treated		HY	2	2	0	6.3	6.5	6.4		QFSS
	Reticulation		HY	2	2	0	5.6	6.6	6.1		QFSS
Iron	Raw	mg/L	HY	11	11	0	0.01	0.01	0.01		QFSS
	Treated		M	26	26	0	0.000	0.233	0.013	0.001	WTP
	Reticulation		HY	2	2	0	0.01	0.01	0.01		QFSS
Manganese	Raw	mg/L	HY	11	11	0	0.001	0.028	0.006		QFSS
	Treated		M	26	26	0	0.05	0.05	0.05	0.001	WTP
	Reticulation		HY	2	2	0	0.001	0.002	0.002		QFSS
Zinc	Raw	mg/L	HY	11	11	0	0.06	0.06	0.06		QFSS
	Treated		HY	2	2	0	0.06	0.06	0.06		QFSS
	Reticulation		HY	2	2	0	0.06	0.06	0.06		QFSS
Aluminium	Raw	mg/L	HY	11	11	0	0.03	0.03	0.03		QFSS
	Treated		M	26	26	0	0.000	0.053	0.004	0.001	WTP
	Reticulation		HY	2	2	0	0.03	0.03	0.03		QFSS
Boron	Raw	mg/L	HY	11	11	0	0.03	0.04	0.03		QFSS
	Treated		HY	2	2	0	0.03	0.03	0.03		QFSS

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
	Reticulation		HY	2	2	0	0.03	0.03	0.03		QFSS
Copper	Raw	mg/L	HY	11	11	0	0.003	0.026	0.005		QFSS
	Treated		HY	2	2	0	0.013	0.019	0.016		QFSS
	Reticulation		HY	2	2	0	0.006	0.008	0.007		QFSS
Annual Aluminium Metals	Raw	mg/L	Y	6	6	0	0.003	0.160	0.037		QFSS
	Treated		Y	1	1	0	0.004	0.004	0.004		QFSS
	Reticulation		Y	1	1	0	0.005	0.005	0.005		QFSS
Annual Arsenic Metals	Raw	mg/L	Y	6	6	0	0.0006	0.0064	0.0027		QFSS
	Treated		Y	1	1	0	0.0034	0.0034	0.0034		QFSS
	Reticulation		Y	1	1	0	0.0034	0.0034	0.0034		QFSS
Annual Cadmium Metals	Raw	mg/L	Y	6	6	0	0.0001	0.0001	0.0001		QFSS
	Treated		Y	1	1	0	0.0001	0.0001	0.0001		QFSS
	Reticulation		Y	1	1	0	0.0001	0.0001	0.0001		QFSS
Annual Chromium Metals	Raw	mg/L	Y	6	6	0	0.0001	0.0022	0.0007		QFSS
	Treated		Y	1	1	0	0.0001	0.0001	0.0001		QFSS
	Reticulation		Y	1	1	0	0.0001	0.0001	0.0001		QFSS
Annual Copper Metals	Raw	mg/L	Y	6	6	0	0.001	0.034	0.013		QFSS
	Treated		Y	1	1	0	0.017	0.017	0.017		QFSS
	Reticulation		Y	1	1	0	0.007	0.007	0.007		QFSS
Annual Iron Metals	Raw	mg/L	Y	6	6	0	0.008	0.170	0.077		QFSS
	Treated		Y	1	1	0	0.005	0.005	0.005		QFSS
	Reticulation		Y	1	1	0	0.005	0.005	0.005		QFSS
Annual Lead Metals	Raw	mg/L	Y	6	6	0	0.0001	0.0008	0.0003		QFSS
	Treated		Y	1	1	0	0.0002	0.0002	0.0002		QFSS
	Reticulation		Y	1	1	0	0.0004	0.0004	0.0004		QFSS
Annual Manganese Metals	Raw	mg/L	Y	6	6	0	0.0006	0.0780	0.0394		QFSS
	Treated		Y	1	1	0	0.0009	0.0009	0.0009		QFSS
	Reticulation		Y	1	1	0	0.0009	0.0009	0.0009		QFSS
Annual Nickel Metals	Raw	mg/L	Y	6	6	0	0.0006	0.0087	0.0036		QFSS
	Treated		Y	1	1	0	0.0004	0.0004	0.0004		QFSS
	Reticulation		Y	1	1	0	0.0004	0.0004	0.0004		QFSS
Annual Zinc Metals	Raw	mg/L	Y	6	6	0	0.001	0.017	0.006		QFSS
	Treated		Y	1	1	0	0.006	0.006	0.006		QFSS

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
	Reticulation		Y	1	1	0	0.007	0.007	0.007		QFSS

NOTE: QFSS Limit of Reporting not provided to Gympie Regional Council.

Table 4 - Gympie Water Analysis

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
Chlorine Residual		mg/L	-	-	-	-	-	-	-	-	-
	Treated		D	365	365	0	1.81	4.51	2.61	0.01	WTP
	Reticulation		W	115	115	0	0.10	2.41	1.09		QFSS
Total Trihalomethanes	Raw	ug/L	-	-	-	-	-	-	-	-	-
	Treated		-	-	-	-	-	-	-	-	-
	Reticulation		M	13	13	0	32	130	70		QFSS
E. Coli	Raw	mpn/100mL	-	-	-	-	-	-	-	-	-
	Treated		M	11[1]	0	0	0	0	0		QFSS
	Reticulation		W	115	115	0	0	0	0		QFSS
pH	Raw		HY	2	2	0	7.14	7.57	7.36		QFSS
	Treated		D	365	365	0	6.80	7.40	7.10	1	WTP
	Reticulation		HY	4	4	0	7.16	7.38	7.29		QFSS
Total Hardness	Raw	$mgCaCO_3/L$	HY	2	2	0	115	143	129		QFSS
	Treated		M	26	26	0	40	200	116	1	WTP
	Reticulation		HY	4	4	0	94	141	120		QFSS
Temporary Hardness	Raw	$mgCaCO_3/L$	HY	2	2	0	110	111	111		QFSS
	Treated		HY	2	2	0	85	108	97		QFSS
	Reticulation		HY	4	4	0	75	110	94		QFSS
Alkalinity	Raw	$mgCaCO_3/L$	HY	2	2	0	110	110	110		QFSS
	Treated		HY	2	2	0	85	110	98		QFSS
	Reticulation		HY	4	4	0	75	110	94		QFSS
Residual Alkalinity	Raw	meq/L	HY	2	0	0	0.0	0.0	0.0		QFSS
	Treated		HY	2	0	0	0.0	0.0	0.0		QFSS
	Reticulation		HY	4	0	0	0.0	0.0	0.0		QFSS
Silica	Raw	mg/L	HY	2	2	0	20	23	22		QFSS
	Treated		HY	2	2	0	17	23	20		QFSS
	Reticulation		HY	4	4	0	17	23	20		QFSS
Total Dissolved Ions	Raw	mg/L	HY	2	2	0	265	334	300		QFSS
	Treated		HY	2	2	0	254	330	292		QFSS

[1] One sample was not tested, as it arrived at the laboratory >2 days after collection so was deemed unsuitable for microbiological analysis. Too late in month to collect another sample.

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
	Reticulation		HY	4	4	0	223	336	282		QFSS
Total Dissolved Solids	Raw	mg/L	HY	2	2	0	220	290	255		QFSS
	Treated		HY	2	2	0	220	290	255		QFSS
	Reticulation		HY	4	4	0	190	290	243		QFSS
True Colour	Raw	Hazen	HY	2	2	0	8	10	9		QFSS
	Treated		D	365	365	0	1	2	1	1	WTP
	Reticulation		HY	4	4	0	8	8	8		QFSS
Turbidity	Raw	NTU	D	365	365	0	3.0	323.0	15.8	0.001	WTP
	Treated		D	365	365	0	0.012	0.900	0.114	0.001	WTP
	Reticulation		HY	4	4	0	1	1	1		QFSS
pH Saturation	Raw		HY	2	2	0	8.1	8.2	8.2		QFSS
	Treated		HY	2	2	0	8.1	8.3	8.2		QFSS
	Reticulation		HY	4	4	0	8.1	8.4	8.3		QFSS
Saturation Index	Raw		HY	2	2	0	-1.0	-0.6	-0.8		QFSS
	Treated		HY	2	2	0	-1.0	-0.5	-0.8		QFSS
	Reticulation		HY	4	4	0	-1.1	-0.9	-1.0		QFSS
Mole Ratio	Raw		HY	2	2	0	2.5	3.1	2.8		QFSS
	Treated		HY	2	2	0	2.3	3.2	2.8		QFSS
	Reticulation		HY	4	4	0	2.8	3.1	2.9		QFSS
Sodium	Raw	mg/L	HY	2	2	0	34	48	41		QFSS
	Treated		HY	2	2	0	35	48	42		QFSS
	Reticulation		HY	4	4	0	32	50	41		QFSS
Potassium	Raw	mg/L	HY	2	2	0	1.6	1.7	1.7		QFSS
	Treated		HY	2	2	0	1.6	1.6	1.6		QFSS
	Reticulation		HY	4	4	0	1.5	1.7	1.6		QFSS
Calcium	Raw	mg/L	HY	2	2	0	17	21	19		QFSS
	Treated		HY	2	2	0	17	20	19		QFSS
	Reticulation		HY	4	4	0	15	20	18		QFSS
Magnesium	Raw	mg/L	HY	2	2	0	18	22	20		QFSS
	Treated		HY	2	2	0	17	22	20		QFSS
	Reticulation		HY	4	4	0	14	22	19		QFSS
Hydrogen	Raw	mg/L	HY	2	0	0	0.0	0.0	0.0		QFSS
	Treated		HY	2	0	0	0.0	0.0	0.0		QFSS

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
	Reticulation		HY	4	0	0	0.0	0.0	0.0		QFSS
Bicarbonate	Raw	mg/L	HY	2	2	0	133	135	134		QFSS
	Treated		HY	2	2	0	103	132	118		QFSS
	Reticulation		HY	4	4	0	91	133	114		QFSS
Carbonate	Raw	mg/L	HY	2	2	0	0.1	0.3	0.2		QFSS
	Treated		HY	2	2	0	0.1	0.4	0.3		QFSS
	Reticulation		HY	4	4	0	0.1	0.1	0.1		QFSS
Hydroxide	Raw	mg/L	HY	2	0		0.0	0.0	0.0		QFSS
	Treated		HY	2	0		0.0	0.0	0.0		QFSS
	Reticulation		HY	4	0		0.0	0.0	0.0		QFSS
Chloride	Raw	mg/L	HY	2	2	0	52	78	65		QFSS
	Treated		HY	2	2	0	53	78	66		QFSS
	Reticulation		HY	4	4	0	46	80	63		QFSS
Fluoride	Raw	mg/L	HY	2	2	0	0.08	0.46	0.27		QFSS
	Treated		D	363	363	0	0.14	0.99	0.79	0.01	WTP
	Reticulation		M	12	12	0	0.74	0.93	0.80		QFSS
Nitrate	Raw	mg/L	HY	2	2	0	0.05	0.24	0.15		QFSS
	Treated		HY	2	2	0	0.10	0.19	0.15		QFSS
	Reticulation		HY	4	4	0	0.09	0.22	0.14		QFSS
Sulphate	Raw	mg/L	HY	2	2	0	10	27	19		QFSS
	Treated		HY	2	2	0	27	27	27		QFSS
	Reticulation		HY	4	4	0	23	28	26		QFSS
Iron	Raw	mg/L	HY	2	2	0	0.01	0.02	0.02		QFSS
	Treated		M	26	26	0	0.000	0.018	0.005	0.001	WTP
	Reticulation		HY	4	4	0	0.01	0.01	0.01		QFSS
Manganese	Raw	mg/L	HY	2	2	0	0.001	0.001	0.001		QFSS
	Treated		M	26	26	0	0.005	0.05	0.024	0.001	WTP
	Reticulation		HY	4	4	0	0.001	0.001	0.001		QFSS
Zinc	Raw	mg/L	HY	2	2	0	0.06	0.06	0.06		QFSS
	Treated		HY	2	2	0	0.06	0.06	0.06		QFSS
	Reticulation		HY	4	4	0	0.06	0.13	0.08		QFSS
Aluminium	Raw	mg/L	HY	2	2	0	0.03	0.03	0.03		QFSS
	Treated		M	26	26	0	0.001	0.03	0.011	0.001	WTP

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
	Reticulation		HY	4	4	0	0.03	0.03	0.03		QFSS
Boron	Raw	mg/L	HY	2	2	0	0.03	0.03	0.03		QFSS
	Treated		HY	2	2	0	0.03	0.04	0.04		QFSS
	Reticulation		HY	4	4	0	0.03	0.04	0.03		QFSS
Copper	Raw	mg/L	HY	2	2	0	0.003	0.009	0.006		QFSS
	Treated		HY	2	2	0	0.003	0.003	0.003		QFSS
	Reticulation		HY	4	4	0	0.004	0.120	0.038		QFSS
Annual Aluminium Metals	Raw	mg/L	Y	1	1	0	0.025	0.025	0.025		QFSS
	Treated		Y	1	1	0	0.026	0.026	0.026		QFSS
	Reticulation		Y	2	2	0	0.023	0.025	0.023		QFSS
Annual Arsenic Metals	Raw	mg/L	Y	1	1	0	0.0005	0.0005	0.0005		QFSS
	Treated		Y	1	1	0	0.0005	0.0005	0.0005		QFSS
	Reticulation		Y	2	2	0	0.0005	0.0007	0.0007		QFSS
Annual Cadmium Metals	Raw	mg/L	Y	1	1	0	0.0001	0.0001	0.0001		QFSS
	Treated		Y	1	1	0	0.0001	0.0001	0.0001		QFSS
	Reticulation		Y	2	2	0	0.0001	0.0001	0.0001		QFSS
Annual Chromium Metals	Raw	mg/L	Y	1	1	0	0.0002	0.0002	0.0002		QFSS
	Treated		Y	1	1	0	0.0002	0.0002	0.0002		QFSS
	Reticulation		Y	2	2	0	0.0003	0.0006	0.0006		QFSS
Annual Copper Metals	Raw	mg/L	Y	1	1	0	0.003	0.003	0.003		QFSS
	Treated		Y	1	1	0	0.003	0.003	0.003		QFSS
	Reticulation		Y	2	2	0	0.015	0.13	0.13		QFSS
Annual Iron Metals	Raw	mg/L	Y	1	1	0	0.005	0.005	0.005		QFSS
	Treated		Y	1	1	0	0.005	0.005	0.005		QFSS
	Reticulation		Y	2	2	0	0.005	0.016	0.016		QFSS
Annual Lead Metals	Raw	mg/L	Y	1	1	0	0.0001	0.0001	0.0001		QFSS
	Treated		Y	1	1	0	0.0001	0.0001	0.0001		QFSS
	Reticulation		Y	2	2	0	0.0006	0.0090	0.0090		QFSS
Annual Manganese Metals	Raw	mg/L	Y	1	1	0	0.0008	0.0008	0.0008		QFSS
	Treated		Y	1	1	0	0.0012	0.0012	0.0012		QFSS
	Reticulation		Y	2	2	0	0.0010	0.0028	0.0028		QFSS
Annual Nickel Metals	Raw	mg/L	Y	1	1	0	0.0011	0.0011	0.0011		QFSS
	Treated		Y	1	1	0	0.0012	0.0012	0.0012		QFSS

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
	Reticulation		Y	2	2	0	0.0015	0.0033	0.0033		QFSS
Annual Zinc Metals	Raw	mg/L	Y	1	1	0	0.006	0.006	0.006		QFSS
	Treated		Y	1	1	0	0.008	0.008	0.008		QFSS
	Reticulation		Y	2	2	0	0.007	0.130	0.130		QFSS

NOTE: QFSS Limit of Reporting not provided to Gympie Regional Council.

Table 5 - Imbil Water Analysis

Parameter	Scheme	Units	Frequency of sampling Required	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
Chlorine Residual	Raw	mg/L	-	-	-	-	-	-	-	-	-
	Treated		D	361	361	0	1.86	4.90	3.43	0.01	WTP
	Reticulation		M	24	24	0	0.31	1.43	0.77		QFSS
Total Trihalomethanes	Raw	ug/L	-							-	
	Treated		-							-	
	Reticulation		M	12	12	1	43	260	173		QFSS
E. Coli	Raw	mpn/100mL	-							-	-
	Treated		-							-	-
	Reticulation		M	24	24	0	0	0	0		QFSS
pH	Raw		HY	2	2	0	6.91	7.40	7.16		QFSS
	Treated		M	24	24	0	7.10	7.50	7.31	1	WTP
	Reticulation		HY	2	2	0	7.31	7.61	7.46		QFSS
Total Hardness	Raw	$mgCaCO_3/L$	HY	2	2	0	107	116	112		QFSS
	Treated		M	24	24	0	74	210	129	1	WTP
	Reticulation		HY	2	2	0	102	115	109		QFSS
Temporary Hardness	Raw	$mgCaCO_3/L$	HY	2	2	0	98	98	98		QFSS
	Treated		HY	2	2	0	98	99	99		QFSS
	Reticulation		HY	2	2	0	96	99	98		QFSS
Alkalinity	Raw	$mgCaCO_3/L$	HY	2	2	0	98	98	98		QFSS
	Treated		HY	2	2	0	98	99	99		QFSS
	Reticulation		HY	2	2	0	96	96	96		QFSS
Residual Alkalinity	Raw	meq/L	HY	2	2	0	0.0	0.0	0.0		QFSS
	Treated		HY	2	2	0	0.0	0.0	0.0		QFSS
	Reticulation		HY	2	2	0	0.0	0.0.	0.0		QFSS
Silica	Raw	mg/L	HY	2	2	0	22	23	23		QFSS
	Treated		HY	2	2	0	21	23	22		QFSS
	Reticulation		HY	2	2	0	21	22	22		QFSS
Total Dissolved Ions	Raw	mg/L	HY	2	2	0	220	235	228		QFSS
	Treated		HY	2	2	0	241	245	243		QFSS
	Reticulation		HY	2	2	0	230	246	238		QFSS
Total Dissolved Solids	Raw	mg/L	HY	2	2	0	180	200	190		QFSS
	Treated		HY	2	2	0	200	210	205		QFSS

Parameter	Scheme	Units	Frequency of sampling Required	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
	Reticulation		HY	2	2	0	190	210	200		QFSS
True Colour	Raw	Hazen	HY	2	2	0	13	23	18		QFSS
	Treated		W	24	24	0	1	2	1	1	WTP
	Reticulation		HY	2	2	0	8	8	8		QFSS
Turbidity	Raw	NTU	HY	2	2	0	4	11	8		QFSS
	Treated		M	335	355	0	0.01	0.44	0.11	0.001	WTP
	Reticulation		HY	2	2	0	1	1	1		QFSS
pH Saturation	Raw		HY	2	2	0	8.2	8.3	8.3		QFSS
	Treated		HY	2	2	0	8.2	8.2	8.2		QFSS
	Reticulation		HY	2	2	0	8.2	8.3	8.3		QFSS
Saturation Index	Raw		HY	2	2	0	-1.3	-0.9	-1.1		QFSS
	Treated		HY	2	2	0	-1.3	-0.9	-1.1		QFSS
	Reticulation		HY	2	2	0	-0.9	-0.7	-0.8		QFSS
Mole Ratio	Raw		HY	2	2	0	2.6	3.1	2.9		QFSS
	Treated		HY	2	2	0	2.8	3.2	3.0		QFSS
	Reticulation		HY	2	2	0	2.4	2.8	2.6		QFSS
Sodium	Raw	mg/L	HY	2	2	0	24	26	25		QFSS
	Treated		HY	2	2	0	30	30	30		QFSS
	Reticulation		HY	2	2	0	29	30	30		QFSS
Potassium	Raw	mg/L	HY	2	2	0	1.40	1.50	1.45		QFSS
	Treated		HY	2	2	0	1.40	1.50	1.45		QFSS
	Reticulation		HY	2	2	0	1.40	1.50	1.45		QFSS
Calcium	Raw	mg/L	HY	2	2	0	16	18	17		QFSS
	Treated		HY	2	2	0	17	18	18		QFSS
	Reticulation		HY	2	2	0	16	18	17		QFSS
Magnesium	Raw	mg/L	HY	2	2	0	16	17	17		QFSS
	Treated		HY	2	2	0	17	18	18		QFSS
	Reticulation		HY	2	2	0	15	17	16		QFSS
Hydrogen	Raw	mg/L	HY	2	2	0	0.0	0.0	0.0		QFSS
	Treated		HY	2	2	0	0.0	0.0	0.0		QFSS
	Reticulation		HY	2	2	0	0.0	0.0	0.0		QFSS
Bicarbonate	Raw	mg/L	HY	2	2	0	119	119	119		QFSS
	Treated		HY	2	2	0	120	121	121		QFSS

Parameter	Scheme	Units	Frequency of sampling Required	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
	Reticulation		HY	2	2	0	116	121	119		QFSS
Carbonate	Raw	mg/L	HY	2	2	0	0.1	0.2	0.2		QFSS
	Treated		HY	2	2	0	0.1	0.1	0.1		QFSS
	Reticulation		HY	2	2	0	0.1	0.3	0.2		QFSS
Hydroxide	Raw	mg/L	HY	2	2	0	0.0	0.0	0.0		QFSS
	Treated		HY	2	2	0	0.0	0.0	0.0		QFSS
	Reticulation		HY	2	2	0	0.0	0.0	0.0		QFSS
Chloride	Raw	mg/L	HY	2	2	0	36	47	42		QFSS
	Treated		HY	2	2	0	48	53	51		QFSS
	Reticulation		HY	2	2	0	45	53	49		QFSS
Fluoride	Raw	mg/L	HY	2	2	0	0.09	0.09	0.09		QFSS
	Treated		HY	2	2	0	0.08	0.08	0.08		QFSS
	Reticulation		HY	2	2	0	0.08	0.09	0.09		QFSS
Nitrate	Raw	mg/L	HY	2	2	0	0.35	0.52	0.44		QFSS
	Treated		HY	2	2	0	0.20	0.49	0.35		QFSS
	Reticulation		HY	2	2	0	0.18	0.49	0.34		QFSS
Sulphate	Raw	mg/L	HY	2	2	0	5.8	6.1	6.0		QFSS
	Treated		HY	2	2	0	5.8	6.4	6.1		QFSS
	Reticulation		HY	2	2	0	5.7	6.3	6.0		QFSS
Iron	Raw	mg/L	HY	2	2	0	0.01	0.12	0.07		QFSS
	Treated		M	24	24	0	0.001	0.099	0.016	0.001	WTP
	Reticulation		HY	2	2	0	0.01	0.01	0.01		QFSS
Manganese	Raw	mg/L	HY	2	2	0	0.001	0.001	0.001		QFSS
	Treated		M	24	24	0	0.005	0.050	0.035	0.001	WTP
	Reticulation		HY	2	2	0	0.001	0.002	0.002		QFSS
Zinc	Raw	mg/L	HY	2	2	0	0.06	0.06	0.06		QFSS
	Treated		HY	2	2	0	0.06	0.06	0.06		QFSS
	Reticulation		HY	2	2	0	0.06	0.06	0.06		QFSS
Aluminium	Raw	mg/L	HY	2	2	0	0.03	0.06	0.05		QFSS
	Treated		M	24	24	0	0.002	0.056	0.015	0.001	WTP
	Reticulation		HY	2	2	0	0.03	0.03	0.03		QFSS
Boron	Raw	mg/L	HY	2	2	0	0.02	0.003	0.03		QFSS
	Treated		HY	2	2	0	0.02	0.03	0.03		QFSS

Parameter	Scheme	Units	Frequency of sampling Required	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
	Reticulation		HY	2	2	0	0.02	0.03	0.03		QFSS
Copper	Raw	mg/L	HY	2	2	0	0.009	0.014	0.012		QFSS
	Treated		HY	2	2	0	0.009	0.012	0.011		QFSS
	Reticulation		HY	2	2	0	0.013	0.028	0.021		QFSS
Annual Aluminium Metals	Raw	mg/L	Y	1	1	0	0.27	0.27	0.27		QFSS
	Treated		Y	1	1	0	0.059	0.059	0.059		QFSS
	Reticulation		Y	1	1	0	0.059	0.059	0.059		QFSS
Annual Arsenic Metals	Raw	mg/L	Y	1	1	0	0.0012	0.0012	0.0012		QFSS
	Treated		Y	1	1	0	0.0006	0.0006	0.0006		QFSS
	Reticulation		Y	1	1	0	00006	00006	00006		QFSS
Annual Cadmium Metals	Raw	mg/L	Y	1	1	0	0.0001	0.0001	0.0001		QFSS
	Treated		Y	1	1	0	0.0001	0.0001	0.0001		QFSS
	Reticulation		Y	1	1	0	0.0001	0.0001	0.0001		QFSS
Annual Chromium Metals	Raw	mg/L	Y	1	1	0	0.0014	0.0014	0.0014		QFSS
	Treated		Y	1	1	0	0.0002	0.0002	0.0002		QFSS
	Reticulation		Y	1	1	0	0.0002	0.0002	0.0002		QFSS
Annual Copper Metals	Raw	mg/L	Y	1	1	0	0.029	0.029	0.029		QFSS
	Treated		Y	1	1	0	0.013	0.013	0.013		QFSS
	Reticulation		Y	1	1	0	0.019	0.019	0.019		QFSS
Annual Iron Metals	Raw	mg/L	Y	1	1	0	1.000	1.000	1.000		QFSS
	Treated		Y	1	1	0	0.043	0.043	0.043		QFSS
	Reticulation		Y	1	1	0	0.032	0.032	0.032		QFSS
Annual Lead Metals	Raw	mg/L	Y	1	1	0	0.0009	0.0009	0.0009		QFSS
	Treated		Y	1	1	0	0.0005	0.0005	0.0005		QFSS
	Reticulation		Y	1	1	0	0.0011	0.0011	0.0011		QFSS
Annual Manganese Metals	Raw	mg/L	Y	1	1	0	0.3200	0.3200	0.3200		QFSS
	Treated		Y	1	1	0	0.0089	0.0089	0.0089		QFSS
	Reticulation		Y	1	1	0	0.0042	0.0042	0.0042		QFSS
Annual Nickel Metals	Raw	mg/L	Y	1	1	0	0.0040	0.0040	0.0040		QFSS
	Treated		Y	1	1	0	0.0009	0.0009	0.0009		QFSS
	Reticulation		Y	1	1	0	0.0009	0.0009	0.0009		QFSS
Annual Zinc Metals	Raw	mg/L	Y	1	1	0	0.021	0.021	0.021		QFSS
	Treated		Y	1	1	0	0.008	0.008	0.008		QFSS

Parameter	Scheme	Units	Frequency of sampling Required	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
	Reticulation		Y	1	1	0	0.017	0.017	0.017		QFSS

NOTE: QFSS Limit of Reporting not provided to Gympie Regional Council.

Table 6- Kandanga Water Analysis

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
Chlorine Residual	Raw	mg/L	-	-	-	-	-	-	-	-	-
	Treated		D	360	360	0	1.00	4.48	2.72	0.01	WTP
	Reticulation		M	24	24	0	0.13	1.90	0.84		QFSS
Total Trihalomethanes	Raw	ug/L	-							-	
	Treated		-							-	
	Reticulation		M	12	12	0	65	240	151		QFSS
E. Coli	Raw	mpn/100mL	-							-	-
	Treated		-								-
	Reticulation		M	24	24	0	0	0	0		QFSS
pH	Raw		HY	2	2	0	7.84	7.95	7.90		QFSS
	Treated		M	24	24	0	7.2	7.9	7.5	1	WTP
	Reticulation		HY	2	2	0	7.72	8.01	7.87		QFSS
Total Hardness	Raw	$mgCaCO_3/L$	HY	2	2	0	169	212	191		QFSS
	Treated		M	24	24	0	96	218	186	1	WTP
	Reticulation		HY	2	2	0	151	213	182		QFSS
Temporary Hardness	Raw	$mgCaCO_3/L$	HY	2	2	0	158	186	172		QFSS
	Treated		HY	2	2	0	158	178	168		QFSS
	Reticulation		HY	2	2	0	140	178	159		QFSS
Alkalinity	Raw	$mgCaCO_3/L$	HY	2	2	0	160	190	175		QFSS
	Treated		HY	2	2	0	160	180	170		QFSS
	Reticulation		HY	2	2	0	140	180	160		QFSS
Residual Alkalinity	Raw	meq/L	HY	2	2	0	0.0	0.0	0.0		QFSS
	Treated		HY	2	2	0	0.0	0.0	0.0		QFSS
	Reticulation		HY	2	2	0	0.0	0.0	0.0		QFSS
Silica	Raw	mg/L	HY	2	2	0	27	29	28		QFSS
	Treated		HY	2	2	0	28	30	29		QFSS
	Reticulation		HY	2	2	0	28	29	29		QFSS
Total Dissolved Ions	Raw	mg/L	HY	2	2	0	313	391	352		QFSS
	Treated		HY	2	2	0	324	395	360		QFSS
	Reticulation		HY	2	2	0	298	393	346		QFSS
Total Dissolved Solids	Raw	mg/L	HY	2	2	0	240	310	275		QFSS
	Treated		HY	2	2	0	260	320	290		QFSS

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
	Reticulation		HY	2	2	0	240	310	275		QFSS
True Colour	Raw	Hazen	HY	2	2	0	8	13	11		QFSS
	Treated		M	24	24	0	1	1	1	1	WTP
	Reticulation		HY	2	2	0	8	8	8		QFSS
Turbidity	Raw	NTU	HY	2	2	0	3	4	4		QFSS
	Treated		M	332	332	0	0.00	0.29	0.07	0.001	WTP
	Reticulation		HY	2	2	0	1	1	1		QFSS
pH Saturation	Raw		HY	2	2	0	7.9	8.0	8.0		QFSS
	Treated		HY	2	2	0	7.9	8.1	8.0		QFSS
	Reticulation		HY	2	2	0	7.9	8.1	8.0		QFSS
Saturation Index	Raw		HY	2	2	0	-0.2	0.0	-0.1		QFSS
	Treated		HY	2	2	0	-0.3	0.0	-0.2		QFSS
	Reticulation		HY	2	2	0	-0.2	-0.1	-0.2		QFSS
Mole Ratio	Raw		HY	2	2	0	1.9	2.0	2.0		QFSS
	Treated		HY	2	2	0	1.8	2.4	2.1		QFSS
	Reticulation		HY	2	2	0	1.9	2.2	2.1		QFSS
Sodium	Raw	mg/L	HY	2	2	0	25	32	29		QFSS
	Treated		HY	2	2	0	30	37	34		QFSS
	Reticulation		HY	2	2	0	29	36	33		QFSS
Potassium	Raw	mg/L	HY	2	2	0	1.50	1.60	1.55		QFSS
	Treated		HY	2	2	0	1.50	1.60	1.55		QFSS
	Reticulation		HY	2	2	0	1.50	1.70	1.60		QFSS
Calcium	Raw	mg/L	HY	2	2	0	16	20	18		QFSS
	Treated		HY	2	2	0	16	20	18		QFSS
	Reticulation		HY	2	2	0	15	20	18		QFSS
Magnesium	Raw	mg/L	HY	2	2	0	31	40	36		QFSS
	Treated		HY	2	2	0	31	40	36		QFSS
	Reticulation		HY	2	2	0	27	40	34		QFSS
Hydrogen	Raw	mg/L	HY	2	2	0	0.0	0.0	0.0		QFSS
	Treated		HY	2	2	0	0.0	0.0	0.0		QFSS
	Reticulation		HY	2	2	0	0.0	0.0	0.0		QFSS
Bicarbonate	Raw	mg/L	HY	2	2	0	192	225	209		QFSS
	Treated		HY	2	2	0	190	216	203		QFSS

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
	Reticulation		HY	2	2	0	169	216	193		QFSS
Carbonate	Raw	mg/L	HY	2	2	0	0.8	1.2	1.0		QFSS
	Treated		HY	2	2	0	0.5	1.3	0.9		QFSS
	Reticulation		HY	2	2	0	0.7	1.0	0.9		QFSS
Hydroxide	Raw	mg/L	HY	2	2	0	0.0	0.0	0.0		QFSS
	Treated		HY	2	2	0	0.0	0.0	0.0		QFSS
	Reticulation		HY	2	2	0	0.0	0.0	0.0		QFSS
Chloride	Raw	mg/L	HY	2	2	0	38	66	52		QFSS
	Treated		HY	2	2	0	45	74	60		QFSS
	Reticulation		HY	2	2	0	44	75	60		QFSS
Fluoride	Raw	mg/L	HY	2	2	0	0.06	0.07	0.07		QFSS
	Treated		HY	2	2	0	0.06	0.07	0.07		QFSS
	Reticulation		HY	2	2	0	0.06	0.06	0.06		QFSS
Nitrate	Raw	mg/L	HY	2	2	0	0.04	0.31	0.23		QFSS
	Treated		HY	2	2	0	0.16	0.38	0.27		QFSS
	Reticulation		HY	2	2	0	0.43	0.60	0.52		QFSS
Sulphate	Raw	mg/L	HY	2	2	0	5.3	8.8	7.1		QFSS
	Treated		HY	2	2	0	5.0	8.9	7.0		QFSS
	Reticulation		HY	2	2	0	4.8	8.8	6.8		QFSS
Iron	Raw	mg/L	HY	2	2	0	0.01	0.01	0.01		QFSS
	Treated		M	24	24	0	0.001	0.084	0.012	0.001	WTP
	Reticulation		HY	2	2	0	0.01	0.01	0.01		QFSS
Manganese	Raw	mg/L	HY	2	2	0	0.001	0.001	0.001		QFSS
	Treated		HY	2	2	0	0.001	0.001	0.001		QFSS
	Reticulation		HY	2	2	0	0.001	0.001	0.001		QFSS
Zinc	Raw	mg/L	HY	2	2	0	0.06	0.06	0.06		QFSS
	Treated		HY	2	2	0	0.06	0.06	0.06		QFSS
	Reticulation		HY	2	2	0	0.06	0.06	0.06		QFSS
Aluminium	Raw	mg/L	HY	2	2	0	0.03	0.03	0.03		QFSS
	Treated		M	24	24	0	0.005	0.083	0.016	0.001	WTP
	Reticulation		HY	2	2	0	0.03	0.03	0.03		QFSS
Boron	Raw	mg/L	HY	2	2	0	0.03	0.03	0.03		QFSS
	Treated		HY	2	2	0	0.03	0.03	0.03		QFSS

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
	Reticulation		HY	2	2	0	0.03	0.03	0.03		QFSS
Copper	Raw	mg/L	HY	2	2	0	0.003	0.003	0.003		QFSS
	Treated		HY	2	2	0	0.003	0.003	0.003		QFSS
	Reticulation		HY	2	2	0	0.005	0.008	0.007		QFSS
Annual Aluminium Metals	Raw	mg/L	Y	1	1	0	0.100	0.100	0.100		QFSS
	Treated		Y	1	1	0	0.061	0.061	0.061		QFSS
	Reticulation		Y	1	1	0	0.086	0.086	0.086		QFSS
Annual Arsenic Metals	Raw	mg/L	Y	1	1	0	0.0019	0.0019	0.0019		QFSS
	Treated		Y	1	1	0	0.0011	0.0011	0.0011		QFSS
	Reticulation		Y	1	1	0	0.0013	0.0013	0.0013		QFSS
Annual Cadmium Metals	Raw	mg/L	Y	1	1	0	0.0001	0.0001	0.0001		QFSS
	Treated		Y	1	1	0	0.0001	0.0001	0.0001		QFSS
	Reticulation		Y	1	1	0	0.0001	0.0001	0.0001		QFSS
Annual Chromium Metals	Raw	mg/L	Y	1	1	0	0.0007	0.0007	0.0007		QFSS
	Treated		Y	1	1	0	0.0004	0.0004	0.0004		QFSS
	Reticulation		Y	1	1	0	0.0003	0.0003	0.0003		QFSS
Annual Copper Metals	Raw	mg/L	Y	1	1	0	0.001	0.001	0.001		QFSS
	Treated		Y	1	1	0	0.001	0.001	0.001		QFSS
	Reticulation		Y	1	1	0	0.004	0.004	0.004		QFSS
Annual Iron Metals	Raw	mg/L	Y	1	1	0	0.014	0.014	0.014		QFSS
	Treated		Y	1	1	0	0.005	0.005	0.005		QFSS
	Reticulation		Y	1	1	0	0.007	0.007	0.007		QFSS
Annual Lead Metals	Raw	mg/L	Y	1	1	0	0.0001	0.0001	0.0001		QFSS
	Treated		Y	1	1	0	0.0001	0.0001	0.0001		QFSS
	Reticulation		Y	1	1	0	0.0003	0.0003	0.0003		QFSS
Annual Manganese Metals	Raw	mg/L	Y	1	1	0	0.0810	0.0810	0.0810		QFSS
	Treated		Y	1	1	0	0.0051	0.0051	0.0051		QFSS
	Reticulation		Y	1	1	0	0.0054	0.0054	0.0054		QFSS
Annual Nickel Metals	Raw	mg/L	Y	1	1	0	0.0029	0.0029	0.0029		QFSS
	Treated		Y	1	1	0	0.0010	0.0010	0.0010		QFSS
	Reticulation		Y	1	1	0	0.0010	0.0010	0.0010		QFSS
Annual Zinc Metals	Raw	mg/L	Y	1	1	0	0.001	0.001	0.001		QFSS
	Treated		Y	1	1	0	0.001	0.001	0.001		QFSS

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
	Reticulation		Y	1	1	0	0.001	0.001	0.001		QFSS

NOTE: QFSS Limit of Reporting not provided to Gympie Regional Council.

Table 7 - Kilkivan Water Analysis

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
Chlorine Residual	Raw	mg/L	-	-	-	-	-	-	-	-	-
	Treated		D	365	365	0	0.81	1.50	1.14	0.01	WTP
	Reticulation		W	25	5	0	0.66	1.00	0.84		QFSS
Total Trihalomethanes	Raw	mg/L	-							-	-
	Treated		-							-	-
	Reticulation		M	13	13	0	8	26	19		QFSS
E. Coli	Raw	mpn/100mL	-							-	-
	Treated		-							-	-
	Reticulation		M	25	25	0	0	0	0		QFSS
pH	Raw		HY	8	8	0	7.54	7.99	7.81		QFSS
	Treated		D	365	365	0	7.00	7.70	7.42	1	WTP
	Reticulation		HY	2	2	0	7.54	8.05	7.80		QFSS
Total Hardness	Raw	$mgCaCO_3/L$	HY	8	8	0	320	772	498		QFSS
	Treated		M	23	23	0	125	194	151	1	WTP
	Reticulation		HY	2	2	0	140	142	141		QFSS
Temporary Hardness	Raw	$mgCaCO_3/L$	HY	8	8	0	264	602	400		QFSS
	Treated		HY	2	2	0	139	139	139		QFSS
	Reticulation		HY	2	2	0	140	142	141		QFSS
Alkalinity	Raw	$mgCaCO_3/L$	HY	8	8	0	260	600	400		QFSS
	Treated		M	25	25	0	130	180	158	1	WTP
	Reticulation		HY	2	2	0	160	180	170		QFSS
Residual Alkalinity	Raw	meq/L	HY	8	8	0	0.0	0.0	0.0		QFSS
	Treated		HY	2	2	0	0.1	0.8	0.5		QFSS
	Reticulation		HY	2	2	0	0.4	0.7	0.6		QFSS
Silica	Raw	mg/L	HY	8	8	0	24	75	41		QFSS
	Treated		HY	2	2	0	13	15	14		QFSS
	Reticulation		HY	2	2	0	13	15	14		QFSS
Total Dissolved Ions	Raw	mg/L	HY	8	8	0	591	1280	905		QFSS
	Treated		HY	2	2	0	340	391	366		QFSS
	Reticulation		HY	2	2	0	366	391	379		QFSS
Total Dissolved Solids	Raw	mg/L	HY	8	8	0	460	990	700		QFSS
	Treated		HY	2	2	0	270	300	285		QFSS

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
	Reticulation		HY	2	2	0	280	300	290		QFSS
True Colour	Raw	Hazen	HY	8	8	0	8	32	11		QFSS
	Treated		D	364	364	0	0	0	0	1	WTP
	Reticulation		HY	2	2	0	8	8	8		QFSS
Turbidity	Raw	NTU	HY	8	8	0	1	5	2		QFSS
	Treated		D	365	365	0	0.00	0.15	0.03	0.001	WTP
	Reticulation		HY	2	2	0	1	1	1		QFSS
pH Saturation	Raw		HY	8	8	0	7.0	7.6	7.3		QFSS
	Treated		HY	2	2	0	8.0	8.0	8.0		QFSS
	Reticulation		HY	2	2	0	7.9	8.0	8.0		QFSS
Saturation Index	Raw		HY	8	8	0	0.1	0.8	0.5		QFSS
	Treated		HY	2	2	0	-0.9	0.1	-0.4		QFSS
	Reticulation		HY	2	2	0	-0.4	0.1	-0.2		QFSS
Mole Ratio	Raw		HY	8	8	0	1.9	2.4	2.2		QFSS
	Treated		HY	2	2	0	1.8	2.9	2.4		QFSS
	Reticulation		HY	2	2	0	1.9	2.5	2.2		QFSS
Sodium	Raw	mg/L	HY	8	8	0	54	100	83		QFSS
	Treated		HY	2	2	0	48	63	56		QFSS
	Reticulation		HY	2	2	0	55	62	59		QFSS
Potassium	Raw	mg/L	HY	8	8	0	0.30	2.30	1.60		QFSS
	Treated		HY	2	2	0	0.9	1.0	1.0		QFSS
	Reticulation		HY	2	2	0	0.9	1.0	1.0		QFSS
Calcium	Raw	mg/L	HY	8	8	0	15	77	46		QFSS
	Treated		HY	2	2	0	19	19	19		QFSS
	Reticulation		HY	2	2	0	20	20	20		QFSS
Magnesium	Raw	mg/L	HY	8	8	0	51	180	94		QFSS
	Treated		HY	2	2	0	22	22	22		QFSS
	Reticulation		HY	2	2	0	22	22	22		QFSS
Hydrogen	Raw	mg/L	HY	8	8	0	0.0	0.0	0.0		QFSS
	Treated		HY	2	2	0	0.0	0.0	0.0		QFSS
	Reticulation		HY	2	2	0	0.0	0.0	0.0		QFSS
Bicarbonate	Raw	mg/L	HY	8	8	0	319	725	483		QFSS
	Treated		HY	2	2	0	174	212	193		QFSS

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
	Reticulation		HY	2	2	0	194	211	203		QFSS
Carbonate	Raw	mg/L	HY	8	8	0	1.0	4.5	2.2		QFSS
	Treated		HY	2	2	0	0.2	1.7	1.0		QFSS
	Reticulation		HY	2	2	0	0.4	1.4	0.9		QFSS
Hydroxide	Raw	mg/L	HY	8	8	0	0.0	0.0	0.0		QFSS
	Treated		HY	2	2	0	0.0	0.0	0.0		QFSS
	Reticulation		HY	2	2	0	0.0	0.0	0.0		QFSS
Chloride	Raw	mg/L	HY	8	8	0	95	250	181		QFSS
	Treated		HY	2	2	0	68	72	70		QFSS
	Reticulation		HY	2	2	0	68	70	69		QFSS
Fluoride	Raw	mg/L	HY	8	8	0	0.09	0.20	0.16		QFSS
	Treated		HY	2	2	0	0.06	0.07	0.07		QFSS
	Reticulation		HY	2	2	0	0.06	0.07	0.07		QFSS
Nitrate	Raw	mg/L	HY	8	8	0	0.05	4.90	1.28		QFSS
	Treated		HY	2	2	0	0.24	0.42	0.33		QFSS
	Reticulation		HY	2	2	0	0.22	0.42	0.32		QFSS
Sulphate	Raw	mg/L	HY	8	8	0	4.9	31.0	14.5		QFSS
	Treated		HY	2	2	0	3.4	4.4	3.9		QFSS
	Reticulation		HY	2	2	0	3.4	4.5	4.0		QFSS
Iron	Raw	mg/L	HY	8	8	0	0.01	0.01	0.01		QFSS
	Treated		M	26	26	0	0.00	0.03	0.00	0.01	WTP
	Reticulation		HY	2	2	0	0.01	0.01	0.01		QFSS
Manganese	Raw	mg/L	HY	8	8	0	0.001	0.960	0.242		QFSS
	Treated		M	26	26	0	0.030	0.050	0.049	0.01	WTP
	Reticulation		HY	2	2	0	0.001	0.001	0.001		QFSS
Zinc	Raw	mg/L	HY	8	8	0	0.06	0.06	0.06		QFSS
	Treated		HY	2	2	0	0.06	0.06	0.06		QFSS
	Reticulation		HY	2	2	0	0.06	0.06	0.06		QFSS
Aluminium	Raw	mg/L	HY	8	8	0	0.03	0.03	0.03		QFSS
	Treated		M	26	26	0	0.000	0.035	0.004	0.1	WTP
	Reticulation		HY	2	2	0	0.03	0.03	0.03		QFSS
Boron	Raw	mg/L	HY	8	8	0	0.05	0.09	0.07		QFSS
	Treated		HY	2	2	0	0.05	0.05	0.05		QFSS

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
	Reticulation		HY	2	2	0	0.05	0.05	0.05		QFSS
Copper	Raw	mg/L	HY	8	8	0	0.003	0.007	0.004		QFSS
	Treated		HY	2	2	0	0.003	0.003	0.003		QFSS
	Reticulation		HY	2	2	0	0.045	0.050	0.048		QFSS
Annual Aluminium Metals	Raw	mg/L	Y	4	4	0	0.003	0.003	0.003		QFSS
	Treated		Y	1	1	0	0.003	0.003	0.003		QFSS
	Reticulation		Y	1	1	0	0.003	0.003	0.003		QFSS
Annual Arsenic Metals	Raw	mg/L	Y	4	4	0	0.0010	0.0046	0.0022		QFSS
	Treated		Y	1	1	0	0.0005	0.0005	0.0005		QFSS
	Reticulation		Y	1	1	0	0.0005	0.0005	0.0005		QFSS
Annual Cadmium Metals	Raw	mg/L	Y	4	4	0	0.0001	0.0001	0.0001		QFSS
	Treated		Y	1	1	0	0.0001	0.0001	0.0001		QFSS
	Reticulation		Y	1	1	0	0.0001	0.0001	0.0001		QFSS
Annual Chromium Metals	Raw	mg/L	Y	4	4	0	0.0001	0.0020	0.0006		QFSS
	Treated		Y	1	1	0	0.0001	0.0001	0.0001		QFSS
	Reticulation		Y	1	1	0	0.0001	0.0001	0.0001		QFSS
Annual Copper Metals	Raw	mg/L	Y	4	4	0	0.001	0.006	0.003		QFSS
	Treated		Y	1	1	0	0.003	0.003	0.003		QFSS
	Reticulation		Y	1	1	0	0.048	0.048	0.048		QFSS
Annual Iron Metals	Raw	mg/L	Y	4	4	0	0.005	0.063	0.023		QFSS
	Treated		Y	1	1	0	0.005	0.005	0.005		QFSS
	Reticulation		Y	1	1	0	0.005	0.005	0.005		QFSS
Annual Lead Metals	Raw	mg/L	Y	4	4	0	0.0001	0.0002	0.0002		QFSS
	Treated		Y	1	1	0	0.0001	0.0001	0.0001		QFSS
	Reticulation		Y	1	1	0	0.0007	0.0007	0.0007		QFSS
Annual Manganese Metals	Raw	mg/L	Y	4	4	0	0.0002	0.9800	0.4080		QFSS
	Treated		Y	1	1	0	0.0001	0.0001	0.0001		QFSS
	Reticulation		Y	1	1	0	0.0001	0.0001	0.0001		QFSS
Annual Nickel Metals	Raw	mg/L	Y	4	4	0	0.0013	0.0039	0.0020		QFSS
	Treated		Y	1	1	0	0.0002	0.0002	0.0002		QFSS
	Reticulation		Y	1	1	0	0.0003	0.0003	0.0003		QFSS
Annual Zinc Metals	Raw	mg/L	Y	4	4	0	0.001	0.007	0.004		QFSS
	Treated		Y	1	1	0	0.002	0.002	0.002		QFSS

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
	Reticulation		Y	1	1	0	0.015	0.015	0.015		QFSS

NOTE: QFSS Limit of Reporting not provided to Gympie Regional Council.

Table 8 - Rainbow Beach Water Analysis

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
Chlorine Residual	Raw	mg/L	-	-	-	-	-	-	-	-	-
	Treated		WD	344	344	0	0.55	1.27	0.97	0.01	WTP
	Reticulation		W	84	84	0	0.40	1.68	0.80		QFSS
Total Trihalomethanes	Raw	ug/L	-							-	-
	Treated		-							-	-
	Reticulation		M	12	12	0	9	16	13		QFSS
E. Coli	Raw	mpn/100mL	-							-	-
	Treated		M	12	12	0	0	0	0		QFSS
	Reticulation		W	84	84	0	0	0	0		QFSS
pH	Raw		HY	8	8	0	4.98	7.31	5.60		QFSS
	Treated		WD	334	334	0	6.60	7.50	7.01	1	WTP
	Reticulation		HY	2	2	0	7.15	7.54	7.35		QFSS
Total Hardness	Raw	$mgCaCO_3/L$	HY	8	8	0	6	9	8		QFSS
	Treated		M	12	12	0	8	12	9	1	WTP
	Reticulation		HY	2	2	0	9	10	9		QFSS
Temporary Hardness	Raw	$mgCaCO_3/L$	HY	8	8	0	2	8	3		QFSS
	Treated		HY	2	2	0	3	8	6		QFSS
	Reticulation		HY	2	2	0	9	10	9		QFSS
Alkalinity	Raw	$mgCaCO_3/L$	HY	8	8	0	2	120	17		QFSS
	Treated		M	12	12	0	132	148	142	1	WTP
	Reticulation		HY	2	2	0	110	120	115		QFSS
Residual Alkalinity	Raw	meq/L	HY	8	8	0	0.0	2.2	0.3		QFSS
	Treated		HY	2	2	0	0.0	2.0	1.0		QFSS
	Reticulation		HY	2	2	0	2.0	2.3	2.2		QFSS
Silica	Raw	mg/L	HY	8	8	0	9	10	9		QFSS
	Treated		HY	2	2	0	9	10	10		QFSS
	Reticulation		HY	2	2	0	9	9	9		QFSS
Total Dissolved Ions	Raw	mg/L	HY	8	8	0	42	248	42		QFSS
	Treated		HY	2	2	0	46	227	137		QFSS
	Reticulation		HY	2	2	0	231	250	241		QFSS
Total Dissolved Solids	Raw	mg/L	HY	8	8	0	49	180	71		QFSS
	Treated		HY	2	2	0	54	170	112		QFSS

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
	Reticulation		HY	2	2	0	170	180	175		QFSS
True Colour	Raw	Hazen	HY	8	8	0	8	8	8		QFSS
	Treated		WD	334	334	0	1	0	1		WTP
	Reticulation		HY	2	2	0	8	8	8		QFSS
Turbidity	Raw	NTU	HY	8	8	0	1	2	1		QFSS
	Treated		WD	334	334	0	0.113	0.367	0.239	0.001	WTP
	Reticulation		HY	2	2	0	1	1	1		QFSS
pH Saturation	Raw		HY	8	8	0	9.5	11.4	11.0		QFSS
	Treated		HY	2	2	0	9.6	11.1	10.4		QFSS
	Reticulation		HY	2	2	0	9.1	9.4	9.3		QFSS
Saturation Index	Raw		HY	8	8	0	-6.4	-2.2	-5.4		QFSS
	Treated		HY	2	2	0	-5.7	-2.6	-4.2		QFSS
	Reticulation		HY	2	2	0	-2.0	-1.8	-1.9		QFSS
Mole Ratio	Raw		HY	8	8	0	2.4	6.5	5.6		QFSS
	Treated		HY	2	2	0	2.8	5.9	4.4		QFSS
	Reticulation		HY	2	2	0	2.2	2.6	2.4		QFSS
Sodium	Raw	mg/L	HY	8	8	0	12	70	21		QFSS
	Treated		HY	2	2	0	13	62	38		QFSS
	Reticulation		HY	2	2	0	63	70	67		QFSS
Potassium	Raw	mg/L	HY	8	8	0	0.38	0.64	0.50		QFSS
	Treated		HY	2	2	0	0.51	0.65	0.58		QFSS
	Reticulation		HY	2	2	0	0.51	0.52	0.52		QFSS
Calcium	Raw	mg/L	HY	8	8	0	0	1	0		QFSS
	Treated		HY	2	2	0	1	1	1		QFSS
	Reticulation		HY	2	2	0	1	2	1		QFSS
Magnesium	Raw	mg/L	HY	8	8	0	1	2	2		QFSS
	Treated		HY	2	2	0	2	2	2		QFSS
	Reticulation		HY	2	2	0	1	2	1		QFSS
Hydrogen	Raw	mg/L	HY	8	8	0	0.0	0.0	0.0		QFSS
	Treated		HY	2	2	0	0.0	0.0	0.0		QFSS
	Reticulation		HY	2	2	0	0.0	0.0	0.0		QFSS
Bicarbonate	Raw	mg/L	HY	8	8	0	3	147	22		QFSS
	Treated		HY	2	2	0	4	134	69		QFSS

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
	Reticulation		HY	2	2	0	136	148	142		QFSS
Carbonate	Raw	mg/L	HY	8	8	0	0.0	0.2	0.0		QFSS
	Treated		HY	2	2	0	0.0	0.1	0.1		QFSS
	Reticulation		HY	2	2	0	0.1	0.3	0.2		QFSS
Hydroxide	Raw	mg/L	HY	8	8	0	0.0	0.0	0.0		QFSS
	Treated		HY	2	2	0	0.0	0.0	0.0		QFSS
	Reticulation		HY	2	2	0	0.0	0.0	0.0		QFSS
Chloride	Raw	mg/L	HY	8	8	0	20	28	24		QFSS
	Treated		HY	2	2	0	23	25	24		QFSS
	Reticulation		HY	2	2	0	25	25	25		QFSS
Fluoride	Raw	mg/L	HY	8	8	0	0.02	0.02	0.02		QFSS
	Treated		HY	2	2	0	0.02	0.02	0.02		QFSS
	Reticulation		HY	2	2	0	0.02	0.02	0.02		QFSS
Nitrate	Raw	mg/L	HY	8	8	0	0.10	1.10	0.35		QFSS
	Treated		HY	2	2	0	0.39	0.78	0.59		QFSS
	Reticulation		HY	2	2	0	0.44	0.50	0.47		QFSS
Sulphate	Raw	mg/L	HY	8	8	0	2.8	4.2	3.3		QFSS
	Treated		HY	2	2	0	3.0	3.0	3.0		QFSS
	Reticulation		HY	2	2	0	3.0	3.0	3.0		QFSS
Iron	Raw	mg/L	HY	8	8	0	0.01	0.05	0.02		QFSS
	Treated		M	12	12	0	0.01	0.08	0.04	0.01	WTP
	Reticulation		HY	2	2	0	0.01	0.03	0.02		QFSS
Manganese	Raw	mg/L	HY	8	8	0	0.001	0.004	0.002		QFSS
	Treated		M	12	12	0	0.005	0.050	0.046	0.01	WTP
	Reticulation		HY	2	2	0	0.000	0.001	0.001		QFSS
Zinc	Raw	mg/L	HY	8	8	0	0.06	0.06	0.06		QFSS
	Treated		HY	2	2	0	0.06	0.06	0.06		QFSS
	Reticulation		HY	2	2	0	0.06	0.06	0.06		QFSS
Aluminium	Raw	mg/L	HY	8	8	0	0.03	0.03	0.03		QFSS
	Treated		M	12	12	0	0.009	0.036	0.024	0.1	WTP
	Reticulation		HY	2	2	0	0.03	0.03	0.03		QFSS
Boron	Raw	mg/L	HY	8	8	0	0.02	0.02	0.02		QFSS
	Treated		HY	2	2	0	0.02	0.02	0.02		QFSS

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
	Reticulation		HY	2	2	0	0.02	0.02	0.02		QFSS
Copper	Raw	mg/L	HY	8	8	0	0.003	0.031	0.011		QFSS
	Treated		HY	2	2	0	0.004	0.015	0.010		QFSS
	Reticulation		HY	2	2	0	0.009	0.009	0.009		QFSS
Annual Aluminium Metals	Raw	mg/L	Y	4	4	0	0.019	0.110	0.043		QFSS
	Treated		Y	1	1	0	0.027	0.027	0.027		QFSS
	Reticulation		Y	1	1	0	0.024	0.024	0.024		QFSS
Annual Arsenic Metals	Raw	mg/L	Y	4	4	0	0.0001	0.0004	0.0002		QFSS
	Treated		Y	1	1	0	0.0001	0.0001	0.0001		QFSS
	Reticulation		Y	1	1	0	0.0001	0.0001	0.0001		QFSS
Annual Cadmium Metals	Raw	mg/L	Y	4	4	0	0.0001	0.0001	0.0001		QFSS
	Treated		Y	1	1	0	0.0001	0.0001	0.0001		QFSS
	Reticulation		Y	1	1	0	0.0001	0.0001	0.0001		QFSS
Annual Chromium Metals	Raw	mg/L	Y	4	4	0	0.0001	0.0003	0.0002		QFSS
	Treated		Y	1	1	0	0.0002	0.0002	0.0002		QFSS
	Reticulation		Y	1	1	0	0.0003	0.0003	0.0003		QFSS
Annual Copper Metals	Raw	mg/L	Y	4	4	0	0.001	0.008	0.005		QFSS
	Treated		Y	1	1	0	0.016	0.016	0.016		QFSS
	Reticulation		Y	1	1	0	0.009	0.009	0.009		QFSS
Annual Iron Metals	Raw	mg/L	Y	4	4	0	0.015	0.480	0.182		QFSS
	Treated		Y	1	1	0	0.024	0.024	0.024		QFSS
	Reticulation		Y	1	1	0	0.022	0.022	0.022		QFSS
Annual Lead Metals	Raw	mg/L	Y	4	4	0	0.0001	0.0150	0.0041		QFSS
	Treated		Y	1	1	0	0.0002	0.0002	0.0002		QFSS
	Reticulation		Y	1	1	0	0.0009	0.0009	0.0009		QFSS
Annual Manganese Metals	Raw	mg/L	Y	4	4	0	0.0010	0.0035	0.0021		QFSS
	Treated		Y	1	1	0	0.0170	0.0170	0.0170		QFSS
	Reticulation		Y	1	1	0	0.0006	0.0006	0.0006		QFSS
Annual Nickel Metals	Raw	mg/L	Y	4	4	0	0.0001	0.0008	0.0003		QFSS
	Treated		Y	1	1	0	0.0001	0.0001	0.0001		QFSS
	Reticulation		Y	1	1	0	0.0001	0.0001	0.0001		QFSS
Annual Zinc Metals	Raw	mg/L	Y	4	4	0	0.004	0.008	0.006		QFSS
	Treated		Y	1	1	0	0.003	0.003	0.003		QFSS

Parameter	Scheme	Units	Frequency of sampling	Total No. samples collected	No of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
	Reticulation		Y	1	1	0	0.011	0.011	0.011		QFSS

NOTE: QFSS Limit of Reporting not provided to Gympie Regional Council.

Appendix C: Risk management improvement plan - progress

Table 18 – Whole of System Risk Register including Progress against the risk management improvement program (RMIP) in the approved DWQMP- All Schemes

Process Step	Primary hazard	Other hazards managed by same barriers	Source of Hazard/Event	Primary Preventive Measure	Other Preventative Measures	RMIP			Updates
						Immediate (30/06/2022)	Short Term (30/06/2023)	Long Term (30/06/2027)	
Whole of System	Protozoa (Crypto/ Giardia) (Retic)		Flood	Pressurised network	Repair as soon as possible, disaster management plan, leakage management software		Convert flow/pressure monitoring from external hosting to GRC SCADA		Flow meters are installed; issues with reverse flow monitoring
	Disinfection byproducts (surface water)	Disinfection byproducts (bores)	Reactions with organic matter and chlorine (All schemes except for Mary Valley)	Control of chlorination (refer to scheme risk assessments)	Source water quality		-		4 years of test results now; only issues are with Mary Valley schemes which are assessed separately
	Chlorate		Breakdown of sodium hypochlorite (not relevant for the gas chlorine schemes)	Various (refer to scheme risk assessments)	Less stock on hand at smaller schemes (some issues when chlorine usage drops)	Review/implement inventory control and testing of hypo quality at time of purchase.Water testing	Investigative monitoring for chlorate to determine need/frequency for inclusion in verification monitoring		Queensland Government guidance released for chlorate <0.8 mg/L (2021)

Table 19 – Progress against the risk management improvement program in the approved DWQMP- Amamoor

Process Step	Primary hazard	Other hazards managed by same barriers	Source of Hazard/Event	Primary Preventive Measure	Other Preventative Measures	RMIP			Updates
						Immediate (30/06/2022)	Short Term (30/06/2023)	Long Term (30/06/2027)	
Supernatant return	Protozoa (Crypto/ Giardia) (Gympie, Mary Valley, Kinbombi)		Supernatant return - concentration of oocysts	Filtration and UV	Supernatent return is limited by pump flows.	Investigate local usage of supernatant or return to creek (if allowable)	Develop concept design for excess supernatant disposal and implement.		New plant design has supernatant return limited by pumped flow.
Pre-Chlorination	Manganese	Iron	Naturally occurring underdose of chlorine	Prechlorination	Filtration, daily operator checks, disinfection (oxidation)				Targeting 0.1-0.3 mg/L from pre-chlorination
	Disinfection byproducts (surface water)		Reaction with organic matter and chlorine	Chlorination OCP	Control and monitoring of pre-dose to provide Fe and Mn removal without over-dosing	Complete investigation to develop THM control strategy.	Scope and implement upgrade works from preferred strategy	Scope and implement upgrade works from preferred strategy	Gathering data for Action plan to reduce THMs
	Chlorate		Sodium hypochlorite breakdown	Twice per week deliveries of chlorine lowers risk of hypochlorite solution breakdown		Initial monitoring of sodium hypochlorite deliveries for chlorate. Water testing	Refer to Whole of System RMIP (Chlorate)		Queensland Government guidance released for chlorate <0.8 mg/L (2021)
Filtration	Loss of Supply	Turbidity	Filter breakthrough	Tankering water form Gympie		Development strategy from Mary Valley WTP upgrade to operate in dirty water	Develop strategy for Mary Valley WTP upgrade to operate in dirty water events		Connection point to WTP to provide tankered water from Gympie to system
Chlorine Disinfection	Chlorate		Sodium hypochlorite breakdown	Twice per week deliveries of chlorine lowers risk of hypochlorite solution breakdown					Refer to pre-chlorination
UV Disinfection	Protozoa (Crypto/ Giardia) (Gympie, Mary Valley, Kinbombi)		UV failure	Fault alarm from UV system will interlock plant	Filtration - online monitoring and auto shutdown; Incident Management Plan		Update operational monitoring and CCP documents for all parameters required for effective disinfection		

Table 20 – Progress against the risk management improvement program in the approved DWQMP- Cooloola Cove

Process Step	Primary hazard	Other hazards managed by same barriers	Source of Hazard/Event	Primary Preventive Measure	Other Preventative Measures	RMIP			Updates
						Immediate (30/06/2022)	Short Term (30/06/2023)	Long Term (30/06/2027)	
Teewah Creek	Loss of supply		Fire/flood/ loss of power/ raw water main break	Reservoir storage	Disaster management, duplicate raw water mains				There are two lines. Newer line in service,
Coagulation/ Flocculation	Protozoa (Crypto/ Giardia) (Teewah Creek)	Colour	Underdose coagulant	Coagulation OCP	Jar testing as required				From previous RMIP - Turbidity meter connection into ClearSCADA - Completed. (raw plus filters & final)
Sand Filters	Protozoa (Crypto/ Giardia) (Teewah Creek)		Filter breakthrough	Filtration OCP			Investigate options for filter to waste		From previous RRMIP - Online monitoring and automated plant shutdown - filtered water turbidity (Cooloola TCB) - Completed
Soda Ash dosing	pH		Underdose soda ash	Dosing checked daily and adjusted based on operational monitoring					On-line pH (dosed and final)
Cooloola Reservoir	Bacteria/ Virus (Reticulation)		Ingress into tank	Sealed storage	Disinfection residual	Refer to Whole of System RMIP (Reservoir ingress); Clean and inspect CWS	Refer to Whole of System RMIP (Reservoir ingress)	Refer to Whole of System RMIP (Reservoir ingress)	Change to Process Step title
	Protozoa (Crypto/ Giardia) (Retic)		Ingress into tank	Sealed storage		Refer to Whole of System RMIP (Reservoir ingress); Clean and inspect CWS	Refer to Whole of System RMIP (Reservoir ingress)	Refer to Whole of System RMIP (Reservoir ingress)	
Tin Can Bay Ground level Reservoir	Protozoa (Crypto/ Giardia) (Retic)		Ingress into tank	Sealed storage			Planned to be decommissioned		Planned to be decommissioned
Tin Can Bay Tower	Protozoa (Crypto/ Giardia) (Retic)		Ingress into tank	Sealed storage			Planned to be decommissioned		Planned to be decommissioned

Table 21 – Progress against the risk management improvement program in the approved DWQMP- Goomeri

Process Step	Primary hazard	Other hazards managed by same barriers	Source of Hazard/Event	Primary Preventive Measure	Other Preventative Measures	RMIP			Updates
						Immediate (30/06/2022)	Short Term (30/06/2023)	Long Term (30/06/2027)	
Surface Water (Kinbombi Creek, Weir, OS Storages)	Bacteria/ Virus (Gympie, Mary Valley, Kinbombi)		Grazing, human activity	Chlorination OCP	Full treatment, including ozone and UV				
	Protozoa (Crypto/ Giardia) (Gympie, Mary Valley, Kinbombi)	Turbidity	Grazing, human activity	Filtration OCP	UV and Ozonation				No online monitoring from individual filters. Daily grab samples suggest that there are likely to be spikes > 0.5 NTU. Ozonation is not sufficient to expect Crypto removal (<32mg.min/L). UV system commissioned September 2021
	Cyanobacterial toxins		Annual algal blooms - some potentially toxic species have been identified	Ozone/BAC	Chlorine oxidation				Have commenced monthly monitoring
	Loss of supply		Raw water infrastructure failure	Disaster	Multiple sources				Cleaned weir intake and replaced pond valves.
Groundwater	Protozoa (Crypto/ Giardia) (Western bores)	Turbidity	Ingress into bores	Filtration CCP	Ozination				Ozonation is not sufficient to expect Crypto removal (<32mg.min/L). UV commissioned September 2021
	Hardness/TDS		Naturally occurring		Ion exchange water softner (but not currently used)	Develop long term water supply & security strategy for Goomeri (incl. treatment processes for the available sources)	Consider installing softener on just bore water - & develop brine disposal	Consider installing softener on just bore water - & develop brine disposal	Whilst a high risk, this is lower priority as it is not based on a health outcome
Coagulation / settling	Turbidity	Colour	Underdose of coagulant	Dosing checked daily and adjusted based on operational monitoring	Filtration OCP				Raw water turbidity SCADA alarm to guide potential underdosing
Soda Ash	pH		Underdose of soda ash	Dosing checked daily and adjusted based on operational monitoring					Not currently in use
	pH		Overdose of soda ash	Dosing checked daily and adjusted based on operational monitoring					Not currently in use
Sand filtration	Protozoa (Crypto/ Giardia) (Gympie, Mary Valley, Kinbombi)	Protozoa (Crypto/ Giardia) (Western bores); Turbidity	Filter breakthrough	Filtration OCP	Combined filter outlet turbidity monitoring; Ozone system and UV disinfection		Filter replacement, install individual online turbidity meters		Filter media replaced 2019. Under review again 2021. UV system installed 2021.
Ozonation	Taste and Odour		Algal blooms	ORP measurement adjustment					Regularly testing of ozone concentration commenced
Primary Disinfection (Hypo)	Bacteria/ Virus (Gympie, Mary Valley, Kinbombi)		Chlorine underdose	Chlorination OCP			Install additional chlorine monitoring prior to Clear Water Tanks		Additional monitoring will allow quicker response to dosing changes
	Chlorate		Breakdown of sodium hypochlorite				Refer to Whole of System RIMP (Chlorate)		Queensland Government guidance released for chlorate <0.8 mg/L (2021)

Process Step	Primary hazard	Other hazards managed by same barriers	Source of Hazard/Event	Primary Preventive Measure	Other Preventative Measures	RMIP			Updates
						Immediate (30/06/2022)	Short Term (30/06/2023)	Long Term (30/06/2027)	
Secondary disinfection (hypo)	Disinfection byproducts (surface water)		Reactions with organic matter	Chlorination OCP	Ozone BAC				Secondary dosing off-line (was after softener)
	Chlorate		Breakdown of sodium hypochlorite				Refer to Whole of System RMIP (Chlorate)		Secondary dosing off-line (was after softener)
Goomeri Reservoir	Bacteria/ Virus (Reticulation)	Protozoa (Crypto/ Giardia) (Retic)	Ingress into Reservoir	Sealed storage, vermin proofed	Monitoring point at the reservoir; tank drained, cleaned and inspected in 2018	Refer to Whole of System RMIP (Reservoir ingress)	Refer to Whole of System RMIP (Reservoir ingress)	Refer to Whole of System RMIP (Reservoir ingress)	Reservoir cleaned 2021
	Chlorine		Manual re-dosing causing overdose	Undertaken and managed under ERP					Rarely happens, hence the mitigated likelihood score. Manually monitoring reservoir every week
	Disinfection byproducts (surface water)		Water age, low turnover	Bore water in use until filter refurbishment	Ozone BAC		Investigate options for increasing turnover of reservoir		Manually monitoring reservoir every week

Table 22 – Progress against the risk management improvement program in the approved DWQMP- Gympie

Process Step	Primary hazard	Other hazards managed by same barriers	Source of Hazard/Event	Primary Preventive Measure	Other Preventative Measures	RMIP			Updates
						Immediate (30/06/2022)	Short Term (30/06/2023)	Long Term (30/06/2027)	
Mary River	Loss of Supply		Asset failure - raw water tunnel	Reservoir storage	Disaster Management Plan	Undertake inspection of intake tunnel	Develop contingency plan for raw water tunnel bypass		If the raw water tunnel collapses, there is no raw water supply to the WTP; possibly could set up temporary/manual pumping line
PAC dosing	Taste and odour		Algal blooms	PAC dosing					Consider improvements to PAC dosing
pH adjustment	pH		Overdose sodium hydroxide	Dosed water pH monitoring	Dosing as required (high flow low alkalinity)				If plant operates on ACH instead of Alum can reduce the need for hydroxide dosing. (Still running on Alum after trials)
Supernatant return	Protozoa (Crypto/ Giardia) (Gympie, Mary Valley, Kinbombi)		Concentration through waste recycle	Filtration CCP	Online monitoring of filtration		Investigate possibility of ceasing this practice and sending supernatant to sewer (currently being scoped)		8 L/s return ~ 4 % of total flow.
Filtration	Protozoa (Crypto/ Giardia) (Gympie, Mary Valley, Kinbombi)	Turbidity	Filter breakthrough	Filtration CCP					Backwash normally triggered on time (25 – 50 hours)
Clear Water Storage	Protozoa (Crypto/ Giardia) (Gympie, Mary Valley, Kinbombi)		Failure of backwash procedure allowing dirty water to enter the Clear Water Tank	Operator training and awareness	Backwash Procedure (EWSI1104)		SCADA Lockout to prevent accidental initiation of backwash		
Whole of WTP	Loss of supply		Asset failure	Plant manned daily	Disaster Management Plan	Replacing flocculation paddles	Repair works for Jones Hill inground reservoir		Risk assessment on WTP has identified works needed to Jones Hill Reservoir
Re-chlorination (Ferguson Hill)	Chlorate		Sodium hypochlorite decay – Ferguson Hill redosing	Continual recirculation - lower dose	Primary disinfection is chlorine gas				Chlorate investigation
Reservoir Storage	Bacteria/ Virus (Reticulation)	Protozoa (Crypto/ Giardia) (Retic)	Ingress into reservoirs - Jones Hill in-ground	Residual disinfection	Sealed storages	Refer to Whole of System RMIP (Reservoir ingress); Fill gaps underneath corrugations	Refer to Whole of System RMIP (Reservoir ingress)	Refer to Whole of System RMIP (Reservoir ingress)	Currently undergoing condition assessment
	Bacteria/ Virus (Reticulation)		Ingress into reservoirs - Penny Road and Noosa Road WPS	Sealed storages	Residual disinfection	Refer to Whole of System RMIP (Reservoir ingress)	Refer to Whole of System RMIP (Reservoir ingress)	Refer to Whole of System RMIP (Reservoir ingress)	Currently off-line
	Protozoa (Crypto/ Giardia) (Retic)		Ingress into reservoirs - Penny Road and Noosa Road WPS	Sealed storages		Refer to Whole of System RMIP (Reservoir ingress)	Refer to Whole of System RMIP (Reservoir ingress)	Refer to Whole of System RMIP (Reservoir ingress)	Currently off-line

Table 23 – Progress against the risk management improvement program in the approved DWQMP- Imbil

Process Step	Primary hazard	Other hazards managed by same barriers	Source of Hazard/Event	Primary Preventive Measure	Other Preventative Measures	RMIP			Updates
						Immediate (30/06/2022)	Short Term (30/06/2023)	Long Term (30/06/2027)	
Borumba Dam & Yabba Creek	Bacteria/ Virus (Gympie, Mary Valley, Kinbombi)		Unprotected catchment	Disinfection CCP	UV disinfection				
	Protozoa (Crypto/ Giardia) (Gympie, Mary Valley, Kinbombi)	Turbidity	Unprotected catchment	Filtration CCP	UV disinfection				
	Cyanobacterial toxins		Algal blooms	Chlorination					
	Cyanobacteria		Algal blooms	Filtration CCP	plant shutdown on high turbidity				
	Manganese	Iron	Naturally occuring	Coagulation	oxidation				
	Taste and odour		Algal blooms	Filtration CCP	oxidation				
	Heavy metals		Mining activity past or present	Full treatment process					
	Loss of Supply		Raw water pumps fail/ raw water main break / flood/ power supply	Engineering design	Treated water supply 2-3 days, disaster management				
Pre-chlorination	Manganese	Iron	Naturally occuring, underdose of chlorine	Disinfection CCP	Online monitoring and control				Single predose chlorine pump (but is common size between the three plants for redundancy)
	Disinfection byproducts (surface water)		Reaction with organic matter and chlorine	Disinfection CCP	Control and monitoring of pre-dose to provide Fe and Mn removal without over-dosing				Targetting 0.1 - 0.3 mg/L from pre-chlorination
	Chlorate		Sodium hypochlorite breakdown	High frequency deliveries of chlorine lowers risk of hypochlorite solution breakdown		Initial monitoring of sodium hypochlorite deliveries for chlorate. Water testing	Refer to Whole of System RMIP (Chlorate)		Queensland Government guidance released for chlorate <0.8 mg/L (2021)
FIltration	Protozoa (Crypto/ Giardia) (Gympie, Mary Valley, Kinbombi)	Turbidity	Filter breakthrough/ coagulant underdose	Filtration CCP	Online monitoring and control, UV, filter to waste. Auto shutdown on turbidity critical limit.				Shutdown at 0.5 NTU for 15 minutes
	Loss of supply	Turbidity	Filter breakthrough	Tankering water from Gympie		Develop strategy for Mary Valley WTP upgrade to operate in dirty raw water events (linked to THM investigation)	Develop strategy for Mary Valley WTP upgrade to operate in dirty raw water events		Connection at WTP to provide tankered water from Gympie to system
Chlorine Disinfection (hypo)	Disinfection byproducts (surface water)		Reaction with organic matter and chlorine	Disinfection CCP	Control and monitoring of pre-dose to provide Fe and Mn removal without over-dosing	Complete investigation to develop THM control strategy.	Scope and implement upgrade works from preferred strategy	Scope and implement upgrade works from preferred strategy	Gathering data for Action plan to reduce THMs
	Chlorate		Sodium hypochlorite breakdown	Twice per week deliveries of chlorine					Refer to pre-chlorination
UV disinfection	Protozoa (Crypto/ Giardia) (Gympie, Mary Valley, Kinbombi)		UV failure	Fault alarm from UV system will interlock plant	Filtration - online monitoring and auto shutdown; Incident Management Plan		Update operational monitoring and CCP documents for all parameters required for effective disinfection		
Reservoir Storage	Bacteria/ Virus (Reticulation)		Reservoir ingress	Sealed reservoirs	Disinfectant residual				From previous RMIP - Roof replacement. Completed 2020
	Protozoa (Crypto/ Giardia) (Retic)		Reservoir ingress	Sealed reservoirs					From previous RMIP - Roof replacement. Completed 2020

Table 24 – Progress against the risk management improvement program in the approved DWQMP- Kandanga

Process Step	Primary hazard	Other hazards managed by same barriers	Source of Hazard/Event	Primary Preventive Measure	Other Preventative Measures	RMIP			Updates
						Immediate (30/06/2022)	Short Term (30/06/2023)	Long Term (30/06/2027)	
Kandanga Creek	Heavy metals		Mining activities in catchment	Full treatment process					Previous single lead sample at 0.011 mg/L associated with other metals - appears to be isolated to one sample tap. Highest value from 2017 was 0.0011 mg/L
WTP bypass	Protozoa (Crypto/ Giardia) (Gympie, Mary Valley, Kinbombi)	Turbidity, Manganese, Iron	Accidental or deliberate use of bypass	Bolt installed to prevent operation	Operator training, only use under incident management team				No complete bypass
Supernatant return	Protozoa (Crypto/ Giardia) (Gympie, Mary Valley, Kinbombi)		Supernatant return - concentration of oocysts	Filtration and UV	Develop concept design for excess supernatant disposal and implement.	Investigate local usage of supernatant or return to creek (if allowable)	Develop concept design for excess supernatant disposal and implement.		New plant design has supernatent return limited by pumped flow.
Pre-chlorination	Manganese (Kandanga)	Iron	Naturally occuring, underdose of chlorine	Prechlorination	Filtration, daily operator checks, disinfection (oxidation)				Targetting 0.1 - 0.3 mg/L from pre-chlorination
	Disinfection byproducts (surface water)		Reaction with organic matter and chlorine	Chlorination OCP	Control and monitoring of pre-dose to provide Fe and Mn removal without over-dosing	Complete investigation to develop THM control strategy.	Scope and implement upgrade works from preferred strategy	Scope and implement upgrade works from preferred strategy	Gathering data for Action plan to reduce THMs
	Chlorate		Sodium hypochlorite breakdown	Twice per week deliveries of chlorine lowers risk of hypochlorite solution breakdown		Initial monitoring of sodium hypochlorite deliveries for chlorate. Water testing	Refer to Whole of System RMIP (Chlorate)		Queensland Government guidance released for chlorate <0.8 mg/L (2021)
Filtration	Loss of supply	Turbidity	Filter breakthrough	Tankering water from Gympie		Develop strategy for Mary Valley WTP upgrade to operate in dirty raw water events (linked to THM investigation)	Develop strategy for Mary Valley WTP upgrade to operate in dirty raw water events		Connection at WTP to provide tankered water from Gympie to system
Chlorine Disinfection	Chlorate		Sodium hypochlorite breakdown	Twice per week deliveries of chlorine lowers risk of hypochlorite solution breakdown					Refer to pre-chlorination
UV Disinfection	Protozoa (Crypto/ Giardia) (Gympie, Mary Valley, Kinbombi)		UV failure	Fault alarm from UV system will interlock plant	Filtration - online monitoring and auto shutdown; Incident Management Plan		Update operational monitoring and CCP documents for all parameters required for effective disinfection		
Reservoir Storage	Bacteria/ Virus (Reticulation)		Reservoir ingress	Sealed tank	Disinfectant residual; recent remedial works				From previous RMIP - Roof replacement. Completed 2020
	Protozoa (Crypto/ Giardia) (Retic)		Reservoir ingress	Sealed tank	Disinfectant residual; recent remedial works				From previous RMIP - Roof replacement. Completed 2020

Table 25 – Progress against the risk management improvement program in the approved DWQMP- Kilkivan

Process Step	Primary hazard	Other hazards managed by same barriers	Source of Hazard/Event	Primary Preventive Measure	Other Preventative Measures	RMIP			Updates
						Immediate (30/06/2022)	Short Term (30/06/2023)	Long Term (30/06/2027)	
Disinfection (hypo)	Chlorine	pH	Chlorine overdose	Chlorination CCP	Operational monitoring		Installation of chlorine instrumentation		Installation of chlorine instrumentation
	Bacteria/Virus (Running Creek bore - Kilkivan)	Bacteria/ Virus (Western bores)	Chlorine underdose	Chlorination CCP			Installation of chlorine instrumentation		Installation of chlorine instrumentation
	Chlorate		Breakdown of sodium hypochlorite				Refer to Whole of System RMIP (Chlorate)		Queensland Government guidance released for chlorate <0.8 mg/L (2021)

Table 26 – Progress against the risk management improvement program in the approved DWQMP- Rainbow Beach

Process Step	Primary hazard	Other hazards managed by same barriers	Source of Hazard/Event	Primary Preventive Measure	Other Preventative Measures	RMIP			Updates
						Immediate (30/06/2022)	Short Term (30/06/2023)	Long Term (30/06/2027)	
Bores	Iron		Corrosion of steel bore casing	Predose chlorine	Daily operational checks				Bore casings replaced in 3 bores. PB1 still to do
	Taste and odour			Flushing of bores	Predose chlorine				Flushing undertaken - approx 3 monthly
Settling Tank	pH		Overdose soda ash	Dosing checked daily and adjusted based on operational monitoring	Operator adjustment as necessary				On-line final pH
Soda Ash dosing	pH		Overdose soda ash	Dosing checked daily and adjusted based on operational monitoring					On-line final pH
Reservoirs	Bacteria/ Virus (Reticulation)		Ingress into tank	Sealed storages	Residual disinfection	Develop scope for Reservoir No.1 roof replacement	Replacement roof for Reservoir No.1		Central box gutters on reservoirs - will be engineered out over time Roof replaced reservoir #2 in 2020/21.
	Protozoa (Crypto/ Giardia) (Retic)		Ingress into tank	Sealed storages		Develop scope for Reservoir No.1 roof replacement	Replacement roof for Reservoir No.1		Central box gutters on reservoirs - will be engineered out over time Roof replaced reservoir #2 in 2020/21.