BSC DWQMP ANNUAL REPORT
2023 – 2024 FINANCIAL YEAR

Drinking Water Service Provider ID - 18

GBA CONSULTING ENGINEERS

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1.0 INTRODUCTION

This is the Drinking Water Quality Management Plan (DWQMP) Annual Report for Boulia Shire Council (BSC) for the 2023 – 2024 Financial Year. This annual report will assist the Regulator in determining whether the approved DWQMP (including any approval conditions) have been complied with. It also provides a mechanism for service providers to report publicly on their performance in managing drinking water quality.

BSC is a registered Service Provider with Identification (SPID) number 18. BSC operates under an approved DWQMP to ensure consistent supply of safe quality drinking water in order to protect public health. This is done through proactive identification and minimisation of public health related risks associated with drinking water.

This annual report includes:

- Activities undertaken over the financial year in operating Council's drinking water services
- A summary of the Boulia and Urandangi drinking water quality for the 2023 – 2024 Financial Year
- A summary of Council's performance in implementing the approved DWQMP
- Incidents reported to the Regulator
- Customer complaints
- Review outcomes and audit findings.

This report will be accessible to the public through the BSC website or upon request at the Council office located in Boulia.

2.0 SUMMARY OF SCHEMES OPERATED

BSC is a small Drinking Water Service Provider, as defined in the *Water Supply (Safety and Reliability) Act of 2008.* Boulia Shire covers an area of 61,635km^2 with a permanent population of approximately 470 people which swells during the cooler months due to travelling tourists. There are two operational drinking water schemes in the shire, located in the towns of Boulia and Urandangi.

The administration centre of the shire is located in Boulia. Both drinking water schemes source their water from shallow sub-artesian bores less than 100m deep. These bores yield relatively low volumes of water with five bores required to supply Boulia's water needs. Being sub-artesian water, the source water supply does not comply with the Australian Drinking Water Guidelines and therefore, BSC are required to disinfect the drinking water in both schemes before it can be reticulated to the public. Table 1 below provides a brief summary of the two drinking water schemes.

Table 1: Summary of schemes

Scheme	Water Source	Treatment	Population Served	Number of Connections	Demand
Boulia	Sub-Artesian Bore Water	Chlorination	314	119	770 KL/d
Urandangi	Sub-Artesian Bore Water	Chlorination	2	19	61 KL/d

3.0 DWQMP IMPLEMENTATION

The implementation of BSC's DWQMP has provided Council with an operational framework to manage the drinking water supply systems of Boulia and Urandangi to ensure the supply of safe drinking water for the Shire.

3.1 Quarterly RMIP Reporting

Boulia Shire Council's DWQMP Amendment was approved by the Director-General of the Department of Regional Development, Manufacturing and Water (the Regulator) in October 2022. As per Section 7.9 of the Information Notice for the Decision, Council's amendment was approved on the condition that they provide quarterly progress reports to the Regulator, detailing the status of their DWQMP Risk Management Improvement Programme (RMIP). Table 2 below outlines the reporting requirements for Council, including the dates that the reports were submitted to the Regulator. Of these reports, three were due to be submitted during the 2023 – 2024 Financial Year. The last report was submitted on the 2nd of February 2024, fulfilling Council's requirement to submit quarterly RMIP updates to the Regulator.

Table 2: BSC Quarterly RMIP progress report due dates

Quarter	Report Due	Submitted
1st October 2022 - 31st December 2022	1st February 2023	30/01/2023
1st January 2023 - 31st March 2023	1st May 2023	5/05/2023
1st April 2023 - 30th June 2023	1st August 2023	1/08/2023
1st July 2023 - 30th September 2023	1st November 2023	24/10/2023
1st October 2023 - 31st December 2023	1st February 2024	1/02/2024

3.2 RMIP Summary

Table 3 below provides a status summary of BSC's RMIP for the 2023 – 2024 Financial Year. The RMIP is an integral part of the DWQMP as it identifies the main risk factors and mitigation measures associated with Council's drinking water schemes. During the 2023 - 2024 Financial Year, Council completed nine of their Risk Management Improvement Items.

Table 3: Boulia Shire Council Risk Management Improvement Program Implementation Status

Code	Scheme	Improvement Actions	Target Date	Actions Taken to Date	Status/Revised Target Date
B1	Boulia- Disinfection System	Provide training to staff to manage the disinfection system	June 2023	This item was put on hold while Council were in the process of procuring and installing a new Electro-chlorination (Salt) Unit which was designed to replace the current Chlorine gas disinfection system. The new Eletro-chlorination Unit was commissioned in June 2024, with the Chlorine gas system fully decommissioned. As such, training is no longer required for the Chlorine gas disinfection system.	Item complete.
B2	Boulia- Disinfection System	Install non-return valves at high-risk locations (town common stables, STP etc.)	June 2023	High-Risk locations have been identified. This was addressed as part of the disinfection system upgrade with the installation of the new Electro-chlorination (Salt) Unit.	Item complete.
B3	Boulia- Bore/Sourcing Infrastructure	Investigate Turbidity levels	June 2023	Council have completed their investigation. Measuring Turbidity in NTUs saw a big decrease in Turbidity levels within the source and distribution water, with an average of 1.32NTU recorded for the source water and an average of 0.44NTU recorded for the distribution system (data collected from June 2022 - November 2024). Having monitored Turbidity consistently for the last two years, Council re-assessed the Turbidity targets outlined in the 2022 DWQMP during the DWQMP Review/Amendment that took place in 2024.	Item complete.
B4	Boulia- Whole of System	Upgrade the Boulia pump telemetry system from 3G to 4G	June 2023	Complete.	Item completed.
B5	Boulia- Whole of System	Update operation and maintenance procedures with a protocol to follow if water to the town is lost and required to be brought back on again to address the sediment disturbance hazard	April 2023	Procedure has been written and implemented. The review date for this procedure is set for July 2025.	Item completed.

Code	Scheme	Improvement Actions	Target Date	Actions Taken to Date	Status/Revised Target Date
B6	Boulia-Disinfection System	Upgrades to the chlorine disinfection system	Dec 2023	Council sought funding to upgrade the WTP to an Electro-chlorination (Salt) Unit. The new electrochlorination system was commissioned in June 2024, with the old Chlorine gas system fully decommissioned.	Item complete.
B7	Boulia-Verification Monitoring	Investigate and develop an improved process for verification monitoring for *E.coli* within the 24-hr holding period	April 2023	Complete. All verification monitoring for *E.coli* and Total Coliforms is now being sent to Mt Isa within the 24-hr holding period.	Item completed.
B8	Boulia- Whole of System	Formal collation and documentation of operation and maintenance procedures	April 2023	All current procedures have been updated and missing procedures have been written. The review date for all BSC operation and maintenance procedures is set for July 2025.	Item completed.
B9	Boulia-Source Water	Investigation into the presence of radiological activity in Boulia's source water	Dec 2023	Radiological testing was added to the verification monitoring programme in the October 22 Amendment. Testing was conducted in December 2022 and 2023 which found Gross Alpha, Gross Beta and Uranium levels to be under the ADWG health guidelines. Moving forward, Council will continue to test these parameters at 6-monthly intervals in the source water and distribution system.	Item complete.
U1	Urandangi-Bore	Seal the Urandangi bore	June 2023	This item was put on hold while Council decided how they wanted to manage the Urandangi drinking water scheme. In June 2024, the official decision to transition the scheme to a non-potable scheme was agreed upon by Council, with the official transition day set for the 2/12/2024. As such, this item is no longer relevant.	N/A
U2	Urandangi-Bore/Sourcing Infrastructure	Continue to inform the community of Urandangi's elevated fluoride levels	Dec 2022	This item is no longer relevant as Urandangi has been transitioned to a non-potable scheme.	N/A

Code	Scheme	Improvement Actions	Target Date	Actions Taken to Date	Status/Revised Target Date
U3	Urandangi-Source Water	Update operation and maintenance procedures to include the new chlorine dosing and testing regime, the risks associated with chlorine dosing and procedures to follow if chlorine levels drop too low/high	April 2023	This item is no longer relevant as Urandangi has been transitioned to a non-potable scheme.	N/A
U4	Urandangi-Bore	Cap old Urandangi bore	June 2023	This item is no longer relevant as Urandangi has been transitioned to a non-potable scheme.	N/A
U5	Urandangi-Verification Monitoring	Investigate and develop an improved process for verification monitoring for *E.coli* within the 24hr holding period	April 2023	This item is no longer relevant as Urandangi has been transitioned to a non-potable scheme.	N/A
U6	Urandangi-Source Water	Investigation into the presence of radiological activity in Urandangi's source water	Dec 2023	This item is no longer relevant as Urandangi has been transitioned to a non-potable scheme.	N/A

4.0 WATER QUALITY MONITORING SUMMARY – COMPLIANCE WITH QUALITY CRITERIA

Council conducts weekly operational testing within Boulia's distribution system and quarterly monitoring of Boulia's bores. Monthly testing is conducted for Urandangi's distribution system. Weekly visual inspections are also undertaken of all drinking water infrastructure (bores, reservoirs, water treatment equipment etc.) within both schemes. Finally, verification monitoring is conducted annually (bores) and biannually (distribution system) across both schemes, with samples being sent to an external laboratory.

The biggest change for BSC during the 2023 - 2024 Financial Year was the installation of an Electro-chlorination system that replaced the Chlorine Gas system. The installation resulted in short term issues resulting in the need for some manual dosing with Chlorine tablets into Boulia's ground level reservoir, however, these issues have now been resolved. Since the Electro-chlorination systems implementation, the DWQMP has been amended and is currently awaiting Regulator approval.

Sections 4.1 and 4.2 below summarise all operational and verification monitoring for Boulia and Urandangi undertaken during the reporting period, while Section 4.3. discusses any potential water quality issues encountered by Council.

4.1 Boulia Drinking Water Quality Summary 2023 - 2024 Financial Year

Table 4: Boulia Annual Source Water – Verification Monitoring Results

Parameters	Units	No. of Samples Tested as per DWQMP	Samples Tested FY	Summary of Results					ADWG Value			
				Maximum Value	Mean Value	Minimum Values	Std Dev	95th %	Health	Exceedances	Aesthetic	Exceedances
E.coli	CFU/100mL	5	5	0	0	0	0	0	1	0		
Total Coliforms	CFU/100mL	5	5	0	0	0	0	0				
Conductivity	µS/cm	5	5	1400	1374	1350	16.25	1396				
Dissolved Organic Carbon	mg/L	5	5	1	1	1	0	1				
Dissolved Oxygen	mg/L	5	5	10.4	9.18	5.9	1.66	10.34				
pH	mg/L	5	5	7.5	7.36	7.3	0.08	7.48			≥6.5 & ≤ 8.5	0
Total Dissolved Solids	mg/L	5	5	750	732	720	11.66	748			600	5
Turbidity	NTU	5	5	2.6	1.78	0.6	0.68	2.52			5	0
Chlorate	mg/L	5	5	0.01	0.01	0.01	0	0.01	0.8	0		
Chloride	mg/L	5	5	210	198	170	14.7	210			250	0
Fluoride	mg/L	5	5	1	0.9	0.9	0.049	1	1.5	0		
Lead	mg/L	5	5	0.0002	0.00018	0.0001	0.00004	0.0002	0.01	0		
Nitrate	mg/L	5	5	0.01	0.01	0.01	0	0.01	50	0		
Nitrite	mg/L	5	5	0.01	0.01	0.01	0	0.01	3	0		
Selenium	mg/L	5	5	0.001	0.001	0.001	0	0.001	0.01	0		
Silica (SiO_2)	mg/L	5	5	18	17.2	16	0.758	18			80	0

Parameters	Units	No. of Samples Tested as per DWQMP	Samples Tested FY	Summary of Results					ADWG Value			
				Maximum Value	Mean Value	Minimum Values	Std Dev	95th %	Health	Exceedances	Aesthetic	Exceedances
Silver	mg/L	5	5	0.001	0.001	0.001	0	0.001	0.1	0		
Sodium	mg/L	5	5	210	190	180	10.95	206			180	3
Total Iron	mg/L	5	5	0.26	0.177	0.095	0.065	0.254			0.3	0
Soluble Iron	mg/L	5	5	0.008	0.0032	0.001	0.0025	0.007				
Total Manganese	mg/L	5	5	0.057	0.0512	0.045	0.004	0.057	0.5	0		
Soluble Manganese	mg/L	5	5	0.084	0.058	0.047	0.013	0.079				
Uranium	mg/L	5	5	0.001	0.001	0.001	0	0.001	0.017	0		
Gross Alpha	Bq/L	5	5	0.233±0.06	0.113±0.04	0.033±0.03	0.07±0.01	0.213±0.06			0.5	0
Gross Beta	Bq/L	5	5	0.173±0.05	0.077±0.05	0.043±0.04	0.049±0.05	0.152±0.05			0.5	0
Aesthetic Guideline Exceedance												
Health Guideline Exceedance												

Table 5: Boulia 6-monthly Distribution System – Verification Monitoring Results

Parameters	Units	No. of Samples Tested as per DWQMP	Samples Tested FY	Summary of Results					ADWG Value			
				Maximum Value	Mean Value	Minimum Values	Std Dev	95th %	Health	Exceedances	Aesthetic	Exceedances
E.coli	CFU/100mL	6	6	0	0	0	0	0	1	0		
Total Coliforms	CFU/100mL	6	6	0	0	0	0	0	1	0		
Conductivity	µS/cm	6	6	1420	1385	1350	35	1420				
True Colour	HU	6	6	1	1	1	0	1			15	0
Dissolved Organic Carbon	mg/L	6	6	1	1	1	0	1				
Dissolved Oxygen	mg/L	6	6	9.5	9.28	9	0.18	9.48				
pH	pH Units	6	6	7.9	7.73	7.6	0.094	7.89			≥6.5 & ≤ 8.5	0
Total Dissolved Solids	mg/L	6	6	790	766.67	750	12.47	785			600	6
Turbidity	NTU	6	6	1	0.72	0.5	0.20	1			5	0
Chlorate	mg/L	6	6	0.01	0.01	0.01	0	0.01	0.8	0		
Chloride	mg/L	6	6	210	191.67	180	12.13	207.5			250	0
Fluoride	mg/L	6	6	1.3	1.15	1.1	0.076	1.275	1.5	0		
Lead	mg/L	6	6	0.0006	0.000283	0.0002	0.000146	0.000525	0.01	0		
Nitrate	mg/L	6	6	0.01	0.01	0.01	0	0.01	50	0		
Nitrite	mg/L	6	6	0.01	0.01	0.01	0	0.01	3	0		

Parameters	Units	No. of Samples Tested as per DWQMP	Samples Tested FY	Summary of Results					ADWG Value			
				Maximum Value	Mean Value	Minimum Values	Std Dev	95th %	Health	Exceedances	Aesthetic	Exceedances
Sodium	mg/L	6	6	190	180	170	8.16	190			180	2
Uranium	mg/L	6	6	0.001	0.001	0.001	0	0.001	0.017	0		
Total Iron	mg/L	6	6	0.25	0.13	0.063	0.06	0.225			0.3	0
Soluble Iron	mg/L	6	6	0.047	0.015	0.001	0.016	0.0403				
Total Manganese	mg/L	6	6	0.067	0.032	0.014	0.017	0.0593	0.5	0		
Soluble Manganese	mg/L	6	6	0.0019	0.00085	0.0005	0.00048	0.00163				
Trihalomethanes	mg/L	6	6	0.024	0.0058	0.002	0.0081	0.01875	0.25	0		
Aesthetic Guideline Exceedance												
Health Guideline Exceedance												

Table 6: Boulia In-house Operational Monitoring – Source Water and Distribution System Results

Analyte	Units	Testing Frequency	No. of Samples Tested as per DWQMP	Samples Tested FY	Summary of Results					ADWG Value			
					Maximum Value	Mean Value	Minimum Values	Std Dev	95th %	Health	Exceedances	Aesthetic	Exceedances
Source Water													
E.coli	CFU/100mL	6-Monthly	10	19	0	0	0	0	0	1	0		
Total Coliforms	CFU/100mL	6-Monthly	10	19	25	2.526	0	5.66	8.8				
Turbidity	NTU	6-Monthly	10	19	3.68	1.273	0.25	0.778	2.024			5	0
Total Iron	mg/L	6-Monthly	10	19	0.36	0.24	0.11	0.067	0.351			0.3	4
Distribution System													
E. coli	mg/L	Monthly	36	36	0	0	0	0	0	1	0		
Total Coliforms	pH Units	Monthly	36	36	0	0	0	0	0				
Free Chlorine	mg/L	Weekly	156	144	1.99	0.93	0.13	0.32	1.42			>0.2, <5	1 (<0.2)
Turbidity	NTU	Monthly	36	36	2.35	0.493	0.1	0.429	1			5	0
pH	mg/L	Monthly	36	36	8.01	7.1997	6.63	0.285	7.848			≥6.5 & ≤ 8.5	0
Conductivity	µS/cm	Monthly	36	36	1422	1384.56	1335	13.75	1420				
Aesthetic Guideline Exceedance													
Health Guideline Exceedance													

Table 7: Boulia *E.coli* Annual Value Compliance Table

Year	1/07/2020 - 30/06/2024											
Month	***July***	***August***	***September***	***October***	***November***	***December***	***January***	***February***	***March***	***April***	***May***	***June***
No. of samples collected	3	11	3	3	8	3	3	8	6	3	12	3
No. of samples collected in which *E.coli* is detected	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12-month period	74	78	72	71	70	70	70	70	70	70	67	66
No. 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

Table 8: Urandangi Annual Source Water – Verification Monitoring

Parameters	Units	No. of Samples Tested as per DWQMP	Samples Tested FY	Result	ADWG Value			
					Health	Exceedances	Aesthetic	Exceedances
E.coli	CFU/100mL	1	1	0	1	0		
Total Coliforms	CFU/100mL	1	1	1776				
Conductivity	µS/cm	1	1	2170				
Dissolved Organic Carbon	mg/L	1	1	<1				
Dissolved Oxygen	mg/L	1	1	11.2				
pH	mg/L	1	1	7.2			≥6.5 & ≤ 8.5	0
Total Dissolved Solids	mg/L	1	1	1300			600	1
Turbidity	NTU	1	1	0.5			5	0
Chlorate	mg/L	1	1	0.01	0.8	0		
Chloride	mg/L	1	1	400			250	1
Fluoride	mg/L	1	1	1.7	1.5	1		
Lead	mg/L	1	1	0.0002	0.01	0		
Nitrate	mg/L	1	1	0.24	50	0		
Nitrite	mg/L	1	1	0.25	3	0		
Selenium	mg/L	1	1	0.004	0.01	0		
Silica (SiO_2)	mg/L	1	1	49			80	0
Silver	mg/L	1	1	<0.001	0.1	0		

Parameters	Units	No. of Samples Tested as per DWQMP	Samples Tested FY	Result	ADWG Value			
					Health	Exceedances	Aesthetic	Exceedances
Sodium	mg/L	1	1	290			180	1
Total Iron	mg/L	1	1	0.002			0.3	
Soluble Iron	mg/L	1	1	0.001				
Total Manganese	mg/L	1	1	0.032	0.5	0		
Soluble Manganese	mg/L	1	1	0.028				
Uranium	mg/L	1	1	0.017	0.017	0		
Gross Alpha	Bq/L	1	1	0.394 ±0.086			0.5	0
Gross Beta	Bq/L	1	1	0.068 ±0.053			0.5	0
Aesthetic Guideline Exceedance								
Health Guideline Exceedance								

Table 9: Urandangi Distribution System – Verification Monitoring

Parameters	Units	No. of Samples Tested as per DWQMP	Samples Tested FY	Summary of Results			ADWG Value			
				Maximum Value	Mean Value	Minimum Values	Health	Exceedances	Aesthetic	Exceedances
E.coli	CFU/100mL	4	4	109	27.25	0	1	1		
Conductivity	µS/cm	4	4	2240	2047.5	1910				
True Colour	HU	4	4	1	1	1			15	0
Dissolved Organic Carbon	mg/L	4	4	1	1	1				
Dissolved Oxygen	mg/L	4	4	10.2	9.675	9.4				
pH	pH Units	4	4	7.9	7.675	7.5			≥6.5 & ≤ 8.5	0
Total Dissolved Solids	mg/L	4	4	1900	1425	1100			600	4
Turbidity	NTU	4	4	3.7	1.375	0.5			5	0
Chlorate	mg/L	4	4	0.01	0.01	0.01	0.8	0		
Chloride	mg/L	4	4	390	345	320			250	4
Fluoride	mg/L	4	4	1.9	1.8	1.7	1.5	4		
Lead	mg/L	4	4	0.0011	0.0007	0.0002	0.01	0		
Nitrate	mg/L	4	4	0.33	0.2925	0.26	50	0		
Nitrite	mg/L	4	4	0.01	0.01	0.01	3	0		
Sodium	mg/L	4	4	210	190	170			180	2
Uranium	mg/L	4	4	0.013	0.01175	0.011	0.017	0		
Total Iron	mg/L	4	4	0.044	0.01925	0.004			0.3	0

Parameters	Units	No. of Samples Tested as per DWQMP	Samples Tested FY	Summary of Results			ADWG Value			
				Maximum Value	Mean Value	Minimum Values	Health	Exceedances	Aesthetic	Exceedances
Soluble Iron	mg/L	4	4	0.035	0.01075	0.001				
Total Manganese	mg/L	4	4	0.041	0.01805	0.0007	0.5	0		
Soluble Manganese	mg/L	4	4	0.025	0.012025	0.0005				
Trihalomethanes	mg/L	4	4	0.002	0.002	0.002	0.25	0		
Aesthetic Guideline Exceedance										
Health Guideline Exceedance										

Table 10: Urandangi In-house Operational Monitoring – Distribution System Results

Parameters	Units	No. of Samples Tested as per DWQMP	Samples Tested FY	Summary of Results			ADWG Value			
				Maximum Value	Mean Value	Minimum Values	Health	Exceedances	Aesthetic	Exceedances
Distribution System										
E.coli	CFU/100mL	48	11	51	5.5	0.0	1	3		
Total Coliforms	CFU/100mL	48	11	51	25.7	0.0				
Free Chlorine	mg/L	104	0	0	0	0			>0.2, <5	
Turbidity	NTU	48	15	4.66	0.89	0.11			5	0
pH	mg/L	48	14	7.7	7.2	6.9			≥6.5 & ≤ 8.5	0
Conductivity	µS/cm	48	14	2174	1983.1	1863.0				
Aesthetic Guideline Exceedance										
Health Guideline Exceedance										

Table 11: Urandangi *E.coli* Annual Value Compliance Table

Year	1/07/2021- 30/06/2024											
Month	***July***	***August***	***September***	***October***	***November***	***December***	***January***	***February***	***March***	***April***	***May***	***June***
No. of samples collected	0	2	0	2	2	2	0	2	0	0	4	2
No. of samples collected in which *E.coli* is detected	0	0	0	0	2	1	0	1	0	0	0	0
No. of samples collected in previous 12-month period	23	21	15	15	15	15	15	13	13	13	16	16
No. failures for previous 12-month period	1	0	0	0	2	3	3	4	4	4	4	4
% of samples that comply	95.7%	100%	100%	100%	86.7%	80%	80%	69.2%	69.2%	69.2%	75%	75%
Compliance with 98% annual value	No	Yes	Yes	Yes	No	No	No	No	No	No	No	No

4.2 Boulia and Urandangi Verification and Operational Monitoring Summary

4.2.1 Boulia

The following ADWG aesthetic exceedances were identified within Boulia's source water during the reporting period:

- Total Dissolved Solids (verification monitoring; 5 exceedances from 5 samples)
- Sodium (verification monitoring; 3 exceedances from 5 samples)
- Total Iron (operational monitoring; 4 exceedances from 19 samples)

The following ADWG aesthetic exceedances were identified within Boulia's distribution system during the reporting period:

- Total Dissolved Solids (verification monitoring; 6 exceedances from 6 samples)
- Sodium (verification monitoring; 2 exceedances from 6 samples)
- Free Chlorine (operational monitoring 1 sample below the lower critical limit of 0.2mg/L)

There were no ADWG health exceedances identified within the Boulia scheme during the reporting period.

4.2.2 Urandangi

The following ADWG aesthetic exceedances were identified within Urandangi's source water during the reporting period:

- Total Dissolved Solids (verification monitoring; 1 exceedance from 1 sample)
- Chloride (verification monitoring; 1 exceedance from 1 sample)
- Sodium (verification monitoring; 1 exceedance from 1 sample)

The following ADWG health exceedances were identified within Urandangi's source water during the reporting period:

- Fluoride (verification monitoring; 1 exceedance from 1 sample)
- Uranium (verification monitoring; 1 exceedance from 1 sample)

The following ADWG aesthetic exceedances were identified within Urandangi's distribution system during the reporting period:

- Chloride (verification monitoring; 4 exceedances from 4 samples)
- Sodium (verification monitoring; 2 exceedances from 4 samples)
- Total Dissolved Solids (verification monitoring; 4 exceedances from 4 samples)

The following ADWG health exceedances were identified within Urandangi's distribution system during the reporting period:

- Fluoride (verification monitoring; 4 exceedances from 4 samples)
- *E.coli* (verification monitoring; 1 exceedance from 4 samples)
- *E.coli* (operational monitoring; 3 exceedances from 11 samples)

4.3 Summary of Water Quality Within the Schemes

4.3.1 Boulia

Since the implementation of chlorination within the Boulia drinking water scheme, the drinking water distributed to customers generally meets the aesthetic and health ADWG values. Exceedances for Total Dissolved Solids (TDS), Sodium and Total Iron were identified within Boulia's source water during the reporting period, however only exceedances for Total Dissolved Solids and Sodium were identified within the distribution system; with Total Iron issues being addressed during the water treatment process (note that elevated Total Iron concentrations are a natural characteristic of Boulia's source water).

Elevated Total dissolved Solids and Sodium are common in groundwater supplies. The ADWG aesthetic value for Sodium has been set at 180mg/L, based on the taste threshold for Sodium in water. In terms of health risks associated with the consumption of elevated levels of Sodium, there is evidence linking excess Sodium intake with cardiovascular disease, however, Sodium intake via. the drinking water supply only makes a modest contribution when compared with an individual's total intake and therefore, no health guideline value has been set for Sodium concentrations in drinking water. It should also be noted that Boulia's average Sodium concentration sits at 190 mg/L for the source water, which is only slightly above the ADWG aesthetic. The average Sodium concentration for Boulia's distribution system is 180mg/L.

In regard to Total Dissolved Solids, there are no health effects directly associated with elevated concentrations in drinking water, however, concentrations above the ADWG aesthetic value of 600 mg/L can cause palatability issues within the water supply. Boulia's source and distribution water had an average TDS concentration of 732 mg/L and 767 mg/L respectively, concentrations that are only slightly above the ADWG aesthetic. Furthermore, no palatability customer complaints were received during the reporting period, suggesting that these elevated concentrations are not a major issue for the scheme.

Finally, Boulia had one week during May 2024 where the Free Chlorine residual fell below the lower critical limit of 0.2mg/L at the Boulia reservoir. It should be noted that during this period, no record of the Free Chlorine levels falling below the lower critical limit were recorded throughout the distribution system. This occurred during the commissioning of the new Electro-chlorination Unit and was likely caused by some teething issues encountered with the new system that have since been rectified. In response, Council manually dosed the ground level reservoir with Chlorine tablets to bring the Free Chlorine residual back up above the lower critical limit.

4.3.2 Urandangi

Urandangi reported elevated concentrations of Total Dissolved Solids and Sodium within the drinking water supply. Similar to Boulia, these exceedances are not considered an issue for the scheme.

Chloride exceedances were also identified in Urandangi's source water and distribution system. The ADWG aesthetic value for Chloride has been set at 250 mg/L. No health value has been stipulated for Chloride as healthy individuals can tolerate the intake of large quantities of Chloride, provided there is a corresponding intake of fresh water. Elevated Chloride concentrations are therefore, not considered a risk for the scheme.

In regard to ADWG health value exceedances, five Fluoride exceedances were reported within Urandangi's source water and distribution system. Elevated Fluoride levels are a natural characteristic of the Urandangi scheme and are associated with the underlying geology of the area. As such, Fluoride exceedances are regularly identified within the scheme and reported as Drinking Water Incidents to the Regulator. This is discussed further in Section 5 below.

Finally, *E.coli* was detected in Urandangi's distribution system on three separate occasions throughout the reporting period. This can be attributed to a lack of Chlorination of the town's water supply, resulting in an inability for the Free Chlorine residual to be maintained throughout the town. Reasons for the lack of Free Chlorine monitoring and chlorination of the town water supply are discussed further in Sections 4.5 and 6. It should be noted that Urandangi has been on a Boil Water Alert for the entire reporting period, with a current population of 0 and therefore, the *E.coli* detections were not considered to be a major hazard for the scheme.

4.4 *E.coli* Verification and Operational Monitoring

Bacteriological sampling within the Boulia's drinking water recorded no positive *E.coli* results for the reporting period. Therefore, the Boulia scheme has been compliant with the 98% *E.coli* value for the 2023-2024 Financial Year and is therefore compliant with Section 52(4) of the *Public Health Regulation 2018*).

Bacteriological sampling within Urandangi's drinking water identified 4 positive results for *E.coli*, therefore, the Urandangi scheme was not compliant with the 98% *E.coli* value for the reporting period.

4.5 Missed Verification and Operational Monitoring

4.5.1 Boulia

There was no missed operational or verification monitoring within the Boulia scheme during the reporting period.

4.5.2 Urandangi

During the reporting period, there was no missed verification monitoring, however, in-house operational monitoring was missed for the months of July, January, February, March and April, which resulted in the following missed testing for the Urandangi scheme:

- *E. coli*, 37 of the required 48 tests were missed.
- Total Coliforms, 37 of the required 48 tests were missed.
- pH, 34 of the required 48 tests were missed.
- Conductivity, 34 of the required 48 tests were missed.
- Free Chlorine, all 104 required tests were missed.

Missed operational testing was predominantly attributed to road closures, a lack of available staff and a lack of residents within the town, as detailed below:

- **Road Closures –** all roads into Urandangi are unsealed and therefore, any type of wet weather often leads to road closures and the town becoming inaccessible. When multiple wet weather events occur in a row, this can result in the town being inaccessible for weeks at a time.
- **Staff Availability –** Urandangi is located approximately 300km from the town of Boulia. As there is no permanent Council workforce located in Urandangi, it is a 600km return trip for a Council worker to drive from Boulia to Urandangi to collect water samples. Boulia, being a small town does not have a large Council workforce and therefore, staff are not always available to collect water samples. This, in combination with wet weather resulted in five months of operational testing being missed for the town.
- **Town Population –** Since the town was last evacuated during the April / May 2023 flood event, the population has fluctuated between 2 and 0 people, with the current population being 0 people. While, providing safe drinking water is a priority for Council, the lack of a permanent population within Urandangi, in combination with road closures and staff availabilities has made it hard for Council to undertaken monitoring as stipulated in their DWQMP. Furthermore, the town has been on a Boil Water Alert since December 2022 and non-potable drinking water signs have been placed at all entrances to the town since August 2023, reducing the risk of unsafe drinking water being distributed to individuals.

It should be noted that road closures and staff availability also contributed to a lack of chlorination of the Urandangi water supply for the reporting period.

5.0 INCIDENTS REPORTED TO THE REGULATOR

During the reporting period, BSC had two ongoing Drinking Water Incidents, as detailed in Table 12 below.

Table 12: Drinking water incidents reported to the Regulator during the 2022-2023 Financial Year

Incident Date	Scheme	Issue	Preventive Actions	Investigation Report
Initially reported in February 2016, updates provided 5/09/2023 11/3/2024 4/6/2024	Urandangi (DWI-7-18-00004)	Source and distribution water Fluoride levels in exceedance of ADWG health guideline value.	Public notification and ongoing monitoring to ensure values are stable and remain only slightly above the ADWG health limit.	N/A, ongoing incident.
30/12/2023 (Incident Report submitted on the 11/7/2023)	Urandangi (DWI-18-22-10098)	On the 30/12/2022, Urandangi was evacuated due to a flood event, a follow-up flood event occurring in April 2023 caused serious damage to water infrastructure, including the collapse of the town bore.	In December 2022, 21 people were evacuated from Urandangi to Mt Isa. Following this event a Boil Water Alert was implemented for the town which is still in place while Council determine how they can move forward with the management of the scheme (see Section 6).	N/A, ongoing incident.

BSC has an ongoing incident for the naturally elevated levels of Fluoride within Urandangi's drinking water. The elevated fluoride levels are associated with the natural geology of the area and averages around 1.8mg/L. Treatment to reduce Fluoride levels in the drinking water is not financially feasible, due to the small population of the town and considering that the concentration is only slightly above the ADWG health value of 1.5mg/L. The main issues associated with elevated Fluoride levels in Urandangi is dental fluorosis primarily affecting children under the age of 6. Despite the frequent exceedance of Fluoride levels, verification monitoring three times a year has been deemed suitable for the scheme as historical data has identified Fluoride concentrations to be within a consistent range. At this stage, Council's primary management strategy is to provide annual public notification to residents in the form of a fluoride factsheet to help the community understand the potential impacts of elevated Fluoride in the drinking water.

Council also have an ongoing Drinking Water Event in response to the flooding that occurred in Urandangi in December/January 2022/23. This Event is discussed further in Section 6 below.

6.0 URANDANGI DRINKING WATER SCHEME UPDATE

Historically in Urandangi, chlorination of the drinking water supply has been difficult due to a lack of available and suitably qualified staff. This was further complicated in December 2022 and April 2023 when two flood events occurred within the town, causing for residents to be evacuated on both occasions. The first flood event resulted in a Boil Water Alert being issued for the town which is currently still in place.

During both floods, no access could be gained to the town, resulting in missed operational testing and an inability for the ground level reservoir to be manually dosed with Chlorine tablets. Following the second round of flooding in April/May significant damage to drinking water infrastructure occurred including the collapse of the Urandangi town bore and ingress of flood water into the reservoirs. In response to this, Council drilled a new bore in May 2023.

In July 2023, Council decided to investigate the process that would be required for making the Urandangi Drinking Water Scheme a non-potable scheme. Consultation was undertaken with the Regulator and QLD Health. Following this initial consultation, non-potable water signs were erected at all entrances to and throughout the town in August 2023 (Figure 1) and the decision to transition the scheme to non-potable was formally endorsed by Council during the June 2024 Ordinary Council meeting. This decision was relayed to the Regulator via. email on the 15/07/2024. During the June Council meeting it was also decided that the official date for the scheme's transition to non-potable would be set to the 2nd of December 2024.

Further updates on the transition will be provided in the 2024 - 2025 Annual Report.

Figure 1: Example of non-potable signage that has been erected at all entrances to Urandangi and throughout the town.

7.0 CUSTOMER COMPLAINTS

There were no customer complaints made to Council during the 2023 - 2024 Financial Year.

8.0 DWQMP REVIEW OUTCOMES

The last DWQMP Review was conducted in January 2024 and submitted to the Regulator on the 31/01/2024. The Review identified the following updates that needed to be incorporated into Council's DWQMP:

- Contact details of the new Director of Works
- Removal of the Urandangi scheme due to Council's intention to transition it to non-potable
- Catchment categorisation of the Boulia scheme
- Updates to the Risk Assessment with new mitigated risk levels for radiological activity in the source water
- Addition of the CEO's endorsement to the DWQMP
- Updates to the Risk Management Improvement Programme to remove completed items and revise the timeframes of remaining items
- Details of the new arrangement to send *E.coli* verification monitoring samples to Mt Isa for testing.

In summary, the Review found the current DWQMP to be out of date and requiring an Amendment. Subsequently, Council applied for an Amendment to their DWQMP in March 2024. To date, this new Amendment has not yet been approved.

The next review will be scheduled for completion in 2026.

9.0 DWQMP AUDIT FINDINGS

The last audit was completed in March 2022. Audit findings and recommendations were incorporated into the 2022 DWQMP Amendment. The next audit is scheduled for completion in 2026.

10.0 CUSTOMER SERVICE STANDARDS REVIEW

BSC did not undertake a review of their Customer Service Standards during the 2023 - 2024 Financial Year. The next review is scheduled to be undertaken in 2025.