

ANNUAL REPORT 2018/2019



▼ Drinking Water Quality Management Plan (DWQMP)

Bundaberg Regional Council

Detail	Information
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LGA covered by this plan	Bundaberg Regional Council
Water Service Areas covered by this plan	Bundaberg, Kalkie, Gregory River, Gin Gin, Gooburru, Moore Park, River Park, Rocky Point, Wallaville, Lake Monduran.

1. Glossary of Terms

ADWG 2011	Australian Drinking Water Guidelines (2011) Published by the National Health and Medical Research Council of Australia.
ALS	Australian Laboratory Services
BRC	Bundaberg Regional Council
E. coli	Escherichia coli is a bacterium which is considered to be a superior indicator for detecting faecal contamination which could present a potential health risk.
CaCO₃	Calcium Carbonate
CFU/100ml	Colony forming units per 100 millilitres
CCP	Critical Control Point
DAF	Diffused Air Flootation
DNRME	Department of Natural Resources Mines Energy
DWQMP	Drinking Water Quality Management Plan
DWQMT	Drinking Water Quality Management Team
F&SS	Forensic & Scientific Services (Queensland Government)
GWTP	Groundwater Treatment Plant/s
IMS	Integrated Management System
LIMS	Laboratory Information Management System
MIB	Methylisoborneol, is an organic chemical with a strong odour that can present with an algal bloom
mg/L	Milligrams per litre
NTU	Nephelometric Turbidity Units
PFAS	Per- and poly - fluoroalkyl substances
QWSR	Queensland Water Supply Regulator
QH	Queensland Health
QCP	Quality Control Point
THM/s	Trihalomethanes are a group of chemicals that may be formed as a by-product when chlorine reacts with organic matter that can be found in some water sources.
TOC	Total Organic Carbon
W&WW	Water & Wastewater
WSA	Water Service Area
WTP	Water Treatment Plant
<	Less than
>	Greater than
µg/L	Micro-Grams per litre
µS/cm	Micro-Siemens per centimetre

2. Introduction

This report documents the performance of Bundaberg Regional 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 Bundaberg Regional Council 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.

It has been prepared in accordance with the *Water Industry Regulatory Reform – drinking water quality management plan report factsheet* published by the Department of Natural Resources Mines Energy (DNRME), Queensland.

3. Overview of Operations

The Bundaberg Regional Council has ten (10) Water Service Areas (WSA). These are identified as the Coastal and Hinterland Operational areas.

Coastal Operational Area comprises Bundaberg (City), Kalkie, Moore Park, River Park, Rocky Point and Gooburru Water Service Areas (WSA).

Hinterland Operational Area consists of Gregory River, Gin Gin, Wallaville and Lake Monduran Water Service Areas (WSA)

Bundaberg Water Service Area (WSA)

Surface water and groundwater provide the raw water supplies in this WSA. The Branyan WTP is fundamental to supply being a large conventional plant which treats raw surface water from the Burnett River. This plant utilises a process comprising PAC Adsorption, coagulation, flocculation, clarification, sedimentation, filtration and disinfection. Groundwater supplies are treated through a number of small groundwater treatment plants (GWTP's) located around the city. These GWTP's operate an aeration over limestone process with disinfection. Connected population is around 54,696.

Kalkie WSA

The Kalkie WSA encompasses the areas of The Port, Burnett Heads, Bargara, The Hummock, Innes Park, Coral Cove, Elliott Heads and Riverview. Raw water for this WSA originates from the Burnett River however it is delivered to the Kalkie WTP via SunWater's Woongarra Main Channel. This plant operates a Dissolved Air Floatation (DAF) system which incorporate coagulation, flocculation, clarification (DAF), filtration and disinfection. Due to the reliance on the SunWater irrigation channel and the potential for this supply to be unavailable, an interconnection to the Bundaberg WSA was made. This allows treated water to be pumped from the Bundaberg WSA direct to the Hummock reservoirs for consumption within the Kalkie WSA. Connected population is around 19,067.

Moore Park WSA

The Moore Park WSA employs both surface and ground water as sources of raw water. Located behind the township is the Vecellios Road WTP. This WTP treats surface water supplied via the SunWater Gooburru Main Channel. Potable water is achieved from a DAF process utilising coagulation, flocculation, clarification filtration and disinfection. Groundwater supplies are treated to a potable standard using an aeration over limestone process with disinfection. Connected population is around 2,945.

River Park WSA

River Park is a small rural estate supported by its own WTP. This plant sources raw water directly from a SunWater irrigation holding dam nearby. Plant process involves coagulation, flocculation, clarification, filtration, and disinfection. Connected population is around 319.

Rocky Point WSA

Rocky Point is a small coastal community situated on Baffle Creek which is located approximately 60km north of Bundaberg. The township has its own WTP which treats underground water to produce a potable water supply via an aeration over limestone process with disinfection. Connected population is around 221.

Gooburrum WSA

The Gooburrum WSA encompasses a very small community/estate. A small groundwater treatment plant, being an aeration over limestone with disinfection configuration, provides the potable water. In February 2018 an interconnection with the Bundaberg WSA treated water supply was made, this now supplements the treated groundwater supply, improving water quality and security. Connected population is around 139.

Gregory River WSA

This WSA includes the towns of Childers and Woodgate as well as the communities of Redridge, Forest Ridge, Kinkuna and Goodwood. Potable water is supplied from the Gregory River WTP with the raw surface water coming from the Gregory River. The plant operates a Dissolved Air Floatation system using coagulation, flocculation, clarification (DAF), and disinfection. Connected population is around 5,698.

Gin Gin WSA

The Gin Gin WTP extracts its raw water from both Gin Gin Creek and the SunWater irrigation channel. The WTP is a constant rate treatment plant which provides potable water to the town of Gin Gin. The treatment process involves coagulation, flocculation, clarification, filtration and disinfection. Connected population is around 1,452.

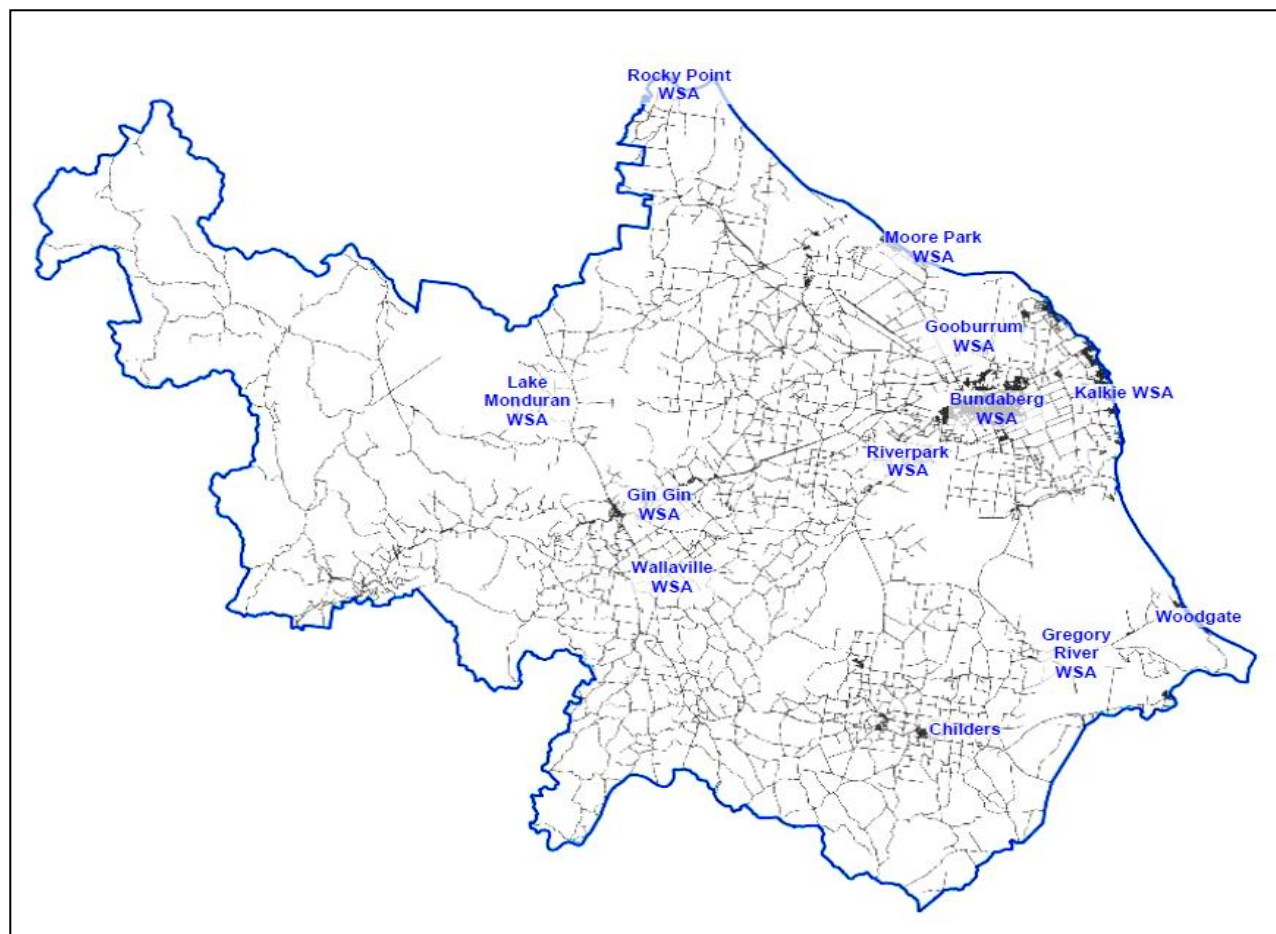
Wallaville WSA

The township of Wallaville is provided potable water from the Wallaville WTP. This plant extracts raw water from the Burnett River and is treated through a process that involves coagulation, flocculation, clarification, filtration and disinfection. Connected population is around 248.

Lake Monduran WSA

Lake Monduran is essentially a tourist park located next to the Fred Haigh Dam. Raw water is drawn directly from the dam and treated to a potable standard at the WTP. The process involves coagulation, flocculation, filtration, and disinfection. The population here fluctuates due to it being a tourist park so an actual static population figure cannot be used. Water connections are around 16.

Figure 1. Overview Map of the Bundaberg Regional Council – Water Service Area's (WSA)



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

There were eight (8) notifications during the 2018/2019 financial year to the Queensland Water Supply Regulator (QWSR) under sections 102 or 102A of the Water Supply (Safety & Reliability) Act 2008.

Seven (7) of these notifications involved the detection of Trihalomethanes (THM's) for the Gregory River and Lake Monduran WSA's that exceeded the ADWG Health limit of 250µg/L. The chlorination of drinking water may produce by-products such as a group of chemicals known as THM's. THM's may be formed when chlorine reacts with organic matter that can be found in some water sources. These seven (7) incidents are classified as on-going incidents and therefore are under observation by the QWSR and Queensland Health. It is a requirement that Council supply quarterly THM analysis reports from the Gregory River and Lake Monduran WSA's to these agencies whilst under this surveillance.

One (1) notification for non-compliance with water quality criteria was also reported for a low level lead detection. During BRC's routine dead-end metal analysis program, returned a low level of Lead detection of 0.017mg/L within the Bundaberg WSA that exceeded the ADWG Health limit of 0.01mg/L. All other sites tested in this dead-end metals analysis program of samples collected from residential taps within the Bundaberg WSA returned Lead results below the ADWG Health limit of 0.01mg/L. Council accessed the water treatment plants supplying the Bundaberg WSA and found the WTPs to be functioning appropriately with no detection of lead in the treated water. A mains flush was carried out at the testing location. The retest result was <0.001mg/L.

4.1 Non-compliance with the water quality criteria and corrective and preventative actions undertaken.

Incident Description – Gregory River WSA:

Throughout the year, the Gregory River can contain varying elevated levels of dissolved natural organics. The current configuration of the Gregory River WTP struggles to deal with these and therefore at times the THM levels in the treated water can exceed the ADWG Health limit of 250µg/L. A total of sixteen (16) tests were undertaken for THM analysis over the year within the Gregory River WSA. Ten (10) of these tests exceeded the ADWG Health limit. The average of these exceedances was 311µg/L.

Corrective and Preventative Actions:

Council is acutely aware of this situation and in conjunction with QH and QWSR, Council diligently carries out quarterly THM analysis with results going to the QWSR. The filtered water is also analysed at a monthly frequency for Total Organic Carbon (TOC) as a surrogate for THM precursors. As indicated Gregory River water can contain high levels of dissolved organics that are difficult to remove with the current treatment process. BRC has considered various treatment and transfer strategies and has determined that the preferred strategy is to continue sourcing water from the Gregory River at the weir and to build a new treatment plant at the exiting site. In view of the process and hydraulic limitations of the existing plant and the plant's age, BRC has commenced construction of a new WTP adjacent to the existing plant. The new treatment plant will incorporate activated carbon adsorption to reduce dissolved organics and will deliver an average of 60 L/s over a 24 hour period. Allowing for a 20 hour per day plant operating period this requires a peak delivery rate of 72 L/s.

Incident Description – Lake Monduran WSA:

Lake Monduran (Fred Haigh Dam) can also contain elevated levels of natural organics. The existing configuration of the Lake Monduran WTP can have difficulty in treating elevated levels of these organics and therefore, at times, the THM levels in the treated water can exceed the ADWG Health limit of 250µg/L. A total of four (4) samples were taken for THM analysis throughout the year. Three (3) of these tests exceeded the ADWG Health limit. The average of these exceedances was 297µg/L.

Corrective and Preventative Actions:

Council is cognizant of this situation and in conjunction with QH and QWSR, Council diligently carries out quarterly THM analysis with results going to the above authorities. Analysis is also carried out on a monthly frequency on the filtered water for Total Organic Carbon (TOC), as a surrogate for THM precursors. A preliminary cost estimate has been conducted for upgrades to the Lake Monduran Treatment Plant. The cost estimates have been developed for the purposes of comparing options and for preliminary budgeting. However, the scope and quality of the works has not been fully defined. An evaluation of technologies is planned to address disinfection by-product (DBP) issues.

5. Actions taken to implement the DWQMP

Council has implemented operational limits at all its potable water treatment plants. These have been defined as Quality Control Point (QCP) and Critical Control Point (CCP).

QCP limits are set to highlight excursions of operational process limits prior to reaching or exceeding any CCP limits. This means QCP's are an "early warning indicator" intended to alert operators that the process may be starting to deviate from its intended process track and that operational plant changes are required.

CCP limits are set to biological, chemical and physical limits that must be controlled to prevent, eliminate or reduce any exceedance of any ADWG health value limit. Examples of CCP limits include process turbidity, chlorine residuals, pH and heterotrophic plate counts. Any CCP limit exceedances requires immediate action from operational staff and following process investigation, notification to the QWSR may be required.

To ensure water quality continuity, operators are alerted by various alarms through on-line monitoring and operational analysis, plus they are also alerted through formatted operational log sheets. This formatting instructs the cells to change colour to either, yellow for a QCP exceedance or red for a CCP exceedance.

Exceedance alerts are also received by managerial, supervisory and technical staff via the LIMS database generated from the Bundaberg Regional Council Central Laboratory. The Central Laboratory provides not only results on tests that cannot be undertaken at the WTP but also verification analysis. QCP & CCP parameters have been set within the LIMS database and any exceedances are highlighted. Each day at 9:00am an auto-script runs and provides a report to all operational and technical staff detailing status of limits with any exceedances.

QCP exceedances are not reportable to the regulator but are reportable to the Bundaberg Regional Council Water Services Incident Group on IMS Form No. FM-8-012. Any reoccurring QCP's or CCP's will highlight a possible plant or operational issue. These will be taken before the Drinking Water Quality Management Team meetings, discussed, and potential solutions decided. If the solution is major in terms of cost, these will then be incorporated into the budget.

Refer to Appendix B for a summary of progress in implementing each of the Improvement Program actions.

5.1 Revisions made to the operational monitoring program to assist in maintaining the compliance with water quality criteria¹ in verification monitoring.

The Bundaberg Regional Council continues to conduct operational monitoring programs across all BRC water schemes, as per the Bundaberg Regional Council DWQMP. The monitoring program was reviewed in April 2019 for its continued relevance and suitability by studying test results and parameter trends across all WSA's.

5.2 Amendments made to the DWQMP.

The BRC DWQMP has undergone an internal review and this was submitted to the Department of Natural Resources, Mines and Energy's – Office of Water Supply Regulator (OWSR) on 5th July 2019 for their assessment. BRC are now currently responding to an Information Requirement Notice for additional information that will be submitted to the OWSR prior to 28th February 2020.

6. Customer Complaints Related to Water Quality

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

The following table indicates the type and number of complaints that were received regarding water quality during the 2018/2019 financial year.

Table 1. Water Quality Complaints

WSA	Suspected Illness	Discoloured Water	Cloudy Water	Taste and Odour	Total
Bundaberg	0	49	6	12	67
Kalkie	0	15	15	20	50
Moore Park	0	2	0	2	4
Gooburru	0	2	0	2	4
Gregory River	0	5	1	4	10
Gin Gin	0	1	0	0	1
River Park	0	0	0	0	0
Rocky Point	0	0	0	0	0
Wallaville	0	0	0	0	0
Lake Monduran	0	0	0	0	0
Total	0	74	22	40	136

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

6.1 Suspected Illness.

On occasions, complaints are received from customers who believe their illness may be associated with the water supply. Bundaberg Regional Council investigates all alleged illness complaints relating to its various potable water supplies. This is normally done by sampling from the closest reticulation sampling point for the presence of *E. coli* and free chlorine residual. If required other tests are carried out to determine any potential causes.

During 2018/2019 reporting year, there were no suspected illness complaints arising from the Bundaberg Regional Council water supply systems.

6.2 Discoloured Water.

As shown above, seventy-four (74) customer complaints were received during 2018/2019 relating to discoloured water.

The majority of dirty water complaints are addressed by contacting the customer directly and establishing if the issue is still occurring, if so, advice is given that Council will send out a crew to undertake a mains flush. If deemed necessary Council will send an officer to the complaint location and if required a sample may be obtained from an external point of the property closest to the main. The mains may be flushed followed by a free chlorine residual test. If sample collection is undertaken these are taken to the Bundaberg Regional Council Central Laboratory for analysis with the results being conveyed to the complainant.

Discoloured water can result from such things as sloughing within the mains following water main repairs.

6.3 Cloudy Water.

At times, milky/white water can be experienced at the consumers tap. This is due to air being trapped within the water main. This can occur following repair work when re-establishing the water mains back into service. During 2018/2019, twenty-two (22) complaints were received regarding cloudy water. Direct customer contact is made on all cloudy water complaints. The customer is provided information on what it is and why it is happening. The customer is also advised if the issue continues to occur to advise Council and an operational crew will be sent out to flush the mains.

6.4 Taste and Odour.

Forty (40) complaints were received during 2018/2019 reporting period relating to taste and odour.

Due to varying raw surface water conditions, some Bundaberg Regional Council WSA's can experience Methylisoborneol (MIB) and Geosmin at levels above the taste threshold of 5ng/L. When this occurs, an 'earthy' and/or 'musty' taint from trace levels of MIB/Geosmin can be experienced. The tastes and odours that result from these compounds are produced by certain types of algae that produce MIB/Geosmin. Whilst algae is effectively removed in the treatment process there can be an 'earthy' taint detectable from ultra-trace levels of MIB/Geosmin. The compounds MIB/Geosmin are non-toxic and naturally occurring and as a result the water is safe to consume and does not reflect a compromise in the standard of tap water. The potable tap water will continue to meet the requirements of the ADWG.

Bundaberg Regional Council carries out routine monitoring of MIB/Geosmin levels. In times of MIB/Geosmin being detectable in the potable water, statements are provided to the community via the Mayor's office which can appear on local and social media and on Council's website.

If taste and/or odour complaints are received, Council contacts the customer to establish what is causing the issue. In the case of MIB/Geosmin the customer is advised what this is and why it is occurring. If deemed necessary Council will send an officer to investigate, a sample may be taken from a nearby access point with this taken to the Bundaberg Regional Council Central Laboratory for analysis and the results being conveyed back to the complainant.

Taste and/or odour complaints regarding potable water can be subjective as it depends on an individual's perception of taste. In some WSA's the Bundaberg Regional Council can operate on either surface water and/or groundwater, this change can prompt complaints as there can be a slight change in the water taste and/or odour.

7. Findings and Recommendations of the DWQMP Auditor

The next regular audit of the Bundaberg Regional Council DWQMP is due to be conducted by 30th June 2021.

7.1 Recommendations from the Previous Regular Audit.

The recommendations from the audit conducted by Viridis Consultants (December 2016) are as follows:

- **Recommendation** (REF: REC-001/16): Critical controls points should be reviewed and updated to ensure that each CCP is a current process and that there is a defined critical limit at which action must be taken to reduce or remove a hazard.
Action completed: A review of the Critical Control Points to be carried out as nominated in the BRC DWQMP Improvement Plan. (UAN 18-35)
- **Recommendation** (REF: REC: 002/16): Review and update process flow diagrams to ensure that they accurately reflect the current scheme conditions.
Action completed: The process flow diagrams have been reviewed and updated to reflect the current scheme conditions in conjunction with the review of the Bundaberg Regional Council DWQMP.

7.2 Opportunities for Improvement.

Opportunities for improvement were noted, where statutory requirements are being met, but processes could be improved. The opportunities for improvement from the audit conducted by Viridis Consultants (December 2016) are as follows:

- OFI (REF: OFI-001/16): It is recommended that once critical limits are reviewed (refer to recommendation REC-001/16) and updated, that the ability to change set points within the SCADA system is limited to supervisors or managers, with an appropriate process in place to assess, approve and document any changes made.

Action completed: Introduction of a management of change process for all operational set points to have a control as well as provide effective management and communications to any changes. This will also include a review of SCADA system access via unique operator specific passwords to track any changes.

8. Hazards and hazardous events that affected the quality of drinking water during the year and which were not addressed in the DWQMP

There were no new hazards or hazardous events identified during the 2018/2019 reporting year that were not addressed in the approved DWQMP.

Appendix A – Summary of Compliance with Water Quality Criteria for Drinking Water

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.

Verification monitoring for 2018/2019 has been carried out in line with the verification monitoring program as stated in the Bundaberg Regional Council DWQMP Section 10 – Operational and Verification Monitoring.

Table 1. Verification Monitoring Results – SWA & Metals – All WSA's

Verification Monitoring – Bundaberg Water Service Area July 2018 – June 2019 – SWA & Metals											
Parameter	Laboratory Name	Unit of Measure	Limit of Reporting	Frequency of Sampling	Total No. Samples Collected	No. of Samples in which Parameter Detected	ADWG Health Value	No. of Samples Exceeding ADWG Health Value	Min Value	Max Value	Average Value
Alkalinity	BRC Central Laboratory	mg/L CaCO ₃	3.0	Quarterly	32	32	~	~	24	74	39
Aluminium	ALS	mg/L	0.01	Biannual	17	17	~	~	0.04	0.08	0.05
Antimony	ALS	mg/L	0.001	Biannual	17	17	0.003	0	<0.001	<0.001	<0.001
Arsenic	ALS	mg/L	0.001	Biannual	17	17	0.01	0	<0.001	<0.001	<0.001
Barium	ALS	mg/L	0.001	Biannual	17	17	2	0	0.010	0.039	0.022
Beryllium	ALS	mg/L	0.001	Biannual	17	17	0.06	0	<0.001	<0.005	0.001
Boron	ALS	mg/L	0.05	Biannual	17	17	4	0	<0.050	0.060	0.051
Cadmium	ALS	mg/L	0.0001	Biannual	17	17	0.002	0	<0.0001	<0.0001	<0.0001
Calcium	BRC Central Laboratory	mg/L as Ca	1.0	Quarterly	32	32	~	~	9.62	25.15	15.11
Calcium Hardness	BRC Central Laboratory	mg/L CaCO ₃	1.0	Quarterly	32	32	~	~	24.0	62.9	37.8
Chloride	BRC Central Laboratory	mg/L as Cl ⁻	4.0	Quarterly	32	32	~	~	83.68	112.93	93.26
Chlorine (Free)	BRC Central Laboratory	mg/L	0.05	Monthly	201	201	5	0	<0.05	1.51	0.79
Chromium	ALS	mg/L	0.001	Biannual	17	17	0.05	0	<0.001	<0.001	<0.001
Conductivity	BRC Central Laboratory	µS/cm	1.0	Quarterly	32	32	~	~	381	524	432
Colour (True)	BRC Central Laboratory	Pt.Co Units	0	Quarterly	32	32	15	0	0	0	0
Copper	ALS	mg/L	0.001	Biannual	17	17	2	0	0.002	0.207	0.020
Fluoride	BRC Central Laboratory	mg/L as F ⁻	0.25	Quarterly	32	32	1.5	0	<0.10	<0.25	0.13
Hardness (Total)	BRC Central Laboratory	mg/L CaCO ₃	1.0	Quarterly	32	32	~	~	44.3	109.6	66.6
Iron	ALS	mg/L	0.05	Biannual	17	17	~	~	<0.05	0.10	0.054
Lanthanum	ALS	mg/L	0.001	Biannual	17	17	0.002	0	<0.001	<0.001	<0.001
Lead	ALS	mg/L	0.001	Biannual	17	17	0.01	1	<0.001	0.017	0.002
Magnesium	BRC Central Laboratory	mg/L as Mg	2.0	Quarterly	32	32	~	~	3.65	13.31	6.92
Manganese	ALS	mg/L	0.001	Biannual	17	17	0.5	0	<0.001	0.014	0.002
Molybdenum	ALS	mg/L	0.001	Biannual	17	17	0.05	0	<0.001	<0.001	<0.001

Verification Monitoring – Bundaberg Water Service Area July 2018 – June 2019 – SWA & Metals – Cont'd											
Nickel	ALS	mg/L	0.001	Biannual	17	17	0.02	0	<0.001	0.013	0.002
Nitrate	BRC Central Laboratory	mg/L as NO ₃ ⁻	0.5	Quarterly	32	32	50	0	<0.25	20.08	12.90
Nitrite	BRC Central Laboratory	mg/L as NO ₂ ⁻	0.1	Quarterly	32	32	3	0	<0.1	<0.1	<0.1
pH	BRC Central Laboratory	pH units @ 25°C	1.0	Monthly	194	194	~	~	6.67	7.93	7.46
Phosphate (Dissolved)	BRC Central Laboratory	mg/L as PO ₄ ³⁻	0.5	Quarterly	32	32	~	~	<0.25	<0.50	0.31
Potassium	BRC Central Laboratory	mg/L	1.0	Quarterly	32	32	~	~	<0.20	4.13	0.98
Selenium	ALS	mg/L	0.01	Biannual	17	17	0.01	0	<0.01	<0.01	<0.01
Silver	ALS	mg/L	0.001	Biannual	17	17	0.1	0	<0.001	<0.001	<0.001
Sodium	BRC Central Laboratory	mg/L	2.5	Quarterly	32	32	~	~	49.20	60.71	54.65
Sulphate	BRC Central Laboratory	mg/L as SO ₄ ²⁻	4.5	Quarterly	32	32	500	0	2.26	49.71	9.62
Total Dissolved Solids	BRC Central Laboratory	mg/L	~	Quarterly	32	32	~	~	255.3	351.1	289.2
Turbidity	BRC Central Laboratory	NTU	0.03	Quarterly	32	32	~	~	<0.03	3.80	0.35
Uranium	ALS	mg/L	0.001	Biannual	17	17	0.017	0	<0.001	<0.001	<0.001
Zinc	ALS	mg/L	0.005	Biannual	17	17	~	~	<0.005	0.199	0.021

Verification Monitoring – Kalkie Water Service Area July 2018 – June 2019 – SWA & Metals											
Parameter	Laboratory Name	Unit of Measure	Limit of Reporting	Frequency of Sampling	Total No. Samples Collected	No. of Samples in which Parameter Detected	ADWG Health Value	No. of Samples Exceeding ADWG Health Value	Min Value	Max Value	Average Value
Alkalinity	BRC Central Laboratory	mg/L CaCO ₃	3.0	Quarterly	20	20	~	~	45	64	58
Aluminium	ALS	mg/L	0.01	Biannual	10	10	~	~	0.02	0.05	0.03
Antimony	ALS	mg/L	0.001	Biannual	10	10	0.003	0	<0.001	<0.001	<0.001
Arsenic	ALS	mg/L	0.001	Biannual	10	10	0.01	0	<0.001	<0.001	<0.001
Barium	ALS	mg/L	0.001	Biannual	10	10	2	0	0.034	0.038	0.036
Beryllium	ALS	mg/L	0.001	Biannual	10	10	0.06	0	<0.001	<0.001	<0.001
Boron	ALS	mg/L	0.05	Biannual	10	10	4	0	<0.05	<0.05	<0.05
Cadmium	ALS	mg/L	0.0001	Biannual	10	10	0.002	0	<0.0001	<0.0001	<0.0001
Calcium	BRC Central Laboratory	mg/L as Ca	1.0	Quarterly	20	20	~	~	17.03	25.42	20.09
Calcium Hardness	BRC Central Laboratory	mg/L CaCO ₃	1.0	Quarterly	20	20	~	~	45.6	63.6	50.2
Chloride	BRC Central Laboratory	mg/L as Cl ⁻	4.0	Quarterly	20	20	~	~	74.22	108.23	89.12
Chlorine (Free)	BRC Central Laboratory	mg/L	0.05	Monthly	113	113	5	0	<0.05	1.32	0.48
Chromium	ALS	mg/L	0.001	Biannual	10	10	0.05	0	<0.001	<0.001	<0.001
Conductivity	BRC Central Laboratory	μS/cm	1.0	Quarterly	20	20	~	~	439	610	512
Colour (True)	BRC Central Laboratory	Pt.Co Units	0	Quarterly	20	20	15	0	0	0	0
Copper	ALS	mg/L	0.001	Biannual	10	10	2	0	0.004	0.257	0.048
Fluoride	BRC Central Laboratory	mg/L as F ⁻	0.25	Quarterly	20	20	1.5	0	<0.10	0.16	0.11
Hardness (Total)	BRC Central Laboratory	mg/L CaCO ₃	1.0	Quarterly	20	20	~	~	85.2	109.9	99.6
Iron	ALS	mg/L	0.05	Biannual	10	10	~	~	<0.05	0.06	0.05
Lanthanum	ALS	mg/L	0.001	Biannual	10	10	0.002	0	<0.001	<0.001	<0.001
Lead	ALS	mg/L	0.001	Biannual	10	10	0.01	0	<0.001	0.006	0.002
Magnesium	BRC Central Laboratory	mg/L as Mg	2.0	Quarterly	20	20	~	~	8.47	14.5	11.84
Manganese	ALS	mg/L	0.001	Biannual	10	10	0.5	0	<0.001	0.01	0.002
Molybdenum	ALS	mg/L	0.001	Biannual	10	10	0.05	0	<0.001	<0.001	<0.001

Verification Monitoring – Kalkie Water Service Area July 2018 – June 2019 – SWA & Metals – Cont'd											
Nickel	ALS	mg/L	0.001	Biannual	10	10	0.02	0	<0.001	0.003	0.001
Nitrate	BRC Central Laboratory	mg/L as NO ₃ ⁻	0.5	Quarterly	20	20	50	0	0.47	5.38	2.59
Nitrite	BRC Central Laboratory	mg/L as NO ₂ ⁻	0.1	Quarterly	20	20	3	0	<0.1	<0.1	<0.1
pH	BRC Central Laboratory	pH units @ 25°C	1.0	Monthly	111	111	~	~	7.25	8.14	7.57
Phosphate (Dissolved)	BRC Central Laboratory	mg/L as PO ₄ ³⁻	0.5	Quarterly	20	20	~	~	<0.25	<0.50	0.31
Potassium	BRC Central Laboratory	mg/L	1.0	Quarterly	20	20	~	~	2.69	4.30	3.55
Selenium	ALS	mg/L	0.01	Biannual	10	10	0.01	0	<0.01	<0.01	<0.01
Silver	ALS	mg/L	0.001	Biannual	10	10	0.1	0	<0.001	<0.001	<0.001
Sodium	BRC Central Laboratory	mg/L	2.5	Quarterly	20	20	~	~	48.48	64.30	58.04
Sulphate	BRC Central Laboratory	mg/L as SO ₄ ⁻	4.5	Quarterly	20	20	500	0	31.26	49.41	40.81
Total Dissolved Solids	BRC Central Laboratory	mg/L	~	Quarterly	20	20	~	~	294.1	408.7	343.2
Turbidity	BRC Central Laboratory	NTU	0.03	Quarterly	20	20	~	~	<0.03	0.45	0.17
Uranium	ALS	mg/L	0.001	Biannual	10	10	0.017	0	<0.001	<0.001	<0.001
Zinc	ALS	mg/L	0.005	Biannual	10	10	~	~	<0.005	0.010	0.008

Verification Monitoring – Moore Park Water Service Area July 2018 – June 2019 – SWA & Metals

Parameter	Laboratory Name	Unit of Measure	Limit of Reporting	Frequency of Sampling	Total No. Samples Collected	No. of Samples in which Parameter Detected	ADWG Health Value	No. of Samples Exceeding ADWG Health Value	Min Value	Max Value	Average Value
Alkalinity	BRC Central Laboratory	mg/L CaCO ₃	3.0	Quarterly	4	4	~	~	25	80	49
Aluminium	ALS	mg/L	0.01	Biannual	4	4	~	~	0.01	0.01	0.01
Antimony	ALS	mg/L	0.001	Biannual	4	4	0.003	0	<0.001	<0.001	<0.001
Arsenic	ALS	mg/L	0.001	Biannual	4	4	0.01	0	<0.001	<0.001	<0.001
Barium	ALS	mg/L	0.001	Biannual	4	4	2	0	0.028	0.033	0.031
Beryllium	ALS	mg/L	0.001	Biannual	4	4	0.06	0	<0.001	<0.001	<0.001
Boron	ALS	mg/L	0.05	Biannual	4	4	4	0	<0.05	0.05	0.05
Cadmium	ALS	mg/L	0.0001	Biannual	4	4	0.002	0	<0.0001	<0.0001	<0.0001
Calcium	BRC Central Laboratory	mg/L as Ca	1.0	Quarterly	4	4	~	~	9.50	21.47	14.01
Calcium Hardness	BRC Central Laboratory	mg/L CaCO ₃	1.0	Quarterly	4	4	~	~	23.8	53.7	35.1
Chloride	BRC Central Laboratory	mg/L as Cl ⁻	4.0	Quarterly	4	4	~	~	91.39	117.85	100.44
Chlorine (Free)	BRC Central Laboratory	mg/L	0.05	Monthly	61	61	5	0	0.18	1.23	0.77
Chromium	ALS	mg/L	0.001	Biannual	4	4	0.05	0	<0.001	<0.001	<0.001
Conductivity	BRC Central Laboratory	µS/cm	1.0	Quarterly	4	4	~	~	450	560	499
Colour (True)	BRC Central Laboratory	Pt.Co Units	0	Quarterly	4	4	15	0	0	0	0
Copper	ALS	mg/L	0.001	Biannual	4	4	2	0	0.006	0.025	0.015
Fluoride	BRC Central Laboratory	mg/L as F ⁻	0.25	Quarterly	4	4	1.5	0	<0.10	0.12	0.11
Hardness (Total)	BRC Central Laboratory	mg/L CaCO ₃	1.0	Quarterly	4	4	~	~	48.8	114.4	72.5
Iron	ALS	mg/L	0.05	Biannual	4	4	~	~	<0.05	<0.05	<0.05
Lanthanum	ALS	mg/L	0.001	Biannual	4	4	0.002	0	<0.001	<0.001	<0.001
Lead	ALS	mg/L	0.001	Biannual	4	4	0.01	0	<0.001	0.002	0.001
Magnesium	BRC Central Laboratory	mg/L as Mg	2.0	Quarterly	4	4	~	~	6.00	14.58	9.00
Manganese	ALS	mg/L	0.001	Biannual	4	4	0.5	0	<0.001	0.003	0.002
Molybdenum	ALS	mg/L	0.001	Biannual	4	4	0.05	0	<0.001	<0.001	<0.001

Verification Monitoring – Moore Park Water Service Area July 2018 – June 2019 – SWA & Metals – Cont'd											
Nickel	ALS	mg/L	0.001	Biannual	4	4	0.02	0	<0.001	0.001	0.001
Nitrate	BRC Central Laboratory	mg/L as NO ₃ ⁻	0.5	Quarterly	4	4	50	0	0.84	10.98	6.01
Nitrite	BRC Central Laboratory	mg/L as NO ₂ ⁻	0.1	Quarterly	4	4	3	0	<0.1	<0.1	<0.1
pH	BRC Central Laboratory	pH units @ 25°C	1.0	Monthly	61	61	~	~	7.23	7.79	7.53
Phosphate (Dissolved)	BRC Central Laboratory	mg/L as PO ₄ ³⁻	0.5	Quarterly	4	4	~	~	<0.25	<0.50	0.31
Potassium	BRC Central Laboratory	mg/L	1.0	Quarterly	4	4	~	~	1.39	2.27	1.82
Selenium	ALS	mg/L	0.01	Biannual	4	4	0.01	0	<0.01	<0.01	<0.01
Silver	ALS	mg/L	0.001	Biannual	4	4	0.1	0	<0.001	<0.001	<0.001
Sodium	BRC Central Laboratory	mg/L	2.5	Quarterly	4	4	~	~	63.55	74.84	69.01
Sulphate	BRC Central Laboratory	mg/L as SO ₄ ²⁻	4.5	Quarterly	4	4	500	0	5.14	54.42	27.53
Total Dissolved Solids	BRC Central Laboratory	mg/L	~	Quarterly	4	4	~	~	301.5	375.2	334.3
Turbidity	BRC Central Laboratory	NTU	0.03	Quarterly	4	4	~	~	<0.03	0.15	0.10
Uranium	ALS	mg/L	0.001	Biannual	4	4	0.017	0	<0.001	<0.001	<0.001
Zinc	ALS	mg/L	0.005	Biannual	4	4	~	~	0.006	0.035	0.025

Verification Monitoring – River Park Water Service Area July 2018 – June 2019 – SWA & Metals											
Parameter	Laboratory Name	Unit of Measure	Limit of Reporting	Frequency of Sampling	Total No. Samples Collected	No. of Samples in which Parameter Detected	ADWG Health Value	No. of Samples Exceeding ADWG Health Value	Min Value	Max Value	Average Value
Alkalinity	BRC Central Laboratory	mg/L CaCO ₃	3.0	Quarterly	4	4	~	~	75	87	81
Aluminium	ALS	mg/L	0.01	Biannual	4	4	~	~	0.01	0.04	0.03
Antimony	ALS	mg/L	0.001	Biannual	4	4	0.003	0	<0.001	<0.001	<0.001
Arsenic	ALS	mg/L	0.001	Biannual	4	4	0.01	0	<0.001	<0.001	<0.001
Barium	ALS	mg/L	0.001	Biannual	4	4	2	0	0.039	0.044	0.042
Beryllium	ALS	mg/L	0.001	Biannual	4	4	0.06	0	<0.001	<0.001	<0.001
Boron	ALS	mg/L	0.05	Biannual	4	4	4	0	<0.05	<0.05	<0.05
Cadmium	ALS	mg/L	0.0001	Biannual	4	4	0.002	0	<0.0001	<0.0001	<0.0001
Calcium	BRC Central Laboratory	mg/L as Ca	1.0	Quarterly	4	4	~	~	17.43	19.53	18.24
Calcium Hardness	BRC Central Laboratory	mg/L CaCO ₃	1.0	Quarterly	4	4	~	~	43.6	48.8	45.6
Chloride	BRC Central Laboratory	mg/L as Cl ⁻	4.0	Quarterly	4	4	~	~	73.15	115.58	87.03
Chlorine (Free)	BRC Central Laboratory	mg/L	0.05	Monthly	28	28	5	0	0.28	1.24	0.67
Chromium	ALS	mg/L	0.001	Biannual	4	4	0.05	0	<0.001	<0.001	<0.001
Conductivity	BRC Central Laboratory	µS/cm	1.0	Quarterly	4	4	~	~	487	687	556
Colour (True)	BRC Central Laboratory	Pt.Co Units	0	Quarterly	4	4	15	0	0	0	0
Copper	ALS	mg/L	0.001	Biannual	4	4	2	0	0.117	1.12	0.485
Fluoride	BRC Central Laboratory	mg/L as F ⁻	0.25	Quarterly	4	4	1.5	0	<0.10	0.17	0.12
Hardness (Total)	BRC Central Laboratory	mg/L CaCO ₃	1.0	Quarterly	4	4	~	~	91.8	125.0	105.7
Iron	ALS	mg/L	0.05	Biannual	4	4	~	~	<0.05	<0.05	<0.05
Lanthanum	ALS	mg/L	0.001	Biannual	4	4	0.002	0	<0.001	<0.001	<0.001
Lead	ALS	mg/L	0.001	Biannual	4	4	0.01	0	<0.001	0.002	0.001
Magnesium	BRC Central Laboratory	mg/L as Mg	2.0	Quarterly	4	4	~	~	11.39	18.29	14.41
Manganese	ALS	mg/L	0.001	Biannual	4	4	0.5	0	0.001	0.012	0.006
Molybdenum	ALS	mg/L	0.001	Biannual	4	4	0.05	0	<0.001	<0.001	<0.001

Verification Monitoring – River Park Water Service Area July 2018 – June 2019 – SWA & Metals – Cont'd											
Nickel	ALS	mg/L	0.001	Biannual	4	4	0.02	0	<0.001	<0.001	<0.001
Nitrate	BRC Central Laboratory	mg/L as NO ₃ ⁻	0.5	Quarterly	4	4	50	0	0.37	0.53	0.48
Nitrite	BRC Central Laboratory	mg/L as NO ₂ ⁻	0.1	Quarterly	4	4	3	0	<0.1	<0.1	<0.1
pH	BRC Central Laboratory	pH units @ 25°C	1.0	Monthly	26	26	~	~	7.09	7.64	7.41
Phosphate (Dissolved)	BRC Central Laboratory	mg/L as PO ₄ ³⁻	0.5	Quarterly	4	4	~	~	<0.25	<0.50	0.31
Potassium	BRC Central Laboratory	mg/L	1.0	Quarterly	4	4	~	~	3.79	4.54	4.20
Selenium	ALS	mg/L	0.01	Biannual	4	4	0.01	0	<0.01	<0.01	<0.01
Silver	ALS	mg/L	0.001	Biannual	4	4	0.1	0	<0.001	<0.001	<0.001
Sodium	BRC Central Laboratory	mg/L	2.5	Quarterly	4	4	~	~	59.46	77.07	67.71
Sulphate	BRC Central Laboratory	mg/L as SO ₄ ²⁻	4.5	Quarterly	4	4	500	0	42.93	51.60	49.29
Total Dissolved Solids	BRC Central Laboratory	mg/L	~	Quarterly	4	4	~	~	326.3	460.3	372.2
Turbidity	BRC Central Laboratory	NTU	0.03	Quarterly	4	4	~	~	<0.03	0.35	0.17
Uranium	ALS	mg/L	0.001	Biannual	4	4	0.017	0	<0.001	<0.001	<0.001
Zinc	ALS	mg/L	0.005	Biannual	4	4	~	~	0.014	0.034	0.025

Verification Monitoring – Rocky Point Water Service Area July 2018 – June 2019 – SWA & Metals

Parameter	Laboratory Name	Unit of Measure	Limit of Reporting	Frequency of Sampling	Total No. Samples Collected	No. of Samples in which Parameter Detected	ADWG Health Value	No. of Samples Exceeding ADWG Health Value	Min Value	Max Value	Average Value
Alkalinity	BRC Central Laboratory	mg/L CaCO ₃	3.0	Quarterly	4	4	~	~	24	29	26
Aluminium	ALS	mg/L	0.01	Biannual	4	4	~	~	0.01	0.02	0.02
Antimony	ALS	mg/L	0.001	Biannual	4	4	0.003	0	<0.001	<0.001	<0.001
Arsenic	ALS	mg/L	0.001	Biannual	4	4	0.01	0	<0.001	<0.001	<0.001
Barium	ALS	mg/L	0.001	Biannual	4	4	2	0	0.056	0.081	0.069
Beryllium	ALS	mg/L	0.001	Biannual	4	4	0.06	0	<0.001	<0.001	<0.001
Boron	ALS	mg/L	0.05	Biannual	4	4	4	0	<0.05	0.05	0.05
Cadmium	ALS	mg/L	0.0001	Biannual	4	4	0.002	0	<0.0001	<0.0001	<0.0001
Calcium	BRC Central Laboratory	mg/L as Ca	1.0	Quarterly	4	4	~	~	8.60	10.06	9.30
Calcium Hardness	BRC Central Laboratory	mg/L CaCO ₃	1.0	Quarterly	4	4	~	~	21.5	25.2	23.3
Chloride	BRC Central Laboratory	mg/L as Cl ⁻	4.0	Quarterly	4	4	~	~	46.13	66.05	58.20
Chlorine (Free)	BRC Central Laboratory	mg/L	0.05	Monthly	24	24	5	0	0.21	4.90	1.22
Chromium	ALS	mg/L	0.001	Biannual	4	4	0.05	0	<0.001	<0.001	<0.001
Conductivity	BRC Central Laboratory	µS/cm	1.0	Quarterly	4	4	~	~	254	325	300
Colour (True)	BRC Central Laboratory	Pt.Co Units	0	Quarterly	4	4	15	0	0	0	0
Copper	ALS	mg/L	0.001	Biannual	4	4	2	0	0.002	0.008	0.005
Fluoride	BRC Central Laboratory	mg/L as F ⁻	0.25	Quarterly	4	4	1.5	0	<0.10	0.13	0.11
Hardness (Total)	BRC Central Laboratory	mg/L CaCO ₃	1.0	Quarterly	4	4	~	~	26.8	53.5	42.9
Iron	ALS	mg/L	0.05	Biannual	4	4	~	~	<0.05	<0.05	<0.05
Lanthanum	ALS	mg/L	0.001	Biannual	4	4	0.002	0	<0.001	<0.001	<0.001
Lead	ALS	mg/L	0.001	Biannual	4	4	0.01	0	<0.001	<0.001	<0.001
Magnesium	BRC Central Laboratory	mg/L as Mg	2.0	Quarterly	4	4	~	~	0.54	6.80	4.71
Manganese	ALS	mg/L	0.001	Biannual	4	4	0.5	0	0.004	0.008	0.007
Molybdenum	ALS	mg/L	0.001	Biannual	4	4	0.05	0	<0.001	<0.001	<0.001

Verification Monitoring – Rocky Point Water Service Area July 2018 – June 2019 – SWA & Metals – Cont'd											
Nickel	ALS	mg/L	0.001	Biannual	4	4	0.02	0	<0.001	<0.001	<0.001
Nitrate	BRC Central Laboratory	mg/L as NO ₃ ⁻	0.5	Quarterly	4	4	50	0	17.5	22.54	19.65
Nitrite	BRC Central Laboratory	mg/L as NO ₂ ⁻	0.1	Quarterly	4	4	3	0	<0.1	<0.1	<0.1
pH	BRC Central Laboratory	pH units @ 25°C	1.0	Monthly	24	24	~	~	7.30	7.77	7.48
Phosphate (Dissolved)	BRC Central Laboratory	mg/L as PO ₄ ³⁻	0.5	Quarterly	4	4	~	~	<0.25	0.50	0.31
Potassium	BRC Central Laboratory	mg/L	1.0	Quarterly	4	4	~	~	1.62	1.82	1.74
Selenium	ALS	mg/L	0.01	Biannual	4	4	0.01	0	<0.01	<0.01	<0.01
Silver	ALS	mg/L	0.001	Biannual	4	4	0.1	0	<0.001	<0.001	<0.001
Sodium	BRC Central Laboratory	mg/L	2.5	Quarterly	4	4	~	~	30.49	39.78	35.32
Sulphate	BRC Central Laboratory	mg/L as SO ₄ ²⁻	4.5	Quarterly	4	4	500	0	5.52	6.90	6.40
Total Dissolved Solids	BRC Central Laboratory	mg/L	~	Quarterly	4	4	~	~	170.2	217.8	201.0
Turbidity	BRC Central Laboratory	NTU	0.03	Quarterly	4	4	~	~	<0.03	0.35	0.20
Uranium	ALS	mg/L	0.001	Biannual	4	4	0.017	0	<0.001	<0.001	<0.001
Zinc	ALS	mg/L	0.005	Biannual	4	4	~	~	<0.005	<0.005	<0.005

Verification Monitoring – Gooburrum Water Service Area July 2018 – June 2019 – SWA & Metals

Parameter	Laboratory Name	Unit of Measure	Limit of Reporting	Frequency of Sampling	Total No. Samples Collected	No. of Samples in which Parameter Detected	ADWG Health Value	No. of Samples Exceeding ADWG Health Value	Min Value	Max Value	Average Value
Alkalinity	BRC Central Laboratory	mg/L CaCO ₃	3.0	Quarterly	4	4	~	~	18	32	25
Aluminium	ALS	mg/L	0.01	Biannual	2	2	~	~	0.03	0.03	0.03
Antimony	ALS	mg/L	0.001	Biannual	2	2	0.003	0	<0.001	<0.001	<0.001
Arsenic	ALS	mg/L	0.001	Biannual	2	2	0.01	0	<0.001	<0.001	<0.001
Barium	ALS	mg/L	0.001	Biannual	2	2	2	0	0.02	0.03	0.28
Beryllium	ALS	mg/L	0.001	Biannual	2	2	0.06	0	<0.001	<0.001	<0.001
Boron	ALS	mg/L	0.05	Biannual	2	2	4	0	<0.05	<0.05	<0.05
Cadmium	ALS	mg/L	0.0001	Biannual	2	2	0.002	0	<0.0001	<0.0001	<0.0001
Calcium	BRC Central Laboratory	mg/L as Ca	1.0	Quarterly	4	4	~	~	7.62	12.37	9.52
Calcium Hardness	BRC Central Laboratory	mg/L CaCO ₃	1.0	Quarterly	4	4	~	~	19.0	30.9	23.8
Chloride	BRC Central Laboratory	mg/L as Cl ⁻	4.0	Quarterly	4	4	~	~	53.07	61.22	58.51
Chlorine (Free)	BRC Central Laboratory	mg/L	0.05	Monthly	24	24	5	0	0.14	1.09	0.61
Chromium	ALS	mg/L	0.001	Biannual	2	2	0.05	0	<0.001	<0.001	<0.001
Conductivity	BRC Central Laboratory	μS/cm	1.0	Quarterly	4	4	~	~	330	365	351
Colour (True)	BRC Central Laboratory	Pt.Co Units	0	Quarterly	4	4	15	0	0	2	1
Copper	ALS	mg/L	0.001	Biannual	2	2	2	0	0.007	0.010	0.009
Fluoride	BRC Central Laboratory	mg/L as F ⁻	0.25	Quarterly	4	4	1.5	0	<0.10	0.14	0.11
Hardness (Total)	BRC Central Laboratory	mg/L CaCO ₃	1.0	Quarterly	4	4	~	~	36.8	59.6	48.8
Iron	ALS	mg/L	0.05	Biannual	2	2	~	~	<0.05	<0.05	<0.05
Lanthanum	ALS	mg/L	0.001	Biannual	2	2	0.002	0	<0.001	<0.001	<0.001
Lead	ALS	mg/L	0.001	Biannual	2	2	0.01	0	0.002	0.003	0.003
Magnesium	BRC Central Laboratory	mg/L as Mg	2.0	Quarterly	4	4	~	~	4.26	6.66	6.00
Manganese	ALS	mg/L	0.001	Biannual	2	2	0.5	0	<0.001	0.001	0.001
Molybdenum	ALS	mg/L	0.001	Biannual	2	2	0.05	0	<0.001	<0.001	<0.001

Verification Monitoring – Gooburrum Water Service Area July 2018 – June 2019 – SWA & Metals – Cont'd											
Nickel	ALS	mg/L	0.001	Biannual	2	2	0.02	0	0.004	0.004	0.004
Nitrate	BRC Central Laboratory	mg/L as NO ₃ ⁻	0.5	Quarterly	4	4	50	0	33.59	35.16	34.20
Nitrite	BRC Central Laboratory	mg/L as NO ₂ ⁻	0.1	Quarterly	4	4	3	0	<0.1	<0.1	<0.1
pH	BRC Central Laboratory	pH units @ 25°C	1.0	Monthly	24	24	~	~	6.88	7.51	7.13
Phosphate (Dissolved)	BRC Central Laboratory	mg/L as PO ₄ ³⁻	0.5	Quarterly	4	4	~	~	<0.25	<0.50	0.31
Potassium	BRC Central Laboratory	mg/L	1.0	Quarterly	4	4	~	~	1.74	3.13	2.56
Selenium	ALS	mg/L	0.01	Biannual	2	2	0.01	0	<0.01	<0.01	<0.01
Silver	ALS	mg/L	0.001	Biannual	2	2	0.1	0	<0.001	<0.001	<0.001
Sodium	BRC Central Laboratory	mg/L	2.5	Quarterly	4	4	~	~	44.25	47.55	45.48
Sulphate	BRC Central Laboratory	mg/L as SO ₄ ²⁻	4.5	Quarterly	4	4	500	0	6.34	20.91	14.05
Total Dissolved Solids	BRC Central Laboratory	mg/L	~	Quarterly	4	4	~	~	221.1	244.6	235.0
Turbidity	BRC Central Laboratory	NTU	0.03	Quarterly	4	4	~	~	0.15	0.65	0.35
Uranium	ALS	mg/L	0.001	Biannual	2	2	0.017	0	<0.001	<0.001	<0.001
Zinc	ALS	mg/L	0.005	Biannual	2	2	~	~	0.023	0.049	0.036

Verification Monitoring – Gregory River Water Service Area July 2018 – June 2019 – SWA & Metals

Parameter	Laboratory Name	Unit of Measure	Limit of Reporting	Frequency of Sampling	Total No. Samples Collected	No. of Samples in which Parameter Detected	ADWG Health Value	No. of Samples Exceeding ADWG Health Value	Min Value	Max Value	Average Value
Alkalinity	BRC Central Laboratory	mg/L CaCO ₃	3.0	Quarterly	8	8	~	~	37	60	51
Aluminium	ALS	mg/L	0.01	Biannual	8	8	~	~	0.02	0.04	0.03
Antimony	ALS	mg/L	0.001	Biannual	8	8	0.003	0	<0.001	<0.001	<0.001
Arsenic	ALS	mg/L	0.001	Biannual	8	8	0.01	0	<0.001	<0.001	<0.001
Barium	ALS	mg/L	0.001	Biannual	8	8	2	0	0.044	0.052	0.048
Beryllium	ALS	mg/L	0.001	Biannual	8	8	0.06	0	<0.001	<0.001	<0.001
Boron	ALS	mg/L	0.05	Biannual	8	8	4	0	0.09	0.10	0.09
Cadmium	ALS	mg/L	0.0001	Biannual	8	8	0.002	0	<0.0001	<0.0001	<0.0001
Calcium	BRC Central Laboratory	mg/L as Ca	1.0	Quarterly	8	8	~	~	8.11	15.19	11.81
Calcium Hardness	BRC Central Laboratory	mg/L CaCO ₃	1.0	Quarterly	8	8	~	~	20.3	38.0	29.5
Chloride	BRC Central Laboratory	mg/L as Cl ⁻	4.0	Quarterly	8	8	~	~	66.30	196.97	136.68
Chlorine (Free)	BRC Central Laboratory	mg/L	0.05	Monthly	158	158	5	0	<0.05	2.11	0.86
Chromium	ALS	mg/L	0.001	Biannual	8	8	0.05	0	<0.001	<0.001	<0.001
Conductivity	BRC Central Laboratory	μS/cm	1.0	Quarterly	8	8	~	~	420	826	644
Colour (True)	BRC Central Laboratory	Pt.Co Units	0	Quarterly	8	8	15	0	0	1	0
Copper	ALS	mg/L	0.001	Biannual	8	8	2	0	0.003	0.140	0.009
Fluoride	BRC Central Laboratory	mg/L as F ⁻	0.25	Quarterly	8	8	1.5	0	<0.10	0.17	0.12
Hardness (Total)	BRC Central Laboratory	mg/L CaCO ₃	1.0	Quarterly	8	8	~	~	50.7	91.9	70.5
Iron	ALS	mg/L	0.05	Biannual	8	8	~	~	<0.05	<0.05	<0.05
Lanthanum	ALS	mg/L	0.001	Biannual	8	8	0.002	0	<0.001	<0.001	<0.001
Lead	ALS	mg/L	0.001	Biannual	8	8	0.01	0	<0.001	0.002	0.001
Magnesium	BRC Central Laboratory	mg/L as Mg	2.0	Quarterly	8	8	~	~	5.49	13.48	9.83
Manganese	ALS	mg/L	0.001	Biannual	8	8	0.5	0	<0.001	0.015	0.006
Molybdenum	ALS	mg/L	0.001	Biannual	8	8	0.05	0	<0.001	<0.001	<0.001

Verification Monitoring – Gregory River Water Service Area July 2018 – June 2019 – SWA & Metals – Cont'd											
Nickel	ALS	mg/L	0.001	Biannual	8	8	0.02	0	<0.001	<0.001	<0.001
Nitrate	BRC Central Laboratory	mg/L as NO ₃ ⁻	0.5	Quarterly	8	8	50	0	0.71	1.10	0.77
Nitrite	BRC Central Laboratory	mg/L as NO ₂ ⁻	0.1	Quarterly	8	8	3	0	<0.01	<0.01	<0.01
pH	BRC Central Laboratory	pH units @ 25°C	1.0	Monthly	155	155	~	~	6.99	7.80	7.35
Phosphate (Dissolved)	BRC Central Laboratory	mg/L as PO ₄ ³⁻	0.5	Quarterly	8	8	~	~	<0.25	<0.50	0.31
Potassium	BRC Central Laboratory	mg/L	1.0	Quarterly	8	8	~	~	2.60	4.41	3.63
Selenium	ALS	mg/L	0.01	Biannual	8	8	0.01	0	<0.01	<0.01	<0.01
Silver	ALS	mg/L	0.001	Biannual	8	8	0.1	0	<0.001	<0.001	<0.001
Sodium	BRC Central Laboratory	mg/L	2.5	Quarterly	8	8	~	~	56.81	126.26	98.41
Sulphate	BRC Central Laboratory	mg/L as SO ₄ ²⁻	4.5	Quarterly	8	8	500	0	33.17	46.90	38.94
Total Dissolved Solids	BRC Central Laboratory	mg/L	~	Quarterly	8	8	~	~	281.4	556.8	431.6
Turbidity	BRC Central Laboratory	NTU	0.03	Quarterly	8	8	~	~	<0.03	0.55	0.26
Uranium	ALS	mg/L	0.001	Biannual	8	8	0.017	0	<0.001	<0.001	<0.001
Zinc	ALS	mg/L	0.005	Biannual	8	8	~	~	<0.005	0.022	0.011

Verification Monitoring – Gin Gin Water Service Area July 2018 – June 2019 – SWA & Metals											
Parameter	Laboratory Name	Unit of Measure	Limit of Reporting	Frequency of Sampling	Total No. Samples Collected	No. of Samples in which Parameter Detected	ADWG Health Value	No. of Samples Exceeding ADWG Health Value	Min Value	Max Value	Average Value
Alkalinity	BRC Central Laboratory	mg/L CaCO ₃	3.0	Quarterly	4	4	~	~	49	121	87
Aluminium	ALS	mg/L	0.01	Biannual	4	4	~	~	<0.01	<0.01	<0.01
Antimony	ALS	mg/L	0.001	Biannual	4	4	0.003	0	<0.001	<0.001	<0.001
Arsenic	ALS	mg/L	0.001	Biannual	4	4	0.01	0	<0.001	<0.001	<0.001
Barium	ALS	mg/L	0.001	Biannual	4	4	2	0	0.020	0.030	0.028
Beryllium	ALS	mg/L	0.001	Biannual	4	4	0.06	0	<0.001	<0.001	<0.001
Boron	ALS	mg/L	0.05	Biannual	4	4	4	0	<0.05	<0.05	<0.05
Cadmium	ALS	mg/L	0.0001	Biannual	4	4	0.002	0	<0.0001	<0.0001	<0.0001
Calcium	BRC Central Laboratory	mg/L as Ca	1.0	Quarterly	4	4	~	~	9.98	26.64	19.29
Calcium Hardness	BRC Central Laboratory	mg/L CaCO ₃	1.0	Quarterly	4	4	~	~	25.0	66.6	48.2
Chloride	BRC Central Laboratory	mg/L as Cl ⁻	4.0	Quarterly	4	4	~	~	63.22	124.63	95.27
Chlorine (Free)	BRC Central Laboratory	mg/L	0.05	Monthly	62	62	5	0	0.18	2.60	1.26
Chromium	ALS	mg/L	0.001	Biannual	4	4	0.05	0	<0.001	<0.001	<0.001
Conductivity	BRC Central Laboratory	μS/cm	1.0	Quarterly	4	4	~	~	320	638	490
Colour (True)	BRC Central Laboratory	Pt.Co Units	0	Quarterly	4	4	15	0	0	0	0
Copper	ALS	mg/L	0.001	Biannual	4	4	2	0	0.007	0.010	0.009
Fluoride	BRC Central Laboratory	mg/L as F ⁻	0.25	Quarterly	4	4	1.5	0	0.12	0.21	0.17
Hardness (Total)	BRC Central Laboratory	mg/L CaCO ₃	1.0	Quarterly	4	4	~	~	47.4	143.2	100.1
Iron	ALS	mg/L	0.05	Biannual	4	4	~	~	<0.05	<0.05	<0.05
Lanthanum	ALS	mg/L	0.001	Biannual	4	4	0.002	0	<0.001	<0.001	<0.001
Lead	ALS	mg/L	0.001	Biannual	4	4	0.01	0	<0.001	0.005	0.002
Magnesium	BRC Central Laboratory	mg/L as Mg	2.0	Quarterly	4	4	~	~	5.40	18.39	12.47
Manganese	ALS	mg/L	0.001	Biannual	4	4	0.5	0	<0.001	0.006	0.003
Molybdenum	ALS	mg/L	0.001	Biannual	4	4	0.05	0	<0.001	<0.001	<0.001

Verification Monitoring – Gin Gin Water Service Area July 2018 – June 2019 – SWA & Metals – Cont'd											
Nickel	ALS	mg/L	0.001	Biannual	4	4	0.02	0	<0.001	0.002	0.001
Nitrate	BRC Central Laboratory	mg/L as NO ₃ ⁻	0.5	Quarterly	4	4	50	0	0.57	3.02	1.42
Nitrite	BRC Central Laboratory	mg/L as NO ₂ ⁻	0.1	Quarterly	4	4	3	0	<0.1	<0.1	<0.1
pH	BRC Central Laboratory	pH units @ 25°C	1.0	Monthly	61	61	~	~	7.21	8.21	7.61
Phosphate (Dissolved)	BRC Central Laboratory	mg/L as PO ₄ ³⁻	0.5	Quarterly	4	4	~	~	<0.25	<0.50	0.31
Potassium	BRC Central Laboratory	mg/L	1.0	Quarterly	4	4	~	~	1.88	2.59	2.28
Selenium	ALS	mg/L	0.01	Biannual	4	4	0.01	0	<0.01	<0.01	<0.01
Silver	ALS	mg/L	0.001	Biannual	4	4	0.1	0	<0.001	<0.001	<0.001
Sodium	BRC Central Laboratory	mg/L	2.5	Quarterly	4	4	~	~	40.09	71.66	56.79
Sulphate	BRC Central Laboratory	mg/L as SO ₄ ⁻	4.5	Quarterly	4	4	500	0	<1.00	5.75	3.49
Total Dissolved Solids	BRC Central Laboratory	mg/L	~	Quarterly	4	4	~	~	268.0	427.5	328.5
Turbidity	BRC Central Laboratory	NTU	0.03	Quarterly	4	4	~	~	<0.03	0.65	0.26
Uranium	ALS	mg/L	0.001	Biannual	4	4	0.017	0	<0.001	<0.001	<0.001
Zinc	ALS	mg/L	0.005	Biannual	4	4	~	~	<0.005	0.020	0.012

Verification Monitoring – Wallaville Water Service Area July 2018 – June 2019 – SWA & Metals

Parameter	Laboratory Name	Unit of Measure	Limit of Reporting	Frequency of Sampling	Total No. Samples Collected	No. of Samples in which Parameter Detected	ADWG Health Value	No. of Samples Exceeding ADWG Health Value	Min Value	Max Value	Average Value
Alkalinity	BRC Central Laboratory	mg/L CaCO ₃	3.0	Quarterly	4	4	~	~	45	98	72
Aluminium	ALS	mg/L	0.01	Biannual	4	4	~	~	0.04	0.05	0.05
Antimony	ALS	mg/L	0.001	Biannual	4	4	0.003	0	<0.001	<0.001	<0.001
Arsenic	ALS	mg/L	0.001	Biannual	4	4	0.01	0	<0.001	<0.001	<0.001
Barium	ALS	mg/L	0.001	Biannual	4	4	2	0	0.052	0.066	0.059
Beryllium	ALS	mg/L	0.001	Biannual	4	4	0.06	0	<0.001	<0.001	<0.001
Boron	ALS	mg/L	0.05	Biannual	4	4	4	0	<0.05	<0.05	<0.05
Cadmium	ALS	mg/L	0.0001	Biannual	4	4	0.002	0	<0.0001	<0.0001	<0.0001
Calcium	BRC Central Laboratory	mg/L as Ca	1.0	Quarterly	4	4	~	~	17.60	34.00	23.45
Calcium Hardness	BRC Central Laboratory	mg/L CaCO ₃	1.0	Quarterly	4	4	~	~	44.0	85.0	58.6
Chloride	BRC Central Laboratory	mg/L as Cl ⁻	4.0	Quarterly	4	4	~	~	79.69	156.86	122.99
Chlorine (Free)	BRC Central Laboratory	mg/L	0.05	Monthly	37	37	5	0	<0.05	2.96	1.37
Chromium	ALS	mg/L	0.001	Biannual	4	4	0.05	0	<0.01	<0.01	<0.01
Conductivity	BRC Central Laboratory	μS/cm	1.0	Quarterly	4	4	~	~	450	789	618
Colour (True)	BRC Central Laboratory	Pt.Co Units	0	Quarterly	4	4	15	0	0	0	0
Copper	ALS	mg/L	0.001	Biannual	4	4	2	0	0.004	0.034	0.012
Fluoride	BRC Central Laboratory	mg/L as F ⁻	0.25	Quarterly	4	4	1.5	0	<0.10	0.20	0.14
Hardness (Total)	BRC Central Laboratory	mg/L CaCO ₃	1.0	Quarterly	4	4	~	~	99.8	186.5	136.8
Iron	ALS	mg/L	0.05	Biannual	4	4	~	~	<0.05	<0.05	<0.05
Lanthanum	ALS	mg/L	0.001	Biannual	4	4	0.002	0	<0.001	<0.001	<0.001
Lead	ALS	mg/L	0.001	Biannual	4	4	0.01	0	<0.001	0.002	0.001
Magnesium	BRC Central Laboratory	mg/L as Mg	2.0	Quarterly	4	4	~	~	13.40	24.35	18.76
Manganese	ALS	mg/L	0.001	Biannual	4	4	0.5	0	<0.001	0.002	0.002
Molybdenum	ALS	mg/L	0.001	Biannual	4	4	0.05	0	<0.01	<0.01	<0.01

Verification Monitoring – Wallaville Water Service Area July 2018 – June 2019 – SWA & Metals – Cont'd											
Nickel	ALS	mg/L	0.001	Biannual	4	4	0.02	0	<0.001	0.001	0.001
Nitrate	BRC Central Laboratory	mg/L as NO ₃ ⁻	0.5	Quarterly	4	4	50	0	0.33	0.95	0.72
Nitrite	BRC Central Laboratory	mg/L as NO ₂ ⁻	0.1	Quarterly	4	4	3	0	<0.1	<0.1	<0.1
pH	BRC Central Laboratory	pH units @ 25°C	1.0	Monthly	37	37	~	~	7.36	8.32	7.59
Phosphate (Dissolved)	BRC Central Laboratory	mg/L as PO ₄ ³⁻	0.5	Quarterly	4	4	~	~	<0.25	<0.50	0.31
Potassium	BRC Central Laboratory	mg/L	1.0	Quarterly	4	4	~	~	3.19	4.49	4.02
Selenium	ALS	mg/L	0.01	Biannual	4	4	0.01	0	<0.01	<0.01	<0.01
Silver	ALS	mg/L	0.001	Biannual	4	4	0.1	0	<0.001	<0.001	<0.001
Sodium	BRC Central Laboratory	mg/L	2.5	Quarterly	4	4	~	~	46.73	71.81	63.43
Sulphate	BRC Central Laboratory	mg/L as SO ₄ ⁻	4.5	Quarterly	4	4	500	0	35.67	43.12	39.14
Total Dissolved Solids	BRC Central Laboratory	mg/L	~	Quarterly	4	4	~	~	301.5	528.6	414.2
Turbidity	BRC Central Laboratory	NTU	0.03	Quarterly	4	4	~	~	<0.03	0.25	0.15
Uranium	ALS	mg/L	0.001	Biannual	4	4	0.017	0	<0.001	<0.001	<0.001
Zinc	ALS	mg/L	0.005	Biannual	4	4	~	~	0.008	0.041	0.02

Verification Monitoring – Lake Monduran Water Service Area July 2018 – June 2019 – SWA & Metals

Parameter	Laboratory Name	Unit of Measure	Limit of Reporting	Frequency of Sampling	Total No. Samples Collected	No. of Samples in which Parameter Detected	ADWG Health Value	No. of Samples Exceeding ADWG Health Value	Min Value	Max Value	Average Value
Alkalinity	BRC Central Laboratory	mg/L CaCO ₃	3.0	Quarterly	4	4	~	~	58	64	61
Aluminium	ALS	mg/L	0.01	Biannual	2	2	~	~	0.02	0.02	0.02
Antimony	ALS	mg/L	0.001	Biannual	2	2	0.003	0	<0.001	<0.001	<0.001
Arsenic	ALS	mg/L	0.001	Biannual	2	2	0.01	0	<0.001	<0.001	<0.001
Barium	ALS	mg/L	0.001	Biannual	2	2	2	0	0.017	0.018	0.018
Beryllium	ALS	mg/L	0.001	Biannual	2	2	0.06	0	<0.001	<0.001	<0.001
Boron	ALS	mg/L	0.05	Biannual	2	2	4	0	<0.05	<0.05	<0.05
Cadmium	ALS	mg/L	0.0001	Biannual	2	2	0.002	0	<0.0001	<0.0001	<0.0001
Calcium	BRC Central Laboratory	mg/L as Ca	1.0	Quarterly	4	4	~	~	11.77	15.39	13.20
Calcium Hardness	BRC Central Laboratory	mg/L CaCO ₃	1.0	Quarterly	4	4	~	~	29.4	38.5	33.0
Chloride	BRC Central Laboratory	mg/L as Cl ⁻	4.0	Quarterly	4	4	~	~	31.35	35.10	32.79
Chlorine (Free)	BRC Central Laboratory	mg/L	0.05	Monthly	12	12	5	0	<0.05	1.41	0.55
Chromium	ALS	mg/L	0.001	Biannual	2	2	0.05	0	<0.001	<0.001	<0.001
Conductivity	BRC Central Laboratory	μS/cm	1.0	Quarterly	4	4	~	~	230	244	237
Colour (True)	BRC Central Laboratory	Pt.Co Units	0	Quarterly	4	4	15	0	0	0	0
Copper	ALS	mg/L	0.001	Biannual	2	2	2	0	0.004	0.257	0.048
Fluoride	BRC Central Laboratory	mg/L as F ⁻	0.25	Quarterly	4	4	1.5	0	<0.10	0.19	0.14
Hardness (Total)	BRC Central Laboratory	mg/L CaCO ₃	1.0	Quarterly	4	4	~	~	47.2	55.0	50.4
Iron	ALS	mg/L	0.05	Biannual	2	2	~	~	<0.05	0.06	0.05
Lanthanum	ALS	mg/L	0.001	Biannual	2	2	0.002	0	<0.001	<0.001	<0.001
Lead	ALS	mg/L	0.001	Biannual	2	2	0.01	0	<0.001	0.001	0.001
Magnesium	BRC Central Laboratory	mg/L as Mg	2.0	Quarterly	4	4	~	~	3.22	5.74	4.18
Manganese	ALS	mg/L	0.001	Biannual	2	2	0.5	0	0.002	0.003	0.003
Molybdenum	ALS	mg/L	0.001	Biannual	2	2	0.05	0	<0.001	<0.001	<0.001

Verification Monitoring – Lake Monduran Water Service Area July 2018 – June 2019 – SWA & Metals – Cont'											
Nickel	ALS	mg/L	0.001	Biannual	2	2	0.02	0	<0.001	0.003	0.01
Nitrate	BRC Central Laboratory	mg/L as NO ₃ ⁻	0.5	Quarterly	4	4	50	0	0.59	1.08	0.88
Nitrite	BRC Central Laboratory	mg/L as NO ₂ ⁻	0.1	Quarterly	4	4	3	0	<0.1	<0.1	<0.1
pH	BRC Central Laboratory	pH units @ 25°C	1.0	Monthly	12	12	~	~	7.46	8.04	7.76
Phosphate (Dissolved)	BRC Central Laboratory	mg/L as PO ₄ ³⁻	0.5	Quarterly	4	4	~	~	<0.25	<0.50	0.31
Potassium	BRC Central Laboratory	mg/L	1.0	Quarterly	4	4	~	~	2.24	2.46	2.38
Selenium	ALS	mg/L	0.01	Biannual	2	2	0.01	0	<0.01	<0.01	<0.01
Silver	ALS	mg/L	0.001	Biannual	2	2	0.1	0	<0.001	<0.001	<0.001
Sodium	BRC Central Laboratory	mg/L	2.5	Quarterly	4	4	~	~	25.73	27.60	26.69
Sulphate	BRC Central Laboratory	mg/L as SO ₄ ⁻	4.5	Quarterly	4	4	500	0	<1.00	2.31	1.53
Total Dissolved Solids	BRC Central Laboratory	mg/L	~	Quarterly	4	4	~	~	154.1	163.5	159.0
Turbidity	BRC Central Laboratory	NTU	0.03	Quarterly	4	4	~	~	<0.03	0.20	0.13
Uranium	ALS	mg/L	0.001	Biannual	2	2	0.017	0	<0.001	<0.001	<0.001
Zinc	ALS	mg/L	0.005	Biannual	2	2	~	~	<0.005	0.010	0.008

Table 2. Verification Monitoring Results – Pesticides – All Detected WSA's

Scheme Name	Scheme Component	Parameter	Laboratory Name	Unit of Measure	Limit of Reporting	Frequency of sampling	Total No. samples collected	No. of Samples in which Parameter Detected	ADWG Health Value	No. of samples exceeding ADWG Health Value	Min Value	Max Value	Average Value
Bundaberg WSA	Branyan WTP Reservoir	Atrazine	F&SS	µg/L	0.01	Quarterly	24	24	20	0	<0.02	0.03	0.02
		Hexazinone	F&SS	µg/L	0.01	Quarterly	24	24	400	0	<0.01	0.02	0.01
		Metolachlor	F&SS	µg/L	0.01	Quarterly	24	24	300	0	<0.01	0.03	0.01
	Powers St WTP Reservoir	Bromacil	F&SS	µg/L	0.01	Quarterly	24	24	400	0	<0.02	0.08	0.03
Kalkie WSA	Kalkie WTP Reservoir	Atrazine	F&SS	µg/L	0.01	Quarterly	4	4	20	0	<0.02	0.04	0.03
		Hexazinone	F&SS	µg/L	0.01	Quarterly	4	4	400	0	<0.01	0.03	0.02
		Metolachlor	F&SS	µg/L	0.01	Quarterly	4	4	300	0	<0.01	<0.02	0.01
Moore Park WSA	Vecellios Rd Reservoir	Atrazine	F&SS	µg/L	0.01	Quarterly	7	7	20	0	<0.02	0.20	0.06
		Hexazinone	F&SS	µg/L	0.01	Quarterly	7	7	400	0	<0.01	<0.02	0.01
		Metolachlor	F&SS	µg/L	0.01	Quarterly	7	7	300	0	<0.01	0.02	0.01
Gregory River WSA	Gregory River Reservoir	Atrazine	F&SS	µg/L	0.01	Quarterly	4	4	20	0	<0.02	0.32	0.14
		Diuron	F&SS	µg/L	0.01	Quarterly	4	4	20	0	<0.02	<0.05	0.03
		Hexazinone	F&SS	µg/L	0.01	Quarterly	4	4	400	0	<0.01	<0.02	0.01
		Metolachlor	F&SS	µg/L	0.01	Quarterly	4	4	300	0	<0.01	0.15	0.08
River Park WSA	River Park Reservoir	Atrazine	F&SS	µg/L	0.01	Quarterly	4	4	20	0	<0.02	0.09	0.05
		Hexazinone	F&SS	µg/L	0.01	Quarterly	4	4	400	0	0.03	0.06	0.04
		Metolachlor	F&SS	µg/L	0.01	Quarterly	4	4	300	0	0.01	0.07	0.03
Wallaville WSA	Wallaville Reservoir	Atrazine	F&SS	µg/L	0.01	Quarterly	4	4	20	0	<0.02	0.20	0.07
		Hexazinone	F&SS	µg/L	0.01	Quarterly	4	4	400	0	0.02	0.05	0.04
		Metolachlor	F&SS	µg/L	0.01	Quarterly	4	4	300	0	0.01	0.21	0.07

The Bundaberg Regional Council carries out full and comprehensive pesticide analysis on a routine basis. The above table only includes detections of a characteristic that has an ADWG Health Value.

Table 3. Verification Monitoring Results – E. coli – All WSA's

Drinking Water Scheme	Bundaberg WSA											
Year	2018 / 2019											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	17	18	16	16	16	16	16	16	16	16	22	16
No. of samples collected in which <i>E. coli</i> 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	179	180	180	180	179	195	195	195	195	195	201	201
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%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
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

The Public Health Regulation 2005 (the regulation) requires 98 percent 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)

Drinking Water Scheme	Kalkie WSA											
Year	2018 / 2019											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	9	8	11	8	9	8	9	8	18	8	9	8
No. of samples collected in which <i>E. coli</i> 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	102	102	104	104	104	104	104	104	113	113	113	113
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%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
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

The Public Health Regulation 2005 (the regulation) requires 98 percent 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)

Drinking Water Scheme	Moore Park WSA											
Year	2018 / 2019											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	5	5	6	5	5	5	5	5	5	5	5	5
No. of samples collected in which <i>E. coli</i> 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	61	62	61	61	61	61	61	61	61	61	61
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%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
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

The Public Health Regulation 2005 (the regulation) requires 98 percent 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)

Drinking Water Scheme	River Park WSA											
Year	2018 / 2019											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	2	2	4	2	2	2	2	2	4	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	0	0	0	0	0	0
No. of samples collected in previous 12 month period	24	24	26	26	26	26	26	26	28	28	28	28
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%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
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

The Public Health Regulation 2005 (the regulation) requires 98 percent 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)

Drinking Water Scheme	Rocky Point WSA											
Year	2018 / 2019											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	2	2	2	2	2	2	2	2	2	2	2	2
No. of samples collected in which <i>E. coli</i> 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	22	22	22	24	24	24	24	24	24	24	24	24
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
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

The Public Health Regulation 2005 (the regulation) requires 98 percent 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)

Drinking Water Scheme	Gooburrum WSA											
Year	2018 / 2019											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	2	2	2	2	2	2	2	2	2	2	2	2
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	24	24	24	24	24	24	24	24	24	24	24	24
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
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

The Public Health Regulation 2005 (the regulation) requires 98 percent 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)

Drinking Water Scheme	Gregory River WSA											
Year	2018 / 2019											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	13	14	12	13	13	14	13	13	13	13	14	13
No. of samples collected in which <i>E. coli</i> 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	156	157	156	156	156	157	157	157	157	157	158	158
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%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
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

The Public Health Regulation 2005 (the regulation) requires 98 percent 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)

Drinking Water Scheme	Gin Gin WSA											
Year	2018 / 2019											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	5	5	5	5	5	5	5	5	5	5	6	6
No. of samples collected in which <i>E. coli</i> 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	61	61	61	61	61	61	60	60	60	61	62
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%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
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

The Public Health Regulation 2005 (the regulation) requires 98 percent 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)

Drinking Water Scheme	Wallaville WSA											
Year	2018 / 2019											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	3	3	3	3	3	4	3	3	3	3	3	3
No. of samples collected in which <i>E. coli</i> 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	36	36	36	36	36	37	37	37	37	37	37	37
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%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
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

The Public Health Regulation 2005 (the regulation) requires 98 percent 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)

Drinking Water Scheme	Lake Monduran WSA											
Year	2018 / 2019											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	1	1	1	1	1	1	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	0	0	0	0	0	0
No. of samples collected in previous 12 month period	12	12	12	12	12	12	12	12	12	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%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
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

The Public Health Regulation 2005 (the regulation) requires 98 percent 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. Summary of Trihalomethane Sampling – 2018/2019

Water Service Area	Frequency of Sampling	Total No. of Samples	No. of Samples Exceeding ADWG Health Guideline of 250 µg/L	Value of Exceedances (µg/L)
Bundaberg WSA	Quarterly	23	0	-
Kalkie WSA	Quarterly	20	0	-
Gregory River WSA	Quarterly	16	10	300, 280, 260, 270, 380, 390, 310, 390, 250, 280
Moore Park WSA	Quarterly	8	0	-
Gin Gin WSA	Quarterly	8	0	-
River Park WSA	Quarterly	8	0	-
Gooburrum WSA	Quarterly	4	0	-
Rocky Point WSA	Quarterly	4	0	-
Wallaville WSA	Quarterly	8	0	-
Lake Monduran WSA	Quarterly	4	3	280, 350, 260
	Totals	103	13	-

Appendix B – Implementation of the DWQMP Risk Management Improvement Program

Table 1. Improvement Program

Unique Action No.	Proposed Action	Priority Rating	Outcome	Allocated Responsibility	Target Completion Date
18-01	A number of water treatment plants do not have online chlorine analyzers. This was identified as a risk as chlorine is a major disinfection barrier. BRC will install online chlorine analyzers that will include high and low level alarms on all plants that use chlorine for disinfection (which is all current BRC water treatment plants). (Lake Monduran & Rocky Point WTPs – remaining to have online chlorine analysers installed).	1	Implementation plan for the installation of chlorine analyzers	Manager Process & Asset Management	Jun 2020
18-02	After the DNRME review of the DWQMP Section 3 (Risk Assessment), BRC is to provide a briefing to SunWater and DoH regarding the findings of the risk assessment	1	Communication of water quality risks with BRC stakeholders	Manager Process & Asset Management	Mar 2020
18-03	Review the options to improve the security around the Bundaberg Bore Treatment Plants. – Has now progressed to be part of a detailed study/assessment within the 19/20 Council budget.	1	Security improvements options assessment	Manager Planning & Delivery	Jun 2020
18-04	Identify initial procedures and work instructions required to support the CCP program	2	List of support procedures	Compliance Technical Officer	Jun 2020
18-05	Prepare and implement listed procedures and instructions to support the CCP program.	2	CCP support procedures	Compliance Technical Officer	Sep 2020
18-06	Annual Review of Risk Management Plans and associated Risk Tables to reflect any changes in operational practices, new unforeseen risks and potential changes in legislation. Program an annual review of Risk Management Plans.	1	Annual Review of Risk Management Plans	Compliance Technical Officer	Ongoing Each Year - Annual Review
18-07	Implementation plan for the development of an Operations Manual for each WTP to incorporate DWQMP elements. This will include a Process Control Plan for each process unit for all water treatment plants. (Critical Control Point Plan).	3	Implementation Plan for Operations Manual	Manager Process & Asset Management	Jun 2020

Unique Action No.	Proposed Action	Priority Rating	Outcome	Allocated Responsibility	Target Completion Date
18-08	Develop a Drinking Water Incident Response Manual for the Management of Incidents and Emergencies. (Roles & Responsibilities, Response Procedures and Plans, Training and Awareness, Induction, Practice Drills). Incorporate Taste & Odour Events Procedure (MIB/ Geosmin) this will incorporate the management of PAC operation at all WTP's where a PAC installation is currently available. This will be extended to the remaining WTP's as PAC systems are installed.	3	Incident Response Manual	Manager Process & Asset Management	Jun 2020
18-10	Development of the BRC website to incorporate Water & Wastewater performance data and statistics. To include provision for more community education on water and wastewater. This could also include information on cross connections and backflows. KPI performance information may also be included.	3	Improved website with more community information	Manager Process & Asset Management	On-Going Development
18-11	Monthly review of the DWQMP Improvement Program to ensure continual adherence to target timelines. Assess whether target dates are achievable and re-evaluate where required.	1	Regular oversight of Improvement Plan to ensure commitment to drinking water quality management.	Manager Process & Asset Management	On-Going Quarterly Review
18-14	BRC to continue to develop and link operational procedures and information into the BRC Water Services Operations Manual. The Operations Manual is a repository and link to all things water and wastewater undertake. A portal to IMS procedures, operational workflows, processes, practices and responsible persons.	3	Development of the BRC Water Services Operations Manual	Manager Process & Asset Management	June 2020
18-15	Identify improvements for long term water quality analysis from annual review of operational performance by reviewing Incidents/Exceedances.	1	Annual review of monitoring programs	Manager Process & Asset Management	On-Going Annual Review (2019 – Completed 30/04/19)

Unique Action No.	Proposed Action	Priority Rating	Outcome	Allocated Responsibility	Target Completion Date
18-18	Implement a Process Control Plan for each process unit for all water treatment plants. (Critical Control Point Plan) This plan will be written into the Operations Manual.	3	Critical Control Point Plan for all WTP's.	Compliance Technical Officer	Mar 2020
18-19	Gregory River Water Treatment Plant (WTP) identified improvement measures; Build a new WTP beside the existing WTP. This will incorporate online instrumentation (e.g. turbidimeters, pH meters, & free chlorine residual analysers. Coagulation/flocculation/sedimentation/filtration/disinfection process replacing the existing DAF process. Will also incorporate powdered activated carbon (PAC) dosing system and a PAC contact tank. Reconfiguration of the filters to use dual filter media.	2	Upgraded Water Treatment Plant	Manager Planning & Delivery	2020 (Capital Investment Plan) Design Stage Completed June 2018

Unique Action No.	Proposed Action	Priority Rating	Outcome	Allocated Responsibility	Target Completion Date
18-21	Kalkie Water Treatment Plant (WTP) implementation plan. The Kalkie WTP implementation plan identified the following improvement measures; Upgrade the existing Kalkie WTP. The plant process will have conventional units such as – Coagulation/flocculation/sedimentation/filtration/disinfection process replacing the existing DAF process. The upgraded plant will incorporate powdered activated carbon (PAC) dosing system and a PAC contact tank. Upgrade the alum storage and dosing system to a new bulk liquid coagulant storage and dosing system; Establish a new bulk bag PAC handling and dosing facility to replace the existing PAC system that uses 15kg bags; Set up an acid (preferably sulphuric acid) storage and dosing facility to enable flexibility in achieving the desired coagulation pH target; Install online instrumentation (e.g., turbidimeters, pH meter and free chlorine residual analysers; Install a sedimentation process to increase the solids removal capacity and improve the clarified water quality (turbidity as well as TOC) and provide a robust treatment process for prolonged raw water turbidity events;	1	Development of an Implementation Plan	Manager Planning & Delivery	Design Complete Jun 2018 Construction 2020/21

Unique Action No.	Proposed Action	Priority Rating	Outcome	Allocated Responsibility	Target Completion Date
18-22	Lake Monduran Water Treatment Plants (WTP) identified improvement measures; - Investigate alternative treatment options to address removal of organics, and algal hazards. Option 1 – Upgrade to Existing Plant - Additional pre-treatment process for coagulation and settling to remove of organics and algal removal prior to filtration; - Establish a PAC dosing and storage facility and contact tank to address raw water source algal bloom risks. - Implementation of control system to include pump operation and filter operation to ensure operation and reliability of the plant; - Filter media replacement; - Differential pressure testing for the filters to ensure the performance of the filters post backwashing; Removal and replacement of the elevated storage tank – (Completed 07/05/2013). Option 2 - Investigate other Treatment Technology Options Option 3 - BRC may decide to make this water service scheme a non-potable scheme due the high capital costs to upgrade the WTP with a low number of connections.	3	Development of an Implementation Plan	Manager Process & Asset Management	Dependent upon Council decision & budget

Unique Action No.	Proposed Action	Priority Rating	Outcome	Allocated Responsibility	Target Completion Date
18-24	All Ground Water Treatment Plants (GWTP's): Consideration being given to in-line turbidimeters.	3	Consideration only, outcome will need to be determined. Currently on hold, outcome will be subject to a detailed assessment of the Bundaberg Groundwater system being completed.	Manager Process & Asset Management	Jun 2020 (Subject to priorities) On Hold
18-26	All Reservoirs: An investigation is required to establish a reservoir cleaning program.	1	Formal reservoir cleaning schedule	Manager Process & Asset Management	Dec 2019
18-27	Kalkie WTP: A review of the supernatant return point in the off-stream storage is required. The potential exists for short circuiting to occur. This is to be rectified with the plant upgrade as per item 18-21 above.	1	Investigation only, outcome will need to be determined. Supernatant return upgrade will be incorporated in the 2019 WTP upgrade. Refer UAN 18-21	Manager Process & Asset Management	Align with Upgrade 2020

Unique Action No.	Proposed Action	Priority Rating	Outcome	Allocated Responsibility	Target Completion Date
18-28	Wallaville Water Treatment Plant (WTP) identified improvement measures; Option 1 – Upgrade to Existing Plant - Establish a PAC dosing and storage facility and contact tank to address raw water source algal bloom risks Option 2 – Alternative raw water supply - Groundwater supply is currently being investigated. Option 3 - Investigate alternative Treatment Technology Options.	3	Potential for a PAC Dosing installation. An alternate raw water supply is now being investigated. Draft report to be submitted	Manager Process & Asset Management	Dependent on Council Decision & Budget (TBA) Dec 2019
18-29	Remove any statements of the level of each critical limit throughout the DWQMP. Create an appendix as the sole point of reference to avoid mismatches. This was identified in the DWQMP Review.	3	Central point of reference with the DWQMP.	Compliance Technical Officer	Completed Jun 2019
18-30	Add new identified Risks to Risk Tables - Vandenberg Bore Repair-Patch - Gooburru Patch - Caryle Gardens – Private Chlorine Injection - Branyan WTP Reservoir, micro check following overflow - Ground WTP Spray Bed - potential for Micro contamination - Zandes Lane Bores – Potential for contamination. - Gin Gin PAC to Risk Tables - Lake Monduran Process changes to risk tables	1	Identified risks added to Risk tables	Compliance Technical Officer	Completed Jun 2019

Unique Action No.	Proposed Action	Priority Rating	Outcome	Allocated Responsibility	Target Completion Date
18-31	Alter Lake Monduran CCP Diagrams to reflect process control changes.	1	Relevant and up to date CCP Diagrams	Compliance Technical Officer	Completed Jun 2019
18-32	Develop a formal BRC Water & Wastewater Drinking Water Quality Policy statement for inclusion into the DWQMP.	2	Creation of formal drinking water quality policy statement.	Compliance Technical Officer	Completed Jun 2019
18-33	Develop pH calibration record sheets within the WTP operational logs for all WTP's, in lieu of calibration stickers.	1	Formal Calibration Log	Compliance Technical Officer	Complete Jun 2018
18-34	Add Contact Time (CT) tables to WTP operational logs.	1	CT Reference Point	Manager Process & Asset Management	Mar 2020
18-35	Recommendation (REF: REC-001/16): Critical Control Points (CCP) and Quality Control Points (QCP) should be reviewed and updated to ensure that each CCP/QCP is a current process and that there is a defined critical limit at which action must be taken to reduce or remove a hazard. Re-assess if some CCP's can now be QCP's.	1	CCP's/QCP's are current to ensure hazards are minimised or removed.	Workshop: Treatment & Governance Teams	Jun 2020
18-36	Recommendation (REF: REC-002/16): Review and update process flow diagrams to ensure that they accurately reflect the current scheme conditions.	1	Flow diagrams will be an up to date reflection of the process.	Compliance Technical Officer	Completed Jun 2019
18-37	OFI (REF: OFI-001/16): It is recommended that once critical limits are reviewed (refer to recommendation REC-001/16) and updated, that the ability to change set points within the SCADA system is limited to supervisors or managers, with an appropriate process in place to assess, approve and document any changes made.	1	SCADA changes are secure and limited to managerial/supervisory staff.	Compliance Technical Officer	Sep 2020

Unique Action No.	Proposed Action	Priority Rating	Outcome	Allocated Responsibility	Target Completion Date
18-38	OFI (REF: OFI 002/16): It is recommended that calibration stickers are updated at the time of calibration, or when a probe is replaced, to clearly identify where equipment is within the calibration date, or if calibration has lapsed.	1	Enhanced clarity of calibration status and sound recording practises.	Compliance Technical Officer	Completed (Refer to UAN 18-33)
18-39	OFI (REF: OFI-003/16): It is recommended that a visual assessment of reservoir condition be undertaken at a higher frequency than currently implemented to identify obvious integrity breaches, for example weekly or fortnightly, and to trigger prompt and timely corrective actions.	1	Reservoirs are inspected regularly for obvious faults or damage.	Treatment Coordinator	Completed Dec 2018
18-40	Add critical/sensitive customers (Hospitals, Clinics, Brewed Drinks, etc.) to DWQMP Continuity Plan.	1	Central point for identifying who are critical customers	Compliance Technical Officer	Mar 2020
18-41	Review DWQMP for currency and relevance.	1	Up to date and relevant DWQMP	Manager Process & Asset Management	Completed Jun 2019
18-42	Undertake an assessment of the Bundaberg groundwater treatment system. This will assess WTP/bore interconnectivity, minimisation of risks, multi-barriers along with whole of life costs and alternatives to spray beds.	2	Provision of available options in regard to the future operational direction of the Bundaberg groundwater treatment system.	Manager Process & Asset Management	Oct 2020

Unique Action No.	Proposed Action	Priority Rating	Outcome	Allocated Responsibility	Target Completion Date
18-44	An audit of all SCADA sites undertaken with the development of an implementation plan for the identification, management and control of cybersecurity risks. These risks and controls will be incorporated into the Drinking Water Quality Management Plan. (Audit completed – May 2019).	2	Address cybersecurity risks in the management and control of Drinking Water.	Manager Process & Asset Management	Mar 2020
18-45	Water & Wastewater Disaster Business Continuity Plan requires updating to now reflect business name change (Water Services). Content also needs to be brought up to date.	2	Up to date and relevant Disaster Business Continuity Plan.	Manager Process & Asset Management	Dec 2019