



SUSTAINABLY DEVELOPING THE OUTBACK

DIAMANTINA DRINKING WATER QUALITY MANAGEMENT PLAN

Service Provider ID 42

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Contact for enquiries and proposed changes.

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APPENDIX C BEDOURIE & BIRDSVILLE OPERATIONAL MONITORING LOCATIONS

GLOSSARY

ADWG	Australian Drinking Water Guidelines
CCP	Critical Control Point
DSC	Diamantina Shire Council
DWQMP	Drinking Water Quality Management Plan
<i>E.coli</i>	<i>Escherichia coli</i>
GAB	Great Artesian Basin
mg/L	Milligrams per Litre
NTU	Nephelometric Turbidity Unit
OCP	Operational Control Point
O & M	Operation and Maintenance
PFAS	Per- and Polyfluoroalkyl Substances
PVC	Polyvinyl Chloride
QWSR	Queensland Water Supply Regulator
RA	Risk Assessment
Regulator, DLGWV	Department of Local Government, Water and Volunteers
RMIP	Risk Management Improvement Programme
SCADA	Supervisory Control and Data Acquisition
SPID	Service Provide Identification Number
WSP	Water Service Provider

1.0 INTRODUCTION

1.1 Drinking Water Quality Management Plan Overview

This document describes how Diamantina Shire Council provides safe and reliable drinking water services to the communities of Bedourie and Birdsville, in conjunction with the *Water Supply (Safety and Reliability) Act 2008 (the Act)* which commenced on the 1st July 2008.

The purpose of *the Act* is to provide for the safety and reliability of water supply throughout Queensland and it includes provisions relating to the management of drinking water quality, aimed at protecting public health. This outcome is achieved primarily through a regulatory framework for drinking water quality which requires Drinking Water Service Providers to:

- Undertake monitoring and reporting on drinking water quality;
- Have an approved Drinking Water Quality Management Plan (DWQMP).

This DWQMP is consistently prepared with the DWQMP Guideline issued by the Department of Local Government, Water and Volunteers (DLGWV).

The operation of a water service or a drinking water service is also covered under other State and Commonwealth Legislation. The requirements of the *Water Supply (Safety and Reliability) Act 2008* do not negate the requirements of other Legislation unless expressly stated. The Drinking Water Service Provider (DWSP) is responsible for obtaining any necessary approvals under other Acts to ensure the compliant operation of their services. Other State and Commonwealth Legislation relating to the operations of water services may include:

- *Public Health Act 2005*
- *Public Health Regulation 2018*
- *Plumbing and Drainage Act 2018*
- *Planning Act 2016*
- *Environmental Protection Act 1994*
- *Water Act 2000*
- *Trade Practices Act 1974*
- *Work Health and Safety Act 2011*
- *Food Act 2006*

1.2 Registered Service Details

This Drinking Water Quality Management Plan relates to the water supply services owned and operated by:

Diamantina Shire Council, Service Provider ID 42
17 Herbert Street
BEDOURIE 4829
P: (07) 4746 1600
E: admin@diamantina.qld.gov.au

The first point of contact in relation to this plan is:

Brent Reeman, Interim Director of Infrastructure
P: (07) 4746 1600
M: 0428 197 177
E: Brent.Reeman@Diamantina.qld.gov.au

The declared service area maps for each scheme can be located here:
<https://www.diamantina.qld.gov.au/about-council/council-publications>

The administration centre and main works depot for the Shire are located in Bedourie. There is also Customer Service available at the information centre in Birdsville.

1.3 Chief Executive Office Endorsement

Diamantina Shire Council recognises the importance of this DWQMP in the management and provision of safe and reliable drinking water services to the reticulated parts of the Shire. DSC aims to maintain an integrated approach to their drinking water management, ensuring that the requirements of this DWQMP are adhered to by all DSC staff and any contractors operating on behalf of DSC. In particular, DSC endorses all outcomes from the current Risk Assessment and all items outlined in the Risk Management Improvement Programme.

Julianne Meier
.....

12 June 2026
Date.....

Julianne Meier
Chief Executive Officer

1.4 Diamantina Shire Council

The Diamantina Shire is located in Queensland’s central-west and covers an area of 95,000km² with a population of approximately 266 people (as per the 2021 census from the Australian Bureau of Statistics). The Shire consists of two towns; Bedourie and Birdsville. The administrative centre of the Shire is located in Bedourie, approximately 500km south-west of Longreach.

Council provides potable water to both Birdsville and Bedourie which is sourced from deep artesian bores. Birdsville also has a distribution system for non-potable river water sourced from the Diamantina River, however, this system is currently not operational. Birdsville’s potable and non-potable mains are different colours to avoid confusion and potential cross-connections. The non-potable water is also pumped at a lower water pressure with all valves correctly labelled in the junction box. It’s therefore extremely unlikely for the non-potable water supply to be confused with the potable water supply.

Council’s 2022-27 Corporate Plan, developed to provide strategic direction for the Shire, includes the strategy: “*Guarantee quality, potable urban water supply.*” Table 1 below outlines the current population and connections (including 10-yr population projections) for the towns of Bedourie and Birdsville. Figure 1 below depicts Diamantina Shire Council’s location in relation to the rest of Queensland.

Table 1: Bedourie and Birdsville Population Projections.

Scheme Name	Communities Served	Current			10-year Projection		
		Population	Connections	Demand	Population	Connections	Demand
Bedourie	Bedourie	122	70	1.15ML/day	140	75	1.15ML/day
Birdsville Bore Supply	Birdsville	110	70	0.8ML/day	160	85	0.8ML/day

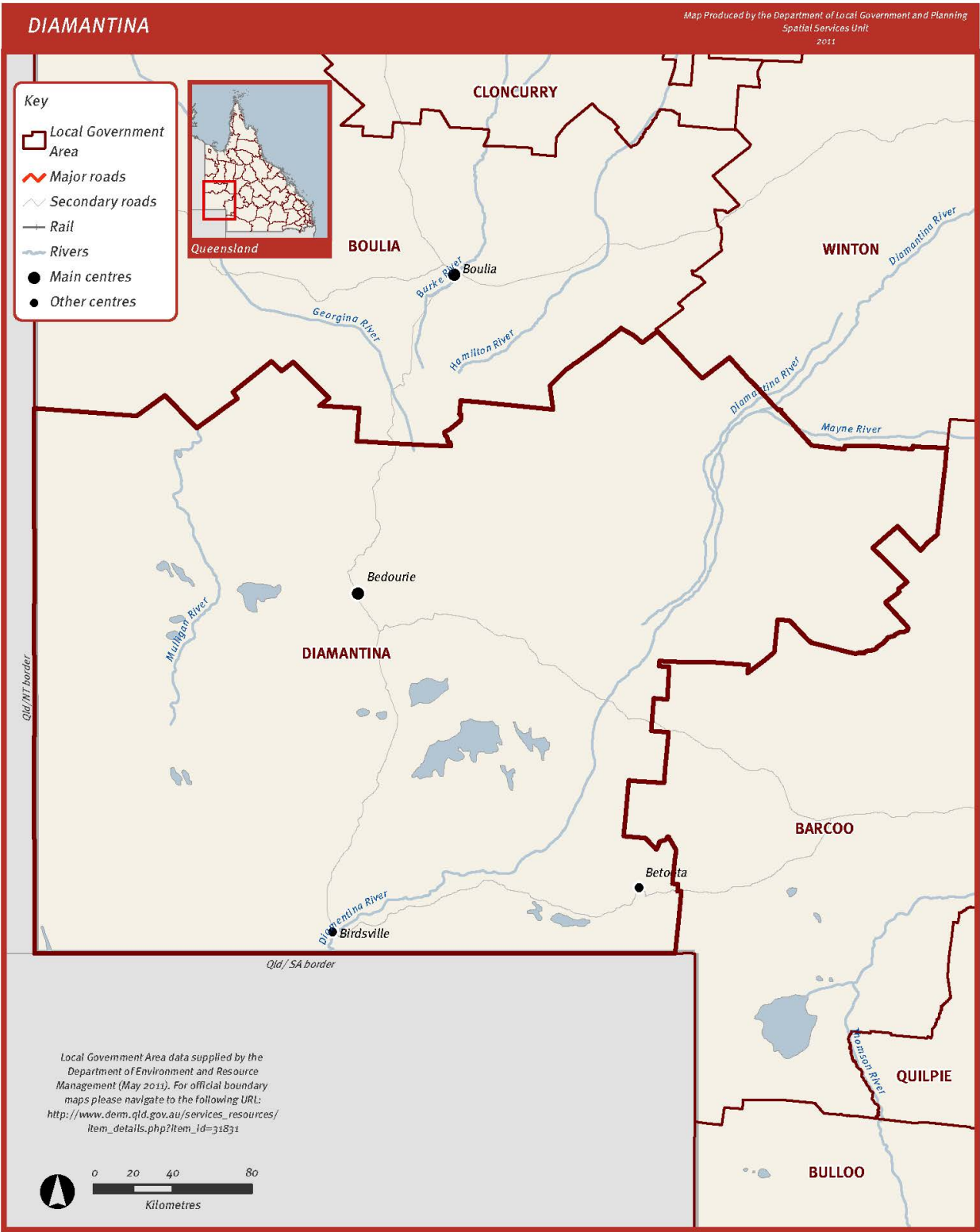


Figure 1: Diamantina Shire Council location relative to Queensland.

1.5 Diamantina Shire Council Stakeholders

Table 2: Diamantina Shire Council Stakeholders and Sensitive Users.

Organisation	Contact Name and Details	DWQMP Relevance	How the stakeholder is engaged in the DWQMP
Diamantina Shire Council	Julianne Meier Chief Executive Officer P: (07) 4746 1600 E: Julianne.Meier@Diamantina.qld.gov.au	Council CEO	DWQMP oversight
	Brent Reeman Interim Director of Infrastructure P: (07) 4746 1600 M: 0428 197 177 E: Brent.Reemna@Diamantina.qld.gov.au	Overall Supervisor	Risk management participant and DWQMP implementation
	Jodie Girdler Facilities and Town Services Manager P: (07) 4746 1600 E: Jodie.girdler@diamantina.qld.gov.au	Town Services Manager	Risk management participant and DWQMP implementation
	Joel Blyth Birdsville Town Services Supervisor M: 0407 146 902	Birdsville Town Supervisor	Risk management participant and DWQMP implementation
GBA Engineers	Stuart Bourne Senior Engineer P: (07) 4651 5177 E: GBourne@gbaengineers.com.au	Planning, design and construction of works	Risk management participant and engineering supervision
	Isabeau Gavel Senior Environmental Officer P: (07) 4651 5177 M: 0418 411 920 E: igavel@gbaengineers.com.au	Consultancy services	Risk management participant, preparation of DWQMP and DWQMP reporting
Water Supply Regulator	P: 1300 596 709 (24-hour hotline) E: DrinkingWater.Reporting@dlgww.qld.gov.au	Water Supply Regulator	Approval of DWQMP documentation
Queensland Public Health Unit	82-86 Bolsover Street, Rockhampton QLD 4700 PO Box 946, Rockhampton QLD 4700 P: (07) 4920 6989	Public Health Unit	Public Health
SGS Melbourne EH&S	10/585 Blackburn Rd, Notting Hill VIC 3186 P: (03) 9574 3200 E: Au.SampleReceipt.Melbourse@sgs.com	Water Analysis Authority	Chemical Analysis/ Reporting Water Quality
QLD Government Chief Information Office	P: (07) 3215 3951 E: qgisvrt@qld.gov.au	Cyber Security Hotline	Cyber Security Assistance
Bedourie Town Sensitive Users			

Organisation	Contact Name and Details	DWQMP Relevance	How the stakeholder is engaged in the DWQMP
Bedourie Clinic	Kepler St, Bedourie QLD 4829 P: (07) 4746 1226	Local health Service	Sensitive User
Bedourie State School	Timor St, Bedourie QLD 4482 P: (07) 4746 1224	Sensitive User	Sensitive User
Birdsville Town Sensitive Users			
Birdsville Clinic	31 Adelaide St, Birdsville QLD 4482 P: (07) 4656 3245	Local health Service	Sensitive User
Birdsville State School	54 Adelaide St, Birdsville QLD 4829 P: (07) 4656 3233	Sensitive User	Sensitive User

2.0 CATCHMENT CHARACTERISTICS

2.1 The Great Artesian Basin

The potable water supply for both towns is sourced from the Great Artesian Basin (GAB), which extends over the blue shaded area on Figure 2 below.



Figure 2: Great Artesian Basin Area and Location Relative to Queensland.

The water of the GAB is held in sandstone layers laid down by the continental erosion of higher ground during the Triassic, Jurassic, and early Cretaceous periods, during a time when much of what is now inland Australia was below sea level. The sandstone was then covered by a layer of marine sedimentary rock shortly afterwards, which formed a confining layer - trapping water in the sandstone aquifer. The eastern edge of the basin was uplifted when the Great Dividing Range formed. The other side was created from the landforms of the Central Eastern Lowlands and the Great Western Plateau to the west.

Most recharge water enters the rock formations from relatively high ground near the eastern edge of the basin (in Queensland and New South Wales) and very gradually flows towards the south and west. A much smaller amount of water enters along the western margin in arid central Australia, flowing to the south and east. As the sandstones are permeable, water gradually makes its way through the pores between the sand grains, flowing at a rate of one to five metres per year.

The age of the groundwater within the GAB has been determined by carbon-14 and chlorine-36 dating. Combined with hydraulic modelling for the recharge areas, the water within the GAB would be expected to display a consistent quality.

3.0 BEDOURIE DRINKING WATER SCHEME

The Bedourie Drinking Water Scheme consists of two deep Artesian bores; Old Bedourie Bore (RN 316) and New Bedourie Bore (RN184306). The Bedourie distribution system was constructed in 1996 and was extended to the industrial area in 2000. The Old Bedourie Bore is located on the southern side of Nappa Street and the New Bedourie Bore is located in a fenced compound on the northern side of Nappa Street. The town is fed by the New Bedourie Bore and the Old Bedourie Bore remains connected as a back-up supply. Neither bore is at significant risk from bushfires, flooding or damage by vehicles or machinery.

Water is pumped under positive pressure from the bores directly into the distribution system, where it passes through a single cooling pond which cools the water via a manifold from 44°C to ~30°C (depending upon ambient temperatures).

Finally, there is a ground level and elevated reservoir located next to the new bore in the fenced compound on the northern side of Nappa Street. These reservoirs have been isolated from the distribution system with the pipework removed. As such, there is no potential for drinking water to be accidentally reticulated to the town through the reservoirs. There are no plans to recommission the reservoirs.

3.1 Infrastructure

Table 3: Bedourie Drinking Water Scheme Infrastructure Details.

Component		Details	
Source	Name	Old Bedourie Bore	New Bedourie Bore
	Details	Artesian RN: 316 Depth: 400m Drill Date: 1905 Aquifer: Longsight Sandstone Details: Sealed	Artesian RN: 184306 Depth: 420m Drill Date: 2019 Aquifer: Longsight Sandstone Details: Sealed
		Allocation: 150 ML/a (shared water licence for the two bores) Closed head pressure: 529 kPa Unrestricted flow: 42 L/s See Appendix A for Department of Resources Bore Cards	
	% of Supply	20%	80%
	Reliability	100%	100%
	Catchment Categorisation	Category I - fully protected groundwater.	
	Contamination Sources	None.	
	Water Quality Issues	High Temperature, water comes out of the ground at 44°C	
	Type	Cooling pond	

Component		Details
Source Infrastructure	Description	Bore flows under artesian pressure through the cooling pond and directly into reticulation via pressure control valves.
Treatment		Cooling.
Disinfection		Not provided.
Distribution System	Pipe material	MDPE
	Age range	27 years @ 2025
	Approx. % of total length	48% (4,165m)
	Age range	25 years @ 2025
	Approx. % of total length	4% (347m)
	Age range	23 years @ 2025
	Approx. % of total length	48% (4,111m)
	Areas where potential long detention periods could be expected?	Industrial subdivision and Bedourie racecourse.
	Areas where low water pressure (e.g. < 12 m) could be expected during peak or other demand periods?	Not applicable.
Reservoirs	Ground Level Reservoir	Ground Level Reservoir – decommissioned
	Capacity	400 kL
	Roofed (Y/N)	Yes.
	Vermin-proof (Y/N)	Yes.
	Runoff directed off roof (Y/N)	Yes.
	Elevated Reservoir	Elevated Reservoir – decommissioned
	Capacity	200 kL
	Roofed (Y/N)	Yes.
	Vermin-proof (Y/N)	Yes.
	Runoff directed off roof (Y/N)	Yes.



Figure 3: Annotated QLD Globe Image of Bedourie's Drinking Water Infrastructure.

Bedourie Town Bore

New Bore Connections

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DRAWING REGISTER			
DRAWING NUMBER	REVISION	DATE	DRAWING SHEET DESCRIPTION
160150-1/01	B	12/10/2020	Layout Plan
160150-1/02	B	12/10/2020	Plan Details
160150-1/03	B	12/10/2020	Cable Tray Details
160150-1/04	A	12/10/2020	Bore Headworks

LEGEND:

- ✕ WATER VALVE
- WATER HYDRANT
- WATER PIPE 1250MM
- WATER PIPE 1100MM & 63.50MM
- NEW WATER MAIN 1250MM PE (SUPPORTED ON CABLE TRAY)
- NEW WATER MAIN UG 1250MM PE
- NEW WATER LANE TO OLD BORE

LAYOUT PLAN

Scale 1:1000

Rev.	Revision Description	By	Date
B	Drawing Register Added	AB	12/10/2020
A	Original Issue	MB	09/12/2019

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All dimensions shown in metres unless otherwise specified.

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Email: admin@gbawater.com.au

Drawn: **Andres Barrera**

Checked: **Richard Lewis**

Approved when signed:

— RPE No. —

Client: **Diamantina Shire Council**

Project: **160150 DSC Rural - Water & Sewer**

Title: **Bedourie Town Bore Connection Layout Plan**

Category: Water	Drawing No.	Rev.
	160150-1/01	B
Scale: As Shown	Size: A	

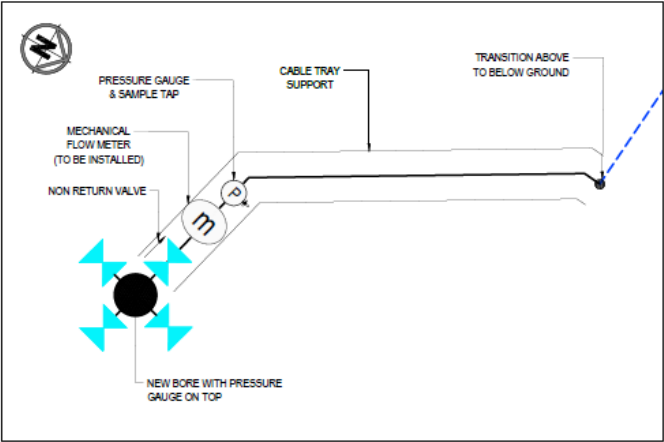
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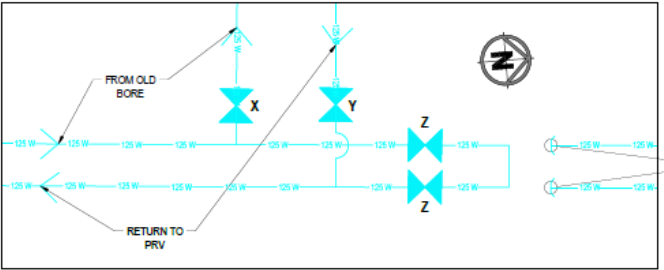
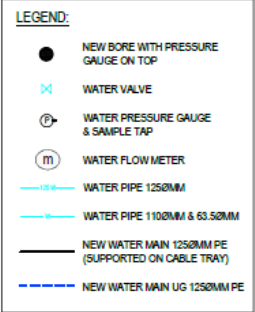
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DETAIL B
Scale 1:100



DETAIL C
Scale 1:100

NOTES

1. TO FEED TOWN FROM OLD BORE AND BYPASS DETAIL A:
CLOSE VALVE X - Y
OPEN VALVE Z
2. NORMAL OPERATION:
CLOSE VALVE Z
OPEN VALVES X - Y

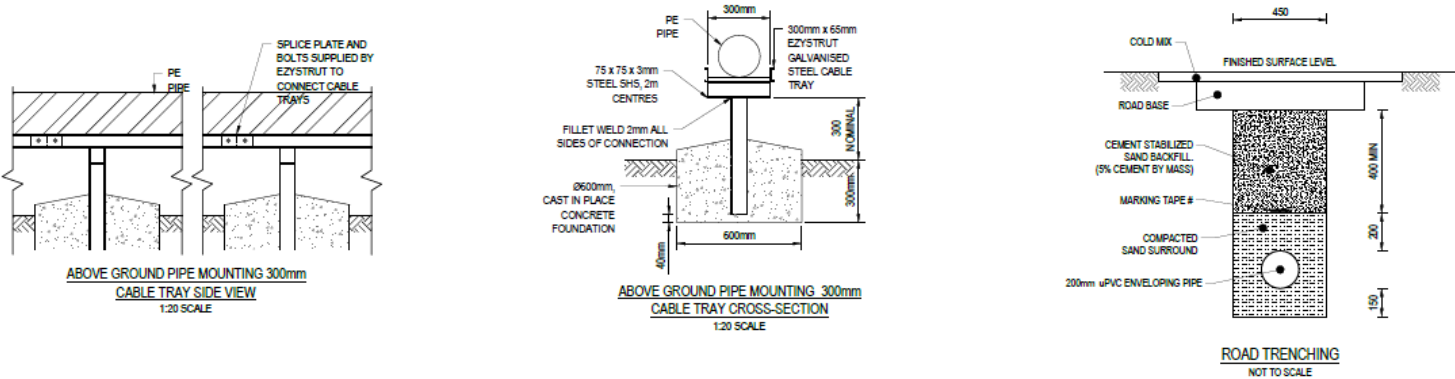
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B Drawing Register Added		AB		12/10/2020		All dimensions shown in metres unless otherwise specified.		Title: Bedourie Town Bore Connection Plan Details		160150-1/02	
A Original Issue		MB		03/12/2019		Drawn: Andres Barrera		Approved when signed: _____		B	
Rev. Revision Description		By		Date		Checked: Richard Lewis		RPEQ No.: _____		Scale: As Shown	
										Size: A3	

Figure 5: Bedourie Drinking Water Supply Schematics.

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CABLE TRAY DETAILS



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B Drawing register added			Drawn: Andres Barrera			Title: Bedourie Town Bore Connection Cable Tray Details	160150-1/03	B
A Original Issue			Checked: Richard Lewis			Approved when signed: RPEO No: —	Scale: As Shown	Size: A3
Rev.	Revision Description	By	Date					

Figure 6: Bedourie Drinking Water Supply Schematics.

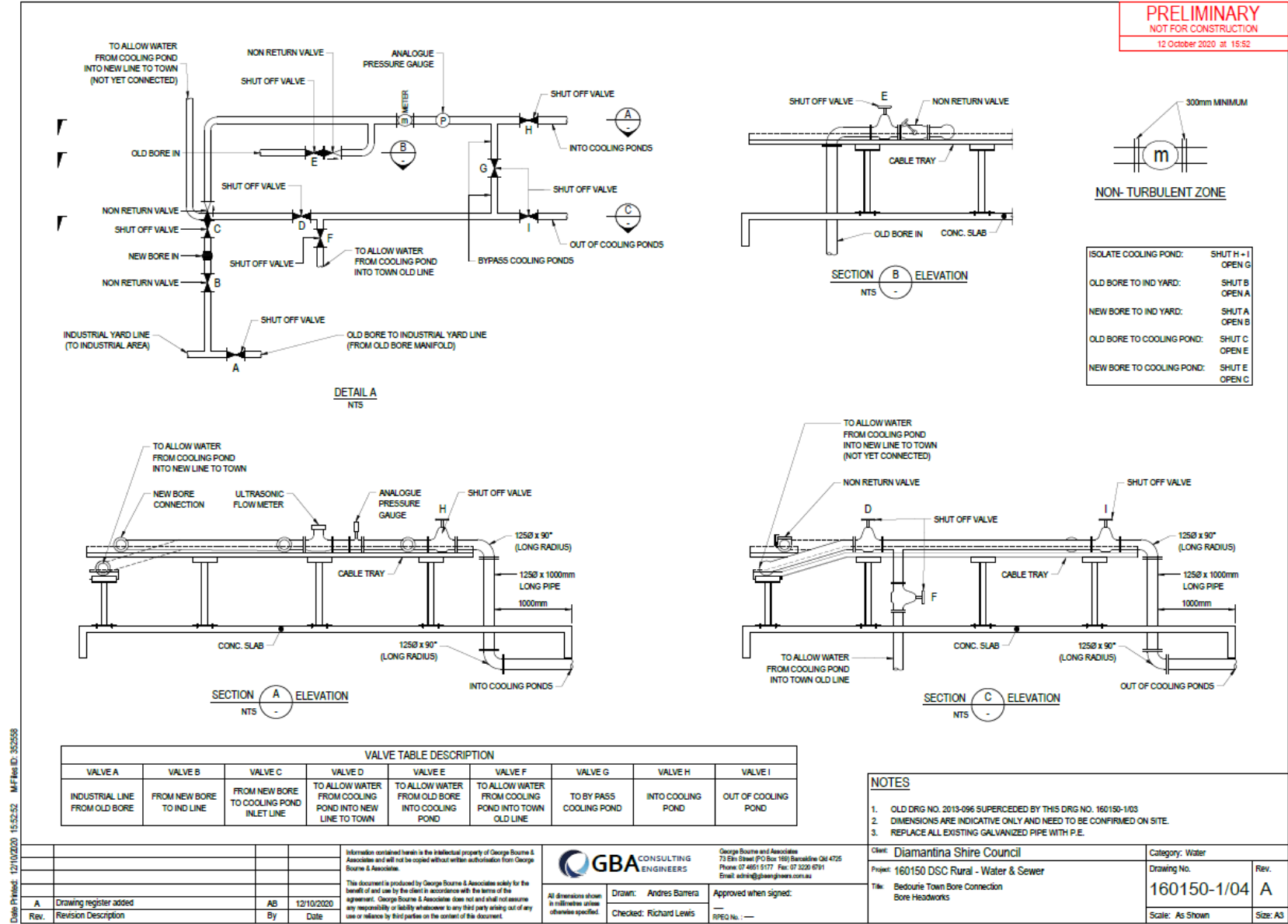


Figure 7: Bedourie Drinking Water Supply Schematics.

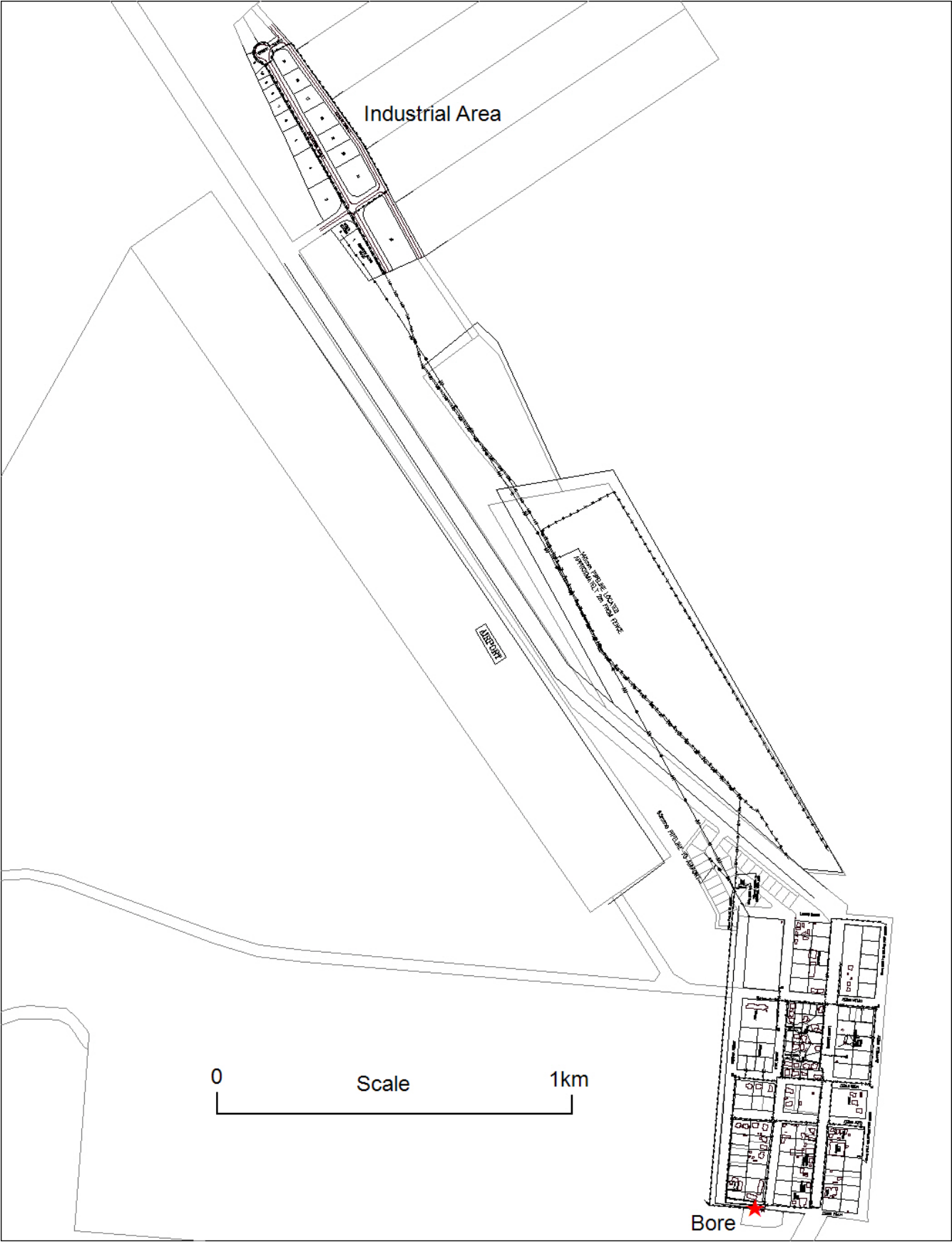


Figure 8: Bedourie Drinking Water Supply Schematics.

4.0 BIRDSTVILLE DRINKING WATER SCHEME

The Birdsville Drinking Water Scheme consists of two deep Artesian bores; Birdsville Old Bore (RN 14645) and Birdsville New Bore (RN 211035). Additionally, Birdsville has a raw water scheme which distributes untreated river water throughout the town for irrigation use. The Birdsville distribution system was constructed in 1984, supplied from the Old Bore which was drilled in 1961. In 2025, Council drilled a new bore (Birdsville New Bore), which they anticipate will be fully commissioned in 2026 via consultation with the Water Supply Regulator and QLD Health. The Birdsville Old Bore is located on the northern edge of town adjacent to the Birdsville airport. The Birdsville New Bore is located directly north of the town, off the Eyre Developmental Road on Lot 7/SP340136. Both bores are located in fenced compounds and neither bore is at significant risk from bushfires, flooding or damage by vehicles or machinery.

The Birdsville scheme consists of two reservoirs (a Ground Level and an Elevated reservoir), three cooling ponds and three heat exchange systems. The two reservoirs and two of the heat exchangers and cooling ponds are existing infrastructure, located in the same compound as the old bore, whilst the third cooling pond and heat exchange system were built in 2025, located adjacent to the new bore, to be commissioned at the same time. Cooling is the only treatment provided for Birdsville's drinking water.

Currently, water from the old bore flows under artesian pressure through a heat exchange system into the ground level reservoir. It then passes through a second heat exchange system and into the elevated reservoir. The two cooling ponds are used to supply water to the heat exchange systems. Water is cooled to ~35°C depending on ambient temperatures.

When the new system is commissioned, water will flow from the new bore under artesian pressure through a parallel heat exchange and into the ground level reservoir. Water from the new cooling pond will cool the heat exchange system. All cooling pond piping is kept separate from the distribution system line to prevent contamination of the drinking water supply. Additionally, the drinking water line that runs through the heat exchange flows at a higher pressure than the cooling pond line to ensure that cooling pond water cannot contaminate the drinking water line should a leak occur. Finally, the solenoid which controls the drinking water flow to the town is located after the heat exchange so that pressure is constantly maintained within the heat exchanger, further preventing contamination.

The intention is for the new cooling pond system to cool the water to a similar temperature as the old system (~35°C). The new bore cannot bypass the new heat exchange system. Should the new heat exchanger need to be taken offline for repairs or maintenance, then water will be supplied to the old town bore and cooling system. Furthermore, there is no pressure monitoring undertaken on the new heat exchange system as this is difficult to monitor. When the reservoirs are full, a solenoid closes the bore water supply to the heat exchange which is interlocked with the cooling pond water which shuts down at the same time. Therefore, there is no water passing through the heat exchange when the reservoirs are full. Within the heat exchanger, the distribution line and cooling pond water line are separated by rubber seals and therefore leaks are clearly visible when the water supply is shut off when the reservoirs are full.

Reservoir levels are maintained by a float system with a solenoid at the bottom to activate the pumps between reservoirs. Both reservoirs are sealed against contamination and due to the positive pressure throughout the distribution system, under normal operating conditions there is no opportunity for contamination of the drinking water supply to occur.

4.1 Infrastructure

Table 4: Birdsville Drinking Water Scheme Infrastructure Details.

Component		Details	
Source	Name	Birdsville Old Bore	Birdsville New Bore
	Details	Artesian RN: 14645 Depth: 1,220m Allocation: 343 ML/a Drill Date: 1961 Aquifer: Hooray Sandstone Yield: Unrestricted flow (40L/s) Closed head pressure: 1,200 kPa Details: Sealed	Artesian RN: 211035 Depth: 1,305m Allocation: 343 ML/a Drill Date: 2025 Aquifer: Hooray Sandstone Yield: Controlled flow (70L/s) Details: Sealed
		See Appendix A for Bore Report Cards.	
	% of supply	100% - to be decreased to 0% as bore is transition to a back-up bore once new bore is commissioned	0% - to be increased to 100% once commissioned
	Reliability	100%	100%
	Catchment Categorisation	Category I - fully protected groundwater.	
	Contamination Sources	None.	
	Water Quality Issues	High temperature, water comes out of the ground at approximately 99°C.	
Treatment	Type	Cooling is the only treatment provided. There is an automatic shut-off valve located after the new heat exchange system for if water exceeds 60°C.	
Disinfection	Type	Not applicable.	
Distribution System	Pipe Material	Galvanised steel	
	Age range	41 years @2025	
	Approx. % of total length	3% (105m)	
	Pipe Material	MDPE	
	Age range	10 years @2025	
	Approx. % of total length	67% (2,783m)	

Component		Details
	Areas where potential long detention periods could be expected	Industrial subdivision and Bedourie racecourse.
	Areas where low water pressure (e.g. < 12 m) could be expected during peak or other demand periods)	Not applicable.
Reservoirs	Name	Birdsville Ground Level Reservoir
	Capacity	400 kL
	Roofed (Y/N)	Yes.
	Vermin-proof (Y/N)	Yes.
	Runoff directed off roof (Y/N)	Yes.
	Name	Birdsville Elevated Reservoir
	Capacity	200 kL
	Roofed (Y/N)	Yes.
	Vermin-proof (Y/N)	Yes.
	Runoff directed off roof (Y/N)	Yes.

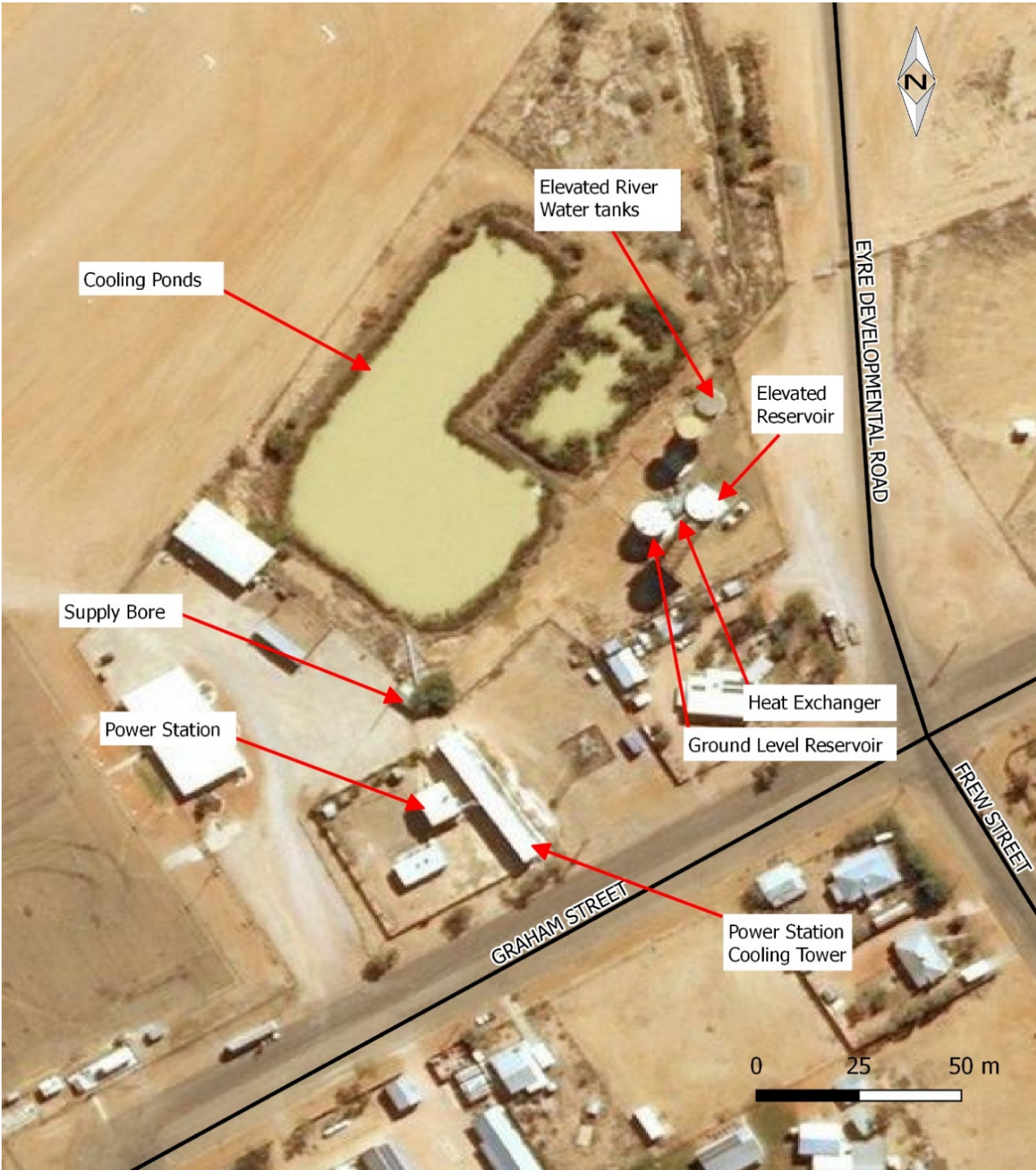


Figure 9: Birdsville Old Bore Infrastructure.



Figure 10: Location of Birdsville Old Bore infrastructure in relation to the New Bore infrastructure.

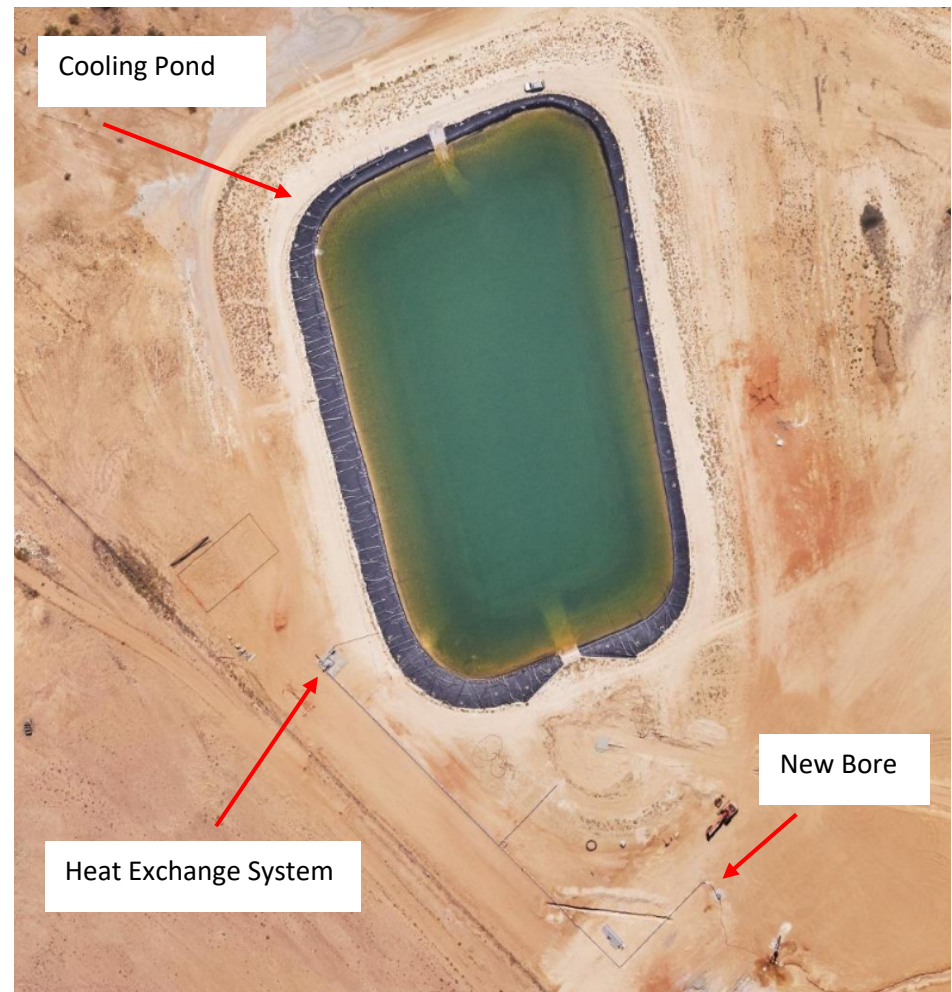


Figure 11: Birdsville New Bore infrastructure.

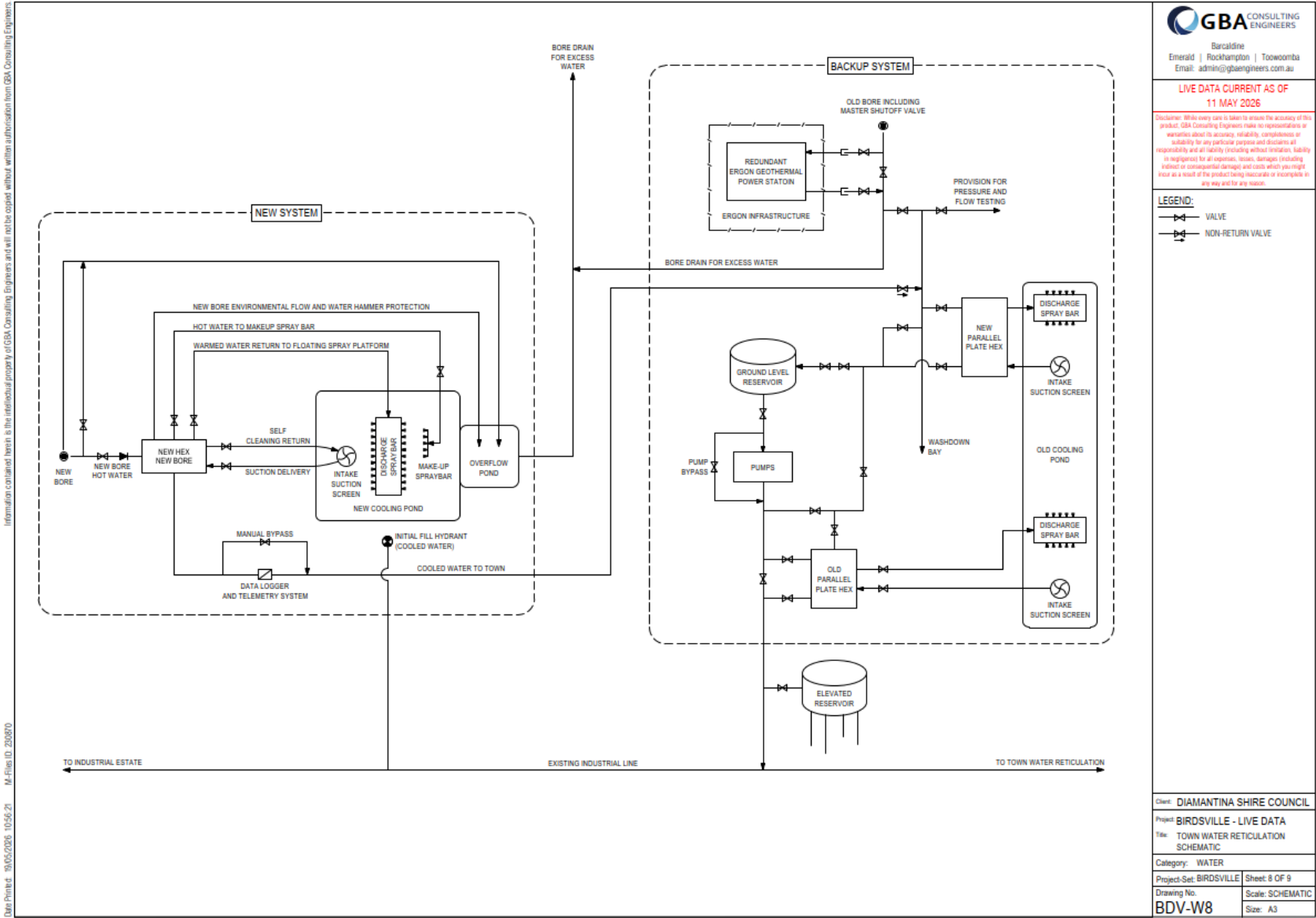


Figure 12: Birdsville Drinking Water Supply Schematics.

4.2 Geothermal Power Station Operation

There is an Ergon geothermal power station located next to the Birdsville Old Bore compound which was decommissioned in 2022. When the power station was operational, water was passed through the power station prior to entering the town cooling and storage systems. Supply to the power station is controlled by manual valves at the borehead which are currently switched off, bypassing the station. The borehead valves to the power station are located in the same fenced compound as the old bore and are under Council control and cannot be accessed without Council permission. Thus, this system adds no risk to the Birdsville scheme as there is no contact of bore water with the power station. There are also no plans to recommission the power station.

4.3 Birdsville Races and Big Red Bash

Each year, Birdsville hosts the Big Red Bash in July and horse races in September. During these weekends, the population for the town increases from around 150 people to approximately 6,000 (Birdsville races) and 10,000 (Big Red Bash). While the Big Red Bash is held remotely (out of town on a cattle station), Birdsville (being the nearest town), sees all individuals attending the event pass through the town on their way to the festival. To date, these events have not significantly impacted upon the town's water supply or quality. As Council does not monitor the daily water usage for the town, they currently do not have an estimate of the town's drinking water consumption during these events.

In the lead up to these events, Council flushes the Birdsville distribution system to remove any stagnant water that may be preset in the mains to ensure a safe drinking water service is provided. Council have also removed all river water reticulation points within the town to prevent event attendees from accidentally filling their drinking water bottles with non-potable river water.

If the town's water supply were to exceed the flow-rate of the heat exchange systems and hot water was being reticulated to the town, Council would issue a Public Notice via the usual communication methods (outlined in Section 10 below) warning individuals of the elevated water temperature. Water restrictions would also be implemented to help curb unnecessary water use. Additionally, some level of cooling would still be provided by the reservoirs.

If a power outage were to occur, a back-up generator is available on-site to run the heat exchange systems.

5.0 BEDOURIE AND BIRDSVILLE DRINKING WATER QUALITY

Bedourie and Birdsville's source water is of a quality that does not require chemical treatment as it is sterile at the source and generally complies with Australian Drinking Water Guideline (ADWG) health and aesthetic values. Council's decision to not disinfect the water also reduces the complexity of the schemes, making them more manageable for the water operators. Additionally, disinfection is not a viable option for Council to pursue due to the installation and ongoing maintenance costs that would be required.

The data provided in Sections 5.1 and 5.2 below confirms that the drinking water supplied by the Bedourie and Birdsville bores is generally within the ADWG with only a few occasional health and aesthetic exceedances (discussed in Section 5.1.1 and 5.2.1 below).

5.1 Bedourie Drinking Water Quality 2017-2025 Summary

Table 5: Bedourie internal and external water quality monitoring – source water.

Analyte	Units	Monitoring	Summary of Results						Guideline Values			
			Samples Tested	Maximum Value	Mean Value	Minimum Values	Std Dev	95 th %	Health	Exceedances	Aesthetic	Exceedances
<i>E. coli</i>	MPN/100mL	Internal	207	0	0	0	0	0	1	0		
Total Coliforms	MPN/100mL	Internal	168	0	0	0	0	0				
Turbidity	NTU	Internal	58	1.8	0.4	0.02	0.45	1.23			5	0
<i>E. coli</i>	CFU/100ml	External	19	0	0	0	0	0	1	0		
Total Coliforms	CFU/100mL	External	19	0	0	0	0	0				
Turbidity	NTU	External	12	0.8	0.558333	0.5	0.103749	0.745			5	0
Dissolved Organic Carbon	mg/L	External	20	4.6	1.285	0.2	1.169733	4.125				
pH	pH Units	External	21	8.4	8.185714	7.8	0.172615	8.4			≥6.5 & ≤8.5	0
Conductivity	µS/cm	External	21	930	849.2857	7	189.7	928				
Total Dissolved Solids	mg/L	External	21	560	512.8571	450	28.47603	550			600	0
Chloride	mg/L	External	21	100	83.61905	73	6.183513	91			250	0
Fluoride	mg/L	External	21	0.8	0.664762	0.1	0.145164	0.8	1.5	0		
Selenium	mg/L	External	19	0.003	0.001474	0.001	0.000752	0.003	0.004	0		
Silver	mg/L	External	4	0.001	0.00055	0.0001	0.00045	0.001	0.1	0		
Sodium	mg/L	External	21	220	193.8095	140	16.46821	210			180	18
Aluminium	mg/L	External	21	0.75	0.041238	0.001	0.158598	0.02			0.2	1
Total Iron	mg/L	External	21	2.6	0.212905	0.012	0.538835	0.31			0.3	2
Soluble Iron	mg/L	External	21	0.7	0.115429	0.02	0.142551	0.19				
Total Manganese	mg/L	External	21	0.046	0.014319	0.0023	0.007749	0.019	0.1	0	0.05	0
Soluble Manganese	mg/L	External	21	0.026	0.013033	0.005	0.003809	0.017				

Analyte	Units	Monitoring	Summary of Results						Guideline Values			
			Samples Tested	Maximum Value	Mean Value	Minimum Values	Std Dev	95 th %	Health	Exceedances	Aesthetic	Exceedances
Arsenic	mg/L	External	11	0.003	0.001045	0.0005	0.00094	0.003	0.01	0		
Antimony	mg/L	External	4	0.002	0.0015	0.001	0.0005	0.002	0.003	0		
Barium	mg/L	External	4	0.068	0.067	0.066	0.000707	0.06785	2	0		
Boron	mg/L	External	4	0.21	0.195	0.19	0.00866	0.207	4	0		
Beryllium	mg/L	External	4	0.001	0.00055	0.0001	0.00045	0.001	0.06	0		
Cadmium	mg/L	External	11	0.0002	0	0.00005	0	0.00015	0.002	0		
Cyanide	mg/L	External	9	0.004	0.004	0.004	0	0.004	0.08	0		
Chromium	mg/L	External	10	0.004	0.00095	0.0005	0.001036	0.00265	0.05	0		
Copper	mg/L	External	11	0.008	0.003127	0.001	0.002362	0.007	2	0	1	0
Mercury	mg/L	External	11	0.0001	0	0.00005	0	0.0001	0.001	0		
Molybdenum	mg/L	External	4	0.01	0.01	0.01	0	0.01	0.05	0		
Lead	mg/L	External	11	0.003	0.001109	0.0002	0.000931	0.0029	0.005	0		
Nickel	mg/L	External	11	0.001	0.000682	0.0005	0.000241	0.001	0.02	0		
Zinc	mg/L	External	11	0.013	0.004727	0.001	0.003165	0.0095			3	0
Uranium	mg/L	External	15	0.001	0.001	0.001	0	0.001	0.017	0		
Gross Alpha	Bq/L	External	11	0.0138±0.043	0.0568±0.0313	0.019±0.025	0.0385±0.006	0.13±0.043			0.5	0
Gross Beta	Bq/L	External	11	0.078±0.044	0.063±0.042	0.033±0.039	0.013±0.002	0.077±0.044			0.5	0
Aesthetic Guideline Exceedance												
Health Guideline Exceedance												

Table 6: Bedourie external water quality monitoring 2017-2025– distribution system.

Analyte	Units	Monitoring	Summary of Results		Guideline Values			
			Samples Tested	Average	Health	Exceedances	Aesthetic	Exceedances
<i>E. coli</i>	MPN/100mL	External	2	0	1	0		
Total Coliforms	MPN/100mL	External	2	0				
Turbidity	NTU	External	2	0.5			5	0
Dissolved Organic Carbon	mg/L	External	2	1				
pH	pH Units	External	2	8.05			≥6.5 & ≤8.5	0
Conductivity	µS/cm	External	2	865.5				
Total Dissolved Solids	mg/L	External	2	505			600	0
Chloride	mg/L	External	2	77.5			250	0
Fluoride	mg/L	External	2	0.7	1.5	0		
Selenium	mg/L	External	2	0.001	0.004	0		
Sodium	mg/L	External	2	200			180	2
Aluminium	mg/L	External	2	0.0025			0.2	0
Total Iron	mg/L	External	2	0.13			0.3	0
Soluble Iron	mg/L	External	2	0.125				
Total Manganese	mg/L	External	2	0.0135	0.1	0	0.05	0
Soluble Manganese	mg/L	External	2	0.014				
Arsenic	mg/L	External	1	0.0005	0.01	0		
Cadmium	mg/L	External	1	0.00005	0.002	0		
Chromium	mg/L	External	1	0.0005	0.05	0		
Copper	mg/L	External	1	0.004	2	0	1	0
Mercury	mg/L	External	1	0.0001	0.001	0		
Lead	mg/L	External	1	0.0006	0.005	0		

Analyte	Units	Monitoring	Summary of Results		Guideline Values			
			Samples Tested	Average	Health	Exceedances	Aesthetic	Exceedances
Nickel	mg/L	External	1	0.0005	0.02	0		
Zinc	mg/L	External	1	0.006			3	0
Uranium	mg/L	External	2	0.001	0.017	0		
Gross Alpha	Bq/L	External	2	0.04±0.029			0.5	0
Gross Beta	Bq/L	External	2	0.043±0.043			0.5	0
Aesthetic Guideline Exceedance								
Health Guideline Exceedance								

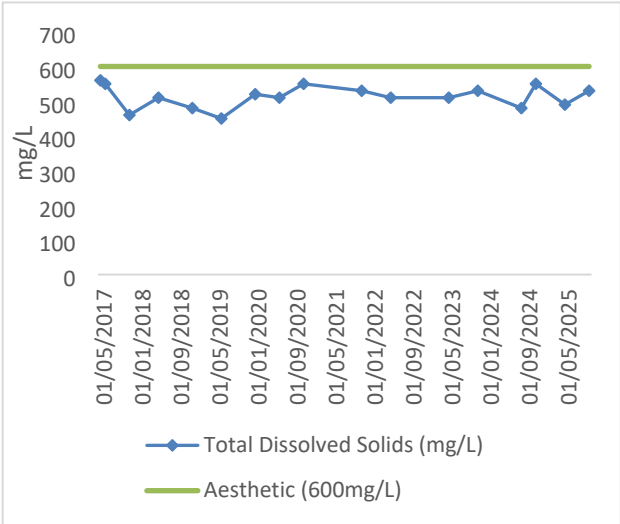


Figure 13: Bedourie source water Total Dissolved Solids trends, 2017- 2025.

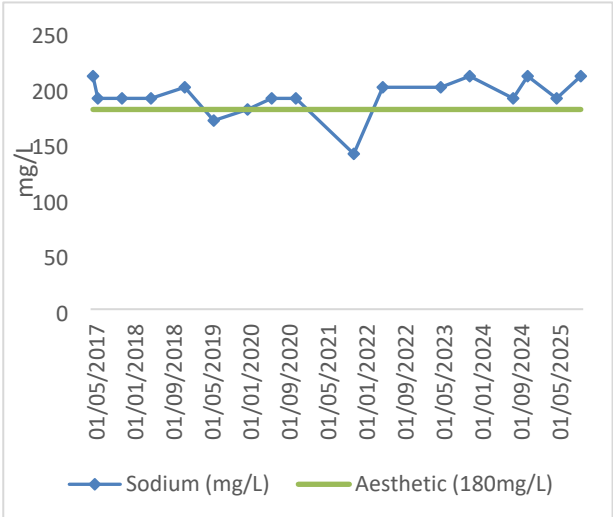


Figure 14: Bedourie source water Sodium trends, 2017- 2025.

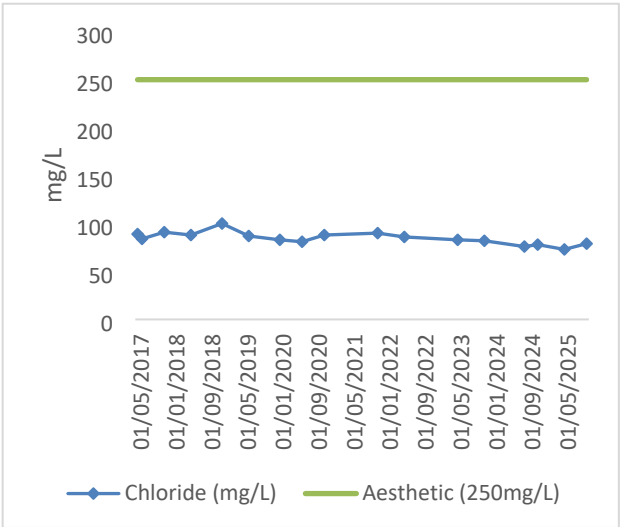


Figure 15: Bedourie source water Chloride trends, 2017- 2025.

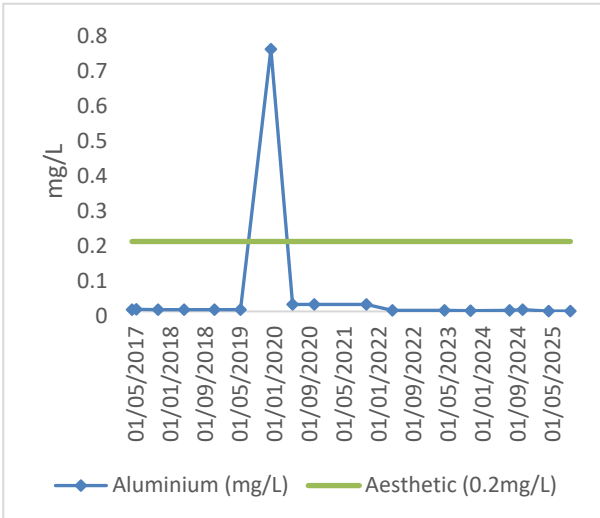


Figure 16: Bedourie source water Aluminium trends, 2017- 2025.

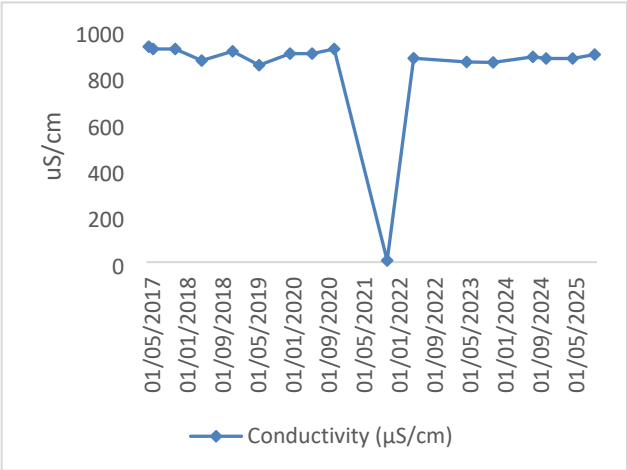


Figure 17: Bedourie source water Conductivity trends, 2017- 2025.

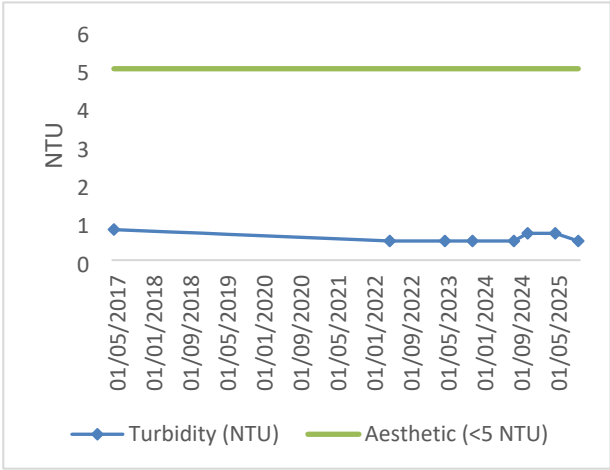


Figure 18: Bedourie source water Turbidity trends, 2017- 2025.

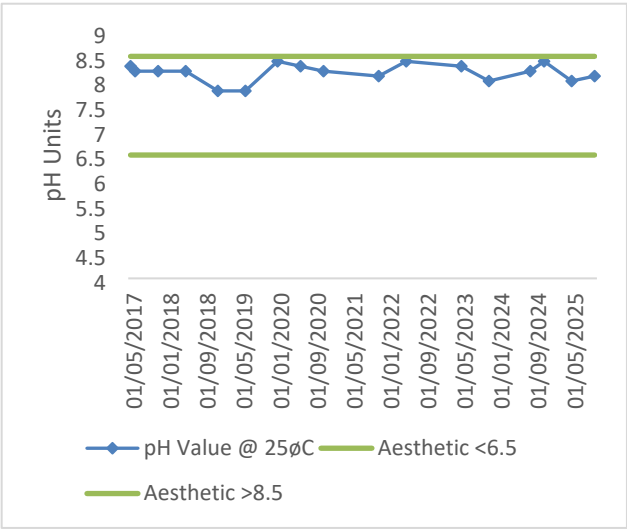


Figure 19: Bedourie source water pH trends, 2017- 2025.

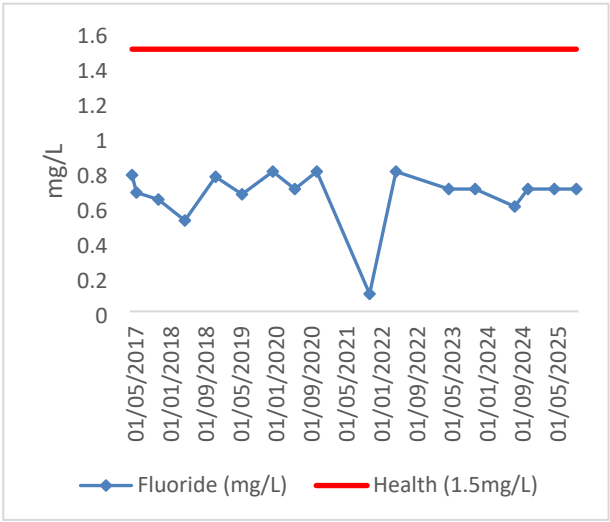


Figure 20: Bedourie source water Fluoride trends, 2017- 2025.

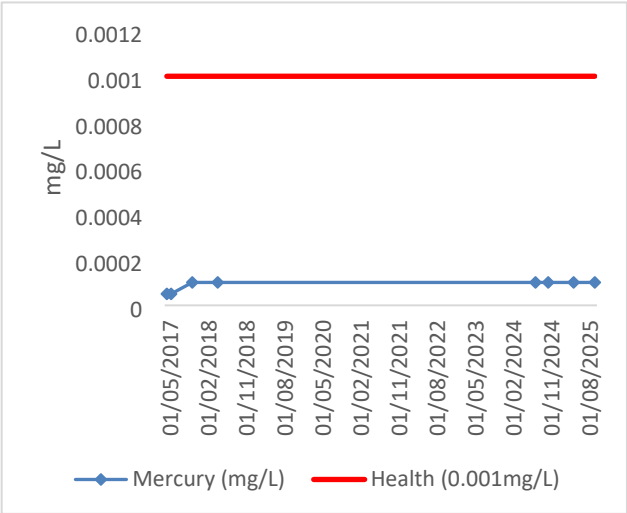


Figure 21: Bedourie source water Mercury trends, 2017- 2025.

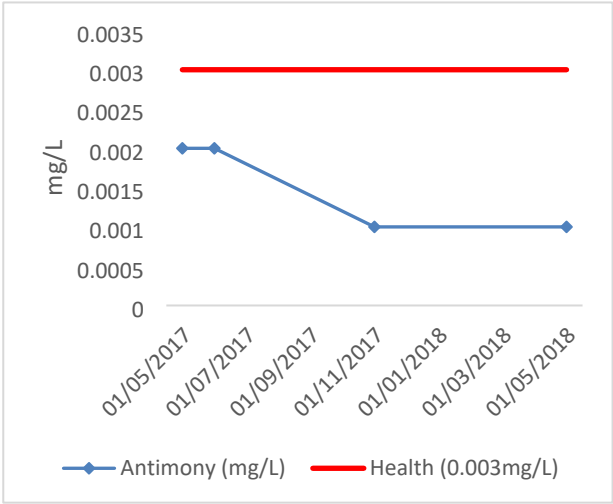


Figure 22: Bedourie source water Antimony trends, 2017- 2018.

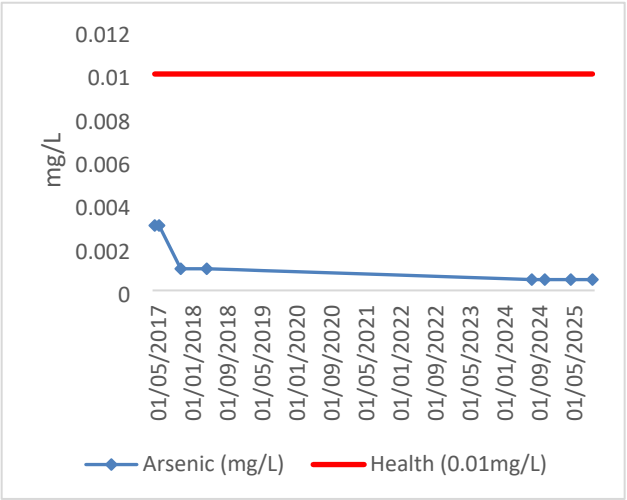


Figure 23: Bedourie source water Arsenic trends, 2017- 2025.

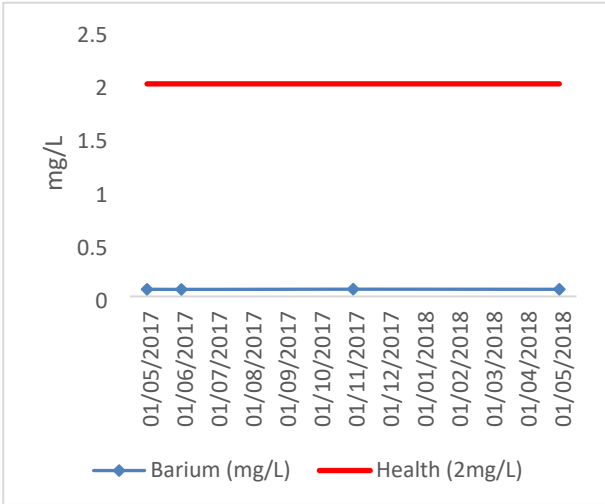


Figure 24: Bedourie source water Barium trends 2017- 2018.

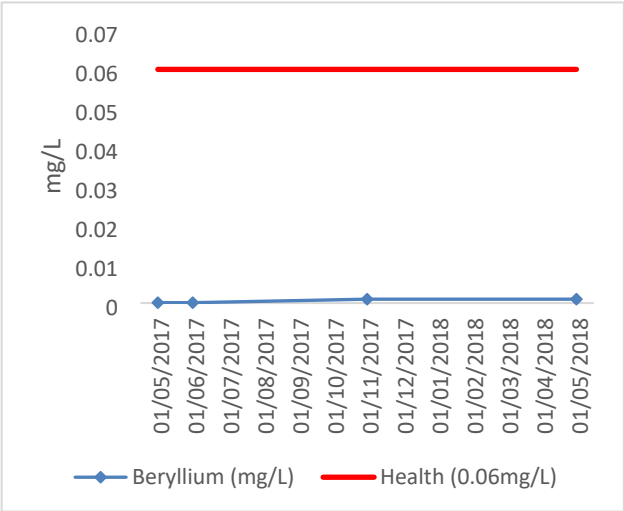


Figure 25: Bedourie source water Beryllium trends, 2017- 2018.

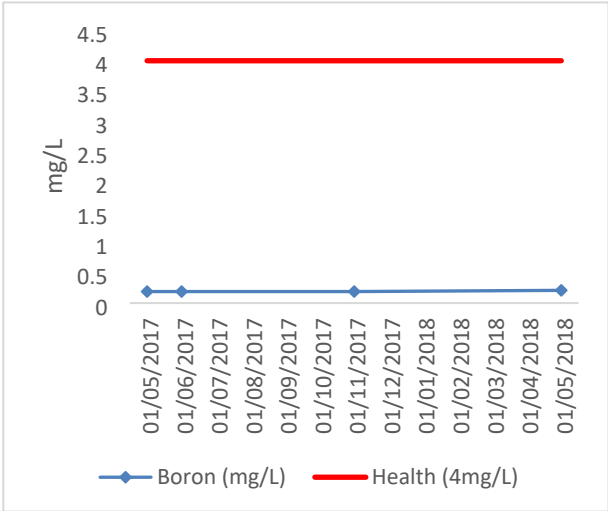


Figure 26: Bedourie source water Boron trends, 2017- 2018.

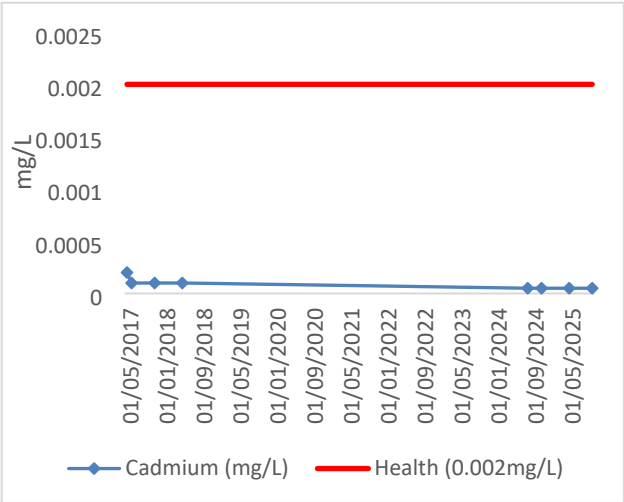


Figure 27: Bedourie source water Cadmium trends, 2017- 2025.

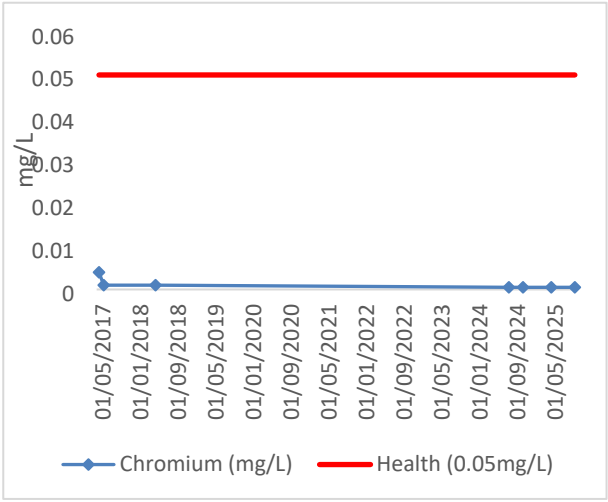


Figure 28: Bedourie source water Chromium trends, 2017- 2025.

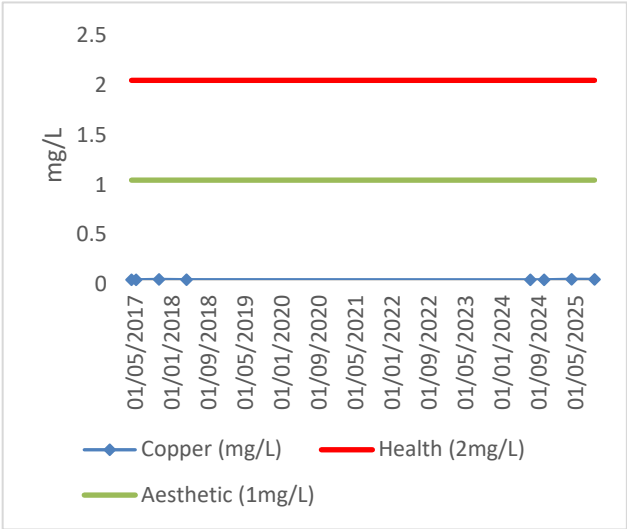


Figure 29: Bedourie source water Copper trends, 2017- 2025.

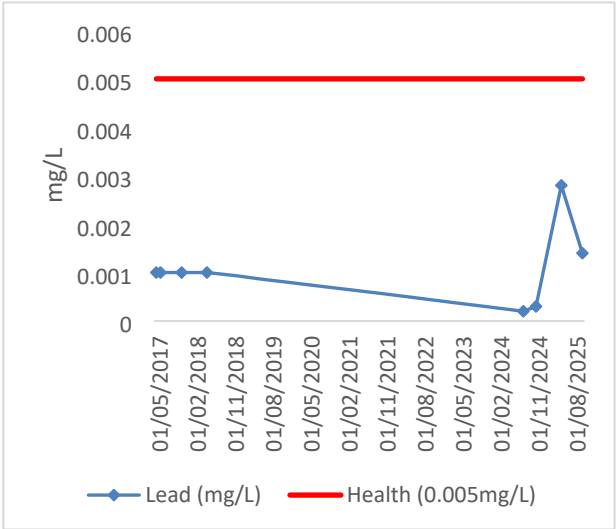


Figure 30: Bedourie source water Lead trends, 2017- 2025.

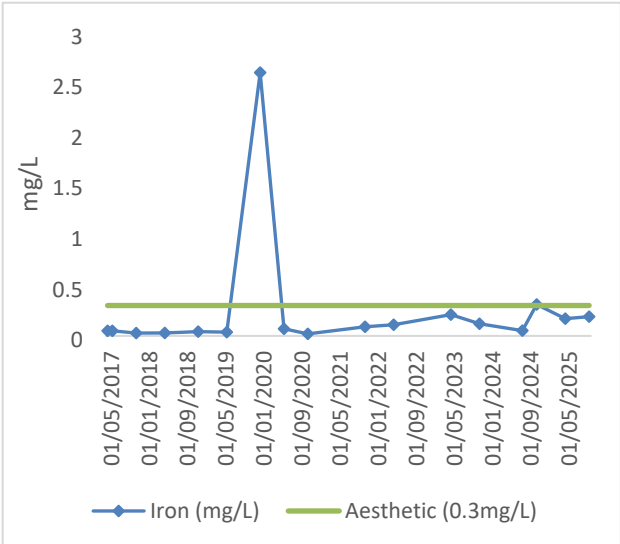


Figure 31: Bedourie source water Iron trends, 2017- 2025.

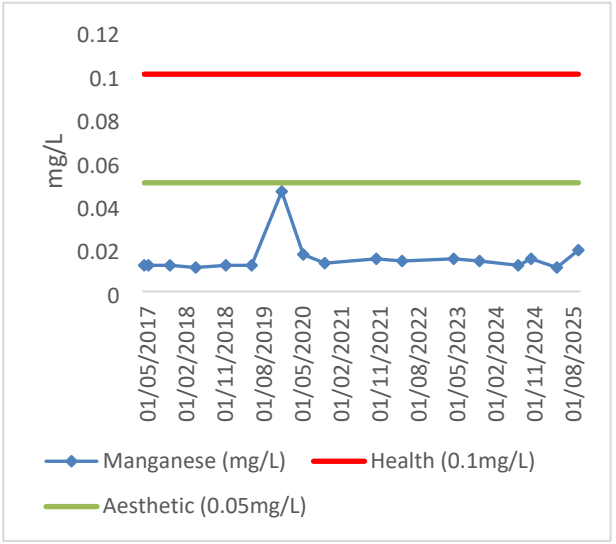


Figure 32: Bedourie source water Manganese trends, 2017- 2025.

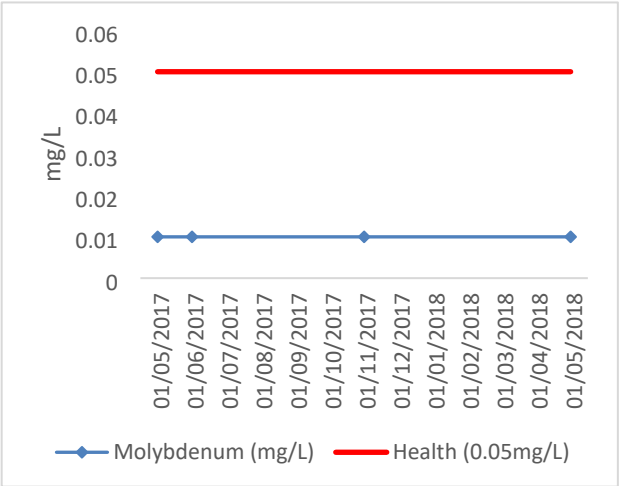


Figure 33: Bedourie source water Molybdenum trends, 2017- 2018.

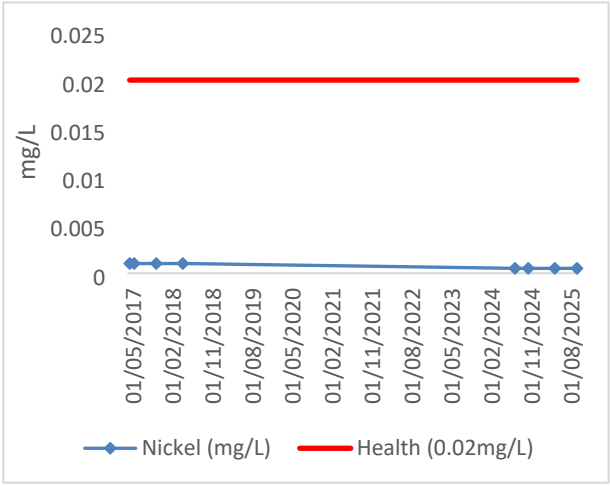


Figure 34: Bedourie source water Nickel trends, 2017- 2025.

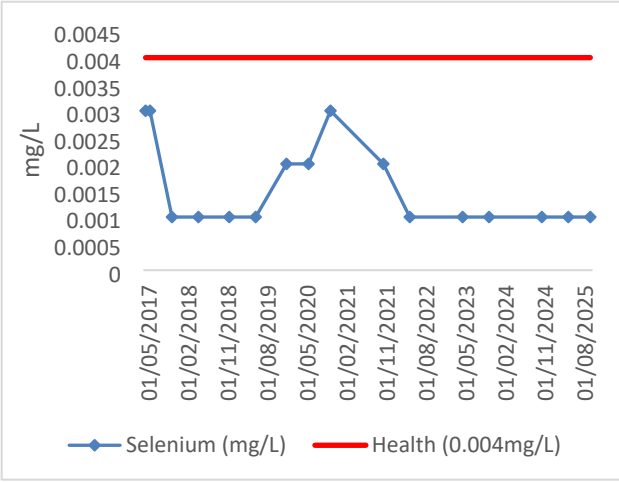


Figure 35: Bedourie source water Selenium trends, 2017- 2025.

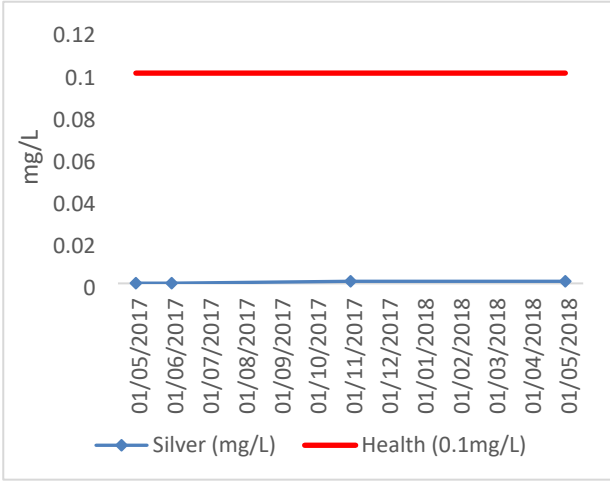


Figure 36: Bedourie source water Silver trends, 2017- 2018.

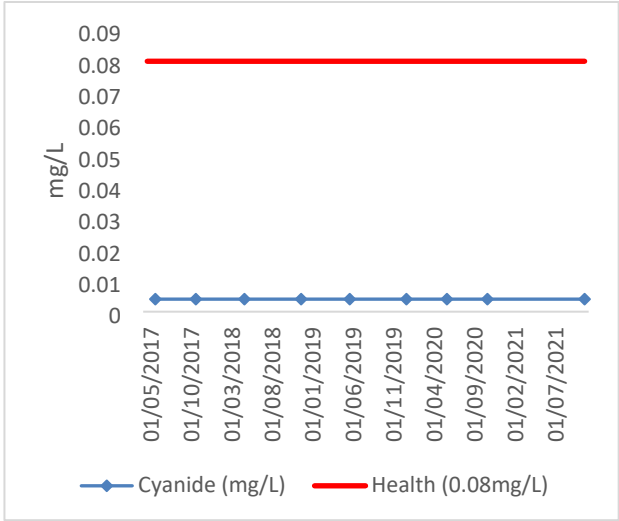


Figure 37: Bedourie source water Cyanide trends, 2017- 2025.

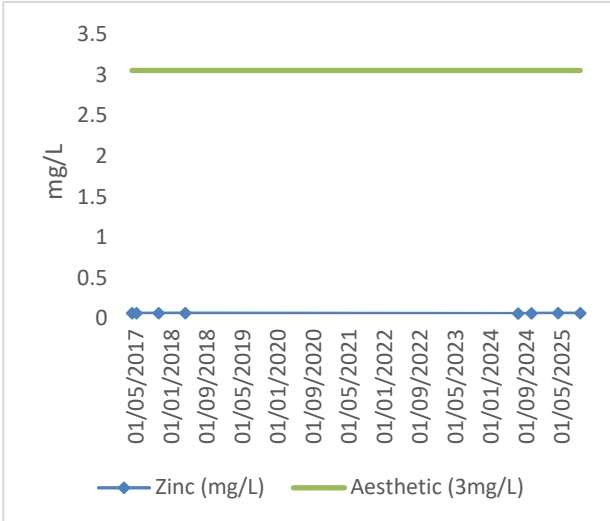


Figure 38: Bedourie source water Zinc trends, 2017- 2025.

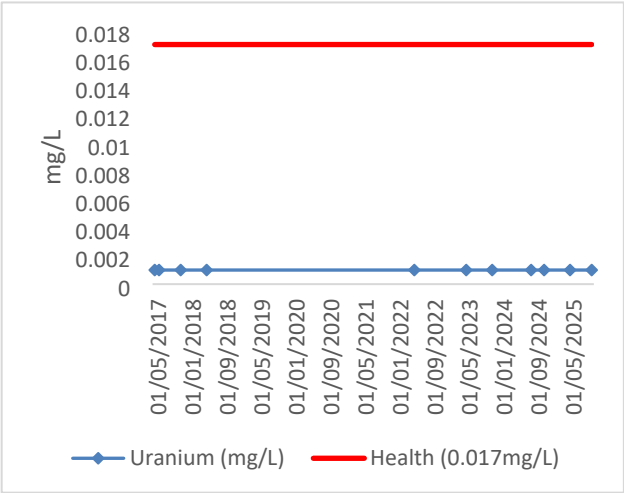


Figure 39: Bedourie source water Uranium trends, 2017- 2025.

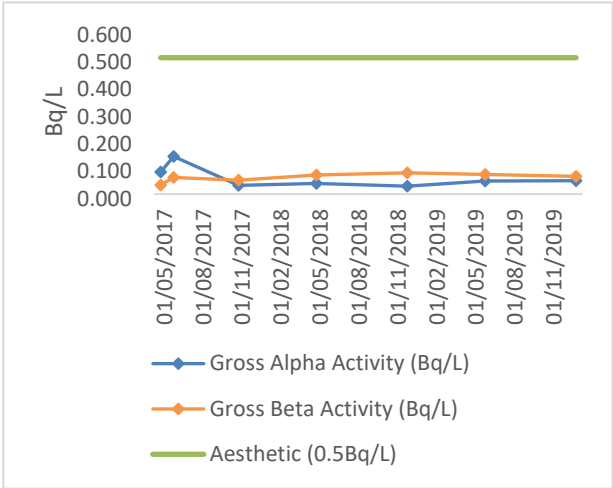


Figure 40: Bedourie source water Gross Alpha and Gross Beta trends, 2022- 2025.

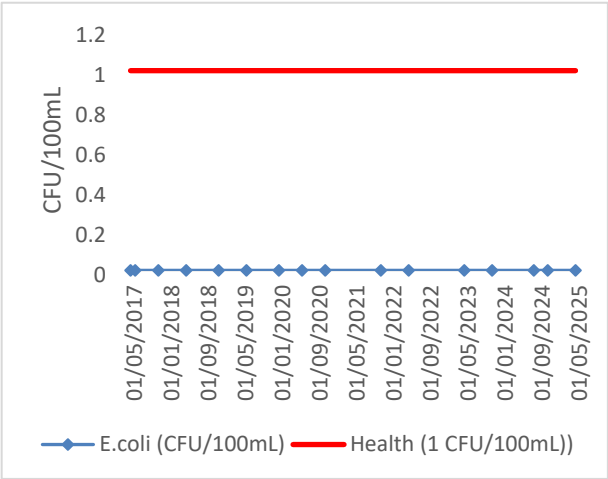


Figure 41: Bedourie source water *E.coli* trends, 2017- 2025.

5.1.1 Bedourie Water Quality ADWG Value Exceedances

Bedourie's source water has natural elevated levels of Sodium. 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, 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 to an individual's total intake; therefore, no health guideline value has been set for Sodium concentrations in drinking water. It should also be noted that Bedourie's average Sodium concentration within the distribution system sits at 200mg/L, only slightly above the ADWG and therefore, this is considered acceptable by Council.

Additionally, there have been ADWG aesthetic exceedances for Iron (2x source water exceedances) and Aluminium (1x source water exceedance). Both of these exceedances were isolated incidents and therefore, are considered outliers and not a concern for the scheme.

Finally, there have been two historic *E.coli* detections within the scheme which occurred in July and August of 2009. At the time this was attributed to pathogenic ingress following on from mains repairs. Since these two detections, Council have prioritised good hygiene practices when repairing, maintaining, or commissioning new mains and subsequently there have been no more *E.coli* detections within the scheme. In mid-2012, *E.coli* sampling was increased from one to three distribution samples per month to further improve the reliability and validity of the in-house monitoring programme.

5.2 Birdsville Drinking Water Quality Summary 2017- 2025.

Table 7: Birdsville internal and external water quality monitoring – Birdsville Old Bore.

Analyte	Units	Monitoring	Summary of Results						Guideline Values			
			Samples Tested	Maximum Value	Mean Value	Minimum Values	Std Dev	95 th %	Health	Exceedances	Aesthetic	Exceedances
<i>E. coli</i>	MPN/100mL	Internal	213	0	0	0	0	0	1	0		
Total Coliforms	MPN/100mL	Internal	192	0	0	0	0	0				
Turbidity	NTU	Internal	75	3.4	0.74	0.03	0.92	2.53			5	0
<i>E. coli</i>	CFU/100ml	External	17	0	0	0	0	0	1	0		
Total Coliforms	CFU/100mL	External	17	31	1.823529	0	7.294118	6.2				
Turbidity	NTU	External	8	1	0.6	0.5	0.165831	0.895			5	0
Dissolved Organic Carbon	mg/L	External	17	4.9	1.388235	0.2	1.275047	4.18				
pH	pH Units	External	18	8.5	8.111111	7.7	0.233069	8.415			≥6.5 & ≤8.5	0
Conductivity	µS/cm	External	18	928	815.7222	710	45.21775	864.25				
Total Dissolved Solids	mg/L	External	18	570	522.7222	480	28.81706	561.5			600	0
Chloride	mg/L	External	18	58	54.77778	49	2.322727	58			250	0
Fluoride	mg/L	External	18	1.9	1.666667	1.5	0.11547	1.815	1.5	18		
Selenium	mg/L	External	16	0.002	0.00125	0.001	0.000433	0.002	0.004	0		
Silver	mg/L	External	4	0.001	0.001	0.001	0	0.001	0.1	0		
Sodium	mg/L	External	18	220	188.3333	150	17.71691	211.5			180	12
Aluminium	mg/L	External	17	0.046	0.035706	0.001	0.009688	0.0436			0.2	0
Total Iron	mg/L	External	18	0.15	0.028444	0.007	0.032762	0.08795			0.3	0
Soluble Iron	mg/L	External	18	0.085	0.017389	0.005	0.016955	0.02975				
Total Manganese	mg/L	External	18	0.023	0.013922	0.0006	0.006269	0.0213	0.1	0	0.05	0
Soluble Manganese	mg/L	External	18	0.019	0.011711	0.0005	0.006223	0.019				
Arsenic	mg/L	External	8	0.001	0.00075	0.0005	0.00025	0.001	0.01	0		

Analyte	Units	Monitoring	Summary of Results						Guideline Values			
			Samples Tested	Maximum Value	Mean Value	Minimum Values	Std Dev	95 th %	Health	Exceedances	Aesthetic	Exceedances
Antimony	mg/L	External	4	0.001	0.001	0.001	0	0.001	0.003	0		
Barium	mg/L	External	4	0.18	0.17	0.16	0.007071	0.1785	2	0		
Boron	mg/L	External	4	0.54	0.5075	0.48	0.023848	0.537	4	0		
Beryllium	mg/L	External	4	0.001	0.001	0.001	0	0.001	0.06	0		
Cadmium	mg/L	External	8	0.0001	0.000075	0.00005	0.000025	0.0001	0.002	0		
Cyanide	mg/L	External	10	0.009	0.0045	0.004	0.0015	0.00675	0.08	0		
Chromium	mg/L	External	8	0.001	0.00075	0.0005	0.00025	0.001	0.05	0		
Copper	mg/L	External	8	0.24	0.031375	0.001	0.078859	0.1574	2	0	1	0
Mercury	mg/L	External	8	0.0001	0.0001	0.0001	0	0.0001	0.001	0		
Molybdenum	mg/L	External	4	0.002	0.00125	0.001	0.000433	0.00185	0.05	0		
Lead	mg/L	External	8	0.001	0.0006	0.0002	0.0004	0.001	0.005	0		
Nickel	mg/L	External	8	0.001	0.00075	0.0005	0.00025	0.001	0.02	0		
Zinc	mg/L	External	8	0.022	0.006	0.001	0.006305	0.0164			3	0
Uranium	mg/L	External	11	0.001	0.001	0.001	0	0.001	0.017	0		
Gross Alpha	Bq/L	External	7	0.133±0.044	0.065±0.032	0.02±0.022	0.038±0.007	0.123±0.04			0.5	0
Gross Beta	Bq/L	External	7	0.087±0.047	0.066±0.043	0.033±0.039	0.018±0.003	0.086±0.05			0.5	0
Aesthetic Guideline Exceedance												
Health Guideline Exceedance												

Table 8: Birdsville external water quality monitoring 2017-2025– Distribution System.

Analyte	Units	Monitoring	Summary of Results		Guideline Values			
			Samples Tested	Average	Health	Exceedances	Aesthetic	Exceedances
<i>E. coli</i>	MPN/100mL	External	2	0	1	0		
Total Coliforms	MPN/100mL	External	2	0				
Turbidity	NTU	External	2	0.5			5	0
Dissolved Organic Carbon	mg/L	External	2	1				
pH	pH Units	External	2	8.1			≥6.5 & ≤8.5	0
Conductivity	µS/cm	External	2	798.5				
Total Dissolved Solids	mg/L	External	2	530			600	0
Chloride	mg/L	External	2	54			250	0
Fluoride	mg/L	External	2	1.6	1.5	2		
Selenium	mg/L	External	2	0.001	0.004	0		
Sodium	mg/L	External	2	195			180	2
Aluminium	mg/L	External	2	0.0195			0.2	0
Total Iron	mg/L	External	2	0.0125			0.3	0
Soluble Iron	mg/L	External	2	0.0085				
Total Manganese	mg/L	External	2	0.017	0.1	0	0.05	0
Soluble Manganese	mg/L	External	2	0.017				
Arsenic	mg/L	External	1	0.0005	0.01	0		
Cadmium	mg/L	External	1	0.00005	0.002	0		
Chromium	mg/L	External	1	0.0005	0.05	0		
Copper	mg/L	External	1	0.001	2	0	1	0
Mercury	mg/L	External	1	0.0001	0.001	0		
Lead	mg/L	External	1	0.0002	0.005	0		

Analyte	Units	Monitoring	Summary of Results		Guideline Values			
			Samples Tested	Average	Health	Exceedances	Aesthetic	Exceedances
Nickel	mg/L	External	1	0.0005	0.02	0		
Zinc	mg/L	External	1	0.001			3	0
Uranium	mg/L	External	2	0.001	0.017	0		
Gross Alpha	Bq/L	External	2	0.056±0.031			0.5	0
Gross Beta	Bq/L	External	2	0.062±0.042			0.5	0
Aesthetic Guideline Exceedance								
Health Guideline Exceedance								

Table 9: Birdsville internal water quality monitoring 2017-2025– Birdsville New Bore (not yet commissioned).

Analyte	Units	Monitoring	Summary of Results		Guideline Values			
			Samples Tested	Value	Health	Exceedances	Aesthetic	Exceedances
<i>E. coli</i>	MPN/100mL	External	1	0	1	0		
Total Coliforms	MPN/100mL	External	1	0				
Turbidity	NTU	External	1	0.7			5	0
Dissolved Organic Carbon	mg/L	External	1	1				
pH	pH Units	External	1	7.5			≥6.5 & ≤8.5	0
Conductivity	µS/cm	External	1	818				
Total Dissolved Solids	mg/L	External	1	540			600	0
Chloride	mg/L	External	1	52			250	0
Fluoride	mg/L	External	1	1.6	1.5	1		
Selenium	mg/L	External	1	0.001	0.004	0		
Sodium	mg/L	External	1	200			180	1
Aluminium	mg/L	External	1	0.021			0.2	0
Total Iron	mg/L	External	1	3			0.3	1
Soluble Iron	mg/L	External	1	3.2				
Total Manganese	mg/L	External	1	0.059	0.1	0	0.05	1
Soluble Manganese	mg/L	External	1	0.054				
Arsenic	mg/L	External	1	0.0005	0.01	0		
Cadmium	mg/L	External	1	0.00005	0.002	0		
Chromium	mg/L	External	1	0.0005	0.05	0		
Copper	mg/L	External	1	0.015	2	0	1	0
Mercury	mg/L	External	1	0.0001	0.001	0		
Lead	mg/L	External	1	0.0049	0.005	0		

Analyte	Units	Monitoring	Summary of Results		Guideline Values			
			Samples Tested	Value	Health	Exceedances	Aesthetic	Exceedances
Nickel	mg/L	External	1	0.0005	0.02	0		
Zinc	mg/L	External	1	0.004			3	0
Uranium	mg/L	External	1	0.001	0.017	0		
Gross Alpha	Bq/L	External	1	0.043			0.5	0
Gross Beta	Bq/L	External	1	0.044 ±0.042			0.5	0
Aesthetic Guideline Exceedance								
Health Guideline Exceedance								

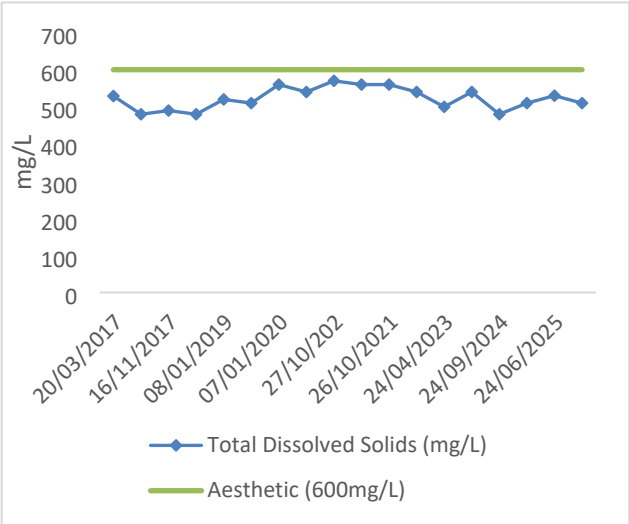


Figure 42: Birdsville source water Total Dissolved Solids trends, 2017- 2025.

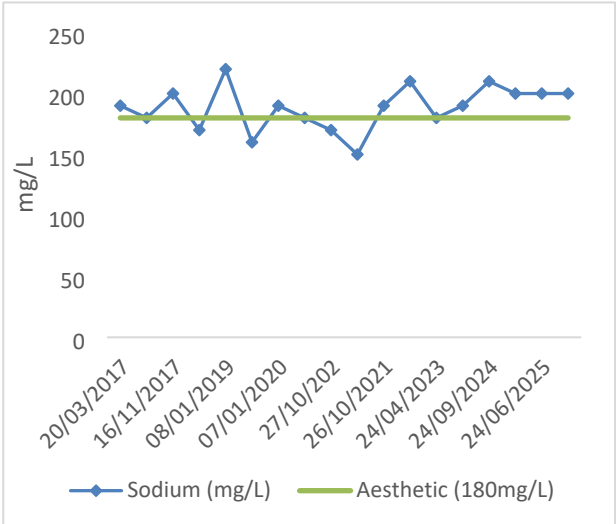


Figure 43: Birdsville source water Sodium trends, 2017- 2025.

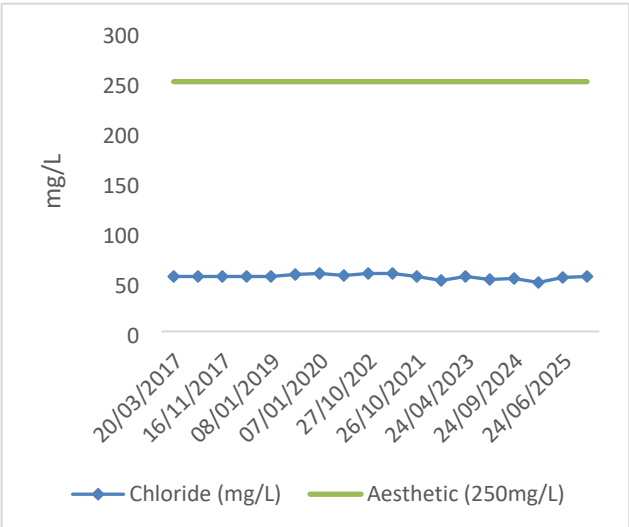


Figure 44: Birdsville source water Chloride trends, 2017- 2025.

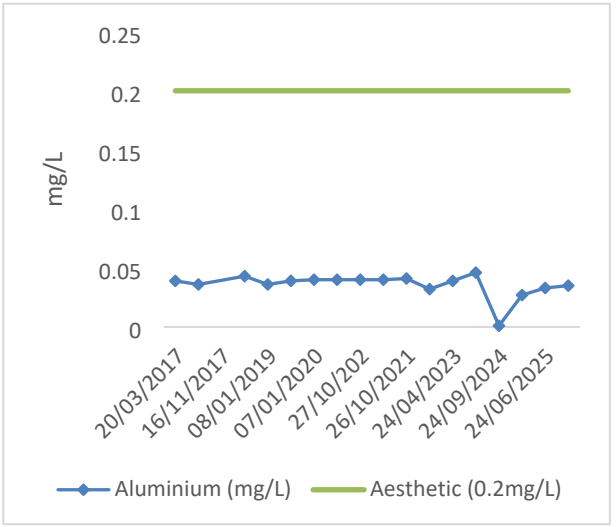


Figure 45: Birdsville source water Aluminium trends, 2017- 2025.

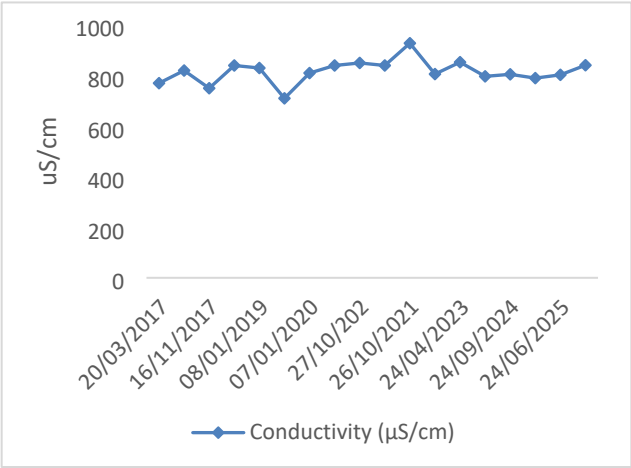


Figure 46: Birdsville source water Conductivity trends, 2017- 2025.

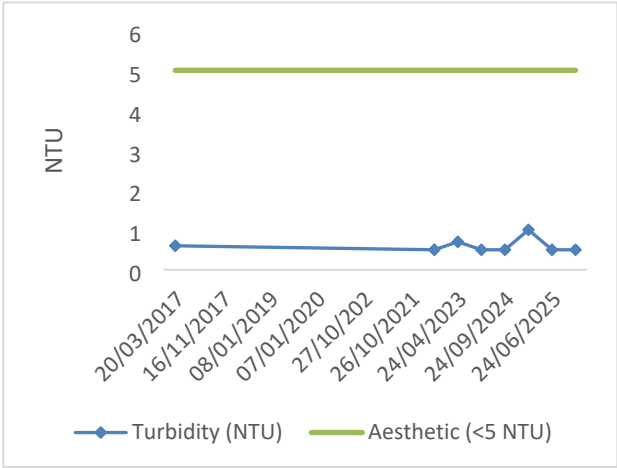


Figure 47: Birdsville source water Turbidity trends, 2017- 2025.

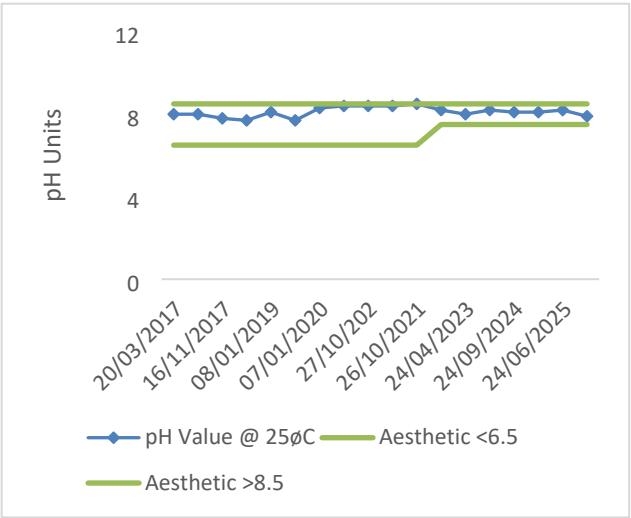


Figure 48: Birdsville source water pH trends, 2017- 2025.

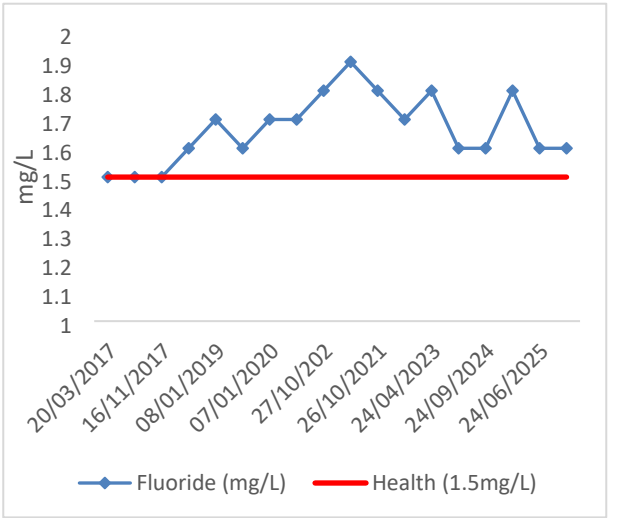


Figure 49: Birdsville source water Fluoride trends, 2017- 2025.

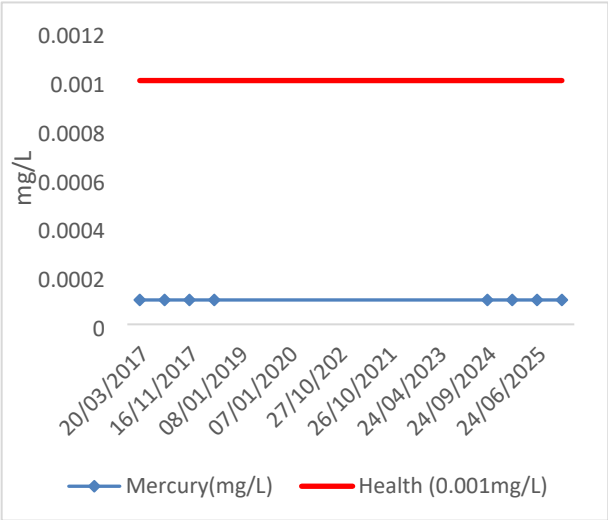


Figure 50: Birdsville source water Mercury trends, 2017- 2025.

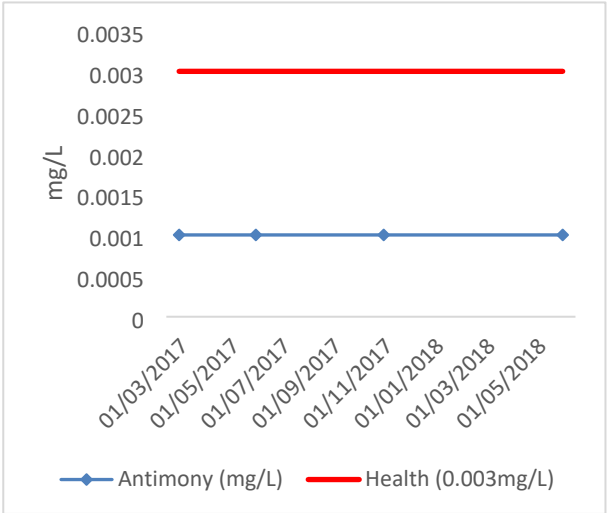


Figure 51: Birdsville source water Antimony trends, 2017- 2018.

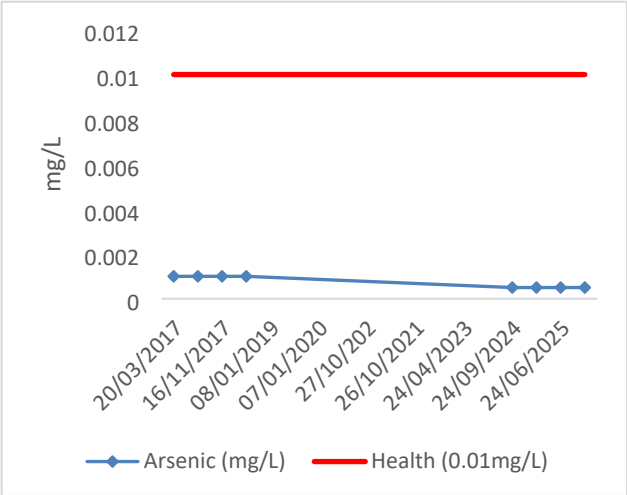


Figure 52: Birdsville source water Arsenic trends, 2017- 2025.

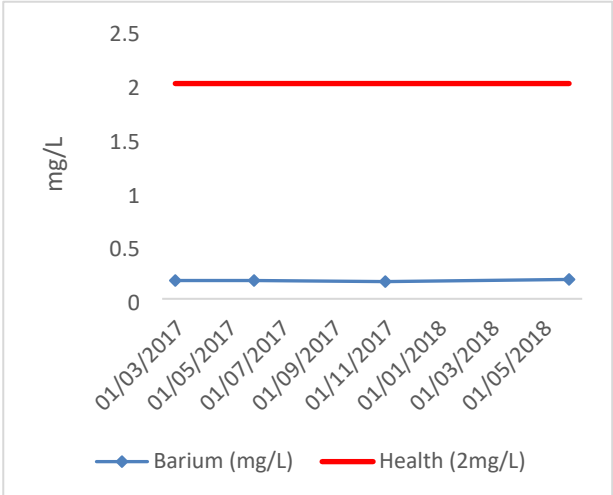


Figure 53: Birdsville source water Barium trends 2017- 2018.

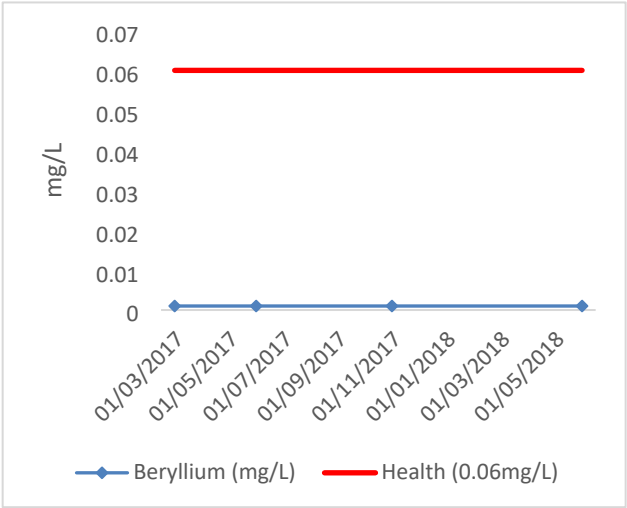


Figure 54: Birdsville source water Beryllium trends, 2017- 2018.

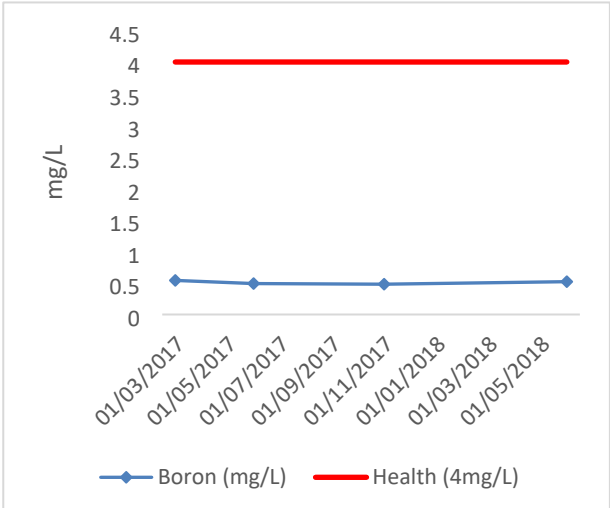


Figure 55: Birdsville source water Boron trends, 2017- 2018.

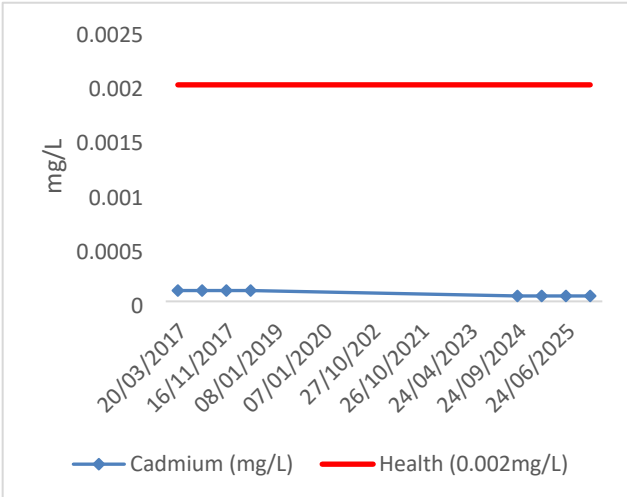


Figure 56: Birdsville source water Cadmium trends, 2017- 2025.

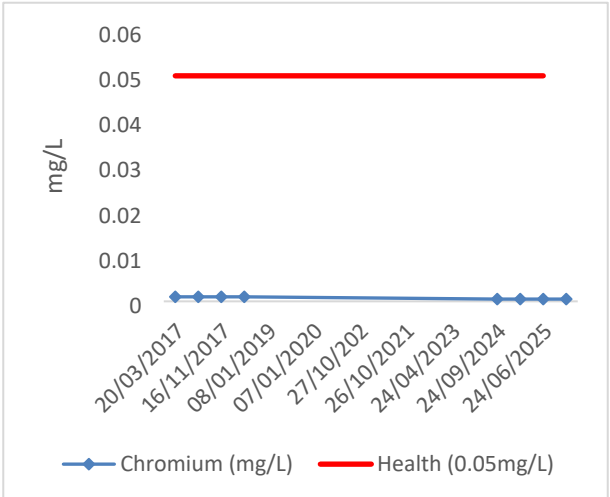


Figure 57: Birdsville source water Chromium trends, 2017- 2025.

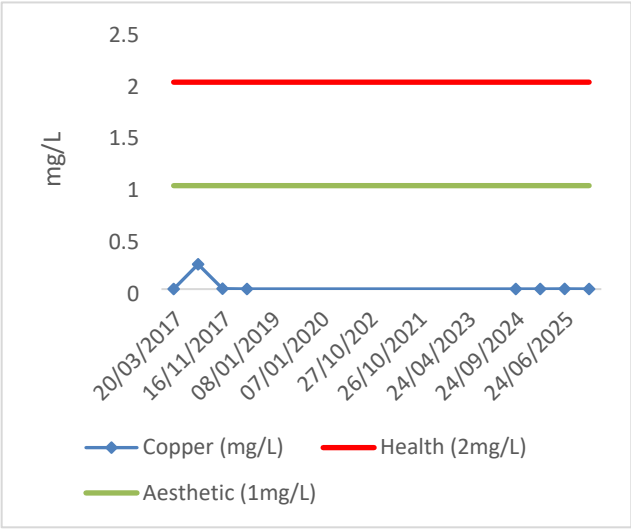


Figure 58: Birdsville source water Copper trends, 2017- 2025.

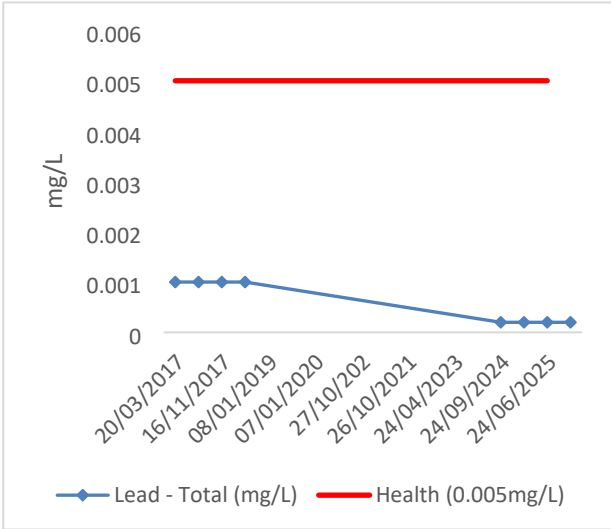


Figure 59: Birdsville source water Lead trends, 2017- 2025.

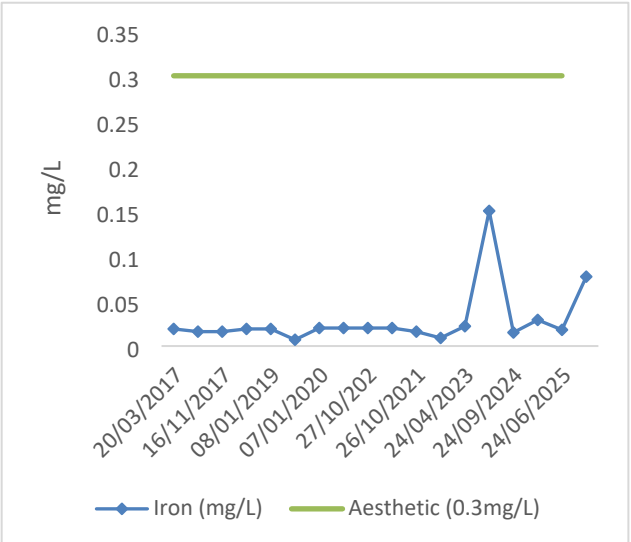


Figure 60: Birdsville source water Iron trends, 2017- 2025.



Figure 61: Birdsville source water Manganese trends, 2017- 2025.

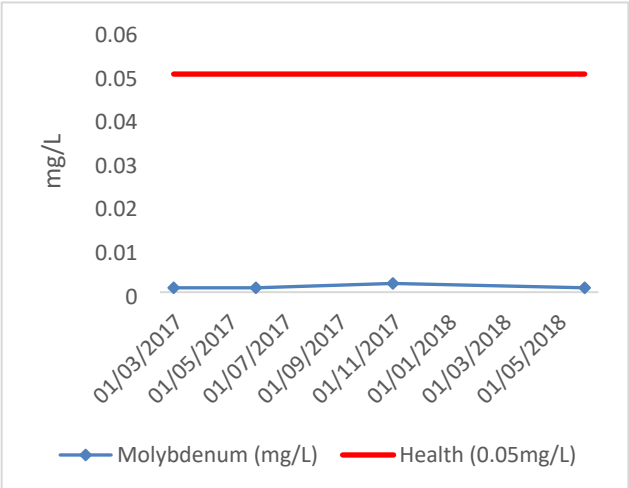


Figure 62: Birdsville source water Molybdenum trends, 2017- 2018.

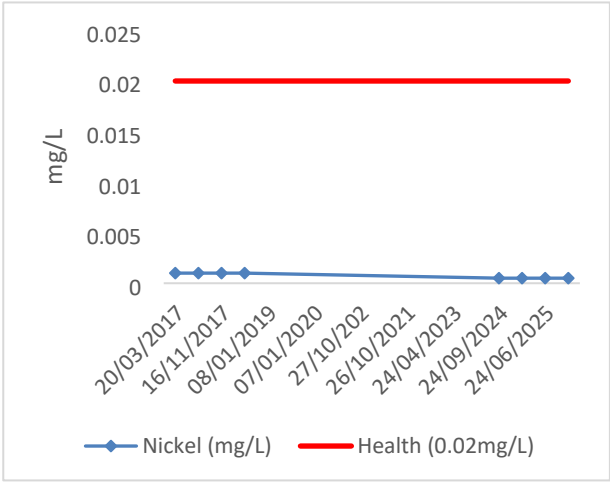


Figure 63: Birdsville source water Nickel trends, 2017- 2025.

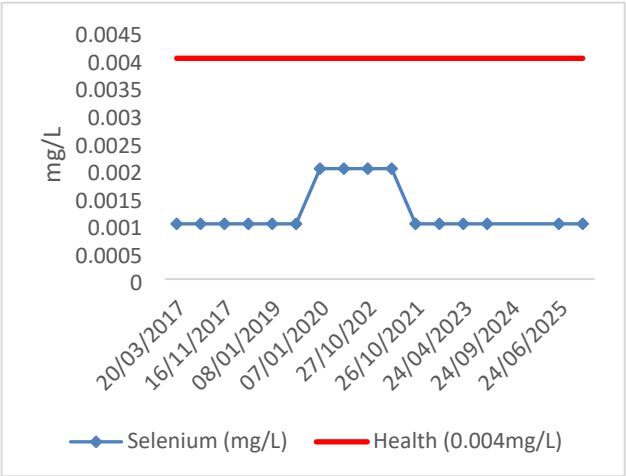


Figure 64: Birdsville source water Selenium trends, 2017- 2025.

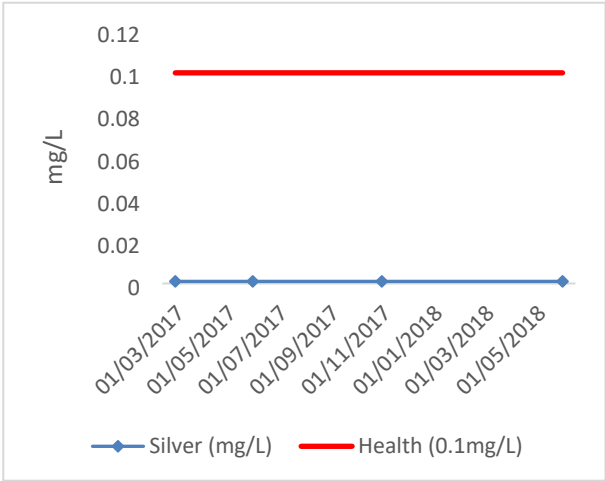


Figure 65: Birdsville source water Silver trends, 2017- 2018.

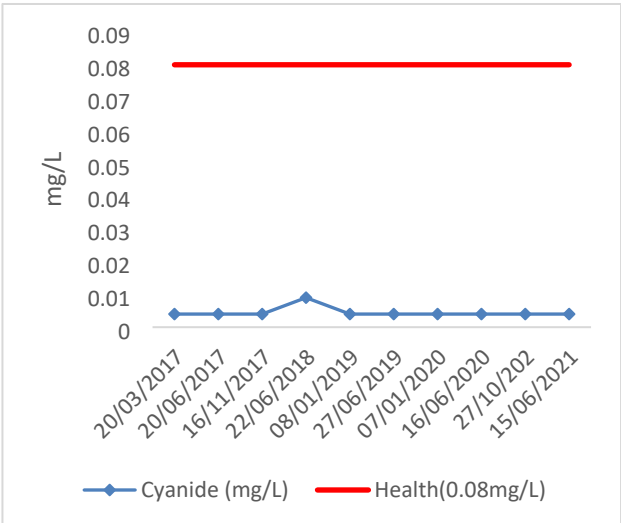


Figure 66: Birdsville source water Cyanide trends, 2017- 2025.

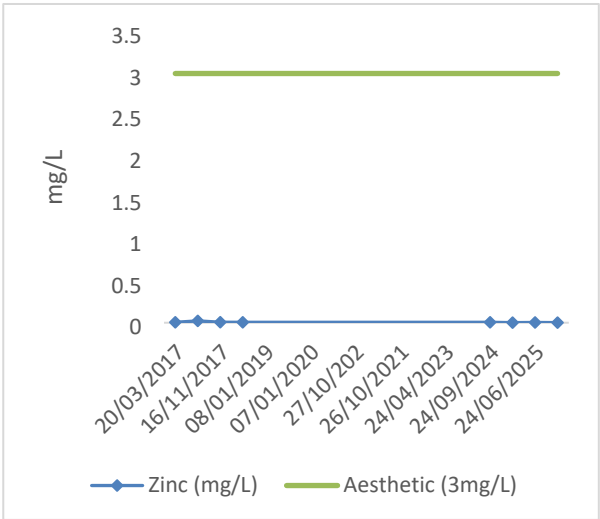


Figure 67: Birdsville source water Zinc trends, 2017- 2025.

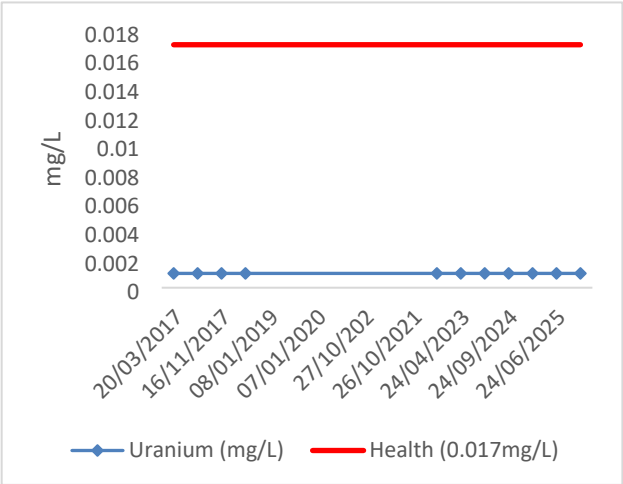


Figure 68: Birdsville source water Uranium trends, 2017- 2025.

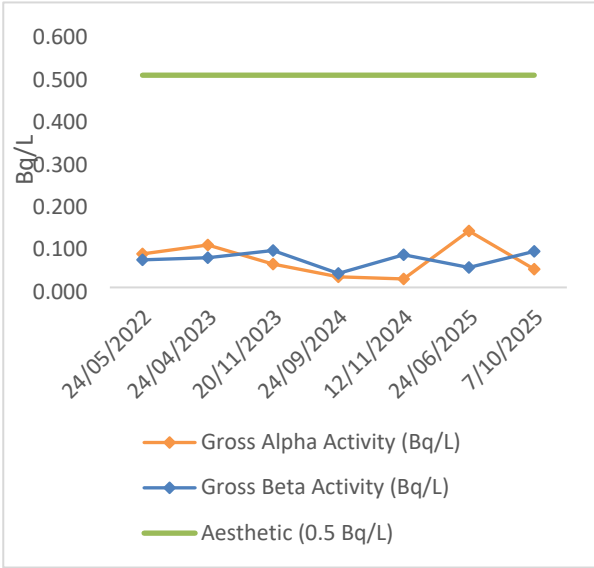


Figure 69: Birdsville source water Gross Alpha and Gross Beta trends, 2022- 2025.

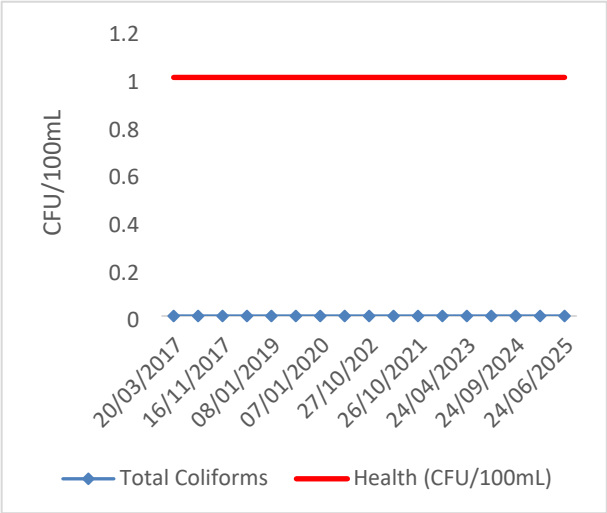


Figure 70: Birdsville source water *E.coli* trends, 2017- 2025.

5.2.1 Birdsville Water Quality ADWG Value Exceedances

Similar to Bedourie, Birdsville's drinking water has naturally elevated Sodium levels, with an average concentration of 195mg/L in the distribution system. As this is only slightly above the ADWG aesthetic limit, this is considered acceptable by Council.

Birdsville's drinking water also has naturally elevated Fluoride levels which are consistently above the ADWG health value, this is discussed in more depth in Section 5.2.3 below.

There have been two *E.coli* detections within the Birdsville scheme, occurring in February and April of 2011. The *E.coli* detections were associated with a failure of the reservoir roof which had rusted badly and was allowing for birds and possibly even small vertebrates to access the drinking water supply. The roof was replaced in 2013 and is now properly vermin-proofed. There have been no more *E.coli* detections within the scheme since. In mid-2012, *E.coli* sampling was increased from one to three distribution samples per month to further improve the reliability and validity of the in-house monitoring programme.

5.2.2 Birdsville High Water Temperature

Birdsville's high water temperature is a characteristic of deep Artesian water. As mentioned above, Council uses three heat exchangers to reduce the temperature of the water being reticulated to the town. Currently, the old system heat exchangers are cleaned approximately every 2-months, although temperature fluctuations observed during visual inspections can indicate a need for cleaning or other operational issues. Once commissioned, the new heat exchange system will be cleaned at 6-monthly intervals.

If both the old and new heat exchange systems were to fail or were required to be taken off-line for repairs, Council would issue a Public Notice via the usual communication methods (outlined in Section 10 below) warning individuals of the elevated water temperature. Water restrictions may also be implemented to help curb unnecessary water use. Additionally, some level of cooling would still be provided by the reservoirs.

If a power outage were to occur, a back-up generator is available on-site to run the heat exchange systems.

To assist with unplanned maintenance issues, a plumber can be flown in from either Boulia or Mt Isa and an electrician from Mt Isa. Due to good working relationships, this can usually be done on short notice if required.

5.2.3 Birdsville Elevated Fluoride

DSC has an ongoing Drinking Water Incident for the elevated Fluoride levels within Birdsville's drinking water. Elevated Fluoride is associated with Birdsville's natural geology and averages around 1.7 mg/L, slightly above ADWG health value of 1.5 mg/L. Treatment to reduce Fluoride levels is not financially feasible for Council considering the town's small population and that the concentration is only slightly above the ADWG health value. The main issues associated with elevated Fluoride is dental fluorosis primarily affecting children under the age of 6. Despite the frequent exceedance of Fluoride levels, 6-monthly verification monitoring has been deemed suitable for the scheme as historical data has identified Fluoride concentrations to remain within a consistent range. At this stage, Council's primary management strategy is to provide public notification to Birdsville residents in the form of a Fluoride factsheet to help the community understand the potential impacts of elevated Fluoride in the drinking water supply. Refer to Appendix C for a copy of the Fluoride factsheet.

5.3 *Naegleria fowleri*

In December 2025, external water quality monitoring was undertaken for *Naegleria fowleri* within the Bedourie and Birdsville schemes. Results from this testing are provided in Table 10 below. *N. fowleri* was not detected in either of the schemes.

The chosen locations included:

- Bedourie Council Depot – chosen to provide a representative sample for the distribution system. Being a closed system that flows under positive pressure, the only chance for *N. fowleri* to enter into the drinking water supply would be during a mains break.
- Birdsville Elevated Reservoir – considered the most likely point of ingress for the scheme since the water temperature in the ground level reservoir exceeds the amoeba's upper thermal limit.

Table 10: *N. fowleri* water quality monitoring undertaken in Bedourie and Birdsville.

Location	Parameter	Results
Bedourie Council Depot	<i>Naegleria</i> spp.	Not Detected
	<i>N. fowleri</i>	Not Detected
Birdsville Elevated Reservoir	<i>Naegleria</i> spp.	Not Detected
	<i>N. fowleri</i>	Not Detected

5.4 Drinking Water Complaints

Diamantina Shire Council has several ways that complaints can be made, all of which are outlined on the Council website: <https://www.diamantina.qld.gov.au/about-council/complaints>.

Complaints can be made via the following methods:

- In person at Council's Administration Centre in Bedourie or by calling (07) 4746 1600.
- By filling in the Administrative Action Complaint Form, available online from the Council website.
- In writing, by letter or email, addressed to the Chief Executive Officer.

Postal Address: 17 Herbert Street, BEDOURIE QLD 4829

Fax: (07) 4746 1272

Email: admin@diamantina.qld.gov.au

The following details must be included when a complaint is lodged:

- The nature of the complaint with as much detail as possible;
- Details of any loss or detriment suffered;
- If the incident has been reported to any other agency or authority;
- The remedy being sought;
- Any supporting information or documentation, including names and contact details of anyone else who is able to support the complaint;
- Details of the complainant.

Council aims to investigate all complaints as quickly and efficiently as possible. The officer handling each complaint will contact the complainant within 7 days of the complaint being made to provide an update on any rectification methods and their expected timeframes. Where necessary, Council can assist complainants in lodging their complaints.

All drinking water complaints that are lodged with Council are sent directly to the Facilities and Town Services Manager who actions them. Once received, all complaints are filed in Council's database and kept for a minimum of five years.

It should be noted that it is not uncommon for informal complaints to be made to Council. Due to the small populations of the towns, most individuals know they can talk directly to the water operators for any drinking water related issues. If informal complaints are made, these are investigated by Council with details of the investigation outcomes recorded in Council's document management system. Council acknowledges that in the past, informal complaints may have been made and not properly recorded. Moving forward Council will ensure that all informal/formal complaints are adequately documented.

5.4.1 Bedourie Drinking Water Quality Complaints

To date, there is no record of any formal water quality complaints within the Bedourie drinking water scheme.

5.4.2 Birdsville Drinking Water Quality Complaints

In 2012, Council had two written complaints stating that the water was foul smelling. At this time Council had been repainting both drinking water reservoirs and water was being run directly to town. Under normal operating conditions, the bore water would have sat in the reservoirs, aerating the Sulphur and removing the foul smell. However, due to the required maintenance, there was no opportunity to get rid of the smell. Nonetheless, Council issued a public notice regarding the water and additional testing was done to confirm that the water supply was still within the ADWG and safe for consumption.

In 2017, Council had two more complaints stating that the tap water looked dirty. The investigation found that during the Birdsville races, fire trucks were removing large quantities of water from the reticulation at high flow rates, causing sediment to be stirred up in the distribution system, increasing the Turbidity. As the water was already in reticulation, there was no opportunity to rectify the issue.

No other formal complaints have been made for the Birdsville scheme.

6.0 HAZARD IDENTIFICATION AND RISK ASSESSMENT

The hazard identification and risk assessment for Diamantina Shire Council's DWQMP was undertaken using the risk methodology detailed in the Departmental guideline. The risk assessment outlined below, below includes a mitigated and unmitigated hazard assessment for each scheme which includes:

- Identified hazards or hazardous events
- Hazard or hazardous event sources
- An assessment of the unmitigated maximum risk level likelihood of each hazard being present or each hazardous event occurring
- Existing preventative measures implemented to counteract each hazard or hazardous event, or reduce the maximum risk level
- A re-assessed residual risk level which details the final risk level of a hazard or hazardous event that is applicable when the appropriate mitigation measures have been implemented. The residual risk is determined using the same methodology as the initial maximum risk assessment; however, changes to the assessed likelihood (or consequence) should result in an overall lower risk level.

As the Bedourie and Birdsville drinking water schemes are very similar and generally operated by the same people, a combined risk assessment was conducted. The final risk assessment notes where differences between the schemes were identified. The risk assessment was reviewed in October 2025 and amended accordingly. Moving forward, Council intends to review the risk assessment every 2 years, to coincide with the DWQMP Regular Reviews. All amendments will be referred to the Interim Director of Infrastructure for input, review and acceptance of the new risk assessment.

6.1 Risk Assessment Methodology

In assessing the risk score of each hazard or hazardous event, the first step is to determine the consequence. Consequence categories used are outlined in Table 11 below.

Table 11: Consequence Descriptors.

Consequence	Descriptors
Insignificant	Negligible injury or health effects, isolated complaints related to aesthetic parameters. Little to no disruption to the normal operation of the scheme.
Minor	Negligible injury or health effects, widespread complaints related to aesthetic parameters.
Moderate	Potential acute health impact or potential chronic health impact.
Major	Acute health impact, no declared outbreak expected.
Catastrophic	Declared outbreak expected with an acute health impact. One or more fatalities or large number of hospitalisations.

Once the consequences were identified, the likelihood of each consequence occurring was determined using the Likelihood categories outlined in Table 12 below.

Table 12: Likelihood Descriptors.

Likelihood	Descriptors
Almost Certain	Hazard is considered to be present on a daily to weekly basis.
Likely	Occurs more often than once per month and up to once per week.
Possible	Occurs more often than once per year and up to once a month.
Unlikely	Unlikely but may occur once every 1- 5 years.
Rare	Hazard is expected to arise in exceptional circumstances; <1 occurrence every 5 years.

The risk scores were then assessed using the likelihood and consequence matrix provided in Table 13 below. The risk score was calculated by the intercept of likelihood and consequence.

Table 13: Risk Matrix used for the Bedourie and Birdsville Risk Assessments.

Likelihood	Consequence				
	Insignificant	Minor	Moderate	Major	Catastrophic
Almost Certain	Medium – 6	High – 10	High – 15	Extreme – 20	Extreme – 25
Likely	Medium – 5	Medium – 8	High – 12	High – 16	Extreme – 20
Possible	Low – 3	Medium – 6	Medium – 9	High – 12	High – 15
Unlikely	Low – 2	Low – 4	Medium – 6	Medium – 8	High – 10
Rare	Low – 1	Low – 2	Low – 3	Medium – 5	Medium – 6

Finally, uncertainty was assessed using the definitions outlined in Table 14 below. Assessing uncertainty provides an indication of the need to undertake further work or gather more data to ensure that the risk assessment is accurate and reliable.

Table 14: Uncertainty Definitions used for the Hazard and Hazardous Events Assessment.

Level of Uncertainty	Definition
Certain	There is 5 years of continuous monitoring data, which has been trended and assessed, with at least daily monitoring; or the processes involved are thoroughly understood.
Confident	There is 5 years of continuous monitoring data, which has been collated and assessed, with at least weekly monitoring or monitoring for the duration of seasonal events; or there is a good understanding of the processes involved.
Reliable	There is at least a year of continuous monitoring data available, which has been assessed; or there is reasonable understanding of the processes involved.
Estimate	There is limited monitoring data available; or there is limited understanding of the processes involved.
Uncertain	There is limited or no monitoring data available; or the processes are not well understood, and the processes are based on best estimates.

The acceptable risk level in relation to public health depends very much on the Likelihood and Consequence descriptors used for the assessment. For the criteria used by DSC, all risk levels identified as Medium or less are considered acceptable risks for the scheme.

In some cases, actions have been taken to reduce low or medium level risks, while other high level risks have been left unmitigated (e.g. elevated Fluoride levels in Birdsville). These decisions are based on two factors:

- the magnitude of the risk, and
- the cost and difficulty of actions required to reduce the risk.

All unacceptable risks identified in the risk assessment are used to inform the Risk Management Improvement Programme, outlined in Section 7 below.

6.2 Bedourie and Birdsville Drinking Water Risk Assessment

Hazard Source	Hazard/Hazardous Event	Location	Unmitigated			Primary Preventative Measure	Other Preventative Measures	Mitigated			Uncertainty	Documented Procedures	Comments	RMIP Item
			Likelihood	Consequence	Risk Level			Likelihood	Consequence	Risk Level				
Source Water														
Bacteria and Virus	Contamination in the Artesian Aquifer	Bedourie/ Birdsville	Rare	Catastrophic	Medium – 6	Deep Artesian water is sterile at the source, providing protection from bacteria/virus contamination	Operational and verification monitoring for <i>E.coli</i> .	Rare	Catastrophic	Medium – 6	Certain	CCP3	Mitigated risk level is as low as possible.	
Protozoa	Contamination in the Artesian Aquifer	Bedourie/ Birdsville	Rare	Catastrophic	Medium – 6	Deep Artesian water is sterile at the source, providing protection from protozoa contamination		Rare	Catastrophic	Medium – 6	Certain		Mitigated risk level is as low as possible.	
<i>Naegleria fowleri</i>	Contamination in the Artesian Aquifer	Bedourie/ Birdsville	Rare	Catastrophic	Medium – 6	Deep Artesian water is sterile at the source, providing protection from <i>N. fowleri</i> contamination		Rare	Catastrophic	Medium – 6	Certain		Mitigated risk level is as low as possible. <i>N. fowleri</i> monitoring undertaken in Dec 2025 did not detect the amoeba.	
Bacteria and Virus	Borehead integrity compromised causing ingress through borehead or cracked casing	Bedourie/ Birdsville	Unlikely	Catastrophic	High – 10	All bores are deep flowing and always under positive pressure at the surface. Source water is pasteurised due to the heat.	Working day visual inspections of bores including checks for pressure, temperature and borehead integrity.	Rare	Catastrophic	Medium – 6	Certain	CCP3 Borehead Inspection Procedure	Mitigated risk level is as low as possible.	
Protozoa	Borehead integrity compromised causing ingress through borehead or cracked casing	Bedourie/ Birdsville	Unlikely	Catastrophic	High – 10	All bores are deep flowing and always under positive pressure at the surface. Source water is pasteurised due to the heat.	Working day visual inspections of bores including checks for pressure, temperature and borehead integrity.	Rare	Catastrophic	Medium – 6	Certain	Borehead Inspection Procedure	Mitigated risk level is as low as possible.	
<i>Naegleria fowleri</i>	Borehead integrity compromised causing ingress through borehead or cracked casing	Bedourie/ Birdsville	Unlikely	Catastrophic	High – 10	All bores are deep flowing and always under positive pressure at the surface. Source water is pasteurised due to the heat.	Working day visual inspections of bores including checks for pressure, temperature and borehead integrity.	Rare	Catastrophic	Medium – 6	Certain	Borehead Inspection Procedure	Mitigated risk level is as low as possible. <i>N. fowleri</i> monitoring undertaken in Dec 2025 did not detect the amoeba.	
Pathogenic ingress	Contamination from source water flowing through Geothermal Power Station prior to being reticulated to town	Birdsville	Possible	Catastrophic	High – 15	As of 2022, the Geothermal Power Station has been decommissioned.	Sealed system reticulated under pressure. Isolation valves prior to the power station preventing accidental reticulation through power station.	Rare	Catastrophic	Medium – 6	Certain	CCP3	When the plant was running a Risk Assessment Workshop was held with Ergon Energy and DSC to identify risks and associated hazards. Uncertainty updated to Certain as power station has been decommissioned. Mitigated risk level is as low as possible.	
Chemical ingress			Possible	Major	High – 12			Rare	Major	Medium – 5	Certain			

Hazard Source	Hazard/Hazardous Event	Location	Unmitigated			Primary Preventative Measure	Other Preventative Measures	Mitigated			Uncertainty	Documented Procedures	Comments	RMIP Item
			Likelihood	Consequence	Risk Level			Likelihood	Consequence	Risk Level				
Loss of water supply	Long term power supply failure	Bedourie	Unlikely	Minor	Low – 4	Bedourie scheme does not require power. Water is reticulated under Artesian pressure.	None.	Rare	Minor	Low – 2	Confident	Working day visual inspections.		
Loss of water supply	Long term power supply failure	Birdsville	Unlikely	Major	Medium – 8	Reservoirs can hold 1x day supply of drinking water but this can be lengthened with water restrictions.	Back-up generator available on-site.	Rare	Major	Medium – 5	Reliable	Working day visual inspections.		
Loss of water supply	Bore failure	Bedourie/ Birdsville	Rare	Major	Medium – 5	By 2026, both schemes will be operating with two bores, providing a back-up water supply should one bore fail.	Working-day visual inspections of bores.	Rare	Major	Medium – 5	Confident	Borehead integrity inspection procedure and working day visual inspections.	New Bedourie Bore drilled in 2019 and new Birdsville bore drilled in 2025. Mitigated risk level is as low as possible.	S3: Commissioning of Birdsville New Bore.
Loss of water supply	Bore failure caused by flooding	Bedourie/ Birdsville	Unlikely	Major	Medium – 8	Infrastructure in both schemes is located above the historic flood levels.		Rare	Major	Medium – 5	Confident	Disaster Management Plan. Borehead integrity inspection procedure and working day visual inspections.	To date, has not been an issue for either scheme. Mitigated risk level is as low as possible.	
Loss of water supply	Bore failure caused by fire	Bedourie/ Birdsville	Unlikely	Major	Medium – 8	Infrastructure in both schemes is free from flammable debris.		Rare	Major	Medium – 5	Confident	Disaster Management Plan. Borehead integrity inspection procedure and working day visual inspections.	To date, has not been an issue for either scheme. Mitigated risk level is as low as possible.	
Loss of water supply	Bore failure caused by natural disaster	Bedourie/ Birdsville	Unlikely	Major	Medium – 8	Flood and Fire (assessed above) are the most likely natural disasters to damage infrastructure.	GAB water supply provides water security during droughts.	Rare	Major	Medium – 5	Confident	Disaster Management Plan. Borehead integrity inspection procedure and working day visual inspections.	To date, has not been an issue for either scheme. Mitigated risk level is as low as possible.	
Loss of water supply	Bore failure caused by sabotage/accidental damage to bore	Bedourie/ Birdsville	Unlikely	Major	Medium – 8	Birdsville Bores and Bedourie New Bore located in fenced compounds with locked gates.	Working day visual inspections, including making sure the compound gates are locked.	Rare	Major	Medium – 5	Confident	Borehead integrity inspection procedure and working day visual inspections.	To date, damage to water infrastructure has not been an issue for Council. Mitigated risk level is as low as possible.	S4: Reinstating fenced compound around Bedourie Old Bore.
Temperature	Supply of water above safe temperature	Birdsville	Almost Certain	Moderate	High – 15	3x heat exchange systems and dual reservoir storage provide cooling to ~35°C.	Bypass valves for the cooling treatment processes (old system) can only be operated by Council water officers. Bypass of the new cooling system is not possible.	Rare	Moderate	Low – 3	Confident	Working day visual inspections.	Water temperature is distributed as low as is reasonably practical. Bedourie water, at 45°C from the bore is not considered dangerous and therefore RA only includes Birdsville.	
Sodium	Naturally elevated Sodium levels present in	Bedourie/ Birdsville	Almost Certain	Insignificant	Medium – 6	6-monthly verification monitoring to track exceedances.		Almost Certain	Insignificant	Medium – 6	Certain		Average Sodium concentrations in Bedourie/Birdsville water are only slightly above the ADWG aesthetic	

Hazard Source	Hazard/Hazardous Event	Location	Unmitigated			Primary Preventative Measure	Other Preventative Measures	Mitigated			Uncertainty	Documented Procedures	Comments	RMIP Item
			Likelihood	Consequence	Risk Level			Likelihood	Consequence	Risk Level				
	source water, above the ADWG guideline value												value of 180mg/L. This is considered acceptable by Council. Mitigated risk level is as low as possible.	
Fluoride	Elevated Fluoride levels naturally occurring in source water	Birdsville	Almost Certain	Moderate	High – 15	Annual notification to residents informing them of the elevated Fluoride. Distribution of a Fluoride Fact-sheet which identifies health risks of Fluoride and how to avoid dental fluorosis.	Ongoing Monitoring of fluoride levels to ensure they remain only slightly above the ADWG health value.	Almost Certain	Moderate	High – 15	Confident	CCP1	On-going drinking water incident with the WSR for the elevated Fluoride levels. Potential chronic effect would not impact visitors. Treatment to reduce fluoride level is not financially feasible. Elevated Fluoride levels are discussed further in Section 5.2.3. Mitigated risk level is as low as possible.	S1: Annual notification to residents informing about the elevated Fluoride levels.
Heavy Metals	Elevated Heavy Metal levels naturally occurring in source water	Bedourie/ Birdsville	Unlikely	Major	Medium – 8	All source water comes from deep aquifers (~1,200m+) which would be protected from leaching contaminants.	6-monthly verification monitoring.	Rare	Major	Medium – 5	Reliable	CCP1/2	Verification monitoring programme was updated in 2024 to include these parameters. Mitigated risk level is as low as possible.	
Radiological Activity	Elevated Gross Alpha, Gross Beta or Uranium naturally occurring in source water	Bedourie/ Birdsville	Unlikely	Major	Medium – 8	6-monthly verification monitoring.		Rare	Major	Medium – 5	Reliable	CCP1/2	Verification monitoring programme was updated in 2022 to include these parameters. Mitigated risk level is as low as possible.	
PFAS	Elevated PFAS levels naturally occurring in source water	Bedourie/ Birdsville	Unlikely	Major	Medium – 8	All source water comes from deep aquifers (~1,200m+) which would be protected from leaching contaminants.		Rare	Major	Medium – 5	Reliable	CCP1/2	Verification monitoring undertaken in 2018 did not identify reportable limits of PFAS in the source water.	S6: PFAS testing to confirm mitigated risk level assessment
Heat Exchange Systems and Cooling Ponds														
Pathogenic ingress	Contamination of source water through incorrect hygiene practices during maintenance and repair of heat exchange systems	Birdsville	Possible	Catastrophic	High – 15	Maintenance always undertaken by contract plumber familiar with system requirements.	Staff and contractors to check for vermin prior to heat exchange cleaning. Staff trained to exercise correct hygiene practices.	Rare	Catastrophic	Medium – 6	Confident	CCP3 Water Mains Repair, Maintenance and Commissioning Procedures and Heat Exchanger Cleaning Procedure.	Mitigated risk level is as low as possible.	
Pathogenic Ingress	Contamination of source water from leak in the New Birdsville Bore Heat Exchange piping	Birdsville	Possible	Catastrophic	High – 15	Bore water line runs at a higher pressure than the cooling pond water line, ensuring that cooling pond water can't	Pressure from borehead is constant unless GAB pressure failure. Pressure is maintained in heat exchange as the solenoid which controls	Rare	Catastrophic	Medium – 6	Confident		Mitigated risk level is as low as possible.	

Hazard Source	Hazard/Hazardous Event	Location	Unmitigated			Primary Preventative Measure	Other Preventative Measures	Mitigated			Uncertainty	Documented Procedures	Comments	RMIP Item
			Likelihood	Consequence	Risk Level			Likelihood	Consequence	Risk Level				
						contaminate the drinking water line.	flow to town is located after the heat exchange.							
Temperature	Poor quality cooling pond water entering the Old Birdsville Bore heat exchange system, causing it to malfunction.	Birdsville	Possible	Moderate	Medium – 9	Coarse filter installed at intake from pond and in-line filter at inlet to heat exchanger (old system)	New heat exchange system to be commissioned with the New Birdsville Bore, if one malfunctions, the other can be used as a back-up.	Rare	Moderate	Low – 3	Confident		Residents would receive notice of expected elevated temperatures. Cooling pond was cleaned in 2020, vegetation growth was found to be minimal. Lining of the cooling pond to eliminate vegetation growth is impractical due to the structure of the piping.	
Temperature	Failure of the old heat exchange system	Birdsville	Possible	Moderate	Medium – 9	3x heat exchange systems are used for the scheme. If the old system were to fail, water would be supplied through the new system.	Working day visual inspections to ensure infrastructure is operating as normal.	Rare	Moderate	Low – 3	Confident		Should both systems fail, water would still be reticulated to town, just at an elevated temperature, flowing through both reservoirs which would provide some level of cooling. Water restrictions can assist in preventing hot water being reticulated to town if needed and residents would be notified of the expected increase in temperature.	
Temperature	Failure of the new heat exchange system	Birdsville	Possible	Moderate	Medium – 9	Daily automatic backwash of new heat exchanger to prevent scale and algae build up. Automatic shut-off valve located after the heat exchange if water exceeds 60°C.	Working day visual inspections to ensure infrastructure is operating as normal. 3x heat exchange systems are used for the scheme. If the new system were to fail, water would be supplied through the old system.	Rare	Moderate	Low – 3	Reliable			
Damage to infrastructure	Pipe breakage in old cooling ponds	Bedourie/ Birdsville	Unlikely	Minor	Low – 3	New copper pipe cooling system installed.	Working day visual inspections.	Rare	Minor	Low – 2	Confident			
Reservoirs														
Bacteria and Virus	Contamination of water supply in reservoir	Birdsville	Unlikely	Catastrophic	High – 10	Reservoirs are sealed and vermin proof and water temperature in reservoirs is approximately 60°C (elevated reservoir) 45°C (ground reservoir),	Working day visual inspections of reservoirs and water quality monitoring.	Rare	Catastrophic	Medium – 6	Confident	CCP3 Reservoir Inspection Procedure.	Mitigated risk level is as low as possible.	S2: Operational monitoring of location downstream of reservoirs for

Hazard Source	Hazard/Hazardous Event	Location	Unmitigated			Primary Preventative Measure	Other Preventative Measures	Mitigated			Uncertainty	Documented Procedures	Comments	RMIP Item
			Likelihood	Consequence	Risk Level			Likelihood	Consequence	Risk Level				
						providing some form of pasteurisation.								<i>E.coli</i> and Total Coliforms.
Protozoa	Contamination of water supply in reservoir	Birdsville (Elevated Reservoir)	Unlikely	Catastrophic	High – 10	Reservoirs is sealed and vermin proof and water temperature is approximately 60°C, providing some form of pasteurisation.	Working day visual inspections of reservoirs.	Rare	Catastrophic	Medium – 6	Estimate	Reservoir Inspection Procedure.	Mitigated risk level is as low as possible.	
<i>Naegleria fowleri</i>	Contamination of water supply in reservoir	Birdsville (Elevated Reservoir)	Unlikely	Catastrophic	High – 10	Reservoirs is sealed and vermin proof and water temperature is approximately 60°C, providing some form of pasteurisation.	Working day visual inspections of reservoirs.	Rare	Catastrophic	Medium – 6	Reliable	Reservoir Inspection Procedure.	Mitigated risk level is as low as possible. <i>N. fowleri</i> monitoring undertaken in Dec 2025 did not detect the amoeba.	
Protozoa	Contamination of water supply in reservoir	Birdsville (Ground Reservoir)	Unlikely	Catastrophic	High – 10	Reservoirs are sealed and vermin proof	Working day visual inspections of reservoirs.	Rare	Catastrophic	Medium – 6	Estimate	Reservoir Inspection Procedure.		
<i>Naegleria fowleri</i>	Contamination of water supply in reservoir	Birdsville (Ground Reservoir)	Unlikely	Catastrophic	High – 10	Reservoirs are sealed and vermin proof	Working day visual inspections of reservoirs.	Rare	Catastrophic	Medium – 6	Reliable	Reservoir Inspection Procedure.	Mitigated risk level is as low as possible. <i>N. fowleri</i> monitoring undertaken in Dec 2025 did not detect the amoeba.	
Pathogenic or Chemical Ingress	Contamination from illegal access to reservoirs	Birdsville	Unlikely	Catastrophic	High – 10	Reservoirs are located in a fenced compound with locked gates.	Working day visual inspections of reservoirs, including ensuring compound fence is intact and gate locked.	Rare	Catastrophic	Medium – 6	Reliable	CCP3 Reservoir Inspection Procedure.	Birdsville is a small towns where break-ins would be noticed. Mitigated risk level is as low as possible.	S2: Operational monitoring of location downstream of reservoirs for <i>E.coli</i> and Total Coliforms.
Damage to Infrastructure	Infrastructure damage caused by illegal access to reservoirs	Birdsville	Unlikely	Catastrophic	High – 10	Reservoirs are located in a fenced compound with locked gates.	Working day visual inspections of reservoirs, including ensuring compound fence is intact and gate locked.	Rare	Catastrophic	Medium – 6	Reliable	Reservoir Inspection Procedure.	Birdsville is a small towns where break-ins would be noticed. Mitigated risk level is as low as possible.	
Loss of water supply	Failure of the fill solenoid for the GLR	Birdsville	Unlikely	Major	Medium – 8	Working day visual inspections to ensure infrastructure is operating as normal.		Rare	Major	Medium – 5	Reliable	Reservoir Inspection Procedure.	Mitigated risk level is as low as possible.	
Loss of water supply	Failure of the level probe in the GLR	Birdsville	Unlikely	Major	Medium – 8	Working day visual inspections to ensure infrastructure is operating as normal.		Rare	Major	Medium – 5	Reliable	Reservoir Inspection Procedure.	Mitigated risk level is as low as possible.	

Hazard Source	Hazard/Hazardous Event	Location	Unmitigated			Primary Preventative Measure	Other Preventative Measures	Mitigated			Uncertainty	Documented Procedures	Comments	RMIP Item
			Likelihood	Consequence	Risk Level			Likelihood	Consequence	Risk Level				
Loss of water supply	Failure of both lift pumps	Birdsville	Unlikely	Major	Medium – 8	Working day visual inspections to ensure infrastructure is operating as normal.		Rare	Major	Medium – 5	Reliable	Reservoir Inspection Procedure.	Mitigated risk level is as low as possible.	
Loss of water supply	Failure of the level probe in the ER	Birdsville	Unlikely	Major	Medium – 8	Working day visual inspections to ensure infrastructure is operating as normal.		Rare	Major	Medium – 5	Reliable	Reservoir Inspection Procedure.	Mitigated risk level is as low as possible.	
Repair, Maintenance and Commissioning of Mains														
Bacteria/Virus	Contamination during repair, maintenance or commissioning of water mains	Bedourie/ Birdsville	Possible	Catastrophic	High – 15	Staff trained to exercise correct hygiene practices.	Maintenance undertaken by plumber.	Rare	Catastrophic	Medium – 6	Confident	CCP3 Water Mains Repair, Maintenance and Commissioning Procedures.	Mitigated risk level is as low as possible.	
Protozoa	Contamination during repair, maintenance or commissioning of water mains	Bedourie/ Birdsville	Possible	Catastrophic	High – 15	Staff trained to exercise correct hygiene practices.	Maintenance undertaken by plumber.	Rare	Catastrophic	Medium – 6	Confident	Water Mains Repair, Maintenance and Commissioning Procedures.	Mitigated risk level is as low as possible.	
<i>Naegleria fowleri</i>	Contamination during repair, maintenance or commissioning of water mains	Bedourie/ Birdsville	Possible	Catastrophic	High – 15	Staff trained to exercise correct hygiene practices.	Maintenance undertaken by plumber.	Rare	Catastrophic	Medium – 6	Confident	Water Mains Repair, Maintenance and Commissioning Procedures.	Mitigated risk level is as low as possible.	
Turbidity	Elevated Turbidity during repair, maintenance or commissioning of water mains		Possible	Minor	Medium – 6	Staff trained to exercise correct hygiene practices.	Maintenance undertaken by plumber.	Rare	Minor	Low – 2	Confident	CCP2 Water Mains Repair, Maintenance and Commissioning Procedures.		
Bacteria/Virus	Contamination caused by backflow occurring during repair, maintenance or commissioning of water mains.	Bedourie/ Birdsville	Possible	Catastrophic	High – 15	Water services have non-return valves fitted.	Maintenance always undertaken by plumber. Staff trained to exercise correct hygiene practices.	Rare	Catastrophic	Medium – 6	Confident	CCP3 Water Mains Repair, Maintenance and Commissioning Procedures.	Mitigated risk level is as low as possible.	
Protozoa	Contamination caused by backflow occurring during repair, maintenance or commissioning of water mains.	Bedourie/ Birdsville	Possible	Catastrophic	High – 15	Water services have non-return valves fitted.	Maintenance always undertaken by plumber.	Rare	Catastrophic	Medium – 6	Confident	Water Mains Repair, Maintenance and Commissioning Procedures.	Mitigated risk level is as low as possible.	
<i>Naegleria fowleri</i>	Contamination caused by backflow occurring during repair, maintenance or	Bedourie/ Birdsville	Possible	Catastrophic	High – 15	Water services have non-return valves fitted.	Staff trained to exercise correct hygiene practices.	Rare	Catastrophic	Medium – 6	Confident	Water Mains Repair, Maintenance and Commissioning Procedures.	Mitigated risk level is as low as possible.	

Hazard Source	Hazard/Hazardous Event	Location	Unmitigated			Primary Preventative Measure	Other Preventative Measures	Mitigated			Uncertainty	Documented Procedures	Comments	RMIP Item
			Likelihood	Consequence	Risk Level			Likelihood	Consequence	Risk Level				
	commissioning of water mains.													
Hydrocarbons	Contamination from major spill near water mains during repair, maintenance or commissioning activities.	Bedourie/ Birdsville	Unlikely	Moderate	Medium – 6	Staff adequately trained so that they can respond well to these situations.		Rare	Moderate	Low – 3	Confident	Water Mains Repair, Maintenance and Commissioning Procedures.		
Distribution System														
Bacteria/Virus	Contamination from drinking water that has a long detention time in the main.	Bedourie/ Birdsville	Possible	Catastrophic	High – 15	Flushing water mains that have a long detention time based on bacteriological results.	Compact distribution systems for both schemes.	Rare	Catastrophic	Medium – 6	Confident	CCP3 Water Mains Repair, Maintenance and Commissioning Procedures.	Long mains to racecourses to be flushed prior to any events. Mitigated risk level is as low as possible.	
Bacteria/Virus	Contamination from a lack of or failure of backflow prevention devices in the distribution system.	Bedourie/ Birdsville	Possible	Catastrophic	High – 15	Positive pressure in reticulation system. New, small systems - shut-downs are rare.	Water services have non-return valves fitted.	Rare	Catastrophic	Medium – 6	Confident	CCP3	Mitigated risk level is as low as possible.	
Bacteria/Virus	Contamination of potable water through illegal access to water supply mains	Bedourie/ Birdsville	Unlikely	Catastrophic	High – 10	Both schemes are small, illegal activities would be noticed by Council.		Rare	Catastrophic	Medium – 6	Confident	CCP3	Mitigated risk level is as low as possible.	
Bacteria/Virus	Contamination from the accidental cross-connection of untreated river water mains with the potable water mains.	Birdsville	Unlikely	Catastrophic	High – 10	River water pipes are colour coded purple and operate at a lower pressure to assist in accidental cross-connections.	Both mains systems are clearly marked and include non-return valves at each property service point. River water has high Turbidity, Turbidity is monitored monthly to ensure no cross-connecting has occurred. Maintenance always undertaken by one plumber contractor, familiar with requirements.	Rare	Catastrophic	Medium – 6	Confident	CCP3 Water Mains Repair, Maintenance and Commissioning Procedures (refer to RMIP).	Monthly operational and biannual verification monitoring to date has not identified cross-contamination to be an issue for the scheme. Mitigated risk level is as low as possible.	
Heavy Metals	Contamination of potable water supply from leaching of metals from MDPE/galvanised steel distribution systems.	Birdsville	Possible	Major	High – 12	Distribution system is now 95% polyethylene piping.	6-monthly verification monitoring.	Rare	Major	Medium – 5	Confident	CCP1	Mitigated risk level is as low as possible.	
Whole of System														

Hazard Source	Hazard/Hazardous Event	Location	Unmitigated			Primary Preventative Measure	Other Preventative Measures	Mitigated			Uncertainty	Documented Procedures	Comments	RMIP Item
			Likelihood	Consequence	Risk Level			Likelihood	Consequence	Risk Level				
Dependence on single plumber	Employment of a Contract plumber with limited knowledge of the schemes, including risks and controls.	Bedourie/ Birdsville	Possible	Major	High – 12	Operation and maintenance Procedures. Council engineer has good knowledge of the schemes and associated risks.	Distribution system drawings updated in 2023 with regular updates now occurring in response to distribution system upgrades/changes.	Rare	Major	Medium – 5	Reliable	Bedourie/Birdsville Drinking Water Scheme Operating Plans.	Plumber can be sourced form Boulia as required.	
Lack of skilled/trained staff	Inability for staff to respond to drinking water events or changes in drinking water quality due to lack of formal training/skills.	Bedourie/ Birdsville	Unlikely	Catastrophic	High – 10	Maintenance undertaken by plumber/water operators who are familiar with the schemes.	Documented operation and maintenance procedures.	Rare	Catastrophic	Medium – 6	Reliable	Bedourie/Birdsville Drinking Water Scheme Operating Plans.	Plumber can be sourced form Boulia as required.	
Cyber Security breach.	Breach of Council's internal system causing access to restricted information.	Bedourie/ Birdsville	Possible	Major	High – 12	Restricted administrative privileges	Multi-factor authentication for all users. Back-up systems in place.	Rare	Major	Medium – 5	Reliable		Diamantina does not rely on computerised technologies within their water supply schemes. If a breach were to occur they would only obtain remote access to records and not infrastructure.	
Prolonged mains repair time	Outdated water network drawings.	Bedourie/ Birdsville	Possible	Minor	Medium – 6	Plumber familiar with the system.	Distribution drawings updated in 2023	Rare	Minor	Low – 2	Confident	Water Mains Repair, Maintenance and Commissioning Procedures		

7.0 RISK MANAGEMENT IMPROVEMENT PROGRAMME

DSC’s Risk Management Improvement Programme for both the Bedourie and Birdsville schemes is provided in Table 15 below. The RMIP was reviewed and amended in November 2025 via consultation with the Interim Director of Infrastructure. Moving forward, Council intends to review all completion target dates at 6-monthly intervals to ensure that the processes are in place for items to be completed within their forecast timeframes. The target dates for all RMIP items were determined via consultation with Council staff responsible for the respective items.

Table 15: Bedourie and Birdsville Risk Management Improvement Programme.

2026 Code	2024 Code	Hazard/Hazardous Event	Scheme	Improvement Item	Priority	Target Date/s	Comments	Responsibility
S1	S2	Elevated Fluoride levels in the source water	Birdsville	Annual notification to Birdsville residents informing them of the potential health impacts of elevated Fluoride levels in the drinking water.	High	Ongoing	Fluoride factsheet was updated in 2024.	Interim Director of Infrastructure
S2	S3	Pathogenic ingress into the Birdsville Reservoirs	Birdsville	<i>E.coli</i> and Total Coliform operational testing to be conducted from the new sampling point downstream of the two reservoirs. Data will be used to help indicate when reservoir cleaning may be required.	High	Dec 2026	Target date set to enable Council to obtain approximately 1 year of viable data that can be used to assess trends.	Interim Director of Infrastructure
S3	N/A	Loss of water supply caused by bore failure	Birdsville	Commissioning of new Birdsville bore.	High	June 2026	New Bore drilled 2025, Council currently discussing commissioning process with Regulator and QLD Health	Interim Director of Infrastructure
S4	N/A	Damage to infrastructure	Bedourie	Reinstating the fenced compound around the Bedourie Old Bore	High	Dec 2026		Interim Director of Infrastructure
S5	N/A	PFAS	Bedourie/Birdsville	PFAS testing undertaken in Bedourie in 2018, Council to undertake one off testing of Bedourie and Birdsville source water to confirm that the mitigated risk level for PFAS is correct.	High	June 2026	Quote obtained from lab and bottles ordered.	Interim Director of Infrastructure

8.0 OPERATION AND MAINTENANCE PROCEDURES

Council have developed a series of Operation and Maintenance Procedures and Critical Control Points (CCPs) for the operation of the Bedourie and Birdsville schemes. Table 16 below outlines the current status of all Operation and Maintenance Procedures. Moving forward, Council will undertake reviews of all CCPs and O&M Procedures on the following triggers:

- Following significant changes in processes;
- At the time of the scheduled DWQMP Review.

Table 16: Bedourie and Birdsville Operation and Maintenance Procedures.

Scheme Component / Sub-component	Preventive Measure Managed	Documented Procedure	Version Date	Status
Whole of System	Birdsville Drinking Water Scheme	Birdsville Fluoride Factsheet	October 2025	Implemented.
Sourcing Infrastructure & Distribution System	Repair, Maintenance and Commissioning of Mains	Repair, Maintenance and Commissioning of Mains	October 2025	Implemented.
	Heat Exchange Systems	Birdsville Heat Exchange Cleaning	October 2025	Implemented.
	Boreheads	Borehead Inspection Procedure	October 2025	Implemented.
		Procedure for managing bore failure	September 2015	Procedure outdated.
	Geothermal Power Station	Operational procedures of geothermal power plant & drinking water supply	April 2015	Procedures currently not required.
Reservoirs	Infrastructure	Reservoir Inspection Procedure	October 2025	Implemented.
Water Sampling	Verification and Operational Monitoring	Water Sampling Procedure	October 2025	Implemented.

8.1 Critical Control Points

The following Critical Control Points have been implemented within the Bedourie and Birdsville schemes:

- **CCP 1:** ADWG Health Exceedance (Source or Distribution)
- **CCP 2:** *E.coli* Detection (Source or Distribution)

CCP1: ADWG Health Exceedance (Source or Distribution)			
What is measured?	Where /how is it measured?	What is the Control Point?	What are the Hazards?
Drinking Water Quality	In-house and external verification water quality monitoring	ADWG Health Parameters	Pathogenic ingress Public Health Risks
Target Value: Drinking water monitoring identifies tested parameters to sit within ADWG health values.			
Alert Level: Potential exceedance of an ADWG health value Responsibility: Water Operator		Critical Limit: Confirmed exceedance of an ADWG health value OR <i>E.coli</i> detection Responsibility: Water Operator	
1. Immediately re-sample to verify result. 2. Inform Interim Director of Infrastructure. 3. Notify the Drinking Water Supply Regulator. 4. If follow-up sampling does not identify any exceedances then re-commence the scheme's operation as normal, via. consultation with the Regulator. 5. If follow-up sample confirms exceedance then escalate to Critical Limit response. Note that <i>E.coli</i> detections do not need to be verified and are to be escalated to the Critical Limit response immediately. Reporting: Alert Supervisor and Drinking Water Supply Regulator.		1. Inform Interim Director of Infrastructure and Regulator of confirmed result. 2. Refer to CCP 3 for procedure to follow for <i>E.coli</i> detections. 3. Isolate effected area if possible. 4. Review the need for a Boil Water Alert or an alternative water supply. 5. Conduct investigation into exceedance. 6. Re-sample. 7. Continue operation as normal if testing shows exceeded parameter has been corrected via. consultation with the Regulator. 8. Complete incident reporting forms. Note that Boil Water Alerts can only be lifted via. consultation with QLD Health and the Water Regulator.	

CCP2: <i>E.coli</i> Detections (Source or Distribution)			
What is measured?	Where /how is it measured?	What is the Control Point?	What are the Hazards?
<i>E.coli</i> Total Coliforms Turbidity	In-house operational monitoring and external verification monitoring	<i>E.coli</i> detections	Pathogenic ingress Public Health Risk
Target Value: No <i>E.coli</i> detections in source water or distribution system			
Alert Level: Turbidity >5 NTU & Elevated Total Coliforms Responsibility: Water Operator		Critical Limit: <i>E.coli</i> detection Responsibility: Water Operator	
1. Notify Interim Director of Infrastructure. 2. Where exceedance is reported (e.g. source water or distribution), commence <i>E.coli</i> sampling. 3. Flush Mains. 4. Re-sample for Turbidity and Total Coliforms. 5. If exceedances are still being detected, re-commence flushing. 6. If <i>E.coli</i> is detected, escalate to Critical Limit response. 7. If <i>E.coli</i> is not being detected and Turbidity and Total Coliforms are no longer elevated after mains flushing, then re-commence the normal operation of the scheme. Reporting: Alert Supervisor.		1. Inform Interim Director of Infrastructure and issue Boil Water Alert. 2. Notify Drinking Water Regulator. 3. Isolate the affected area if possible and commence investigation into exceedance. 4. Re-test for <i>E.coli</i> to ensure it was not a sampling error. 5. Flush mains, then re-test for <i>E.coli</i> , Total Coliforms and Turbidity. 6. If <i>E.coli</i> is still being detected, re-flush the mains. 7. The Boil Water Alert is to remain in place until operational and verification monitoring detects no <i>E.coli</i>. 8. Complete incident reporting forms. Note that Boil Water Alerts can only be lifted via. consultation with QLD Health and the Water Regulator. Reporting: Alert Supervisor and Drinking Water Supply Regulator.	

9.0 OPERATIONAL AND VERIFICATION MONITORING

The water quality monitoring programme is an essential part of the operation of Council's schemes to ensure they're operating within their performance limits and providing safe drinking water. The programme has been developed and modified in response to historical data analysis and requirements under the ADWG.

Council maintains copies of water quality data from 2009 onwards, all of which is trended in a master spreadsheet that is regularly updated by GBA Consulting Engineers (GBA). Inhouse Colilert testing is undertaken by Council in Bedourie, entered into a spreadsheet on the Council server and sent to Council's engineering consultants to be added to the master spreadsheet which is readily available to Council.

All external verification monitoring is undertaken by the NATA accredited SGS Laboratory in Melbourne. Samples are taken by staff in Bedourie and Birdsville, before being put on a flight to Brisbane and couriered through to the lab in Melbourne. All results are trended in the master spreadsheet maintained by GBA. If any ADWG aesthetic or health exceedances are identified, it is the responsibility of the Council water operator to notify the Interim Director of infrastructure for further escalation of the incident.

While Council prioritises and adheres to their water quality monitoring programmes, in the past, there have been unavoidable/unforeseen circumstances that have led to some missed samples, caused by unavailability of staff, lost samples during transportation and seasonal flooding, resulting in road closures. Additionally, due to the remoteness of the shire, Council experiences issues with getting the *E.coli* samples to the external laboratory within the 24-hour holding period. Often, by the time samples are collected from each town and flown to Brisbane, more than 24-hrs has passed, voiding the validity of the *E.coli* tests.

Tables 17 and 18 below outlines in the in-house and external monitoring programmes for both schemes. Refer to Appendix D for water sampling locations for each scheme.

In addition to the operational monitoring programmes outlined below, Council also implements the following management measure to ensure public safety regarding pathogenic ingress while providing water services with no disinfection:

- Mains flushing – quarterly (Bedourie and Birdsville)
- Air Scouring –every 3-4 years, organised through the RAPADWSA group (Bedourie and Birdsville)
- Reservoir Cleaning –every 3-4 years, organised through the RAPADWSA group (Birdsville)
- Documented Reservoir Inspections – 6-monthly intervals (Birdsville)
- Weekly visual inspections – all drinking water infrastructure, including the pumps, cooling ponds and heat exchange systems (Bedourie and Birdsville).

Table 17: Bedourie and Birdsville in-house monitoring programme.

Site	Location	Monitoring Frequency	Parameter	Target value	ADWG Health Guideline	Actions if Target Exceeded	Positions Responsible
Bedourie							Overall Responsibility: Chief Executive Officer Implementation and Review: Interim Director of Infrastructure. Operations: Water Operator
Raw Water	Bedourie Town Bore (New) and Bedourie Town Bore (Old) Bedourie town bores (old and new)	Weekly Visual Inspections	Old Bore Pressure	529 kPa	N/A	Investigate leaks and blockages	
			New Bore Pressure	550 kPa	N/A	contact plumber to travel to Bedourie asap	
			Bore-head Integrity	Sealed with no potential ingress points (both bores)	N/A	Re-seal or report maintenance issues to DOI	
Cooling Ponds	Cooling Pond Inlet/outlet		Inlet Temperature	50°C	N/A	Contact plumber and investigate issue	
			Outlet Temperature	42°C	N/A		
			Integrity	No bubbles coming from pond surface	N/A	Commence investigation for pipe leak	
Distribution System	3x samples tested from the following: - Council Depot - Airport - Industrial Area Workshop Tap	Monthly Grab Sample	E. coli	0	1	Refer to Section 10	
			Total Coliforms	0	N/A	Flush mains and re-test.	
			Turbidity	<1	>5		

Site	Location	Monitoring Frequency	Parameter	Target value	ADWG Health Guideline	Actions if Target Exceeded	Positions Responsible
Birdsville							
Raw Water	Birdsville town bores (old and new)	Weekly Visual Inspections	Old Bore Pressure	1,200 kPa	N/A	Investigate leaks and blockages	
			New Bore Pressure	1120 kPa	N/A	contact plumber to travel to Birdsville asap	
			Bore-head Integrity	Sealed with no potential ingress points (both bores)	N/A	Re-seal or report maintenance issues to DOI	
Cooling Ponds	Cooling Pond Inlet/outlet		Integrity	No bubbles coming from pond surface	N/A	Commence investigation for pipe leak	
Heat Exchange Systems	HEX1 (between bore & GLR)		Outlet Temperature	Between 80-50°C, target is 50°C	N/A	Investigate for blockages and	
	HEX2 (between GLR & ER)		Outlet Temperature	Between 50-40°C	N/A	possible leaks clean heat exchangers and	
	HEX3 (new system)		Tbc when operational		N/A	have Plumber attend	
			Pumps	No maintenance/operational issues or leaking	N/A	Report maintenance issues to DOI	
Reservoirs	Ground level and elevated reservoir		Pumps	No maintenance/operational issues or leaking	N/A		

Site	Location	Monitoring Frequency	Parameter	Target value	ADWG Health Guideline	Actions if Target Exceeded	Positions Responsible
			Integrity	Sealed with no potential ingress points	N/A		
Distribution System	4 samples tested from the following: - Council Depot - Wirrari Centre - Council-owned House on Bilby Street - Tap located downstream of the ground level and elevated reservoirs	Monthly Grab Sample	<i>E. coli</i>	0	1	Refer to Section 10	
			Total Coliforms	0	N/A	Flush mains and re-test.	
			Turbidity	<1	<5		

Table 18: Bedourie and Birdsville 6-monthly Verification Monitoring Programme.

Characteristic	Parameter	ADWG &/or Regulation Value	Associated Hazard	Sampling Locations		Positions Responsible
				Bedourie	Birdsville	
Microbial Quality	<i>E.coli</i>	Nil Detected – Health	Bacteria			
	Total Coliforms	Nil Detected				
Physical	Conductivity	N/A				
	Dissolved Organic Carbon	N/A				
	pH	pH 6.5 – 8.5 – Aesthetic				
	Total Dissolved Solids	600 mg/L – Aesthetic				
	Turbidity	5 NTU – Aesthetic				
Inorganics	Aluminium	0.2mg/L – Aesthetic	Hazards that arise from the Natural Geological Processes in the aquifer			
	Chloride	250mg/L – Aesthetic				
	Fluoride	1.5mg/L – Health				
	Selenium	0.004mg/L – Health				
	Sodium	180mg/L – Aesthetic				
	Total Iron	0.3mg/L - Aesthetic				
	Soluble Iron	N/A				

Characteristic	Parameter	ADWG &/or Regulation Value	Associated Hazard	Sampling Locations		Positions Responsible
				Bedourie	Birdsville	
	Total Manganese	0.05mg/L – <i>Aesthetic</i> 0.1mg/L – <i>Health</i>				
	Soluble Manganese	N/A				
	Uranium	0.017mg/L – <i>Health</i>				
	Gross Alpha	0.5 Bq/L – <i>Aesthetic</i>				
	Gross Beta	0.5 Bq/L – <i>Aesthetic</i>				
	Arsenic	0.01mg/L – <i>Health</i>				
	Cadmium	0.002mg/L – <i>Health</i>				
	Chromium	0.05mg/L – <i>Health</i>				
	Copper	1mg/L – <i>Aesthetic</i> 2mg/L – <i>Health</i>				
	Mercury	0.001mg/L – <i>Health</i>				
	Lead	0.005mg/L – <i>Health</i>				
	Nickel	0.02mg/L – <i>Health</i>				
	Zinc	3mg/L – <i>Aesthetic</i>				

10.0 INCIDENTS AND EMERGENCIES

Diamantina Shire Council operates on a 3-level incident and emergency framework in the management of their drinking water incidents and emergencies, starting at Level 1 (least severe) through to Level 3 (most severe); these are outlined in Table 19 below. It should be noted that during a full-scale emergency response and recovery scenario (e.g. a natural disaster), the Local Disaster Management Group is activated in accordance with DSC's Local Disaster Management Plan. The Diamantina Local Disaster Management Plan can be accessed here: <https://www.diamantina.qld.gov.au/downloads/file/925/local-disaster-management-plan-2022-23>.

During an incident or emergency, Council will notify residents using the usual notification channels, including the Council website and Facebook page. Sensitive users will also be notified, using the contact details provided in Table 2 above.

The drinking water incident and emergency action plan for the Bedourie and Birdsville schemes is provided in Section 10.1 below.

Table 19: DSC 3-Level Incident and Emergency Framework.

Alert Level	Description	Key Management Responses	Positions Responsible
Level 1 Low-Risk Operational Actions	Operational issues that could escalate if not responded to. These types of incidents are managed immediately and effectively by DSC staff, without any public health impact to the community. For example: - Exceedance of an Operational Control Point - Exceedance of an ADWG Aesthetic value that can be managed under the DWQMP. - Short-term drinking water infrastructure fail.	1. Notify Water Operator and/or Interim Director of Infrastructure. 2. Check and act upon operation and maintenance procedures. 3. Take appropriate actions to rectify the situation.	Water Operator, Interim Director of Infrastructure
Level 2 Medium-Risk Incidents and Emergencies	All ADWG health exceedances and incidents where normal actions under the DWQMP do not effectively manage the issue and there is a concern that public health may be impacted. For example: - Detection of a parameter with no water quality criteria that may have an adverse impact upon public health. - Detection of an ADWG aesthetic/screening value exceedance that may have an adverse impact upon public health (e.g. radiological activity). - Minor exceedance of an ADWG health value. - Short-term loss of drinking water supply (<24 hours).	1. Report incident/event to DOI and implement short-term management measures. 2. Where further health advice is required, notify Regulator. 3. Where public health may be impacted, notify residents. 4. Undertake incident investigation and appropriate corrective actions as soon as practicable to minimise the impact of the incident.	Water Operator, Interim Director of Infrastructure, Water Regulator

Alert Level	Description	Key Management Responses	Positions Responsible
	Cyber security breach		
Level 3 High-Risk Declared Disaster	This level of emergency or disaster requires coordination across departments and is dealt with at the CEO level. For example: - Widespread outbreak of a waterborne disease. - Major loss of drinking water supply, e.g. >24 hours over wide area. - Gross exceedance of an ADWG health guideline value for a chemical parameter (e.g. more than five times the ADWG health guideline limit). - Declared disaster. - Long-term drinking water infrastructure fail. - Detection of <i>E.coli</i> in the treated water.	- Report incident/event to the Regulator. - Notify Interim Director of Infrastructure who will inform the Chief Executive Officer - CEO makes the call to activate the Local Disaster Management Plan (as required). - Where public health may be impacted, notify residents. - Implement short-term management measures. - Undertake incident investigation.	Water Operator, Interim Director of Infrastructure, Water Regulator, Chief Executive Officer

10.1 DSC Incident and Emergency Action Plan

Table 20: DSC drinking water Incident and emergency action plan.

Level	Incident Or Emergency	Summary Of Actions to be Undertaken	Positions Responsible for Actions
1	Exceedance of OCP or exceedance of an ADWG aesthetic value that can be managed under the DWQMP	1. Water Operator to notify DOI. 2. Ensure all control measures identified in the operation and maintenance procedures are functioning effectively. Review records for anomalies. If simple adjustment is required, make adjustment and record details. 3. If a more substantial system change is required (e.g. maintenance to overcome a recurring problem), advise DOI so budget can be made available. 4. Organise system change or list for capital works as appropriate.	Water Operator & DOI
	Short-term drinking water infrastructure fail	1. Water Operator to notify DOI. 2. Determine the potentially affected area and isolate. 3. Inform concerned customers of the details of the incident and anticipated progress (if required). 4. Rectify the problem. 5. Investigate options to avoid any reoccurrence. 6. If a more substantial system change is required (e.g. maintenance to overcome a recurring problem), advise DOI so budget can be made available.	Water Operator & DOI
2	Detection of a parameter with no water quality criteria that may have an adverse impact upon Public Health OR detection of an ADWG aesthetic value exceedance that may have an adverse impact upon public health	1. Water Operator to notify DOI. 2. Check with the testing laboratory to confirm the exceedance OR re-commence in-house monitoring to confirm exceedance or adverse water quality criteria. 3. Report details of the exceedance to the Regulator within 3 hours via the Drinking Water Hotline (P: 1300 596 709) and the online notification form within 24 hours (E: DrinkingWater.Reporting@dlgwv.qld.gov.au). Contact Public Health Unit if required. 4. Determine potentially affected area and advise customers (via the usual communication channels) if required. 5. Commence investigation into water quality criteria or aesthetic exceedance. Some aesthetic exceedances or adverse water quality may be able to be fixed with mains flushing. 6. Once investigation is complete and the issue fixed, re-test the drinking water supply and send samples to the external laboratory (if required) for confirmation that there are no issues. 7. Investigate options to avoid any reoccurrences.	Water Operator, DOI, Water Supply Regulator

Level	Incident Or Emergency	Summary Of Actions to be Undertaken	Positions Responsible for Actions
		8. Upon resolution, provide a written report to the Regulator (Part 2 of Incident Reporting Form).	
	Minor exceedance of an ADWG health value	1. Water Operator to notify DOI. 2. Where an exceedance has been observed check with the testing laboratory to confirm the exceedance. 3. Report details to Regulator within 3 hours via the Drinking Water Hotline (P: 1300 596 709) and the online notification form within 24 hours (E: DrinkingWater.Reporting@dlgwv.qld.gov.au). Contact Public Health Unit if required. 4. Determine if water quality can be corrected and the time/resources required. Ensure all control measures are functioning effectively. 5. Advise customers and make temporary water supply arrangements including bottled potable water if required. 6. Rectify the problem or inform consumers of ongoing water quality limitation. 7. Once rectified, re-test and send the water samples to an external lab for verification monitoring to confirm the issue has been resolved (if required). 8. Provide a written report to the Regulator (Part 2 of Incident Reporting Form).	Water Operator, DOI, Water Supply Regulator
	Short-term loss of drinking water (<24 hours)	1. Water Operator to notify DOI. 2. Details of the supply loss or infrastructure fail are to be reported to the Regulator within 3 hours via the Drinking Water Hotline (P: 1300 596 709) and the online notification form within 24 hours (E: DrinkingWater.Reporting@dlgwv.qld.gov.au). Contact Public Health Unit if required. 3. Determine the potentially affected area and advise effected customers (via the usual communication channels) and implement temporary water restrictions if applicable. 4. Rectify the problem. 5. Investigate options to avoid any reoccurrence. 6. Upon resolution, provide a written report to the Regulator (Part 2 of Incident Reporting Form).	Water Operator, DOI, Water Supply Regulator
	Cyber Security Breach	1. Water Operator to notify DOI. 2. Determine the potentially affected area (i.e. access to WTP or remote access to Council files). 3. Alert Australian Government Cyber Security Hotline (P: (07) 3215 3951)	Water Operator, DOI, Water Supply Regulator

Level	Incident Or Emergency	Summary Of Actions to be Undertaken	Positions Responsible for Actions
		4. Notify Regulator within 3 hours via. the Drinking Water Hotline (P: 1300 596 709) and the online notification form within 24 hours (E:DrinkingWater.Reporting@dlgwv.qld.gov.au) 5. Rectify the problem. Ensure all control measures are functioning effectively. 6. Investigate options to avoid any recurrence. 7. Upon resolution, provide a written report to Regulator (Part 2 of Incident Reporting Form), if required.	
3	Widespread outbreak of a waterborne disease OR detection of <i>E.coli</i> in the water supply	1. Water Operator to notify DOI. 2. DOI to alert CEO to coordinate notification, investigation and response including activation of the Emergency Response Plan/Disaster Management Pant (as required). 3. Details of the outbreak are to be reported to Regulator within 3 hours via the Drinking Water Hotline (P: 1300 596 709) and the online notification form within 24 hours (E:DrinkingWater.Reporting@dlgwv.qld.gov.au). 4. Determine the potentially affected area and isolate if possible. Issue a Boil Water Alert and advise effected customers (via the usual communication channels) or other precautions as required. 5. Flush all affected mains. 6. Provide additional chlorine dosing if practical. 7. Undertake a comprehensive contamination investigation and take necessary corrective actions. 8. Upon resolution, provide a written report to the Regulator (Part 2 of Incident Reporting Form).	Water Operator, DOI, Regulator, CEO
	Major loss of drinking water supply (>24 hours) OR long-term drinking water infrastructure fail	1. Water Operator to notify DOI. 2. DOI to alert CEO to coordinate notification, investigation and response including activation of the Emergency Response Plan/Disaster Management Pant (as required). 3. Details of the supply loss or infrastructure fail are to be reported to Regulator within 3 hours via. the Drinking Water Hotline (P: 1300 596 709) and the online notification form within 24 hours (E:DrinkingWater.Reporting@dlgwv.qld.gov.au). 4. Determine the potentially affected area and advise effected customers (via. the usual communication channels) and implement temporary water restrictions if applicable. 5. Make temporary water supply arrangements if required. 6. Rectify the problem. 7. Investigate options to avoid any reoccurrence.	Water Operator, DOI, Regulator, CEO

Level	Incident Or Emergency	Summary Of Actions to be Undertaken	Positions Responsible for Actions
		8. Upon resolution, provide a written report to Regulator (Part 2 of Incident Reporting Form).	
	Gross exceedance of an ADWG health value	1. Water Operator to notify DOI. 2. DOI to alert CEO to coordinate notification, investigation and response including activation of the Emergency Response Plan/Disaster Management Pant (as required). 3. Check with the testing laboratory to confirm the exceedance (a sudden gross exceedance is only likely to occur as the result of sabotage or an unreported chemical spill). 4. Report details of the exceedance to Regulator within 3 hours via. the Drinking Water Hotline (P: 1300 596 709) and the online notification form within 24 hours (E: DrinkingWater.Reporting@dlgww.qld.gov.au) 5. Determine the potentially affected area and advise effected customers (via. the usual communication channels) not to drink the water. 6. Re-test the drinking water supply and send samples to the external laboratory for confirmation that health exceedance was not a testing error. 7. Make temporary supply arrangements, including bottled potable water if required. 8. Commence investigation into exceedance and rectify the problem. 9. Once, rectified, re-test the drinking water supply and send samples to the external laboratory to confirm that the problem has been fixed and the drinking water is safe for consumption. 10. Investigate options to avoid any reoccurrence. 11. Upon resolution, provide a written report to Regulator (Part 2 of Incident Reporting Form).	Water Operator, DOI, Regulator, CEO
	Declared disaster	1. Water Operator to notify DOI. 2. DOI to alert CEO and liaise with Local Disaster Management centre to monitor the potential effect of the disaster upon water supply services. 3. If impact to drinking water services, details of the event to be reported to Regulator within 3 hours via. the Drinking Water Hotline (P: 1300 596 709) and the online notification form within 24 hours (E: DrinkingWater.Reporting@dlgww.qld.gov.au) 4. If the water supply has been affected, consider a Boil Water Alert and take relevant actions as per the DWQMP	Water Operator, DOI, Regulator, CEO

Level	Incident Or Emergency	Summary Of Actions to be Undertaken	Positions Responsible for Actions
		and direction from the Local Disaster Management Centre and Regulator. 5. If the water supply has been affected, upon resolution, provide a written report to Regulator (Part 2 of Incident Reporting Form).	

11.0 INFORMATION MANAGEMENT

Diamantina Shire Council is a relatively small organisation with a records system that is available to all relevant staff. Engineering services are provided by GBA Consulting Engineers who are based in Barcaldine. GBA provides technical support for Council's water operations, preparing tender documents and specifications for new works and as-constructed data for completed works. GBA also develops, maintains, and distributes the works procedures to cover construction, maintenance, testing and inspections to control risks to water supply quality.

All records are computerised and stored for at least 7 years. Table 21 below outlines the specific details in relation to DSC's information management system.

Table 21: Drinking Water Information Management Details.

Information/ Document	Format (Hardcopy /Electronic)	Storage Location	Position Responsible	Comments
Operational Monitoring Data	Hardcopy/ Electronic	Filed on DSC/GBA servers.	DSC Town Foreman and GBA Environmental Officer	Operational monitoring data is recorded in an excel spreadsheet which is sent to the Bedourie Town Foreman to be stored in Council's electronic filing system and forwarded onto GBA.
Verification Monitoring Data	Electronic	Filed on DSC/GBA servers.	DSC Town Foreman and GBA Environmental Officer	Verification monitoring data is sent from the lab to the Bedourie Town Foreman and GBA where it is stored in the respective electronic filing systems.
Customer Complaints	Hardcopy/ Electronic	Filed on DSC server.	DSC Administrative Officer and Interim Director of Infrastructure	Complaints may be received in person, over the phone or via. email or fax. Once received, all complaints are stored in Council's electronic filing system.
Maintenance	Hardcopy/ Electronic	Filed on DSC server.	DSC Administrative Officer and Interim Director of Infrastructure	Maintenance issues are stored in Council's electronic filing system and collated for addition to Council's maintenance register.
Operation and Maintenance Procedures	Electronic	Filed on DSC/GBA servers.	DSC Administration Officer and GBA Environmental Officer.	O&M procedure are predominantly written by GBA and forwarded onto Council for storage in Council's electronic filing system.

APPENDIX A

**DEPARTMENT OF RESOURCES BORE REPORT CARDS (BEDOURIE OLD BORE/BEDOURIE NEW
BORE/BIRDSVILLE BORE)**

Report Date: 25/09/2023 20:51

From Year:

Registered Number	Facility Type	Facility Status	Drilled Date	Office	Shire
316	Artesian - Controlled Flow	Existing	01/01/1905	Longreach	2750 - DIAMANTINA
Details			Location		
Description	RESERVE 1		Latitude	24-21-45	Basin 0011
Parish	374 - BEDOURIE		Longitude	139-28-08	Sub-area
Original Name	BEDOURIE TOWN NO.2		GIS Latitude	-24.3623661	Lot 2
			GIS Longitude	139.4690122	Plan SP127186
			Easting	344708	
			Northing	7304798	Map Scale 254 - 1: 250 000
Driller Name	J. HANNAY, A.F. SPARHAM		Zone	54	Map Series M - Metric Series
Drill Company	HANNAY BRO.		Accuracy		Map No SG54-1
Const Method	CABLE TOOL		GPS Accuracy		Map Name BEDOURIE
Bore Line			Checked	Yes	Prog Section
D/O File No	25/12/B/1	Polygon			
R/O File No	25/12/B/1	Equipment			
H/O File No	L05527B	RN of Bore Replaced			
Log Received Date		Data Owner			
Roles					

Casing										7 records for RN	316
Pipe	Date	Rec	Top (m)	Bottom (m)	Material Description	Mat Size (mm)	Size Desc	Outside Diameter (mm)			
A	01/01/1905	1	0.00	60.70	Steel Casing		WT - Wall Thickness	254			
A	01/01/1905	2	0.00	119.20	Steel Casing		WT - Wall Thickness	203			
A	01/01/1905	3	0.00	362.70	Steel Casing		WT - Wall Thickness	152			
A	01/01/1905	4	362.70	400.50	Open End						
A	19/01/1981	6	0.00	363.30	Steel Casing	4.760	WT - Wall Thickness	127			

From Year:

Pipe	Date	Rec	Top (m)	Bottom (m)	Material Description	Mat Size (mm)	Size Desc	Outside Diameter (mm)
X	01/01/1905	5	0.00		Grout			
X	19/01/1981	7	0.00	363.00	Grout			

Strata Logs

20 records for RN 316

Rec	Top (m)	Bottom (m)	Strata Description
1	0.00	9.75	SAND AND COPIE
2	9.75	19.20	CLAY, SAND, COPIE GRAVEL
3	19.20	31.39	SOAPSTONE, DRIFT SAND, GRAVEL
4	31.39	35.97	CLAY, MUD
5	35.97	52.73	CLAY CARRING COPIE
6	52.73	77.72	CLAY
7	77.72	86.87	FINE SAND AND CLAY
8	86.87	100.58	DRIFT SAND GRAVEL
9	100.58	104.24	SAND
10	104.24	114.30	SAND AND CLAY
11	114.30	201.17	SHALE
12	201.17	227.08	SHALE LAYERS CLAY
13	227.08	288.04	SHALE
14	288.04	297.18	SAND AND COPIE
15	297.18	319.74	SHALE STREAKS AND LIMESTONE
16	319.74	350.52	SHALE
17	350.52	365.15	SHALE SAND LIMESTONE AND CLAY
18	365.15	385.88	SANDSTONE
19	385.88	390.14	SAND GRAVEL AND SANDSTONE

Report Date: 25/09/2023 20:51

From Year:

Rec	Top (m)	Bottom (m)	Strata Description
20	390.14	400.51	SANDSTONE

Stratigraphies6 records for RN 316

Source	Rec	Top (m)	Bottom (m)	Strata Description
DNR	1	0.00	31.40	QUATERNARY ALLUVIUM
DNR	2	31.40	121.90	MACKUNDA FORMATION
DNR	3	121.90	192.00	ALLARU MUDSTONE
DNR	4	192.00	214.90	TOOLEBUC FORMATION
DNR	5	214.90	342.60	WALLUMBILLA FORMATION
DNR	6	342.60	400.50	LONGSIGHT SANDSTONE

Aquifers7 records for RN 316

Rec	Top (m)	Bottom (m)	Lithology	Date	SWL (m)	Flow	Quality	Yield (L/s)	Contr	Cond	Formation Name
1	12.50		SDST - Sandstone							PS	QUATERNARY ALLUALUV
2	77.70		SDST - Sandstone							PS	MACKUNDA FORMATION
3	107.60		SDST - Sandstone							PS	MACKUNDA FORMATION
4	354.20		SDST - Sandstone							PS	LONGSIGHT SANDSFORM
5	362.70	366.70	SDST - Sandstone							PS	LONGSIGHT SANDSFORM
6	377.00	389.50	SDST - Sandstone							PS	LONGSIGHT SANDSFORM
7	390.10		SDST - Sandstone							PS	LONGSIGHT SANDSFORM

Pump Tests Part 115 records for RN 316

Pipe	Date	Rec	RN of Pumped Bore	Top (m)	Bottom (m)	Dist (m)	Meth	Test Types	Pump Type	Suction Set (m)	Q Prior to Test (l/s)	Dur of Q PR (mins)	Pres on Arriv (m)	Q on Arriv (l/s)
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Report Date: 25/09/2023 20:51

From Year:

Pipe	Date	Rec	RN of Pumped Bore	Top (m)	Bottom (m)	Dist (m)	Meth	Test Types	Pump Type	Suction Set (m)	Q Prior to Test (l/s)	Dur of Q PR (mins)	Pres on Arriv (m)	Q on Arriv (l/s)
A	11/08/1905	1	316				F/F							139.36
A	24/10/1921	1					F/F							71.18
A	18/09/1922	1					F/F							70.18
A	20/10/1923	1					F/F							69.19
A	16/07/1925	1					F/F							57.73
A	20/06/1930	1					F/F							61.49
A	15/11/1938	1					F/F							65.31
A	01/07/1947	20	316	362.70	390.10	0.00	F/F	FR						15.78
A	21/10/1952	1					F/F							40.03
A	20/04/1953	1					F/F							40.03
A	11/08/1965	1					F/F							46.01
A	03/06/1970	1	316			1.50	ART	ST					1.08	44.28
A	18/01/1981	1	316			0.80	ART	DT						
A	03/07/1990	1	316			1.00	ART	FR ST					51.79	
A	01/08/2001	1	316			0.73	ART	ST FR ST					52.30	

Pump Tests Part 2															15 records for RN 316	
Pipe	Date	Rec	Test Dur (mins)	SWL(m)	Recov Time (mins)	Resid DD (m)	Max DD or P RED (m)	Q at Max DD (l/s)	Time to Max DD (mins)	Max Q (l/s)	Calc Stat HD (m)	Design Yield (l/s)	Design BP (m)	Suct. Set (m)	Tmsy (m2/Day)	Stor
A	11/08/1905	1		94.49				139.36		139.36						
A	24/10/1921	1						71.18		71.18						
A	18/09/1922	1						70.18		70.18						
A	20/10/1923	1						69.19		69.19						

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Queensland Government
Groundwater Information
Bore Report

From Year:

Pipe	Date	Rec	Test Dur (mins)	SWL(m)	Recov Time (mins)	Resid DD (m)	Max DD or P RED (m)	Q at Max DD (l/s)	Time to Max DD (mins)	Max Q (l/s)	Calc Stat HD (m)	Design Yield (l/s)	Design BP (m)	Suct. Set (m)	Tmsy (m2/Day)	Stor
A	16/07/1925	1						57.73		57.73						
A	20/06/1930	1						61.49		61.49						
A	15/11/1938	1		57.75				65.31		65.31						
A	01/07/1947	20						63.38		63.38						
A	21/10/1952	1						40.03		40.03						
A	20/04/1953	1						40.03		40.03						
A	11/08/1965	1						58.66		58.66						
A	03/06/1970	1	120	47.55				59.60	120	59.60					177	
A	18/01/1981	1	342	51.83			37.70	34.48	120			33.60	0.00		155	
A	03/07/1990	1	240	54.04			43.52	41.65	30	44.28	56.06				144	
A	01/08/2001	1	230	52.30			50.26	41.28	60	45.45	54.13				145	

Bore Conditions1 records for RN 316

Date	Drain Details			Headworks									
	Tot Len (km)	Max Run (km)	Cond	Ret Len (km)	Cond	Ctrl	Leak	Flow Irreg	Precip	Est Use (ML/yr)	Num of Cattle	Num of Sheep	Comments
01/08/2001					Good	F							

Elevations1 records for RN 316

Pipe	Date	Elevation (m)	Precision	Datum	Meas	Point	Survey Source
X	01/01/2100	91.40	SVY	STD - State Datum	N	Natural Surface	

Water Analysis Part 14 records for RN 316

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From Year:

Pipe	Date	Rec	Analyst	Analysis No	Depth (m)	Meth	Src	Cond (uS/cm)	pH	Si (mg/L)	Total Ions (mg/L)	Total Solids (mg/L)	Hard	Alk	Fig. of Merit	SAR	RAH
A	01/01/1966	1	GCL	33000		PU	GB	900	8.3		741.60	535.74	8	348			6.80
A	03/06/1970	1	GCL	46449		PU	GB	900	8.3		763.35	543.76	11	354		29.1	6.86
A	01/01/1975	1	GCL	66036		PU	GB	935	8.2		708.40	500.51	21	342		18.6	6.41
A	03/07/1990	1	GCL	137085		MA	GR	863	8.5	17	733.52	546.47	9	345	0.0	32.2	6.71

Water Analysis Part 2

4 records for RN 316

Pipe	Date	Rec	Na	K	Ca	Mg	Mn	HCO3	Fe	CO3	Cl	F	NO3	SO4	Zn	Al	B	Cu
A	01/01/1966	1	226.0		3.2	0.0		405.0		9.6	92.0	0.80		5.0				
A	03/06/1970	1	224.0		4.0	0.3		432.0			100.0	0.05	0.0	3.0				
A	01/01/1975	1	195.0	3.0	7.5	0.5		409.0		3.7	89.0	0.70						
A	03/07/1990	1	221.9	4.7	3.1	0.3	0.00	402.2	0.00	8.9	91.5	0.84	0.0	0.0				

Water Levels

0 records for RN 316

Wire Line Logs

3 records for RN 316

Date	Run	Type		Source	Top (m)	Bottom (m)	Operator	Comments
12/10/2000	1	CALU	Caliper Unspecified	BEDOURIE S C	-2.00	380.950		
12/10/2000	1	GR	Gamma Ray	BEDOURIE S C	-1.14	381.110		
23/10/2012	1	CAL3	Caliper 3 arm	PAPER	0.00	379.000		

Field Measurements

4 records for RN 316

Pipe	Date	Depth (m)	Conduct (uS/cm)	pH	Temp (C)	NO3 (mg/L)	DO2 (mg/L)	Eh (mV)	Alkalinity (mV)	Samp	Method	Samp	Source
A	11/08/1965				43.0					PU	Pump - Other or Flowing Bore	GB	Groundwater - from Bore
A	18/01/1981				44.0					PU	Pump - Other or Flowing Bore	GB	Groundwater - from Bore

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Queensland Government
Groundwater Information
Bore Report

From Year:

Pipe	Date	Depth (m)	Conduct (uS/cm)	pH	Temp (C)	NO3 (mg/L)	DO2 (mg/L)	Eh (mV)	Alkalinity (mV)	Samp	Method	Samp	Source
A	03/07/1990				45.0					PU	Pump - Other or Flowing Bore	GB	Groundwater - from Bore
A	01/08/2001		897		44.0					PU	Pump - Other or Flowing Bore	GB	Groundwater - from Bore

Special Water Analysis 0 records for RN 316

Report Date: 25/09/2023 20:51

From Year:

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Queensland Government
Groundwater Information
Bore Report

Report Date: 25/09/2023 20:50

From Year:

Registered Number	Facility Type	Facility Status	Drilled Date	Office	Shire
184306	Artesian - Controlled Flow	Existing	09/11/2019	Longreach	2750 - DIAMANTINA
Details			Location		
Description			Latitude	24-21-42	Basin 0011
Parish	6000 - NO LONGER USED		Longitude	139-28-07	Sub-area
Original Name			GIS Latitude	-24.3617714363	Lot 610
			GIS Longitude	139.4685112412	Plan EU8
			Easting	344657	
			Northing	7304863	Map Scale
Driller Name	BEALE, WILLIAM		Zone	54	Map Series
Drill Company	WATER DRILL AUSTRALIA		Accuracy		Map No
Const Method	ROTARY MUD		GPS Accuracy		Map Name
Bore Line			Checked	Yes	Prog Section
D/O File No		Polygon			
R/O File No		Equipment			
H/O File No		RN of Bore Replaced			
Log Received Date	28/01/2020	Data Owner			
Roles	Town Water Supply Underground Coal Gasification (UCG) Monitoring				

Casing								7 records for RN 184306
Pipe	Date	Rec	Top (m)	Bottom (m)	Material Description	Mat Size (mm)	Size Desc	Outside Diameter (mm)
A	09/11/2019	1	0.00	120.00	Steel Casing	6.400	WT - Wall Thickness	219
A	09/11/2019	2	0.00	348.00	Steel Casing	6.400	WT - Wall Thickness	168
A	09/11/2019	3	338.00	426.00	Steel Casing	6.600	WT - Wall Thickness	141
A	09/11/2019	4	360.00	420.00	Perforated or Slotted Casing	10.000	AP - Aperture Size	141
X	09/11/2019	5	4.00	343.00	Centraliser			

Queensland Government
Groundwater Information
Bore Report

Report Date: 25/09/2023 20:50

From Year:

Pipe	Date	Rec	Top (m)	Bottom (m)	Material Description	Mat Size (mm)	Size Desc	Outside Diameter (mm)
X	09/11/2019	6	0.00	120.00	Grout			270
X	09/11/2019	7	0.00	348.00	Grout			200

Strata Logs7 records for RN 184306

Rec	Top (m)	Bottom (m)	Strata Description
1	0.00	1.00	FINE SAND
2	1.00	5.00	CLAY
3	5.00	110.00	SAND FINE/MEDIUM/COURSE & SMALL GRAVEL
4	110.00	348.00	SHALE
5	348.00	360.00	SHALE & HARD BANDS OF SILTSTONE
6	360.00	420.00	SANDSTONE SOFT & FINE/MEDIUM GRAIN SIZE*
7	420.00	426.00	SHALE

Stratigraphies0 records for RN 184306

Aquifers1 records for RN 184306

Rec	Top (m)	Bottom (m)	Lithology	Date	SWL (m)	Flow	Quality	Yield (L/s)	Contr	Cond	Formation Name
1	360.00	420.00	SDST - Sandstone	09/11/2019	52.10	Y	POTABLE	100.00	Y	PS	LONGSIGHT SANDSTONE

Pump Tests Part 10 records for RN 184306

Pump Tests Part 20 records for RN 184306

Bore Conditions0 records for RN 184306

Elevations0 records for RN 184306

Report Date: 25/09/2023 20:50

Queensland Government
Groundwater Information
Bore Report

From Year:

Water Analysis Part 1	0 records for RN 184306
Water Analysis Part 2	0 records for RN 184306
Water Levels	0 records for RN 184306
Wire Line Logs	0 records for RN 184306
Field Measurements	0 records for RN 184306
Special Water Analysis	0 records for RN 184306

Queensland Government
Groundwater Information
Bore Report

Report Date: 25/09/2023 20:50

From Year:

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Report Date: 25/09/2023 14:42

From Year:

Registered Number	Facility Type	Facility Status	Drilled Date	Office	Shire
14645	Artesian - Controlled Flow	Existing	25/04/1961	Longreach	2750 - DIAMANTINA
Details			Location		
Description	TOWN RESERVE		Latitude	25-53-48	Basin 0021
Parish	3391 - MUDDAWARRY		Longitude	139-21-07	Sub-area
Original Name	BIRDSVILLE TOWN BORE		GIS Latitude	-25.8966313	Lot 30
			GIS Longitude	139.3518761	Plan SP112844
			Easting	334901	
Driller Name			Northing	7134726	Map Scale 254 - 1: 250 000
Drill Company			Zone	54	Map Series M - Metric Series
Const Method	ROTARY RIG		Accuracy		Map No SG54-5
Bore Line			GPS Accuracy		Map Name BIRDSVILLE
D/O File No	140/044/0003	Polygon	Checked	Yes	Prog Section
R/O File No	25/12/B/2	Equipment	NE		
H/O File No	00065	RN of Bore Replaced			
Log Received Date		Data Owner			
Roles	GAB Monitoring Water Supply				

Casing								8 records for RN 14645
Pipe	Date	Rec	Top (m)	Bottom (m)	Material Description	Mat Size (mm)	Size Desc	Outside Diameter (mm)
A	05/05/1961	1	0.00	144.20	Steel Casing		WT - Wall Thickness	203
A	05/05/1961	2		1221.03	Steel Casing		WT - Wall Thickness	152
A	05/05/1961	3	1173.18	1219.20	Perforated or Slotted Casing		AP - Aperture Size	
A	05/05/1961	4			Grout			
A	16/06/1987	1	0.00	208.00	Steel Casing	4.760	WT - Wall Thickness	127

From Year:

Pipe	Date	Rec	Top (m)	Bottom (m)	Material Description	Mat Size (mm)	Size Desc	Outside Diameter (mm)
A	16/06/1987	2	0.00	208.00	Grout			127
A	16/06/1987	3	0.00	182.00	Grout			152
A	16/06/1987	4	0.00	10.00	Grout			203

Strata Logs

16 records for RN 14645

Rec	Top (m)	Bottom (m)	Strata Description
1	0.00	27.43	STONE
2	27.43	38.10	SANDSTONE
3	38.10	67.06	CLAY
4	67.06	275.84	MUDSTONE, SANDSTONE BANDS
5	275.84	455.68	SHALE AND SANDSTONE
6	455.68	496.82	SANDSTONE, SHALE AND COAL
7	496.82	710.18	SHALE BANDS SANDSTONE
8	710.18	752.86	SHALE BANDS LIMESTONE
9	752.86	792.48	HARD SHALE
10	792.48	821.44	SANDY SHALE
11	821.44	1112.52	HARD SHALE
12	1112.52	1176.53	SHALE AND SANDSTONE
13	1176.53	1221.03	SANDSTONE
902			00/04/1961 SWL +133.70 M TMP NUL C
903			00/04/1961 DISCH " M3D DRILLER
910	1176.50		QUALITY DESCRIPT/CONDUCT: 820

Stratigraphies

9 records for RN 14645

Report Date: 25/09/2023 14:42

From Year:

Source	Rec	Top (m)	Bottom (m)	Strata Description
DNR	1	0.00		QUATERNARY DUNE SANDS
DNR	2		49.40	TERTIARY
DNR	3	49.40	423.70	WINTON FORMATION
DNR	4	423.70	589.80	MACKUNDA FORMATION
DNR	5	589.80	908.30	ALLARU MUDSTONE
DNR	6	908.30	918.40	TOOLEBUC FORMATION
DNR	7	918.40	1126.50	WALLUMBILLA FORMATION
DNR	8	1126.50	1175.60	CADNA-OWIE FORMATION
DNR	9	1175.60	1221.03	HOORAY SANDSTONE

Aquifers											1 records for RN	14645
Rec	Top (m)	Bottom (m)	Lithology	Date	SWL (m)	Flow	Quality	Yield (L/s)	Contr	Cond	Formation Name	
1	1176.50	1219.20	SDST - Sandstone			Y			Y	PS	HOORAY SANDSTONE	

Pump Tests Part 1													9 records for RN 14645	
Pipe	Date	Rec	RN of Pumped Bore	Top (m)	Bottom (m)	Dist (m)	Meth	Test Types	Pump Type	Suction Set (m)	Q Prior to Test (l/s)	Dur of Q PR (mins)	Pres on Arriv (m)	Q on Arriv (l/s)
A	01/05/1961	20	14645	1176.50		0.00	ART	FR DT ST					126.77	1.05
A	01/12/1964	20	14645	1176.50		0.00	ART	ST					123.96	1.05
A	10/06/1970	1					ART	FR ST DT					52.82	
A	03/10/1986	1				0.05	ART	FR DT			0.00	95	72.42	
A	18/06/1988	1	14645			0.87	ART	FR ST DT					111.75	6.02
A	30/07/1992	1	14645			1.00	ART	ST					97.05	
A	08/06/2001	1	14645			1.01	ART	ST FR ST					53.63	

Report Date: 25/09/2023 14:42

From Year:

Pipe	Date	Rec	RN of Pumped Bore	Top (m)	Bottom (m)	Dist (m)	Meth	Test Types	Pump Type	Suction Set (m)	Q Prior to Test (l/s)	Dur of Q PR (mins)	Pres on Arriv (m)	Q on Arriv (l/s)
A	11/08/2004	1	14645	1176.53	1219.20	0.91	ART	ST FR ST					43.11	
A	29/06/2010	1	14645	1176.55	1219.20	0.87	ART	ST FR ST					44.74	

Pump Tests Part 2

9 records for RN 14645

Pipe	Date	Rec	Test Dur (mins)	SWL(m)	Recov Time (mins)	Resid DD (m)	Max DD or P RED (m)	Q at Max DD (l/s)	Time to Max DD (mins)	Max Q (l/s)	Calc Stat HD (m)	Design Yield (l/s)	Design BP (m)	Suct. Set (m)	Tmsy (m2/Day)	Stor
A	01/05/1961	20		127.62				40.05		39.39	146.00	37.81			95	
A	01/12/1964	20		126.78				40.03			128.60				95	
A	10/06/1970	1		123.96				32.61		48.49	133.80	18.32			95	
A	03/10/1986	1	180	120.80				44.75	1	46.32	132.28	41.96			95	
A	18/06/1988	1	280	121.08			110.25	37.09	15	38.62	132.00	34.30			94	
A	30/07/1992	1	60	126.67	60						133.60				96	
A	08/06/2001	1	135	116.46			110.84	41.94	1	43.61	121.39	38.52			96	
A	11/08/2004	1	231	116.91			111.05	41.37	60	42.99	129.76	38.86			95	
A	29/06/2010	1	260	116.03	120		111.50	40.42	120	42.12	131.00	37.82			95	

Bore Conditions

4 records for RN 14645

Date	Drain Details			Headworks										Comments
	Tot Len (km)	Max Run (km)	Cond	Ret Len (km)	Cond	Ctrl	Leak	Flow Irreg	Precip	Est Use (ML/yr)	Num of Cattle	Num of Sheep		
03/10/1986													Test aborted as mercury was lost in 2nd manometer making pressure readings dubious.	
08/06/2001					Good	F								

From Year:

Date	Tot Len (km)	Max Run (km)	Cond	Ret Len (km)	Cond	Ctrl	Leak	Flow Irreg	Precip	Est Use (ML/yr)	Num of Cattle	Num of Sheep	Comments
11/08/2004	2.0	2.0	Fair							866.4			
29/06/2010					Good	F							Artesian facility, 1 year monitoring bore. Note bore water go's completly on the boil @ around the 103 degree mark rendering the orifice meter unmeasurable, although back pressure observations were recorde through out the entire flow recession test.

Elevations

2 records for RN 14645

Pipe	Date	Elevation (m)	Precision	Datum	Meas	Point	Survey Source
X	05/05/1961	48.80	SVY	Surveyed	STD - State Datum	N	Natural Surface
X	29/06/2010	47.00	GPS	Global Positioning System	ASD - Assumed Datum	N	Natural Surface

Water Analysis Part 1

4 records for RN 14645

Pipe	Date	Rec	Analyst	Analysis No	Depth (m)	Meth	Src	Cond (uS/cm)	pH	Si (mg/L)	Total Ions (mg/L)	Total Solids (mg/L)	Hard	Alk	Fig. of Merit	SAR	RAH
A	10/06/1970	1	GCL	046450	1176.00	PU	GB	820	8.1		714.00	0.00	8	358	0.0	32.4	7.01
A	02/10/1986	1	GCL	117988	1221.00	PU	GB	810	8.5	62	680.00	520.00	10	325	0.0	25.3	6.30
A	11/08/2004	1	GCL	216015	1219.20	PU	GB	807	8.0	72	659.83	524.85	3	339	0.0	49.1	6.72
X	29/06/2010	1	GCL	301453	1176.53	PU	GB	812	8.4	73	675.00	539.00	4	347	0.0	40.0	6.80

Water Analysis Part 2

4 records for RN 14645

Pipe	Date	Rec	Na	K	Ca	Mg	Mn	HCO3	Fe	CO3	Cl	F	NO3	SO4	Zn	Al	B	Cu
A	10/06/1970	1	204.0		3.0			437.0			66.0	2.00		2.0				
A	02/10/1986	1	195.0	5.1	1.8	0.0	0.02	410.0	0.02	9.0	72.0	1.80	0.0	2.3				
A	11/08/2004	1	185.6	5.3	1.0	0.0	0.01	407.8	0.00	2.6	55.2	1.73	0.0	0.5	0.00	0.05	0.46	0.00

Report Date: 25/09/2023 14:42

From Year:

Pipe	Date	Rec	Na	K	Ca	Mg	Mn	HCO3	Fe	CO3	Cl	F	NO3	SO4	Zn	Al	B	Cu
X	29/06/2010	1	193.0	5.2	1.7	0.1	0.01	410.0	<0.01	6.0	56.0	1.70	<0.5	1.0	<0.01	0.05	0.49	<0.03

Water Levels

1 records for RN 14645

Pipe	Date	Time	Measure (m)	Meas	Point	Remark	Meas	Type	Coll Auth	Coll	Method	Project	Quality
X	05/05/1961		133.70	N	Natural Surface		NR	Not Recorded	NR	NR	Not Recorded		130 Data is of unknown quality

Wire Line Logs

7 records for RN 14645

Date	Run	Type	Source	Top (m)	Bottom (m)	Operator	Comments
05/10/1961	1	TEMPL	Temperature	DNR	0.00	1210.000	TEMP AT TOP 98.3 DEG C. TEMP AT BOTTOM 113.9 DEG C
02/10/2000	1	CCL	Casing Collar Locator	DNR	0.00	1211.000	CASING 0-1211M. UNKNOWN BELOW 1211M.
02/10/2000	1	CAL		DNR	0.00	1211.000	CASING 5" 0-207M. CASING 6" 207-1186M. UNKNOWN BELOW 1186M.
02/10/2000	1	GR	Gamma Ray	DNR	0.00	1224.000	SANDSTONE BANDED 1125-1179M. SANDSTONES GOOD 1179-1190, 1210-1224M.
09/10/2000	1	GR	Gamma Ray	BIRDSVILLE S C	0.14	1225.790	
09/10/2000	2	GR	Gamma Ray	BIRDSVILLE S C	-0.19	1225.660	
10/10/2000	1	CALU	Caliper Unspecified	BIRDSVILLE S C	-1.91	1186.590	

Field Measurements

4 records for RN 14645

Pipe	Date	Depth (m)	Conduct (uS/cm)	pH	Temp (C)	NO3 (mg/L)	DO2 (mg/L)	Eh (mV)	Alkalinity (mV)	Samp Method	Samp Source
A	03/10/1986				98.5						
A	08/06/2001		747	8.4	99.9					PU	Pump - Other or Flowing Bore
A	11/08/2004		753	7.3	97.8					PU	Pump - Other or Flowing Bore GB Groundwater - from Bore
A	29/06/2010		766	7.8	99.0					PU	Pump - Other or Flowing Bore GB Groundwater - from Bore

Report Date: 25/09/2023 14:42

Queensland Government
Groundwater Information
Bore Report

From Year:

Special Water Analysis	0 records for RN 14645
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Report Date: 25/09/2023 14:42

From Year:

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From Year:

Registered Number	Facility Type	Facility Status	Drilled Date	Office	Shire
211035	Artesian - Controlled Flow	Existing	02/07/2025	Longreach	2750 - DIAMANTINA
Details			Location		
Description			Datum	GDA94	Basin 0021
Parish	6000 - NO LONGER USED		Latitude	25-53-34	Sub-area
Original Name	BIRDSVILLE TOWN BORE		Longitude	139-21-02.5	Lot 7
			GIS Latitude	-25.892778	Plan SP340136
			GIS Longitude	139.350694	
Driller Name	GILLETT, STEVEN		Easting	334777.5	Map Scale
			Northing	7135151.6	Map Series
Const Method	ROTARY MUD		Zone	54	Map No
Bore Line			Accuracy		Map Name
D/O File No	Polygon		GPS Accuracy		Prog Section
R/O File No	Equipment		Checked	Yes	
H/O File No	RN of Bore Replaced				
Log Received Date	10/07/2025	Data Owner			
Roles	Town Water Supply				

Casing									8 records for RN 211035
Pipe	Date	Rec	Top (m)	Bottom (m)	Material Description	Mat Size (mm)	Size Desc	Outside Diameter (mm)	
A	02/07/2025	1	0.00	145.42	Steel Casing	6.400	WT - Wall Thickness	244	
A	02/07/2025	2	0.00	1078.72	Steel Casing	6.400	WT - Wall Thickness	178	
A	02/07/2025	3	1063.34	1305.00	Steel Casing	6.400	WT - Wall Thickness	141	
A	02/07/2025	4	1063.34	1305.00	Perforated or Slotted Casing	5.000	AP - Aperture Size	141	
X	02/07/2025	5	0.00	145.42	Centraliser				

Report Date: 29/10/2025 09:19

From Year:

Pipe	Date	Rec	Top (m)	Bottom (m)	Material Description	Mat Size (mm)	Size Desc	Outside Diameter (mm)
X	02/07/2025	6	0.00	1078.72	Centraliser			
X	02/07/2025	7	0.00	145.42	Grout			311
X	02/07/2025	8	0.00	1078.72	Grout			216

Strata Logs

12 records for RN 211035

Rec	Top (m)	Bottom (m)	Strata Description
1	0.00	2.00	SAND, ROCK, RED
2	2.00	16.26	ROCK, HARD, WHITE
3	16.26	91.75	CLAY, TAN
4	91.75	110.49	CLAY, GREY
5	110.49	226.17	SHALE, PUGGY
6	226.17	339.60	SHALE, SANDY, WITH HARD BANDS
7	339.60	404.75	SHALE
8	404.75	611.53	SHALE, SANDY, WITH HARD BANDS
9	611.53	639.65	SHALE
10	639.65	968.17	SHALE, PUGGY
11	968.17	1116.90	SHALE, SANDY, WITH HARD BANDS
12	1116.90	1305.00	SANDSTONE, GREY *

Stratigraphies

0 records for RN 211035

Aquifers

1 records for RN 211035

Rec	Top (m)	Bottom (m)	Lithology	Date	SWL (m)	Flow	Quality	Yield (L/s)	Contr	Cond	Formation Name
1	1116.90	1305.00	SDST - Sandstone	02/07/2025	112.69	Y	POTABLE	70.00	Y	PS	

Queensland Government
Groundwater Information
Bore Report

Report Date: 29/10/2025 09:19

From Year:

Pump Tests Part 1	0 records for RN 211035
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Pump Tests Part 2	0 records for RN 211035
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Bore Conditions	0 records for RN 211035
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Elevations	0 records for RN 211035
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Water Analysis Part 1	0 records for RN 211035
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Water Analysis Part 2	0 records for RN 211035
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Water Levels	0 records for RN 211035
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Wire Line Logs	0 records for RN 211035
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Field Measurements	1 records for RN 211035
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Pipe	Date	Depth (m)	Conduct (uS/cm)	pH	Temp (C)	NO3 (mg/L)	DO2 (mg/L)	Eh (mV)	Alkalinity (mV)	Samp	Method	Samp	Source
A	02/07/2025		687	8.1	98.0					PU	Pump - Other or Flowing Bore	GB	Groundwater - from Bore

Special Water Analysis	0 records for RN 211035
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Queensland Government
Groundwater Information
Bore Report

Report Date: 29/10/2025 09:19

From Year:

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APPENDIX B
BIRDSVILLE FLUORIDE FACT SHEET

Naturally occurring fluoride in Birdsville's drinking water

Fluoride is a natural element often found in water, plants, rocks, soil, air and some foods. Research shows that fluoride helps protect teeth against tooth decay. Regularly drinking water containing small amounts of fluoride can help reduce tooth decay for people of all ages.

What is the drinking water standard for fluoride?

The Australian Drinking Water Guidelines recommend an upper limit of 1.5 mg/L (or parts per million) of fluoride in drinking water. This is equivalent to one twentieth of a teaspoon of fluoride in a bathtub of water.

Many Western Queensland towns source their drinking water from groundwater (i.e. bores). These water sources can contain natural fluoride levels that are above this limit.

Monitoring of Birdsville's drinking water supply has indicated that it contains naturally occurring fluoride at an average concentration of 1.8 mg/L. This is slightly above the recommended limit in the Australian Drinking Water Guidelines.

Conventional water treatment processes and most domestic water filters do not reduce the level of fluoride present in your drinking water.

What are the risks of elevated levels of fluoride in drinking water?

There are two side effects that have been associated with elevated levels of fluoride in drinking water. The first is dental fluorosis and the second is skeletal fluorosis, which only occurs with very high levels of fluoride in drinking water.

What is dental fluorosis?

The main side effect associated with elevated levels of fluoride in drinking water is a condition known as dental fluorosis.

Dental fluorosis is largely an aesthetic concern and most often occurs as a mild change to the appearance of tooth enamel. It can appear as small, almost invisible, white lines in the enamel. More rarely, and in more severe cases, it can appear as pitting or staining of the enamel.

Dental fluorosis can occur if too much fluoride is ingested when teeth are developing at around one to four years of age. Teeth already present in the mouth are not at risk of developing fluorosis.

The risk of developing dental fluorosis, or experiencing more severe forms of the condition, increases with greater levels of fluoride in drinking water. However occasionally dental fluorosis occurs in developing teeth at relatively low fluoride levels.

Showering or bathing in water containing high levels of fluoride does not increase the risk of developing dental fluorosis.

What can I do to minimise the risk of dental fluorosis?

Most domestic water filters do not reduce the level of fluoride present in your drinking water. Parents can reduce the risk of children developing dental fluorosis by:

- Ensuring children do not take fluoride supplements (e.g. fluoride tablets and/or drops).
- Cleaning children's teeth with low fluoride or fluoride free toothpaste until the age of 18 months, unless otherwise recommended by a dentist.
- If fluoridated toothpaste is used, ensuring only a pea-sized amount of toothpaste is used and that children spit out after brushing and rinse their mouths with water.
- Monitoring and restricting other sources of fluoride in their children's diet (such as seafood and tea, which are known to contain fluoride).
- Providing bottled drinking water with low fluoride content where possible and not substituting bottled drinking water with soft drinks or other drinks high in sugar.
- Breast-feeding infants where possible and using bottled water to add to infant formula.

Help and assistance

For general enquiries contact your local Public Health Unit:

- Longreach: (07) 4658 4790
- Rockhampton: (07) 4920 6989
- Townsville: (07) 4433 6900

For more information:

- Contact your dental professional
- Visit www.health.qld.gov.au/oralhealth
- Call 13 HEALTH (13 43 25 84) for confidential health advice 24 hours a day, seven days a week
- Email oral_health@health.qld.gov.au

The information in this fact sheet applies only to those parts of Queensland with levels of naturally occurring fluoride above the drinking water Guideline or 1.5 milligrams per litre. It does not apply to locations with standard levels of water fluoridation.

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APPENDIX C
BEDOURIE & BIRDSVILLE OPERATIONAL MONITORING LOCATIONS

Please note that Operational Monitoring is conducted monthly to test for E.coli, Total Coliforms and Turbidity at all three operational monitoring locations. Verification monitoring occurs bi-annually.



-24.340

-24.340

-24.350

-24.350

-24.360

-24.360

0 250 500 m

Datum: World Geodetic 1984 (WGS84)

Legend

Sampling Locations

- ▲ Operational Monitoring Locations
- ◆ Verification Monitoring Locations

139.440

139.450

139.460

139.470

139.480

139.490

Map: 1



Diamantina Shire Coucil DWQMP **Operational and Verification** **Monitoring Locations - Bedourie**



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Please note that Operational Monitoring is conducted monthly to test for E.coli, Total Coliforms and Turbidity at all three operational monitoring locations. Verification monitoring occurs bi-annually.



Council Depot (Mandatory)

Council Depot (Optional)

Birdsville New Bore (Mandatory)

Tap Downstream of Ground Level Reservoir (Mandatory)

Birdsville Old Bore (Mandatory)

Wirrari Centre (Optional)

Wirrari Centre (Mandatory)

Council Owned House on Bilby St (Mandatory)

Datum: World Geodetic 1984 (WGS84)

Legend

Sampling Locations

- ▲ Operational Monitoring Locations
- ◆ Verification Monitoring Locations

0 250 500 m



Diamantina Shire Coucil DWQMP **Operational and Verification** **Monitoring Locations - Birdsville**



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