

# Drinking Water Quality Management Plan (DWQMP) Annual Report

## 2015 – 2016

### SunWater

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LGA covered by this plan: Mareeba Shire Council, Southern Downs Regional Council, Burdekin Shire Council, Whitsunday Regional Council, Mackay Regional Council, Central Highlands Regional Council,

Water Supply Schemes (WSS) and Town Water Schemes (TWS) covered by this plan:

#### Far North Queensland

- Burdekin Haughton WSS – Burdekin Falls Dam TWS
- Burdekin Haughton WSS – Clare TWS
- Mareeba Dimbulah WSS – Mutchilba TWS

#### North Queensland

- Bowen Broken WSS – Eungella Dam TWS
- Proserpine River WSS – Peter Faust Dam TWS

#### Central Queensland

- Nogo MacKenzie WSS – Fairbairn Dam TWS
- Eton WSS – Kinchant Dam TWS

#### South West Queensland

- MacIntyre Brook WSS – Coolmunda Dam TWS
- Upper Condamine WSS – Leslie Dam TWS

## Glossary of terms

ADWG 2004	Australian Drinking Water Guidelines (2004). Published by the National Health and Medical Research Council of Australia
ADWG 2011	Australian Drinking Water Guidelines (2011). Published by the National Health and Medical Research Council of Australia
<i>E. coli</i>	<i>Escherichia coli</i> , a bacterium which is considered to indicate the presence of faecal contamination and therefore potential health risk
HACCP	Hazard Analysis and Critical Control Points certification for protecting drinking water quality
mg/L	Milligrams per litre
NTU	Nephelometric Turbidity Units
MPN/100mL	Most probable number per 100 millilitres
CFU/100mL	Colony forming units per 100 millilitres
<	Less than
>	Greater than
WTP	Water Treatment Plant
BGA	Blue Green Algae
WSS	Water Supply Scheme
TWS	Town Water Supply

## Document history and status

Revision	Date	Description	By	Review	Approved
A		Initial Draft	James Harris (Jacobs)	Nicholas Stanton (Jacobs)	Nicholas Stanton (Jacobs)
0	13/12/2016	Final	James Harris (Jacobs)	Nicholas Stanton (Jacobs)	Nicholas Stanton (Jacobs)
1	02/08/2017	Final amended – Corrections to E.Coli Tables	James Harris (Jacobs)	Nicholas Stanton (Jacobs)	Nicholas Stanton (Jacobs)

## 1. Introduction

This report documents the performance of SunWater's drinking water service with respect to water quality and performance in implementing the actions detailed in the drinking water quality management plan (DWQMP) 2012-2015 and 2015-2018 (which came into effect on the 19<sup>th</sup> May, 2016 after approval by the regulator) as required under the *Water Supply (Safety and Reliability) Act 2008* (the Act). The report is for the period 1 July 2015- 30 June 2016.

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 report 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](http://www.dews.qld.gov.au).

## 2. Overview of Operations

This DWQMP annual report applies to nine (9) drinking water schemes owned and operated by SunWater across Queensland.

The Burdekin Falls Dam town water supply (TWS) sources water from the Burdekin Falls Dam. The treatment comprises of a package system incorporating a single-stage flocculation zone, followed by a standard up-flow lamella tube settler / clarifier tank to settle the suspended solids and other small foreign matter prior to filtration via an integrated suction media filter and then disinfection with sodium hypochlorite before reticulation.

The Clare TWS sources water from the Burdekin River / Burdekin Falls Dam via the Clare irrigation channel system. The treatment comprises of a standard clarifier tank to flocculate and settle the suspended solids and other small foreign matter prior to media filtration for removal of remaining suspended solids and algae and then disinfection with sodium hypochlorite before reticulation.

The Coolmunda Dam TWS sources water from the Coolmunda Dam. The treatment process utilises the alluvium sands to pre-filter the source water from the water table. Suspended solids, algae and other small foreign matter is removed in the alluvium sands and the bore pump screens prior to aeration and disinfection with sodium hypochlorite at the WTP before reticulation.

The Eungella Dam TWS sources water from the Eungella Dam. The treatment comprises of pre-filtering and the addition of coagulant to assist in the removal of suspended solids, algae and other small foreign matter prior to media and carbon filtration. Soda ash dosing is provided for pH balancing prior to disinfection with sodium hypochlorite before reticulation.

The Fairbairn Dam TWS sources water from the Fairbairn Dam. The treatment comprises of two (2) standard up-flow clarifiers to settle the suspended solids and other small foreign matter prior to media filtration and disinfection with sodium hypochlorite before reticulation.

The Kinchant Dam TWS sources water from the Kinchant Dam. The treatment comprises of pre-filtering and the addition of coagulant to assist in the removal of the suspended solids, algae and other small foreign matter prior to media and carbon filtration. Soda ash dosing is provided for pH balancing prior to disinfection with sodium hypochlorite before reticulation. This WTP was decommissioned on the 22<sup>nd</sup> February, 2016 and was subsequently removed from the DWQMP.

The Leslie Dam TWS sources water from the Leslie Dam. The treatment comprises of pre-filtering and the addition of coagulant to assist in the removal of the suspended solids, algae and other small foreign matter prior to media and carbon filtration. Soda ash dosing is provided for pH balancing prior to disinfection with sodium hypochlorite before reticulation.

The Mutchilba TWS sources water from the Tinaroo Dam via the Mareeba irrigation channel system. The treatment comprises of pre-filtering and the addition of coagulant to assist in the removal of suspended solids, algae and other small foreign matter to media and carbon filtration before reticulation.

The Peter Faust Dam TWS sources water from the Peter Faust Dam. The treatment comprises of the addition of coagulant to assist in the removal of the suspended solids through a single clarifier, algae and other small foreign matter prior to media filtration. Filtered water is disinfected with sodium hypochlorite before reticulation.

### 3. Actions taken to implement the DWQMP

SunWater has implemented the DWQMP including setting operational limits, as defined in EM25 Water Treatment Plant Routine Inspection Checklist and EM25 – Water Treatment Operations. Non-compliances with limits are investigated using SunWater's QM2 Incident reporting.

#### **Progress in implementing the risk management improvement program**

**Appendix A** of the approved DWQMP outlines the Improvement Plan Actions. A brief status report of the progress of these actions is included in **Appendix B** of this document.

In general all improvement items have been resolved, either by being completed or by being determined to be unnecessary and removed from the list. Some actions, such as the requirement for all operators to have a Certificate 3 in water treatment operations are ongoing. Due to staff turnover, this remains a continual process.

#### **Revisions made to the operational monitoring program to assist in maintaining the compliance with water quality criteria<sup>1</sup> in verification monitoring.**

The operational monitoring program has been reviewed and no revisions have been made over the past year.

Drinking water quality is tested in accordance with ADWG limits on a number of key parameters and monitored on two levels to ensure safe drinking water for consumers. The drinking water quality tests involve routine monthly testing of water chemistry (aesthetics) and micro-biology at a NATA accredited laboratory, fortnightly testing for Cyanobacteria (BGA) on raw water samples at the Queensland Government phycology laboratory (located within the Department of Science, Information Technology and Innovation) and weekly / daily testing at the WTP laboratory of water chemistry (aesthetics) and residual chlorine.

Three water quality test locations (test points) are routinely sampled within each of the distribution networks to provide a high level of confidence that a representative water quality analysis has been undertaken and to provide certainty that scheme is delivering safe drinking water quality to consumers. Each sampling point was selected based on providing the highest probability of finding non-compliant drinking water in order to prevent a worst case scenario for a public health incident. The sampling points at each scheme are located at the water treatment plant and end of the reticulation mains.

#### **Amendments made to the DWQMP**

No amendments were made to the 2012-2015 DWQMP between 1<sup>st</sup> July, 2015 and 30<sup>th</sup> June, 2016, however it was replaced by the approved 2015-2018 plan after approval by the regulator on 19<sup>th</sup> May, 2016.

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<sup>1</sup> Refer to *Water Quality and Reporting Guideline for a Drinking Water Service* for the water quality criteria for drinking water.

## 4. Compliance with water quality criteria for drinking water

SunWater TWS operate under quality management standards AM 28 for the production of safe drinking water. A series of quality control parameters for DWQ have been developed from acceptance criteria outlined in ADWG (2011). Key parameters for operator testing and water quality acceptance are shown below in Table 4 (a): Drinking Water Quality Control Parameters.

**Table 4 (a): Drinking Water Quality Control Parameters**

Parameter	Monitoring Frequency	Acceptable Limits
Raw water pH	Weekly	NA
Raw water turbidity	Weekly	NA
Treated water pH	Every 2-3 days	6.5 – 8.5
Treated water turbidity	Every 2-3 days	< 5 NTU
Residual chlorine (free)	Every 2-3 days	> 0.5 mg/L after 30 mins
Total chlorine	Every 2-3 days	< 5 mg/L
Aluminium	Weekly	< 0.2 mg/L
<i>E.coli</i>	Monthly	< 1 cfu / 100 mL
Total coliforms	Monthly	N/A - significant changes will be investigated <sup>2</sup>
Heterotrophic plate count	Monthly	N/A - significant changes will be investigated <sup>3</sup>

*Note: Aluminium testing only performed at sites that have aluminium sulfate dosing.*

Across all TWS, AM 28 standard operating procedures requires the residual chlorine level is kept within the range of 1.5 to 2.5 mg/L at the clear water storage tank to prevent micro-organism colonies developing within the mains distribution system.

A summary of compliance with water quality criteria is included in Appendix A. This includes the following information:

- parameter
- unit of measure
- total number of samples collected
- number of samples that did not meet the water quality criteria
- maximum concentration or count

The water quality results over the 2015/16 reporting period met the recommended values in the ADWG, with the following exceptions for each of the listed water schemes.

### Burdekin Falls Dam TWS

- Across the three sample points there were four (4) instances where turbidity level was above the ADWG aesthetic limit of 5 NTU.
- Across the three sample points there were seven (7) instances where free chlorine was below the acceptable limit of 0.5 mg/L, however, none of these instances resulted in no free chlorine residual in the system.

### Clare TWS

- Twenty-seven (27) instances where pH exceeded the acceptable limits.
- Five (5) instances where turbidity exceeded the DWQMP aesthetic limit of 5 NTU.

<sup>2</sup> No guideline value has been set for total coliforms in drinking water. SunWater uses Total Coliforms as an indicator. Increased concentrations are investigated.

<sup>3</sup> No guideline value has been set for heterotrophic plate counts in drinking water. Immediately after disinfection, numbers would be expected to be low. SunWater uses HPC as an indicator of distribution system cleanliness. Marked increases in numbers after disinfection or within distribution systems are investigated.

- Three hundred and seventeen (317) instances where free chlorine was below the acceptable limit, however, none of these instances resulted in no free chlorine residual in the system.
- Three (3) instances where the recorded data shows total chlorine was above the acceptable limit. Details are provided in Section 5.

#### Coolmunda Dam TWS

- One (1) instance where *E. coli* was detected. Details of this incident are provided in Section 5.

#### Eungella Dam TWS

- Two (2) instances where free chlorine was below the SunWater acceptable limit of 0.5 mg/L, however, only one (1) of these instances resulted in no free chlorine residual in the system.

#### Fairbairn Dam TWS

- Eight (8) instances where free chlorine was below the SunWater acceptable limit of 0.5 mg/L, however, none of these instances resulted in no free chlorine residual in the system.

#### Peter Faust Dam

- Two (2) instances where pH exceeded the acceptable limit.
- Four (4) instances where free chlorine was below the SunWater acceptable limit of 0.5 mg/L, however, none of these instances resulted in no free chlorine residual in the system.
- One (1) instance where the recorded data shows total chlorine was above the acceptable limit. Details are provided in Section 5.

In summary, there was one (1) detection of *E.Coli* at the Coolmunda Dam scheme during the period from 1 July 2015 to 30 June 2016. Further details on the incident are provided in Section 5.

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

One (1) notification to the regulator under sections 102 and 102A of the Act was made between 1 July 2015 and 30 June 2016. This incident was a detection of *E.Coli* and occurred at Coolmunda Dam WTP.

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

As outlined above, for this reporting period there was one (1) instance where a non-compliance with water quality criteria. The non-compliance was at Coolmunda Dam WTP after *Escherichia coli* (*E. coli*) exceeded the acceptable limit of <1 CFU/100ml. This non-compliance required notification to the regulator under sections 102 or 102A of the act and is described in further detail below.

Four other notifiable non-conformances were identified when reviewing the data for the preparation of this annual report. No internal notification was provided at the time of these samples being taken. These recorded samples are listed below:

1. 14/8/2015 – Peter Faust Dam (WTP sample), 12 mg/L of total chlorine.
2. 10/7/2015 – Clare WTP (pre clear water storage), 5.42 mg/L of total chlorine
3. 3/9/2015 – Clare WTP (post clear water storage), 5.9 mg/L of total chlorine
4. 3/9/2015 – Clare WTP (sample point at town swimming pool)

These four samples values were entered into the SWMS R1 database system around the dates the samples were taken, but were not reported internally. As such, no investigation or corrective actions were taken at the time.

Jacobs Engineering has undertaken a retrospective investigation of these reports and notes the following:

1 – The sample reported from Peter Faust Dam on 14/8/2015 is considered to be an erroneous entry into the SWMS system. The system is not capable of dosing chlorine to the levels indicated, and the samples on the preceding and proceeding days do not reflect this high level of total chlorine.

2 – The sample taken from Clare WTP on 10/7/2015 does reflect the hand written operator logs and are therefore believed to be an accurate recording of the sample taken, however the sample location is prior to the clear water storage and does not represent the final treated water. The sample taken on the same day on the outlet of the clear water storage shows a total chlorine of 3.52 mg/L and the next day 11/7/2015 shows 2.24 mg/L at the tank outlet. This data indicates that no water exceeding 5 mg/L of total chlorine was released by the WTP.

3 & 4 – The samples taken from Clare WTP on 3/9/2015 show 5.9 mg/L of total chlorine at the outlet of the clear water storage, and 5.3 mg/L of total chlorine at the town pool reservoir sample point. These recordings reflect the operator hand-written logs and are therefore believed to be an accurate recording of the sample taken. The logs state that on 3/9/2015 the operators identified an air lock in the chlorine dosing pump which had been preventing chlorine dosing. In order to ensure all water leaving the plant was disinfected sodium hypochlorite was added directly to the clear water storage tank. It is believed that this has resulted in the high total chlorine readings.

The two sample points above, while treated water, do not represent the final water provided to customers “at the tap”. The SunWater office, and school sample points are at customer tap locations and these two sample points showed 3.37 mg/L and 3.10 mg/L of total chlorine respectively on 3/9/2015, and 0.61 mg/L and 0.64 mg/L the following day on 4/9/2015.

At no time in any of the above instances were any customer complaints received by SunWater, and there have been no reports (suspected or confirmed) of any illnesses.

In mid-September 2015 as part of the actions identified in the DWMP improvement plan SunWater initiated an automated internal alert system which provides notification to SunWater personnel and Jacobs Engineering whenever a parameter is entered into the SWMS R1 database and exceeds a DWQMP or internal limit. This system has been used successfully since implementation and there have been a number of instances where incorrect entries to SWMS have been identified promptly and rectified or resampled where necessary.

In addition to the improved and automated reporting systems, training of water treatment plant operators has been conducted and an update of operational and maintenance work instructions have been produced. Both of these activities have involved reiteration of the importance of immediate notification of any water quality limit exceedances.

### **Prescribed incidents or Events reported to the Regulator and corrective and preventive actions undertaken.**

As outlined above, for this reporting period there was one (1) instance that required notification to the regulator under sections 102 or 102A of the Act. The incident occurred at Coolmunda Dam WTP after *Escherichia coli* (*E. coli*) exceeded the acceptable limit of <1 CFU/100ml. Details of this incident are as follows.

#### *Non-compliance information*

Operators at the Coolmunda Dam WTP took their regular microbiological sample at 0900 on 01/02/2016 at two sample locations, the picnic ground and the SunWater office on site. The sample was sent to Toowoomba Regional Water Laboratory Services, Mt Kynoch, Toowoomba for testing and analysis and arrived on 02/02/2016.

SunWater received the test report from the laboratory by email at 0936 on Tuesday 09/02/2016, which showed the sample tested positive for *E. coli* at the picnic ground with a reading of 3 CFU/100ml and had also had unusually high detections of both total coliforms (820 CFU/100ml) and elevated total plate count (TPC) (>2,000 CFU/100ml). Records showed that the free chlorine residual at the picnic ground sample location was 0.59 mg/L on 01/02/2016 and the pH was around 7.6.

Gordon Delaney, of SunWater, first opened the email and was made aware of the *E. coli* detection at approximately 1130 on 09/02/2016 and immediately notified Nicholas Stanton of Jacobs Engineering

who is engaged as the duty engineer for water treatment and is responsible for assisting with incidents.

Nicholas Stanton made immediate attempts to contact the on-site operators but was unable to contact the Manager, Operations Supervisor, or Operator due to a nation-wide outage of the Telstra mobile network. Gordon Delaney initiated the verbal notification with the regulator by phone at 1345 on 09/02/2016. At this time the Telstra mobile network had reactivated and Nicholas Stanton was able to contact the on-site operators and subsequently provide a further update to the office of the water supply regulator. It is noted that the taps in the picnic ground are signed as "Do not drink the water" as a precaution, and the five (5) rural farms which are supplied water for non-potable usage (No domestic use but for cattle). SunWater staff do drink the water.

#### *Corrective actions undertaken*

The operators were notified of the positive E. coli detection by Nicholas Stanton at approximately 1345 when the Telstra mobile network was operating correctly.

The following immediate steps were taken:

- The system was flushed immediately.
- A free chlorine residual reading was taken after the flushing at the picnic ground and was 0.69 mg/L.
- A new microbacteriological sample was taken at 0900 at the picnic ground and 0910 at the SunWater office on 10/02/2016 and was sent to the laboratory for testing and analysis by transport at 1200 on 10/02/2016.
- SunWater staff on site were instructed to boil water until further notice.
- The five (5) rural farms which receive the water were also notified of the detection.
- SunWater operators were directed to flush the system again and inspect the reservoirs for signs of possible vermin contamination.

The follow up samples were analysed and returned on 17/02/2016 and recorded no detections of E. coli, no total coliforms, and a TPC of 2 at the picnic ground and no detections at the SunWater office.

The source of the E. coli contamination was unable to be determined and given the free chlorine residual on the day the sample was taken, the clear water sample at the office, and the lack of any apparent contamination in the reservoir it is likely that the original sample in which the E. coli was detected was contaminated, however, this cannot be confirmed.

#### *Preventive actions undertaken*

SunWater operators are undertaking more frequent flushing of the system and investigating measures to ensure this process is not impeding supply obligations.

It was noted that the incident response from the laboratory was slow, and came in an unmarked email. The laboratory has been contacted and advised to contact SunWater by phone immediately when a presumptive E. coli test is made (prior to finalisation of the lab report). Laboratory staff have also been provided with a clear, up-to-date contact list for any issues that may occur on site.

It should be noted that a written incident report was submitted to the regulator on 10/02/16 and the subsequent investigation was submitted on 18/02/16.

## 6. Customer complaints related to water quality

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

Throughout the year no complaints about water quality were received.

During 2015/16, there were no suspected or confirmed cases of illness arising from the water supply system.



## 7. Findings and recommendations of the DWQMP auditor

No audit has been conducted on the current DWQMP.

The next DWQMP audit is scheduled to be completed by the 15<sup>th</sup> August, 2017.

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

The next internal review of the DWQMP is due before 15th August, 2017.

## Appendix A – Summary of compliance with water quality criteria

**Table 1 - Verification monitoring results**

Scheme name	Parameter	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)	DWQMP Limit	Laboratory name
Burdekin Falls Dam	Treated water pH		Every 2-3 days	44	44	0	7.9	8.1	8.01	6.5 – 8.5	Burdekin Falls Dam WTP Laboratory
	Treated water turbidity	NTU	Every 2-3 days	365	361	4	0	12.38	0.3	< 5 NTU	Burdekin Falls Dam WTP Laboratory
	Residual chlorine (free)	mg/L	Every 2-3 days	454	447	7	0.2	2.6	1.17	> 0.5 mg/L after 30 mins	Burdekin Falls Dam WTP Laboratory
	Treated water total chlorine	mg/L	Every 2-3 days	454	454	0	0.2	2.5	1.33	< 5 mg/L	Burdekin Falls Dam WTP Laboratory
	<i>E.coli</i>	Cfu/100mL	Monthly	19	0	0	<1	<1	<1	< 1 cfu / 100mL	NATA Accredited Laboratory
Clare	Treated water pH		Every 2-3 days	344	317	27	7.5	8.8	8.15	6.5 – 8.5	Clare WTP Laboratory
	Treated water turbidity	NTU	Every 2-3 days	344	339	5	0	11.1	0.87	< 5 NTU	Clare WTP Laboratory
	Residual chlorine (free)	mg/L	Every 2-3 days	1720	1349	371	0.03	5.87	1.2	> 0.5 mg/L after 30 mins	Clare WTP Laboratory
	Treated water total chlorine	mg/L	Every 2-3 days	1713	1710	3	0.05	5.9	1.31	< 5 mg/L	Clare WTP Laboratory
	<i>E.coli</i>	Cfu/100mL	Monthly	12	0	0	<1	<1	<1	< 1 cfu / 100mL	NATA Accredited Laboratory
	Raw Water Cadmium	mg/L	Annually	1	1	0	<0.0001	<0.0001	<0.0001	0.002 mg/L ADWG Limit	Envirocheck Enterprises Pty Ltd
	Raw Water Chromium	mg/L	Annually	1	1	0	<0.001	<0.001	<0.001	0.05 mg/L ADWG Limit	Envirocheck Enterprises

Scheme name	Parameter	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)	DWQMP Limit	Laboratory name
											Pty Ltd
	Raw Water Copper	mg/L	Annually	1	1	0	<0.001	<0.001	<0.001	2 mg/L (health) 1 mg/L (aesthetic) ADWG Limits	Envirocheck Enterprises Pty Ltd
	Raw Water Lead	mg/L	Annually	1	1	0	<0.001	<0.001	<0.001	0.01 mg/L ADWG Limit	Envirocheck Enterprises Pty Ltd
	Raw Water Nickel	mg/L	Annually	1	1	0	<0.01	<0.01	<0.01	0.02 mg/L ADWG Limit	Envirocheck Enterprises Pty Ltd
	Raw Water Zinc	mg/L	Annually	1	1	0	<0.004	<0.004	<0.004	3 mg/L (aesthetic) (no health limit) ADWG Limits	Envirocheck Enterprises Pty Ltd
Coolmunda Dam	Treated water pH		Every 2-3 days	312	312	0	7.3	7.8	7.57	6.5 – 8.5	Coolmunda Dam WTP Laboratory
	Treated water turbidity	NTU	Every 2-3 days	312	312	0	0.11	4.37	1.44	< 5 NTU	Coolmunda Dam WTP Laboratory
	Residual chlorine (free)	mg/L	Every 2-3 days	312	312	0	0.54	2.48	1.36	> 0.5 mg/L after 30 mins	Coolmunda Dam WTP Laboratory
	<i>E.coli</i>	Cfu/100mL	Monthly	18	1	1	<1	3	<1	< 1 cfu / 100mL	NATA Accredited Laboratory
Eungella Dam	Treated water pH		Every 2-3 days	141	141	0	6.5	6.6	6.53	6.5 – 8.5	Eungella Dam WTP Laboratory
	Treated water turbidity	NTU	Every 2-3 days	141	141	0	0	0.8	0.19	< 5 NTU	Eungella Dam WTP Laboratory
	Residual chlorine (free)	mg/L	Every 2-3 days	141	139	2	0	6.5	0.59	> 0.5 mg/L after 30 mins	Eungella Dam WTP Laboratory
	Treated water total chlorine	mg/L	Every 2-3 days	47	47	0	0.5	0.7	0.62	<0.5 mg/L	Eungella Dam WTP Laboratory
	<i>E.coli</i>	Cfu/100mL	Monthly	25	0	0	<1	<1	<1	< 1 cfu / 100mL	NATA Accredited Laboratory
Fairbairn Dam	Treated water pH		Every 2-3 days	152	152	0	6.58	8.02	7.34	6.5 – 8.5	Fairbairn Dam WTP

Scheme name	Parameter	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)	DWQMP Limit	Laboratory name
	Treated water turbidity	NTU	Every 2-3 days	152	152	0	0.57	1.6	0.94	< 5 NTU	Laboratory Fairbairn Dam WTP Laboratory
	Residual chlorine (free)	mg/L	Every 2-3 days	152	144	8	0.1	2.7	1.32	> 0.5 mg/L after 30 mins	Fairbairn Dam WTP Laboratory
	Treated water total chlorine	mg/L	Every 2-3 days	152	152	0	0.4	3.4	1.82	<0.5 mg/L	Fairbairn Dam WTP Laboratory
	<i>E.coli</i>	Cfu/100mL	Monthly	18	0	0	<1	<1	<1	< 1 cfu/100ml	NATA Accredited Laboratory
Kinchant Dam	Treated water pH		Every 2-3 days	132	132	0	6.8	7.7	7.14	6.5 – 8.5	Kinchant Dam WTP Laboratory
	Treated water turbidity	NTU	Every 2-3 days	130	130	0	0.09	2.4	0.3	< 5 NTU	Kinchant Dam WTP Laboratory
	Residual chlorine (free)	mg/L	Every 2-3 days	132	132	0	0.5	2.3	1.4	> 0.5 mg/L after 30 mins	Kinchant Dam WTP Laboratory
	Treated water total chlorine	mg/L	Every 2-3 days	98	98	0	0.6	2.6	1.63	< 5 mg/L	Kinchant Dam WTP Laboratory
	<i>E.coli</i>	Cfu/100mL	Monthly	12	0	0	<1	<1	<1	< 1 cfu / 100mL	NATA Accredited Laboratory
Leslie Dam	Treated water pH		Every 2-3 days	96	96	0	7.3	7.4	7.39	6.5 – 8.5	Leslie Dam WTP Laboratory
	Treated water turbidity	NTU	Every 2-3 days	96	96	0	0.65	1.12	0.86	< 5 NTU	Leslie Dam WTP Laboratory
	Residual chlorine (free)	mg/L	Every 2-3 days	96	96	0	1.61	2.87	2.45	> 0.5 mg/L after 30 mins	Leslie Dam WTP Laboratory
	Treated water total chlorine	mg/L	Every 2-3 days	96	96	0	1.82	3.26	2.58	< 5mg/L	Leslie Dam WTP Laboratory
	<i>E.coli</i>	Cfu/100mL	Monthly	10	0	0	<1	<1	<1	< 1 cfu / 100mL	NATA Accredited Laboratory
Mutchilba	Treated water pH		Every 2-3	156	156	0	6.4	7.3	6.8	6.5 – 8.5	Mutchilba

Scheme name	Parameter	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)	DWQMP Limit	Laboratory name
			days								WTP Laboratory
	Treated water turbidity	NTU	Every 2-3 days	156	156	0	0	3.9	0.61	< 5 NTU	Mutchilba WTP Laboratory
	Residual chlorine (free)	mg/L	Every 2-3 days	156	156	0	0.46	2.5	1.17	> 0.5 mg/L after 30 mins	Mutchilba WTP Laboratory
	Treated water total chlorine	mg/L	Every 2-3 days	156	156	0	0.42	3	1.26	< 5mg/L	Mutchilba WTP Laboratory
	<i>E.coli</i>	Cfu/100mL	Monthly	20	0	0	<1	<1	<1	< 1 cfu / 100mL	NATA Accredited Laboratory
Peter Faust Dam	Treated water pH		Every 2-3 days	104	102	2	7.9	8.7	8.19	6.5 – 8.5	Peter Faust Dam WTP Laboratory
	Treated water turbidity	NTU	Every 2-3 days	109	109	0	0	3.24	0.77	< 5 NTU	Peter Faust Dam WTP Laboratory
	Residual chlorine (free)	mg/L	Every 2-3 days	722	718	4	0.3	12*	2.15	> 0.5mg/L after 30mins	Peter Faust Dam WTP Laboratory
	Treated water total chlorine	mg/L	Every 2-3 days	364	363	1	0.8	12*	3.02	< 5mg/L	Peter Faust Dam WTP Laboratory
	<i>E.coli</i>	Cfu/100mL	Monthly	10	0	0	<1	<1	<1	< 1 cfu / 100mL	NATA Accredited Laboratory
	Chloroform	µg/L	Monthly	5	5	0	51	120	89	0.25 mg/L ADWG Limit	Envirocheck Enterprises Pty Ltd
	Bromodichloro-methane	µg/L	Monthly	5	5	0	21	46	37	0.25 mg/L ADWG Limit	Envirocheck Enterprises Pty Ltd
	Dibromochloromethane	µg/L	Monthly	5	5	0	8	19	15.8	0.25 mg/L ADWG Limit	Envirocheck Enterprises Pty Ltd
	Bromoform	µg/L	Monthly	5	5	0	1.7	2.1	1.96	0.25 mg/L ADWG Limit	Envirocheck Enterprises Pty Ltd

\*Maximum sample believed to be an erroneous entry, please refer to Section 5 for further information.

**Note: Samples from different locations of each site were combined for reporting.**

Table 2 (a) - Reticulation *E. coli* verification monitoring at Burdekin Falls Dam 2015

***Escherichia coli* public health compliance:  
Calculation of 12 month 'rolling' annual value**

Department of Environment  
and Resource Management

Drinking water scheme: Burdekin Falls Dam

Year	2015											
Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
No. of samples collected							2	2	2	2	2	4
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)							0	0	0	0	0	0
No. of samples collected in previous 12 month period												14
No. of failures for previous 12 month period												0
% of samples that comply												100.0%
Compliance with 98% annual value												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 referred to as the 'annual value' in Schedule 3A of the regulation.

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

The shaded out area is not applicable if data is not available for the previous 12 months.

Table 3 (b) - Reticulation *E. coli* verification monitoring at Burdekin Falls Dam 2016

***Escherichia coli* health compliance:  
Calculation of 12 month 'rolling' annual value**

Department of **Environment and Resource Management**  
Conserving and managing Queensland's environment and natural resources

Drinking water scheme: Burdekin Falls Dam

Year	2016											
Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
No. of samples collected	2	2	2	1	2	2						
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)	0	0	0	0	0	0						
No. of samples collected in previous 12 month period	16	18	20	21	23	25	23	21	19	17	15	11
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 referred to as the 'annual value' in Schedule 3A of the regulation.

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

Table 4 (c) - Reticulation *E. coli* verification monitoring at Clare Water Treatment Plant 2015

***Escherichia coli* public health compliance:  
Calculation of 12 month 'rolling' annual value**

Department of Environment  
and Resource Management

Drinking water scheme: Clare Water Treatment Plant

Year	2015											
Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
No. of samples collected							1	1	1	1	1	2
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)							0	0	0	0	0	0
No. of samples collected in previous 12 month period												7
No. of failures for previous 12 month period												0
% of samples that comply												100.0%
Compliance with 98% annual value												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 referred to as the 'annual value' in Schedule 3A of the regulation.

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

The shaded out area is not applicable if data is not available for the previous 12 months.



Table 5 (d) - Reticulation *E. coli* verification monitoring at Clare Water Treatment Plant 2016

***Escherichia coli* health compliance:  
Calculation of 12 month 'rolling' annual value**

Department of Environment and Resource Management  
Conserving and managing Queensland's environment and natural resources

Drinking water scheme: Clare Water Treatment Plant

Year	2016											
Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
No. of samples collected	1	1	1	1	1	1						
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)	0	0	0	0	0	0						
No. of samples collected in previous 12 month period	8	9	10	11	12	13	12	11	10	9	8	6
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 referred to as the 'annual value' in Schedule 3A of the regulation.

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

Table 6 (e) - Reticulation *E. coli* verification monitoring at Coolmunda Dam 2015

***Escherichia coli* public health compliance:  
Calculation of 12 month 'rolling' annual value**

Department of Environment  
and Resource Management

Drinking water scheme: Coolmunda Dam

Year	2015											
Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
No. of samples collected							2	2	2	2	2	2
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)							0	0	0	0	0	0
No. of samples collected in previous 12 month period												12
No. of failures for previous 12 month period												0
% of samples that comply												100.0%
Compliance with 98% annual value												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 referred to as the 'annual value' in Schedule 3A of the regulation.

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

The shaded out area is not applicable if data is not available for the previous 12 months.

Table 7 (f) - Reticulation *E. coli* verification monitoring at Coolmunda Dam 2016

**Escherichia coli health compliance:  
 Calculation of 12 month 'rolling' annual value**

Drinking water scheme: Coolmunda Dam

Year	2016											
Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
No. of samples collected	2	2	2	2	2	2						
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)	0	1	0	0	0	0						
No. of samples collected in previous 12 month period	14	16	18	20	22	24	22	20	18	16	14	12
No. of failures for previous 12 month period	0	1	1	1	1	1	1	1	1	1	1	1
% of samples that comply	100.0%	93.8%	94.4%	95.0%	95.5%	95.8%	95.5%	95.0%	94.4%	93.8%	92.9%	91.7%
Compliance with 98% annual value	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

**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 referred to as the 'annual value' in Schedule 3A of the regulation.

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

Table 8 (g) - Reticulation *E. coli* verification monitoring at Eungella Dam 2015

***Escherichia coli* public health compliance:  
Calculation of 12 month 'rolling' annual value**

Department of Environment  
and Resource Management

Drinking water scheme: Eungella Dam

Year	2015											
Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
No. of samples collected							2	2	3	3	3	2
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)							0	0	0	0	0	0
No. of samples collected in previous 12 month period												15
No. of failures for previous 12 month period												0
% of samples that comply												100.0%
Compliance with 98% annual value												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 referred to as the 'annual value' in Schedule 3A of the regulation.

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

The shaded out area is not applicable if data is not available for the previous 12 months.

Table 9 (h) - Reticulation *E. coli* verification monitoring at Eungella Dam 2016

**Escherichia coli health compliance:  
Calculation of 12 month 'rolling' annual value**

Department of **Environment and Resource Management**  
Conserving and managing Queensland's environment and natural resources

Drinking water scheme: Eungella Dam

Year	2016											
Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
No. of samples collected	2	2	2	2	2	2						
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)	0	0	0	0	0	0						
No. of samples collected in previous 12 month period	17	19	21	23	25	27	25	23	20	17	14	12
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 referred to as the 'annual value' in Schedule 3A of the regulation.

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

Table 10 (i) - Reticulation *E. coli* verification monitoring at Fairbairn Dam Water Treatment Plant 2015

***Escherichia coli* public health compliance:  
Calculation of 12 month 'rolling' annual value**

Department of Environment  
and Resource Management

Drinking water scheme: Fairbairn Dam Water Treatment Plant

Year	2015											
Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
No. of samples collected							2	2	0	2	0	0
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)							0	0	0	0	0	0
No. of samples collected in previous 12 month period												6
No. of failures for previous 12 month period												0
% of samples that comply												100.0%
Compliance with 98% annual value												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 referred to as the 'annual value' in Schedule 3A of the regulation.

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

The shaded out area is not applicable if data is not available for the previous 12 months.

Table 11 (j) - Reticulation *E. coli* verification monitoring at Fairbairn Dam Water Treatment Plant 2016

Department of Environment and Resource Management  
 Conserving and managing Queensland's environment and natural resources

***Escherichia coli* health compliance:  
 Calculation of 12 month 'rolling' annual value**

Drinking water scheme: Fairbairn Dam Water Treatment Plant

Year	2016											
Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
No. of samples collected	2	2	2	2	2	2						
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)	0	0	0	0	0	0						
No. of samples collected in previous 12 month period	8	10	12	14	16	18	16	14	14	12	12	12
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 referred to as the 'annual value' in Schedule 3A of the regulation.

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

Table 12 (k) - Reticulation *E. coli* verification monitoring at Kinchant Dam 2015

***Escherichia coli* public health compliance:  
Calculation of 12 month 'rolling' annual value**

Department of Environment  
and Resource Management

Drinking water scheme: Kinchant Dam

Year	2015											
Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
No. of samples collected							0	2	2	2	2	2
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)							0	0	0	0	0	0
No. of samples collected in previous 12 month period												10
No. of failures for previous 12 month period												0
% of samples that comply												100.0%
Compliance with 98% annual value												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 referred to as the 'annual value' in Schedule 3A of the regulation.

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

The shaded out area is not applicable if data is not available for the previous 12 months.



Table 13 (l) - Reticulation *E. coli* verification monitoring at Kinchant Dam 2016

**Escherichia coli health compliance:**  
**Calculation of 12 month 'rolling' annual value**

Department of Environment and Resource Management  
 Conserving and managing Queensland's environment and natural resources

Drinking water scheme: Kinchant Dam

Year	2016											
Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
No. of samples collected	2											
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)	0											
No. of samples collected in previous 12 month period	12	12	12	12	12	12	12	10	8	6	4	2
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 referred to as the 'annual value' in Schedule 3A of the regulation.

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

Table 14 (m) - Reticulation *E. coli* verification monitoring at Leslie Dam 2015

***Escherichia coli* public health compliance:  
Calculation of 12 month 'rolling' annual value**

Department of Environment  
and Resource Management

Drinking water scheme: Leslie Dam

Year	2015											
Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
No. of samples collected							0	1	1	1	1	1
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)							0	0	0	0	0	0
No. of samples collected in previous 12 month period												5
No. of failures for previous 12 month period												0
% of samples that comply												100.0%
Compliance with 98% annual value												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 referred to as the 'annual value' in Schedule 3A of the regulation.

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

The shaded out area is not applicable if data is not available for the previous 12 months.

Table 15 (n) - Reticulation *E. coli* verification monitoring at Leslie Dam 2016

***Escherichia coli* health compliance:  
Calculation of 12 month 'rolling' annual value**

Drinking water scheme: Leslie Dam

Year	2016											
Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
No. of samples collected	2	1	1	1	1	1						
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)	0	0	0	0	0	0						
No. of samples collected in previous 12 month period	7	8	9	10	11	12	12	11	10	9	8	7
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 referred to as the 'annual value' in Schedule 3A of the regulation.

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

Table 16 (o) - Reticulation *E. coli* verification monitoring at Mutchilba Township 2015

***Escherichia coli* public health compliance:  
Calculation of 12 month 'rolling' annual value**

Department of **Environment  
and Resource Management**

Drinking water scheme: Mutchilba Township

Year	2015											
Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
No. of samples collected							2	2	2	4	2	2
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)							0	0	0	0	0	0
No. of samples collected in previous 12 month period												14
No. of failures for previous 12 month period												0
% of samples that comply												100.0%
Compliance with 98% annual value												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 referred to as the 'annual value' in Schedule 3A of the regulation.

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

The shaded out area is not applicable if data is not available for the previous 12 months.

Table 17 (p) - Reticulation *E. coli* verification monitoring at Mutchilba Township 2016

**Escherichia coli health compliance:  
 Calculation of 12 month 'rolling' annual value**

Drinking water scheme: Mutchilba Township

Year	2016											
Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
No. of samples collected	2	2	2	2	2	2						
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)	0	0	0	0	0	0						
No. of samples collected in previous 12 month period	16	18	20	22	24	26	24	22	20	16	14	12
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 referred to as the 'annual value' in Schedule 3A of the regulation.

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

Table 18 (q) - Reticulation *E. coli* verification monitoring at Peter Faust Dam 2015

***Escherichia coli* public health compliance:  
Calculation of 12 month 'rolling' annual value**

Department of Environment  
and Resource Management

Drinking water scheme: Peter Faust Dam

Year	2015											
Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
No. of samples collected							1	2	2	1	1	1
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)							0	0	0	0	0	0
No. of samples collected in previous 12 month period												8
No. of failures for previous 12 month period												0
% of samples that comply												100.0%
Compliance with 98% annual value												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 referred to as the 'annual value' in Schedule 3A of the regulation.

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

The shaded out area is not applicable if data is not available for the previous 12 months.

Table 19 (r) - Reticulation *E. coli* verification monitoring at Peter Faust Dam 2016

**Escherichia coli health compliance:**  
**Calculation of 12 month 'rolling' annual value**

Drinking water scheme: Peter Faust Dam

Year	2016											
Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
No. of samples collected	1	1	1	1	1	1						
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)	0	0	0	0	0	0						
No. of samples collected in previous 12 month period	9	10	11	12	13	14	13	11	9	8	7	6
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 referred to as the 'annual value' in Schedule 3A of the regulation.

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

## Appendix B – Implementation of the DWQMP Risk Management Improvement Program

**Table 20 – Progress against the risk management improvement program in the approved DWQMP**

Item No.	HACCP Control Area	Hazard / Event	Recommendation / Preventative Measure	Target date/s	Status as at 30 June 2016	(If implementing these actions will take longer than anticipated, please provide detail, as it may affect the approved DWQMP)
<b><u>2012 – 2015 DWQMP</u></b>						
1	Catchments [Applies to all TWS with surface run-off as source water to WTP]	Dissolved heavy metals- or hydrocarbons	Implement additional NATA Laboratory testing of raw water quality for heavy metals and hydrocarbon contamination against ADWG limits. The heavy metals that will be tested include Cd, Cr, Cu, Pb, Ni and Zn. Other parameters that will be tested are shown in Appendix E as an example. The frequency of testing will be carried out annually for characterisation of the raw water. Subject to the findings of the testing, complete a design study & business case for chemical treatment and removal of heavy metals	FY 13/14	Complete	This testing is undertaken annually.
2	Reticulation mains [Applies to all TWS at Dam sites with surface run-off as source water to WTP]	Taste, Colour >15HU, Turbidity >5NTU	Fitting of triple filters in SunWater staff cottages (dam sites) & /or caravan park kiosk / other customers premises. Investigate routine Colitag (eColi) testing of filtered water in tank.	FY 13/14	Removed	SunWater has determined that this action is not an efficient and secure preventative measure and also will not provide protection to all customers. SunWater will instead continue to improve treatment capability and procedures at the treatment plant.
3	Operator / Management Training [Applies to all TWS]	1. Public health risks from non-compliant or poor water quality & odours / bad tastes from micro-biological build up. 2. Knowledge / technical expertise lost when operators / staff transition	Ensure all technical support, supervisory staff & WTP operators have attained certificate 3 standards. Conduct refresher training ever 2 yrs. Increase the frequency of NATA drinking water quality testing	FY 13/14	Ongoing	Existing SunWater operators have completed Certificate 3 training. The WTP is always under the supervision of a certificate 3 trained operator.
4	Terrorism	Chemical hazards - dangerous chemicals, poisons or damage to water infrastructure	Review training programs to ensure staff properly manage incidents involving dangerous chemicals, poisons or damage to water infrastructure	FY 13/14	Ongoing	Training in emergency management plans is ongoing
5	Natural Disasters	Biological hazards – Ecoli, Coliforms, HPC (fish kills) or organic matter, low DO	Review training programs to ensure staff properly manage incidents involving impacts of cyclones, bush fires or flood damage to water infrastructure & treatment facilities	FY 13/14	Ongoing	Training in emergency management plans is ongoing



Item No.	HACCP Control Area	Hazard / Event	Recommendation / Preventative Measure	Target date/s	Status as at 30 June 2016	(If implementing these actions will take longer than anticipated, please provide detail, as it may affect the approved DWQMP)
6	Operating Manuals and Emergency Action Plans (EAP) [Applies to all TWS]	Biological, Chemical & Physical hazards – (incl, Ecoli, Coliforms & HPC)	<p>Review current maintenance philosophy &amp; implement (RCM) asset management programs to all TWS schemes. Develop DWQ scenarios and document emergency action plans for drinking water quality incidents.</p> <p>Ensure all technical support, supervisory staff &amp; WTP operators are involved with documenting standard practices and EAP's for DWQ emergencies and incident management.</p> <p>Conduct workshops and risk assessments every 2-3 yrs for EAP revision as part of the RCM approach to managing TWS assets and operations.</p> <p>1. Update existing operating manuals for Fairbairn, Mutchilba, Kinchant, Eungella &amp; Leslie TWS.</p> <p>2. Develop new operating manuals for BFD, Coolmunda, Clare, Dalbeg, Millaroo, PFD TWS</p>	FY 13/14	Completed/Ongoing	Risk assessment was completed in 2015 prior to the submission of the latest DWQMP for approval by the regulator. This will be reassessed in 2-3 years as scheduled
7	Rainwater Tank (Coolmunda Dam WTP)	Biological, Chemical & Physical hazards – (incl, Ecoli, Coliforms & HPC)	<p>1. Implement maintenance plan as recommended in the Queensland Health Guideline for Rainwater Tanks including inspecting and cleaning the accumulated sediment every 2-3 years.</p> <p>2. Signage to the public tap for "No drinking".</p> <p>3. Letter to the household advising to boil the water before use.</p> <p>4. Investigate other options such as chlorination or UV disinfection.</p>	FY13/14	Signage to the public tap for "No drinking". Investigation of other options such as chlorination or UV disinfection is not implemented yet.	SunWater to continue to investigate.
<b><u>2015 – 2018 DWQMP</u></b>						
1	Data Collection / Retention	General	Improvements to be made to SunWater's data collection system (SAP) to improve the quality of data recording, this is to include limits for each parameter so that if an entry is input which is outside the limits the operator is alerted to check the data and if it is correct, raise an incident.	FY 15/16	Water quality data analysis support from specialist water consultant	SunWater continue to work with specialist water consultant to further improve data collection system.
2	Dam Catchment, Water Storage & Empoundment Area	Chemical hazards – Hydrocarbon contamination	Complete base-line hydrocarbon testing of dam storages during a period of heavy recreational use and add hydrocarbon testing to annual heavy metals test regime (Applicable for drinking water	FY 16/17	Incomplete	

Item No.	HACCP Control Area	Hazard / Event	Recommendation / Preventative Measure	Target date/s	Status as at 30 June 2016	(If implementing these actions will take longer than anticipated, please provide detail, as it may affect the approved DWQMP)
			<i>supplies sourcing water from dams).</i>			
3	Water Treatment Plant	pH outside of guideline range	<i>Investigate ways to improve final treated water pH at the following sites: Burdekin Falls Dam WTP and Clare WTP (examine ways to reduce pH), and Eungella and Mutchilba (examine ways to raise pH).</i>	<i>FY 17/18</i>	<i>Incomplete</i>	
4	Water Treatment Plant	High Turbidity	<i>Investigate ways to improve final treated water turbidity values at all sites.</i>	<i>FY 17/18</i>	<i>Incomplete</i>	
5	All	General	<i>Staff Training – ongoing</i>	<i>Ongoing</i>	<i>Training completed in 2016, conducted by specialist water consultant</i>	<i>SunWater to complete operator training every two years.</i>
6	All	General	<i>Create Emergency Action Plans (EAP) for all WTPs</i>	<i>FY 17/18</i>	<i>Incomplete</i>	