

# Drinking Water Quality Management Plan Report

2019-2020

SPID: 476



This report has been prepared in accordance with the Drinking Water  
Quality Management Plan Report Guidance Note

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## 1. Service Provider Details

Detail	Information
SPID	476
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BRC Water Services	<a href="mailto:WaterServicesAdmin@bundaberg.qld.gov.au">WaterServicesAdmin@bundaberg.qld.gov.au</a>
Website	<a href="http://www.bundaberg.qld.gov.au">www.bundaberg.qld.gov.au</a>
LGA covered by this plan	Bundaberg Regional Council
Water Service Schemes covered by this plan	Bundaberg, Kalkie, Gregory River, Gin Gin, Gooburrum, Moore Park, River Park, Rocky Point, Wallaville, Lake Monduran.

## 2. Glossary of Terms

<b>ADWG 2011</b>	Australian Drinking Water Guidelines (2011) Published by the National Health and Medical Research Council of Australia.
<b>ALS</b>	Australian Laboratory Services
<b>BRC</b>	Bundaberg Regional Council
<b>E. coli</b>	Escherichia coli is a bacterium which is considered to be a superior indicator for detecting faecal contamination which could present a potential health risk.
<b>CaCO<sub>3</sub></b>	Calcium Carbonate
<b>CFU/100ml</b>	Colony forming units per 100 millilitres
<b>CCP</b>	Critical Control Point
<b>DAF</b>	Diffused Air Flootation
<b>DNRME</b>	Department of Natural Resources Mines Energy
<b>DWQMP</b>	Drinking Water Quality Management Plan
<b>DWQMT</b>	Drinking Water Quality Management Team
<b>F&amp;SS</b>	Forensic & Scientific Services (Queensland Government)
<b>GWTP</b>	Groundwater Treatment Plant/s
<b>IMS</b>	Integrated Management System
<b>LIMS</b>	Laboratory Information Management System
<b>mg/L</b>	Milligrams per litre
<b>MIB</b>	Methylisobomeol, is an organic chemical with a strong odour that can present with an algal bloom
<b>NTU</b>	Nephelometric Turbidity Units
<b>PFAS</b>	Per- and poly - fluoroalkyl substances
<b>QWSR</b>	Queensland Water Supply Regulator
<b>QH</b>	Queensland Health
<b>QCP</b>	Quality Control Point
<b>THM/s</b>	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.
<b>TOC</b>	Total Organic Carbon
<b>W&amp;WW</b>	Water & Wastewater
<b>WSA</b>	Water Service Area
<b>WTP</b>	Water Treatment Plant
<b>&lt;</b>	Less than
<b>&gt;</b>	Greater than
<b>µg/L</b>	Micro-Grams per litre
<b>µS/cm</b>	Micro-Siemens per centimetre

### 3. Introduction

This is the Drinking Water Quality Management Plan (DWQMP) report for Bundaberg Regional Council (BRC) for the 2019-2020 financial year.

BRC is a registered service provider with identification (SPID) number 476. BRC is operating under an approved DWQMP to ensure consistent supply of safe quality drinking water in order to protect public health. This is done through proactive identification and minimisation of public health related risks associated with drinking water.

This report documents the performance of BRC's drinking water services with respect to;

- ❖ The water quality performance of BRC's drinking water supply;
- ❖ The actions undertaken to implement the DWQMP, and
- ❖ The information BRC is required to provide to the Queensland Water Supply Regulator (Department of Natural Resources, Mines & Energy (DNRME)) in accordance with the *Water Supply (Safety and Reliability) Act 2008* (the Act).

This report is submitted to the Regulator, DNRME, to fulfil Council's regulatory requirement, and is also made available to customers through Council's website or for inspection upon request at Council offices.

This report has been prepared in accordance with the *Drinking Water Quality Management Plan Report – Guidance Note 2018* and *Drinking Water Quality Management Plan Report Template* published by DNRME.

## 4. Overview of Operations

BRC has ten (10) Water Service Areas (WSA) which are zoned in either the Coastal or Hinterland Operational areas. Table 1 below provides a summary of each WSA.

*Table 1 - Summary of Schemes*

Scheme (Population)	Water Source	Treatment Process	Treatment Capacity (ML/day)	Towns supplied
Coastal Operational Area				
Bundaberg Water Service Area (WSA) (54,764)	Burnett River	Water Treatment Plant (WTP) - PAC Adsorption, coagulation, flocculation, clarification, sedimentation, filtration and disinfection.	21	Bundaberg City
	Bores; - Heaps St - Peatey St - Lovers Walk - Powers St - Works Depot - Dr Mays Rd	Groundwater Treatment Plant (GWTP) - Aeration over limestone process with disinfection	57.6 (combined)	
Kalkie WSA (18,894)	Burnett River via SunWater’s Woongarra Main Channel	WTP - Coagulation, flocculation, clarification (DAF), filtration and disinfection	17.3	The Port, Burnett Heads, Bargara, The Hummock, Innes Park, Coral Cove, Elliott Heads, Riverview
	Bundaberg WSA treated water supplement to Hummock reservoirs for consumption within the Kalkie WSA.			
Moore Park WSA (2969)	SunWater Gooburrum Main Channel	WTP - Coagulation, flocculation, clarification filtration and disinfection	2.16	Moore Park
	Zandes Bores 1 & 2	GWTP - Aeration over limestone process with disinfection		
River Park WSA (320)	SunWater irrigation holding dam	WTP - Coagulation, flocculation, clarification, filtration, and disinfection	1.5	River Park
Rocky Point WSA (224)	Bore	GWTP - Aeration over limestone process with disinfection	0.69	Rocky Point
Gooburrum WSA (133)	Bore	GWTP - Aeration over limestone process with disinfection	1.296	Gooburrum
	Bundaberg WSA treated water supplement			
Hinterland Operational Area				
Gregory River WSA (5703)	Gregory River	WTP - coagulation, flocculation, clarification (DAF), and disinfection	4.3	Childers, Woodgate, Redridge, Forest Ridge, Kinkuna, Goodwood
Gin Gin WSA (1457)	Gin Gin Creek & SunWater Channel	WTP - coagulation, flocculation, clarification, filtration and disinfection	1	Gin Gin
Wallaville WSA (248)	Burnett River	WTP - coagulation, flocculation, clarification, filtration and disinfection	2.5	Wallaville
Lake Monduran WSA (16 Water Connections)	Fred Haigh Dam	WTP - coagulation, flocculation, filtration, and disinfection	0.86	Lake Monduran Tourist Park



Figure 1 Overview Map of BRC's WSA's 2019-2020

## 5. DWQMP Implementation

During the reporting period the following two positions were filled within BRC's Water Services Department;

- ❖ Treatment Team Manager – Service Delivery Team, and
- ❖ Technical Officer (Compliance) – Governance Team.

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). Following the recommendations from the last external DWQMP audit conducted in 2016, the task of reviewing and updating all Water Treatment Plant QCPs and CCPs is a project being undertaken by the new Treatment Team Manager.

As part of Council's ongoing monitoring program exceedance alerts are received by managerial, supervisory and technical staff via the LIMS database generated from the BRC 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.

In addition to the above, several DWQMP information sessions have been conducted with operational staff to make them aware of the approved DWQMP and their role in its continued implementation.

A voluntary Annual Management Review meeting has also been held with key internal stakeholders to discuss trends and identify improvement actions that have been added to the DWQMP Improvement Plan. 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

BRC continues to carry out operational monitoring programs across all BRC water schemes, as per the approved DWQMP.

An annual compliance review of BRC's verification monitoring program was conducted in May 2020. The purpose of the review was to assess the programs continued relevance, identify areas of concern, and to ensure that BRC is complying with sampling requirements set by the ADWG (2011) & *Public Health Regulation 2018*, by studying test results and parameter trends across all WSA's.

### 5.2 Amendments made to the DWQMP

During the 2019-2020 financial year, BRC's DWQMP underwent a regular review. The DWQMP was subsequently amended and submitted to DNRME for assessment. Following the assessment process, the amended DWQMP was approved with conditions by DNRME on 27 May 2020.

An update register was used to capture all amendments made to the DWQMP during the review. The register has been included in the DWQMP under Section 2 which was submitted to the Regulator at the time of amendment application submission.



## 6. Notification to the Regulator under section 102 & 102A of the Act

During the 2019-2020 financial year there were five (5) notifications sent to the Queensland Water Supply Regulator (QWSR) under sections 102 or 102A of the *Water Supply (Safety & Reliability) Act 2008*.

Four (4) of these notifications involved the detection of Trihalomethanes (THM's) from the Gregory River and Lake Monduran WSA's that exceeded the Australian Drinking Water Guidelines (ADWG) Health limit of 250µg/L.

In Australia, THM's are present in drinking water principally as the result/by-product of disinfection using chlorination. When added to water, chlorine can react with naturally occurring organic material to produce THM's.

These four (4) incidents are classified as 'on-going incidents' and therefore are under observation by the QWSR and Queensland Health (QH). It is a requirement that BRC supply quarterly THM analysis reports from the Gregory River and Lake Monduran WSA's to these agencies whilst under this surveillance.

The remaining recorded non-compliance related to a high free chlorine level reading at the Lovers Walk Water Treatment Plant (WTP) of >6 mg/L. It was identified through investigation and further testing that an instrumentation error lead to the incorrect reading of >6 mg/L. Additional analysis confirmed that the free chlorine level at Lovers Walk (WTP) was in fact 3 mg/L, which complied with the ADWG Health limit of 5mg/L.

### 6.1 Non-compliance with the water quality criteria and corrective and preventative actions undertaken

#### 6.1.1 Detection of THM's – Gregory River WSA

##### Incident Description

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 354µg/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 with construction due for completion in October 2020. The plant will be online early 2021.

### 6.1.2 Detection of THM's – Lake Monduran WSA

#### Incident Description

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. Two (2) of these tests exceeded the ADWG Health limit. The average of these exceedances was 310µg/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.

Audits of the treatment plant are also conducted to identify areas of improvement to ensure that the plant is operating at its optimal level.

## 7. Customer Complaints

BRC's Water Services monitors and investigates customer complaints received relating to drinking water quality. Reporting on the number of complaints received, general details of complaints and the actions undertaken is a requirement that BRC must comply with in accordance with section 142(3)(g) of the Act.

Table 2 below provides a summary of the number and nature of customer complaints received during the 2019-2020 financial year.

*Table 2 - Water Quality Customer Complaints*

WSA	Discoloured Water	Cloudy Water	Taste & Odour	Suspected Illness	Total
Bundaberg	41	1	9	0	51
Kalkie	1	4	4	2	11
Moore Park	0	0	1	0	1
Gooburru	1	0	1	0	2
Gregory River	5	0	1	0	6
Gin Gin	1	0	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
<b>Total</b>	<b>49</b>	<b>5</b>	<b>16</b>	<b>2</b>	<b>-</b>

### Discoloured Water

During 2019-2020, BRC received forty-nine (49) customer complaints relating to discoloured water across all WSA's, the majority of which were report within the Bundaberg WSA. These complaints are primarily the result of sloughing of sediments in the water mains. Generally, these issues can be resolved quickly through operational corrective actions such as flushing.

When conducting repairs to the water mains infrastructure, Council's reticulation crew(s) operate using a risk-based assessment process to ensure that the water quality is always protected and maintained. A flush of the water mains is undertaken on completion of works, at which time the residual chlorine levels are checked for compliance with the ADWG (2011).

### 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 and can occur following repair work when re-establishing the water mains back into service. During 2019-2020, five (5) 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.

## Taste & Odour

Taste and odour complaints regarding potable water can be subjective as it depends on an individual's perception. During 2019-2020 BRC received sixteen (16) water quality complaints related to taste/odour. In some WSA's BRC 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. The most common complaint descriptions included chlorine, chemical and earthy/dirt.

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.

When taste and/or odour complaints are received, Council contacts the customer to obtain further information regarding the matter. The latest water quality results for the WTP that supplies the water to property are checked and if no issues are identified the customer is provided information on what is potentially causing the taste/odour issue and why it is happening. If the matter persists the customer is advised that they can contact Council and an operational crew will be sent out to flush the mains.

## Suspected Illness

On occasions, complaints are received from customers who believe an illness they are experiencing may be associated with the water supply. BRC investigates all alleged illness complaints relating to its various potable water supplies, typically by testing the closest reticulation sampling point for the presence of *E. coli* and free chlorine residual levels.

During 2019-2020 Council received two (2) suspected illness complaints. Following investigation into both complaints it was revealed that the potable water quality supply met the ADWG values and was not the cause of the illnesses. For the first complaint received it was determined that the suspected illness was a result of a faulty grey water tank external to the customers property, which is not part of Council's infrastructure network. The second customer was referred to QLD Health's Wide Bay Public Health Unit, where further sampling was conducted. It was confirmed that the drinking water supplied to the property was not the cause.

## 8. Findings and Recommendations of the DWQMP Auditor

No audit was conducted during the reporting period 1/7/2019 to 30/06/2020. As per the requirements of Condition 10.2 of the *Information Notice for the Decision*, issued to BRC by DNRME on the 29 May 2020, the next scheduled external audit of BRC's DWQMP is to be conducted by 30 June 2021.

The details of the last external audit conducted in 2016 were included in the 2016-2017 DWQMP annual report. Overall, in 2016 the lead auditor reported that BRC demonstrated a very high level of compliance with the regular audit imposed by the Act during the Audit period.

## 9. Verification Monitoring – Water Quality Information & Summary

BRC undertakes verification monitoring across the drinking water network to ensure the provision of safe and reliable drinking water to our customers.

To determine compliance, verification monitoring results are assessed against the following:

- ❖ Drinking water quality criteria prescribed in the *Public Health Regulation 2005*;
- ❖ Health guideline values in the ADWG (2011); and
- ❖ Water quality criteria stated in the *Water Quality and Reporting Guideline for a Drinking Water Service*.

The water quality data for 2019-2020 has been summarised in Appendix A. The reported statistics do not include results derived from repeat samples, or from emergency or investigative samples undertaken in response to an elevated result, as described in the ADWG (2011) section 10.3.1.

Furthermore, data used to calculate the 12 month 'rolling' annual value for *E. coli* has also been presented in Appendix A. A microbial compliance of 100% was achieved during the 2019-20 financial year.

Verification monitoring for 2019-2020 has been carried out in line with the verification monitoring program as stated in the BRC DWQMP *Section 10 – Operational and Verification Monitoring*.

## Appendix A. Summary of Compliance with Water Quality Criteria for Drinking Water

Result	Page(s)
WSA's Standard Water Analysis (SWA)	17-26
Pesticide	27
<i>E. coli</i>	28-32
THM's	33

Verification Monitoring – Bundaberg Water Service Area July 2019 – June 2020											
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 <sub>3</sub>	3	Quarterly	32	32	~	~	23	87	43.594
Aluminium	ALS	mg/L	0.01	Biannual	16	16	~	~	0.02	0.05	0.033
Antimony	ALS	mg/L	0.001	Biannual	16	16	0.003	0	<0.001	<0.001	<0.001
Arsenic	ALS	mg/L	0.001	Biannual	16	16	0.01	0	<0.001	<0.001	<0.001
Barium	ALS	mg/L	0.001	Biannual	16	16	2	0	0.009	0.043	0.024
Beryllium	ALS	mg/L	0.001	Biannual	16	16	0.06	0	<0.001	<0.001	<0.001
Boron	ALS	mg/L	0.05	Biannual	16	16	4	0	<0.05	0.06	0.051
Cadmium	ALS	mg/L	0.0001	Biannual	16	16	0.002	0	<0.0001	<0.0001	<0.0001
Calcium	BRC Central Laboratory	mg/L as Ca	1	Quarterly	32	32	~	~	9.31	29.43	16.392
Calcium Hardness	BRC Central Laboratory	mg/L CaCO <sub>3</sub>	1	Quarterly	32	32	~	~	23.3	73.6	40.975
Chloride	BRC Central Laboratory	mg/L as Ca	4	Quarterly	32	32	~	~	77.83	130.02	96.748
Chlorine (Free)	BRC Central Laboratory	mg/L	0.05	Monthly	191	191	5	0	0.04	1.61	0.842
Chromium	ALS	mg/L	0.001	Biannual	16	16	0.05	0	<0.001	<0.001	<0.001
Conductivity	BRC Central Laboratory	µS/cm	1	Quarterly	32	32	~	~	375	756	460.875
Colour (True)	BRC Central Laboratory	Pt.Co Units	0	Quarterly	32	32	15	0	0	10	0.344
Copper	ALS	mg/L	0.001	Biannual	16	16	2	0	0.003	0.184	0.037
Fluoride	BRC Central Laboratory	mg/L as F <sup>-</sup>	0.25	Quarterly	32	32	1.5	0	<0.25	<0.4	<0.302
Hardness (Total)	BRC Central Laboratory	mg/L CaCO <sub>3</sub>	1	Quarterly	32	32	~	~	25.2	328.3	88.009
Iron	ALS	mg/L	0.05	Biannual	16	16	~	~	<0.05	<0.05	<0.05
Lanthanum	ALS	mg/L	0.001	Biannual	16	16	0.002	0	<0.001	<0.001	<0.001
Lead	ALS	mg/L	0.001	Biannual	16	16	0.01	0	<0.001	0.005	0.002
Magnesium	BRC Central Laboratory	mg/L as Mg	2	Quarterly	32	32	~	~	2.25	19.22	7.957
Manganese	ALS	mg/L	0.001	Biannual	16	16	0.5	0	0.001	0.008	0.002
Molybdenum	ALS	mg/L	0.001	Biannual	16	16	0.05	0	<0.001	<0.001	<0.001
Nickel	ALS	mg/L	0.001	Biannual	16	16	0.02	0	<0.001	0.003	0.001
Nitrate	BRC Central Laboratory	mg/L as NO <sub>3</sub> <sup>-</sup>	0.5	Quarterly	32	32	50	0	0.31	18.69	11.754
Nitrite	BRC Central Laboratory	mg/L as NO <sub>2</sub> <sup>-</sup>	0.1	Quarterly	32	32	3	0	<0.1	<0.1	<0.1
pH	BRC Central Laboratory	pH units @ 25°C	1	Monthly	191	191	~	~	6.8	8.1	7.414
Phosphate (Dissolved)	BRC Central Laboratory	mg/L as PO <sub>4</sub> <sup>3-</sup>	0.5	Quarterly	32	32	~	~	<0.25	0.5	<0.398
Potassium	BRC Central Laboratory	mg/L	1	Quarterly	32	32	~	~	<1	4.99	<1.876
Selenium	ALS	mg/L	0.01	Biannual	16	16	0.01	0	<0.01	<0.01	<0.01
Silver	ALS	mg/L	0.001	Biannual	16	16	0.1	0	0.001	0.001	0.001
Sodium	BRC Central Laboratory	mg/L	2.5	Quarterly	32	32	~	~	48.55	75.84	55.766
Sulphate	BRC Central Laboratory	mg/L as SO <sub>4</sub> <sup>-</sup>	4.5	Quarterly	32	32	500	0	<4.5	51.55	13.508
Total Dissolved Solids	BRC Central Laboratory	mg/L	~	Quarterly	32	32	~	~	251.2	506.5	311.903
Turbidity	BRC Central Laboratory	NTU	0.03	Quarterly	32	32	~	~	0.015	0.45	0.16
Uranium	ALS	mg/L	0.001	Biannual	16	16	0.017	0	<0.001	<0.001	<0.001
Zinc	ALS	mg/L	0.005	Biannual	16	16	~	~	<0.005	0.343	0.047



Verification Monitoring – Kalkie Water Service Area July 2019 – June 2020 – 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 <sub>3</sub>	3	Quarterly	20	20	~	~	52	52	64.150
Aluminium	ALS	mg/L	0.01	Biannual	10	10	~	~	0.02	0.1	0.036
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	0.03	0.041	0.035
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	Quarterly	20	20	~	~	18.09	24.53	20.610
Calcium Hardness	BRC Central Laboratory	mg/L CaCO <sub>3</sub>	1	Quarterly	20	20	~	~	45.2	61.3	51.465
Chloride	BRC Central Laboratory	mg/L as Ca	4	Quarterly	20	20	~	~	87.42	131.71	112.755
Chlorine (Free)	BRC Central Laboratory	mg/L	0.05	Monthly	101	101	5	0	0.02	1.58	0.518
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	Quarterly	20	20	~	~	473	735	608.700
Colour (True)	BRC Central Laboratory	Pt.Co Units	0	Quarterly	20	20	15	0	0	1	0.050
Copper	ALS	mg/L	0.001	Biannual	10	10	2	0	0.007	0.051	0.024
Fluoride	BRC Central Laboratory	mg/L as F <sup>-</sup>	0.25	Quarterly	20	20	1.5	0	<0.25	<0.4	<0.288
Hardness (Total)	BRC Central Laboratory	mg/L CaCO <sub>3</sub>	1	Quarterly	20	20	~	~	91.9	144.9	116.310
Iron	ALS	mg/L	0.05	Biannual	10	10	~	~	<0.05	<0.05	<0.050
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	0.001	<0.001
Magnesium	BRC Central Laboratory	mg/L as Mg	2	Quarterly	20	20	~	~	11.21	20.05	15.667
Manganese	ALS	mg/L	0.001	Biannual	10	10	0.5	0	0.001	0.003	0.001
Molybdenum	ALS	mg/L	0.001	Biannual	10	10	0.05	0	<0.001	<0.001	<0.001
Nickel	ALS	mg/L	0.001	Biannual	10	10	0.02	0	<0.001	<0.001	<0.001
Nitrate	BRC Central Laboratory	mg/L as NO <sub>3</sub> <sup>-</sup>	0.5	Quarterly	20	20	50	0	0.63	6.11	3.756
Nitrite	BRC Central Laboratory	mg/L as NO <sub>2</sub> <sup>-</sup>	0.1	Quarterly	20	20	3	0	<0.1	<0.1	<0.1
pH	BRC Central Laboratory	pH units @ 25°C	1	Monthly	101	101	~	~	6.93	7.78	7.495
Phosphate (Dissolved)	BRC Central Laboratory	mg/L as PO <sub>4</sub> <sup>3-</sup>	0.5	Quarterly	20	20	~	~	<0.25	<0.5	<0.438
Potassium	BRC Central Laboratory	mg/L	1	Quarterly	20	20	~	~	2.89	4.69	3.654
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	~	~	54.15	79.67	67.482
Sulphate	BRC Central Laboratory	mg/L as SO <sub>4</sub> <sup>-</sup>	4.5	Quarterly	20	20	500	0	29.61	56.73	42.035
Total Dissolved Solids	BRC Central Laboratory	mg/L	~	Quarterly	20	20	~	~	316.9	492.4	407.825
Turbidity	BRC Central Laboratory	NTU	0.03	Quarterly	20	20	~	~	0.1	0.25	0.125
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	0.024	0.013

Verification Monitoring – Moore Park Water Service Area July 2019 – June 2020 – 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 <sub>3</sub>	3	Quarterly	4	4	~	~	41	41	46.25
Aluminium	ALS	mg/L	0.01	Biannual	3	3	~	~	0.01	0.03	0.02
Antimony	ALS	mg/L	0.001	Biannual	3	3	0.003	0	<0.001	<0.001	<0.001
Arsenic	ALS	mg/L	0.001	Biannual	3	3	0.01	0	<0.001	<0.001	<0.001
Barium	ALS	mg/L	0.001	Biannual	3	3	2	0	0.021	0.031	0.025
Beryllium	ALS	mg/L	0.001	Biannual	3	3	0.06	0	<0.001	<0.001	<0.001
Boron	ALS	mg/L	0.05	Biannual	3	3	4	0	<0.05	<0.05	<0.05
Cadmium	ALS	mg/L	0.0001	Biannual	3	3	0.002	0	<0.0001	<0.0001	<0.0001
Calcium	BRC Central Laboratory	mg/L as Ca	1	Quarterly	4	4	~	~	11.01	13.41	12.043
Calcium Hardness	BRC Central Laboratory	mg/L CaCO <sub>3</sub>	1	Quarterly	4	4	~	~	27.5	33.5	30.1
Chloride	BRC Central Laboratory	mg/L as Ca	4	Quarterly	4	4	~	~	77.55	91.24	85.11
Chlorine (Free)	BRC Central Laboratory	mg/L	0.05	Monthly	60	60	5	0	0.4	1.41	0.819
Chromium	ALS	mg/L	0.001	Biannual	3	3	0.05	0	<0.001	<0.001	<0.001
Conductivity	BRC Central Laboratory	µS/cm	1	Quarterly	4	4	~	~	405	492	450.75
Colour (True)	BRC Central Laboratory	Pt.Co Units	0	Quarterly	4	4	15	0	0	0	0
Copper	ALS	mg/L	0.001	Biannual	3	3	2	0	0.008	0.065	0.03
Fluoride	BRC Central Laboratory	mg/L as F <sup>-</sup>	0.25	Quarterly	4	4	1.5	0	<0.25	<0.4	<0.288
Hardness (Total)	BRC Central Laboratory	mg/L CaCO <sub>3</sub>	1	Quarterly	4	4	~	~	57.1	70.2	63.35
Iron	ALS	mg/L	0.05	Biannual	3	3	~	~	<0.05	<0.05	<0.05
Lanthanum	ALS	mg/L	0.001	Biannual	3	3	0.002	0	<0.001	<0.001	<0.001
Lead	ALS	mg/L	0.001	Biannual	3	3	0.01	0	<0.001	0.004	0.002
Magnesium	BRC Central Laboratory	mg/L as Mg	2	Quarterly	3	3	~	~	7.55	8.81	8.277
Manganese	ALS	mg/L	0.001	Biannual	3	3	0.5	0	0.003	0.008	0.005
Molybdenum	ALS	mg/L	0.001	Biannual	3	3	0.05	0	<0.001	<0.001	<0.001
Nickel	ALS	mg/L	0.001	Biannual	3	3	0.02	0	<0.001	0.002	0.001
Nitrate	BRC Central Laboratory	mg/L as NO <sub>3</sub> <sup>-</sup>	0.5	Quarterly	4	4	50	0	5.14	5.58	5.338
Nitrite	BRC Central Laboratory	mg/L as NO <sub>2</sub> <sup>-</sup>	0.1	Quarterly	4	4	3	0	<0.1	<0.1	<0.1
pH	BRC Central Laboratory	pH units @ 25°C	1	Monthly	60	60	~	~	7.1	7.81	7.396
Phosphate (Dissolved)	BRC Central Laboratory	mg/L as PO <sub>4</sub> <sup>3-</sup>	0.5	Quarterly	4	4	~	~	<0.25	<0.5	<0.438
Potassium	BRC Central Laboratory	mg/L	1	Quarterly	4	4	~	~	1.67	2.43	1.925
Selenium	ALS	mg/L	0.01	Biannual	3	3	0.01	0	<0.01	<0.01	<0.01
Silver	ALS	mg/L	0.001	Biannual	3	3	0.1	0	<0.001	<0.001	<0.001
Sodium	BRC Central Laboratory	mg/L	2.5	Quarterly	4	4	~	~	55.99	63.72	60.443
Sulphate	BRC Central Laboratory	mg/L as SO <sub>4</sub> <sup>-</sup>	4.5	Quarterly	4	4	500	0	24.14	28.32	26.515
Total Dissolved Solids	BRC Central Laboratory	mg/L	~	Quarterly	4	4	~	~	271.4	329.6	302
Turbidity	BRC Central Laboratory	NTU	0.03	Quarterly	4	4	~	~	0.1	0.35	0.2
Uranium	ALS	mg/L	0.001	Biannual	3	3	0.017	0	<0.001	<0.001	<0.001
Zinc	ALS	mg/L	0.005	Biannual	3	3	~	~	0.006	0.058	0.028

Verification Monitoring – River Park Water Service Area July 2019 – June 2020 – 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 <sub>3</sub>	3	Quarterly	4	4	~	~	41	41	77.25
Aluminium	ALS	mg/L	0.01	Biannual	4	4	~	~	0.01	0.16	0.088
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	0.041	0.055	0.049
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	Quarterly	4	4	~	~	13.32	22.68	18.773
Calcium Hardness	BRC Central Laboratory	mg/L CaCO <sub>3</sub>	1	Quarterly	4	4	~	~	33.3	56.7	46.925
Chloride	BRC Central Laboratory	mg/L as Ca	4	Quarterly	4	4	~	~	84.06	126.1	105.118
Chlorine (Free)	BRC Central Laboratory	mg/L	0.05	Monthly	24	24	5	0	0.08	1.26	0.668
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	Quarterly	4	4	~	~	570	773	699
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	0.044	1.13	0.348
Fluoride	BRC Central Laboratory	mg/L as F <sup>-</sup>	0.25	Quarterly	4	4	1.5	0	<0.25	<0.4	<0.288
Hardness (Total)	BRC Central Laboratory	mg/L CaCO <sub>3</sub>	1	Quarterly	4	4	~	~	69.9	144.3	113.525
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	Quarterly	4	4	~	~	8.78	21.03	15.98
Manganese	ALS	mg/L	0.001	Biannual	4	4	0.5	0	0.005	0.035	0.015
Molybdenum	ALS	mg/L	0.001	Biannual	4	4	0.05	0	<0.001	<0.001	<0.001
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 <sub>3</sub> <sup>-</sup>	0.5	Quarterly	4	4	50	0	<0.39	5.13	1.743
Nitrite	BRC Central Laboratory	mg/L as NO <sub>2</sub> <sup>-</sup>	0.1	Quarterly	4	4	3	0	<0.1	0.1	<0.1
pH	BRC Central Laboratory	pH units @ 25°C	1	Monthly	24	24	~	~	7.07	7.6	7.340
Phosphate (Dissolved)	BRC Central Laboratory	mg/L as PO <sub>4</sub> <sup>3-</sup>	0.5	Quarterly	4	4	~	~	<0.25	<0.5	<0.438
Potassium	BRC Central Laboratory	mg/L	1	Quarterly	4	4	~	~	1.7	4.71	3.895
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	~	~	63.38	83.82	74.25
Sulphate	BRC Central Laboratory	mg/L as SO <sub>4</sub> <sup>-</sup>	4.5	Quarterly	4	4	500	0	28.38	63.31	53.323
Total Dissolved Solids	BRC Central Laboratory	mg/L	~	Quarterly	4	4	~	~	381.9	517.9	468.325
Turbidity	BRC Central Laboratory	NTU	0.03	Quarterly	4	4	~	~	0.1	0.3	0.2
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	~	~	0.013	0.058	0.035

Verification Monitoring – Rocky Point Water Service Area July 2019 – June 2020 – 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 <sub>3</sub>	3	Quarterly	4	4	~	~	24	24	24.5
Aluminium	ALS	mg/L	0.01	Biannual	4	4	~	~	0.01	0.02	0.018
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	0.072	0.09	0.081
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	Quarterly	4	4	~	~	8.85	9.48	9.22
Calcium Hardness	BRC Central Laboratory	mg/L CaCO <sub>3</sub>	1	Quarterly	4	4	~	~	22.1	23.7	23.025
Chloride	BRC Central Laboratory	mg/L as Ca	4	Quarterly	4	4	~	~	55.57	68.64	63.783
Chlorine (Free)	BRC Central Laboratory	mg/L	0.05	Monthly	24	24	5	0	0.24	1.09	0.671
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	Quarterly	4	4	~	~	286	339	316.75
Colour (True)	BRC Central Laboratory	Pt.Co Units	0	Quarterly	4	4	15	0	0	1	0.25
Copper	ALS	mg/L	0.001	Biannual	4	4	2	0	0.002	0.012	0.007
Fluoride	BRC Central Laboratory	mg/L as F <sup>-</sup>	0.25	Quarterly	4	4	1.5	0	<0.25	<0.4	<0.288
Hardness (Total)	BRC Central Laboratory	mg/L CaCO <sub>3</sub>	1	Quarterly	4	4	~	~	52.1	53.2	52.675
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	Quarterly	4	4	~	~	6.93	7.47	7.113
Manganese	ALS	mg/L	0.001	Biannual	4	4	0.5	0	0.002	0.008	0.005
Molybdenum	ALS	mg/L	0.001	Biannual	4	4	0.05	0	<0.001	<0.001	<0.001
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 <sub>3</sub> <sup>-</sup>	0.5	Quarterly	4	4	50	0	15.04	20.32	17.183
Nitrite	BRC Central Laboratory	mg/L as NO <sub>2</sub> <sup>-</sup>	0.1	Quarterly	4	4	3	0	<0.1	<0.1	<0.1
pH	BRC Central Laboratory	pH units @ 25°C	1	Monthly	24	24	~	~	7.2	7.54	7.368
Phosphate (Dissolved)	BRC Central Laboratory	mg/L as PO <sub>4</sub> <sup>3-</sup>	0.5	Quarterly	4	4	~	~	<0.25	<0.5	<0.438
Potassium	BRC Central Laboratory	mg/L	1	Quarterly	4	4	~	~	1.58	1.77	1.683
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	~	~	32.48	38.9	36.5
Sulphate	BRC Central Laboratory	mg/L as SO <sub>4</sub> <sup>-</sup>	4.5	Quarterly	4	4	500	0	5.86	8.24	7.188
Total Dissolved Solids	BRC Central Laboratory	mg/L	~	Quarterly	4	4	~	~	191.6	227.1	212.2
Turbidity	BRC Central Laboratory	NTU	0.03	Quarterly	4	4	~	~	0.2	0.5	0.288
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	0.007	0.006

Verification Monitoring – Gooburrum Water Service Area July 2019 – June 2020 – 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 <sub>3</sub>	3	Quarterly	4	4	~	~	19	19	34.5
Aluminium	ALS	mg/L	0.01	Biannual	2	2	~	~	0.03	0.05	0.04
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	0.044	0.09	0.067
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	0.08	0.065
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	Quarterly	4	4	~	~	7.2	18.52	12.595
Calcium Hardness	BRC Central Laboratory	mg/L CaCO <sub>3</sub>	1	Quarterly	4	4	~	~	18	46.3	31.475
Chloride	BRC Central Laboratory	mg/L as Ca	4	Quarterly	4	4	~	~	61.15	91.74	75.993
Chlorine (Free)	BRC Central Laboratory	mg/L	0.05	Monthly	24	24	5	0	0.23	1.49	0.709
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	Quarterly	4	4	~	~	336	466	423.75
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	0.014	0.046	0.03
Fluoride	BRC Central Laboratory	mg/L as F <sup>-</sup>	0.25	Quarterly	4	4	1.5	0	<0.25	<0.4	<0.288
Hardness (Total)	BRC Central Laboratory	mg/L CaCO <sub>3</sub>	1	Quarterly	4	4	~	~	36.1	84.3	66.45
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	0.004	0.003
Magnesium	BRC Central Laboratory	mg/L as Mg	2	Quarterly	4	4	~	~	4.35	10.15	8.395
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
Nickel	ALS	mg/L	0.001	Biannual	2	2	0.02	0	<0.001	0.005	0.003
Nitrate	BRC Central Laboratory	mg/L as NO <sub>3</sub> <sup>-</sup>	0.5	Quarterly	4	4	50	0	7.64	39.03	29.413
Nitrite	BRC Central Laboratory	mg/L as NO <sub>2</sub> <sup>-</sup>	0.1	Quarterly	4	4	3	0	<0.1	<0.1	<0.1
pH	BRC Central Laboratory	pH units @ 25°C	1	Monthly	24	24	~	~	6.93	7.72	7.308
Phosphate (Dissolved)	BRC Central Laboratory	mg/L as PO <sub>4</sub> <sup>3-</sup>	0.5	Quarterly	4	4	~	~	<0.25	<0.5	<0.438
Potassium	BRC Central Laboratory	mg/L	1	Quarterly	4	4	~	~	1.91	3.37	2.703
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	~	~	45.43	54.93	51.53
Sulphate	BRC Central Laboratory	mg/L as SO <sub>4</sub> <sup>-</sup>	4.5	Quarterly	4	4	500	0	6.17	23.12	17.83
Total Dissolved Solids	BRC Central Laboratory	mg/L	~	Quarterly	4	4	~	~	225.1	312.2	283.9
Turbidity	BRC Central Laboratory	NTU	0.03	Quarterly	4	4	~	~	0.15	0.45	0.25
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	~	~	0.009	0.056	0.033

Verification Monitoring – Gregory River Water Service Area July 2019 – June 2020 – 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 <sub>3</sub>	3	Quarterly	8	8	~	~	44	44	54.5
Aluminium	ALS	mg/L	0.01	Biannual	8	8	~	~	0.04	0.28	0.151
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	0.025	0.035	0.03
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	<0.05	0.07	<0.055
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	Quarterly	8	8	~	~	9.11	17.83	14.633
Calcium Hardness	BRC Central Laboratory	mg/L CaCO <sub>3</sub>	1	Quarterly	8	8	~	~	22.8	44.6	36.6
Chloride	BRC Central Laboratory	mg/L as Ca	4	Quarterly	8	8	~	~	83.86	233.43	142.885
Chlorine (Free)	BRC Central Laboratory	mg/L	0.05	Monthly	156	156	5	0	0.03	2.13	0.804
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	Quarterly	8	8	~	~	484	940	680.75
Colour (True)	BRC Central Laboratory	Pt.Co Units	0	Quarterly	8	8	15	0	0	0	0
Copper	ALS	mg/L	0.001	Biannual	8	8	2	0	0.004	0.065	0.017
Fluoride	BRC Central Laboratory	mg/L as F <sup>-</sup>	0.25	Quarterly	8	8	1.5	0	<0.25	<0.4	<0.288
Hardness (Total)	BRC Central Laboratory	mg/L CaCO <sub>3</sub>	1	Quarterly	8	8	~	~	55.7	121.6	84.65
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	Quarterly	8	8	~	~	7.71	19.92	11.539
Manganese	ALS	mg/L	0.001	Biannual	8	8	0.5	0	0.001	0.01	0.004
Molybdenum	ALS	mg/L	0.001	Biannual	8	8	0.05	0	<0.001	<0.001	<0.001
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 <sub>3</sub> <sup>-</sup>	0.5	Quarterly	8	8	50	0	0.19	<1	0.478
Nitrite	BRC Central Laboratory	mg/L as NO <sub>2</sub> <sup>-</sup>	0.1	Quarterly	8	8	3	0	<0.1	<0.1	<0.1
pH	BRC Central Laboratory	pH units @ 25°C	1	Monthly	156	156	~	~	7.06	7.64	7.336
Phosphate (Dissolved)	BRC Central Laboratory	mg/L as PO <sub>4</sub> <sup>3-</sup>	0.5	Quarterly	8	8	~	~	<0.25	<0.5	<0.438
Potassium	BRC Central Laboratory	mg/L	1	Quarterly	8	8	~	~	3.64	4.57	4.054
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	~	~	72.27	133.59	96.079
Sulphate	BRC Central Laboratory	mg/L as SO <sub>4</sub> <sup>-</sup>	4.5	Quarterly	8	8	500	0	26.91	54.16	42.666
Total Dissolved Solids	BRC Central Laboratory	mg/L	~	Quarterly	8	8	~	~	324.3	629.8	456.1
Turbidity	BRC Central Laboratory	NTU	0.03	Quarterly	8	8	~	~	0.1	0.25	0.188
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	0.016	0.01

Verification Monitoring – Gin Gin Water Service Area July 2019 – June 2020 – 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 <sub>3</sub>	3	Quarterly	4	4	~	~	39	39	49.75
Aluminium	ALS	mg/L	0.01	Biannual	4	4	~	~	<0.01	0.02	0.013
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	0.018	0.024	0.021
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	Quarterly	4	4	~	~	10.23	12.72	11.548
Calcium Hardness	BRC Central Laboratory	mg/L CaCO <sub>3</sub>	1	Quarterly	4	4	~	~	25.6	31.8	28.875
Chloride	BRC Central Laboratory	mg/L as Ca	4	Quarterly	4	4	~	~	53.99	67.18	60.768
Chlorine (Free)	BRC Central Laboratory	mg/L	0.05	Monthly	60	60	5	0	0.28	2.07	1.206
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	Quarterly	4	4	~	~	285	341	311.25
Colour (True)	BRC Central Laboratory	Pt.Co Units	0	Quarterly	4	4	15	0	0	5	1.25
Copper	ALS	mg/L	0.001	Biannual	4	4	2	0	0.005	0.012	0.009
Fluoride	BRC Central Laboratory	mg/L as F <sup>-</sup>	0.25	Quarterly	4	4	1.5	0	<0.25	<0.4	<0.288
Hardness (Total)	BRC Central Laboratory	mg/L CaCO <sub>3</sub>	1	Quarterly	4	4	~	~	52.2	61.2	56.075
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	0.002
Magnesium	BRC Central Laboratory	mg/L as Mg	2	Quarterly	4	4	~	~	5.94	7.06	6.53
Manganese	ALS	mg/L	0.001	Biannual	4	4	0.5	0	0.002	0.03	0.01
Molybdenum	ALS	mg/L	0.001	Biannual	4	4	0.05	0	<0.001	<0.001	<0.001
Nickel	ALS	mg/L	0.001	Biannual	4	4	0.02	0	<0.001	0.006	0.002
Nitrate	BRC Central Laboratory	mg/L as NO <sub>3</sub> <sup>-</sup>	0.5	Quarterly	4	4	50	0	1.53	4.23	2.668
Nitrite	BRC Central Laboratory	mg/L as NO <sub>2</sub> <sup>-</sup>	0.1	Quarterly	4	4	3	0	<0.1	<0.1	<0.1
pH	BRC Central Laboratory	pH units @ 25°C	1	Monthly	60	60	~	~	7.14	7.7	7.436
Phosphate (Dissolved)	BRC Central Laboratory	mg/L as PO <sub>4</sub> <sup>3-</sup>	0.5	Quarterly	4	4	~	~	<0.25	<0.5	<0.438
Potassium	BRC Central Laboratory	mg/L	1	Quarterly	4	4	~	~	2.34	2.94	2.555
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	~	~	32.39	40.15	35.988
Sulphate	BRC Central Laboratory	mg/L as SO <sub>4</sub> <sup>-</sup>	4.5	Quarterly	4	4	500	0	<4.5	<4.5	<4.5
Total Dissolved Solids	BRC Central Laboratory	mg/L	~	Quarterly	4	4	~	~	191	228.5	208.55
Turbidity	BRC Central Laboratory	NTU	0.03	Quarterly	4	4	~	~	0.15	0.35	0.213
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	~	~	0.011	0.028	0.019



Verification Monitoring – Wallaville Water Service Area July 2019 – June 2020 – 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 <sub>3</sub>	3	Quarterly	4	4	~	~	57	57	84.5
Aluminium	ALS	mg/L	0.01	Biannual	4	4	~	~	0.05	0.08	0.063
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	0.042	0.052	0.049
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	Quarterly	4	4	~	~	19.57	31.95	25.133
Calcium Hardness	BRC Central Laboratory	mg/L CaCO <sub>3</sub>	1	Quarterly	4	4	~	~	48.9	79.9	62.85
Chloride	BRC Central Laboratory	mg/L as Ca	4	Quarterly	4	4	~	~	84.64	160.39	119.45
Chlorine (Free)	BRC Central Laboratory	mg/L	0.05	Monthly	36	36	5	0	0.22	2.7	1.261
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	Quarterly	4	4	~	~	477	873	644.5
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	0.03	0.015
Fluoride	BRC Central Laboratory	mg/L as F <sup>-</sup>	0.25	Quarterly	4	4	1.5	0	<0.25	<0.4	<0.288
Hardness (Total)	BRC Central Laboratory	mg/L CaCO <sub>3</sub>	1	Quarterly	4	4	~	~	108.8	189.3	147.25
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	Quarterly	4	4	~	~	14.37	26.27	20.268
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	<0.001	<0.001	<0.001
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 <sub>3</sub> <sup>-</sup>	0.5	Quarterly	4	4	50	0	0.3	1.66	0.845
Nitrite	BRC Central Laboratory	mg/L as NO <sub>2</sub> <sup>-</sup>	0.1	Quarterly	4	4	3	0	<0.1	<0.1	<0.1
pH	BRC Central Laboratory	pH units @ 25°C	1	Monthly	36	36	~	~	7.46	7.77	7.645
Phosphate (Dissolved)	BRC Central Laboratory	mg/L as PO <sub>4</sub> <sup>3-</sup>	0.5	Quarterly	4	4	~	~	<0.25	<0.5	<0.438
Potassium	BRC Central Laboratory	mg/L	1	Quarterly	4	4	~	~	3.44	4.73	4.193
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	~	~	44.59	74.23	58.515
Sulphate	BRC Central Laboratory	mg/L as SO <sub>4</sub> <sup>-</sup>	4.5	Quarterly	4	4	500	0	27.39	33.73	31.458
Total Dissolved Solids	BRC Central Laboratory	mg/L	~	Quarterly	4	4	~	~	319.6	584.9	431.8
Turbidity	BRC Central Laboratory	NTU	0.03	Quarterly	4	4	~	~	0.1	0.35	0.213
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	0.052	0.022



Verification Monitoring – Lake Monduran Water Service Area July 2019 – June 2020 – 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 <sub>3</sub>	3	Quarterly	4	4	~	~	62	62	69.5
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	0.014	0.018	0.016
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	Quarterly	4	4	~	~	10.13	17.61	12.178
Calcium Hardness	BRC Central Laboratory	mg/L CaCO <sub>3</sub>	1	Quarterly	4	4	~	~	25.3	44	30.425
Chloride	BRC Central Laboratory	mg/L as Ca	4	Quarterly	4	4	~	~	31.86	45.07	38.708
Chlorine (Free)	BRC Central Laboratory	mg/L	0.05	Monthly	12	12	5	0	0.05	2	0.638
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	Quarterly	4	4	~	~	232	285	265.75
Colour (True)	BRC Central Laboratory	Pt.Co Units	0	Quarterly	4	4	15	0	0	1	0.25
Copper	ALS	mg/L	0.001	Biannual	2	2	2	0	0.503	0.508	0.506
Fluoride	BRC Central Laboratory	mg/L as F <sup>-</sup>	0.25	Quarterly	4	4	1.5	0	<0.25	<0.4	<0.288
Hardness (Total)	BRC Central Laboratory	mg/L CaCO <sub>3</sub>	1	Quarterly	4	4	~	~	49.2	178.2	85.4
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	<0.001	0.002	0.002
Magnesium	BRC Central Laboratory	mg/L as Mg	2	Quarterly	4	4	~	~	4.65	5.8	5.323
Manganese	ALS	mg/L	0.001	Biannual	2	2	0.5	0	0.001	0.005	0.003
Molybdenum	ALS	mg/L	0.001	Biannual	2	2	0.05	0	<0.001	<0.001	<0.001
Nickel	ALS	mg/L	0.001	Biannual	2	2	0.02	0	<0.001	<0.001	<0.001
Nitrate	BRC Central Laboratory	mg/L as NO <sub>3</sub> <sup>-</sup>	0.5	Quarterly	4	4	50	0	0.65	1.41	1.043
Nitrite	BRC Central Laboratory	mg/L as NO <sub>2</sub> <sup>-</sup>	0.1	Quarterly	4	4	3	0	<0.1	<0.1	<0.1
pH	BRC Central Laboratory	pH units @ 25°C	1	Monthly	12	12	~	~	7.6	7.88	7.733
Phosphate (Dissolved)	BRC Central Laboratory	mg/L as PO <sub>4</sub> <sup>3-</sup>	0.5	Quarterly	4	4	~	~	<0.25	<0.5	<0.438
Potassium	BRC Central Laboratory	mg/L	1	Quarterly	4	4	~	~	2.31	2.85	2.635
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	~	~	25.5	36.91	31.228
Sulphate	BRC Central Laboratory	mg/L as SO <sub>4</sub> <sup>-</sup>	4.5	Quarterly	4	4	500	0	<4.5	<4.5	<4.5
Total Dissolved Solids	BRC Central Laboratory	mg/L	~	Quarterly	4	4	~	~	155.4	191	178.05
Turbidity	BRC Central Laboratory	NTU	0.03	Quarterly	4	4	~	~	0.15	0.4	0.263
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	~	~	0.008	0.018	0.013

Verification Monitoring Results – Pesticides – 2019-2020 - 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	Hexazinone	F&SS	µg/L	0.01	Quarterly	20	3 (1)	400	0	<0.01	0.02	0.01
		2,4-D	F&SS	µg/L	0.01	Quarterly		3(1)	30	0	<0.02	0.05	0.04
	Power St WTP Reservoir	Bromacil	F&SS	µg/L	0.01	Quarterly		4(4)	400	0	0.02	0.05	0.04
Gin Gin WSA	Gin Gin Reservoir	Hexazinone	F&SS	µg/L	0.01	Quarterly	4	4(4)	400	0	0.01	0.02	0.01
		2,4-D	F&SS	µg/L	0.01	Quarterly		4(1)	30	0	<0.02	0.05	0.04
Gooburrum WSA	Gooburrum Reservoir	Hexazinone	F&SS	µg/L	0.01	Quarterly	4	4(1)	400	0	<0.01	0.02	0.01
Gregory River WSA	Gregory River Reservoir	Atrazine	F&SS	µg/L	0.01	Quarterly	4	4(1)	20	0	<0.02	0.08	0.04
		Hexazinone	F&SS	µg/L	0.01	Quarterly		4(1)	400	0	<0.01	0.01	0.01
		Metolachlor	F&SS	µg/L	0.01	Quarterly		4(1)	300	0	<0.01	0.03	0.02
Kalkie WSA	Kalkie WTP Reservoir	Atrazine	F&SS	µg/L	0.01	Quarterly	4	4(2)	20	0	<0.02	0.03	0.02
		Hexazinone	F&SS	µg/L	0.01	Quarterly		4(4)	400	0	0.02	0.04	0.03
Lake Monduran WSA	Lake Monduran Reservoir	Hexazinone	F&SS	µg/L	0.01	Quarterly	3	3(3)	400	0	0.01	0.02	0.01
		2,4-D	F&SS	µg/L	0.01	Quarterly		3(3)	30	0	<0.05	0.08	0.02
Moore Park WSA	Vecellios Rd Reservoir	Hexazinone	F&SS	µg/L	0.01	Quarterly	4	4(2)	400	0	<0.01	0.01	0.01
		Metolachlor	F&SS	µg/L	0.01	Quarterly		4(1)	300	0	<0.01	0.05	0.02
River Park WSA	River Park Reservoir	Atrazine	F&SS	µg/L	0.01	Quarterly	4	4(2)	20	0	<0.02	0.03	0.02
		Hexazinone	F&SS	µg/L	0.01	Quarterly		4(4)	400	0	0.03	0.05	0.04
		Metolachlor	F&SS	µg/L	0.01	Quarterly		4(1)	300	0	<0.01	0.01	0.01
		Fipronil	F&SS	µg/L	0.01	Quarterly		4(1)	0.7	0	<0.02	0.55	0.15
Wallaville WSA	Wallaville Reservoir	Hexazinone	F&SS	µg/L	0.01	Quarterly	4	4(4)	400	0	0.02	0.05	0.04
		Metolachlor	F&SS	µg/L	0.01	Quarterly		4(1)	300	0	<0.01	0.01	0.01

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.

Verification Monitoring Results – E. coli													
Drinking Water Scheme	Bundaberg WSA 2019-2020												
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
No. of samples collected	16	16	16	16	16	16	16	16	16	15	16	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	200	198	198	198	198	198	198	198	198	197	191	191	
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)

Verification Monitoring Results – E. coli													
Drinking Water Scheme	Kalkie WSA 2019-2020												
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
No. of samples collected	9	8	8	8	9	8	9	8	9	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	113	113	110	110	110	110	110	110	101	101	101	101	
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)

Verification Monitoring Results – E. coli													
Drinking Water Scheme	Moore Park WSA 2019-2020												
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	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	60	60	60	60	60	60	60	60	60	60	
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)

Verification Monitoring Results – E. coli													
Drinking Water Scheme	River Park WSA 2019-2020												
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	28	28	26	26	26	26	26	26	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)

Verification Monitoring Results – E. coli													
Drinking Water Scheme	Rocky Point WSA 2019-2020												
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)

Verification Monitoring Results – E. coli													
Drinking Water Scheme	Gooburrum WSA 2019-2020												
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)

Verification Monitoring Results – E. coli													
Drinking Water Scheme	Gregory River WSA 2019-2020												
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
No. of samples collected	13	13	13	13	13	13	13	13	13	13	13	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	158	157	158	158	158	157	157	157	157	157	156	156	
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)

Verification Monitoring Results – E. coli													
Drinking Water Scheme	Gin Gin WSA 2019-2020												
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	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	62	62	62	62	62	62	62	62	62	62	61	60	
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)

Verification Monitoring Results – E. coli													
Drinking Water Scheme	Wallaville WSA 2019-2020												
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
No. of samples collected	3	3	3	3	3	3	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	37	37	37	37	37	36	36	36	36	36	36	36	
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)

Verification Monitoring Results – E. coli													
Drinking Water Scheme	Lake Monduran WSA 2019-2020												
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)

Summary of Trihalomethane Sampling – 2019-2020				
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	280, 290, 280, 510, 460, 420, 410, 290, 270, 330
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	2	260, 360
	<b>Totals</b>	<b>103</b>	<b>12</b>	



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

Unique Action No.	Proposed Action	Priority Rating	Outcome	Target Completion Date	Allocated Responsibility
18-01	A number of water treatment plants do not have online chlorine analysers. This was identified as a risk as chlorine is a major disinfection barrier. BRC will install online chlorine analysers 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).	High	Implementation plan for the installation of chlorine analyzers	Aug-20	Manager Process & Asset Management
18-02	After the DERM 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	High	Communication of water quality risks with BRC stakeholders	Aug-20	Manager Process & Asset Management
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.	High	Security improvements options assessment	Sep-20	Manager Process & Asset Management
18-04	Identify initial procedures and work instructions required to support the CCP program	Medium	List of support procedures	Oct-20	Treatment Team Manager
18-05	Prepare and implement listed procedures and instructions to support the CCP program.	Medium	CCP support procedures	Oct-20	Treatment Team Manager
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.	High	Annual Review of Risk Management Plans	Ongoing	Technical Officer (Compliance)
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).	Low	Implementation Plan for Operations Manual	Aug-20	Manager Process & Asset Management - delegated to Senior Technical Officer
18-08	Develop a Drinking Water Incident Response Manual for the Management of Incidents and Emergencies. (Roles & Responsibilities, Response	Low	Incident Response Manual	Aug-20	Manager Process & Asset Management -

Unique Action No.	Proposed Action	Priority Rating	Outcome	Target Completion Date	Allocated Responsibility
	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.				delegated to Senior Technical Officer
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.	Low	Improved website with more community information	On-going	Manager Process & Asset Management
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.	High	Regular oversight of Improvement Plan to ensure commitment to drinking water quality management.	On-going (monthly meeting)	Manager Process & Asset Management - delegated to Governance Team
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.	Low	Development of the BRC Water Services Operations Manual	Sep-20	Manager Process & Asset Management
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.	Low	Critical Control Point Plan for all WTP's.	Oct-20	Treatment Team Manager
18-19	Gregory River Water Treatment Plant (WTP) identified improvement measures; <ul style="list-style-type: none"> <li>•Build a new WTP beside the existing WTP. This will incorporate online instrumentation (e.g. turbidimeters, pH meters, &amp; free chlorine residual analysers.</li> </ul> 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.	Medium	Upgraded Water Treatment Plant	2020 (Capital Investment Plan) Design Stage completed June 2018	Manager Process & Asset Management

Unique Action No.	Proposed Action	Priority Rating	Outcome	Target Completion Date	Allocated Responsibility
18-21	<p>Kalkie Water Treatment Plant (WTP) implementation plan.</p> <p>The Kalkie WTP implementation plan identified the following improvement measures;</p> <ul style="list-style-type: none"> <li>• Upgrade the existing Kalkie WTP. The plant process will have conventional units such as –</li> </ul> <p>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;</p> <p>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;</p>	High	Development of an Implementation Plan	<p>Design complete Jun 2018</p> <p>Construction 2021</p>	Manager Planning & Delivery
18-22	<p>Lake Monduran Water Treatment Plants (WTP) identified improvement measures;</p> <ul style="list-style-type: none"> <li>• Investigate alternative treatment options to address removal of organics, and algal hazards.</li> </ul> <p>Option 1 – Upgrade to Existing Plant</p> <ul style="list-style-type: none"> <li>• Additional pre-treatment process for coagulation and settling to remove of organics and algal removal prior to filtration;</li> <li>• Establish a PAC dosing and storage facility and contact tank to address raw water source algal bloom risks.</li> <li>• Implementation of control system to include pump operation and filter operation to ensure operation and reliability of the plant;</li> <li>• Filter media replacement;</li> </ul>	Low	Development of an Implementation Plan	Dependent on Council decision & budget	Manager Process & Asset Management

Unique Action No.	Proposed Action	Priority Rating	Outcome	Target Completion Date	Allocated Responsibility
	<ul style="list-style-type: none"> <li>Differential pressure testing for the filters to ensure the performance of the filters post backwashing;</li> <li><del>Removal and replacement of the elevated storage tank – (Completed 07/05/2013).</del></li> </ul> 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.				
18-24	All Ground Water Treatment Plants (GWTP's): Consideration being given to in-line turbidimeters.	Low	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.	Jun 2020 (Subject to priorities)	Manager Process & Asset Management
18-26	All Reservoirs: An investigation is required to establish a reservoir cleaning program.	High	Formal reservoir cleaning schedule	Oct-20	Treatment Team Manager
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.	High	Investigation only, outcome will need to be determined.  Supernatant return upgrade will be incorporated in the 2019 WTP upgrade.  Refer UAN 18-21	Align with upgrade 2021	Manager Planning & Delivery
18-28	Wallaville Water Treatment Plant (WTP) identified improvement measures; Option 1 – Upgrade to Existing Plant <ul style="list-style-type: none"> <li>Establish a PAC dosing and storage facility and contact tank to address raw water source algal bloom risks</li> </ul> Option 2 – Alternative raw water supply <ul style="list-style-type: none"> <li>Groundwater supply is currently being investigated.</li> </ul> Option 3 - Investigate alternative Treatment Technology Options.	Low	Potential for a PAC Dosing installation.  An alternate raw water supply is now being investigated.	Dependent on Council decision & budget (TBA)	Manager Process & Asset Management

Unique Action No.	Proposed Action	Priority Rating	Outcome	Target Completion Date	Allocated Responsibility
18-34	Add Contact Time (CT) tables to WTP operational logs.	High	CT Reference Point	Oct-20	Manager Process & Asset Management - delegated to Senior Technical Officer
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.	High	CCP's/QCP's are current to ensure hazards are minimised or removed.	Mar-21	Treatment Team Manager
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.	High	SCADA changes are secure and limited to managerial/supervisory staff.	Apr-21	Technical Officer (Compliance)
18-40	Add critical/sensitive customers (Hospitals, Clinics, Brewed Drinks, etc.) to DWQMP Continuity Plan.	High	Central point for identifying who are critical customers	Sep-20	Technical Officer (Compliance)
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.	Medium	Provision of available options in regard to the future operational direction of the Bundaberg groundwater treatment system.	Oct-20	Manager Process & Asset Management
20-01	MA- 01 Build out Private SCADA Network: Work-in-progress with numerous water sites now completed. Final testing and cutover required for all water facilities, sites & equipment.	High	Private SCADA Network built.	Dec-20	Chief Information Officer
20-02	MA- 02 Build single point of access and authentication method: On completion of MA-01 a single point access will be built as a mechanism to enter the telemetry network	High	Single point of Access available.	Dec-20	Chief Information Officer
20-03	MA-03 Implement rules to prevent across network access. Following the completion of MA-01 & MA-02 - BRC can facilitate secure entry to the IT/OT network	High	Rules implemented to prevent across network access.	Dec-20	Chief Information Officer

Unique Action No.	Proposed Action	Priority Rating	Outcome	Target Completion Date	Allocated Responsibility
20-04	MA-04 Disallow open internet access: Will be completed as part of MA-01 & MA-02 and will consider to allow Windows Updates etc.	High	Open internet Access ceased.	Dec-20	Chief Information Officer
20-05	MA-05 Install and enable active virus scanning: IT antivirus software currently installed, OT SCADA machines will not have anti-virus installed as it can interfere with SCADA installed software. Cyber security of OT SCADA machines is controlled by restricting internet access and eliminating the use of external USB drives and fire wall settings	High	Restricted external drive usage.	Dec-20	Chief Information Officer
20-06	MA-06 Activate and set windows firewall rules: To be implemented Upon completion of MA-01.	High	Firewall rules enabled.	Dec-20	Chief Information Officer
20-07	MA-07 Implement maintenance and updates schedule: Maintenance is a ongoing activity with any updates to SCADA software, any upgrades / changes to PLC / SCADA configuration files have back-up files saved on each workstation on-site and off-site	High	Active maintenance and update schedule	On-going	Chief Information Officer
20-08	MA-08 Certificate or key based authentication for remote access: To be implemented Upon completion of MA-01	High	Key based authentication implemented.	Dec-20	Chief Information Officer
20-09	MA-09 Two factor authentication: To be implemented Upon completion of MA-01	High	Two factor authentication implemented.	Dec-20	Chief Information Officer
20-10	MA-10 Implement backup schedule: Undertaken as part of maintenance of IT/OT systems and is an ongoing activity, backups of configurations files are made onsite and a copy is stored off-site in the secure corporate 'R' Drive by IT	High	Active backup schedule.	On-going	Chief Information Officer
20-11	MA-11 Ensure validity of software licences used across machines: Ongoing as all SCADA OT software is licenced and authentication is used across SCADA OT machines	High	Validated software licences.	On-going	Chief Information Officer
20-12	Increased awareness from operators surrounding physical security access on ICS sites, provided by means of training sessions. Formal training sessions with water services operators.	High	Conducted formal training sessions.	Dec-20	Manager Process & Asset Management
20-13	Perform routine manual operation of sites, and ensure documentation exists for operating procedures. Staff should be trained and deemed	High	Commence Formal Trainings	Dec-20	Manager Process & Asset Management

Unique Action No.	Proposed Action	Priority Rating	Outcome	Target Completion Date	Allocated Responsibility
	competent to run manual operation of sites. Training of manual mode operations for each facility ongoing.				
20-14	Include information in the plan on what stakeholders have been actively involved in the risk assessment and why.	Medium	Information included in the new plan	Jan-21	Governance Team
20-15	Provide rationale in the plan to explain the acceptable levels of risk, it was noted that prior to the IRN the acceptable risk level in the plan was low. This changed to include both low and medium risk in the plan post IRN. How did BRC risk assessment team come to this decision	Medium	Rationale provided in the new plan	Jan-21	Governance Team
20-16	Suggest including a review section in the plan to document the review processes that BRC is currently doing including long term data trending, data on which the risk assessments have been based etc	Medium	Section included in the new plan	Jan-21	Governance Team
20-17	Group whole of system risks to avoid duplication	Medium	Risks Grouped in the new plan	Jan-21	Governance Team
20-18	Document that all verification data is entered into LIMS & that QCP's & CCP's are reviewed annually for trends, creep, rise into the plan to give the regulator a better understanding of the review process & the basis for the risk ratings	Medium	Reviews conducted and CCP/QCP updated as required	Jan-21	Governance Team/Service Delivery Team