

Drinking Water Quality Management Plan (DWQMP) Report

1st July 2021 – 30th June 2022



DOOMADGEE ABORIGINAL SHIRE COUNCIL

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Glossary of terms

ADWG 2004	Australian Drinking Water Guidelines (2004). Published by the National Health and Medical Research Council of Australia
ADWG 2011	Australian Drinking Water Guidelines (2011). Published by the National Health and Medical Research Council of Australia
<i>E. coli</i>	<i>Escherichia coli</i> , a bacterium which is considered to indicate the presence of faecal contamination and therefore potential health risk
HACCP	Hazard Analysis and Critical Control Points certification for protecting drinking water quality
mg/L	Milligrams per litre
NTU	Nephelometric Turbidity Units
MPN/100mL	Most probable number per 100 millilitres
CFU/100mL	Colony forming units per 100 millilitres
<	Less than
>	Greater than

1. Introduction

This report documents the performance of Doomadgee Aboriginal Shire Council drinking water service with respect to water quality and performance in implementing the actions detailed in the drinking water quality management plan (DWQMP) as required under the *Water Supply (Safety and Reliability) Act 2008* (the Act).

The report assists the Regulator to determine whether the approved DWQMP and any approval conditions have been complied with and provides a mechanism for providers to report publicly on their performance in managing drinking water quality.

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

2. Overview of Operations (optional)

The Doomadgee treatment DWQMP sources water from the Nicholson River. The treatment comprises aeration, chemical dosing, filtration, and sterilisation. Water is disinfected before reticulation.

3. Actions taken to implement the DWQMP

The DWQMP approved on the 12/8/2013 was implemented by the following:

- System elements: A new reservoir was constructed to increase the storage capacity in the system.
- Monitoring: A monitoring program was implemented, including daily, weekly, monthly, and 6-monthly sampling for different elements. The weekly, monthly, and 6-monthly samples were submitted to the Cairns Water laboratory for assessment. Daily samples were analysed by the treatment plant operator.
- The risk management improvement program was implemented as described below.

An update of the DWQMP was submitted for approval in October 2020. DASC is in the process of implementing this plan.

Progress in implementing the risk management improvement program

The risk management improvement program as outlined in the DWQMP approved on the 12/8/2013 was implemented as follows:

- Reticulation main replacement: The old asbestos cement water mains have been replaced.
- Increased monitoring of chlorine residual, turbidity and pH: Water sampling for these parameters is taken daily, excepting weekends, public holidays and sorry days, and the result records are handwritten.
- “Boil Water Alert” template: A template for a “Boil Water Alert” is now available for use at Doomadgee.
- Progressive implementation of treatment plant improvements including SCADA upgrades to improve monitoring and dosing controls.

The DWQMP was updated and submitted for approval in October 2020. An updated risk management improvement program was developed during this update. Implementation of this new program began in early 2021.

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

There were no revisions made to the operational monitoring program during the recent DWQMP update conducted in October 2020.

Amendments made to the DWQMP

The DWQMP was amended as required by the regulator, with the revision submitted to the Department of Energy and Water Supply in October 2020. The amendments included the following:

- Details of infrastructure for providing the service was updated (Section 1.0).
- Identify Hazards and Hazardous Events was updated (Section 3.0).
- The risk assessment was updated (Section 4.0 and Appendix C).
- Risk management measures were updated (Section 5.0)
- Management of incidents and emergencies was updated (Section 5.3)
- Risk Management Improvement Program was updated (section 5.4)
- Appendix B Water Quality Records was updated.

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

4. Compliance with water quality criteria for drinking water

A summary of the results of verification monitoring for 2021–22 is included in Appendix A. During this period there were no non-compliances with water quality criteria reported.

No E. Coli was detected in the 107 samples tested over the reporting period. Note that this has fallen slightly short of the one sample per week per monitoring zone as required for a remote, community managed water supply (population < 5000, Table 9.4).

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

This financial year there were nil instances where the Regulator was notified under sections 102 or 102A of the Act. N/A of these notifications involved the detection of *E. coli* – an organism that may not directly represent a hazard to human health, though indicates the presence of recent faecal contamination. The remaining N/A notifications; were non-compliances with water quality criteria caused by N/A of these incidents required Doomadgee Aboriginal Shire Council to issue a boil water or do not drink notice in the communities.

Non-compliances with the water quality criteria and corrective and preventive actions undertaken

Incident Description: There were no non-compliance incidents recorded in the 2021-2022 financial year

Corrective and Preventative Actions: N/A

Prescribed incidents or Events reported to the Regulator and corrective and preventive actions undertaken.

Incident Description: There were no non-compliance incidents recorded in the 2021-2022 financial year

Corrective and Preventative Actions: N/A

6. Customer complaints related to water quality

Doomadgee Aboriginal Shire Council is required to report on the number of complaints, general details of complaints, and the responses undertaken.

Throughout the year the following complaints about water quality were received:

Table 1 - complaints about water quality, (including per 1000 customers)

	Suspected Illness	Discoloured water	Taste and odour	Total
Scheme 1				
Scheme 2				
Scheme 3				
Scheme 4				
Scheme 5				
Scheme 6				
Total	NIL	NIL	NIL	NIL

Suspected Illness

Complaints are sometimes received from customers who suspect their water may be associated with an illness they are experiencing. Doomadgee Aboriginal Shire Council investigates each complaint relating to alleged illness from our water quality, typically by testing the customers tap and closest reticulation sampling point for the presence of *E. coli*.

During 2021-2022, there were nil confirmed cases of illness arising from the water supply system.

Discoloured water

Nil customer complaints were received from within the Doomadgee water supply scheme related to dirty water.

Taste and odour

Nil taste and odour complaints were received during 2021-2022.

7. Findings and recommendations of the DWQMP auditor

There were no requirements for an audit in the 2021/2022 financial year. The next regular audit of the DWQMP was conducted in October 2022.

8. Outcome of the review of the DWQMP and how issues raised have been addressed

A regular review of the DWQMP was conducted in September 2022 and covered the time period from July 2021 to June 2022. The purpose of the review was to ensure that the DWQMP remains relevant, having regard to the operation of the drinking water service. The next review is due to be undertaken prior to 29 September 2023.

Outcomes of September 2022 review:

- Chief Executive Officer Troy Fraser
- Viridis Consultants, Karen Pither

The most pertinent findings are:

- The water operators were knowledgeable about the operation of the water supply system and had a detailed understanding of water quality and the provision of safe drinking water.
- Aging infrastructure, remoteness, lack of operational procedures and gaps in monitoring and records keeping were identified.
- The operational monitoring results observed at the time of the audit indicated that the system was being well operated and treatment barriers (filtration and disinfection) were performing well.
- DASC demonstrated a commitment to continuous improvement.
- The team of water operators were engaged in the audit and demonstrated a high level of knowledge about the water supply system and its operation. The team has been reacting to issues in the system, which has impacted on the ability to implement other components of the DWQMP.
- There were errors and gaps in the data provided in the annual reports prepared by the consultants.
- The risk assessment, identification of critical control points and critical limits are not adequate for managing public health risk.
- The objectives of the audit were fulfilled without any issues.
- The aeration tower has sufficient capacity for the current population but will need to be upgraded to service future populations.
- Based on a condition assessment of the steel reservoir, repair or replacement of the tank is required. A regular inspection plan for the steel reservoir should also be established.
- Recent upgrades to the chlorine dosing system now include a full alarm system including leak detection.
- Further improvements to the SCADA system were undertaken in late 2020 which included upgrades to allow monitoring of chlorine residual, turbidity, temperature and pH at the inlet and outlet of the water treatment plant. Upgrades also included new Alum and Soda Ash dosing pumps and equipment to allow for automation of the turbidity and pH correction systems.
- Trend analysis on source and output water quality is now available with the recent SCADA upgrades.
- Cyber security has been identified as a risk to the SCADA system. A cyber security consultant should be engaged to implement security measures and provide operator training.
- Standard Operating Procedures for the water treatment plant should be prepared. A formal training register of plant operators has been created.

- A water security investigation was completed to identify alternative sources of water to manage the existing supply during poor wet seasons. Options should be implemented to alleviate supply concerns.
- New risk management strategies should have their effectiveness evaluated.
- Information management, record keeping, and reporting processes need to comply with the requirements of the DWQMP.

The next internal review of the DWQMP is due before 29 September 2023.

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

Based on the findings of the review, no changes have been made to the DWQMP with regards to hazards or hazardous events that have affected the quality of drinking water. The review was conducted after the DWQMP was updated, and significant changes were made to the DWQMP during the update. The review did not identify any further changes required to the DWQMP at this time.

Double click to edit in Excel. Copy and paste table and caption for each scheme. The original Excel tool is accessible at www.dews.qld.gov.au.

Table 3 - Reticulation *E. coli* verification monitoring

Drinking water scheme:	Doomadgee Aboriginal Shire Council											
Year	2021						2022					
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	6	12	8	8	12	8	10	8	8	9	8	10
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	112	114	105	109	110	107	108	109	112	109	119	114
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2005* (the regulation) requires that 98 per cent of samples taken in a 12 month period should contain no *E. Coli*. This requirement is referred to as the 'annual value' in Schedule 3A of the regulation.

This requirement comes into effect once you have 12 months data and should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Appendix B – Implementation of the DWQMP Risk Management Improvement Program

Table 4 – Progress against the risk management improvement program in the approved DWQMP

Scheme Component / Sub-component	Item	Priority	Action(s)			Target date/s	Estimated cost (not req'd by OWSR but important for DWSP)	Responsibility
			interim	short-term	long-term			
Water Treatment Plant	Daily Monitoring of chlorine residual, turbidity and pH	1	Daily monitoring of turbidity, pH and chlorine, to be recorded in the Water Treatment Plant Daily Logbook Maintain all water quality data records where they are easily accessible	Periodic maintenance of dosing systems		Ongoing	TBC	Water Treatment Plant Manager
Emergency Management Plan	Incident Response and Reporting Protocols	1		Prepare documentation		Jun 2023	TBC	Manager Infrastructure
Raw Water Intake Pumps	Standard Operating Procedures	1		Develop procedures for raw water intake pumps		Jun 2023	TBC	Manager Infrastructure
Water Treatment Plant	Standard Operating Procedures	1		Develop procedures for coagulation		Jun 2023	TBC	Manager Infrastructure
Water Treatment Plant	Standard Operating Procedures	1		Develop procedures for filtration		Jun 2023	TBC	Manager Infrastructure

Scheme Component / Sub-component	Item	Priority	Action(s)			Target date/s	Estimated cost (not req'd by OWSR but important for DWSP)	Responsibility
			interim	short-term	long-term			
<i>Water Treatment Plant</i>	<i>Standard Operating Procedures</i>	<i>1</i>		<i>Develop procedures for disinfection</i>		<i>Jun 2023</i>	<i>TBC</i>	<i>Manager Infrastructure</i>
<i>Reticulation</i>	<i>Standard Operating Procedures</i>	<i>1</i>		<i>Develop procedures for mains break repair and maintenance</i>		<i>Jun 2023</i>	<i>TBC</i>	<i>Manager Infrastructure</i>
<i>Reticulation</i>	<i>Standard Operating Procedures</i>	<i>1</i>		<i>Develop procedures for mains flushing</i>		<i>Jun 2023</i>	<i>TBC</i>	<i>Manager Infrastructure</i>
<i>Water Treatment Plant</i>	<i>Operational Monitoring</i>	<i>1</i>	<i>Increase monitoring at the plant to comply with the DWQMP</i>	<i>Install sampling points within the WTP after each process step and prior to the ground level storage reservoirs</i> <i>Install online chlorine residual analyser</i> <i>Establish internal communication processes to ensure any events are reported and actioned in a timely manner</i>		<i>Completed</i>	<i>TBC</i>	<i>Manager Infrastructure</i>

Scheme Component / Sub-component	Item	Priority	Action(s)			Target date/s	Estimated cost (not req'd by OWSR but important for DWSP)	Responsibility
			interim	short-term	long-term			
Water Treatment Plant	Operational Monitoring	1		Undertake trend analysis on source and output water quality.	Establish processes to ensure regulatory requirements are identified and complied with. Establish a compliance register that includes the dates for reporting and other relevant details.	Immediate Implementation	TBC	Manager Infrastructure
Water Treatment Plant	Operational Monitoring	1		Expansion of SCADA for dosing controls Undertake condition assessment of steel reservoir to identify refurbishment activities		Completed	TBC	Manager Infrastructure

Scheme Component / Sub-component	Item	Priority	Action(s)			Target date/s	Estimated cost (not req'd by OWSR but important for DWSP)	Responsibility
			interim	short-term	long-term			
Water Treatment Plant	Operational Monitoring	1	Operator to flush lines, consider adjustments to the chlorine dosing at the WTP and retest for instances of zero or low residual results			Ongoing	TBC	Water Treatment Plant Operator
Water Treatment Plant	Operator Training	N/A - Ongoing	Ongoing operator training	Develop a formal register to track training records		Ongoing	TBC	Manager Infrastructure
Water Treatment Plant	Reservoir repairs	2	Secure the hatch of the reservoirs and ensure they are always locked.		Repair or replace steel reservoir as required by condition inspection outcome Establish a regular inspection of the reservoir tanks, roofs and hatches.	Jun 2023	TBC	Manager Infrastructure

Scheme Component / Sub-component	Item	Priority	Action(s)			Target date/s	Estimated cost (not req'd by OWSR but important for DWSP)	Responsibility
			interim	short-term	long-term			
Water Treatment Plant	Plant Labelling	2		Label all pipes, valves, pumps, and sample points with the names/terms used in the SCADA system and plant drawings		Ongoing	TBC	Manager Infrastructure
Water Treatment Plant	Aeration Tower	2			Upgrade of aeration tower to service future populations	Dec 2023	TBC	Manager Infrastructure
Water Treatment Plant	Risk Management	1	Undertake study to identify alternative / backup sources to manage the existing supply drying up due to poor wet season	Installation of a new infiltration gallery south-west of existing, to extract water that bypasses upstream gallery. Installation of pump stations to extract surface water from Elizabeth and Gum Hole Waterhole.	Installation of a pump station and pipework to extract water from Blue Hole.	Ongoing with planned completion of short-term by Jun 2023	TBC	AECOM

Scheme Component / Sub-component	Item	Priority	Action(s)			Target date/s	Estimated cost (not req'd by OWSR but important for DWSP)	Responsibility
			interim	short-term	long-term			
<i>Water Treatment Plant</i>	<i>Risk Management</i>	<i>1</i>	<i>Implement basic WTP operator training to increase awareness of potential threats</i>	<i>Engage consultant to identify necessary upgrades and preventative measures required to maintain cyber security for SCADA and IT systems</i>	<i>Upgrade SCADA and IT software to reduce exposure to cyber security threats</i>	<i>Completed</i>	<i>TBC</i>	<i>Manager Infrastructure</i>

Scheme Component / Sub-component	Item	Priority	Action(s)			Target date/s	Estimated cost (not req'd by OWSR but important for DWSP)	Responsibility
			interim	short-term	long-term			
Water Treatment Plant	Operation and Maintenance	N/A - Ongoing	<p>Note any corrective actions taken in response to an operational monitoring result that is out of the operational range on the plant diary or daily record sheets</p>	<p>Include seasonal requirements in the maintenance plan</p> <p>Establish a spreadsheet to record verification results and to track the number of samples and frequencies to avoid missing samples</p> <p>Record the daily operational monitoring results in spreadsheet</p> <p>Implement the record keeping processes establishment for calibration</p> <p>Establish an external service and calibration (annual) process to ensure monitoring equipment are in good working order</p>		Ongoing	TBC	Water Treatment Plant Manager

Scheme Component / Sub-component	Item	Priority	Action(s)			Target date/s	Estimated cost (not req'd by OWSR but important for DWSP)	Responsibility
			interim	short-term	long-term			
<i>Water Treatment Plant</i>	<i>Risk management</i>	<i>N/A</i>			<i>Evaluate effectiveness of new risk management strategies once implemented</i>	<i>Immediate Implementation</i>	<i>TBC</i>	<i>Manager Infrastructure</i>

* Priority Rankings: 1 = implemented within 1 year, 2 = implemented within 2 years, 3 = implemented within 5 years.