Drinking Water Quality Management Plan (DWQMP) report

2016-2017

Banana Shire Council

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Glossary of terms

ADWG 2011	Australian Drinking Water Guidelines (2011). Published by the National Health and Medical Research Council of Australia
E. coli	*Escherichia coli*, a bacterium which is considered to indicate the presence of faecal contamination and therefore potential health risk
CCP	Critical Control Point, A critical control point (CCP) is defined as a step which control can be applied and is essential to prevent or eliminate a water safety hazard or reduce it to an acceptable level.
HACCP	Hazard Analysis and Critical Control Points certification for protecting drinking water quality
mg/L	Milligrams per litre
NTU	Nephelometric Turbidity Units, used to measure clarity of water
MPN/100mL	Most probable number per 100 millilitres
CFU/100mL	Colony forming units per 100 millilitres
<	Less than
>	Greater than
DWQMP	Drinking Water Quality Management Plan – the documents summarising how water service providers manage quality risks for consumers.
WTP	Water Treatment Plant - processes raw water (sourced from a dam or bore) to make drinking water.

1. Introduction

This report documents the performance of Banana Shire Council's drinking water service with respect to water quality and performance in implementing the actions detailed in the drinking water quality management plan (DWQMP) as required under the *Water Supply (Safety and Reliability) Act 2008* (the Act).

The report assists the Regulator to determine whether the approved DWQMP and any approval conditions have been complied with and provides a mechanism for providers to report publicly on their performance in managing drinking water quality.

This template has been prepared in accordance with the *Water Industry Regulatory Reform – drinking water quality management plan report factsheet* published by the Department of Energy and Water Supply, Queensland, accessible at www.dews.qld.gov.au.

2. Overview of Operations

Council operates a total of nine (9) drinking water supply schemes throughout the Shire consisting of:-

- Banana
- Baralaba
- Biloela
- Callide Dam
- Goovigen
- Moura
- Taroom
- Thangool
- Theodore

Council also operates non-potable water supply schemes at Wowan and Cracow. The non-potable schemes are not covered by this plan.

Council manages drinking water quality through its approved Drinking Water Quality Management Plan (DWQMP) which protects public health by ensuring the provision of a safe water supply.

Council operates treatment plants at Biloela (supplying Biloela, Thangool and Callide Dam communities), Moura (supplying Moura and Banana), Baralaba, Taroom and Theodore. Goovigen is a chlorinated bore supply. Council operates and maintains all water supply infrastructure in these schemes including intakes, pumping stations, treatment facilities, reservoir storages and reticulation mains.

3. Actions taken to implement the DWQMP

Progress in implementing the risk management improvement program

Key items of progress are highlighted in Appendix B

In summary the following items progressed during the reporting period.

- Reviewed CCP operational targets, alert limits, and critical limits
- Baralaba WTP upgrade progressed (completed in subsequent reporting year).
- Goovigen reservoir and chlorination facility completed.

Revisions made to the operational monitoring program to assist in maintaining the compliance with water quality criteria[1] in verification monitoring.

Additional E. coli sampling and analysis is performed using Banana Shire Council's own laboratories and has yet to be formally incorporated into the DWQMP during the amendment process.

Amendments made to the DWQMP

The DWQMP Plan was updated in February 2017 (competed in October 2017) the changes were;

Page no/Appendix	Changes
Cover	Title page review date changed
Page 1 of 90	Document issue record updated version 5
Page 14 of 90	Added stakeholder telephone details
Page 32 of 90	Replaced lime with sodium hydroxide
Page 32 of 90	Replaced chlorine gas with potassium permanganate
Page 32 of 90	Updated fluoridation status
Page 32 of 90	Removed reference to pre-treatment oxidation using chlorine
Page 35 of 90	Amended Figure 2-11 to show process changes with revised chemicals
Page 35 of 90	Updated coagulant dose rate
Page 35 of 90	Added potassium permanganate dosing information
Page 35 of 90	Updated raw water mixing tank details
Page 37 of 90	Amended PAC dosing information
Pages 37 and 38 of 90	Changed pH adjustment chemical from lime to sodium hydroxide and updated dose information
Page 40 of 90	Amended figure 2-13 to show chemical dosing points
Page 40 of 90	Added comment on lime not being used as a pH adjustment chemical
Page 43 of 90	Updated online chlorine probe information
Page 45 of 90	Amended chemicals dosed, replacing pre-coagulation chlorine dosing with potassium permanganate and pH adjustment with lime to sodium hydroxide
Page 46 of 90	Amended Figure 2-14 to include town bores 7 and 7D
Page 47 of 90	Amended Figure 2-15 to include new treatment chemicals and dosing points
Page 48 of 90	Updated fluoridation information
Pages 49-52 of 90	Updated dosing chemical information

[1] Refer to *Water Quality and Reporting Guideline for a Drinking Water Service* for the water quality criteria for drinking water.

Page no/Appendix	Changes
Page 53 of 90	Included Bores 7 and 7D
Page 55 of 90	Updated Figure 2-16 to reflect new reservoir installation
Page 56 of 90	Updated reservoir description
Page 56 of 90	Updated Table 2-5
Page 57 of 90	Updated reservoir information
Page 81 of 90	Added sodium hydroxide
Appendix Q	Updated 2016 column and comments
CCP Procedure – Drinking Water Disinfection	Added DEWS definition. Updated Table 1
Appendix N	Amended frequency of surface water radiological testing to every 5 years according to Table 9.5 ADWG
Appendix N	Amended frequency of groundwater radiological testing to every 2 years according to Table 9.5 ADWG
Appendix N	Changed frequency of Manganese monitoring for Moura treated water to weekly in line with reticulation testing
Appendix N	Changed frequency of Manganese monitoring for Taroom raw water and treated water to weekly
Appendix N	Added method for in-house analysis of E. coli and coliforms for reticulation samples in Biloela, Moura, Callide Dam Village, Goovigen, Thangool, and Baralaba.
Appendix N	Updated method for Salinity
Appendix N	Updated Fluoride method and frequency to include Fluoridation requirements for NATA comparative testing against ISE probe
Appendix I	Added new treatment chemical dosing into Appendix

Table 1 List of Changes to DWQMP.

4. Compliance with water quality criteria for drinking water

The water quality criteria mean health guideline values in the most current Australian Drinking Water Guidelines, as well as the standards in the Public Health Regulation 2005.

- The results of the verification monitoring have been summarised in Appendix A

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

This financial year there were five instances where the Regulator was notified under sections 102 or 102A of the Act

Two of the incidents related to short term situations where manganese exceeded the health guideline of 0.5 mg/L in the Biloela and Baralaba water supply schemes with a maximum recorded concentration at 0.9 mg/L. Whilst manganese is an essential element for human nutrition, concentrations above the guidelines create taste and colour issues, and long term severe exceedances can create health issues.

One notification involved detection of small traces of the industrial chemical triethyl phosphate in the Biloela water scheme. Subsequent samples were below the limits of detection, without risks to public health.

The remaining two notifications related to chlorine in the Goovigen water scheme, with one notification related to high chlorine and one related to low chlorine.

None of these incidents required Banana Shire Council to issue a boil water or do not drink notice in the communities.

None of these notifications involved the detection of *E. coli*.

Non-compliances with the water quality criteria and corrective and preventive actions undertaken

Incident description: During routine testing it was found that there was low chlorine residual in the Goovigen reservoir when the automatic chlorine bottle changeover had failed to work correctly.

Corrective and Preventive Actions: Flushing of the mains brought chlorine readings back to normal, with ongoing monitoring of online instrumentation.

Incident description: During commissioning of a new reservoir at Goovigen, a “dead leg” of reticulation main was flushed with super-chlorinated water from the reservoir. Subsequent chlorine tests to check for complete flushing indicated elevated chlorine levels remained in the town network.

Corrective and Preventive Actions: Flushing of the mains soon brought chlorine readings back to normal. Changeover to the upgraded chlorination facility improved control.

Incident description: During routine testing it was found that there was elevated manganese in treated water at Biloela as a result of a sudden change in raw water quality.

Corrective and Preventive Actions: After optimising the treatment process over a period of several days, a marked decline in soluble manganese to levels below the guidelines was achieved. Sampling and control procedures were updated, and further improvement options investigated with the assistance of consultants.

6. Customer complaints related to water quality

Banana Shire Council is required to report on the number of complaints, general details of complaints, and the responses undertaken.

Throughout the year the following complaints about water quality were received:

Table 2 - complaints about water quality, (including per 1000 customers)

Service	Suspected illness	Discoloured Water	Taste and Odour
Banana	0	0	0
Baralaba	0	3 (6.52)	0
Biloela	2 (0.34)	72 (12.21)	6 (1.02)
Goovigen	0	1 (9.17)	0
Moura	1 (0.43)	1 (0.43)	0
Taroom	0	0	0
Thangool	0	4 (13.47)	2 (6.73)
Theodore	0	0	0
TOTAL	**3 (0.27)**	**81 (7.42)**	**8 (0.73)**

Seven complaints were counted in both columns where a taste and odour and discoloured water complaint were included in the same call.

Suspected Illness

Complaints are sometimes received from customers who suspect their water may be associated with an illness they are experiencing. Banana Shire Council investigates each complaint relating to alleged illness from our water quality, typically by testing the customers tap and closest reticulation sampling point for the presence of *E. coli*. , with no health risks detected.

During 2016-2017, there were three complaints of suspected illness arising from the water supply system;

- Moura; elevated chlorine content following a reservoir changeover.
- Taroom; Suspected dirty water, follow up samples indicated water was safe.
- Biloela; Suspected dirty water, follow up samples indicated water was safe.

Discoloured water

The majority of water complaints were about discoloured water. This followed unseasonably hot weather in February 2017 causing significantly increased daily flows and stirring up of sediments in the Biloela reticulation network, coupled with a reservoir changeover that caused a period of high velocity in the trunk mains. No health risks were detected.
Most other complaints were related to mains flushing activities. Banana Shire Council works to a limit of 5 metres per second flushing velocity to limit the number of disturbances to customers whilst maintaining a safe chlorine residual in the reticulation network.

Public communication was carried out advising residents to flush their taps on these occasions to reduce the impact. Additional control methods were installed to limit trunk mains velocity during changeover.

Taste and odour

A total of eight taste and odour complaints were received during the period, six in the Biloela scheme, and a further two in the connected Thangool scheme.

All incidents received follow up, usually resulting in sampling and flushing, with no tests detecting water outside of quality guidelines.

7. Findings and recommendations of the DWQMP auditor

Banana Shire Council worked on reviewing and updating procedures and corrective actions following on from the audit performed by Bligh Tanner Pty. Ltd. in late 2016 covering the time period from 2015-2016. The purpose of the audit was to verify the accuracy of the monitoring and performance data provided to the Regulator; assess compliance with the DWQMP; and to assess the relevance of the DWQMP in relation to the service provided. A summary of, and recommendations from, the Audit report are included below:

- *Summary of auditor's findings*
  - Some schematics and associated scheme descriptions were identified as inaccurate or incomplete
  - Critical control points were not all implemented as stated
  - Operational monitoring was not all implemented as stated
  - Verification monitoring was not all implemented as stated
- *Recommendations of the auditor*
  - That the CCP Procedures be reviewed and updated to reflect operating conditions and fully implemented
  - The monitoring plan should be amended to reflect the actual sampling taken to avoid potential miscommunication when undertaking regulatory reporting.

The following improvement activities were completed;

- Identify and document all relevant regulatory and formal requirements.
- Review management plan requirements periodically to reflect any changes.
- Identify all stakeholders who could affect or be affected by decisions or activities of the drinking water supplier.
- Update the list of relevant agencies.
- Construct a flow diagram of the water supply system from catchment to consumer.

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

A review of the Drinking Water Quality Management Plan was commenced in February 2017 (with further work completed in October 2017), this included reviews of;

- Risk assessments.
- Plant schematics.

The purpose of the review was to ensure that the DWQMP remains relevant, having regard to the operation of the drinking water service, and the changes are summarised in Table 1.

The review findings and progress made are summarised in Appendix C – "Summary of review actions identified."

Appendix A – Summary of compliance with water quality criteria

The results from the verification monitoring program have been compared against the levels of the water quality criteria specified by the Regulator in the Water Quality and Reporting Guideline for a Drinking Water Service.

The reported statistics do not include results derived from repeat samples, or from emergency or investigative samples undertaken in response to an elevated result and sample results that were received but incorrectly entered into our database (i.e. filed incorrectly).

Many parameters are also subject to more frequent testing by Banana Shire Council's internal laboratories.

The rolling annual compliance criteria of 98% non-detections remained below 100% for the last 6 months of 2016in the Baralaba water supply scheme because of detections of *E. Coli.* in January 2016. No subsequent detections have occurred.

Table A-1

Drinking water scheme: **Banana**

Year	*2016/17*											
Month	*Jul-16*	*Aug-16*	*Sep-16*	*Oct-16*	*Nov-16*	*Dec-16*	*Jan-17*	*Feb-17*	*Mar-17*	*Apr-17*	*May-17*	*Jun-17*
No. of samples collected	2	1	1	1	1	1	1	1	1	2	1	1
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	58	53	49	45	41	37	33	29	25	22	18	14
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

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2005* (the regulation) requires that 98 per cent of samples taken in a 12 month period should contain no *E. Coli*. This requirement is refered to as the 'annual value' in Schedule 3A of the regulation.

This requirement comes into effect once you have 12 months data and should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Table A-2

Drinking water scheme: **Baralaba**

Year	*2016/17*											
Month	*Jul-16*	*Aug-16*	*Sep-16*	*Oct-16*	*Nov-16*	*Dec-16*	*Jan-17*	*Feb-17*	*Mar-17*	*Apr-17*	*May-17*	*Jun-17*
No. of samples collected	1	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	33	32	31	31	31	31	28	27	26	25	24	23
No. of failures for previous 12 month period	1	1	1	1	1	1	0	0	0	0	0	0
% of samples that comply	97.0%	96.9%	96.8%	96.8%	96.8%	96.8%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	NO	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2005* (the regulation) requires that 98 per cent of samples taken in a 12 month period should contain no *E. Coli*. This requirement is refered to as the 'annual value' in Schedule 3A of the regulation.

This requirement comes into effect once you have 12 months data and should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Table A-3

Drinking water scheme: **Biloela**

Year	*2016/17*											
Month	*Jul-16*	*Aug-16*	*Sep-16*	*Oct-16*	*Nov-16*	*Dec-16*	*Jan-17*	*Feb-17*	*Mar-17*	*Apr-17*	*May-17*	*Jun-17*
No. of samples collected	12	14	16	15	15	12	6	11	16	12	15	13
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
No. of samples collected in previous 12 month period	142	144	148	151	154	156	150	149	153	153	156	157
No. of failures for previous 12 month period	1	1	1	1	1	1	1	1	0	0	0	0
% of samples that comply	99.3%	99.3%	99.3%	99.3%	99.4%	99.4%	99.3%	99.3%	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

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2005* (the regulation) requires that 98 per cent of samples taken in a 12 month period should contain no *E. Coli*. This requirement is refered to as the 'annual value' in Schedule 3A of the regulation.

This requirement comes into effect once you have 12 months data and should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Table A-4

Drinking water scheme: **Callide Dam Village**

Year	*2016/17*											
Month	*Jul-16*	*Aug-16*	*Sep-16*	*Oct-16*	*Nov-16*	*Dec-16*	*Jan-17*	*Feb-17*	*Mar-17*	*Apr-17*	*May-17*	*Jun-17*
No. of samples collected	1	1	1	1	1	1	1	1	1	1	1	1
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	53	49	45	41	37	34	30	25	21	17	13	9
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

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2005* (the regulation) requires that 98 per cent of samples taken in a 12 month period should contain no *E. Coli*. This requirement is refered to as the 'annual value' in Schedule 3A of the regulation.

This requirement comes into effect once you have 12 months data and should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Table A-5

Drinking water scheme: **Goovigen**

Year	*2016/17*											
Month	*Jul-16*	*Aug-16*	*Sep-16*	*Oct-16*	*Nov-16*	*Dec-16*	*Jan-17*	*Feb-17*	*Mar-17*	*Apr-17*	*May-17*	*Jun-17*
No. of samples collected	1	1	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	11	11	12	13	14	15	16	17	18	19	20	21
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

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2005* (the regulation) requires that 98 per cent of samples taken in a 12 month period should contain no *E. Coli*. This requirement is refered to as the 'annual value' in Schedule 3A of the regulation.

This requirement comes into effect once you have 12 months data and should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Table A-6

Drinking water scheme: **Moura**

Year	*2016/17*											
Month	*Jul-16*	*Aug-16*	*Sep-16*	*Oct-16*	*Nov-16*	*Dec-16*	*Jan-17*	*Feb-17*	*Mar-17*	*Apr-17*	*May-17*	*Jun-17*
No. of samples collected	12	14	14	13	15	9	6	8	15	12	15	12
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	139	141	143	144	150	149	143	139	142	142	145	145
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

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2005* (the regulation) requires that 98 per cent of samples taken in a 12 month period should contain no *E. Coli*. This requirement is refered to as the 'annual value' in Schedule 3A of the regulation.

This requirement comes into effect once you have 12 months data and should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Table A-7

Drinking water scheme: **Taroom**

Year	*2016/17*											
Month	*Jul-16*	*Aug-16*	*Sep-16*	*Oct-16*	*Nov-16*	*Dec-16*	*Jan-17*	*Feb-17*	*Mar-17*	*Apr-17*	*May-17*	*Jun-17*
No. of samples collected	0	6	6	6	6	6	6	6	6	6	6	6
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	66	66	66	66	66	66	66	66	66	66	66	66
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

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2005* (the regulation) requires that 98 per cent of samples taken in a 12 month period should contain no *E. Coli*. This requirement is refered to as the 'annual value' in Schedule 3A of the regulation.

This requirement comes into effect once you have 12 months data and should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Table A-8

Drinking water scheme: **Theodore**

Year	*2016/17*											
Month	*Jul-16*	*Aug-16*	*Sep-16*	*Oct-16*	*Nov-16*	*Dec-16*	*Jan-17*	*Feb-17*	*Mar-17*	*Apr-17*	*May-17*	*Jun-17*
No. of samples collected	0	6	6	6	6	6	6	6	6	6	6	6
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	66	66	66	66	66	66	66	66	66	66	66	66
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

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2005* (the regulation) requires that 98 per cent of samples taken in a 12 month period should contain no *E. Coli*. This requirement is refered to as the 'annual value' in Schedule 3A of the regulation.

This requirement comes into effect once you have 12 months data and should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Table A-9

Drinking water scheme: **Thangool**

Year	*2016/17*											
Month	*Jul-16*	*Aug-16*	*Sep-16*	*Oct-16*	*Nov-16*	*Dec-16*	*Jan-17*	*Feb-17*	*Mar-17*	*Apr-17*	*May-17*	*Jun-17*
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	61	58	55	51	47	45	41	38	34	31	27	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

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2005* (the regulation) requires that 98 per cent of samples taken in a 12 month period should contain no *E. Coli*. This requirement is refered to as the 'annual value' in Schedule 3A of the regulation.

This requirement comes into effect once you have 12 months data and should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Table 3 A – Verification monitoring - Chemical

SCHEME NAME	CHEMICAL PARAMETER #	UNITS OF MEASUREMENT	TOTAL COUNT OF TESTS	NO OF TEST PASSED	% COMPLIANCE	LABORATORY NAME	PLANNED COUNT
Baralaba	SWA	mg/L	10	10	100	QH	4
Biloela	SWA	mg/L	29	29	100	QH	4
Goovigen	SWA	mg/L	4	4	100	QH	4
Moura	SWA	mg/L	2	2	100	QH	4
Taroom	SWA	mg/L	4	3	100	QH	4
Theodore	SWA	mg/L	5	3	100	QH	4

Comments: Chemical parameters [#] ***(Standard Water Analysis) – which includes*** *Calcium, Sodium, Potassium, Magnesium, Bicarbonate, Carbonate, Hydroxide, Chloride, Fluoride, Sulphate, Iron, Manganese, Zinc, Aluminium, Boron, Copper, Nitrate, Sulphate, Silica.*

Table 3 B – Verification monitoring – Metals

SCHEME NAME	CHEMICAL PARAMETER #	UNITS OF MEASUREMENT	TOTAL COUNT OF TESTS	NO OF TEST PASSED	% COMPLIANCE	LABORATORY NAME	PLANNED COUNT
Baralaba	Metals	mg/L	2	2	100	QH	4
Biloela	Metals	mg/L	24	24	100	QH	2
Goovigen	Metals	mg/L	5	5	100	QH	4
Moura	Metals	mg/L	4	4	100	QH	4
Taroom	Metals	mg/L	4	4	100	QH	4
Theodore	Metals	mg/L	4	4	100	QH	4

Comments: Chemical parameters* - (Heavy Metal Analysis) - which includes - Aluminium, Arsenic, Cadmium, Chromium, Copper, Iron, Lead, Manganese, Nickel, Zinc.

Table 3 C – Verification monitoring – Physical Parameters

SCHEME NAME	PHYSICAL PARAMETER	TOTAL COUNT OF TESTS	NO OF TEST PASSED	% COMPLIANCE	LABORATORY NAME	PLANNED COUNT
Baralaba	Physical	6	6	100	QH	4
Biloela	Physical	8	8	100	QH	4
Goovigen	Physical	4	4	100	QH	4
Moura	Physical	2	2	100	QH	4
Taroom	Physical	2	2	100	QH	4
Theodore	Physical	3	3	100	QH	4

Comments: Physical Parameters: includes - Conductivity, pH, Total Hardness*, Alkalinity, Residual Alkalinity, Total Dissolved Solids, Total Dissolved Ions, True Colour, Turbidity. *Total Hardness is an aesthetic property and has no health guideline value, any aesthetic considerations are not included in this table.

Table 3 D – Verification monitoring – Pesticides

SCHEME NAME	PESTICIDES	TOTAL COUNT OF TESTS	NO OF TEST PASSED*	% COMPLIANCE	LABORATORY NAME	PLANNED COUNT
Baralaba	Herbicides / Pesticides	9	9	100	QH	4
Biloela	Herbicides / Pesticides	17	17	100	QH	2
Goovigen	Herbicides / Pesticides	2	2	100	QH	2
Moura	Herbicides / Pesticides	4	4	100	QH	4
Taroom	Herbicides / Pesticides	3	3	100	QH	1
Theodore	Herbicides / Pesticides	3	3	100	QH	4

*Includes non-recordable detections of analytes.

Table 3 E – Verification monitoring – Radiological

SCHEME NAME	RADIOLOGICAL PARAMETER	TOTAL COUNT OF TESTS	NO OF TEST PASSED	% COMPLIANCE	LABORATORY NAME	PLANNED FREQUENCY
Baralaba	Corrected Activity	1	1	100	QH	5 YEAR
Biloela	Corrected Activity	10	10	100	QH	5 YEAR
Goovigen	Corrected Activity	1	1	100	QH	2 YEAR
Moura	Corrected Activity	1	1	100	QH	5 YEAR
Taroom	Corrected Activity	1	1	100	QH	2 YEAR
Theodore	Corrected Activity	1	1	100	QH	5 YEAR

Table 3 E – Verification monitoring – Disinfection By-Products

SCHEME NAME	PARMETER	UNITS OF MEASUREMENT	TOTAL COUNT OF TESTS	NO OF TEST PASSED	PLANNED COUNT
Baralaba	THM'S	µg/L	12	12	12
Biloela	THM'S	µg/L	12	12	12
Goovigen	THM'S	µg/L	4	4	4
Moura	THM'S	µg/L	11	11	12
Taroom	THM'S	µg/L	12	12	12
Theodore	THM'S	µg/L	12	12	12

Appendix B – Implementation of the DWQMP Risk Management Improvement Program

Table 4 – Key items of progress against the risk management improvement program in the approved DWQMP

Item No.	Scheme Component / Sub-component	Action(s)	Target date/s	Status	(If implementing these actions will take longer than anticipated, please provide detail, as it may affect the approved DWQMP)
All schemes (excluding Taroom)	Cyanobacteria	Cyanobacteria response and action plan	End 2012	Waiting to be approved in QA system	
All schemes	Spill into raw water response	Contact internal emergency liaison	End 2012	Draft prepared	
All schemes	DBP generation	Review THM monitoring program	-	Complete	
Theodore WTP	Dosing of PAC, KMNO4	Implement dosing to control iron, manganese, algal toxins and reduce THM formation	-	Waiting on plant upgrade	2019
Theodore WTP	Filter breakthrough	Automate backwash	-	Waiting on plant upgrade	2019
Theodore WTP	Chlorine over/under dosing	Install monitoring	-	Complete	2020
Moura/Biloela WTP	Dosing of PAC, KMNO4	Implement dosing to control iron, manganese, algal toxins and reduce THM formation	2014/2015	Complete	
Biloela WTP	Filter breakthrough	Automate backwash	2014/2015	Complete	
Baralaba WTP	Dosing of PAC, KMNO4	Implement dosing to control iron, manganese, algal toxins and reduce THM formation	2014/2015	Ongoing	(completed in 2017)
Banana Shire Bores	Integrity investigation	Check bores for potential for contamination and rectify	-	Ongoing	

Appendix C – Summary of review actions identified

Table 5 – Action status

Action	Detail	Complete	Comment
CCP for Turbidity targets	Review individual schemes against current guideline	Y	
CSG Water report	Download annual report and check for water quality excursions.	Y	
Moura Chlorine CCP	Increase residual target to 0.8-1.2 mg/L and include in amendment	Y	Target updated
Biloela TWPS Cl2 target	Set residual target to 0.5 - 0.7 mg/L and include in amendment	Y	Target updated
Theodore WTP CCP	Set residual target to 1.2-1.7 mg/L and include in amendment	Y	Target updated
Baralaba WTP Mn target	CCP for management plan amendment	N	Target updated
Banana Shire Mn CCP procedure	CCP for management plan amendment	N	
CCP for turbidity	Investigate targets for plants (0.3mg/L alert) for inclusion in amendment	Y	
Fluoride check standard	Implement QC calibration check	Y	
Theodore WTP online cl2	Review current probe system for suitability and performance	Y	
Moura Raw Water Turbidimeter	Check Stage 2 tender documentation for meter	Y	
CCA testing from Theodore landfill	Check requirement and if still open. Metals analysis of Moura Raw Water shows no Arsenic or Chromium	Y	
Tools disinfection procedure	Mondays all tools are sanitised. After any sewer work they are sanitised on return to depot.	Y	
Residences on water mains + raw	Obtain list of customers on Raw or large mains. List has been developed.	Y	
Contaminated land register	Obtain list of contaminated land from Environment Section.	Y	
Baralaba res fence	Not installed at time of inspection.	N	Access is locked.
Review bore sealing Biloela borefield	Bore infiltration inspection. Needs schedule implemented.	Partial	
Taroom WTP upgrade design report	Tender has been issued for design of upgrade.	Y	
Calibration frequency review	Check frequency of calibration requirements for instruments	Y	
Biloela Dam Manganese increase from pigging	Draft letter to Sunwater re Stag Creek pipeline for notification in advance	N	
Check Biloela WTP Supernatant reuse	Reuse of supernatant limited to 10% operationally. Documented.	Y	
Taroom bore monitoring at site	Review what has been performed previously for suitability.	Y	