

Drinking Water Quality Management Plan (DWQMP) Report

2024-2025

Version: 1
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Water Supply Schemes Covered by This Plan	Blackbutt, Kingaroy, Murgon, Nanango, Proston, Wondai, Bjelke-Petersen Dam, Boondooma Dam

Glossary of terms

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

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1. Introduction

This report documents the performance of South Burnett 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 DWQMP and any approval conditions have been complied with and provides a mechanism for providers to report publicly on their performance in managing drinking water quality.

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

2. Overview of Operations

South Burnett Regional Council water reticulation schemes service the townships of Blackbutt, Kingaroy, Murgon, Nanango, Proston and Wondai, with two smaller drinking water systems at Bjelke-Petersen Dam and Boondooma Dam tourist parks also operated under the approved DWQMP.

The following table provides operational information for each scheme.

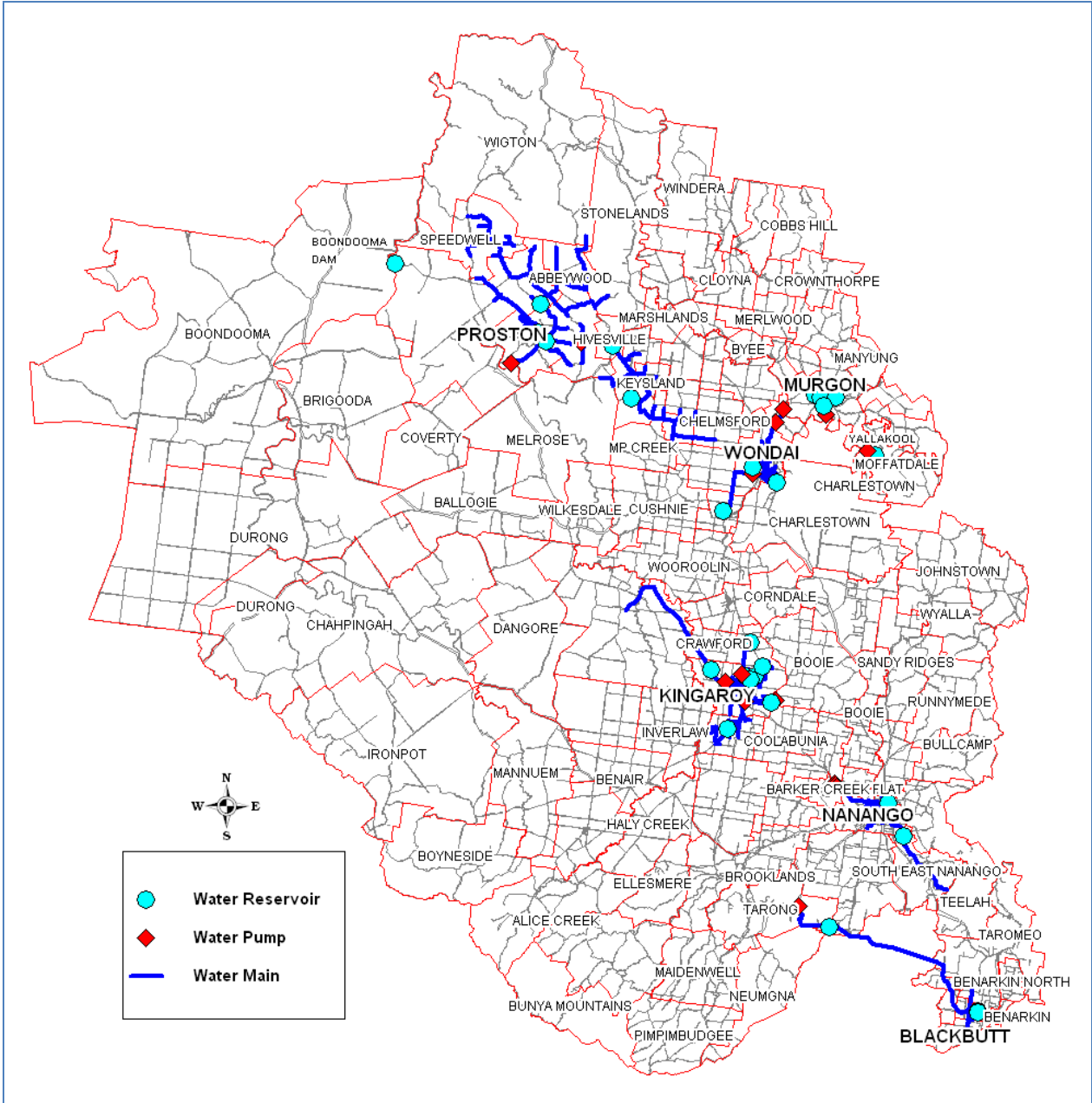
WATER SUPPLY SCHEME	TREATMENT PLANT	WATER SOURCE	WATER TREATMENT PROCESS	CAPACITY
Blackbutt	Blackbutt WTP	<ul style="list-style-type: none"> • Boobir Dam • Boondooma Dam 	<ul style="list-style-type: none"> • Flocculation • Sedimentation • Filtration • Disinfection 	1.15 ML/day
Kingaroy	Gordonbrook WTP	<ul style="list-style-type: none"> • Gordonbrook Dam • Boondooma Dam 	<ul style="list-style-type: none"> • PAC Dosing • Coagulation • Settling • Clarification • Floatation • Filtration • Disinfection 	9.72 ML/day
Murgon	Murgon WTP	<ul style="list-style-type: none"> • Barambah Creek.(Murgon Wier) 	<ul style="list-style-type: none"> • Flocculation • Sedimentation • Filtration • Disinfection 	2.8 ML/day
Nanango	Nanango WTP	<ul style="list-style-type: none"> • Barkers Creek Bore Field 	<ul style="list-style-type: none"> • Disinfection 	1.4 ML/day
Proston	Proston WTP	<ul style="list-style-type: none"> • Boondooma Dam • Proston Weir 	<ul style="list-style-type: none"> • Flocculation • Sedimentation • Filtration • Disinfection 	0.5 ML/day
Wondai	Wondai WTP	<ul style="list-style-type: none"> • Barambah Creek (Ficks Crossing) 	<ul style="list-style-type: none"> • Flocculation • Dissolved Air Flotation • Filtration • Disinfection 	3.3 ML/day

Bjelke-Petersen Dam	Bjelke-Petersen Dam WTP	<ul style="list-style-type: none"> • Bjelke-Peterson Dam 	<ul style="list-style-type: none"> • Flocculation • Filtration • Disinfection 	0.2 ML/day
Boondooma Dam	Boondooma Dam WTP	<ul style="list-style-type: none"> • Boondooma Dam 	<ul style="list-style-type: none"> • Flocculation • Sedimentation • Filtration • Disinfection 	0.12 ML/day

Water is disinfected with chlorine (liquid sodium hypochlorite) before entering the reticulation system and is transferred from the treatment plants to storage reservoirs through the reticulation systems.

South Burnett Regional Council maintains more than 610.4 kilometres of water mains supplying approximately 9,932 properties connected to potable water supply through the South Burnett. The networks also comprise a total of 31 pump stations and 32 reservoirs with a total capacity of approximately 21.21 ML, and 10 re-chlorination stations. Figure 1 shows the extent of the South Burnett Regional Councils potable water distribution system; including areas serviced and the location of drinking water infrastructure.

Figure 1: Overview Map of South Burnett Regional Council's Potable Water Distribution Network



3. Actions taken to implement the DWQMP

3.1 Progress in implementing the risk management improvement program.

The current approved DWQMP is Version 9.1 2024. The approved RMIP can be in Appendix B to compare with the completed tasks in the below tables from the superseding plan 8.3 2021.

Version 9.1. 2024 was approved in late October 2024. The last regular audit of Council Drinking Water Management plan was completed in April 2025.

All remaining tasks from the RMIP are located below in Table 1. Following the review/audit these items have been incorporated into the new RMIP with the amended plan application. Please refer to current approved RMIP in Appendix B.

Completed risk reduction actions are detailed in Table 2.

Table 1 Implementation of Risk Management Improvement Program (Version 8.3 2021)

Ref	Scheme component / Sub-component	Hazard / Hazardous event	Priority	Action(s)			Target date(s)	Estimated cost	Responsibility	Comments
				Interim	Short-term	Long Term				
Current Tasks										
S14	Proston weir and pump station	Loss of supply to Proston scheme	Low	Pump hire		Procurement of Pumps and water licences	Jun-28	N/A	MWW	RMIP S14 has been superceeded by 2023- ?? in DWQMP V10.2 2025
S21	SCADA All schemes	Change to set points/ water quality	Low	System checks against set point summary		SCADA and PLC upgrades with built in prevention	TBC	N/A	MWW	RMIP S14 has been superceeded by RMIP numbers 2023- 039, 2023-80, 2023-145, 2023-190, 2023-190, 2023-223, 2023-253 in DWQMP V10.2 2025
S25	Kingaroy	THM	High			Design and Construct off site storage to store Boondooma Dam Raw Water	Mar-26	TBA	MWW	Off site storage dam will maintain continuity of supply from Boondooma Dam reducing the need to use 100% Gordonbrook supply. Funding has been approved and design is completed and Off Stream Storage is under construction. Due to be commissioned 1.03.2026 .
S27	All Schemes	Water Quality / Disinfection	Medium			Develop a disinfection strategy to reduce water age and maintain fire fighting capacity.	Jun-30	TBA	MWW	Water age historically was managed by reducing reservoir storages at outer reservoirs. This is also been identified in the recently undertaken DWQO strategy 2025.
S28	All Treatment Plants	Turbidity	Medium	Continue to optimise jar testing and filter performance		Develop long term turbidity reduction plan for all WTP's	Jun-26	TBA	MWW	S28 - has been superceeded - Council has assessed the performance of the filters at all WTP as part of the DWQO Strategy. This has identified what needs to be done to optimise filtration at all plants. These improvement measures have been included as part of the RMIP's for the current plan amendment.

Table 2 Completed tasks of Risk Management Improvement Program (Version 8.1 2021)

Ref	Scheme component / Sub-component	Hazard / Hazardous event	Priority	Action(s)			Target date(s)	Estimated cost	Responsibility	Comments
				Interim	Short-term	Long Term				
Completed Tasks										
S1	Catchment and Operations	Loss of Key staff, operational knowledge	Medium	Review O&M manuals to ensure they are sufficient for the purpose. (See S2)		Complete O&M's for Nanango, Proston and Yallakool WTP's. See below	Complete	N/A	N/A	Operational staff has now either been formally trained to Certificate II & III levels or are actively being trained to coming on the training. All operators/team members are utilised in a staff roster rotations. Operators/team members are confident in operating all plants. The large water treatment plants, and reticulation now have operation - maintenance manuals and procedures. This risk is now deemed complete.
S2	Catchment and Operations	Loss of Key staff, operational knowledge	High	Review all operation and maintenance manuals, including sampling data, handling, and communication procedures.		Complete O&M's for Nanango, Proston and Yallakool WTP's. See below	Complete	N/A	N/A	SBRC completed procedures for reticulation and all large water treatment plants Operation and Maintenance manuals as per section 5.2 The remainder O&M's required have now been identified in the below item.
S3	Catchment and Operations	Currently there is no promulgation of the Incident and Emergency Response Plan, and no linkage of it to the Regional Disaster Management Plan.	Medium	Review Incident and Emergency Response Plan and document the linkages into Regional Disaster Management Plan.			Completed 31 December 2013	N/A	N/A	SBRC endorsed Councils revised South Burnett Local Disaster Management Plan on 18 February 2014. Linkages to the SBLDMG and responsibilities have been added to the DWQMP Incident and Response Plan (refer Appendix 1). Promulgation of the Incident and Response Plan through the South Burnett Local Disaster Management Group (SBLDMG) was achieved during the SBLDMG meeting on the 16 June 2014. The linkages between the South Burnett Local Disaster Management Plan and Councils DWQMP were presented at this meeting by Russell Hood (General Manager -Infrastructure) Minutes of the meeting are attached in Appendix B. This risk is now deemed complete.
S4	Kingaroy Scheme	Re-Chlorination	Medium	Engineer to investigate flow and dosing rates.			Completed	N/A	WE	Upon completion of the Gordonbrook Water Treatment Plant, organics removal has been increased allowing the redosing stations flow rates reduced. Future operational adjustments will be upon engineering recommendations. This risk is now considered acceptable.
S5	Yallakool WTP	Lack of significant Operation data	Low	Include verification, raw and treated water data in DWQMP		Include in plan	Completed	N/A	TC	Verification monitoring is now included in the DWQMP. This is now considered an acceptable risk.
S7	Boondooma and Proston Water Treatment Plant	No connection to SCADA	Low	For the interim and short term existing operational visits will remain. These are considered satisfactory, however connection to SCADA will aid in operational procedures.		Complete project.	Completed	N/A	WE	SCADA projects completed November 2017
S8	All Areas	IT Systems damaged by network access or possible intrusion via external contractors Inc. scada programmers, electricians, process engineers, instrument technicians	Low	Existing preventative measures are considered suitable.			Cyber security complete	N/A	Manager ICT	to date no issues with this hazard however need to undertake a vulnerability assessment to be completed by 30th June 2020
S6	Nanango, Proston and Yallakool Water Treatment Plant	Lack of Operation and Maintenance Manual	Low	Operators are very familiar and well trained in the operation of this system.		Complete O&M's for this plant as mentioned in section 5.3	Jun-20	N/A	MWW, WE, TC	SBRC has prioritised the completion of O&M's for the larger water treatment plants. The small plants planned to be complete by the target date mentioned.
S9	All Areas	ICT patches and upgrades of hardware and software failure.	Low	Existing preventative measures are considered suitable.			Jul-20	N/A	Manager ICT	To date no issues with this hazard however process to be implemented for upgrades to be updated regularly
S10	All Areas	Loss of supply to drought	Low	Review any existing documentation and provide a plan.			Jun-21	N/A	MWW	Consultants are currently reviewing the Drought Management Plan in final Draft.
S11	All Areas	High THM's	Low	Secure budget allocation to complete a review.			Completed	N/A	MWW	THM review by external water quality expert or auditor to ensure best practices are adopted.
S12	All Areas	Procedures	Low	Procedures are in draft mode	Operational staff have performed these tasks and formalising the process and training for new operational staff.	Complete draft procedures and complete operational training.	Completed	N/A	MWW	All procedures have been finalised as SWI's for Treatment and Network Operators and additional SOP's relating to SBRC Laboratory Procedures. These are noted in Appendix F.
S13	Proston WTP	Water Quality, plant under-performing.	Low	Operators are trained on site	Jar Tests performed off site.	Jar testing and formal training of operators	Completed	N/A	MWW	
S15	All Areas	Drifting analysers / water quality	Low	Calibration sheets		Instrument service agreements	Completed	N/A	MWW	Maintenance manuals have been provided and staff are trained. Eg Council organises equipment suppliers to do onsite training workshops
S16	Blackbutt WTP, Wondai WTP and Nanango WTP	PLC Failure / loss of supply	Medium	Operation operations		SCADA and PLC upgrades	Completed	N/A	MWW	Tenders awarded to complete the significant upgrades to Regional SCADA and PLC upgrades as a multiple year project.
S17	All Areas	General reservoir risks and hazards	Low			Develop formal inspection and reporting program.	Completed	N/A	MWW	Reservoir inspections are currently adhoc. Improvement is to formally inspect record and report defects.
S18	All areas	Dirty water / High turbidity / poor disinfection	Low			Investigate turbidity testing on site for water main repairs	Completed	N/A	MWW	This forms part of the new approved DWQMP revision 10
S19	QA system	Water Quality, plant under-performing.	Low			Implement additional quality controls for water quality	Completed	N/A	MWW	Implement better controls for capturing calibration data and jar testing results. Controls have been implemented and this is an ongoing action.
S20	Wondai WTP	High turbidity/dirty water	Low	Slow plant flow rate during turbid events		Clarifier requested through MIPP project	Completed	N/A	MWW	This is a risk improvement action item under RMIP for DWQMP revision 10
S22	All Areas	Water Quality, Operator error	Low	Develop Training		SOP for all procedures	Completed	N/A	MWW	Create a SOP for operators to locate and be trained. This is ongoing
S24	All Areas	Water Quality	Low	Check all instruments		Implement Reagent and instrument calibration program	Completed	N/A	MWW	Implement routine program for calibrating, inspecting, bench top instruments and reagents. For benchtop meters this has been implemented through our Lab staff. For onsite analysis, operations staff check and calibrate as per plant operations.
S26	All Schemes	Chlorate and Chlorite	High	Continue 6 monthly sampling as is and report as required.		Include in the verification monitoring plan at next review, and risk assess each scheme.	Completed	N/A	MWW	Most liquid sodium hypochlorite dosing station have a duty and standby tank. Old chlorine is completely depleted before new chlorine
S29	Nanango WTP	Turbidity	High	Implement turbidity monitoring at the Nanango WTP and scheme			Completed	N/A	MWW	
S23	All Areas	Water Quality, Operator error	Low	Develop Training		Develop Jar Testing Procedure to include frequency and document recording process	Completed	N/A	MWW	
S30	All Schemes	Blue Green Algae, Pesticides and Herbicides	Low	Continue to review results as received		Develop a data management system with and output reporting mechanism	Completed	TBA	MWW	All monitoring data is being recorded in SWIMs

3.2 Amendments made to the DWQMP.

Operational monitoring is conducted as per the DWQMP Version 9 (between Jul 2024 & Oct 2024) and Version 9.1 2024 from Nov 2024 to Jun 2025. An increase in some additional water quality parameters have been implemented in a few locations. These minor changes have not influenced or required any changes to the risk evaluations.

A minor amendment was also completed in Aug 2025 to update Yalakool Water Supply to Bjelke-Petersen Dam and Bjelke-Petersen Dam is listed through out this report.

3.2 Amendments made to the DWQMP Risk Management Improvement Program.

The current approved RMIP is in Appendix B.

4. Compliance with water quality criteria for drinking water.

The water quality criteria for potable water compliance are to meet health guideline values in the most current Australian Drinking Water Guidelines 2011, as well as the standards in the Public Health Regulation 2018.

Results from water quality analysis is in Appendix A. Councils current DWQMP was approved in October 2025, with monitoring as per the new plan beginning in November 2025. Water quality information is comprised from monitoring under the previous plan (or DWQMP Version 9.0 for July to October 2024, and the new plan (DWQMP V9.1) from November to June 2025.

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

During the reporting period 2024-2025 there was no microbial incidents reported. However, under sections 102 or 102A of the Act, there was several Physical and Chemical Characteristics incident and events reported to the through to the Regulator. Please see below status and commentary around the incidents report.

OPEN/CLOSE D	Water Service Area	Parameter	Monitorin g Type	QWSR Referenc e	Inciden t Date	Initial Date reported to DWSR	Sample Point ID	Comments
<i>Closed</i>	Proston Water Supply	Chlorates	Verification Monitoring	DWI-491- 25-11833	22-Jan- 25	31-Jan-25	PROS 15	22 Jan 2025 at Pros 15 (0.81) PROS15 - Previous Chlorate testing results for Proston were under the superseded plan and we tested at pros 17 which was the WTP. Chlorate sampling under previous plan Chlorates was not part of our verification monitoring plan but monitoring began from the chlorate advised in Sept 2022. This sample point under the current plan has been relocated to Pros 15. The most recent results that were taken at Pros 17 were sample 15.05.2025 - 0.3 - 8.05.2024 .18 and 1.05.2024 - .81. Due to the low results sampling frequency was reduced until the current plan was approved in Oct 2024. Closed out 14.05.2025
<i>Closed</i>	Wondai Water Supply	Chlorates	Verification Monitoring	DWI-491- 25-11834	22-Jan- 25	31-Jan-25	TING 1	Close out email sent - 7/8/2025

<i>Closed</i>	Boondooma Water Supply	THM's	Verification Monitoring	DWI-491-24-11686	16-Dec-24	20-Dec-24	BOON 13	<p>Elevated levels of THM's have been detected in the reticulation system.</p> <p>Historically THM levels have been exceeded during this time of year due to temperature changes and with recent high rain falls, we have seen an increase in organic matter in the raw water coming into the plant.</p> <p>When the resampling - 6 Jan 2024 Corrective action - Scour and empty the water reserve for THMs</p>
<i>Closed</i>	Boondooma Water Supply	HAA's	Verification Monitoring	DWI-491-25-11848	23-Jan-25	13-Feb-25	BOON 13	<p>Council has a high HAA (Trichloroacetic Acid reading at Boondooma Dam Kiosk (BOON 13) on 22 Jan 2025. Result was received at the lab on the 23 Jan 2025, however Council on received the results of the test on the 13 Feb 2025.</p> <p>The free and total chlorine on the 22 Jan 2025 was 0.07 and 0.27. Chlorine degradation from the plant to the sample location (BOON 13) is expected due to the higher levels of THMs and HAAs identified during the period.</p>

<i>Closed</i>	Murgon Water Supply	THM's	Verification Monitoring	DWI - 491-25-11861	12-Feb-25	18-Feb-25	MURG 5	<p>Council has received high THM results for Murgon at the MURG 5 - Murgon Hospital Reservoir at 260→µg/L.</p> <p>Chlorine results when the samples were taken Free Chlorine - 0.57 and Total Chlorine 0.69. Turb was 1.05.</p> <p>Council has received high THM results for Murgon at the MURG 5 - Murgon Hospital Reservoir at 260→µg/L.</p> <p>Chlorine results when the samples were taken Free Chlorine - 0.57 and Total Chlorine 0.69. Turb was 1.05.</p> <p>13.11.2025 - closed out</p>
<i>Open</i>	Kingaroy Water Supply	THM's	Verification Monitoring	DWI-491-24-11304	30-Sep-24	1-Oct-24	KING 9	Historically THM levels have been exceeded during this time of year due to temperature changes and with recent high rain falls, we have seen an increase in organic matter in the raw water coming into the plant.

<i>Closed</i>	Proston Water Supply	Micro-Plastics	Verification Monitoring	DWI-491-25-11882	06-Jan-25	27-Feb-25	PROS 17	<p>Council undertakes annual Microplastics testing and the recent test has come back with a result of Polyamide - 1,930MPs/L. Reporting only because it is significantly higher than previous years.</p> <p>Due to operational challenges that occurred, Council has had a delay in undertaking the 2024 annual test (completed in Jan 2025).</p> <p>I have attached the last 2 microplastics results for review.</p> <p>Council has removed the requirement for testing of Microplastics in the current QWQMP as there is no ADWG limits on microplastics and we did not want to be doing testing at a specific time and frequency. However, council continues to do testing on an annual basis.</p>
<i>Open</i>	Kingaroy Water Supply		Event Notification	DWI-491-24-11572		10-Dec-25	Mount Wooroolin Res	Mount Wooroolin Reservoir No.1 has now been isolated to remove and future risk to water quality due to the damaged roof. Following successful commissioning of Mount Wooroolin Reservoir No.2, water quality and supply will be maintained whilst reservoir No.1 is isolated.
<i>Closed</i>	Murgon Water Supply	THM's	Verification Monitoring	DWI-491-24-11159	17-Jul-25	8-Aug-24	MURG 5 & MURG 4	Elevated THM's detected across scheme - Corrective action - Scour and empty the water reserve for THMs Investigation report was submitted, then the limits spike again late July
<i>Closed</i>	Blackbutt Water Supply	Chlorates	Verification Monitoring	DWI-491-25-11953	10-Mar-25	20-Mar-25	BLACK1	Closed on 2.6.2025

<i>Closed</i>	Blackbutt Water Supply	Missed Sample	Verification Monitoring	DWI-491-24-11179		14-Aug-24		Due to public holiday in Kingaroy on 12.08 and a public holiday in Brisbane on 14.8 Councils weekly sampling as per DWQMP has not been undertaken
<i>Closed</i>	Nanango Water Supply	Missed Sample	Verification Monitoring	DWI-491-24-11179				Due to public holiday in Kingaroy on 12.08 and a public holiday in Brisbane on 14.8 Councils weekly sampling as per DWQMP has not been undertaken
<i>Closed</i>	Wondai Water Supply	THM's	Verification Monitoring	DWI-491-24-11243	21-Aug-24	3-Sep-24	WOND 12 & TING 1	Elevated THMs detected across the Wondai/Tingoora Scheme
<i>Closed</i>	Wondai Water Supply	Missed Sample	Verification Monitoring	DWI-491-25-11899	5-Mar-25	5-Mar-25	WOND & Murgon	Received notification from the labs in Brisbane that they weren't accepting samples as of the Cyclone Alfred was due to hit. Council undertook internal testing in the SBRC labs with no issues identified. Closed 14.05.2025
<i>Closed</i>	Murgon Water Supply	Missed Sample	Verification Monitoring	DWI-491-25-11899	5-Mar-25	5-Mar-25		Received notification from the labs in Brisbane that they weren't accepting samples as of the Cyclone Alfred was due to hit. Council undertook internal testing in the SBRC labs with no issues identified. Closed 14.05.2025
<i>Closed</i>	Blackbutt Water Supply	Turbidity	Event Notification	DWI-491-25-11929	10-Mar-25	20-Mar-25	Reticulation Network	Closed our 30.05.2025
<i>Closed</i>	Yallakool Water Supply		Event Notification	DWI-491-25-12022	14-Mar-25	22-Mar-25		Notified the regulator of a vandalism attempt and that the pumps failed and the Caravan Park had a water outage for about 4 hours.

<i>Closed</i>	Blackbutt Water Supply	Manganese	Operational CCP	DWI-491-25-12045		1-May-25	Reticulation Network	<p>Through monitoring of event DWI-491-25-11929, Council was undertaking monitoring throughout the reticulation scheme and at customer meter if dirty water was reported. A high Manganese level of 0.624 mg/l.</p> <p>Email notification closing out incident was received on 1.8.2025</p>
<i>Closed</i>	Boondooma Water Supply		Operational	DWI-491-25-12042		30-Apr-25	Reticulation Network	<p>Due to a SunWater pipeline maintenance shut down period, Council will have to truck treated water from the Proston Water Treatment Plant to the Boondooma Water Treatment plant clear water reservoir during this period.</p> <p>Shutdown is from 30.04.2025 to 12.05.2025.</p> <p>During this time verification testing for current open incidents for HAA's, THM and Chlorates at BOON 13 won't be taken at this site for the week beginning 28 April 2025 as the water is being tested as per the verification plan for Pros</p>
<i>Closed</i>	Wondai Water Supply	THM's	Verification Monitoring	DWI-491-25-12065		12-May-25	Reticulation Network	<p>Missed high THM whilst monitoring through spreadsheet.</p> <p>Part B form was submitted to the regulator and a couple weeks later results came back exceeding the 250, as the regulator had not closed it out we ask for this incident to remain open</p>
<i>Closed</i>	Proston Water Supply	THMs	Verification Monitoring	DWI-491-25-12090	13-May-25	23-May-25	Reticulation Network	<p>Received high THMS at PROS 15 (res) believe to be left over water from the SunWater shutdown. Investigation report sent off 24.06.2025</p>

<i>Closed</i>	Wondai Water Supply		Event Notification	DWI-491-25-11899	5-Mar-25	5-Mar-25	WOND	Event notification was sent advising of missed samples as the external labs had closed down due to cyclone Alfred
<i>Closed</i>	Murgon Water Supply		Event Notification	DWI-491-25-11899	5-Mar-25	5-Mar-25	MURG	Event notification was sent advising of missed samples as the external labs had closed down due to cyclone Alfred
<i>Closed</i>	Blackbutt Water Supply	Manganese	Operational CCP	DWI-491-25-11929	12-Mar-25	12-Mar-25	Reticulation Network	On Saturday 8 March dirty water was identified by a treatment operator at the public toilets in Blackbutt and also noted that the Chlorine was low at test points. Flushing of the outer limits was undertaken for approximately 4 hours until was colour cleared up. Program Coordinator contacted Principal Engineer, and after an initial remote assessment identified that an unplanned interruption to the Nukku (Tarong) Pump station which occurred on late on the 3rd of March was expected to have caused Mn in the raw water supply line due to pressure, flow and air lock impacts on the raw water supply to Blackbutt. Supply was restored quickly at the Tarong Pump Station once identified (interruption was expected for approximately 4 hours), however the increase in Mn in the raw water was not flushed out prior to entering the water treatment plant.
<i>Closed</i>	Nanango Water Supply	Manganese	Verification Monitoring	DWI- 491-25-12174		11-Jul-25	Reticulation Network	It was identified after the Change in ADWG health guidelines come in for manganese that Bore C was above the new limit. Bore C has been isolated and will only be used in an emergency and after consultation with the regulator should this occur.

Customer Service Standards

Council's Customer service review has been reviewed in Oct 2025. Council continues to improve record keeping accuracy within the reticulation team for continual improvement with their customer service standards.

Throughout the year 2024-25 the following complaints about water quality were received:

Table 2 - complaints about water quality.

	Health Concern	Discoloured Water	Odour	Taste	Total
Blackbutt		7			7
Kingaroy		14			14
Murgon					0
Nanango		1			1
Wondai		0			0
Boondooma Dam					0
Bjelke-Petersen Dam					0
Proston					0
Total	0	22			22

Customer complaints related to water quality.

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

SBRC has developed the record keeping process for water quality complaints. The increased number from previous years is a result of improved data management systems.

Health Concern:

Complaints are sometimes received from customers who suspect their water may be associated with an illness they are experiencing. South Burnett Regional Council investigates each complaint relating to an alleged illness, typically by follow up testing of the customer's tap water and closed reticulation sampling point.

Discoloured water:

Twenty-two customer complaints were received by South Burnett Regional Council between July 2024 – June 2025 related to dirty water. Complaints received for dirty water in Kingaroy this year were primarily related to Manganese, causing the bulk of the complaints. Other complaints arise when there has been a failure within the reticulation system, such as a broken water main or fire hydrant testing. Oxidising iron and manganese within the reticulation network can also occur. Flushing and scouring are often used to resolve these issues.

5. Findings and recommendations of the DWQMP auditor

The DWQMP regular audit was conducted and completed April 2025. Following the Audit findings and recommendations a review of the DWQMP was conducted. This amendment was submitted to the regulator on 29 October 2025.

Appendix A – Summary of compliance with water quality criteria

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

The reported statistics do not include results derived from repeat samples, or from emergency or investigative samples undertaken in response to an elevated result.

Verification monitoring was conducted as per DWQMP. **Please note, sample numbers may vary due to public holidays and Christmas shutdown periods and laboratory closures over these periods.**

E. coli verification monitoring: Bjelke-Petersen Dam

Bjelke-Petersen Dam WSA												
Month	July 2024	Aug 2024	Sept 2024	Oct 2024	Nov 2024	Dec 2024	Jan 2025	Feb 2025	Mar 2025	Apr 2025	May 2025	June 2025
No. of samples collected	1	1	1	1	1	1	1	1	1	1	1	1
No. of samples collected in which E.coli is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	9	10	10	10	10	10	10	11	11	11	12	12
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

E. coli verification monitoring: Blackbutt

Blackbutt WSA												
Month	July 2024	Aug 2024	Sept 2024	Oct 2024	Nov 2024	Dec 2024	Jan 2025	Feb 2025	Mar 2025	Apr 2025	May 2025	June 2025
No. of samples collected	15	9	15	12	1	1	1	1	1	1	1	5
No. of samples collected in which E.coli is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	138	138	144	141	130	122	112	103	92	81	70	63
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

E. coli verification monitoring: Boondooma

Boondooma WSA												
Month	July 2024	Aug 2024	Sept 2024	Oct 2024	Nov 2024	Dec 2024	Jan 2025	Feb 2025	Mar 2025	Apr 2025	May 2025	June 2025
No. of samples collected	1	1	1	1	1	1	1	1	1	2	2	1
No. of samples collected in which E.coli is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	12	12	12	12	12	12	12	12	12	13	14	14
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

E. coli verification monitoring: Kingaroy

Kingaroy WSA												
Month	July 2024	Aug 2024	Sept 2024	Oct 2024	Nov 2024	Dec 2024	Jan 2025	Feb 2025	Mar 2025	Apr 2025	May 2025	June 2025
No. of samples collected	44	44	44	55	7	7	7	7	7	8	7	7
No. of samples collected in which E.coli is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	537	537	537	548	500	474	437	401	364	317	281	244
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

E. coli verification monitoring: Murgon

Murgon WSA												
Month	July 2024	Aug 2024	Sept 2024	Oct 2024	Nov 2024	Dec 2024	Jan 2025	Feb 2025	Mar 2025	Apr 2025	May 2025	June 2025
No. of samples collected	30	24	24	30	4	5	4	4	4	5	4	4
No. of samples collected in which E.coli is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	276	277	283	289	263	255	235	215	207	188	162	142
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

E. coli verification monitoring: Nanango

Nanango WSA												
Month	July 2024	Aug 2024	Sept 2024	Oct 2024	Nov 2024	Dec 2024	Jan 2025	Feb 2025	Mar 2025	Apr 2025	May 2025	June 2025
No. of samples collected	25	15	25	20	4	5	4	4	5	4	4	4
No. of samples collected in which E.coli is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	229	230	240	235	219	209	193	182	167	151	135	119
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

E. coli verification monitoring: Proston

Proston WSA												
Month	July 2024	Aug 2024	Sept 2024	Oct 2024	Nov 2024	Dec 2024	Jan 2025	Feb 2025	Mar 2025	Apr 2025	May 2025	June 2025
No. of samples collected	3	3	3	3	1	1	1	1	1	1	1	1
No. of samples collected in which E.coli is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	36	36	36	36	34	32	30	28	26	24	22	20
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

E. coli verification monitoring: Wondai

Wondai WSA												
Month	July 2024	Aug 2024	Sept 2024	Oct 2024	Nov 2024	Dec 2024	Jan 2025	Feb 2025	Mar 2025	Apr 2025	May 2025	June 2025
No. of samples collected	30	24	24	30	4	5	5	4	4	5	4	4
No. of samples collected in which E.coli is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	275	276	282	288	262	255	236	216	208	189	163	143
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Water quality Analysis: Bjelke-Petersen Dam Raw Water

Bjelke-Petersen Dam Water Supply																				
Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	
Standard Water Analysis										Disinfection Monitoring										
Calcium	mg/L	4	10	21	38	29.3	38			Free Chlorine		No tests undertaken on Raw Water								
Conductivity	uS/cm	4	10	460	880	642	867			Total Chlorine										
Magnesium	mg/L	4	10	15	30	21.8	30			Disinfection By Products & Pre-Cursor										
pH		4	10	6.55	7.37	6.86	7.27			Total Trihalomethane		No THM tests undertaken on Raw Water								
Sodium Abs. ratio	calc.	4	10	1.6	2.2	1.84	2.2			Bromide	2	6	0.22	0.28	0.26	0.28				
Total Dissolved Solids	mg/L	4	10	240	440	326	431			Chlorate		No tests undertaken on Raw Water								
Turbidity	NTU	4	10	<1	9	3	8			Chlorite										
Alkalinity	mg/L	4	10	66	110	89	110			BGA										
Aluminium	mg/L	4	10	<0.03	0.08	0.04	0.05			BGA - Total Cells	4	6	100	21000	33942.9	149760				
Bicarbonate	mg/L	4	10	81	138	109.1	137.55			BGA - Total Toxic Cells		6	170	24000	4595	18350				
Boron	mg/L	4	10	0.04	0.05	0.04	0.05			<i>BGA-Dolichospermum (Anabaena) circinalis</i> Cells			1	550	550	550	550			
Carbonate	mg/L	4	10	0	0.2	0.05	0.16			<i>BGA-Raphidiopsis raciborskii</i> Cells			6	170	24000	4595	18350			
Chloride	mg/L	4	10	93	220	137.4	206.5			<i>BGA-Synechococcus spp. Cell</i> Cells/mL			6	100	170000	30283.3	128500			
Copper	mg/L	4	10	<0.003	<0.003	0.003	0.002			<i>BGA-Total Cyanobacteria Biovolu</i> mm ³ /L			7	0.000	3.9	0.639	2.787			
Figure of merit ratio	calc.	4	10	1.3	1.4	1.4	1.4			<i>NB: Toxins are only analysed when toxic cell count is greater than 20,000 cells per ml</i>										
Fluoride	mg/L	4	10	<0.02	0.16	0.09	0.16			Heavy Metals										
Hydrogen	mg/L	4	10	0	0	0	0.0			Aluminium	mg/L	0	6	0.039	44	9.9395	35.05			
Hydroxide	mg/L	4	10	0	0	0	0.0			Arsenic	mg/L	0	6	0.0006	0.0016	0.00102	0.00153			
Iron	mg/L	4	10	<0.01	<0.01	0.01	0.01			Cadmium	mg/L	0	6	<0.00010	<0.00010	0.0001	0.00005			
Manganese	mg/L	4	10	<0.00	0.04	0.01	0.04			Chromium	mg/L	0	6	<0.00010	0.0003	0.00013	0.00024			
Mole ratio	calc.	4	10	3.2	4.1	3.66	4.06			Copper	mg/L	0	6	<0.00100	<0.00100	0.001	0.0005			
Nitrate	mg/L	4	10	0.47	65	7.23	36.29			Iron	mg/L	0	6	<0.00500	0.047	0.03067	0.04575			
pH saturation	calc.	4	10	7.8	8.3	8.09	8.26			Lead	mg/L	0	6	<0.00010	<0.00010	0.0001	0.00005			
Potassium	mg/L	4	10	6.6	7.4	6.96	7.4			Manganese	mg/L	0	6	0.014	0.079	0.0475	0.073			
Residual Alkalinity	mg/L	4	10	0	0	0	0			Nickel	mg/L	0	6	0.0007	0.0012	0.00095	0.0012			
Sat. index	calc.	4	10	-1.6	-0.5	-1.22	-0.59			Zinc	mg/L	0	6	<0.00100	0.004	0.003	0.004			
Silica	mg/L	4	10	7	17	12	17			Radionuclides										
Sodium (W:WW:RW)	mg/L	4	10	39	76	54.8	75.1			Total Alpha Activity	Bq/L	1	2	<0.100	<0.100	0.1				
Sulphate	mg/L	4	10	3.5	12	7.46	12			Total Beta Activity	Bq/L	1	2	<0.100	<0.100	0.1				
Temporary Hardness	mg/L	4	10	66	114	90	114			K40 - Corrected Beta Activity	Bq/L	1	2	<0.100	<0.100	0.1				
Total Dissolved Ions	mg/L	4	10	263	491	368	488			Pesticides										
Total Hardness	mg/L	4	10	114	217	163	217					4	4	No limit exceedences reported						
True Colour	Hazen	4	10	<8	34	13	32			PFAS										
Zinc	mg/L	4	10	<0.06	<0.06	0.06	0.03					1	1							

Water quality Analysis: Bjelke-Petersen Dam Treated Water

Bjelke Petersen Dam Treated Water Supply																			
Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance
Standard Water Analysis										Disinfection Monitoring									
Calcium	mg/L	9	9	25	41	31	40.2			Free Chlorine		12	13	0.03	2.4	0.54	1.93		
Conductivity	uS/cm	9	9	500	860	648	860			Total Chlorine		12	13	0.15	2.8	0.78	2.11		
Magnesium	mg/L	9	9	15	30	20.89	29.6			Disinfection By Products & Pre-Cursor									
pH		9	9	7.04	8.11	7.44	8.02			Total Trihalomethane		4	10	85	210	134	197		
Sodium Abs. ratio	calc.	9	9	1.7	2.3	1.94	2.26			Bromide		4	9	0.09	0.24	0.13	0.28		
Total Dissolved Solids	mg/L	9	9	260	440	334	436			Chlorate		4	4	0.12	0.65	0.28	0.58		
Turbidity	NTU	9	9	<1	9	3	8			Chlorite		4	4	<0.01	<0.01	0.01	0.01		
Alkalinity	mg/L	9	9	77	130	99	126			BGA									
Aluminium	mg/L	9	9	<0.03	<0.03	0.03	0.02			BGA- Total Cells		0							
Bicarbonate	mg/L	9	9	94	151	118	149			BGA- Total Toxic Cells		0							
Boron	mg/L	9	9	0.04	0.05	0.04	0.05			<i>NB: Toxins are only analysed when toxic cell count is greater than 20,000 cells per ml</i>									
Carbonate	mg/L	9	9	0.1	1.7	0.39	1.3			Heavy Metals									
Chloride	mg/L	9	9	98	190	134.22	186			Aluminium	mg/L	8	8	0.037	0.35	0.12288	0.3115		
Copper	mg/L	9	9	<0.003	0.019	0.006	0.014			Arsenic	mg/L	8	8	0.0004	0.0006	0.00053	0.0006		
Figure of merit ratio	calc.	9	9	1.2	1.3	1.3	1.3			Bismuth	mg/L	1	1	<0.00010	<0.00010	0.0001	0.00005		
Fluoride	mg/L	9	9	0.12	0.17	0.14	0.17			Cadmium	mg/L	8	8	<0.00010	0.0001	0.0001	0.00008		
Hydrogen	mg/L	9	9	0	0	0	0.0			Chromium	mg/L	8	8	<0.00010	0.0001	0.0001	0.00008		
Hydroxide	mg/L	9	9	0	0	0	0.0			Copper	mg/L	8	8	<0.00100	0.008	0.002	0.0059		
Iron	mg/L	9	9	<0.01	<0.01	0.01	0.01			Iron	mg/L	8	8	<0.00500	0.022	0.00825	0.0192		
Manganese	mg/L	9	9	<0.00	0.01	0	0.01			Lead	mg/L	8	8	<0.00010	0.0003	0.00013	0.00023		
Mole ratio	calc.	9	9	2.3	3.4	3.04	3.4			Manganese	mg/L	8	8	0.0013	0.02	0.00923	0.01965		
Nitrate	mg/L	9	9	0.77	1.2	1.06	1.2			Nickel	mg/L	8	8	0.0005	0.0018	0.00085	0.00149		
pHsaturation	calc.	9	9	7.8	8.2	8.02	8.16			Selenium	mg/L	1	1	<0.00100	<0.00100	0.001	0.0005		
Potassium	mg/L	9	9	6.3	7.7	6.87	7.58			Zinc	mg/L	8	8	0.003	0.01	0.00616	0.00941		
Residual Alkalinity	mg/L	9	9	0	0	0	0			Radionuclides									
Sat. index	calc.	9	9	-1.1	0.3	-0.58	0.22			Total Alpha Activity	Bq/L	2	2	<0.100	<0.100	0.1			
Silica	mg/L	9	9	10	17	14	17			Total Beta Activity	Bq/L	2	2	<0.100	<0.100	0.1			
Sodium (W:WW:RW)	mg/L	9	9	44	80	58.11	78.4			K40 - Corrected Beta Activity	Bq/L	2	2	<0.100	<0.100	0.1			
Sulphate	mg/L	9	9	6.1	12	8.86	12												
Temporary Hardness	mg/L	9	9	77	126	98	124												
Total Dissolved Ions	mg/L	9	9	290	497	379	497												
Total Hardness	mg/L	9	9	124	218	163	218												
True Colour	Hazen	9	9	<8	<8	8	4												
Zinc	mg/L	9	9	<0.06	<0.06	0.06	0.03												

Water quality Analysis: Blackbutt Raw Water

Blackbutt Raw Water																				
Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	
Standard Water Analysis										Disinfection Monitoring										
Calcium	mg/L	8	19	5	24	11.83	23.1			Free Chlorine				No tests undertaken on Raw Water						
Conductivity	uS/cm	8	19	310	980	675	980			Total Chlorine				No tests undertaken on Raw Water						
Magnesium	mg/L	8	19	10	23	18.16	23			Disinfection By Products & Pre-Cursor										
pH		8	19	6.28	7.01	6.67	6.99			Total Trihalomethane				No THM tests undertaken on Raw Water						
Sodium Abs. ratio	calc.	8	19	1.6	9	4.04	6.12			Bromide	Mmg/L	52	46	0.17	0.81	0.65				
Total Dissolved Solids	mg/L	8	18	170	480	342	472			Chlorate				No tests undertaken on Raw Water						
Turbidity	NTU	8	19	<1	64	17	60			Chlorite				No tests undertaken on Raw Water						
Alkalinity	mg/L	8	19	6	81	39	80			BGA										
Aluminium	mg/L	8	18	<0.03	1.4	0.3	1.32			BGA - Total Cells	cells/mL	52	43	33	130000	27890.1	120000			
Bicarbonate	mg/L	8	18	18	99	49.67	97.3			BGA - Total Toxic Cells	cells/mL	13	13	15	120000	9534.6	48600			
Boron	mg/L	8	18	0.03	0.1	0.07	0.1	4 (h)		<i>BGA-Microcystis aeruginosa</i> C	cells/mL		3	150	1000	466.7	925			
Carbonate	mg/L	8	18	0.00	0.1	0.01	0.1			<i>BGA-Raphidiopsis raiborskii</i> C	cells/mL		12	0	670	171.7	659			
Chloride	mg/L	8	19	15	280	165.95	271			<i>BGA-Synechococcus spp. C</i>	cells/mL		13	0	380	74.2	260			
Copper	mg/L	8	18	<0.003	0.011	0.004	0.006	2 (h)		<i>BGA-Total Cyanobacteria Bio</i>	mm3/L		37	0	0.14	0.029	0.092			
Figure of merit ratio	calc.	8	18	0.3	1.1	0.7	1.1			NB: Toxins are only analysed when toxic cell count is greater than 20,000 cells per ml										
Fluoride	mg/L	8	19	0.08	0.15	0.11	0.15	1.5 (h)		Heavy Metals										
Hydrogen	mg/L	8	18	0.00	0.00	0	0.0			Aluminium	mg/L	8	18	0.004	15	1.04822	2.896			
Hydroxide	mg/L	8	18	0.00	0.00	0	0.0			Arsenic	mg/L	8	18	0.0002	0.0023	0.00077	0.0023			
Iron	mg/L	8	18	<0.01	1	0.28	0.97			Cadmium	mg/L	8	18	<0.00010	<1.00000	0.05565	0.07504			
Manganese	mg/L	8	18	<0.00	<0.62	0.07	0.27			Chromium	mg/L	8	18	<0.00010	0.0011	0.00038	0.0011			
Mole ratio	calc.	8	18	3.5	5.3	4.38	5.22			Copper	mg/L	8	18	0.001	0.013	0.00439	0.01045			
Nitrate	mg/L	8	19	0.07	1.5	0.57	1.32	50 (h)		Iron	mg/L	8	18	0.02	1.8	0.55844	1.375			
pH saturation	calc.	8	18	8.2	9.5	8.91	9.5			Lead	mg/L	8	18	0.0001	0.0022	0.00061	0.00169			
Potassium	mg/L	8	19	2.3	6.2	4.19	6.11			Manganese	mg/L	8	18	0.0048	0.71	0.17308	0.5655			
Residual Alkalinity	mg/L	8	18	0	0	0	0			Nickel	mg/L	8	18	0.001	0.003	0.00175	0.003			
Sat. index	calc.	8	18	-3.2	-1.2	-2.32	-1.2			Zinc	mg/L	8	18	0.002	0.027	0.00861	0.02615			
Silica	mg/L	8	18	4	18	11	18			Pesticides										
Sodium (W:WW:RW)	mg/L	8	18	30	140	88.5	140			PFAS		2	2	No limit exceedences reported						
Sulphate	mg/L	8	19	2.7	11	6.72	11	500 (h)												
Temporary Hardness	mg/L	8	18	15	81	41	80													
Total Dissolved Ions	mg/L	8	18	183	476	356	472													
Total Hardness	mg/L	8	18	70	153	104	147													
True Colour	Hazen	8	18	<8	100	33	98													
Zinc	mg/L	8	18	<0.06	<0.06	0.06	0.03													

Water quality analysis: Blackbutt Treated Water

Blackbutt Treated Water																				
Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	
Standard Water Analysis										Disinfection Monitoring										
Calcium	mg/L	12	12	6.5	25	14.58	23.95			Free Chlorine		62	88	0.01	1.39	0.51	1.2			
Conductivity	uS/cm	12	12	370	990	766	990			Total Chlorine		62	88	0.09	1.73	0.72	1.49			
Magnesium	mg/L	12	12	10	23	20.75	23			Disinfection By Products & Pre-Cursor										
pH		12	12	6.4	7.25	6.81	7.23			Total Trihalomethane	ug/L	70	83	64	280	162	268	250		
Sodium Abs. ratio	calc.	12	12	2	6	3.81	5.97			Bromide	mg/L	62	59	0.08	0.47	0.17	0.41			
Total Dissolved Solids	mg/L	12	12	190	490	376	487			Chlorate	mg/L	3	14	0.09	0.9	0.51	0.88	0.8	4	
Turbidity	NTU	12	12	<1	2	1	2		6	Chlorite	mg/L	3	14	<0.01	<0.03	0.02	0.01			
Alkalinity	mg/L	12	12	15	71	46	71			BGA										
Aluminium	mg/L	12	12	<0.03	<0.03	0.03	0.02			BGA - Total Cells		0								
Bicarbonate	mg/L	12	12	18	86	56.08	86			BGA - Total Toxic Cells		0								
Boron	mg/L	12	12	0.03	0.1	0.06	0.1			<i>NB Toxins are only analysed when toxic cell count is greater than 20,000 cells per ml</i>										
Carbonate	mg/L	12	12	0.00	0.1	0.03	0.1			Heavy Metals										
Chloride	mg/L	12	12	77	280	197.25	280			Aluminium	mg/L	3	12	0.067	1.2	0.46064	0.84			
Copper	mg/L	12	12	<0.003	0.005	0.003	0.003			Arsenic	mg/L	3	12	0.0002	0.0003	0.00023	0.0003			
Figure of merit ratio	calc.	12	12	0.4	1	0.7	1			Cadmium	mg/L	3	12	<0.00010	<0.00010	0.0001	0.00005			
Fluoride	mg/L	12	12	0.05	0.08	0.07	0.08			Chromium	mg/L	3	12	<0.00010	0.0002	0.00011	0.0001			
Hydrogen	mg/L	12	12	0.00	0.00	0	0.0			Copper	mg/L	3	12	<0.00100	0.003	0.00218	0.003			
Hydroxide	mg/L	12	12	0.00	0.00	0	0.0			Iron	mg/L	3	12	0.012	0.091	0.04209	0.0508			
Iron	mg/L	12	12	<0.01	<0.01	0.01	0.01			Lead	mg/L	3	12	<0.00010	0.0004	0.00022	0.00026			
Manganese	mg/L	12	12	<0.00	0.01	0	0.0			Manganese	mg/L	3	12	0.0047	0.11	0.03695	0.1004			
Mole ratio	calc.	12	12	3.4	5.1	4.16	5.07			Nickel	mg/L	3	12	0.0004	0.0008	0.00065	0.0008			
Nitrate	mg/L	12	12	<0.06	1.4	0.71	0.84			Zinc	mg/L	3	12	0.002	0.018	0.01009	0.0168			
pH saturation	calc.	12	12	8.3	9.5	8.8	9.47			Radionuclides										
Potassium	mg/L	12	12	2.6	6.3	4.5	6.2			Total Alpha Activity	Bq/L	1	3	<0.1	<0.1	0.05	0.05			
Residual Alkalinity	mg/L	12	12	0	0	0	0			Total Beta Activity	Bq/L	1	3	<0.1	<0.1	0.05	0.05			
Sat. index	calc.	12	12	-3.1	-1	-1.97	-1.04			K40 - Corrected Beta Activity	Bq/L	1	3	<0.1	<0.1	0.05				
Silica	mg/L	12	12	6	14	10	13													
Sodium (W:WV:RV)	mg/L	12	12	40	150	94.33	146.5													
Sulphate	mg/L	12	12	2.4	10	5.43	10													
Temporary Hardness	mg/L	12	12	15	71	46	71													
Total Dissolved Ions	mg/L	12	12	211	492	394	488													
Total Hardness	mg/L	12	12	71	156	122	152													
True Colour	Hazen	12	12	<8	<8	8	4													
Zinc	mg/L	12	12	<0.06	<0.06	0.06	0.03													

Water quality analysis: Boondooma Raw Water

*** **BOON R** – Boon R sample point is situated at the Gordonbrook Treatment Plant before the water sources are blended. BOON R water also considered representative for Boondooma Water Scheme under DWQMP v8.1.

Boondooma Raw Water Supply																					
Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance		
Standard Water Analysis										Disinfection Monitoring											
Calcium	mg/L	2	8	9.4	23	14.8	22.65			Free Chlorine				No tests undertaken on Raw Water							
Conductivity	uS/cm	2	8	250	660	405	646			Total Chlorine				No tests undertaken on Raw Water							
Magnesium	mg/L	2	8	8.4	22	13.68	21.65			Disinfection By Products & Pre-Cursor											
pH		2	8	6.61	7.09	6.76	7.04			Total Trihalomethane				No THM tests undertaken on Raw Water							
Sodium Abs. ratio	calc.	2	8	1.4	2.3	1.79	2.27			Bromide	8	7	0.14	0.38	0.22	0.34					
Total Dissolved Solids	mg/L	2	8	140	330	214	323			Chlorate				No tests undertaken on Raw Water							
Turbidity	NTU	2	8	2	130	39	107			Chlorite				No tests undertaken on Raw Water							
Alkalinity	mg/L	2	8	40	80	58	78			BGA											
Aluminium	mg/L	2	8	<0.03	1.3	0.47	1.27			BGA - Total Cells	0	8	230	32000	4607.5	21185					
Bicarbonate	mg/L	2	8	48	98	70.63	95.2			BGA - Total Toxic Cells	0	1	9700	9700	9700	9700					
Boron	mg/L	2	8	0.03	0.04	0.03	0.04			<i>NB: Toxins are only analysed when toxic cell count is greater than 20,000 cells per ml</i>											
Carbonate	mg/L	2	8	0	0.1	0.03	0.1			Heavy Metals											
Chloride	mg/L	2	8	48	150	85.25	146.5			Aluminium	mg/L	2	7	0.01	0.91	0.45857	0.886				
Copper	mg/L	2	8	<0.003	0.004	0.003	0.003			Arsenic	mg/L	2	7	0.0009	0.002	0.00127	0.00179				
Figure of merit ratio	calc.	2	8	1	1.1	1.1	1.1			Cadmium	mg/L	2	7	<0.00010	0.0001	0.0001	0.00009				
Fluoride	mg/L	2	8	0.11	0.14	0.13	0.14			Chromium	mg/L	2	7	0.0003	0.01	0.00224	0.00751				
Hydrogen	mg/L	2	8	0	0	0	0.0			Copper	mg/L	2	7	<0.00100	0.006	0.00271	0.0057				
Hydroxide	mg/L	2	8	0	0	0	0.0			Iron	mg/L	2	7	0.13	6.1	1.61429	4.72				
Iron	mg/L	2	8	<0.01	0.82	0.36	0.81			Lead	mg/L	2	7	0.0003	0.0026	0.00101	0.00233				
Manganese	mg/L	2	8	<0.00	0.03	0.01	0.02			Manganese	mg/L	2	7	0.071	0.24	0.11143	0.204				
Mole ratio	calc.	2	8	3.5	3.9	3.76	3.9			Nickel	mg/L	2	7	0.0011	0.0089	0.00321	0.00719				
Nitrate	mg/L	2	8	0.15	0.93	0.53	0.84			Zinc	mg/L	2	7	0.002	0.017	0.00886	0.0164				
pH saturation	calc.	2	8	8.2	8.9	8.56	8.83			Pesticides											
Potassium	mg/L	2	8	4.8	6.3	5.35	6.2			No limit exceedences reported											
Residual Alkalinity	mg/L	2	8	0	0	0	0			PFAS											
Sat. index	calc.	2	8	-2.3	-1.2	-1.83	-1.24			1											
Silica	mg/L	2	8	12	18	15	18			1											
Sodium (W:VW:RM)	mg/L	2	8	25	63	40.38	62.65														
Sulphate	mg/L	2	8	2.5	3.6	2.91	3.5														
Temporary Hardness	mg/L	2	8	40	80	58	78														
Total Dissolved Ions	mg/L	2	8	147	362	233	356														
Total Hardness	mg/L	2	8	58	149	93	147														
True Colour	Hazen	2	8	11	150	78	140														
Zinc	mg/L	2	8	<0.06	<0.06	0.06	0.03														

Water quality analysis: Boondooma Treated Water

Boondooma Treated Water																			
Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance
Standard Water Analysis										Disinfection Monitoring									
Calcium	mg/L	12	12	12	25	19.08	24.45			Free Chlorine		12	27	0.02	1.42	0.51	1.12		
Conductivity	uS/cm	12	12	350	710	543	694			Total Chlorine		12	27	0.16	1.69	0.74	1.39		
Magnesium	mg/L	12	12	10	22	16.67	22			Disinfection By Products & Pre-Cursor									
pH		12	12	6.59	7.41	6.95	7.29			Total Trihalomethane		12	28	160	300	239	300		12
Sodium Abs. ratio	calc.	12	12	1.9	2.6	2.23	2.49			Bromide		12	12	0.03	0.08	0.06	0.08		
Total Dissolved Solids	mg/L	12	12	190	350	274	345			Chlorate		4	13	0.29	0.74	0.59	0.71		
Turbidity	NTU	12	12	<1	1	1	1			Chlorite		4	13	<0.01	<0.02	0.01	0.01		
Alkalinity	mg/L	12	12	44	76	63	75			HAA-Trichloroacetic Acid (TCAA)	ug/L	4	19	14	160	82	151	100	6
Aluminium	mg/L	12	12	<0.03	<0.03	0.03	0.02			BGA									
Bicarbonate	mg/L	12	12	54	93	77.25	91.35			BGA - Total Cells		0							
Boron	mg/L	12	12	0.03	0.04	0.03	0.04			BGA - Total Toxic Cells		0							
Carbonate	mg/L	12	12	0	0.1	0.06	0.1			<i>NB: Toxins are only analysed when toxic cell count is greater than 20,000 cells per ml</i>									
Chloride	mg/L	12	12	76	170	123.83	164.5			Heavy Metals									
Copper	mg/L	12	12	0.007	0.02	0.012	0.017			Aluminium	mg/L	4	7	0.029	0.099	0.06417	0.097		
Figure of merit ratio	calc.	12	12	0.9	1	1	1			Arsenic	mg/L	4	7	0.0004	0.0006	0.0005	0.00058		
Fluoride	mg/L	12	12	0.09	0.13	0.11	0.12			Cadmium	mg/L	4	7	<0.00010	0.0001	0.00006	0.00009		
Hydrogen	mg/L	12	12	0	0	0	0			Chromium	mg/L	4	7	0.0002	0.0002	0.0002	0.0002		
Hydroxide	mg/L	12	12	0	0	0	0			Copper	mg/L	4	7	0.01	0.017	0.01333	0.01675		
Iron	mg/L	12	12	<0.01	0.04	0.01	0.03			Iron	mg/L	4	7	0.035	0.085	0.05733	0.08175		
Manganese	mg/L	12	12	<0.00	0	0	0			Lead	mg/L	4	7	0.0003	0.0006	0.00043	0.0006		
Mole ratio	calc.	12	12	3.4	4.1	3.71	4.05			Manganese	mg/L	4	7	0.0033	0.018	0.00963	0.01675		
Nitrate	mg/L	12	12	0.23	0.92	0.49	0.89			Nickel	mg/L	4	7	0.0005	0.0009	0.0008	0.0009		
pH saturation	calc.	12	12	8.2	8.7	8.41	8.7			Zinc	mg/L	4	7	0.008	0.01	0.00917	0.01		
Potassium	mg/L	12	12	5	6.1	5.51	6.1			Radionuclides									
Residual Alkalinity	mg/L	12	12	0	0	0	0			Total Alpha Activity	Bq/L	1	3	<0.1	<0.1	0.05	0.05		
Sat. index	calc.	12	12	-2.1	-0.8	-1.46	-0.91			Total Beta Activity	Bq/L	1	3	<0.1	<0.1	0.05	0.05		
Silica	mg/L	12	12	11	15	13	14			K ₄₀ - Corrected Beta Activity	Bq/L	1	3	<0.1	0.1	0.075	0.098		
Sodium (W:WV:RM)	mg/L	12	12	38	75	55.42	70.6												
Sulphate	mg/L	12	12	2.5	6.2	3.28	4.77												
Temporary Hardness	mg/L	12	12	44	76	63	75												
Total Dissolved Ions	mg/L	12	12	200	389	300	379												
Total Hardness	mg/L	12	12	73	152	116	150												
True Colour	Hazen	12	12	<8	<8	8	4												
Zinc	mg/L	12	12	<0.06	<0.06	0.06	0.03												

Water quality analysis: Kingaroy Raw Water

Kingaroy Water Supply Raw																			
Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95 Percential	ADWG Value	No. Non-Compliance	Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percential	ADWG Value	No. Non-Compliance
Standard Water Analysis										Disinfection Monitoring									
Calcium	mg/L	36	33	10	51	26.39	48.8			Free Chlorine				No tests undertaken on Raw Water					
Conductivity	uS/cm	36	33	270	1500	741	1500			Total Chlorine				No tests undertaken on Raw Water					
Magnesium	mg/L	36	33	8.9	60	27.28	58.4			Disinfection By Products & Pre-Cursor									
pH		36	33	6.63	8.58	7.31	8.25			Total Trihalomethane				No THM tests undertaken on Raw Water					
Sodium Abs. ratio	calc.	36	33	1.4	3.4	2.26	3.24			Bromide	mg/L	153	123	0.15	1.1	0.5	1.1		
Total Dissolved Solids	mg/L	36	33	38	750	362	738			Chlorate				No tests undertaken on Raw Water					
Turbidity	NTU	36	33	1	130	21	114			Chlorite				No tests undertaken on Raw Water					
Alkalinity	mg/L	36	33	42	140	85	130			BGA									
Aluminium	mg/L	36	33	<0.03	1.1	0.19	0.81			BGA - Total Cells	cells/mL	156	120	67	900000	111706.8	439000		
Bicarbonate	mg/L	36	33	51	159	103.33	156			BGA - Total Toxic Cells	cells/mL	34	168	0	79000	7628.8	21250		
Boron	mg/L	36	33	0.03	0.04	0.04	0.04			BGA Toxin-Cylindrospermopsin	ug/L		10	<0.20	0.9	0.64	0.9		
Carbonate	mg/L	36	33	0.00	3.4	0.43	1.62			BGA-Dolichospermum (Anabaena)	cells/mL		5	45	320	663	1930		
Chloride	mg/L	36	33	55	390	171.88	374			BGA-Microcystis aeruginosa Cells	cells/mL		14	30	3200	738.6	1900		
Copper	mg/L	36	33	<0.003	0.01	0.003	0.006			BGA-Paphidopsis raciborskii Cells	cells/mL		94	20	22000	2519	10700		
Figure of merit ratio	calc.	36	33	1.1	1.2	1.1	1.2			BGA-Synechococcus spp. Cell Cou	cells/mL		128	17	540000	47823.8	276500		
Fluoride	mg/L	36	33	<0.10	0.17	0.14	0.16			BGA-Total Cyanobacteria Biovolur	cells/mL		166	0.000	10	0.943	4.775		
Hydrogen	mg/L	36	33	0.00	0.00	0	0.0			<i>NB: Toxins are only analysed when toxic cell count is greater than 20,000 cells per ml</i>									
Hydroxide	mg/L	36	33	0.00	0.1	0	0.0			Heavy Metals									
Iron	mg/L	36	33	<0.01	0.73	0.13	0.58			Aluminium	mg/L	36	32	<0.00300	1.2	0.24128	1.145		
Manganese	mg/L	36	33	0.00	0.04	0	0.01			Arsenic	mg/L	36	32	0.0003	0.005	0.00088	0.0012		
Moleratio	calc.	36	33	2.3	4	3.3	3.9			Cadmium	mg/L	36	32	<0.00010	<0.00010	0.0001	0.00005		
Nitrate	mg/L	36	33	<0.05	1.3	0.51	1.04			Chromium	mg/L	36	32	<0.00010	0.0045	0.00058	0.0017		
pHsaturation	calc.	36	33	7.7	8.8	8.2	8.74			Copper	mg/L	36	32	0.0001	0.007	0.0025	0.0049		
Potassium	mg/L	36	33	4.6	8.2	6.21	8.14			Iron	mg/L	36	32	0.022	1.9	0.496	1.745		
Residual Alkalinity	mg/L	36	33	0	0	0	0			Lead	mg/L	36	32	<0.00010	0.0013	0.00029	0.00098		
Sat. index	calc.	36	33	-2.2	0.9	-0.9	0.48			Manganese	mg/L	36	32	0.035	0.57	0.16109	0.479		
Silica	mg/L	36	33	5	19	12	18			Nickel	mg/L	36	32	0.001	0.0043	0.0023	0.00395		
Sodium (W:WV:RV)	mg/L	36	33	26	150	71.45	144			Zinc	mg/L	36	32	<0.00100	0.005	0.00166	0.004		
Sulphate	mg/L	36	33	2.6	15	6.05	14			Pesticides									
Temporary Hardness	mg/L	36	33	42	136	85	131			PFAS		2	2	No limit exceedences reported					
Total Dissolved Ions	mg/L	36	33	159	820	413	810												
Total Hardness	mg/L	36	33	2	366	172	365												
True Colour	Hazen	36	33	11	170	44	150												
Znc	mg/L	36	33	<0.06	<0.06	0.06	0.03												

Water quality analysis: Kingaroy Treated Water

Kingaroy Treated Water																			
Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance
Standard Water Analysis										Disinfection Monitoring									
Calcium	mg/L	16	16	13	38	26.25	36.9			Free Chlorine	mg/L	256	371	0.02	3.4	1.16	2.3		
Conductivity	uS/cm	16	16	520	1200	850	1090			Total Chlorine	mg/L	256	371	0.12	4	1.44	2.8		
Magnesium	mg/L	16	16	11	38	26.08	37.45			Disinfection By Products & Pre-Cursor									
pH		16	16	6.87	7.69	7.36	7.64			Total Trihalomethane	ug/L	200	249	47	420	186	320		36
Sodium Abs. ratio	calc.	16	16	2.9	3.9	3.27	3.68			Bromide	mg/L	140	162	0.03	0.68	0.19	0.4		
Total Dissolved Solids	mg/L	16	16	300	600	450	567			Chlorate	mg/L	15	18	0.04	0.44	0.16	0.39		
Turbidity	NTU	16	16	<1	1	1	1			Chlorite	mg/L	15	18	<0.01	<0.01	0.01	0.01		
Alkalinity	mg/L	16	16	62	120	90	109			BGA									
Aluminium	mg/L	16	16	-0.03	0.05	0.03	0.05			BGA - Total Cells	cells/mL	58	48	17	4300	1005.1	402500		
Bicarbonate	mg/L	16	16	76	147	109.75	134.35			BGA - Total Toxic Cells	cells/mL		36	0	1400	258.1	6850		
Boron	mg/L	16	16	0.03	0.05	0.04	0.04			BGA Toxin-Cylindrospermopsin	ug/L		9	<0.20	0.5	0.14	0.34		
Carbonate	mg/L	16	16	0	0.5	0.18	0.39			BGA-Dolichospermum (Anabaena) circinalis Cells	cells/mL		3	45	2300	931.7	2115		
Chloride	mg/L	16	16	67	240	169.67	234.5			BGA-Microcystis aeruginosa Cells	cells/mL		10	30	1200	394	975		
Copper	mg/L	16	16	<0.003	0.026	0.007	0.019			BGA-Paphidopsis raciborskii Cells	cells/mL		50	15	7000	948.4	5315		
Figure of merit ratio	calc.	16	16	0.4	1	0.8	0.9			BGA-Synechococcus spp. Cell Count	cells/mL		71	17	520000	40839.5	265000		
Fluoride	mg/L	16	16	0.04	0.06	0.05	0.06			BGA-Total Cyanobacteria Biovolume	cells/mL								
Hydrogen	mg/L	16	16	0	0	0	0			<i>NB: Toxins are only analysed when toxic cell count is greater than 20,000 cells per ml</i>									
Hydroxide	mg/L	16	16	0	0	0	0			Heavy Metals									
Iron	mg/L	16	16	<0.01	0.01	0.01	0.01			Aluminium	mg/L	8	8	0.014	0.074	0.02488	0.05615		
Manganese	mg/L	16	16	0	0	0	0			Arsenic	mg/L	8	8	0.0002	0.0003	0.00024	0.0003		
Mole ratio	calc.	16	16	2.9	3.6	3.24	3.49			Cadmium	mg/L	8	8	<0.00010	<0.00010	0.0001	0.00005		
Nitrate	mg/L	16	16	0.42	0.87	0.62	0.8			Chromium	mg/L	8	8	<0.00010	0.0001	0.0001	0.0001		
pH saturation	calc.	16	16	7.8	8.5	8.13	8.5			Copper	mg/L	8	8	0.003	0.009	0.00563	0.0083		
Potassium	mg/L	16	16	5	6.8	6.11	6.69			Iron	mg/L	8	8	<0.00500	0.008	0.00563	0.0073		
Residual Alkalinity	mg/L	16	16	0	0	0	0			Lead	mg/L	8	8	0.0002	0.0004	0.00026	0.00037		
Sat. index	calc.	16	16	-1.6	-0.1	-0.77	-0.27			Manganese	mg/L	8	8	0.008	0.11	0.03938	0.10545		
Silica	mg/L	16	16	6	16	11	15			Nickel	mg/L	8	8	0.0008	0.0014	0.00116	0.00137		
Sodium (W:VW:RW)	mg/L	16	16	66	130	96.5	119			Zinc	mg/L	8	8	0.002	0.005	0.0035	0.005		
Sulphate	mg/L	16	16	56	67	58.75	63.7			Radionuclides									
Temporary Hardness	mg/L	16	16	62	121	90	111			Total Alpha Activity	Bq/L	1	3	<0.1	<0.1	0.05	0.05		
Total Dissolved Ions	mg/L	16	16	326	667	494	625			Total Beta Activity	Bq/L	1	3	<0.1	<0.1	0.05	0.05		
Total Hardness	mg/L	16	16	75	251	173	247			K40 - Corrected Beta Activity	Bq/L	1	3	<0.1	<0.1	0.05	0.05		
True Colour	Hazen	16	16	<8	<8	8	4			PFAS									
Zinc	mg/L	16	16	<0.06	<0.06	0.06	0.03												

Water quality analysis: Murgon Raw Water

Murgon Raw Water Supply																			
Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance
Standard Water Analysis										Disinfection Monitoring									
Calcium	mg/L	12	12	20	90	47.67	83.4			Free Chlorine				No tests undertaken on Raw Water					
Conductivity	uS/cm	12	12	420	1400	899	1345			Total Chlorine				No tests undertaken on Raw Water					
Magnesium	mg/L	12	12	15	58	33.67	55.25			Disinfection By Products & Pre-Cursor									
pH		12	12	6.99	7.98	7.41	7.88			Total Trihalomethane				No THM tests undertaken on Raw Water					
Sodium Abs. ratio	calc.	12	12	1.5	2.5	1.99	2.39			Bromide	mg/L	12	12	0.21	0.66	0.45	0.65		
Total Dissolved Solids	mg/L	12	12	220	730	462	714			Chlorate				No tests undertaken on Raw Water					
Turbidity	NTU	12	12	1	20	7	19			Chlorite				No tests undertaken on Raw Water					
Alkalinity	mg/L	12	12	71	260	153	255			BGA									
Aluminium	mg/L	12	12	<0.03	0.14	0.06	0.12			BGA - Total Cells	cells/ML	8	10	67	970	474.4	862		
Bicarbonate	mg/L	12	12	87	316	186.25	307.75			BGA - Total Toxic Cells	cells/ML								
Boron	mg/L	12	12	0.03	0.04	0.04	0.04			BGA-Synechococcus spp. Cell Count	cells/ML		3	130	570	423.3	570		
Carbonate	mg/L	12	12	0.1	2.1	0.49	1.5			BGA-Total Cyanobacteria Biovolume	mm3/L		9	0.000	0.01	0.004	0.01		
Chloride	mg/L	12	12	78	270	177.33	264.5			<i>NB: Toxins are only analysed when toxic cell count is greater than 20,000 cells per ml</i>									
Copper	mg/L	12	12	0.014	0.41	0.12	0.355			Heavy Metals									
Figure of merit ratio	calc.	12	12	1.3	2.1	1.6	1.9			Aluminium	mg/L	9	9	0.035	1.2	0.279	0.88		
Fluoride	mg/L	12	12	0.12	0.2	0.15	0.19			Arsenic	mg/L	9	9	0.0004	0.0028	0.00176	0.00268		
Hydrogen	mg/L	12	12	0	0	0	0.0			Bismuth	mg/L	1	1	<0.00010	<0.00010	0.0001	0.00005		
Hydroxide	mg/L	12	12	0	0	0	0.0			Cadmium	mg/L	9	9	<0.00010	0.0001	0.0001	0.00008		
Iron	mg/L	12	12	<0.01	0.15	0.05	0.15			Chromium	mg/L	9	9	<0.00010	0.0014	0.00037	0.00112		
Manganese	mg/L	12	12	<0.00	0.03	0.01	0.02			Copper	mg/L	9	9	0.006	0.9	0.16467	0.676		
Mole ratio	calc.	12	12	2.3	3.4	2.98	3.35			Iron	mg/L	9	9	0.006	0.74	0.27156	0.676		
Nitrate	mg/L	12	12	0.18	1.7	0.78	1.54			Lead	mg/L	9	9	0.0001	0.0008	0.00031	0.00068		
pH saturation	calc.	12	12	7.1	8.3	7.68	8.14			Manganese	mg/L	9	9	0.0097	0.21	0.06741	0.162		
Potassium	mg/L	12	12	3.4	7.1	4.73	6.61			Nickel	mg/L	9	9	0.0013	0.0046	0.00217	0.00396		
Residual Alkalinity	mg/L	12	12	0	0	0	0			Selenium	mg/L	1	1	<0.00100	<0.00100	0.001	0.0005		
Sat. index	calc.	12	12	-1.3	0.8	-0.28	0.58			Zinc	mg/L	9	9	0.003	0.036	0.00867	0.028		
Silica	mg/L	12	12	10	22	17	22			Pesticide									
Sodium (W:W:R:M)	mg/L	12	12	36	110	74	104.5			PFAS									
Sulphate	mg/L	12	12	6.8	48	14.34	30.4				4	4	No limit exceedences reported						
Temporary Hardness	mg/L	12	12	71	263	154	254				1	1							
Total Dissolved Ions	mg/L	12	12	249	868	539	849												
Total Hardness	mg/L	12	12	110	463	258	437												
True Colour	Hazen	12	12	10	96	38	74												
Zinc	mg/L	12	12	<0.06	<0.06	0.06	0.03												

Water quality analysis: Murgon Treated Water

Murgon Treated Water																			
Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance
Standard Water Analysis										Disinfection Monitoring									
Calcium	mg/L	12	12	23	70	44.92	69.45			Free Chlorine	mg/L	160	181	0.03	3.1	1.23	2.7		
Conductivity	uS/cm	12	12	580	1300	914	1245			Total Chlorine	mg/L	160	181	0.17	4.3	1.54	3.1		
Magnesium	mg/L	12	12	17	48	31.75	47.45			Disinfection By Products & Pre-Cursor									
pH		12	12	6.83	7.72	7.13	7.61			Total Trihalomethane	ug/L	52	136	10	410	198	323		26
Sodium Abs. ratio	calc.	12	12	1.9	2.7	2.33	2.7			Bromide	mg/L	52	82	0.05	0.33	0.14	0.28		
Total Dissolved Solids	mg/L	12	12	320	690	482	663			Chlorate	mg/L	4	8	0.13	0.43	0.29	0.43		
Turbidity	NTU	12	12	<1	<1	1	1			Chlorite	mg/L	4	8	<0.01	<0.01	0.01	0.01		
Alkalinity	mg/L	12	12	63	230	124	197			BGA									
Aluminium	mg/L	12	12	<0.03	0.04	0.03	0.04			BGA - Total Cells		0							
Bicarbonate	mg/L	12	12	77	283	152.25	242.85			BGA - Total Toxic Cells		0							
Boron	mg/L	12	12	0.03	0.04	0.04	0.04			<i>NB: Toxins are only analysed when toxic cell count is greater than 20,000 cells per ml</i>									
Carbonate	mg/L	12	12	0	0.8	0.19	0.58			Heavy Metals									
Chloride	mg/L	12	12	98	260	174.83	249			Aluminium	mg/L	8	8	0.016	0.044	0.02629	0.0413		
Copper	mg/L	12	12	0.004	0.02	0.009	0.016			Arsenic	mg/L	8	8	0.0003	0.0008	0.0005	0.00074		
Figure of merit ratio	calc.	12	12	1	1.6	1.3	1.6			Cadmium	mg/L	8	8	<0.00010	0.0001	0.0001	0.00009		
Fluoride	mg/L	12	12	0.05	0.16	0.1	0.14			Chromium	mg/L	8	8	<0.00010	0.0001	0.0001	0.00009		
Hydrogen	mg/L	12	12	0	0	0	0.0			Copper	mg/L	8	8	0.0015	0.02	0.0095	0.0179		
Hydroxide	mg/L	12	12	0	0	0	0.0			Iron	mg/L	8	8	<0.00500	0.008	0.00614	0.0074		
Iron	mg/L	12	12	<0.01	<0.01	0.01	0.01			Lead	mg/L	8	8	0.0001	0.0006	0.0004	0.0006		
Manganese	mg/L	12	12	<0.00	0.01	0	0.01			Manganese	mg/L	8	8	0.0056	0.045	0.01826	0.0396		
Mole ratio	calc.	12	12	2.7	3.8	3.38	3.75			Nickel	mg/L	8	8	0.001	0.0015	0.00123	0.00144		
Nitrate	mg/L	12	12	0.25	1.8	0.87	1.58			Zinc	mg/L	8	8	0.004	0.008	0.00614	0.008		
pH saturation	calc.	12	12	7.3	8.3	7.78	8.19			Radionuclides									
Potassium	mg/L	12	12	3.6	6.7	4.78	6.48			Total Alpha Activity	Bq/L	1	2	<0.100	<0.100	0.05	0.05		
Residual Alkalinity	mg/L	12	12	0	0	0	0			Total Beta Activity	Bq/L	1	2	<0.100	<0.100	0.05	0.05		
Sat. index	calc.	12	12	-1.5	0.4	-0.67	0.18			K40 - Corrected Beta Activity	Bq/L	1	2	<0.100	<0.100	0.05	0.05		
Silica	mg/L	12	12	9	18	15	18												
Sodium (W:WW:RW)	mg/L	12	12	60	120	83.33	114.5												
Sulphate	mg/L	12	12	41	66	50.25	62.7												
Temporary Hardness	mg/L	12	12	63	233	125	200												
Total Dissolved Ions	mg/L	12	12	343	811	543	770												
Total Hardness	mg/L	12	12	129	370	243	368												
True Colour	Hazen	12	12	<8	<8	8	4												
Zinc	mg/L	12	12	<0.06	<0.06	0.06	0.03												

Water quality analysis: Nanango Raw Water

Nanango Raw Water Supply																			
Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance
Standard Water Analysis										Disinfection Monitoring									
Calcium	mg/L	44	44	98	140	118.07	140			Free Chlorine				No tests undertaken on Raw Water					
Conductivity	uS/cm	44	44	2100	2500	2266	2485			Total Chlorine				No tests undertaken on Raw Water					
Magnesium	mg/L	44	44	0.87	94	79.86	91.7			Disinfection By Products & Pre-Cursor									
pH		44	44	6.72	7.45	7.09	7.36			Total Trihalomethane				No THM tests undertaken on Raw Water					
Sodium Abs. ratio	calc.	44	44	3.1	3.9	3.61	3.8			Bromide	mg/L	39	39	1.1	2	1.74	2		
Total Dissolved Solids	mg/L	44	44	1100	1300	1198	1300			Chlorate				No tests undertaken on Raw Water					
Turbidity	NTU	44	44	<1	1	1	1			Chlorite				No tests undertaken on Raw Water					
Alkalinity	mg/L	44	44	170	340	255	340			BGA									
Aluminium	mg/L	44	44	<0.03	<0.03	0.03	0.02			BGA - Total Cells									
Bicarbonate	mg/L	44	44	201	412	309.25	408.7			BGA - Total Toxic Cells									
Boron	mg/L	44	44	0.03	0.06	0.04	0.05			<i>NB: Toxins are only analysed when toxic cell count is greater than 20,000 cells per ml</i>									
Carbonate	mg/L	44	44	0.1	0.9	0.34	0.7			Heavy Metals									
Chloride	mg/L	44	44	470	620	530	610			Aluminium	mg/L	44	44	<0.00300	<0.00300	0.003	0.0015		
Copper	mg/L	44	44	<0.003	0.006	0.003	0.005			Arsenic	mg/L	44	44	0.0002	0.0004	0.00025	0.0003		
Figure of merit ratio	calc.	44	44	1.3	1.7	1.4	1.7			Cadmium	mg/L	44	44	<0.00010	<0.00010	0.0001	0.00005		
Fluoride	mg/L	44	44	0.14	0.24	0.19	0.23			Chromium	mg/L	44	44	<0.00010	0.0012	0.0002	0.00059		
Hydrogen	mg/L	44	44	0	0	0	0.0			Copper	mg/L	44	44	<0.00100	0.006	0.00223	0.00485		
Hydroxide	mg/L	44	44	0	0	0	0.0			Iron	mg/L	44	44	<0.00500	0.19	0.02186	0.05		
Iron	mg/L	44	44	<0.01	<0.01	0.01	0.01			Lead	mg/L	44	44	<0.00010	0.0014	0.00027	0.0005		
Manganese	mg/L	44	44	0	0.56	0.15	0.52			Manganese	mg/L	44	44	0.0002	0.56	0.1553	0.52		4
Moleratio	calc.	44	44	3	4	3.49	3.9			Nickel	mg/L	44	44	0.0006	0.007	0.00118	0.0021		
Nitrate	mg/L	44	44	<0.25	601	17.96	6.5			Zinc	mg/L	44	44	0.001	0.017	0.00473	0.008		
pHsaturation	calc.	44	44	6.9	7.3	7.05	7.3			Pesticides									
Potassium	mg/L	44	44	2.1	3.3	2.73	3.29					26	26	No limit exceedences reported					
Residual Alkalinity	mg/L	44	44	0	0	0	0												
Sat. index	calc.	44	44	-0.5	0.6	0.04	0.4												
Silica	mg/L	44	44	48	55	50	54												
Sodium (W:WW:RW)	mg/L	44	44	190	230	209.55	220												
Sulphate	mg/L	44	44	27	130	66.8	120												
Temporary Hardness	mg/L	44	44	19	339	250	337												
Total Dissolved Ions	mg/L	44	44	1180	1410	1322	1400												
Total Hardness	mg/L	44	44	542	741	631	721												
True Colour	Hazen	44	44	<8	<8	8	4												
Zinc	mg/L	44	44	<0.06	<0.06	0.06	0.03												

Water quality analysis: Nanango Treated Water

Nanango Treated Water Supply																			
Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance
Standard Water Analysis										Disinfection Monitoring									
Calcium	mg/L	12	12	110	120	118.33	120			Free Chlorine	mg/L	124	139	0.42	1.68	1.11	1.46		
Conductivity	uS/cm	12	12	2200	2300	2250	2300			Total Chlorine	gm/L	124	139	0.68	1.81	1.29	1.71		
Magnesium	mg/L	12	12	79	83	80.75	83			Disinfection By Products & Pre-Cursor									
pH		12	12	7.04	7.51	7.27	7.49			Total Trihalomethane	mg/L	24	24	5	22	1.4	22	250	
Sodium Abs. ratio	calc.	12	12	3.5	3.9	3.72	3.9			Bromide	ug/L	24	24	0.8	1.8	1.4	1.79		
Total Dissolved Solids	mg/L	12	12	1200	1200	1200	1200			Chlorate		3	3	0.36	0.53	0.44	0.52		
Turbidity	NTU	12	12	<1	1	1	1			Chlorite		3	3	<0.01	<0.05	0.04	0.03		
Alkalinity	mg/L	12	12	260	340	286	340			BGA									
Aluminium	mg/L	12	12	<0.03	<0.03	0.03	0.02			BGA - Total Cells	cells/mL	0							
Bicarbonate	mg/L	12	12	315	411	347	409.35			BGA - Total Toxic Cells	cells/mL	0							
Boron	mg/L	12	12	0.03	0.04	0.04	0.04			<i>NB: Toxins are only analysed when toxic cell count is greater than 20,000 cells per ml</i>									
Carbonate	mg/L	12	12	0.3	1	0.51	0.84			Heavy Metals									
Chloride	mg/L	12	12	510	540	518.33	534.5			Aluminium	mg/L	8	8	<0.00300	0.009	0.00375	0.00638		
Copper	mg/L	12	12	<0.003	0.034	0.015	0.031			Arsenic	mg/L	8	8	0.0003	0.0003	0.0003	0.0003		
Figure of merit ratio	calc.	12	12	1.3	1.4	1.3	1.4			Cadmium	mg/L	8	8	<0.00010	<0.00010	0.0001	0.00005		
Fluoride	mg/L	12	12	0.18	0.24	0.2	0.23			Chromium	mg/L	8	8	<0.00010	0.0002	0.00018	0.0002		
Hydrogen	mg/L	12	12	0	0	0	0			Copper	mg/L	8	8	0.003	0.13	0.026	0.03325		
Hydroxide	mg/L	12	12	0	0	0	0			Iron	mg/L	8	8	0.009	0.31	0.11913	0.2855		
Iron	mg/L	12	12	<0.01	0.02	0.01	0.02			Lead	mg/L	8	8	0.0002	0.0069	0.00156	0.0054		
Manganese	mg/L	12	12	<0.00	0	0	0			Manganese	mg/L	8	8	0.0035	0.076	0.02556	0.0627		
Mole ratio	calc.	12	12	3	3.5	3.28	3.5			Nickel	mg/L	8	8	0.0007	0.008	0.00178	0.00576		
Nitrate	mg/L	12	12	4.6	7.1	5.08	6.39			Zinc	mg/L	8	8	0.003	0.076	0.017	0.055		
pHsaturation	calc.	12	12	6.9	7	6.98	7			Radionuclides									
Potassium	mg/L	12	12	2.6	2.8	2.68	2.8			Total Alpha Activity	Bq/L	1	2	<0.100	<0.100	0.05	0.05		
Residual Alkalinity	mg/L	12	12	0	0	0	0			Total Beta Activity	Bq/L	1	2	<0.100	<0.100	0.05	0.05		
Sat. index	calc.	12	12	0	0.6	0.29	0.55			K40 - Corrected Beta Activity	Bq/L	1	2	<0.100	<0.100	0.05	0.05		
Silica	mg/L	12	12	49	51	50	50			PFAS									
Sodium (W:WW:RW)	mg/L	12	12	210	220	213.33	220					1	1						
Sulphate	mg/L	12	12	28	65	54.08	63.9												
Temporary Hardness	mg/L	12	12	258	338	285	336												
Total Dissolved Ions	mg/L	12	12	1320	1410	1342	1394												
Total Hardness	mg/L	12	12	605	650	624	645												
True Colour	Hazen	12	12	<8	<8	8	4												
Zinc	mg/L	12	12	<0.06	<0.06	0.06	0.03												

Water quality analysis: Proston Raw Water

Proston Raw Water Supply																			
Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance
Standard Water Analysis										Disinfection Monitoring									
Calcium	mg/L	4	9	10	24	16.22	23.6			Free Chlorine				No tests undertaken on Raw Water					
Conductivity	uS/cm	4	9	280	670	453	666			Total Chlorine				No tests undertaken on Raw Water					
Magnesium	mg/L	4	9	8.7	22	14.51	22			Disinfection By Products & Pre-Cursor									
pH		4	9	6.64	7.16	6.85	7.16			Total Trihalomethane				No THM tests undertaken on Raw Water					
Sodium Abs. ratio	calc.	4	9	1.6	2.4	1.97	2.36			Bromide	mg/L	12	12	0.1	0.28	0.16	0.24		
Total Dissolved Solids	mg/L	4	9	150	340	234	336			Chlorate				No tests undertaken on Raw Water					
Turbidity	NTU	4	9	<1	110	30	94			Chlorite				No tests undertaken on Raw Water					
Alkalinity	mg/L	4	9	42	82	62	81			BGA									
Aluminium	mg/L	4	9	<0.03	1.7	0.41	1.32			BGA- Total Cells	cells/mL	8	8	83	24000	7856.6	22950		
Bicarbonate	mg/L	4	9	51	100	75.56	99.2			BGA- Total Toxic Cells	cells/mL		5	100	9100	2604	7820		
Boron	mg/L	4	9	0.03	0.04	0.03	0.04			<i>BGA-Raphidiopsis raciborskii</i> Cells	cells/mL		5	100	9100	2604	7820		
Carbonate	mg/L	4	9	0	0.1	0.03	0.1			<i>BGA-Synechococcus</i> spp. Cell Count	cells/mL		6	17	14000	3390.7	11850		
Chloride	mg/L	4	9	55	150	95.78	150			<i>BGA-Total Cyanobacteria</i> Biovolume	mm ³ /L		7	0.000	0.55	0.143	0.493		
Copper	mg/L	4	9	<0.003	0.003	0.003	0.003			<i>NB: Toxins are only analysed when toxic cell count is greater than 20,000 cells per ml</i>									
Figure of merit ratio	calc.	4	9	1	1	1	1			Heavy Metals									
Fluoride	mg/L	4	9	0.11	0.15	0.13	0.15			Aluminium	mg/L	8	8	0.008	9.5	1.58513	6.7		
Hydrogen	mg/L	4	9	0	0	0	0			Arsenic	mg/L	8	8	0.0008	0.0022	0.00118	0.00189		
Hydroxide	mg/L	4	9	0	0	0	0			Cadmium	mg/L	8	8	<0.00010	0.0001	0.0001	0.00008		
Iron	mg/L	4	9	<0.01	1	0.29	0.8			Chromium	mg/L	8	8	<0.00010	0.0091	0.00181	0.00676		
Manganese	mg/L	4	9	<0.00	0.02	0.01	0.01			Copper	mg/L	8	8	0.002	0.007	0.00413	0.0063		
Mole ratio	calc.	4	9	3.5	3.9	3.69	3.86			Iron	mg/L	8	8	0.019	5.3	1.26963	4.145		
Nitrate	mg/L	4	9	0.26	1.1	0.64	1.1			Lead	mg/L	8	8	<0.00010	0.0017	0.00066	0.00156		
pH saturation	calc.	4	9	8.2	8.8	8.49	8.76			Manganese	mg/L	8	8	0.035	0.33	0.09938	0.253		
Potassium	mg/L	4	9	4.8	6.1	5.37	6.06			Nickel	mg/L	8	8	0.0007	0.0087	0.0028	0.00702		
Residual Alkalinity	mg/L	4	9	0	0	0	0			Zinc	mg/L	8	8	0.003	0.014	0.00663	0.0119		
Sat. index	calc.	4	9	-2.1	-1	-1.63	-1.04			Pesticides									
Silica	mg/L	4	9	12	19	15	18			PFAS									
Sodium (W:WW:RW)	mg/L	4	9	28	67	45.78	66.2					1	1	No limit exceedences reported					
Sulphate	mg/L	4	9	2.6	3.6	3.01	3.52												
Temporary Hardness	mg/L	4	9	42	82	62	81												
Total Dissolved Ions	mg/L	4	9	161	376	257	372												
Total Hardness	mg/L	4	9	61	151	100	149												
True Colour	Hazen	4	9	<8	120	56	111												
Zinc	mg/L	4	9	<0.06	<0.06	0.06	0.03												

Water quality analysis: Proston Treated Water

Proston Treated Water Supply																			
Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance
Standard Water Analysis										Disinfection Monitoring									
Calcium	mg/L	4	9	11	37	19	33.1			Free Chlorine		20	29	0.38	2.3	1.52	1.85		
Conductivity	uS/cm	4	9	360	1100	561	977			Total Chlorine		20	29	0.62	2.8	1.82	2.14		
Magnesium	mg/L	4	9	9.9	37	17.32	32.5			Disinfection By Products & Pre-Cursor									
pH		4	9	6.64	7.76	7.18	7.69			Total Trihalomethane	ug/L	12	15	130	280	175	231		1
Sodium Abs. ratio	calc.	4	9	2	3.2	2.3	2.99			Bromide	mg/L	12	12	0.02	0.11	0.05	0.08		
Total Dissolved Solids	mg/L	4	9	190	540	283	480			Chlorate		8	17	<0.01	0.81	0.34	0.59		1
Turbidity	NTU	4	9	<1	<1	1	1			Chlorite		8	17	<0.01	0.21	0.02	0.59		
Alkalinity	mg/L	4	9	39	110	63	100			BGA									
Aluminium	mg/L	4	9	<0.03	<0.03	0.03	0.02			BGA - Total Cells		0							
Bicarbonate	mg/L	4	9	48	129	76.89	118.2			BGA - Total Toxic Cells		0							
Boron	mg/L	4	9	0.03	0.03	0.03	0.03			<i>NB: Toxins are only analysed when toxic cell count is greater than 20,000 cells per ml</i>									
Carbonate	mg/L	4	9	0	0.4	0.1	0.34			Heavy Metals									
Chloride	mg/L	4	9	80	270	128.89	237			Aluminium	mg/L	4	8	0.014	0.22	0.06713	0.17065		
Copper	mg/L	4	9	<0.003	0.003	0.003	0.003			Arsenic	mg/L	4	8	0.0002	0.0004	0.00025	0.00037		
Figure of merit ratio	calc.	4	9	0.8	1	0.9	1			Bismuth	mg/L	1	1	<0.00010	<0.00010	0.0001	0.00005		
Fluoride	mg/L	4	9	0.06	0.12	0.09	0.11			Cadmium	mg/L	4	8	<0.00010	0.0001	0.0001	0.00008		
Hydrogen	mg/L	4	9	0	0	0	0.0			Chromium	mg/L	4	8	<0.00010	0.0001	0.0001	0.00008		
Hydroxide	mg/L	4	9	0	0	0	0.0			Copper	mg/L	4	8	<0.00100	0.019	0.00513	0.0148		
Iron	mg/L	4	9	<0.01	<0.10	0.02	0.01			Iron	mg/L	4	8	<0.00500	0.016	0.00913	0.0139		
Manganese	mg/L	4	9	<0.00	<0.00	0	0.0			Lead	mg/L	4	8	<0.00010	0.0018	0.00041	0.00138		
Mole ratio	calc.	4	9	3.1	4	3.51	3.94			Manganese	mg/L	4	8	0.002	0.018	0.00619	0.01422		
Nitrate	mg/L	4	9	0.38	1.2	0.68	1			Nickel	mg/L	4	8	0.0004	0.0016	0.00095	0.00143		
pH saturation	calc.	4	9	7.9	8.8	8.42	8.77			Selenium	mg/L	1	1	<0.00100	<0.00100	0.001	0.0005		
Potassium	mg/L	4	9	4.9	6	5.4	5.82			Zinc	mg/L	4	8	0.008	0.12	0.02888	0.0864		
Residual Alkalinity	mg/L	4	9	0	0	0	0			Radionuclides									
Sat. index	calc.	4	9	-2.1	-0.2	-1.29	-0.35			Total Alpha Activity	Bq/L	1	3	<0.100	0.1	0.0289	0.095		
Silica	mg/L	4	9	10	14	13	14			Total Beta Activity	Bq/L	1	3	<0.100	0.1	0.0289	0.095		
Sodium (W:WW:RW)	mg/L	4	9	38	110	57.11	97.7			K ₄₀ - Corrected Beta Activity	Bq/L	1	3	<0.100	<0.100	0.05	0.05		
Sulphate	mg/L	4	9	2.2	5.1	2.98	4.53												
Temporary Hardness	mg/L	4	9	39	106	63	97												
Total Dissolved Ions	mg/L	4	9	196	596	308	531												
Total Hardness	mg/L	4	9	69	243	118	215												
True Colour	Hazen	4	9	<8	<8	8	4												
Zinc	mg/L	4	9	<0.06	<0.06	0.06	0.03												

Water quality analysis: Wondai Raw Water

Wondai Raw Water Supply																			
Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance
Standard Water Analysis										Disinfection Monitoring									
Calcium	mg/L	12	12	19	74	45.67	72.35			Free Chlorine				No tests undertaken on Raw Water					
Conductivity	uS/cm	12	12	410	1300	888	1300			Total Chlorine				No tests undertaken on Raw Water					
Magnesium	mg/L	12	12	14	52	34.75	52			Disinfection By Products & Pre-Cursor									
pH		12	12	6.9	7.92	7.36	7.85			Total Trihalomethane				No THM tests undertaken on Raw Water					
Sodium Abs. ratio	calc.	12	12	1.5	2.6	2.07	2.55			Bromide	mg/L	8	12	0.21	0.71	0.46	0.68		
Total Dissolved Solids	mg/L	12	12	220	670	465	654			Chlorate				No tests undertaken on Raw Water					
Turbidity	NTU	12	12	3	33	12	29			Chlorite				No tests undertaken on Raw Water					
Alkalinity	mg/L	12	12	70	230	144	225			BGA									
Aluminium	mg/L	12	12	<0.03	0.19	0.06	0.16			BGA - Total Cells	cells/mL	12	12	100	5000	2196.7	20		
Bicarbonate	mg/L	12	12	85	275	175.17	267.85			BGA - Total Toxic Cells	cells/mL	2	2	20	20	20	20		
Boron	mg/L	12	12	0.02	0.04	0.04	0.04			<i>BGA-Raphidiopsis raciborskii</i> Cells	cells/mL	2	2	20	20	20	20		
Carbonate	mg/L	12	12	0	1.6	0.48	1.27			<i>BGA-Synechococcus spp. Cell C</i>	cells/mL	4	4	50	3200	1312.5	2870		
Chloride	mg/L	12	12	76	280	185.5	274.5			<i>BGA-Total Cyanobacteria Biovolu</i>	mm ³ /L	8	8	0.000	0.06	0.02	0.057		
Copper	mg/L	12	12	<0.003	0.52	0.193	0.416			<i>NB: Toxins are only analysed when toxic cell count is greater than 20,000 cells per ml</i>									
Figure of merit ratio	calc.	12	12	1.3	1.8	1.5	1.7			Heavy Metals									
Fluoride	mg/L	12	12	0.1	0.19	0.14	0.18			Aluminium	mg/L	4	9	0.073	1.8	0.378	1.288		
Hydrogen	mg/L	12	12	0	0	0	0.0			Arsenic	mg/L	4	9	0.001	0.0024	0.00172	0.00228		
Hydroxide	mg/L	12	12	0	0	0	0.0			Bismuth	mg/L	1	1	<0.00010	<0.00010	0.0001	0.00005		
Iron	mg/L	12	12	<0.01	0.18	0.05	0.17			Cadmium	mg/L	4	9	<0.00010	0.0001	0.0001	0.00008		
Manganese	mg/L	12	12	<0.00	0.02	0.01	0.02			Chromium	mg/L	4	9	0.0002	0.0021	0.00058	0.00158		
Mole ratio	calc.	12	12	2.4	3.7	3.06	3.54			Copper	mg/L	4	9	0.022	0.92	0.38889	0.864		
Nitrate	mg/L	12	12	0.15	3.2	0.93	2.32			Iron	mg/L	4	9	0.13	1.1	0.43	0.928		
pHsaturation	calc.	12	12	7.3	8.3	7.73	8.19			Lead	mg/L	4	9	0.0001	0.0027	0.00062	0.00202		
Potassium	mg/L	12	12	3.6	6.2	4.91	6.15			Manganese	mg/L	4	9	0.03	0.2	0.08978	0.192		
Residual Alkalinity	mg/L	12	12	0	0	0	0			Nickel	mg/L	4	9	0.0013	0.0032	0.00198	0.00292		
Sat. index	calc.	12	12	-1.4	0.6	-0.38	0.49			Selenium	mg/L	1	1	<0.00100	<0.00100	0.001	0.0005		
Silica	mg/L	12	12	8	21	16	21			Zinc	mg/L	4	9	0.002	0.014	0.00644	0.0132		
Sodium (W:VW:RW)	mg/L	12	12	35	110	76.33	104.5			Pesticides									
Sulphate	mg/L	12	12	6.8	166	26.48	96.15			PFAS		1	1	No limit exceedences reported					
Temporary Hardness	mg/L	12	12	70	227	145	222												
Total Dissolved Ions	mg/L	12	12	244	786	537	773												
Total Hardness	mg/L	12	12	107	398	256	393												
True Colour	Hazen	12	12	7	98	38	80												
Zinc	mg/L	12	12	<0.06	<0.06	0.06	0.03												

Water quality analysis: Wondai Treated Water

Wondai Treated Water Supply																			
Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance
Standard Water Analysis										Disinfection Monitoring									
Calcium	mg/L	24	24	21	76	46.58	71.7			Free Chlorine	mg/L	142	188	0.04	3.9	1.28	2.39		
Conductivity	uS/cm	24	24	140	1400	948	1385			Total Chlorine	mg/L	142	188	0.22	4.1	1.34	2.85		
Magnesium	mg/L	24	24	15	55	35.25	51			Disinfection By Products & Pre-Cursor									
pH		24	24	6.78	8.19	7.51	8.17			Total Trihalomethane		40	95	31	310	173	270	250	7
Sodium Abs. ratio	calc.	24	24	2.2	3	2.57	2.9			Bromide		40	70	0.05	0.66	0.14	0.32		
Total Dissolved Solids	mg/L	24	24	290	750	527	709			Chlorate		16	70	0.12	1.43	0.54	0.96		8
Turbidity	NTU	24	24	<1	1	1	1			Chlorite		16	70	<0.01	<0.01	0.01	0.02		
Alkalinity	mg/L	24	24	75	230	145	227			BGA									
Aluminium	mg/L	24	24	0.01	0.14	0.06	0.12			BGA - Total Cells		0							
Bicarbonate	mg/L	24	24	91	274	175.25	268			BGA - Total Toxic Cells		0							
Boron	mg/L	24	24	0.03	0.04	0.04	0.04			<i>NB: Toxins are only analysed when toxic cell count is greater than 20,000 cells per ml</i>									
Carbonate	mg/L	24	24	0	2.9	0.64	1.9			Heavy Metals									
Chloride	mg/L	24	24	83	300	196.79	297			Aluminium	mg/L	3	7	0.024	0.32	0.11243	0.308		
Copper	mg/L	24	24	<0.003	0.006	0.004	0.005			Arsenic	mg/L	3	7	0.0003	0.0004	0.00034	0.0004		
Figure of merit ratio	calc.	24	24	0.9	1.5	1.2	1.5			Cadmium	mg/L	3	7	<0.00010	0.0001	0.0001	0.00009		
Fluoride	mg/L	24	24	0.06	0.13	0.1	0.13			Chromium	mg/L	3	7	<0.00010	0.0001	0.0001	0.0001		
Hydrogen	mg/L	24	24	0	0	0	0			Copper	mg/L	3	7	0.005	0.012	0.00671	0.0108		
Hydroxide	mg/L	24	24	0	0	0	0			Iron	mg/L	3	7	<0.00500	0.034	0.00943	0.0259		
Iron	mg/L	24	24	<0.01	<0.01	0.01	0.01			Lead	mg/L	3	7	<0.00010	0.0004	0.00017	0.00037		
Manganese	mg/L	24	24	<0.00	0.01	0	0			Manganese	mg/L	3	7	0.0032	0.017	0.00739	0.01466		
Mole ratio	calc.	24	24	2.2	3.7	2.96	3.6			Nickel	mg/L	3	7	0.0009	0.0014	0.00114	0.00137		
Nitrate	mg/L	24	24	0.25	2.7	0.88	1.49			Zinc	mg/L	3	7	0.001	0.007	0.003	0.0061		
pH saturation	calc.	24	24	7.2	8.3	7.71	8.1			Radionuclides									
Potassium	mg/L	24	24	3.7	6.2	4.85	6.09			Total Alpha Activity	Bq/L	1	2	<0.100	<0.100	0.05	0.05		
Residual Alkalinity	mg/L	24	24	0	0	0	0			Total Beta Activity	Bq/L	1	2	<0.100	<0.100	0.05	0.05		
Sat. index	calc.	24	24	-1.4	0.9	-0.2	0.69			K ₄₀ . Corrected Beta Activity	Bq/L	1	2	<0.100	<0.100	0.05	0.05		
Silica	mg/L	24	24	8	19	15	18												
Sodium (W:WW:RW)	mg/L	24	24	56	130	95.08	128.5												
Sulphate	mg/L	24	24	35	69	47.25	55.7												
Temporary Hardness	mg/L	24	24	75	227	145	223												
Total Dissolved Ions	mg/L	24	24	316	877	601	828												
Total Hardness	mg/L	24	24	112	416	261	390												
True Colour	Hazen	24	24	<8	<8	8	4												
Zinc	mg/L	24	24	<0.06	<0.06	0.06	0.03												

Appendix B – Current approved RMIP

Version 8.3 2021

Current

Ref	Scheme component / Sub-component	Hazard / Hazardous event	Priority	Action(s)			Target date(s)	Estimated cost	Responsibility	Comments
				Interim	Short-term	Long Term				
Current Tasks										
S14	Proston weir and pump station	Loss of supply to Proston scheme	Low	Pump hire		Procurement of Pumps and water licences	Jun-28	N/A	MWW	RMIP S14 has been superceeded by 2023- ?? In DWQMP V10.2 2025
S21	SCADA All schemes	Change to set points/ water quality	Low	System checks against set point summary		SCADA and PLC upgrades with built in prevention	TBC	N/A	MWW	RMIP S14 has been superceeded by RMIP numbers 2023- 039, 2023-80, 2023-145, 2023-190, 2023-190, 2023-223, 2023-253 in DWQMP V10.2 2025
S25	Kingaroy	THM	High			Design and Construct off site storage to store Boondooma Dam Raw Water	Mar-26	TBA	MWW	Off site storage dam will maintain continuity of supply from Boondooma Dam reducing the need to use 100% Gordonbrook supply. Funding has been approved and design is completed and Off Stream Storage is under construction. Due to be commissioned 1.03.2026 .
S27	All Schemes	Water Quality / Disinfection	Medium			Develop a disinfection strategy to reduce water age and maintain fire fighting capacity.	Jun-30	TBA	MWW	Water age historically was managed by reducing reservoir storages at outer reservoirs. This is also been identified in the recently undertaken DWQO strategy 2025.
S28	All Treatment Plants	Turbidity	Medium	Continue to optimise jar testing and filter performance		Develop long term turbidity reduction plan for all WTP's	Jun-26	TBA	MWW	S28 - has been superceeded - Council has assessed the performance of the filters at all WTP as part of the DWQO Strategy. This has identified what needs to be done to optimise filtration at all plants. These improvement measures have been included as part of the RMIP's for the current plan amendment.

2023-0019 SBRC DWQMP Review
4 Dec 2023

Risk Management Improvement Plan - Risk Actions Required

No.	Observation	Gap or Comment	Proposed Improvement Measures						Resourcing			
			Interim	Target Date	Short-Term	Target Date	Long-Term	Target Date	Budget	Assigned to	Group	Infra?
2023-001	Scheme: Whole of System - Process Step: Whole of System - Item: WOS1 - Human Error - Competency - Event: Untrained Staff (formal) No or poor water treatment leading to the presence of harmful bacteria or water of poor aesthetic quality. - Risk: Medium	Routine and formal training complete. Continued training of all staff.			Further formal training being planned. Continued training of all staff.	Ongoing			10,000	Manager Water & Wastewater	HR - Training	
2023-002	Scheme: Whole of System - Process Step: Whole of System - Item: WOS2 - Human Error - Information Management - Event: Water quality data storage and summary - Risk: Medium	Controls in place.			Routine and formal training being undertaken. Continued training of all staff. Action assigned above in WOS1.			-	Manager Water & Wastewater	HR - Training		
2023-003	Scheme: Whole of System - Process Step: Whole of System - Item: WOS6 - Resources - Suppliers - Event: Non qualified contactors working on sites leading to WTP breakdown - Risk: Medium				WQ & OH&S Induction TBD. All sites locked and require Operator assistance to gain entry.			-	Manager Water & Wastewater	HR - Training		
2023-004	Scheme: Whole of System - Process Step: Whole of System - Item: WOS7 - Aging Infrastructure - Infrastructure - Event: Asset failure - Risk: High				Asset maintenance register to be created to highlight sections of main prone to breaks or mains replacement. Water supply Project will replace critical infrastructure which will further mitigate this problem. Council to consider and develop guidelines and record keeping for mains breaks to trigger replacement based on performance and cost of repairs. Council to develop a formal asset maintenance register with strategic planning. Strategic plan (whole of government) for water and waste system for whole of system to be prepared.	2025		Internal Wages	Principal Engineer (Water and Wastewater)	Council		
2023-005	Scheme: Whole of System - Process Step: Whole of System - Item: WOS9 - Workflow - Information Management - Event: Delayed response to abnormal WQ results. - Risk: Medium				Council to develop a response plan to non-compliant results.	2024		Internal Wages	Program Coordinator	Laboratory		
2023-006	Scheme: Whole of System - Process Step: Whole of System - Item: WOS11 - Errors - Human - Event: Incorrect sampling procedure resulting in non representative samples recorded/ processed for verification monitoring - Risk: Medium				Council to consider installing dedicated "Ned Kelly" style sampling points to registered sampling sites.	2024		50,000	Program Coordinator	OSM	Yes	
2023-007	Scheme: Whole of System - Process Step: Whole of System - Item: WOS12 - Governance - Cybersecurity - Event: Lack of asset management - Risk: Medium				MC-01-Vulnerability assessment Undertake a cybersecurity audit including a penetration test: - Identify critical sites, devices and access points specific to the Supervisory Control and Data Acquisition (SCADA) for water quality management. These will include 1) pump sites 2) related operational technology systems - servers, firewalls, network switches, access points, Remote Terminal Units (RTUs) and Programmable Logic Controllers (PLCs). 3) Implement actions to maintain effective cyber security controls of SCADA and Industrial Control Systems (ICS). 4) Implement actions and integration consisting of standards and processes to manage both (IT) and (OT). 5) Implement a single point access to enter the telemetry network. 6) Implement a secure entry protocol/procedure to the IT/OT network.	2024		10,000	Principal Engineer (Water and Wastewater)			
2023-008	Scheme: Whole of System - Process Step: Whole of System - Item: WOS13 - Governance - Cybersecurity - Event: Inability to detect critical Assets - Risk: Medium				MC-02 -Governance structure - Framework to be in place with responsibilities - Procedures for information technology and operation technology security to be created. MC-03- Security safeguards - Create a list of permitted applications to be installed / run within Council's Standard Operating Environment (SOE)	2024		3,000	Principal Engineer (Water and Wastewater)/Information and Corporate Technology			
2023-009	Scheme: Whole of System - Process Step: Whole of System - Item: WOS14 - Intentional Interference - Cybersecurity - Event: Disruption of Cyber Information (IT) - Risk: Medium	IT antivirus software currently installed. OT SCADA machines will not have anti-virus installed as this interferes with SCADA installed software and processing. Cybersecurity of OT SCADA machines is controlled by restricting internet access through the use of Meraki firewall/routers and eliminating the use of external USB drives.			MC - 04 Detection process - Require SOE security monitoring system that reports anomalies. e.g. high CPU use, user accounts, high network traffic MC-05 Response & Recovery - Organise routine backups / archiving for ICS equipment, servers and applications.	2024		3,000	Principal Engineer (Water and Wastewater)/Information and Corporate Technology			

Appendix K - Risk Actions Required



No.	Observation	Gap or Comment	Proposed Improvement Measures							Resourcing		
			Interim	Target Date	Short-Term	Target Date	Long-Term	Target Date	Budget	Assigned to	Group	Infra?
2023-010	Scheme: Whole of System - Process Step: Whole of System - Item: WOS18 - Unintentional Interference - Cybersecurity - Event: Disruption of Cyber Information (IT) - Risk: Medium	IT has implemented access controls, monitoring and cyber security measures over corporate systems. SCADA systems are not exposed directly to the internet, and remote access to control systems is not permitted by design or policy.			MA - 01 Build out private SCADA network - requires testing and cutover for all water facilities, sites & equipment MA - 02 Build single point of access and authentication method - Undertake after MA-01. A single point access should be built as a mechanism to enter the telemetry network. MA - 03 Implement rules to prevent across network access - After MA-01 & MA-02, SCADA provider to create and document a procedure for secure entry to the IT/OT network. MA - 04 Disallow open internet access - To be actioned with MA-01 & MA-02. Address vulnerability scenarios but also allows for system updates (e.g. allowing Windows Update).	2024			10,000	Principal Engineer (Water and Wastewater)		
2023-011	Scheme: Whole of System - Process Step: Whole of System - Item: WOS23 - Abuse of Cyber Information - Cybersecurity - Event: Systems Configuration and data files / Disgruntled employee - Risk: Medium				MA-05 Install and enable active virus scanning - OT SCADA machines will not have anti-virus installed as it can interfere with SCADA installed software. Cybersecurity of OT SCADA machines is controlled by restricting internet access and eliminating the use of external USB drives and fire wall settings MA-06 Activate and set windows firewall rules - Do after MA-01 is completed MA-07 Implement maintenance and updates schedule - Maintenance will be ongoing in terms of updating SCADA software. All upgrades or changes to a PLC or SCADA shall have their configuration files backed up and saved on each workstation on-site and off-site. MA-08 Certificate or key based authentication for remote access - Do after MA-01 is completed MA-09 Two factor authentication - Do after MA-01 is completed	2024			10,000	Principal Engineer (Water and Wastewater)		
2023-012	Scheme: Whole of System - Process Step: Whole of System - Item: WOS27 - Control - Cybersecurity - Event: Lack of access control and identity management - Risk: Medium				MA-10 Implement backup schedule - To be done as part of regular maintenance of IT/OT systems. Backups of configurations files to be made and stored onsite with a copy stored off-site in the secure corporate Drive, and with the SCADA provider. 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.	2024			2,000	Principal Engineer (Water and Wastewater)		
2023-013	Scheme: Whole of System - Process Step: Whole of System - Item: WOS28 - Technical advancement - Cybersecurity - Event: Lack of protective technology and maintenance - Risk: Medium				Perform routine manual operation of sites, and ensure documentation exists for operating procedures. Staff should be trained and deemed competent to run manual operation of sites. Training of manual mode operations for each facility ongoing	2024			Internal Wages	Program Coordinator		
2023-014	Scheme: Whole of System - Process Step: Whole of System - Item: WOS29 - Detection - Cybersecurity - Event: Inability to detect a cyber security event - Risk: Medium				Increased awareness from operators surrounding physical security access on ICS sites, provided by means of training sessions. Formal training sessions with water services operators scheduled early May 2020. Add this to the procedures	2024			Internal Wages	Program Coordinator		
2023-015	Scheme: Blackbutt - Process Step: Catchment - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: Very High	There is a catchment management plan in place only for Boondooma. Controls in place but not managed. However risk cannot be reduce at this stage.	Liaise with council on approach to take. Discuss with farmer to remove cattle from the intake area. Toolbox talk for this specific action.	2023	Update procedures and create a Catchment Management Plan for the Blackbutt WTP catchment to link this risk assessment.	2024	Ownership and control of catchment area - including fencing of compound.	TBC - SBRC DWGO Strategy Adoption and Implementation	300,000	Program Coordinator	Procedural	
2023-016	Scheme: Blackbutt - Process Step: Catchment - Item: CMT5 - Bacteria/Virus - Biological - Event: Dairy or other plant discharges - Risk: High	See preventative measures.			Update catchment management plan to include farm practices.	2024			-	Program Coordinator	Procedural	
2023-017	Scheme: Blackbutt - Process Step: Catchment - Item: CMT7 - Heavy metals, e.g., copper, lead - Chemical - Event: Natural geology, or mining - Risk: Low	6 years of WQ results reviewed. The aesthetic limit for Aluminium has been exceed - see elsewhere for plant optimisation.			Monitor Aluminium levels pre and post treatment to gauge the effectiveness of treatment of this aesthetic contaminant.		Follow up monitoring		-	Coordinator Treatment	Procedural	

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2023-018	Scheme: Blackbutt - Process Step: Catchment - Item: CMT8 - Hydrocarbons - Chemical - Event: Illegal disposal of fuel etc., run off from impermeable urban areas - Risk: Low	Legal requirements for persons to manage their stores. Regular patrols. Possible use of a vehicle but low impact.	Query/discuss usage with property owners. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Program Coordinator	Procedural	
2023-019	Scheme: Blackbutt - Process Step: Catchment - Item: CMT10 - Manganese - Chemical - Event: Natural geology - Risk: Very High	6 years of WQ results reviewed. Treatment in place however not designed to remove Mn and treated water has exceedances. Known Mn issue with Boolbir Dam and also Nukku following bulk supply maintenance periods			Additional testing of raw water supply to be implemented in the verification monitoring program	2026			Internal Wages	Program Coordinator	Laboratory	
2023-020	Scheme: Blackbutt - Process Step: Catchment - Item: CMT11 - Sodium (salt) - Chemical - Event: Natural geology - Risk: Medium	6 years of WQ results reviewed. Aesthetic limit reached. Blending recommended.			Consider blending the Blackbutt raw water with the Boondooma water to reduce the sodium level to below the aesthetic limit.	2024			-	Program Coordinator	Procedural	
2023-021	Scheme: Blackbutt - Process Step: Catchment - Item: CMT12 - Pesticides/ Herbicides - Chemical - Event: Used in catchment - Risk: Low	Pesticides are monitored regularly as per the verification monitoring. Any high readings will require to be evaluated and actioned on occurrence.	Query/discuss usage with property owners. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Program Coordinator	Procedural	
2023-022	Scheme: Blackbutt - Process Step: Catchment - Item: CMT13 - other treatment chemicals e.g., PFAS, Microplastics - Chemical - Event: No WWTP discharge, Power Station, Mining, Mill or Airports in catchment - Risk: Medium	Historic PFAS monitoring indicates at low levels. Monitoring frequency increased to quarterly for raw water source for 12 months or event based following change to AD/WG. If identified, additional upstream raw water samples will be undertaken to increase source awareness			Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		-	Program Coordinator		
2023-023	Scheme: Blackbutt - Process Step: Catchment - Item: CMT18 - Various Contaminants - Chemical - Event: Chemical spill - Risk: Low	Freak event, alternative water sources available. No major roads in the catchment. Emergency response plan is considered reliable. Local Disaster Management Group can be called into action if required. LDMG plan. Emergency Response Plan, and streams are generally ephemeral allows time for clean up.	Discuss usage with property owners. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1,		Internal Wages	Program Coordinator	Procedural	
2023-024	Scheme: Blackbutt - Process Step: Catchment - Item: CMT21 - Radioactivity - Radiological - Event: Natural geology - Risk: Low	No data - potentially a high risk rating due to no reports of illness however cannot rule it out. Recommend specific testing for this parameter. Filtration and coagulation likely to remove this to manageable levels if there is a contaminant. No action proposed.	Nil.		Test for radionuclides.	2024			1,000	Water Sampling Technician	Laboratory	
2023-025	Scheme: Blackbutt - Process Step: Catchment - Item: CMT23 - Various Contaminants - Physical/Chemical etc. - Turbidity - Event: Bushfire followed by runoff event - Bushfire impact to catchment leading to increased particulate matter in Dams. - Risk: Medium	Bushfires are common in the catchment, however monitoring results have not shown responsive changes in parameters. Alternative source water can be selected.			Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Program Coordinator	Procedural	
2023-026	Scheme: Blackbutt - Process Step: Intake - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: Very High	Daily inspections. No other active measures to reduce L&C. Residence time in storage and natural die off. Offtake level selection.	Check fences and entry points and secure.	2023	Council to consider fencing/ gates to prevent horses and other animals entering intake area.	2024	Undertake fence and gate management program	2025	20,000	Coordinator Treatment	Procedural	
2023-027	Scheme: Blackbutt - Process Step: Intake - Item: CMT3 - Protozoa/ Cryptosporidium - Biological - Event: Animals in catchment - Contamination of the Dams from dead animals in water. - Risk: Very High	Operational site visits Community notify staff when there is a concern			Update O&M Manual to ensure removal of animals is monitored and performed.	2024			Internal Wages	Coordinator Treatment	Procedural	
2023-028	Scheme: Blackbutt - Process Step: Intake - Item: CMT4 - Amoeba/ Naegleria/ Acanthamoeba - Biological - Event: Animals in catchment - Access by native and feral animals to the Dam introducing faecal contamination. - Risk: High	Daily inspections. No other active measures to reduce L&C.							-	Program Coordinator	Council	
2023-029	Scheme: Blackbutt - Process Step: Intake - Item: CMT20 - Turbidity - Physical - Event: Drought - Risk: High	no real active measures to reduce L&C. Boondooma raw managed by SunWater.							-	Manager Water & Wastewater	O&M	
2023-030	Scheme: Blackbutt - Process Step: Intake - Item: CMT23 - Various Contaminants - Physical/Chemical etc. - Turbidity - Event: Bushfire followed by runoff event - Bushfire impact to catchment leading to increased particulate matter in Dams. - Risk: High	Residence time in dam allows for settling. Alternative source water can be selected. Traditional burn off practices (annually) control undergrowth and the catchment area recovers before the wet season. Potassium Permanganate is currently being investigated instead of a destratification unit.	Investigate if a potassium permanganate unit should be installed. Research seasonal changes in raw water.	2024	Subject to investigation, design potassium permanganate unit to reduce contaminant risk.	2025	Subject to investigation, install a potassium permanganate unit	2026	170,000	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-031	Scheme: Blackbutt - Process Step: Intake - Item: INT2 - Taste and odour - Chemical - Event: Algal bloom - Risk: Very High	Visual inspection with weekly inspection records. Monthly algal testing – increased to weekly when an event is recorded.	Blue-Green Algae Management Plan completed	2023	Staff training	2024			5,000	Program Coordinator	Procedural	
2023-032	Scheme: Blackbutt - Process Step: Intake - Item: INT9 - Various Contaminants - Physical/Chemical etc. - Event: Stagnation or dam turnover - Risk: Low	No aeration in place	DO meter needs to be purchased.	2023					800	Principal Engineer (Water and Wastewater)	Laboratory	
2023-033	Scheme: Blackbutt - Process Step: Filtration - Item: CMT9 - Iron - Chemical - Event: Natural geology, sediment - Risk: Medium	Clarification does not reduce the likelihood but reduces the extent of the contaminant. Filtration reduces the consequence.	Toolbox talk for this specific action.	2023	Update procedures to address chemical dosing and filtration optimisation.	2024			Internal Wages	Coordinator Treatment/Program Coordinator	Procedural	
2023-034	Scheme: Blackbutt - Process Step: Filtration - Item: CMT10 - Manganese - Chemical - Event: Natural geology - Risk: Very High	Clarification does not reduce the likelihood but reduces the extent of the contaminant. Filtration reduces the consequence. Manganese levels are generally low, however there are occasions when the thresholds are exceeded.	Ensure plant optimisation procedures are in place and anticipates seasoning issues that require changes in treatment operations. Particularly if the water source changes and oxidising metals have an influence.	2024			Construction of aeration tower and implementation of KMNO4 dosing of raw water sources	TBC - SSRC DWGO Strategy Adoption and Implementation	911,000	Coordinator Treatment/Program Coordinator	Procedural	

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2023-035	Scheme: Blackbutt - Process Step: Filtration - Item: CMT20 - Turbidity - Physical - Event: Drought - Risk: Low	Coagulation and filtration will reduce this aesthetic issue. Filters can be derated to ensure quality - See O&M Manual.	Discuss at a toolbox talk that the filters are currently underperforming, and assign an action to address this.	2023	Report on the filter performance and investigate set points and turbidity data. Update the O&M Manual accordingly, and if required update the HACCP charts. This will be a new CCP.	2024	Subject to filter performance report. It is possible that additional in line turbidity meter will be installed to measure the filtered water turbidity prior to the chlorine contact tank. Filter media and filter nozzles are due to be replaced.	2025	25,000	Program Coordinator	Procedural	
2023-036	Scheme: Blackbutt - Process Step: Filtration - Item: INT1 - Cyanobacteria - Biological - Event: Algal bloom - Risk: High	Coagulation and filtration will reduce this issue. There is an old system in place for dosing raw water.	Manual dosing procedure in place. PAC powder on site.	2023	Reinstate PAC dosing system.	2023			Internal Wages	Coordinator Treatment/Principal Engineer (Water and Wastewater)	O&M	
2023-037	Scheme: Blackbutt - Process Step: Filtration - Item: INT6 - Failure of supply - Whole of System - Event: loss of power or no water for aerators or clarifier. - Risk: Medium	No UPS or backup generators. Reliant on 2 days water storage at Reservoirs. Ergon has been notified of critical infrastructure locations. Can hire generators.	Complete the solar needs assessment for each WTP.	2024	Switchboard upgrade is planned, and will have capability to connect a generator.	2024	Asses the generation needs of each plant and the connectability of each plant.	2025	30,000	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-038	Scheme: Blackbutt - Process Step: Filtration - Item: INT10 - Various Contaminants - Whole of System - Event: Sabotage/ Terrorism - Non authorised persons accessing the site and interrupting the treatment processes (e.g., Vandalism, trespassing) - Risk: Medium	Site security is considered adequate - Site fully fenced and locked.							-	Manager Water & Wastewater	O&M	
2023-039	Scheme: Blackbutt - Process Step: Filtration - Item: WTP1 - Various Contaminants - Physical/Chemical etc. - Event: PLC failure allowing untreated or semi-treated water through. - Risk: Medium	No SCADA interlocks for filter breakthrough. Filter outlet valve is a fail to close on loss of power.	Review turbidity and Cl2 controls required for each plant.	2024			Improve Plant Control and interlocks to prevent water quality breaches	TBC - SBRC DWQO Strategy Adoption and Implementation	3,578,131	Coordinator Treatment/Program Coordinator	O&M	Yes
2023-040	Scheme: Blackbutt - Process Step: Filtration - Item: WTP4 - Various Contaminants - Pathogens/Turbidity - Event: Under dosing (e.g. from error, equipment failure or running out of chemical) resulting in inadequate coagulation - Risk: Medium	Chemical Transfer and ordering done weekly. WTP Daily log sheet and daily diary includes chemical storage quantity. Weekly jar testing done to confirm dosing rates. Drop down test conducted to confirm pump rates. Now dosing direct from large tanks and levels can be seen inside the tanks. Pump fail alarm. Filter water Turbidity online.	Chemical Transfer and ordering procedure completed	2024					Internal Wages	Program Coordinator	O&M	
2023-041	Scheme: Blackbutt - Process Step: Filtration - Item: WTP5 - Various Contaminants - Pathogens/Turbidity - Event: Elevated turbidity levels leading to insufficient coagulation - Risk: Low	Online Turbidity & manual levels recorded in Operators Log Sheet	Calibration and maintenance schedule for online turbidity meter is to be developed and implemented. This is to occur for all instruments.		See CMT9		See CMT9		3,000	Coordinator Treatment	O&M	
2023-042	Scheme: Blackbutt - Process Step: Filtration - Item: WTP7 - Various Contaminants - Physical/Chemical etc. - Event: Failure of saturation system - Risk: Low		Preventative Maintenance program TBD. Consider holding saturator feed pump as spare (subject to cost and lead time for delivery)	2023					2,500	Coordinator Treatment/Program Coordinator	O&M	
2023-043	Scheme: Blackbutt - Process Step: Filtration - Item: WTP8 - Various Contaminants - Physical/Chemical etc. - Event: Failure of filter resulting in high turbid water. - Risk: Medium	There are no procedures for operation or filter maintenance. Additional training required on filter process and CCP response procedures. Council to consider a filter maintenance program.	Laminate the new HACCP Plans and place on the WTP wall.	2023	There are no procedures for operation or filter maintenance. Additional training required on filter process and CCP response procedures. Council to consider a filter maintenance program.	2024			Internal Wages	Coordinator Treatment/Program Coordinator	Procedural	
2023-044	Scheme: Blackbutt - Process Step: Filtration - Item: WTP9 - Various Contaminants - inability to supply - Event: Backwash / transfer pump failure leading to WTP fail - Risk: Low	Spare pump held as spare.			Create a preventative maintenance program for the scheme.	2024			Internal Wages	Coordinator Maintenance	Procedural	
2023-045	Scheme: Blackbutt - Process Step: Disinfection - Item: CMT3 - Protozoa/ Cryptosporidium - Biological - Event: Animals in catchment - Contamination of the Dams from dead animals in water. Risk: High	Based on HBT assessment there is still a lingering risk. Disinfection by chlorination does not kill Crypto.	Consider the HBT assessment undertaken by NWM and report to management, noting the public risk, but noting that meeting HBT is not compulsory by the state government at this time.	2023	Investigate risks and consider funding for a UV system, and report to council on the risks.		TBC - SBRC DWQO Strategy Adoption and Implementation	Subject to funding, install a UV system. Consider DBP risks.	537,465	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-046	Scheme: Blackbutt - Process Step: Disinfection - Item: DIS1 - Chlorate - Chemical - Event: chemical breakdown - Risk: High	Council currently does not have a chlorate management plan. Action assigned here.	Chlorate Management Plan to be completed. Includes chlorate testing periodically.	2023	Staff training	2024	Depending on the success of the management plan, consider moving to Chlorine Gas, considering chlorates now need to be managed.	2024	4,000	Manager Water & Wastewater	Procedural	
2023-047	Scheme: Blackbutt - Process Step: Disinfection - Item: DIS2 - Chlorine - Chemical - Event: Injection or recirculation pump or chemical injector equipment failure - Risk: Low	Council has acquired some spare parts for system and purchase as spare parts - e.g., Spare pumps, injectors, etc.	Smaller plants: Consider duty standby tanks with automatic changeover look at a lower strength hypo.	2023	Design duty standby tanks with automatic changeover	2024	Install duty standby tanks with automatic changeover	2025	5,000	Program Coordinator	O&M	
2023-048	Scheme: Blackbutt - Process Step: Disinfection - Item: DIS3 - Chlorine - Chemical - Event: chemical underdose or overdose - Risk: Low	WWW have a Water sampling technician who specialise in water sampling. All WWW staff have undertaken chlorine sample training. All equipment is used and calibrated as per the equipment register.			Chlorine sample testing training is scheduled to be conducted annually. The Council laboratory also can perform microbial analysis within 18 hrs from sampling. Although not NATA certified this is considered best practice for verification.	2024	Annual training, and procedure for returning instruments to the lab for calibration.	2024	-	Coordinator Treatment	HR - Training	
2023-049	Scheme: Blackbutt - Process Step: Disinfection - Item: DIS10 - Chlorine ORP - Chemical - Event: Chlorine quickly dissipates due to a high Oxidation demand - Risk: High	Oxidation reduction potential value check is needed. Action assigned here.	Test ORP	2023	Subject to ORP test	2024	Subject to test, however chlorine concentration increases may only be needed instead of other treatments such as potassium permanganate dosing.	2025	500	Water Sampling Technician	Laboratory	
2023-050	Scheme: Blackbutt - Process Step: Reservoirs - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: Low	Weekly inspections in place. Risk not increased, however cannot reduce. All reservoirs are designed to be vermin proof, and are checked on a maintenance program. Ad hoc cleaning programs are implemented when required.	Purchase analysers for the most critical sites.	2023	A regional program maintenance schedule is required to be developed for all analysers and flow meters etc. With a strategy to identify preferred regionalised equipment list.	2024			4,000	Coordinator Treatment/Program Coordinator	O&M	

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2023-051	Scheme: Blackbutt - Process Step: Reservoirs - Item: CMT2 - Bacteria/Virus - Biological - Event: Humans in catchment, e.g. septic, camping - Risk: Low	Weekly inspections in place. Risk not increased, however cannot reduce.	All Council & contract staff that have access to water supply facilities to undergo AquaCard training.	2023	TBD Site Induction. Contactor Safety and WQ Induction. Inducted contractors and staff only allowed to work on site.	2024			Internal Wages	Manager Water & Wastewater	Procedural		
2023-052	Scheme: Blackbutt - Process Step: Reservoirs - Item: INT10 - Various Contaminants - Whole of System - Event: Sabotage/Terrorism - Non authorised persons accessing the site and interrupting the treatment processes (e.g. Vandalism, trespassing) - Risk: High	Regular inspections. Locked access. Community would report unauthorised access to tanks when observed. Some tank sites do not have a secure compound fence. Graffiti is on tank walls. Benarkin requires an additional reservoir. This will help with supply, pressure, and a disinfection station will also improve disinfection residual.			Design of new reservoir - Benarkin.	2025	Installation of new reservoir - Benarkin.		TBC - SBRC DWQO Strategy Adoption and Implementation	300,000	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-053	Scheme: Blackbutt - Process Step: Reservoirs - Item: WTP1 - Various Contaminants - Physical/Chemical etc. - Event: PLC failure allowing untreated or semi-treated water through. - Risk: Medium	Plant has interlocks in place. No issue at the reservoirs.	Investigate SCADA management during failures	2024					Internal Wages	Manager Water & Wastewater	Procedural		
2023-054	Scheme: Blackbutt - Process Step: Reservoirs - Item: RES1 - Bacteria/Virus - Biological - Event: Ingress of faecal material from human or vermin entry. - Risk: Medium	All Reservoirs are roofed, water proofed and vermin proofed. Reservoir Maintenance Schedule and check sheets (include security and internal checks) TBD a Reservoir Top Up dosing procedure. Action assigned here.	Review reservoir cleanliness status.	2023	Produce a reservoir cleaning procedure. A thorough tank inspection program is to be developed and conducted following a storm event.	2024	Allocate annual funds for contract cleaning, say 6 per year. Too include Gordonbrook intakes dive inspection.	2025	40,000	Coordinator Maintenance	O&M		
2023-055	Scheme: Blackbutt - Process Step: Reservoirs - Item: RES2 - Bacteria/Virus - Biological - Event: Poor Tank turnover, high or low chlorine. - Risk: High	Lower frequency of potential issues due to weekly inspections. Project underway to resolve this. Water height adjustable for some reservoirs. Top fill inlets for some tanks. Action assigned here.	Create a reservoir chlorine dosing Top Up procedure.	2023	Create a procedure for tank turnover. Investigate valve configuration and operation for inlet and outlet. Consider future costs. Council to consider online monitoring and alarms for disinfection residual at Reservoirs. Consider future costs and analyser drainage issues. Also include this issue in the chlorate management plan also.	2024			Internal Wages	Program Coordinator	O&M		
2023-056	Scheme: Blackbutt - Process Step: Reservoirs - Item: RES3 - Loss of Supply - Pressure - Event: Loss of water levels that maintain pressure requirements in the distribution. - Risk: Medium	Individual levels set for each Res. Action assigned here.	Create and SOP for alternative or emergency supplies or water restriction implementation.	2023					Internal Wages	Manager Water & Wastewater	Procedural		
2023-057	Scheme: Blackbutt - Process Step: Reticulation - Item: WTP1 - Various Contaminants - Physical/Chemical etc. - Event: PLC failure allowing untreated or semi-treated water through. - Risk: Medium		Investigate SCADA management during failures. Assess future risk.	2023					Internal Wages	Manager Water & Wastewater			
2023-058	Scheme: Blackbutt - Process Step: Reticulation - Item: DIS3 - Chlorine - Chemical - Event: chemical underdose or overdose - Risk: Low	Notification to high priority water uses. Isolation plans are signed by Manager for all program maintenance works.	Flushing Procedure to be completed - an additional program will be created to identify location and frequency with consideration of the current drought conditions, and THM reduction.	2023	Staff training	2024			4,000	Program Coordinator	Procedural		
2023-059	Scheme: Blackbutt - Process Step: Reticulation - Item: RET1 - Bacteria/Virus - Biological - Event: Ingress of contaminated water - Pipe Breaks/Mains Break - Risk: Medium	Procedure in place. Breakage repairs undertaken under Plumbing Code. WR7.7 - Water Service Leak/Repair in place.			Repair Procedure update and training required.	2024			Internal Wages	Program Coordinator	Procedural		
2023-060	Scheme: Blackbutt - Process Step: Reticulation - Item: RET4 - Turbidity - Physical - Event: sloughing of biofilm, resuspension of sediment in reservoirs/mains, or Pipe Breaks/ Mains breaks - Risk: Low		Review dead end locations where possible and add to the flushing program.	2023	Maintenance staff to be trained on valve operation and flushing after repairs. Identify and list sites for Mains Replacement program. See above for the repair procedure action.	2024			Internal Wages	Coordinator Maintenance	Procedural		
2023-061	Scheme: Blackbutt - Process Step: Reticulation - Item: RET6 - Bacteria/Virus - Biological - Event: Dead ends in reticulation leading to stagnation and WQ issues. E.g., Taste and Odour High pH, - Risk: Medium	No dead ends in new developments, generally. Customer complaints initiate a flushing program. New main designs are as per WSSA to prevent dead ends.	Problem areas have to be placed on routine flushing programs.	2023					Internal Wages	Coordinator Maintenance	Procedural		
2023-062	Scheme: Blackbutt - Process Step: Reticulation - Item: RET7 - Bacteria/Virus - Biological - Event: New connections contamination. - Risk: High	Cul-overs procedure for the connection of new mains including inspection and disinfection. ITPs developed. Council considers that the process is current good but requires written procedures.					Development compliance adopts procedures.	2025	Internal Wages	Manager Water & Wastewater	Procedural		
2023-063	Scheme: Blackbutt - Process Step: 2ndaryDis - Item: DIS1 - Chlorate - Chemical - Event: chemical breakdown - Risk: High	No change from previous COP. See redosing below if used.	Consider a rechlorination unit or higher dosage or flushing or a combination of these.	2023	Design rechlorination unit for Benarkin including chlorine set point adjustments at the WTP and at the future 2ndary Cl2 site. Consider subject to the potassium permanganate investigation.	2030	Install rechlorination unit for Benarkin	2035	138,704	Principal Engineer (Water and Wastewater)	O&M	Yes	
2023-064	Scheme: Boondooma - Process Step: Catchment - Item: CMT5 - Bacteria/Virus - Biological - Event: Dairy or other plant discharges - Risk: High	See preventative measures.			Update catchment management plan to include farm practices.	2024			-	Program Coordinator	Procedural		
2023-065	Scheme: Boondooma - Process Step: Catchment - Item: CMT7 - Heavy metals, e.g., copper, lead - Chemical - Event: Natural geology, or mining - Risk: Low	6 years of WQ results reviewed. The aesthetic limit for Aluminium has been exceed - see elsewhere for plant optimisation.			Monitor Aluminium levels pre and post treatment to gauge the effectiveness of treatment of this aesthetic contaminant.	2024	Follow up monitoring	2025	Internal Wages	Coordinator Treatment	O&M		
2023-066	Scheme: Boondooma - Process Step: Catchment - Item: CMT8 - Hydrocarbons - Chemical - Event: Illegal disposal of fuel, fuel form boats, run off from impermeable urban areas - Risk: Low	Legal requirements for persons to manage their stores. Regular patrols. Urban areas limited.	Query/discuss usage with SunWater if needed. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Program Coordinator	Procedural		
2023-067	Scheme: Boondooma - Process Step: Catchment - Item: CMT12 - Pesticides/ Herbicides - Chemical - Event: Used in catchment - Risk: Low	Pesticides are monitored regularly as per the verification monitoring. Any high readings will require to be evaluated and actioned on occurrence.	Query/discuss usage with SunWater if needed. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Program Coordinator	Procedural		

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No.	Observation	Gap or Comment	Proposed Improvement Measures						Resourcing				
			Interim	Target Date	Short-Term	Target Date	Long-Term	Target Date	Budget	Assigned to	Group	Intra?	
2023-068	Scheme: Boondooma - Process Step: Catchment - Item: CMT13 - other treatment chemicals e.g., PFAS, Microplastics - Chemical - Event: WWTP discharge upstream, Power Station, Mining, Mill or Airports in catchment - Risk: High	Historic PFAS monitoring indicates at low levels. Monitoring frequency increased to quarterly for raw water source for 12 months or event based following change to ADWG. If identified, additional upstream raw water samples will be undertaken to increase source awareness. Kingaroy WWTP discharges upstream, but minimal impact expected unless continuous stream flows from Gordonbrook Dam			Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1				Program Coordinator	Procedural	
2023-069	Scheme: Boondooma - Process Step: Catchment - Item: CMT18 - Various Contaminants - Chemical - Event: Chemical spill - Risk: Medium	Freak event, alternative water sources not available. No major roads in the catchment. Emergency response plan is considered reliable. Local Disaster Management Group can be called into action if required. LDMG plan, Emergency Response Plan, and streams are generally ephemeral allows time for clean up.	Query/discuss usage with SunWater if needed. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment. Ensure supply can be isolated until wave passes.	2024	See CMT 1,		Internal Wages	Program Coordinator	Procedural		
2023-070	Scheme: Boondooma - Process Step: Catchment - Item: CMT21 - Radioactivity - Radiological - Event: Natural geology - Risk: Low	Historic data indicates seasonal spikes, but still below health limits. Recommend specific testing for this parameter. Filtration and coagulation likely to remove this to manageable levels if there is a contaminant. No action proposed.	Nil.		Test for radionuclides, increased during winter when increased levels indicate	2025			1,000	Water Sampling Technician	Laboratory		
2023-071	Scheme: Boondooma - Process Step: Catchment - Item: CMT23 - Various Contaminants - Physical/Chemical etc. - Turbidity - Event: Bushfire followed by runoff event - Bushfire impact to catchment leading to increased particulate matter in Dams. - Risk: Medium	Bushfires are common in the catchment, however monitoring results have not shown responsive changes in parameters. Alternative source water cannot be selected.			Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Technical Officer	Procedural		
2023-072	Scheme: Boondooma - Process Step: Intake - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: High	Daily inspections. No other active measures to reduce L&C. Residence time in storage and natural die off. Offtake level selection.			Update O&M Manual to ensure intake level is properly chosen.	2024			Internal Wages	Coordinator Treatment	Procedural		
2023-073	Scheme: Boondooma - Process Step: Intake - Item: CMT3 - Protozoal Cryptosporidium - Biological - Event: Animals in catchment - Contamination of the Dams from dead animals in water. Risk: High	Operational site visits Community notify staff when there is a concern			Update O&M Manual to ensure removal of animals is monitored and performed.	2024			Internal Wages	Coordinator Treatment	Procedural		
2023-074	Scheme: Boondooma - Process Step: Intake - Item: CMT4 - Amoeba/ Naegleria/ Acanthamoeba - Biological - Event: Animals in catchment - Access by native and feral animals to the Dam introducing faecal contamination. - Risk: Medium	Daily inspections. No other active measures to reduce L&C.	Check fences and entry points and secure.	2023	Council to consider fencing/ gates to prevent horses and other animals entering intake area.	2024	Undertake fence and gate management program	2025	20,000	Program Coordinator	Council		
2023-075	Scheme: Boondooma - Process Step: Intake - Item: CMT23 - Various Contaminants - Physical/Chemical etc. - Turbidity - Event: Bushfire followed by runoff event - Bushfire impact to catchment leading to increased particulate matter in Dams. - Risk: High	Residence time in dam allows for settling. Alternative source water cannot be selected however. Traditional burn off practices (annually) control undergrowth and the catchment area recovers before the wet season.	Investigate if a potassium permanganate unit should be installed. Research seasonal changes in raw water.	2024	Subject to investigation, design potassium permanganate unit to reduce contaminant risk.	2025	Subject to investigation, install a potassium permanganate unit	2026	170,000	Principal Engineer (Water and Wastewater)	O&M	Yes	
2023-076	Scheme: Boondooma - Process Step: Intake - Item: INT9 - Various Contaminants - Physical/Chemical etc. - Event: Stagnation or dam turnover - Risk: Medium	No controls in place at this step.	DO meter needs to be purchased.						800	Principal Engineer (Water and Wastewater)	Laboratory		
2023-077	Scheme: Boondooma - Process Step: Filtration - Item: CMT9 - Iron - Chemical - Event: Natural geology, sediment - Risk: Medium	Clarification does not reduce the likelihood but reduces the extent of the contaminant. Filtration reduces the consequence.	Toolbox talk for this specific action.	2023	Update procedures to address chemical dosing and filtration optimisation.	2024			Internal Wages	Coordinator Treatment	Procedural		
2023-078	Scheme: Boondooma - Process Step: Filtration - Item: CMT10 - Manganese - Chemical - Event: Natural geology - Risk: Low	Clarification does not reduce the likelihood but reduces the extent of the contaminant. Filtration reduces the consequence. Manganese levels are generally low, however there are occasions when the thresholds are exceeded.			Ensure plant optimisation procedures are in place and anticipates seasoning issues that require changes in treatment operations.	2024			Internal Wages	Coordinator Treatment	Procedural		
2023-079	Scheme: Boondooma - Process Step: Filtration - Item: CMT20 - Turbidity - Physical - Event: Drought - Risk: Low	Coagulation and filtration will reduce this aesthetic issue. Filters can be derated to ensure quality - See O&M Manual.	Discuss at a toolbox talk that the filters are currently underperforming, and assign an action to address this.	2023	Report on the filter performance and investigate set points and turbidity data. Update the O&M Manual accordingly, and if required update the HACCP charts.	2024	Subject to filter performance report. It is possible that additional in line turbidity meter will be installed to measure the filtered water turbidity prior to the chlorine contact tank. Filter media and filter nozzles are due to be replaced.	2025	25,000	Program Coordinator	Procedural		
2023-080	Scheme: Boondooma - Process Step: Filtration - Item: WTP1 - Various Contaminants - Physical/Chemical etc. - Event: PLC failure allowing untreated or semi-treated water through. - Risk: Medium	Relies on plant operator supervision. CWS and dosing will also shut down. The plant won't pump to the elevated tank, therefore it is a lower risk. Electric actuator on the outlet to the filter.	Check that the electric actuator on the outlet to the filter is a close on failure.	2023			Improve Plant Control and Interlocks to prevent water quality breaches	TBC - SBRC DWQO Strategy Adoption and Implementation	Refer to Blackbutt WTP1 Filtration	Principal Engineer (Water and Wastewater)	O&M	Yes	
2023-081	Scheme: Boondooma - Process Step: Filtration - Item: WTP5 - Various Contaminants - Pathogens/Turbidity - Event: Elevated turbidity levels leading to insufficient coagulation - Risk: Low	Online Turbidity & manual levels recorded in Operators Log Sheet. Operator is in attendance when operating the plant. Turbidity samples are taken by operators a minimum of three days per week.	Calibration and maintenance schedule for online turbidity meter is to be developed and implemented. This is to occur for all instruments.		See CMT9		See CMT9		3,000	Coordinator Treatment	O&M		
2023-082	Scheme: Boondooma - Process Step: Filtration - Item: WTP7 - Various Contaminants - Physical/Chemical etc. - Event: Failure of saturation system - Risk: Low		Preventative Maintenance program TBD.	2023					-	Coordinator Treatment	O&M		
2023-083	Scheme: Boondooma - Process Step: Filtration - Item: WTP6 - Various Contaminants - Physical/Chemical etc. - Event: Failure of filter resulting in high turbid water. - Risk: Medium	There are no procedures for operation or filter maintenance. Additional training required on filter process and CCF response procedures. Council to consider a filter maintenance program.	Laminate the new HACCP Plans and place on the WTP wall.	2023	There are no procedures for operation or filter maintenance. Additional training required on filter process and CCF response procedures. Council to consider a filter maintenance program.	2024			Internal Wages	Coordinator Treatment	Procedural		

Appendix K - Risk Actions Required



No.	Observation	Gap or Comment	Proposed Improvement Measures						Resourcing			
			Interim	Target Date	Short-Term	Target Date	Long-Term	Target Date	Budget	Assigned to	Group	Infra?
2023-084	Scheme: Boondooma - Process Step: Filtration - Item: WTP3 - Various Contaminants - Inability to supply - Event: Backwash / transfer pump failure leading to WTP fail - Risk: Low	Spare pump held as spare.			Create a preventative maintenance program for the scheme.	2024			Internal Wages	Coordinator Maintenance	Procedural	
2023-085	Scheme: Boondooma - Process Step: Disinfection - Item: DIS2 - Chlorine - Chemical - Event: Injection or recirculation pump or chemical injector equipment failure - Risk: Low	Council has acquired some spare parts for system and purchase as spare parts - e.g., Spare pumps, injectors, etc.	Smaller plants: Consider duty standby tanks with automatic changeover look at a lower strength hypo.	2023	Design duty standby tanks with automatic changeover	2024	Install duty standby tanks with automatic changeover	2025	5,000	Program Coordinator	O&M	Yes
2023-086	Scheme: Boondooma - Process Step: Disinfection - Item: DIS10 - Chlorine ORP - Chemical - Event: Chlorine quickly dissipates due to a high Oxidation demand - Risk: High	Oxidation reduction potential value check is needed. Action assigned here.	Test ORP. Increase flushing at the day use area.	2023		2024	Subject to test, however chlorine concentration increases may only be needed instead of other treatments such as potassium permanganate dosing.	2025	500	Water Sampling Technician	Laboratory	
2023-087	Scheme: Boondooma - Process Step: Reservoirs - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: Low	Weekly inspections in place. Risk not increased, however cannot reduce. All reservoirs are designed to be vermin proof, and are checked on a maintenance program. Ad hoc cleaning programs are implemented when required.	Purchase analysers for the most critical sites.	2023	A regional program maintenance schedule action assigned in Blackbutt RA.				4,000	Program Coordinator	O&M	
2023-088	Scheme: Boondooma - Process Step: Reservoirs - Item: WTP1 - Various Contaminants - Physical/Chemical etc. - Event: PLC failure allowing untreated or semi-treated water through. - Risk: Medium	Plant has interlocks in place. No issue at the reservoirs.	Investigate SCADA management during failures	2024					Internal Wages	Manager Water & Wastewater	Procedural	
2023-089	Scheme: Boondooma - Process Step: Reservoirs - Item: RES1 - Bacteria/Virus - Biological - Event: Ingress of faecal material from human or vermin entry. - Risk: Medium	All Reservoirs are roofed, water proofed and vermin proofed. Reservoir Maintenance Schedule and check sheets (include security and internal checks) TBD a Reservoir Top Up dosing procedure. Action assigned here.	Review reservoir cleanliness status.	2023	Reservoir cleaning procedure and program action assigned in Blackbutt RA.				-	Coordinator Maintenance	O&M	
2023-090	Scheme: Boondooma - Process Step: Reservoirs - Item: RES2 - Bacteria/Virus - Biological - Event: Poor Tank turnover, high or low chlorine. - Risk: High	Lower frequency of potential issues due to weekly inspections. Project underway to resolve this. Water height adjustable for some reservoirs. Top fill inlets for some tanks. Action assigned here.	Common reservoir chlorine dosing Top Up procedure action assigned in Blackbutt RA.		Common procedure for tank turnover action assigned in Blackbutt RA.				-	Coordinator Treatment	O&M	
2023-091	Scheme: Boondooma - Process Step: Reservoirs - Item: RES3 - Loss of Supply - Pressure - Event: Loss of water levels that maintain pressure requirements in the distribution. - Risk: Medium	Individual levels set for each Res. Action assigned here. SunWater provides notification for planned shutdowns on the Tarong pipeline. Water can be trucked in from Proston scheme due to the low demands.	Common SOP for emergency supplies or water restriction implementation action assigned in Blackbutt RA.						50,000	Manager Water & Wastewater	Procedural	
2023-092	Scheme: Kingaroy - Process Step: Catchment - Item: CMT5 - Bacteria/Virus - Biological - Event: Dairy or other plant discharges - Risk: Medium	See preventative measures.			Update catchment management plan to include farm practices.	2024			-	Program Coordinator	Procedural	
2023-093	Scheme: Kingaroy - Process Step: Catchment - Item: CMT7 - Heavy metals, e.g., copper, lead - Chemical - Event: Natural geology, or mining - Risk: Low	5 years of WQ results reviewed. The aesthetic limit for Aluminium has been exceed - see elsewhere for plant optimisation.			Monitor Aluminium levels pre and post treatment to gauge the effectiveness of treatment of this aesthetic contaminant.		Follow up monitoring		-	Coordinator Treatment	Laboratory	
2023-094	Scheme: Kingaroy - Process Step: Catchment - Item: CMT8 - Hydrocarbons - Chemical - Event: Illegal disposal of fuel, fuel from boats, run off from impermeable urban areas - Risk: Medium	Legal requirements for persons to manage their stores. Regular patrols. Multiple Fuel Stations in catchment, some with no hydrocarbon capture from bowser areas. Historic data indicates some levels. additional testing required.	Discuss usage with property owners. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Program Coordinator	Procedural	
2023-095	Scheme: Kingaroy - Process Step: Catchment - Item: CMT10 - Manganese - Chemical - Event: Natural geology - Risk: Very High	5 years of WQ results reviewed. Treatment in place however treated water has exceedances. Gordonbrook Dam destratifies the raw water supply near the raw water intake tower, although this supply is second priority. Manganese is monitored in raw water supplies. nown Mn issue. Boondooma following bulk water supply maintenance periods. Off Stream Storage may introduce additional risks			Additional testing of raw water supply to be implemented in the verification monitoring program, and additional Retic monitoring for manganese.	2024			-	Coordinator Treatment/Water Sampling Technician	Procedural	
2023-096	Scheme: Kingaroy - Process Step: Catchment - Item: CMT11 - Sodium (salt) - Chemical - Event: Natural geology - Risk: Medium	Alternative source can be used. Gbr <50% draw is best practice. Refer DWIAP for additional offsite storage and increase allocation. irrigation committee for the Barker Meandue Crk catchment.			Update O&M Manual to advise of draw limit from Gordonbrook Dam for salinity reasons.	2024			-	Principal Engineer (Water and Wastewater)	Procedural	
2023-097	Scheme: Kingaroy - Process Step: Catchment - Item: CMT12 - Pesticides/ Herbicides - Chemical - Event: Used in catchment - Risk: Low	Pesticides are monitored regularly as per the verification monitoring. Any high readings will require to be evaluated and actioned on occurrence.	Query/discuss usage with property owners. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Program Coordinator	Procedural	
2023-098	Scheme: Kingaroy - Process Step: Catchment - Item: CMT13 - other treatment chemicals e.g., PFAS, Microplastics - Chemical - Event: WWTP discharge, Landfill and Airport. In catchment, No Power Station, Mining or Mill in catchment - Risk: High	Historic PFAS monitoring indicates at low levels. Monitoring frequency increased to quarterly for raw water source for 12 months or event based following change to ADWG. If identified, additional upstream raw water samples will be undertaken to increase source awareness. Kingaroy WWTP discharges upstream.			Update procedures and Catchment Management Plan to link this risk assessment. Increase monitoring for stream flow events	2026	See CMT 1		-	Program Coordinator	Procedural	
2023-099	Scheme: Kingaroy - Process Step: Catchment - Item: CMT18 - Various Contaminants - Chemical - Event: Chemical spill - Risk: Low	Freak event, alternative water sources not available. No major roads in the catchment. Emergency response plan is considered reliable. Local Disaster Management Group can be called into action if required. LDMSG plan. Emergency Response Plan, and streams are generally ephemeral allows time for clean up.	Query/discuss usage with property owners. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1,		Internal Wages	Program Coordinator	Procedural	

No.	Observation	Gap or Comment	Proposed Improvement Measures						Resourcing			
			Interim	Target Date	Short-Term	Target Date	Long-Term	Target Date	Budget	Assigned to	Group	Infra?
2023-100	Scheme: Kingaroy - Process Step: Catchment - Item: CMT20 - Turbidity - Physical - Event: Drought - Risk: High	5 years of WQ results reviewed. High readings. Catchment response. Have alternative supply. SunWater pipeline and pumping systems are considered reliable. However this is aging infrastructure and an independent risk assessment should be conducted with SunWater to determine the most accurate residual risk.	Liaise with SunWater on their yield studies including water allocation status and projections, and maintenance shutdowns. Record on the O&M Manuals.	2024	An independent risk assessment may need be conducted to determine the most accurate residual risk for the Boondooma Dam supply.	2025				Principal Engineer (Water and Wastewater)	Procedural	
2023-101	Scheme: Kingaroy - Process Step: Catchment - Item: CMT21 - Radioactivity - Radiological - Event: Natural geology - Risk: Low	No data - potentially a high risk rating due to no reports of illness however cannot rule it out. Recommend specific testing for this parameter. Filtration and coagulation likely to remove this to manageable levels if there is a contaminant. No action proposed.	Nil.		Test for radionuclides.	2024		1,000	Water Sampling Technician	Laboratory		
2023-102	Scheme: Kingaroy - Process Step: Catchment - Item: CMT23 - Various Contaminants - Physical/Chemical etc. - Turbidity - Event: Bushfire followed by runoff event - Bushfire impact to catchment leading to increased particulate matter in Dams. - Risk: Medium	Bushfires are common in the catchment, however monitoring results have not shown responsive changes in parameters. Alternative source water can be selected.			Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Program Coordinator	Procedural	
2023-103	Scheme: Kingaroy - Process Step: Intake - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: High	Daily inspections. No other active measures to reduce L&C. Residence time in storage and natural die off. Offtake level selection.			Update O&M Manual to ensure intake level is properly chosen.	2024			Internal Wages	Coordinator Treatment	Procedural	
2023-104	Scheme: Kingaroy - Process Step: Intake - Item: CMT3 - Protozoal Cryptosporidium - Biological - Event: Animals in catchment - Contamination of the Dams from dead animals in water. - Risk: High	Operational site visits Community notify staff when there is a concern			Update O&M Manual to ensure removal of animals is monitored and performed.	2024			Internal Wages	Coordinator Treatment	Procedural	
2023-105	Scheme: Kingaroy - Process Step: Intake - Item: CMT4 - Amoebal Naegleria/ Acanthamoeba - Biological - Event: Animals in catchment - Access by native and feral animals to the Dam introducing faecal contamination. - Risk: Medium	Daily inspections. No other active measures to reduce L&C.	Check fences and entry points and secure.	2023	Council to consider fencing/ gates to prevent horses and other animals entering intake area.	2024	Undertake fence and gate management program	2025	20,000	Program Coordinator	Council	
2023-106	Scheme: Kingaroy - Process Step: Intake - Item: CMT23 - Various Contaminants - Physical/Chemical etc. - Turbidity - Event: Bushfire followed by runoff event - Bushfire impact to catchment leading to increased particulate matter in Dams. - Risk: High	Residence time in dam allows for settling. Alternative source water can be selected. Traditional burn off practices (annually) control undergrowth and the catchment area recovers before the wet season.	Investigate if a potassium permanganate unit should be installed. Research seasonal changes in raw water.	2024	Subject to investigation, design potassium permanganate unit to reduce contaminant risk.	2025	Subject to investigation, install a potassium permanganate unit	2026	170,000	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-107	Scheme: Kingaroy - Process Step: Intake - Item: INT9 - Various Contaminants - Physical/Chemical etc. - Event: Stagnation or dam turnover - Risk: Medium	Desatralifications in place in Gordonbrook Dam.	DO meter needs to be purchased.		Increase sampling locations to account for new storage	2026- To begin first week after commissioning		800	Principal Engineer (Water and Wastewater)	Laboratory		
2023-108	Scheme: Kingaroy - Process Step: Filtration - Item: CMT9 - Iron - Chemical - Event: Natural geology, sediment - Risk: Low	Clarification does not reduce the likelihood but reduces the extent of the contaminant. Filtration reduces the consequence. DAFF Unit in place.	Toolbox talk for this specific action.	2023	Update procedures to address chemical dosing and filtration optimisation.	2024			Internal Wages	Coordinator Treatment	Procedural	
2023-109	Scheme: Kingaroy - Process Step: Filtration - Item: CMT10 - Manganese - Chemical - Event: Changing raw water supply from 100% Boondooma Raw to blend - Risk: High	Clarification does not reduce the likelihood but reduces the extent of the contaminant. Filtration reduces the consequence. Manganese levels are generally low, however there are occasions when the thresholds are exceeded. DAFF Unit in place. High turbidity has been caused in the past from oxidising manganese in the Clear water storage tank. Final turbidity analysers will catch this control point.			Ensure plant optimisation procedures are in place and anticipates seasoning issues that require changes in treatment operations. Particularly if the water source changes and oxidising metals have an influence.	2024			Internal Wages	Coordinator Treatment	Procedural	
2023-110	Scheme: Kingaroy - Process Step: Filtration - Item: INT10 - Various Contaminants - Whole of System - Event: Sabotage/ Terrorism - Non authorised persons accessing the site and interrupting the treatment processes (e.g., Vandalism, trespassing) - Risk: Medium	Gordonbrook WTP has security fences and control building is locked.	Investigate installation of sensor lights or security cameras to deter illegal entry.	2023	Design security system	2024	Install security system	2025	30,000	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-111	Scheme: Kingaroy - Process Step: Filtration - Item: WTP5 - Various Contaminants - Pathogens/Turbidity - Event: Elevated turbidity levels leading to insufficient coagulation - Risk: Low	Online Turbidity & manual levels recorded in Operators Log Sheet	Calibration and maintenance schedule for online turbidity meter is to be developed and implemented. This is to occur for all instruments.		See CMT9		See CMT9		3,000	Coordinator Treatment	O&M	
2023-112	Scheme: Kingaroy - Process Step: Filtration - Item: WTP7 - Various Contaminants - Physical/Chemical etc. - Event: Failure of saturation system - Risk: Low		Preventative Maintenance program TBD.	2023						Program Coordinator	O&M	
2023-113	Scheme: Kingaroy - Process Step: Filtration - Item: WTP8 - Various Contaminants - Physical/Chemical etc. - Event: Failure of filter resulting in high turbid water. - Risk: Medium	There are no procedures for operation or filter maintenance. Additional training required on filter process and CCP response procedures. Council to consider a filter maintenance program.	Laminate the new HACCP Plans and place on the WTP wall.	2023	There are no procedures for operation or filter maintenance. Additional training required on filter process and CCP response procedures. Council to consider a filter maintenance program.	2024			Internal Wages	Program Coordinator	Procedural	
2023-114	Scheme: Kingaroy - Process Step: Filtration - Item: WTP9 - Various Contaminants - Inability to supply - Event: Backwash / transfer pump failure leading to WTP fall - Risk: Low	Spare pump held as spare.			Create a preventative maintenance program for the scheme.	2024			Internal Wages	Program Coordinator	Procedural	
2023-115	Scheme: Kingaroy - Process Step: Disinfection - Item: CMT15 - Scaling - Chemical - Event: TDS or organics in raw water - Risk: Low	Possible partial oxidation of dissolved solids, however this may introduce THMs. PAC in place.	Consider THM issues. Gather test results.	2023	Consider a trial using Chlorine Dioxide to reduce THMs, but balance with chlorates as Chlorine dioxide will still form chlorates. If this is an issue, trial chlorine gas, and monitor for THMs.	2024	Subject to trials, switch to Chlorine Dioxide.	2025	200,000	Principal Engineer (Water and Wastewater)	O&M	Yes

No.	Observation	Gap or Comment	Proposed Improvement Measures							Resourcing		
			Interim	Target Date	Short-Term	Target Date	Long-Term	Target Date	Budget	Assigned to	Group	Infra?
2023-116	Scheme: Kingaroy - Process Step: Disinfection - Item: DIS4 - DBPs/THMs/ Bromide - Chemical - Event: elevated organics and long detention times Change in Raw water supply from 66% Boondooma /33% Gordonbrook blend to 100% Gordonbrook supply - Risk: High	Weekly monitoring is conducted of all schemes outer reservoirs. The use of Boondooma Water has proven recently to be beneficial in Raw water supply to reduce THM's. Flushing can be performed to turn over stagnant storage. Weekly jar testing at water treatment plants is optimising organics removal. Chlorine residuals are regularly reviewed to maintain disinfection. Recent THM data indicates that a reduction in organic material from the new plant has greatly reduced the THM counts. Sufficient data is not available to be considered higher than and Estimate in the level of uncertainty. Reducing the Gordonbrook Raw water supply reduces THM's due to elevated organic and bromide levels. RMIAP to provide additional Boondooma Raw water storage to mitigate the SunWater maintenance periods.			Investigate THM levels and Gordonbrook Dam water levels to see if a general trigger level is found.	2024	Potential additional water allocation from Boondooma Dam TBD.		25,000	Principal Engineer (Water and Wastewater)	Laboratory	
2023-117	Scheme: Kingaroy - Process Step: Disinfection - Item: DIS10 - Chlorine ORP - Chemical - Event: Chlorine quickly dissipates due to a high Oxidation demand - Risk: High	Oxidation reduction potential value check is needed. Action assigned here.	Test ORP	2023	Subject to ORP test	2024	Subject to test, however chlorine concentration increases may only be needed instead of other treatments such as potassium permanganate dosing.	2025	500	Water Sampling Technician	Laboratory	
2023-118	Scheme: Kingaroy - Process Step: Reservoirs - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: Low	Weekly inspections in place. Risk not increased, however cannot reduce. All reservoirs are designed to be vermin proof, and are checked on a maintenance program. Ad hoc cleaning programs are implemented when required.	Purchase analysers for the most critical sites.	2023	A regional program maintenance schedule action assigned in Blackbutt RA.				4,000	Program Coordinator	O&M	
2023-119	Scheme: Kingaroy - Process Step: Reservoirs - Item: INT10 - Various Contaminants - Whole of System - Event: Sabotage/ Terrorism - Non authorised persons accessing the site and interrupting the treatment processes (e.g. Vandalism, trespassing) - Risk: High	Regular inspections. Locked access. Community would report unauthorised access to tanks when observed. Some tank sites do not have a secure compound fence. Graffiti on tank walls.	Reservoir Maintenance Schedule and check sheets (include security and internal checks).	2024	Design of new fencing around reservoirs - Crana	2025	Installation of new fencing around reservoirs - Crana	2026	50,000	Program Coordinator	O&M	Yes
2023-120	Scheme: Kingaroy - Process Step: Reservoirs - Item: WTP1 - Various Contaminants - Physical/Chemical etc. - Event: PLC failure allowing untreated or semi-treated water through. - Risk: Low	Plant has interlocks in place. No issue at the reservoirs.	Investigate SCADA management during failures	2024					Internal Wages	Manager Water & Wastewater	Procedural	
2023-121	Scheme: Kingaroy - Process Step: Reservoirs - Item: RES1 - Bacteria/Virus - Biological - Event: Ingress of faecal material from human or vermin entry. - Risk: Medium	All Reservoirs are roofed, water proofed and vermin proofed. Reservoir Maintenance Schedule and check sheets (include security and internal checks) TBD a Reservoir Top Up dosing procedure. Action assigned here.	Review reservoir cleanliness status.	2023	Reservoir cleaning procedure and program action assigned in Blackbutt RA.				-	Coordinator Maintenance	O&M	
2023-122	Scheme: Kingaroy - Process Step: Reservoirs - Item: RES2 - Bacteria/Virus - Biological - Event: Poor Tank turnover, high or low chlorine. - Risk: High	Lower frequency of potential issues due to weekly inspections. Project underway to resolve this. Water height adjustable for some reservoirs. Top fill inlets for some tanks. Action assigned here.	Common reservoir chlorine dosing Top Up procedure action assigned in Blackbutt RA.		Common procedure for tank turnover action assigned in Blackbutt RA.				-	Coordinator Maintenance	O&M	
2023-123	Scheme: Kingaroy - Process Step: Reservoirs - Item: RES3 - Loss of Supply - Pressure - Event: Loss of water levels that maintain pressure requirements in the distribution. - Risk: Medium	Individual levels set for each Res. Action assigned here.	Common SOP for emergency supplies or water restriction implementation action assigned in Blackbutt RA.						50,000	Manager Water & Wastewater	Procedural	
2023-124	Scheme: Kingaroy - Process Step: 2ndaryDis - Item: DIS4 - DBPs/THMs/ Bromide - Chemical - Event: elevated organics and long detention times Change in Raw water supply from 66% Boondooma /33% Gordonbrook blend to 100% Gordonbrook supply - Risk: High	Redosing stations are continually monitored to reduce redosing volumes. These dose rates are now much lower than, previous flow rates. Recent THM results indicate much lower indications due to the large amount of organics removal. Disinfection residuals are not to be compromised to reduce THM's. Reducing the Gordonbrook Raw water supply reduces THM's due to elevated organic and bromide levels. RMIAP to provide additional Boondooma Raw water storage to mitigate the SunWater maintenance periods.			Investigate the use of Reservoir Aerators to reduce THMs		TBC - SBRC DWQO Strategy Adoption and Implementation	Relocate Secondary Disinfection points Harris Road and Golf Course to outlet of storage reservoirs to only dose water used as opposed to water stored	328,747	Engineer Water and Wastewater	O&M	Yes
2023-125	Scheme: Murgon - Process Step: Catchment - Item: CMT5 - Bacteria/Virus - Biological - Event: Dairy or other plant discharges - Risk: Medium	See preventative measures.			Update catchment management plan to include farm practices.	2024			-	Program Coordinator	Procedural	
2023-126	Scheme: Murgon - Process Step: Catchment - Item: CMT7 - Heavy metals, e.g., copper, lead - Chemical - Event: Natural geology, or mining - Risk: High	5 years of WQ results reviewed. The aesthetic limit for Aluminium has been exceed - see elsewhere for plant optimisation. The aesthetic limit for Copper has been exceeded.			Monitor Aluminium levels pre and post treatment to gauge the effectiveness of treatment of this aesthetic contaminant.		Follow up monitoring		-	Coordinator Treatment	Laboratory	
2023-127	Scheme: Murgon - Process Step: Catchment - Item: CMT8 - Hydrocarbons - Chemical - Event: Illegal disposal of fuel, fuel from boats. - Risk: Low	Legal requirements for persons to manage their stores. Regular patrols. Some urban area impacts.	Discuss usage with property owners. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Program Coordinator	Procedural	
2023-128	Scheme: Murgon - Process Step: Catchment - Item: CMT10 - Manganese - Chemical - Event: Natural geology - Risk: High	5 years of WQ results reviewed. Treatment in place however treated water has exceedances. Missing raw water information however the treated water results show health exceedances.			Additional testing of raw water supply to be implemented in the verification monitoring program, and additional Retic monitoring for manganese.	2024	Implementation of oxidant dosing to reduce manganese concentrations as per DWQOS 2025	TBC - SBRC DWQO Strategy Adoption and Implementation	922,923	Coordinator Treatment	Laboratory	

No.	Observation	Gap or Comment	Proposed Improvement Measures						Resourcing			
			Interim	Target Date	Short-Term	Target Date	Long-Term	Target Date	Budget	Assigned to	Group	Infra?
2023-129	Scheme: Murgon - Process Step: Catchment - Item: CMT12 - Pesticides/ Herbicides - Chemical - Event: Used in catchment - Risk: Low	Pesticides are monitored regularly as per the verification monitoring. Any high readings will require to be evaluated and actioned on occurrence.	Query/discuss usage with property owners. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Program Coordinator	Procedural	
2023-130	Scheme: Murgon - Process Step: Catchment - Item: CMT13 - other treatment chemicals e.g., PFAS, Microplastics - Chemical - Event: WWTP discharge downstream, Rural Airport In catchment, No Power Station, Mining or Mill in catchment - Risk: High	Historic PFAS monitoring indicates at low levels. Monitoring frequency increased to quarterly for raw water source for 12 months or event based following change to AD/WG. If identified, additional upstream raw water samples will be undertaken to increase source awareness.			Update procedures and Catchment Management Plan to link this risk assessment. Increase monitoring for stream flow events	2024	See CMT 1		-	Program Coordinator	Laboratory	
2023-131	Scheme: Murgon - Process Step: Catchment - Item: CMT18 - Various Contaminants - Chemical - Event: Chemical spill - Risk: Low	Freak event, alternative water sources not available. No major roads in the catchment. Emergency response plan is considered reliable. Local Disaster Management Group can be called into action if required. LDMG plan. Emergency Response Plan.	Query/discuss usage with property owners. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment. Ensure supply can be isolated until wave passes.	2024	See CMT 1,		Internal Wages	Program Coordinator	Procedural	
2023-132	Scheme: Murgon - Process Step: Catchment - Item: CMT21 - Radioactivity - Radiological - Event: Natural geology - Risk: Low	Historic data indicates seasonal spikes, but still below health limits. Recommend specific testing for this parameter. Filtration and coagulation likely to remove this to manageable levels if there is a contaminant. No action proposed.	Nil.		Test for radionuclides. Increased during winter when increased levels indicate	2024			1,000	Water Sampling Technician	Laboratory	
2023-133	Scheme: Murgon - Process Step: Catchment - Item: CMT23 - Various Contaminants - Physical/Chemical etc. - Turbidity - Event: Bushfire followed by runoff event - Bushfire impact to catchment leading to increased particulate matter in Dams. - Risk: Medium	Bushfires are common in the catchment, however monitoring results have not shown responsive changes in parameters. Alternative source water cannot be selected.			Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Program Coordinator	Procedural	
2023-134	Scheme: Murgon - Process Step: Intake - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: High	Daily Inspections. No other active measures to reduce L&C. Residence time in storage and natural die off. Offtake level selection.			Update O&M Manual to ensure intake level is properly chosen.	2024			Internal Wages	Coordinator Treatment	Procedural	
2023-135	Scheme: Murgon - Process Step: Intake - Item: CMT3 - Protozoa/ Cryptosporidium - Biological - Event: Animals in catchment - Contamination of the Dams from dead animals in water. - Risk: High	Operational site visits Community notify staff when there is a concern			Update O&M Manual to ensure removal of animals is monitored and performed.	2024			Internal Wages	Coordinator Treatment	Procedural	
2023-136	Scheme: Murgon - Process Step: Intake - Item: CMT4 - Amoeba/ Naegleria/ Acanthamoeba - Biological - Event: Animals in catchment - Access by native and feral animals to the Dam introducing faecal contamination. - Risk: Medium	Daily Inspections. No other active measures to reduce L&C.	Check fences and entry points and secure.	2023	Council to consider fencing/ gates to prevent horses and other animals entering intake area.	2024	Undertake fence and gate management program	2025	20,000	Coordinator Treatment	Council	
2023-137	Scheme: Murgon - Process Step: Intake - Item: CMT20 - Turbidity - Physical - Event: Drought - Risk: High	no real active measures to reduce L&C	Investigate if a floating intake or selective level withdrawal can be used.	2024	Design intake to reduce contaminant risk.	2025	Install a floating Intake	2026	75,000	Coordinator Treatment	O&M	Yes
2023-138	Scheme: Murgon - Process Step: Intake - Item: CMT23 - Various Contaminants - Physical/Chemical etc. - Turbidity - Event: Bushfire followed by runoff event - Bushfire impact to catchment leading to increased particulate matter in Dams. - Risk: High	Residence time in dam allows for settling, although the creek may still present an issue. Alternative source water cannot be selected however. Traditional burn off practices (annually) control undergrowth and the catchment area recovers before the wet season.	Investigate if a potassium permanganate unit should be installed. Research seasonal changes in raw water.	2024	Subject to investigation, design potassium permanganate unit to reduce contaminant risk.	2025	Subject to investigation, install a potassium permanganate unit	2026	170,000	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-139	Scheme: Murgon - Process Step: Intake - Item: INT9 - Various Contaminants - Physical/Chemical etc. - Event: Stagnation or dam turnover - Risk: Medium	No controls in place at this step.	DO meter needs to be purchased.						800	Principal Engineer (Water and Wastewater)	Laboratory	
2023-140	Scheme: Murgon - Process Step: Filtration - Item: CMT9 - Iron - Chemical - Event: Natural geology, sediment - Risk: Medium	Clarification does not reduce the likelihood but reduces the extent of the contaminant. Filtration reduces the consequence.	Toolbox talk for this specific action.	2023	Update procedures to address chemical dosing and filtration optimisation.	2024	Refer CMT1		Internal Wages	Program Coordinator	Procedural	
2023-141	Scheme: Murgon - Process Step: Filtration - Item: CMT10 - Manganese - Chemical - Event: Natural geology - Risk: High	Clarification does not reduce the likelihood but reduces the extent of the contaminant. Filtration reduces the consequence. Manganese levels are generally low, however there are occasions when the thresholds are exceeded.			Ensure plant optimisation procedures are in place and anticipates seasoning issues that require changes in treatment operations.	2024	Refer CMT1		Internal Wages	Program Coordinator	Procedural	
2023-142	Scheme: Murgon - Process Step: Filtration - Item: CMT20 - Turbidity - Physical - Event: Drought - Risk: Low	Coagulation and filtration will reduce this issue. Filters can be derated to ensure quality - See O&M Manual. Filter targets are being met.			Start capturing the filter outlet turbidity data.	2024	Refer CMT1		-	Program Coordinator	O&M	
2023-143	Scheme: Murgon - Process Step: Filtration - Item: INT1 - Cyanobacteria - Biological - Event: Algal bloom - Risk: High	Coagulation and filtration will reduce this issue.	Manual dosing procedure in place. PAC on site.	2023	Design automatic PAC dosing system.	2024	Install automatic PAC dosing system.	2025	100,000	Program Coordinator	O&M	Yes
2023-144	Scheme: Murgon - Process Step: Filtration - Item: INT10 - Various Contaminants - Whole of System - Event: Sabotage/ Terrorism - Non authorised persons accessing the site and interrupting the treatment processes (e.g., Vandalism, trespassing) - Risk: Medium	Murgon WTP has security fences and control building is locked. Pump sheds and dosing facilities are all protected by locked sheds.	Investigate installation of sensor lights or security cameras to deter illegal entry.	2023	Design security system	2024	Install security system	2025	30,000	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-145	Scheme: Murgon - Process Step: Filtration - Item: WTP1 - Various Contaminants - Physical/Chemical etc. - Event: PLC failure allowing untreated or semi-treated water through. - Risk: Low	SCADA interlocks in place, and shutdown/isolation occurs on failure.	Assigned in Blackbutt RA for action				Improve Plant Control and Interlocks to prevent water quality breaches	TBC - SBRC DWQO Strategy Adoption and Implementation	Refer to Blackbutt WTP1 Filtration	Coordinator Treatment	O&M	Yes
2023-146	Scheme: Murgon - Process Step: Filtration - Item: WTP5 - Various Contaminants - Pathogens/Turbidity - Event: Elevated turbidity levels leading to insufficient coagulation - Risk: Low	Online Turbidity & manual levels recorded in Operators Log Sheet	Calibration and maintenance schedule for online turbidity meter is to be developed and implemented. This is to occur for all instruments.		See CMT9		See CMT9		3,000	Coordinator Treatment	O&M	

Appendix K - Risk Actions Required



No.	Observation	Gap or Comment	Proposed Improvement Measures						Resourcing				
			Interim	Target Date	Short-Term	Target Date	Long-Term	Target Date	Budget	Assigned to	Group	Infra?	
2023-147	Scheme: Murgon - Process Step: Filtration - Item: WTP7 - Various Contaminants - Physical/Chemical etc. - Event: Failure of saturation system - Risk: Low		Preventative Maintenance program TBD.	2023						-	Coordinator Treatment	OSM	
2023-148	Scheme: Murgon - Process Step: Filtration - Item: WTP8 - Various Contaminants - Physical/Chemical etc. - Event: Failure of filter resulting in high turbid water. - Risk: Medium	There are no procedures for operation or filter maintenance. Additional training required on filter process and OCP response procedures. Council to consider a filter maintenance program.	Laminate the new HACCP Plans and place on the WTP wall.	2023	There are no procedures for operation or filter maintenance. Additional training required on filter process and OCP response procedures. Council to consider a filter maintenance program.	2024				Internal Wages	Coordinator Treatment	Procedural	
2023-149	Scheme: Murgon - Process Step: Filtration - Item: WTP9 - Various Contaminants - Inability to supply - Event: Backwash / transfer pump failure leading to WTP fall - Risk: Low	Spare pump held as spare.			Create a preventative maintenance program for the scheme.	2024				Internal Wages	Coordinator Maintenance	Procedural	
2023-150	Scheme: Murgon - Process Step: Disinfection - Item: DIS10 - Chlorine ORP - Chemical - Event: Chlorine quickly dissipates due to a high Oxidation demand - Risk: High	Oxidation reduction potential value check is needed. Action assigned here.	Test ORP	2023	Subject to ORP test	2024	Subject to test, however chlorine concentration increases may only be needed instead of other treatments such as potassium permanganate dosing.	2025	500		Coordinator Treatment/Water Sampling Technician	Laboratory	
2023-151	Scheme: Murgon - Process Step: Reservoirs - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: Low	Weekly inspections in place. Risk not increased, however cannot reduce. All reservoirs are designed to be vermin proof, and are checked on a maintenance program. Ad hoc cleaning programs are implemented when required.	Purchase analysers for the most critical sites.	2023	A regional program maintenance schedule action assigned in Blackbutt RA.					4,000	Principal Engineer (Water and Wastewater)	OSM	
2023-152	Scheme: Murgon - Process Step: Reservoirs - Item: WTP1 - Various Contaminants - Physical/Chemical etc. - Event: PLC failure allowing untreated or semi-treated water through. - Risk: Low	Plant has interlocks in place. No issue at the reservoirs.	Investigate SCADA management during failures	2024						Internal Wages	Manager Water & Wastewater	Procedural	
2023-153	Scheme: Murgon - Process Step: Reservoirs - Item: RES1 - Bacteria/Virus - Biological - Event: Ingress of faecal material from human or vermin entry. - Risk: Medium	All Reservoirs are roofed, water proofed and vermin proofed. Reservoir Maintenance Schedule and check sheets (include security and internal checks) TBD a Reservoir Top Up dosing procedure. Action assigned here.	Review reservoir cleanliness status.	2023	Reservoir cleaning procedure and program action assigned in Blackbutt RA.					-	Coordinator Maintenance	OSM	
2023-154	Scheme: Murgon - Process Step: Reservoirs - Item: RES2 - Bacteria/Virus - Biological - Event: Poor Tank turnover, high or low chlorine. - Risk: High	Lower frequency of potential issues due to weekly inspections. Project underway to resolve this. Water height adjustable for some reservoirs. Top fill inlets for some tanks. Action assigned here.	Common reservoir chlorine dosing Top Up procedure action assigned in Blackbutt RA.		Common procedure for tank turnover action assigned in Blackbutt RA.					-	Program Coordinator	OSM	
2023-155	Scheme: Murgon - Process Step: Reservoirs - Item: RES3 - Loss of Supply - Pressure - Event: Loss of water levels that maintain pressure requirements in the distribution. - Risk: Medium	Individual levels set for each Res. Action assigned here.	Common SOP for emergency supplies or water restriction implementation action assigned in Blackbutt RA.							50,000	Manager Water & Wastewater	Procedural	
2023-156	Scheme: Nanango - Process Step: Catchment - Item: CMT8 - Hydrocarbons - Chemical - Event: Illegal disposal of fuel etc., run off from impermeable urban areas - Risk: Low	Legal requirements for persons to manage their stores. Regular patrols. No major urban area impacts, but Power station upstream.	Discuss usage with property owners. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1			Internal Wages	Program Coordinator	Procedural	
2023-157	Scheme: Nanango - Process Step: Catchment - Item: CMT12 - Pesticides/Herbicides - Chemical - Event: Used in catchment - Risk: Low	Pesticides are monitored regularly as per the verification monitoring. Any high readings will require to be evaluated and actioned on occurrence. Monitoring of all 3 individual bores for Pesticides, Herbicides, Heavy metals are conducted regularly. This monitoring is evaluated in the event additional process is required. Proposed future pipeline from Kingaroy Scheme to Nanango scheme is in concept planning phase.	Discuss usage with property owners. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1			Internal Wages	Program Coordinator	Procedural	
2023-158	Scheme: Nanango - Process Step: Catchment - Item: CMT13 - other treatment chemicals e.g., PFAS, Microplastics - Chemical - Event: Rural Airport (infrequent use), Power Station, Mining in catchment No Mill in catchment - Risk: High	Historic PFAS monitoring indicates at low levels. Monitoring frequency increased to quarterly for raw water source for 12 months or event based following change to ADWG			Update procedures and Catchment Management Plan to link this risk assessment. Increase monitoring for stream flow events	2024	See CMT 1			-	Program Coordinator	Procedural	
2023-159	Scheme: Nanango - Process Step: Catchment - Item: CMT18 - Various Contaminants - Chemical - Event: Chemical spill - Risk: Medium	Freak event, alternative water sources not available. No major roads in the catchment. Emergency response plan is considered reliable. Local Disaster Management Group can be called into action if required. LDMG plan, Emergency Response Plan, and streams are generally ephemeral allows time for clean up.	Discuss usage with property owners. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment. Ensure supply can be isolated until wave passes.	2024	See CMT 1,			Internal Wages	Program Coordinator	Procedural	
2023-160	Scheme: Nanango - Process Step: Catchment - Item: CMT20 - Turbidity - Physical - Event: Drought - Risk: High	5 years of WQ results reviewed. High readings. Strategic Plan is to regionalise water supplies through the regional water supply strategy. Static bore levels are monitored. Strategic plan is to regionalise the water supply between Kingaroy and Nanango schemes.	Sign off on the Drought Management Plan (All schemes) undertaken by NWM in 2021.	2023						Internal Wages	Manager Water & Wastewater	Emergency Response	
2023-161	Scheme: Nanango - Process Step: Catchment - Item: CMT21 - Radioactivity - Radiological - Event: Natural geology - Risk: Low	No data - potentially a high risk rating due to no reports of illness however cannot rule it out. Recommend specific testing for this parameter. Filtration and coagulation likely to remove this to manageable levels if there is a contaminant. No action proposed.	NIL.		Test for radionuclides.	2024				1,000	Water Sampling Technician	Laboratory	
2023-162	Scheme: Nanango - Process Step: Catchment - Item: CMT23 - Various Contaminants - Physical/Chemical etc. - Turbidity - Event: Bushfire followed by runoff event - Bushfire impact to catchment. - Risk: Medium	Bushfires are common in the catchment, however monitoring results have not shown responsive changes in parameters. Alternative source water cannot be selected.			Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1			Internal Wages	Program Coordinator	Procedural	
2023-163	Scheme: Nanango - Process Step: Intake - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: High	Daily inspections. No other active measures to reduce L&C. Residence time in storage and natural die off. Offtake level selection.			Update O&M Manual to ensure intake level is properly chosen.	2024				Internal Wages	Program Coordinator	Procedural	

No.	Observation	Gap or Comment	Proposed Improvement Measures						Resourcing			
			Interim	Target Date	Short-Term	Target Date	Long-Term	Target Date	Budget	Assigned to	Group	Infra?
2023-164	Scheme: Nanango - Process Step: Intake - Item: CMT3 - Protozoa/ Cryptosporidium - Biological - Event: Animals in catchment - Contamination of groundwater from dead animals in water. - Risk: Low	Operational site visits. Community notify staff when there is a concern			Update O&M Manual to ensure removal of animals is monitored and performed.	2024			Internal Wages	Program Coordinator	Procedural	
2023-165	Scheme: Nanango - Process Step: Intake - Item: CMT4 - Amoeba/ Naegleria/ Acanthamoeba - Biological - Event: Animals in catchment - Access by native and feral animals to the groundwater introducing faecal contamination. - Risk: Medium	Daily inspections. No other active measures to reduce L&C.	Check fences and entry points and secure.	2023	Council to consider fencing/ gates to prevent horses and other animals entering bore intake area.	2024	Undertake fence and gate management program	2025	20,000	Program Coordinator	O&M	Yes
2023-166	Scheme: Nanango - Process Step: Disinfection - Item: INT6 - Failure of supply - Whole of System - Event: loss of power. - Risk: High	System will run on gravity from the reservoir. There is no flow at the disinfection point. However some untreated water may go into the system, and although mixed with disinfected water, the treatment is compromised.	Review system pipe and valving setup	2023	Install an auto shut-off valve at the disinfection station to ensure untreated water does not diffuse into the network.	2024			10,000	Program Coordinator	O&M	
2023-167	Scheme: Nanango - Process Step: Disinfection - Item: INT8 - Temperature - Physical - Event: Natural water temperature. - Risk: Low	No change - Require a water validation assessment as the c.t value should be high enough.			Require a water validation assessment as the c.t value should be high enough.	2024			5,000	Manager Water & Wastewater	O&M	
2023-168	Scheme: Nanango - Process Step: Disinfection - Item: WTP1 - Various Contaminants - Physical/Chemical etc. - Event: PLC failure allowing untreated or semi-treated water through e.g., Failure of alarms from dosing equipment. - Risk: High	Automatic shut-off valve proposed should be linked to a PLC failure.			Investigate how to set up the automatic shut-off valve to close on a PLC failure.	2024	Set up the automatic shut-off valve to close on a PLC failure.	2025	5,000	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-169	Scheme: Nanango - Process Step: Disinfection - Item: DIS2 - Chlorine - Chemical - Event: Injection or recirculation pump or chemical injector equipment failure - Risk: Low	Council has acquired a list of critical spare parts for system and purchase as spare parts - e.g., Spare pumps, injectors, etc. Additional Chlorine residual sampling is conducted by operators above the verification sampling.	Smaller plants: Consider duty standby tanks with automatic changeover look at a lower strength hypo.	2023	Design duty standby tanks with automatic changeover	2024	Install duty standby tanks with automatic changeover	2025	5,000	Coordinator Treatment	O&M	Yes
2023-170	Scheme: Nanango - Process Step: Reservoirs - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: Low	Weekly inspections in place. Risk not increased, however cannot reduce. All reservoirs are designed to be vermin proof, and are checked on a maintenance program. Ad hoc cleaning programs are implemented when required.	Purchase analysers for the most critical sites.	2023	A regional program maintenance schedule action assigned in Blackbutt RA.				4,000	Coordinator Treatment	O&M	
2023-171	Scheme: Nanango - Process Step: Reservoirs - Item: WTP1 - Various Contaminants - Physical/Chemical etc. - Event: PLC failure allowing untreated or semi-treated water through e.g., Failure of alarms from dosing equipment. - Risk: High		Investigate SCADA management during failures	2024					Internal Wages	Manager Water & Wastewater	Procedural	
2023-172	Scheme: Nanango - Process Step: Reservoirs - Item: RES1 - Bacteria/Virus - Biological - Event: Ingress of faecal material from human or vermin entry. - Risk: Medium	All Reservoirs are roofed, water proofed and vermin proofed. Reservoir Maintenance Schedule and check sheets (include security and internal checks) TBD a Reservoir Top Up dosing procedure. Action assigned here.	Review reservoir cleanliness status.	2023	Reservoir cleaning procedure and program action assigned in Blackbutt RA.				-	Coordinator Maintenance	O&M	
2023-173	Scheme: Nanango - Process Step: Reservoirs - Item: RES2 - Bacteria/Virus - Biological - Event: Poor Tank turnover, high or low chlorine. - Risk: High	Lower frequency of potential issues due to weekly inspections. Project underway to resolve this. Water height adjustable for some reservoirs. Top fill inlets for some tanks. Action assigned here.	Common reservoir chlorine dosing Top Up procedure action assigned in Blackbutt RA.		Common procedure for tank turnover action assigned in Blackbutt RA.				-	Coordinator Maintenance	O&M	
2023-174	Scheme: Nanango - Process Step: Reservoirs - Item: RES3 - Loss of Supply - Pressure - Event: Loss of water levels that maintain pressure requirements in the distribution. - Risk: Medium	Individual levels set for each Res. Action assigned here.	Common SOP for emergency supplies or water restriction implementation action assigned in Blackbutt RA.						50,000	Manager Water & Wastewater	Procedural	
2023-175	Scheme: Proston - Process Step: Catchment - Item: CMT5 - Bacteria/Virus - Biological - Event: Dairy or other plant discharges - Risk: Medium	See preventative measures.			Update catchment management plan to include farm practices.	2024			-	Program Coordinator	Procedural	
2023-176	Scheme: Proston - Process Step: Catchment - Item: CMT10 - Manganese - Chemical - Event: Natural geology - Risk: High	6 years of WQ results reviewed. Treatment in place however treated water has exceedances for the aesthetic limit.			Additional testing of raw water supply to be implemented in the verification monitoring program, and additional Retic monitoring for manganese.	2024			-	Program Coordinator	Laboratory	
2023-177	Scheme: Proston - Process Step: Catchment - Item: CMT13 - other treatment chemicals e.g., PFAS, Microplastics - Chemical - Event: WWTP discharge upstream, Power Station, Mining, Mill or Airports in catchment - Risk: Low	Historic PFAS monitoring indicates at low levels. Monitoring frequency increased to quarterly for raw water source for 12 months or event based following change to ADWIG			Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		-	Program Coordinator	Procedural	
2023-178	Scheme: Proston - Process Step: Catchment - Item: CMT18 - Various Contaminants - Chemical - Event: Chemical spill - Risk: Low	Freak event, alternative water sources not available. No major roads in the catchment. Emergency response plan is considered reliable. Local Disaster Management Group can be called into action if required. LDMG plan, Emergency Response Plan, and streams are generally ephemeral allows time for clean up.	Discuss usage with property owners. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment. Ensure supply can be isolated until wave passes.	2024	See CMT 1,		Internal Wages	Program Coordinator	Procedural	
2023-179	Scheme: Proston - Process Step: Catchment - Item: CMT21 - Radioactivity - Radiological - Event: Natural geology - Risk: Low	No data - potentially a high risk rating due to no reports of illness however cannot rule it out. Recommend specific testing for this parameter. Filtration and coagulation likely to remove this to manageable levels if there is a contaminant. No action proposed.	Nil.		Test for radionuclides.	2024			1,000	Water Sampling Technician	Laboratory	
2023-180	Scheme: Proston - Process Step: Catchment - Item: CMT23 - Various Contaminants - Physical/Chemical etc. - Turbidity - Event: Bushfire followed by runoff event - Bushfire impact to catchment leading to increased particulate matter in Dams. - Risk: Medium	Bushfires are common in the catchment, however monitoring results have not shown responsive changes in parameters. Alternative source water cannot be selected.			Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Program Coordinator	Procedural	
2023-181	Scheme: Proston - Process Step: Intake - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: High	Daily inspections. No other active measures to reduce L&C. Residence time in storage and natural die off. Offtake level selection.			Update O&M Manual to ensure intake level is properly chosen.	2024			Internal Wages	Coordinator Treatment	Procedural	

Appendix K - Risk Actions Required



No.	Observation	Gap or Comment	Proposed Improvement Measures						Resourcing			
			Interim	Target Date	Short-Term	Target Date	Long-Term	Target Date	Budget	Assigned to	Group	Infra?
2023-182	Scheme: Proston - Process Step: Intake - Item: CMT3 - Protozoal Cryptosporidium - Biological - Event: Animals in catchment - Contamination of the Dams from dead animals in water. - Risk: High	Operational site visits Community notify staff when there is a concern			Update O&M Manual to ensure removal of animals is monitored and performed.	2024			Internal Wages	Coordinator Treatment	Procedural	
2023-183	Scheme: Proston - Process Step: Intake - Item: CMT23 - Various Contaminants - Physical/Chemical etc. - Turbidity - Event: Bushfire followed by runoff event - Bushfire impact to catchment leading to increased particulate matter in Dams. - Risk: High	Residence time in dam allows for settling. Alternative source water cannot be selected however. Traditional burn off practices (annually) control undergrowth and the catchment area recovers before the wet season.	Investigate if a potassium permanganate unit should be installed. Research seasonal changes in raw water.	2024	Subject to investigation, design potassium permanganate unit to reduce contaminant risk.	2025	Subject to investigation, install a potassium permanganate unit	2025	170,000	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-184	Scheme: Proston - Process Step: Intake - Item: INT9 - Various Contaminants - Physical/Chemical etc. - Event: Stagnation or dam turnover - Risk: Medium	No controls in place at this step.	DO meter needs to be purchased.						800	Principal Engineer (Water and Wastewater)	Laboratory	
2023-185	Scheme: Proston - Process Step: Filtration - Item: CMT9 - Iron - Chemical - Event: Natural geology, sediment - Risk: Medium	Clarification does not reduce the likelihood but reduces the extent of the contaminant. Filtration reduces the consequence.	Toolbox talk for this specific action.	2023	Update procedures to address chemical dosing and filtration optimisation.	2024	Refer to CMT1		Internal Wages	Program Coordinator	Procedural	
2023-186	Scheme: Proston - Process Step: Filtration - Item: CMT10 - Manganese - Chemical - Event: Natural geology - Risk: Medium	Clarification does not reduce the likelihood but reduces the extent of the contaminant. Filtration reduces the consequence. Manganese levels are generally low, however there are occasions when the thresholds are exceeded.			Ensure plant optimisation procedures are in place and anticipates seasoning issues that require changes in treatment operations.	2024	Refer to CMT1		Internal Wages	Program Coordinator	Procedural	
2023-187	Scheme: Proston - Process Step: Filtration - Item: CMT19 - Colour - Physical - Event: Naturally occurring - Risk: High	Coagulation and filtration will reduce this issue. Unclear if the treated water has reduced the colour issue.			Review the Proston treated water for colour and determine if filter optimisation is possible.	2024	Refer to CMT1		-	Coordinator Treatment	O&M	
2023-188	Scheme: Proston - Process Step: Filtration - Item: CMT20 - Turbidity - Physical - Event: Drought - Risk: High	Coagulation and filtration will reduce this aesthetic issue. Filters can be derated to ensure quality - See O&M Manual. Turbidity needs to be analysed.			Subject to filter performance report. It is possible that additional in line turbidity meter will be installed to measure the filtered water turbidity prior to the chlorine contact tank. Filter media and filter nozzles are due to be replaced.	2025	Refer to CMT1		25,000	Coordinator Treatment	O&M	
2023-189	Scheme: Proston - Process Step: Filtration - Item: INT10 - Various Contaminants - Whole of System - Event: Sabotage/ Terrorism - Non authorised persons accessing the site and interrupting the treatment processes (e.g. Vandalism, trespassing) - Risk: Medium	Proston water treatment plant is secured with a perimeter fence with dosing equipment located inside the locked dosing shed.	Investigate installation of sensor lights or security cameras to deter illegal entry.	2023	Design security system	2024	Install security system	2025	30,000	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-190	Scheme: Proston - Process Step: Filtration - Item: WTP1 - Various Contaminants - Physical/Chemical etc. - Event: PLC failure allowing untreated or semi-treated water through. - Risk: Low	SCADA interlocks in place, and shutdown/isolation occurs on failure.	Assigned in Blackbutt RA for action				Improve Plant Control and interlocks to prevent water quality breaches	TBC - SBRC DWQO Strategy Adoption and Implementation	Refer to Blackbutt WTP1 Filtration	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-191	Scheme: Proston - Process Step: Filtration - Item: WTP5 - Various Contaminants - Pathogens/Turbidity - Event: Elevated turbidity levels leading to insufficient coagulation - Risk: Low	Online Turbidity & manual levels recorded in Operators Log Sheet	Calibration and maintenance schedule for online turbidity meter is to be developed and implemented. This is to occur for all instruments.		See CMT9		See CMT9		3,000	Program Coordinator	O&M	
2023-192	Scheme: Proston - Process Step: Filtration - Item: WTP7 - Various Contaminants - Physical/Chemical etc. - Event: Failure of saturation system - Risk: Low		Preventative Maintenance program TBD.	2023					-	Coordinator Treatment	O&M	
2023-193	Scheme: Proston - Process Step: Filtration - Item: WTP8 - Various Contaminants - Physical/Chemical etc. - Event: Failure of filter resulting in high turbid water. - Risk: Medium	There are no procedures for operation or filter maintenance. Additional training required on filter process and CCP response procedures. Council to consider a filter maintenance program.	Laminate the new HACCP Plans and place on the WTP wall.	2023	There are no procedures for operation or filter maintenance. Additional training required on filter process and CCP response procedures. Council to consider a filter maintenance program.	2024			Internal Wages	Coordinator Treatment	Procedural	
2023-194	Scheme: Proston - Process Step: Filtration - Item: WTP9 - Various Contaminants - Inability to supply - Event: Backwash / transfer pump failure leading to WTP fail - Risk: Low	Spare pump held as spare.			Create a preventative maintenance program for the scheme.	2024			Internal Wages	Coordinator Maintenance	Procedural	
2023-195	Scheme: Proston - Process Step: Disinfection - Item: DIS2 - Chlorine - Chemical - Event: Injection or recirculation pump or chemical injector equipment failure - Risk: Medium	Council has acquired some spare parts for system and purchase as spare parts - e.g., Spare pumps, injectors, etc.	Smaller plants: Consider duty standby tanks with automatic changeover look at a lower strength hypo.	2023	Design duty standby tanks with automatic changeover	2024	Install duty standby tanks with automatic changeover	2025	5,000	Coordinator Treatment	O&M	Yes
2023-196	Scheme: Proston - Process Step: Disinfection - Item: DIS10 - Chlorine ORP - Chemical - Event: Chlorine quickly dissipates due to a high Oxidation demand - Risk: High	Oxidation reduction potential value check is needed. Action assigned here.	Test ORP	2023	Subject to ORP test	2024	Subject to test, however chlorine concentration increases may only be needed instead of other treatments such as potassium permanganate dosing.	2025	500	Water Sampling Technician	Laboratory	
2023-197	Scheme: Proston - Process Step: Reservoirs - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: Low	Weekly inspections in place. Risk not increased, however cannot reduce. All reservoirs are designed to be vermin proof, and are checked on a maintenance program. Ad hoc cleaning programs are implemented when required.	Purchase analysers for the most critical sites.	2023	A regional program maintenance schedule action assigned in Blackbutt RA.				4,000	Coordinator Treatment	O&M	
2023-198	Scheme: Proston - Process Step: Reservoirs - Item: INT10 - Various Contaminants - Whole of System - Event: Sabotage/ Terrorism - Non authorised persons accessing the site and interrupting the treatment processes (e.g. Vandalism, trespassing) - Risk: High	Regular inspections. Locked access. Community would report unauthorised access to tanks when observed. Some tank sites do not have a secure compound fence. Graffiti on tank walls.	Reservoir Maintenance Schedule and check sheets (include security and internal checks).	2024	Design of new fencing around reservoir - Proston Main Res.	2025	Installation of new fencing around reservoir - Proston Main Res.	2025	50,000	Program Coordinator	O&M	Yes
2023-199	Scheme: Proston - Process Step: Reservoirs - Item: WTP1 - Various Contaminants - Physical/Chemical etc. - Event: PLC failure allowing untreated or semi-treated water through. - Risk: Low	Plant has interlocks in place. No issue at the reservoirs.	Investigate SCADA management during failures	2024					Internal Wages	Manager Water & Wastewater	Procedural	

No.	Observation	Gap or Comment	Proposed Improvement Measures							Resourcing			
			Interim	Target Date	Short-Term	Target Date	Long-Term	Target Date	Budget	Assigned to	Group	Infra?	
2023-200	Scheme: Proston - Process Step: Reservoirs - Item: RES1 - Bacteria/Virus - Biological - Event: Ingress of faecal material from human or vermin entry. - Risk: Medium	All Reservoirs are roofed, water proofed and vermin proofed. Reservoir Maintenance Schedule and check sheets (include security and internal checks) TBD a Reservoir Top Up dosing procedure. Action assigned here.	Review reservoir cleanliness status.	2023	Reservoir cleaning procedure and program action assigned in Blackbutt RA.						Coordinator Maintenance	O&M	
2023-201	Scheme: Proston - Process Step: Reservoirs - Item: RES2 - Bacteria/Virus - Biological - Event: Poor Tank turnover, high or low chlorine. - Risk: High	Lower frequency of potential issues due to weekly inspections. Project underway to resolve this. Water height adjustable for some reservoirs. Top fill inlets for some tanks. Action assigned here.	Common reservoir chlorine dosing Top Up procedure action assigned in Blackbutt RA.		Common procedure for tank turnover action assigned in Blackbutt RA.						Coordinator Maintenance	O&M	
2023-202	Scheme: Proston - Process Step: Reservoirs - Item: RES3 - Loss of Supply - Pressure - Event: Loss of water levels that maintain pressure requirements in the distribution. - Risk: Medium	Individual levels set for each Res. Action assigned here.	Common SOP for emergency supplies or water restriction implementation action assigned in Blackbutt RA.						50,000		Program Coordinator	Procedural	
2023-203	Scheme: Wondal - Process Step: Catchment - Item: CMT5 - Bacteria/Virus - Biological - Event: Dairy or other plant discharges - Risk: Medium	See preventative measures.			Update catchment management plan to include farm practices.	2024					Program Coordinator	Procedural	
2023-204	Scheme: Wondal - Process Step: Catchment - Item: CMT7 - Heavy metals, e.g., copper, lead - Chemical - Event: Natural geology, or mining - Risk: High	5 years of WQ results reviewed. The aesthetic limit for Aluminium has been exceeded - see elsewhere for plant optimisation. The aesthetic limit for Copper has not been exceeded however at Murgon there has.			Monitor Aluminium levels pre and post treatment to gauge the effectiveness of treatment of this aesthetic contaminant.		Follow up monitoring				Coordinator Treatment	Laboratory	
2023-205	Scheme: Wondal - Process Step: Catchment - Item: CMT8 - Hydrocarbons - Chemical - Event: Illegal disposal of fuel, fuel from boats, run off from impermeable urban areas - Risk: Medium	Legal requirements for persons to manage their stores. Regular patrols. Multiple Fuel Stations in catchment, some with no hydrocarbon capture from bowser areas. Multiple Urban areas discharge not raw water source. Additional testing required.	Discuss usage with property owners. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages		Program Coordinator	Procedural	
2023-206	Scheme: Wondal - Process Step: Catchment - Item: CMT10 - Manganese - Chemical - Event: Natural geology - Risk: High	5 years of WQ results reviewed. Treatment in place however treated water has exceedances. Missing raw water information however the treated water results show aesthetic exceedances. Given this is the same water source as Murgon, which has health exceedances, the same risk level is applied			Additional testing of raw water supply to be implemented in the verification monitoring program, and additional Retc monitoring for manganese.	2024					Coordinator Treatment/Water Sampling Technician	Laboratory	
2023-207	Scheme: Wondal - Process Step: Catchment - Item: CMT13 - other treatment chemicals e.g., PFAS, Microplastics - Chemical - Event: WWTP discharges (x3), Landfill and Airport. In catchment, No Power Station, Mining or Mill in catchment - Risk: Low	Historic PFAS monitoring indicates at low levels. Monitoring frequency increased to quarterly for raw water source for 12 months or event based following change to ADWG. If identified, additional upstream raw water samples will be undertaken to increase source awareness.			Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1				Program Coordinator	Procedural	
2023-208	Scheme: Wondal - Process Step: Catchment - Item: CMT21 - Radioactivity - Radiological - Event: Natural geology - Risk: Low	No data - potentially a high risk rating due to no reports of illness however cannot rule it out. Recommend specific testing for this parameter. Filtration and coagulation likely to remove this to manageable levels if there is a contaminant. No action proposed.	Nil.		Test for radionuclides.	2024			1,000		Coordinator Treatment/Water Sampling Technician	Laboratory	
2023-209	Scheme: Wondal - Process Step: Catchment - Item: CMT23 - Various Contaminants - Physical/Chemical etc. - Turbidity - Event: Bushfire followed by runoff event - Bushfire impact to catchment leading to increased particulate matter in Dams. - Risk: Medium	Bushfires are common in the catchment, however monitoring results have not shown responsive changes in parameters. Alternative source water cannot be selected.			Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages		Program Coordinator	Procedural	
2023-210	Scheme: Wondal - Process Step: Intake - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: High	Daily inspections. No other active measures to reduce L&C. Residence time in storage and natural die off. Offtake level selection.			Update O&M Manual to ensure intake level is properly chosen.	2024			Internal Wages		Program Coordinator	Procedural	
2023-211	Scheme: Wondal - Process Step: Intake - Item: CMT3 - Protozoa/ Cryptosporidium - Biological - Event: Animals in catchment - Contamination of the Dams from dead animals in water. - Risk: High	Operational site visits Community nobby staff when there is a concern			Update O&M Manual to ensure removal of animals is monitored and performed.	2024			Internal Wages		Program Coordinator	Procedural	
2023-212	Scheme: Wondal - Process Step: Intake - Item: CMT4 - Amoeba/ Naegleria/ Acanthamoeba - Biological - Event: Animals in catchment - Access by native and feral animals to the Dam introducing faecal contamination. - Risk: Medium	Daily inspections. No other active measures to reduce L&C.	Check fences and entry points and secure.	2023	Council to consider fencing/ gates to prevent horses and other animals entering intake area.	2024	Undertake fence and gate management program	2025	20,000		Program Coordinator	Council	
2023-213	Scheme: Wondal - Process Step: Intake - Item: CMT20 - Turbidity - Physical - Event: Drought - Risk: High	no real active measures to reduce L&C	Investigate if a floating intake or selective level withdrawal can be used.	2024	Design intake to reduce contaminant risk.	2025	Install a floating intake	2026	75,000		Program Coordinator	O&M	Yes
2023-214	Scheme: Wondal - Process Step: Intake - Item: CMT23 - Various Contaminants - Physical/Chemical etc. - Turbidity - Event: Bushfire followed by runoff event - Bushfire impact to catchment leading to increased particulate matter in Dams. - Risk: High	Residence time in dam allows for settling, although the creek may still present an issue. Alternative source water cannot be selected however. Traditional burn off practices (annually) control undergrowth and the catchment area recovers before the wet season.	Investigate if a potassium permanganate unit should be installed. Research seasonal changes in raw water.	2024	Subject to investigation, design potassium permanganate unit to reduce contaminant risk.	2025	Subject to investigation, install a potassium permanganate unit	2026	170,000		Principal Engineer (Water and Wastewater)	O&M	Yes
2023-215	Scheme: Wondal - Process Step: Intake - Item: INT9 - Various Contaminants - Physical/Chemical etc. - Event: Stagnation or dam turnover - Risk: Medium	No controls in place at this step.	DO meter needs to be purchased.						800		Principal Engineer (Water and Wastewater)	Laboratory	

No.	Observation	Gap or Comment	Proposed Improvement Measures							Resourcing		
			Interim	Target Date	Short-Term	Target Date	Long-Term	Target Date	Budget	Assigned to	Group	Infra?
2023-216	Scheme: Wondal - Process Step: Filtration - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: Medium	Clarification does not reduce the likelihood but reduces the extent of the contaminant. Filtration reduces the consequence.			Investigate options for temporary clarifier arrangement (Hire) for expected wet seasonal events. Pipework adjustments required and control integration	TBC - SBRC DWQO Strategy Adoption and Implementation	D&C of new clarifier for Wondal WTP	TBC - SBRC DWQO Strategy Adoption and Implementation	300,000	Manager Water & Wastewater	O&M	Yes
2023-217	Scheme: Wondal - Process Step: Filtration - Item: CMT9 - Iron - Chemical - Event: Natural geology, sediment - Risk: Medium	Clarification does not reduce the likelihood but reduces the extent of the contaminant. Filtration reduces the consequence. DAFF Unit in place.	Toolbox talk for this specific action.	2023	Update procedures to address chemical dosing and filtration optimisation.	2024	Refer to CMT1		Internal Wages	Coordinator Treatment	Procedural	
2023-218	Scheme: Wondal - Process Step: Filtration - Item: CMT10 - Manganese - Chemical - Event: Natural geology - Risk: High	Clarification does not reduce the likelihood but reduces the extent of the contaminant. Filtration reduces the consequence. Manganese levels are generally low, however there are occasions when the thresholds are exceeded. DAFF Unit in place.			Ensure plant optimisation procedures are in place and anticipates seasoning issues that require changes in treatment operations.	2024	Refer to CMT1		-	Coordinator Treatment	Procedural	
2023-219	Scheme: Wondal - Process Step: Filtration - Item: CMT20 - Turbidity - Physical - Event: Drought - Risk: Low	Coagulation and filtration will reduce this aesthetic issue. Filters can be derated to ensure quality - See O&M Manual.					Subject to filter performance report. It is possible that additional in line turbidity meter will be installed to measure the filtered water turbidity prior to the chlorine contact tank. Filter media and filter nozzles are due to be replaced.	2025	25,000	Program Coordinator	O&M	Yes
2023-220	Scheme: Wondal - Process Step: Filtration - Item: CMT24 - Turbidity - Physical - Event: Flood - Risk: Medium	Coagulation and filtration will reduce this issue. The treatment plant process struggles handle high raw water turbidity. This item will be addressed in the MIPP	Toolbox talk to ensure operators to attend the WTP during these times and in the lead up.	2023	Design of plant filtration automatic backwash based on turbidity alert criteria.	2024	Installation of plant filtration automatic backwash based on turbidity alert criteria.	2024	80,000	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-221	Scheme: Wondal - Process Step: Filtration - Item: INT1 - Cyanobacteria - Biological - Event: Algal bloom - Risk: High	Coagulation and filtration will reduce this issue. Will manage THMs.	Manual dosing procedure in place. PAC on site.	2023	Design automatic PAC dosing system.	2024	Install automatic PAC dosing system.	2025	100,000	Program Coordinator	O&M	Yes
2023-222	Scheme: Wondal - Process Step: Filtration - Item: INT10 - Various Contaminants - Whole of System - Event: Sabotage/ Terrorism - Non authorised persons accessing the site and interrupting the treatment processes (e.g. Vandalism, trespassing) - Risk: Medium	Wondal WTP has security fences and control building is locked. Pump sheds and dosing facilities are all protected by locked sheds.	Investigate installation of sensor lights or security cameras to deter illegal entry.	2023	Design security system	2024	Install security system	2025	30,000	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-223	Scheme: Wondal - Process Step: Filtration - Item: WTP1 - Various Contaminants - Physical/Chemical etc. - Event: PLC failure allowing untreated or semi-treated water through. - Risk: Low	SCADA interlocks in place, and shutdown/isolation occurs on failure. Kingfisher radios and telemetry system to be changed. SCADA and telemetry review will be conducted for all SCADA control and strategic plan.	Assigned in Blackbutt RA for action		Kingfisher radios and telemetry system to be changed. SCADA and telemetry review will be conducted for all SCADA control and strategic plan.	2024	Improve Plant Control and interlocks to prevent water quality breaches	Refer to Blackbutt WTP1 Filtration	-	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-224	Scheme: Wondal - Process Step: Filtration - Item: WTP5 - Various Contaminants - Pathogens/Turbidity - Event: Elevated turbidity levels leading to insufficient coagulation - Risk: Low	Online Turbidity & manual levels recorded in Operator Log Sheet	Calibration and maintenance schedule for online turbidity meter is to be developed and implemented. This is to occur for all instruments.		See CMT9		See CMT9		3,000	Coordinator Treatment	O&M	
2023-225	Scheme: Wondal - Process Step: Filtration - Item: WTP7 - Various Contaminants - Physical/Chemical etc. - Event: Failure of saturation system - Risk: Low		Preventative Maintenance program TBD.	2023					-	Coordinator Treatment	O&M	
2023-226	Scheme: Wondal - Process Step: Filtration - Item: WTP8 - Various Contaminants - Physical/Chemical etc. - Event: Failure of filter resulting in high turbid water. - Risk: Medium	There are no procedures for operation or filter maintenance. Additional training required on filter process and CCP response procedures. Council to consider a filter maintenance program.	Laminate the new HACCP Plans and place on the WTP wall.	2023	There are no procedures for operation or filter maintenance. Additional training required on filter process and CCP response procedures. Council to consider a filter maintenance program.	2024			Internal Wages	Coordinator Treatment	Procedural	
2023-227	Scheme: Wondal - Process Step: Filtration - Item: WTP9 - Various Contaminants - Inability to supply - Event: Backwash / transfer pump failure leading to WTP fail - Risk: Low	Spare pump held as spare.			Create a preventative maintenance program for the scheme.	2024			Internal Wages	Coordinator Maintenance	Procedural	
2023-228	Scheme: Wondal - Process Step: Disinfection - Item: DIS1 - Chlorate - Chemical - Event: chemical breakdown - Risk: High	Council currently does not have a chlorate management plan. Action assigned here.	Chlorate Management Plan action assigned in Blackbutt RA		Provide Shade cover of Chemical Storage Tank	2025	Provide new chemical storage facilities and temperature control to minimise chlorine degradation	2027	100,000	Manager Water & Wastewater	O&M	Yes
2023-229	Scheme: Wondal - Process Step: Disinfection - Item: DIS2 - Chlorine - Chemical - Event: Injection or recirculation pump or chemical injector equipment failure - Risk: Low	Council has acquired some spare parts for system and purchase as spare parts - e.g., Spare pumps, injectors, etc.	Smaller plants: Consider duty standby tanks with automatic changeover look at a lower strength hypo.	2023	Design duty standby tanks with automatic changeover	2024	Install duty standby tanks with automatic changeover	2025	5,000	Coordinator Treatment	O&M	Yes
2023-230	Scheme: Wondal - Process Step: Disinfection - Item: DIS10 - Chlorine ORP - Chemical - Event: Chlorine quickly dissipates due to a high Oxidation demand - Risk: High	Oxidation reduction potential value check is needed. Action assigned here.	Test ORP	2023	Subject to ORP test	2024	Subject to test, however chlorine concentration increases may only be needed instead of other treatments such as potassium permanganate dosing.	2025	500	Water Sampling Technician	Laboratory	
2023-231	Scheme: Wondal - Process Step: Reservoirs - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: Low	Weekly inspections in place. Risk not increased, however cannot reduce. All reservoirs are designed to be vermin proof, and are checked on a maintenance program. Ad hoc cleaning programs are implemented when required.	Purchase analysers for the most critical sites.	2023	A regional program maintenance schedule action assigned in Blackbutt RA.				4,000	Coordinator Treatment	O&M	
2023-232	Scheme: Wondal - Process Step: Reservoirs - Item: WTP1 - Various Contaminants - Physical/Chemical etc. - Event: PLC failure allowing untreated or semi-treated water through. - Risk: Low	Plant has interlocks in place. No issue at the reservoirs.	Investigate SCADA management during failures	2024					Internal Wages	Manager Water & Wastewater	Procedural	
2023-233	Scheme: Wondal - Process Step: Reservoirs - Item: RES1 - Bacteria/Virus - Biological - Event: Ingress of faecal material from human or vermin entry. - Risk: Medium	All Reservoirs are roofed, water proofed and vermin proofed. Reservoir Maintenance Schedule and check sheets (include security and internal checks) TBD a Reservoir Top Up dosing procedure. Action assigned here.	Review reservoir cleanliness status.	2023	Reservoir cleaning procedure and program action assigned in Blackbutt RA.				-	Coordinator Maintenance	O&M	

No.	Observation	Gap or Comment	Proposed Improvement Measures						Resourcing				
			Interim	Target Date	Short-Term	Target Date	Long-Term	Target Date	Budget	Assigned to	Group	Infra?	
2023-234	Scheme: Wondal - Process Step: Reservoirs - Item: RES2 - Bacteria/Virus - Biological - Event: Poor Tank turnover, High or low chlorine. - Risk: High	Lower frequency of potential issues due to weekly inspections. Project underway to resolve this. Water height adjustable for some reservoirs. Top fill inlets for some tanks. Action assigned here.	Common reservoir chlorine dosing Top Up procedure action assigned in Blackbutt RA.			Common procedure for tank turnover action assigned in Blackbutt RA.				-	Coordinator Maintenance	O&M	
2023-235	Scheme: Wondal - Process Step: Reservoirs - Item: RES3 - Loss of Supply - Pressure - Event: Loss of water levels that maintain pressure requirements in the distribution. - Risk: Medium	Individual levels set for each Res. Action assigned here.	Common SOP for emergency supplies or water restriction implementation action assigned in Blackbutt RA.						50,000	Manager Water & Wastewater	Procedural		
2023-236	Scheme: Bjelke-Petersen Dam - Process Step: Catchment - Item: CMT5 - Bacteria/Virus - Biological - Event: Dairy or other plant discharges - Risk: Medium	See preventative measures.				Update catchment management plan to include farm practices.	2024		-	Program Coordinator	Procedural		
2023-237	Scheme: Bjelke-Petersen Dam - Process Step: Catchment - Item: CMT10 - Manganese - Chemical - Event: Natural geology - Risk: Medium	6 years of WQ results reviewed. Treatment in place however not designed to remove Mn and treated water has exceedances.				Additional testing of raw water supply to be implemented in the verification monitoring program, and additional Retic monitoring for manganese.	2024		-	Coordinator Treatment	Laboratory		
2023-238	Scheme: Bjelke-Petersen Dam - Process Step: Catchment - Item: CMT13 - other treatment chemicals e.g., PFAS, Microplastics - Chemical - Event: WWTTP discharge upstream, Power Station, Mining, Mill or Airports in catchment - Risk: High	Historic PFAS monitoring indicates at low levels. Monitoring frequency increased to quarterly for raw water source for 12 months or event based following change to ADW/G. If identified, additional upstream raw water samples will be undertaken to increase source awareness.				Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1	-	Program Coordinator	Procedural		
2023-239	Scheme: Bjelke-Petersen Dam - Process Step: Catchment - Item: CMT18 - Various Contaminants - Chemical - Event: Chemical spill - Risk: Low	Freak event, alternative water sources not available. No major roads in the catchment. Emergency response plan is considered reliable. Local Disaster Management Group can be called into action if required. LDMG plan, Emergency Response Plan, and streams are generally ephemeral allows time for clean up.	Discuss usage with property owners. Toolbox talk for this specific action.	2023		Update procedures and Catchment Management Plan to link this risk assessment. Ensure supply can be isolated until wave passes.	2024	See CMT 1,		Internal Wages	Program Coordinator	Procedural	
2023-240	Scheme: Bjelke-Petersen Dam - Process Step: Catchment - Item: CMT21 - Radioactivity - Radiological - Event: Natural geology - Risk: Low	No data - potentially a high risk rating due to no reports of illness however cannot rule it out. Recommend specific testing for this parameter. Filtration and coagulation likely to remove this to manageable levels if there is a contaminant. No action proposed.	Nil.			Test for radionuclides.	2024		1,000	Water Sampling Technician	Laboratory		
2023-241	Scheme: Bjelke-Petersen Dam - Process Step: Catchment - Item: CMT23 - Various Contaminants - Physical/Chemical etc. - Turbidity - Event: Bushfire followed by runoff event - Bushfire impact to catchment leading to increased particulate matter in Dams. - Risk: Medium	Bushfires are common in the catchment, however monitoring results have not shown responsive changes in parameters. Alternative source water cannot be selected.				Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Program Coordinator	Procedural	
2023-242	Scheme: Bjelke-Petersen Dam - Process Step: Intake - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: High	Daily inspections. No other active measures to reduce L&C. Residence time in storage and natural die off. Offtake level selection.				Update O&M Manual to ensure intake level is properly chosen.	2024			Internal Wages	Program Coordinator	Procedural	
2023-243	Scheme: Bjelke-Petersen Dam - Process Step: Intake - Item: CMT3 - Protozoa/ Cryptosporidium - Biological - Event: Animals in catchment - Contamination of the Dams from dead animals in water. Risk: High	Operational site visits Community notify staff when there is a concern				Update O&M Manual to ensure removal of animals is monitored and performed.	2024			Internal Wages	Program Coordinator	Procedural	
2023-244	Scheme: Bjelke-Petersen Dam - Process Step: Intake - Item: CMT4 - Amoeba/ Naegleria/ Acanthamoeba - Biological - Event: Animals in catchment - Access by native and feral animals to the Dam introducing faecal contamination. - Risk: Medium	Daily inspections. No other active measures to reduce L&C.	Check fences and entry points and secure.	2023		Council to consider fencing/ gates to prevent horses and other animals entering intake area.	2024	Undertake fence and gate management program	2025	20,000	Program Coordinator	Council	
2023-245	Scheme: Bjelke-Petersen Dam - Process Step: Intake - Item: CMT20 - Turbidity - Physical - Event: Drought - Risk: High	no real active measures to reduce L&C	Investigate if a floating intake or selective level withdrawal can be used.	2024		Design intake to reduce contaminant risk.	2025	Install a floating intake	2026	75,000	Program Coordinator	O&M	
2023-246	Scheme: Bjelke-Petersen Dam - Process Step: Intake - Item: CMT23 - Various Contaminants - Physical/Chemical etc. - Turbidity - Event: Bushfire followed by runoff event - Bushfire impact to catchment leading to increased particulate matter in Dams. - Risk: High	Residence time in dam allows for settling, although the creek may still present an issue. Alternative source water cannot be selected however. Traditional burn off practices (annually) control undergrowth and the catchment area recovers before the wet season.	Investigate if a potassium permanganate unit should be installed. Research seasonal changes in raw water.	2024		Subject to investigation, design potassium permanganate unit to reduce contaminant risk.	2025	Subject to investigation, install a potassium permanganate unit	2026	170,000	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-247	Scheme: Bjelke-Petersen Dam - Process Step: Intake - Item: INT9 - Various Contaminants - Physical/Chemical etc. - Event: Stagnation or dam turnover - Risk: Medium	No controls in place at this step.	DO meter needs to be purchased.						800	Principal Engineer (Water and Wastewater)	Laboratory		
2023-248	Scheme: Bjelke-Petersen Dam - Process Step: Filtration - Item: CMT9 - Iron - Chemical - Event: Natural geology, sediment - Risk: Medium	Clarification does not reduce the likelihood but reduces the extent of the contaminant. Filtration reduces the consequence.	Toolbox talk for this specific action.	2023		Update procedures to address chemical dosing and filtration optimisation.	2024			Internal Wages	Program Coordinator	Procedural	
2023-249	Scheme: Bjelke-Petersen Dam - Process Step: Filtration - Item: CMT10 - Manganese - Chemical - Event: Natural geology - Risk: Low	Clarification does not reduce the likelihood but reduces the extent of the contaminant. Filtration reduces the consequence. Manganese levels are generally low, however there are occasions when the thresholds are exceeded.				Ensure plant optimisation procedures are in place and anticipates seasoning issues that require changes in treatment operations.	2024			Internal Wages	Program Coordinator	Procedural	
2023-250	Scheme: Bjelke-Petersen Dam - Process Step: Filtration - Item: CMT20 - Turbidity - Physical - Event: Drought - Risk: Low	Coagulation and filtration will reduce this issue. Filters can be derated to ensure quality - See O&M Manual. Filter Targets are being met.						Subject to filter performance report. It is possible that additional in line turbidity meter will be installed to measure the filtered water turbidity prior to the chlorine contact tank. Filter media and filter nozzles are due to be replaced.	2025	25,000	Program Coordinator	O&M	Yes
2023-251	Scheme: Bjelke-Petersen Dam - Process Step: Filtration - Item: INT1 - Cyanobacteria - Biological - Event: Algal bloom - Risk: High	Coagulation and filtration will reduce this issue.	Manual dosing procedure in place. PAC on site.	2023		Design automatic PAC dosing system.	2024	Install automatic PAC dosing system.	2025	100,000	Program Coordinator	O&M	Yes

Appendix K - Risk Actions Required



No.	Observation	Gap or Comment	Proposed Improvement Measures						Resourcing			
			Interim	Target Date	Short-Term	Target Date	Long-Term	Target Date	Budget	Assigned to	Group	Infra?
2023-252	Scheme: Bjeike-Petersen Dam - Process Step: Filtration - Item: INT10 - Various Contaminants - Whole of System - Event: Sabotage/ Terrorism - Non authorised persons accessing the site and interrupting the treatment processes (e.g., Vandalism, trespassing) - Risk: Medium	The water treatment plant is contained within a secured and locked shed. Apart from the filtered water storage tanks. Submersible raw water pumps are well protected by a wet well. The high level reservoir is protected by a security fence.	Investigate installation of sensor lights or security cameras to deter illegal entry.	2023	Design security system	2024	Install security system	2025	30,000	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-253	Scheme: Bjeike-Petersen Dam - Process Step: Filtration - Item: WTP1 - Various Contaminants - Physical/Chemical etc. - Event: PLC failure allowing untreated or semi-treated water through. - Risk: Low	SCADA interlocks in place, and shutdown/isolation occurs on failure. No remote alarming. This plant will be reviewed with the regional SCADA and telemetry review as per the MIPP and RMP.	Assigned in Blackbutt RA for action		Kingfisher radios and telemetry system to be changed. SCADA and telemetry review will be conducted for all SCADA control and strategic plan.	2024	Improve Plant Control and interlocks to prevent water quality breaches	TBC - SBRC DWQO Strategy Adoption and Implementation	Refer to Blackbutt WTP1 Filtration	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-254	Scheme: Bjeike-Petersen Dam - Process Step: Filtration - Item: WTP5 - Various Contaminants - Pathogens/Turbidity - Event: Elevated turbidity levels leading to insufficient coagulation - Risk: Low	Online Turbidity & manual levels recorded in Operators Log Sheet	Calibration and maintenance schedule for online turbidity meter is to be developed and implemented. This is to occur for all instruments.		See CMT9		See CMT9		3,000	Coordinator Treatment	O&M	
2023-255	Scheme: Bjeike-Petersen Dam - Process Step: Filtration - Item: WTP7 - Various Contaminants - Physical/Chemical etc. - Event: Failure of saturation system - Risk: Low		Preventative Maintenance program TBD.	2023					-	Coordinator Treatment	O&M	
2023-256	Scheme: Bjeike-Petersen Dam - Process Step: Filtration - Item: WTP8 - Various Contaminants - Physical/Chemical etc. - Event: Failure of filter resulting in high turbid water. - Risk: Medium	There are no procedures for operation or filter maintenance. Additional training required on filter process and CCP response procedures. Council to consider a filter maintenance program.	Laminated the new HACCP Plans and place on the WTP wall.	2023	There are no procedures for operation or filter maintenance. Additional training required on filter process and CCP response procedures. Council to consider a filter maintenance program.	2024			Internal Wages	Coordinator Treatment	Procedural	
2023-257	Scheme: Bjeike-Petersen Dam - Process Step: Filtration - Item: WTP9 - Various Contaminants - Inability to supply - Event: Backwash / transfer pump failure leading to WTP fail - Risk: Low	Spare pump held as spare.			Create a preventative maintenance program for the scheme.	2024			Internal Wages	Coordinator Maintenance	Procedural	
2023-258	Scheme: Bjeike-Petersen Dam - Process Step: Disinfection - Item: DIS10 - Chlorine ORP - Chemical - Event: Chlorine quickly dissipates due to a High Oxidation demand - Risk: High	Oxidation reduction potential value check is needed. Action assigned here.	Test ORP	2023	Subject to ORP test	2024	Subject to test, however chlorine concentration increases may only be needed instead of other treatments such as potassium permanganate dosing.	2025	500	Water Sampling Technician	Laboratory	
2023-259	Scheme: Bjeike-Petersen Dam - Process Step: Reservoirs - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: Low	Weekly inspections in place. Risk not increased, however cannot reduce. All reservoirs are designed to be vermin proof, and are checked on a maintenance program. Ad hoc cleaning programs are implemented when required.	Purchase analysers for the most critical sites.	2023	A regional program maintenance schedule action assigned in Blackbutt RA.				4,000	Coordinator Treatment	O&M	
2023-260	Scheme: Bjeike-Petersen Dam - Process Step: Reservoirs - Item: WTP1 - Various Contaminants - Physical/Chemical etc. - Event: PLC failure allowing untreated or semi-treated water through. - Risk: Low	Plant has interlocks in place. No issue at the reservoirs.	Investigate SCADA management during failures	2024					Internal Wages	Manager Water & Wastewater	Procedural	
2023-261	Scheme: Bjeike-Petersen Dam - Process Step: Reservoirs - Item: RES1 - Bacteria/Virus - Biological - Event: Ingress of faecal material from human or vermin entry. - Risk: Medium	All Reservoirs are roofed, water proofed and vermin proofed. Reservoir Maintenance Schedule and check sheets (include security and internal checks) TBD a Reservoir Top Up dosing procedure. Action assigned here.	Review reservoir cleanliness status.	2023	Reservoir cleaning procedure and program action assigned in Blackbutt RA.				-	Coordinator Maintenance	O&M	
2023-262	Scheme: Bjeike-Petersen Dam - Process Step: Reservoirs - Item: RES2 - Bacteria/Virus - Biological - Event: Poor Tank turnover, high or low chlorine. - Risk: High	Lower frequency of potential issues due to weekly inspections. Project underway to resolve this. Water height adjustable for some reservoirs. Top fill inlets for some tanks. Action assigned here.	Common reservoir chlorine dosing Top Up procedure action assigned in Blackbutt RA.		Common procedure for tank turnover action assigned in Blackbutt RA.				-	Coordinator Treatment	O&M	
2023-263	Scheme: Bjeike-Petersen Dam - Process Step: Reservoirs - Item: RES3 - Loss of Supply - Pressure - Event: Loss of water levels that maintain pressure requirements in the distribution. - Risk: Medium	Individual levels set for each Res. Action assigned here.	Common SOP for emergency supplies or water restriction Implementation action assigned in Blackbutt RA.						50,000	Manager Water & Wastewater	Procedural	

Total 10,500,570
 Operating Budget 2,872,523
 Infrastructure Capital 7,628,047

Appendix C – Current Verification Monitoring Program

Council undertook Verification monitoring as per the below program from November 2025 (34 weeks). The remainder of the reporting year (Jul 2024-Oct 2024 – 18 Weeks) was undertaken as per verification plan listed in version 8.1 2021
2023-0019 SBRC DWQMP Review
 14 Jul 2025

Appendix G - Treated Water Quality Verification Monitoring Program

Sample Point ID ¹	Description/Location	Access	Water Stage	Photo ID	Responsible Office	Weekly	Monthly	Quarterly	Annually
Blackbutt									
BLACK 8R	Boobir Dam raw water supply	Tap inside raw water line: Operator needs to start plant manually for sample.	Raw		WST		BGA, BGA Toxins ² , Bromide	HM, SWA, Pesticides	PFAS
BLACK 9R	Boondooma Dam Raw Water Supply	Tap on PRV outside the main building	Raw		WST		BGA, BGA Toxins ² , Bromide	HM, SWA, Pesticides	PFAS
BEN 5	Settlers Park Benarkin	Green sample box located in the park	Retic		WST		THM		
BLACK 1	Blackbutt Reservoir	Sample Point Common Outlet of Reservoirs	Clear water		WST		Free and Total chlorine, Ecoli, THM, Bromide, SWA	HM, Chlorites, Chlorates,	Radionuclides ³
Boondooma									
BOON 14R	Boondooma Dam Raw Water Supply	Sample Tap located on inlet pipeline	Raw					HM,SWA, Pesticides	PFAS
BOON 13	Boondooma Dam Kiosk	Sample Tap located on side of Kiosk	Retic		WSO		Free and Total chlorine, Ecoli, SWA, THM, Bromide	Chlorites, Chlorates HAA,	Radionuclides ³
Kingaroy									
GORD R	Gordonbrook WTP/ Gordonbrook Dam Raw	Large pipe next to round concrete tank	Raw		WST	Bromide, BGA. BGA Toxins ²	HM, SWA	Pesticides	PFAS
BOON R	Gordonbrook WTP/Boondooma Dam Raw	Large pipe next to round concrete tank	Raw		WST	Bromide, BGA	HM, SWA	Pesticides	PFAS
GORD B	Gordonbrook WTP/Blended Raw water	From wet rack out if the drain hose from the analyser.	Raw		WST	Bromide, BGA	HM, SWA	Pesticides	
KING F	Gordonbrook WTP/Clear water	Sample from clear water analyser drain located at the bottom floor of clear water pump room	Clear Water		WST			Chlorites, Chlorates, HAA	Radionuclides ³
KING 1A	Haly St Pump station-Tap 1	Sample Tap located inside the fence on the corner of the pump building closest to door.	Retic		WST	Free and Total chlorine, Ecoli, BGA, THM, Bromide	SWA/HM	Chlorites, Chlorates, HAA	
KING 11	Orana Pump Station	Sample tap located on reservoir chlorine recirculation line	Retic		WST			Chlorites, Chlorates	
KING 12	Reservoir St Pump Station	Sample Tap located on Pump outlet manifold	Retic		WST		Free and Total chlorine, Ecoli, BGA, BGA Toxins ² , THM, Bromide		
KING 5	Premier Drive Pump Station/Next to reservoir	Top of the Hill in the new estate. Large round green reservoir. Tap located inside wire fence near pump station shed.	Retic		WST		Free and Total chlorine, Ecoli, BGA, BGA Toxins ² , THM, Bromide	HAA	
KING 14	Harris Rd Pump Station	Located on the spare rising main feed adjacent to the analyser draw off point	Retic		WST			Chlorites, Chlorates	
KING13	Golf Course Pump Station	Located on the discharge side of the pumps supplying the Taabinga reservoir	Retic		WST			Chlorites, Chlorates	
KING 9	Taabinga Heights Reservoir	Located on the top of the rise on the corner of Bonnelle and Ellsmere Rd Taabinga. Tap located inside wire fence on the road side of the right reservoir.	Retic		WST		Free and Total chlorine, Ecoli, BGA, BGA Toxins ² , THM, Bromide	HAA	
KING 6	Kingaroy Heights Reservoir	Located at the reservoir at the top of the hill on the right side of Redmans rd. travelling from Haly St. End. Tap is between tanks at the top of the hill within the reservoir compound.	Retic		WST		THM	HAA	
KING 3	Drive In Reservoir, Couchmans Rd	Located at Reservoir on right Side Couchmans Rd	Retic		WST		THM	HAA	
GOR 15R	Gordonbrook Dam Rest area	Turn right into Recreation Drive just past Memerambi. Follow this to the boat ramp which is past a right hand elbow on to an unsealed section. Sample is taken at the boat ramp area from the dam water.	Retic		WST	BGA			

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14 Jul 2025

Appendix G - Treated Water Quality Verification Monitoring Program

Sample Point ID ¹	Description/Location	Access	Water Stage	Photo ID	Responsible Office	Weekly	Monthly	Quarterly	Annually
Murgon									
MURG 7R	Murgon Water Treatment Plant Raw		Raw		WST		BGA, SWA, Bromide, HM	Pesticides	PFAS
MURG 7	Murgon Water Treatment Plant -	Tap is located on the end of the Water treatment plant building, closest to Gore St. This water is supplied from the retic main in Gore Street.	Retic		WST	Free and Total chlorine, Ecoli, THM, Bromide	SWA, HM	Chlorites, Chlorates, HAA	Radionuclides ³
MURG 7T	Murgon Water Treatment Plant	Outlet of Chlorine Contact Tank	Clear Water		WST		THM, Bromide		
MURG 5	Hospital Reservoir	Tap near the reservoir, near garden bed.	Retic		WST		THM, Bromide		
MURG 4	Golf Links Reservoir	Tap is located against the wall of the reservoir.	Retic		WST		THM, Bromide		
MURG 9	Retschlag St Reservoir (Industrial Estate)	Sample tap is located on the inside of the security fence attached to the pipe located against the wall of the pump building	Retic		WST		THM, Bromide	Chlorites, Chlorates, HAA	
MURG 7F	Town pump station	Sample tap located on analyser rack	Retic		WST		THM, Bromide		
Nanango									
NAN 5R	Nanango Bore A	Bore A is at the Kingaroy End of the three bores	Raw		WST		HM, SWA, Bromide	Pesticides	
NAN 6R	Nanango Bore B	Bore B is located in the middle of the three bores	Raw		WST		HM, SWA, Bromide	Pesticides	
NAN 7R	Nanango Bore C	Bore C is located Nanango side nearest the treatment shed.	Raw		WST		HM, SWA, Pesticides, Bromide		
NAN 8R	Nanango Water Treatment Plant	Sample Tap on Risng main pre chlorine Dosing	Raw		WST		HM, SWA, Bromide		
NAN 8	Nanango Water Treatment Plant	Discharge from Chlorine analyser	Clear Water		WST	Free and Total chlorine, Ecoli		Chlorites, Chlorates	Radionuclides ³ , PFAS
NAN 4	Hospital Reservoir	Sample Tap off Reservoir Outlet	Retic		WST		THM, Bromide, HM, SWA	HAA	
NAN 1	Nanango Lions Park	Tap located in the park in the middle of the lawn outside the public toilet block at BP end of the park.	Retic		WST		THM, Bromide		
Proston									
PROS 15R	Proston Water Treatment Plant Raw	Right hand corner of the buiding looking from the front gate	Raw		WST		BGA, Bromide	HM,SWA, Pesticides,	PFAS
PROS 15	Landfill Reservoir	Located to the left of the reservoir, on the scour point. Located near a wheel track.	Retic		WST		Free and Total chlorine, Ecoli, THM, Bromide	Chlorites, Chlorates, HM	Radionuclides ³
Wondai									
WOND 10R	Wondai Water Treatment Plant Raw	Sample taken from sample tap on raw water inlet line to plant	Raw		WST		BGA, Bromide, SWA	HM, Pesticides	PFAS
WOND 10	Wondai Water Treatment plant	Sample taken from the outlet pump manifold located next to the clear water storage tank. Tap is located next to the reservoir on the town side.	Clear Water		WST	Free and Total chlorine, Ecoli, THM, Bromide	SWA	Chlorites, Chlorates, HM, HAA,	Radionuclides ³
WOND 3	Hines Rd Reservoir	Sample tap is located inside the security fence to the water pump station.	Retic		WST		THM, Bromide	Chlorites, Chlorates, HAA	
WOND 12	Scott Street Reservoir	Sample tap is located inside the security fence on the pump manifold.	Retic		WST		THM, Bromide	Chlorites, Chlorates, HAA	
TING 1	Tingoora Reservoir	Sample tap located inside the security fence on top of the discharge pipework manifold.	Retic		WST		THM, SWA, Bromide	Chlorites, Chlorates, HAA	
Yallakool									
YALLA 18R	Yallakool WTP Raw water suply	Sample tap located inside watr treatment plant building	Raw		WST			SWA, Pesticides	Radionuclides ³ , PFAS
YALLA 18F	Yallakool water treatment plant	Located on the clear water sample tap near the chlorine analyser	Clear Water		WST			Chlorites, Chlorates, HM, Radionuclides	
YALLA 17	Shop	Sample tap located near the shop.	Retic		WST		Free and Total chlorine, Ecoli	SWA, THM, Bromide	

Notes:

¹May also be an operational monitoring site. Green cells indicate this.

²Toxins analysis for respective BGA toxic species. Undertaken when Toxic BGA species numbers triggered as per HACCP limits and BGA management plan

³Radionuclides will be tested quarterly as part of the routine Verification Monitoring Plan for the first 12 months from the date of approved 2024 DWQMP, beginning on the first standard calendar quarterly month after approval, and then annually during the first standard calendar quarterly month thereafter.

⁴Weekly Verification Sampling for the indicated parameters will not be undertaken during the following QFSS Lab closure periods: The week between Good Friday and 7 days following. The week of the Brisbane Public Ekka Holiday. The week that includes Christmas Eve, Christmas Day and Boxing Day. During these Weekly non Verification sampling periods, Operational Sampling will be undertaken for Chlorine and E.coli inhouse at SBRC Water and Wastewater Laboratory using Hach Chlorine Colorimeter and IDEXX TECTA system.