

Drinking Water Service Annual Report 2023-2024



December 2024



MOUNT ISA WATER BOARD

Table of contents

1 Executive Summary	2
2 Introduction	3
3 Source Water	4
Source water quality	4
4 Water Treatment Plant Performance	7
5 Capital Projects 2023–2024	8
6 DWQMP implementation	9
7 Incidents reported	20
8 Customer complaints	21
9 DWQMP review outcomes	21
10 DWQMP audit outcomes	21
Glossary	23



1 Executive Summary

The Mount Isa Water Board (MIWB) is a registered Water Service Provider (SPID: 199) under the *Water Supply (Safety and Reliability) Act 2008* (Qld).

MIWB supplies drinking water to its sole potable water customer, Mount Isa City Council (MICC). MIWB's Drinking Water Quality Management Plan (DWQMP) is a risk-based management plan that considers the key hazards to consumers and to MIWB's ability to supply water, the events that may result in these hazards, and an assessment of the risks that these hazards and hazardous events pose.

The DWQMP details the operational and verification monitoring undertaken by MIWB to ensure that any drinking water quality issues are rapidly identified and responded to in accordance with the Emergency Management Framework (EMF). The operational and verification monitoring program in the reporting period has been implemented in accordance with the relevant approved version of the DWQMP during that period. During this reporting period, MIWB's drinking water supply has been compliant with the ADWG health guidelines for both verification monitoring and operational monitoring against the water quality criteria in the DWQMP.

MIWB also completed a source water and catchment risk assessment, which involved analysis of data gathered over eight years. The

data set included periods of heavy rainfall and drought. A quantitative microbial risk assessment was completed, that justified a lower microbial risk from bacteria, virus and protozoa that was lower than that assigned previously. Following the assessment and taking a conservative approach driven by data, the catchment risk was recategorized as Category 3. This has enabled MIWB to take informed decisions about operations, infrastructure/asset management to be included in the 5-year CAPEX program.

There were no health or aesthetic incidents during the reporting period. However, five "events" were reported to the Water Supply Regulator, which involved security breach at Clear Water Lagoon, the fire at Clear Water Lagoon and missed analyses, that from the current and previous reporting periods.

There were two excursions of Critical Control Points (CCPs), both of which included filtration turbidity. Investigations identified that these were caused by the turbidity analysers.

The DWQMP was reviewed twice and a regular audit of the DWQMP was also completed during this period.

This report has been prepared in accordance with the *Guideline for the preparation, review and audit of drinking water quality management plans*.

2 Introduction

MIWB supplies bulk water to one potable customer and semi-treated water to several industrial customers.

Key business activities include:

- Managing the infrastructure required to transport bulk water from storages at Lake Moondarra and Lake Julius to customers and applying appropriate water treatment processes to comply with MIWB's legislative and commercial requirements;
- Conducting ongoing investigations and planning for future infrastructure requirements relevant to MIWB operations;
- Constructing, operating, and maintaining the bulk water transport and treatment infrastructure necessary to MIWB operations, and;
- Acting as trustee for the Water and Recreation R48 Reserve (R48 Reserve) on behalf of the Department of Natural Resources and Mines, as administrator of the Land Act 1994.

This annual report documents the performance of the MIWB, a registered Water Service Provider (SPID: 199) under the *Water Supply (Safety and Reliability) Act 2008* (Qld), with respect to its Drinking Water Quality Management Plan (DWQMP) as required under the *Water Supply (Safety and Reliability) Act 2008* (the Act) for the Financial Year 2023 – 2024. Only the supply system components operated for the supply of potable water are included in the MIWB DWQMP.

Using the Australian Drinking Water Guidelines and a risk-based approach, the MIWB DWQMP has been developed with the goal of protecting public health through the identification and minimisation of any public health related risks associated with drinking water. MIWB operates under the DWQMP approved by the water supply regulator within the Department of Local Government Water and Volunteers (DLGWV).

The monitoring plan under the DWQMP comprises of monitoring several microbial, physical, and chemical parameters.

The annual report comprises an overview of the below:

1. Activities MIWB undertook in the reporting period related to supply of drinking water
2. Summary of water quality; AND
3. MIWB's performance in implementing the Risk Management Improvement Plan (RMIP).

3 Source Water

MIWB operates a single scheme which encompasses both Lake Julius and Lake Moondarra. Lake Moondarra is the primary supply, with use of Lake Julius during periods of low supply in Lake Moondarra, or to supplement for the purposes of water quality. Lake Julius represents a drought mitigation strategy for the city of Mount Isa. Either water source can be used to supply water to Clear Water Lagoon prior to being pumped to the treatment plant.

Table 1 – Summary of schemes

Water source	Treatment processes	Treatment plant
Lake Moondarra	Microfiltration, chlorination	MITR
Lake Julius	Microfiltration, chlorination	MITR



Source water quality

Sampling and part of the analyses have been undertaken by MIWB, while most of the analyses have been undertaken by an external NATA accredited laboratory.

Table 2 – Parameters monitored in raw water

Microbiological	Physical	Chemical
<i>E.coli</i> and Total coliforms	Temperature	PFAS
Protozoa	pH	Pesticides
Cyanobacteria	Conductivity	Metals, Non-metals
	Turbidity	Nutrients
	Dissolved Oxygen	Total Organic Carbon
	Colour	Cyanobacterial toxins
	Alkalinity, Hardness	

Microbial Load

There was a single detection of *Cryptosporidium* in Clear Water Lagoon during the reporting period. The *E.coli* in the raw water sources averaged at 37.43, 6.65 and 2.21 MPN/100 mL in Lake Julius, Lake Moondarra and Clear Water Lagoon respectively.

Turbidity

Raw water extraction is an Operational Control Point (OCP) critical to maintaining the quality of the non-potable water supply. While a loss of control at this OCP does not directly result in non-compliance, it remains an essential process that is monitored regularly. As shown in the table below, the turbidity of the source water did not exceed the OCP limit, therefore did not necessitate the addition of coagulant.

Table 3 - Source water turbidity (NTU)

	Lake Julius	Lake Moondarra	Clear Water Lagoon
Average	4.8	2.92	3.81
Max	13	16.10	5.87
Min	1.04	1.04	1.62

Cyanobacteria

Cyanobacteria or Blue-Green Algae (BGA) levels fluctuated with temperatures in all the raw water sources. The dominant species in Clear Water Lagoon was *Synechococcales*, which does not produce cyanotoxins. The toxic species of concern remains *Raphidiopsis raciborskii* which produces the toxin cylindrospermopsin, a toxin that can be oxidised by chlorination.

Figure 1 Microscopic images of algae from Clear Water Lagoon

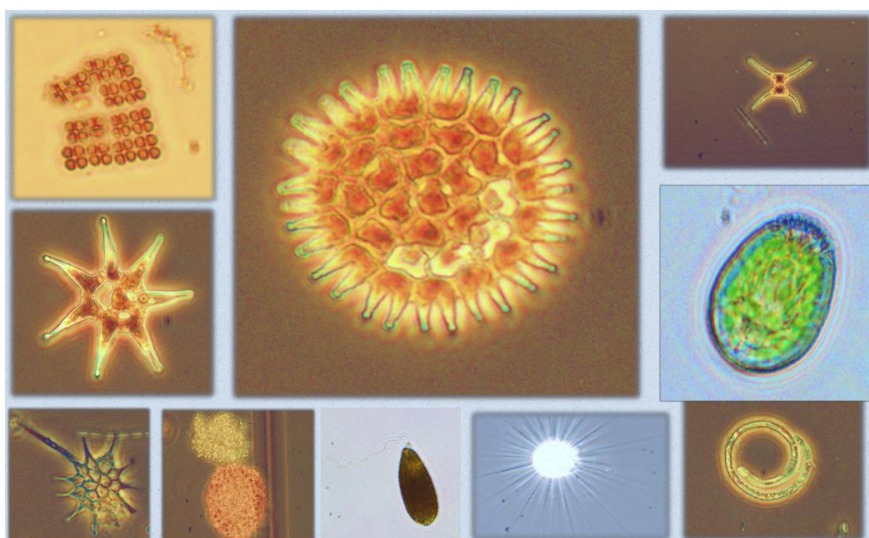
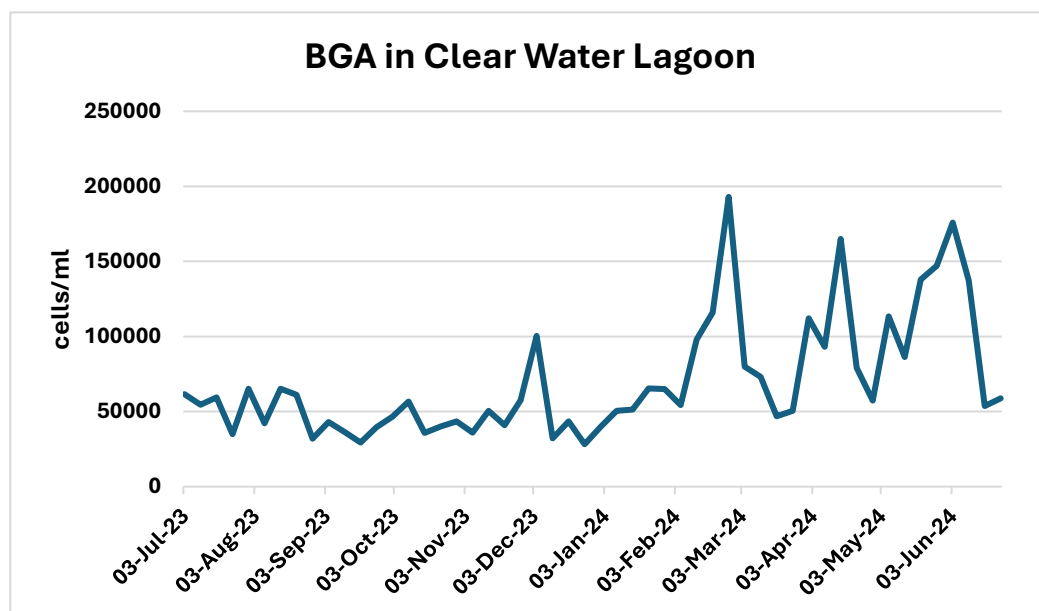


Figure 2 Fluctuations of BGA throughout the year



PFAS

The various classes of PFAS were tested in the source water lakes according to the monitoring plan. There were no detections above the ADWG. Results below detection limit were considered to have a value of zero for statistical analysis.

Table 4 - PFAS in raw water supplies

Scheme component	Parameter	Min	Max	Average (Mean)	ADWG limit	Number of non-compliant samples
Lake Julius	PFOS	<0.002	<0.002	<0.002	N/A	N/A
	PFHxS	<0.002	<0.002	<0.002	N/A	N/A
	Sum of PFOS and PFHxS	<0.002	<0.002	<0.002	0.07 µg/l	0
	PFOA	<0.002	<0.002	<0.002	0.56 µg/l	0
	PFBS	<0.002	<0.002	<0.002	N/A	N/A
Lake Moondarra	PFOS	<0.002	0.003	0.001	N/A	N/A
	PFHxS	<0.002	0.002	0.001	N/A	N/A
	Sum of PFOS and PFHxS	<0.002	0.005	0.002	0.07 µg/l	0
	PFOA	<0.002	<0.002	<0.002	0.56 µg/l	0
	PFBS	<0.002	<0.002	<0.002	N/A	N/A

4 Water Treatment Plant Performance

The two components of treatment are microfiltration and multi-stage chlorination.

Table 5– Daily volume of water supplied (ML) to MICC during FY 2023-24

Minimum	Maximum	Average
10.43	31.89	19.73

Two critical control points (CCPs) – membrane filtration and final disinfection – have been identified within the system and are actively monitored. These CCPs can be actioned to prevent process excursions leading to non-compliant water.

Two CCP events were identified in this reporting period, both associated with turbidity excursions at filter plants. Upon investigation it was identified that these were caused by the turbidity sensors requiring maintenance.

Microfiltration successfully removed 100% of algal cells in the feed water during the reporting period. Despite the on-going BGA bloom in CWL cyanotoxins were controlled by oxidation with chlorine to below the limit of detection when using a NATA accredited method.



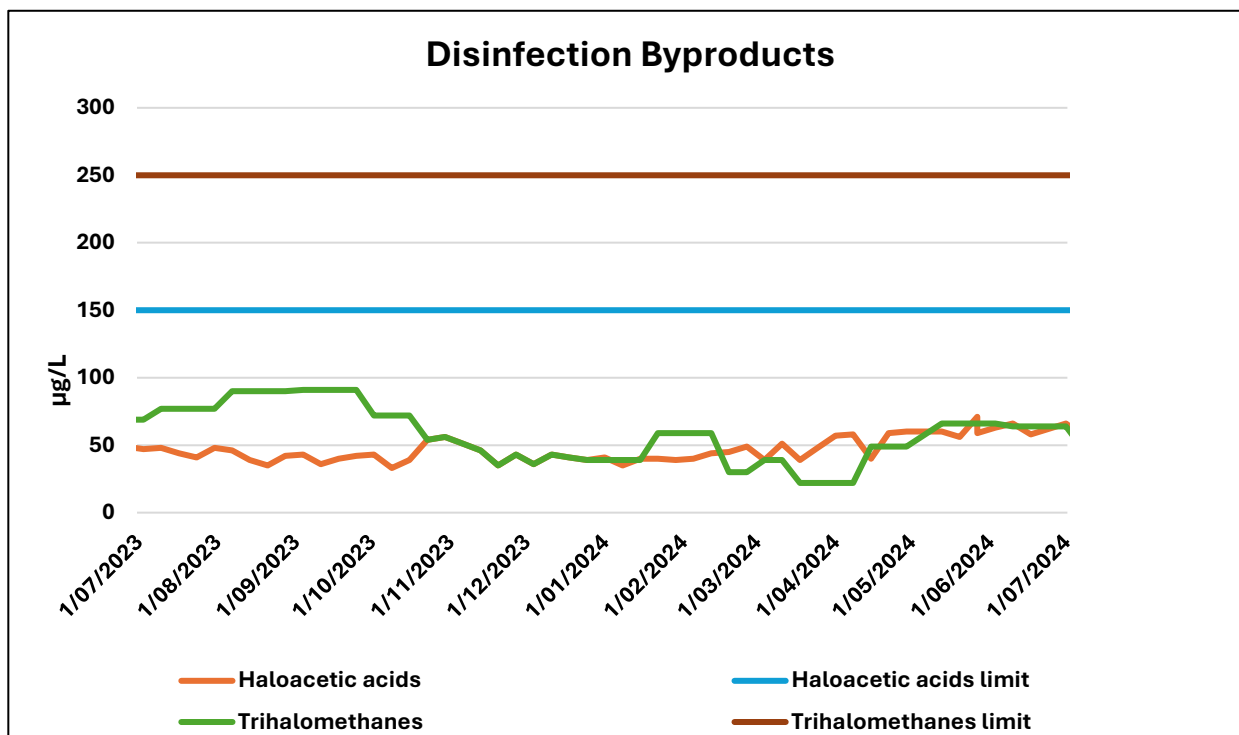
Disinfection

Drinking water treated by MIWB for our sole potable water customer, Mount Isa City Council (MICC), continued to meet the ADWG throughout the reporting period with no detections of *E. coli* in any of the drinking water samples, achieving a rolling compliance value of 100%.

Disinfection By-products

The concentrations of disinfection by-products also continued to meet the ADWG throughout the reporting period. Total THMs and individual HAAs concentrations are reported in the verification monitoring table.

Figure 6 Disinfection by-products in MICC Supply



5 Capital Projects 2023–2024

The following capital projects demonstrate the actions that are undertaken to continually improve our water quality performance and system resilience.

Fred Haigh Pump Station (FHPS) Switchyard and Switch Room Upgrade

The completion of Stage 2 and 3 involved commissioning the high voltage (HV) network and pumping system, enhancing the resilience and availability of the Lake Julius system to meet water demand during critical times.

Filter Plant Membrane Replacement

MIWB replaced and commissioned all 360 filter plant membranes, significantly improving our ability to maintain a potable water supply for the Mount Isa community and ensuring consistent delivery of high-quality drinking water.

High Voltage Access Tracks

Establishing access tracks to MIWB’s HV networks has enhanced the ability to conduct repairs and maintenance, ensuring a reliable power supply network. These tracks also act as firebreaks, providing critical infrastructure protection in the event of a fire.

6 DWQMP implementation

6.1 Conditions of Approval and Compliance

The following table demonstrates our compliance with the conditions of approval of our DWQMP.

Table 6 DWQMP conditions and status of compliance

DWQMP Approval conditions	Status of compliance
<p>Water quality criteria and event reporting</p> <p>An "event" is any occurrence or potential occurrence within the drinking water service that cannot be managed under the approved DWQMP and may affect public health. Events include the detection of parameters with aesthetic guideline values used as indicators for other hazards (e.g., turbidity), detection of unregulated parameters that may harm public health (e.g., chlorate), or failure to complete required water quality testing as outlined in the DWQMP.</p>	<p>Missed samples from the monitoring plan, both in the previous and current approved versions of the DWQMP, were reported post-DWQMP audit, as detailed in Table 6.</p> <p>Except for the above, MIWB remained compliant with this condition.</p>
<p>If, due to verification or other monitoring activities, including a research program or monitoring by another entity, an incident in the drinking water service is identified, the regulator must be immediately notified of the circumstances unless a reasonable excuse exists. This initial notification must be followed up with a written notice in the approved form provided to the regulator as soon as practicable.</p>	<p>Compliant</p>
<p>If an event is identified in the drinking water service, the regulator must be notified immediately, unless there is a reasonable excuse, followed by a written notice in the approved form as soon as possible. An investigation report, using the approved form, must also be submitted promptly, detailing the cause of the event, actions taken to address it, and proposed measures to prevent or minimize recurrence.</p>	<p>Compliant</p>
<p>The regulator's formal acknowledgment for research activities may be sought by submitting the Research Project Notification form.</p>	<p>No research activities were completed in the reporting period.</p>
<p>The next regular review of the approved DWQMP, to ensure its accuracy and relevance to the drinking water service provided, must be completed by 30 June 2025 and at the intervals specified in section 8 of this notice, following the regulatory guidelines established by the regulator.</p>	<p>Planned</p>

The next audit of the approved DWQMP must be completed by 30 June 2024 and at the intervals specified in section 8 of this notice, in accordance with section 108 of the Act and the regulatory guidelines for conducting DWQMP audits and preparing audit reports.	Compliant
No liability is accepted by the State of Queensland for any financial costs incurred in implementing and complying with the approved DWQMP and its conditions.	No claims
HAA's analysis to report individual results for chloroacetic acid, dichloroacetic acid, and trichloroacetic acid to ensure compliance with ADWG health limits.	Reported in the current report, 2023-24

6.2 Governance and Change Management

During the reporting period, MIWB undertook organisational changes, with the appointment of a General Manager for the Operations Division. A Compliance and Quality Team was formed within the division, which is responsible for the management and implementation of the DWQMP including water quality monitoring, lab operations, management of the external laboratory sampling and analysis.

The Compliance and Quality Team provides regular updates in the meeting with the Management Team on water quality processes, circumstances, and outcomes. Water quality discussions are also held with Asset Management, O&M and the Capital Works Teams as required.

6.3 Risk assessment

The Operations Division is involved in Change Management Risk Assessments for operational and infrastructure changes as necessary to identify any implications for water quality and how these risks (if any) will be mitigated.

Refer to Table 2 – Risk management improvement program implementation status for further details of risk management and improvement processes.

6.4 Risk Improvement Program

The actions undertaken to implement the Risk Management Improvement Program (RMIP) are discussed in Table 2.

The risk improvement action items include carry-over items from DWQMP version 6.1 as well as indicating the status of the risk improvement projects identified in the two-yearly review of the DWQMP completed in June 2023; and approved by the Water Supply Regulation group within the Department of Regional Development, Manufacturing and Water (DRDMW) in May 2024.

Table 7 Risk management improvement program implementation status

RMIP Reference	Improvement actions	Status	Status Comments	Target Date
DWQMP RMIP 5.0 (WS-2)	Reduced pressure zones (RPZ) or multiple backflow prevention valves with MIWB maintenance where there may currently be only one valve.	Completed		NA
DWQMP RMIP 6.1 (HE-11/25/28)	Ultraviolet (UV) disinfection project (renamed to second barrier investigation)	Investigation Stage	Complete. Risk assessment remains for virus log reduction and will be addressed in updated RMIP.	
DWQMP RMIP 6.1 (HE-15/18)	Ultrasonics for Clear Water Lagoon investigation.	Completed		NA
DWQMP RMIP 6.1 (HE-34)	Discuss source selection with customers to agree to use Lake Julius to lower Halo Acetic Acids (HAA). However, requires agreement from the customers who own the water (RMIP from 2018). 21/22 Online total organic carbon (TOC) & Specific Ultraviolet Absorbance (SUVA) analysis at MITR lead indicator for chlorination strategy UV disinfection project may assist in chlorine optimisation and meeting Log Reduction Values (LRV). New gas chlorination to provide better control of chlorination	Investigation Stage	Included in options and concept design of 5-year CAPEX program.	2027
DWQMP RMIP 6.1 (HE-35)	Potential cross connection will be removed Online turbidity monitoring to be installed on final water	Investigation Stage	Included in options and concept design of 5-year CAPEX program.	2027

RMIP Reference	Improvement actions	Status	Status Comments	Target Date
DWQMP RMIP 6.1 (WS-2)	Actuated valve on raw water outlet of 50ML to be programmed to close when not pumping to Mount Isa Mines (MIM).	Investigation Stage	Included in options and concept design of 5-year CAPEX program.	2028
DWQMP RMIP 6.1 (WS-5)	Upgraded gas chlorine for better control of chlorination Real time monitoring of Water Quality - turbidity, TOC, colour, Dissolved Oxygen (DO), Conductivity, pH, Temp, Ultraviolet- Transmittance (UVT).	Investigation Stage	Included in options and concept design of 5-year CAPEX program.	2027
DWQMP RMIP 7.1 HE-2 2023	Investigate automation or remote operation of the flocculation system (2023)	Investigation Stage	Included in options and concept design of 5-year CAPEX program.	2025
DWQMP RMIP 7.1 HE-2 2023	Investigate issue with Lake Julius Profiling Sonde and rectify (2023)	Investigation Stage	Included in options and concept design of 5-year CAPEX program.	2027
DWQMP RMIP 7.1 HE-11 2023	Revise Operational Control Point (OCP) procedure to include a limit of up to 50 Nephelometric Turbidity Units (NTU) with flocculation/ coagulation.	Completed		NA
DWQMP RMIP 7.1 HE-3, 4, 15, 17, 18, 19, 33 2023	Investigate options for an additional barrier that can assist in reducing algal toxin risk (e.g. ozone).	Investigation Stage	Operational investigation using algaecide in the CWL progress.	2026
DWQMP RMIP 7.1 HE-22 2023	Investigate feasibility of direct pumping from Lake Moondarra	Completed.	Potential to include post 2030.	NA

RMIP Reference	Improvement actions	Status	Status Comments	Target Date
DWQMP HE-27 2023 RMIP 7.1	Investigate a project to review the integrity of the 50 ML tank and seal. Options may include lining and roof replacement	Completed	Review done every year with the diver inspections. Not flagged to be lined or replaced.	NA
DWQMP HE-25 2023 RMIP 7.1	Progress current project for investigating improving output volume and performance of filter plants: - Condition assessment - Review of operations manual - Refresher training for operational staff	Completed		NA
DWQMP HE-38 2023 RMIP 7.1	Investigate options for backflow prevention on the return chlorine lines and service water lines	Investigation Stage	Included in options and concept design of 5-year CAPEX program.	2027
DWQMP WS-3 2023 RMIP 7.1	Commence a project to investigate replacement of chlorine system at Pump 7 and include automation.	Investigation Stage	Included in options and concept design of 5-year CAPEX program.	2027
DWQMP 2023 RMIP 7.1	Investigate options for Cert 3 training in Water Operations for relevant staff.	Completed.	Structural change resulted in external contractor undertaking water operations. Revised Operations and Maintenance Agreement (OMA) will include requirements for all personal operating MIWB water infrastructure to obtain the Cert 3 training.	NA

6.5 Monitoring Plan- water quality information and summary

This section discusses the compliance with the water quality criteria.

Operational Monitoring

Table 8 – Drinking water quality performance - Operational monitoring

Scheme name	Scheme component	Parameter	Number of samples required to be collected as per DWQMP	Total No. of samples collected	Min	Max	Average (Mean)	Water Quality Criteria (eg ADWG limit)	Number of non-compliant samples	Comments
Lake Julius and Lake Moondarra	MITR	Dissolved Oxygen	52	53	92	104	99	<85 % saturation*	0	
	MITR	pH	52	53	7.3	8.3	7.8	6.5 – 8.5*	0	
	MITR	Apparent Colour	52	51	0	6	2	N/A	N/A	One missed sample, reported as an Event.
	MITR	True Colour	12	13	0	3	2	<15 HU*	0	
	MITR	Turbidity	52	52	0.1	0.3	0.2	< 5 NTU	0	
	MITR	Free Chlorine	365	362	1.1	2.3	1.6	<5 mg/L	0	Real-time monitoring of chlorine levels is conducted using chlorine analysers. Due to staff unavailability, manual readings were missed on three occasions; however, online chlorine readings were used to ensure continuous monitoring during this period.
	MITR	Total Chlorine	52	53	1.1	2.2	1.8	<5 mg/L	0	
	MITR	Algal cell count	As per BGA Manual	5	0	0	0	N/A	N/A	Total cell count

*Note: Aesthetic guideline values only

Verification monitoring

Table 9– Drinking water quality performance - verification monitoring

Scheme name	Parameter	No. of samples required to be collected (as per the approved DWQMP)	No. of samples actually collected and tested	Min.	Max.	Average (Mean)	Water quality criteria ADWG health guideline value)	No. of non-compliant samples	Comments
Lake Julius and Lake Moondarra	<i>Escherichia coli</i>	52	57	<1	<1	<1	< 1 MPN/100mL	0	Results below detection limit were considered to have a value of zero for statistical analysis.
	Total Coliforms	52	57	<1	<1	<1	N/A	N/A	Results below detection limit were considered to have a value of zero for statistical analysis.
	Cyanotoxins	As required by BGA manual	57	<0.05	0.59	0.21	<1 µg/L	0	Results below detection limit were considered to have a value of zero for statistical analysis. 52 results in-house via ELISA method & 5 results from NATA accredited lab (all <0.05µg/L)
	Ammonia	4	5	<0.01	0.33	0.08	<0.5 mg/L*	0	Results below detection limit were considered to have a value of zero for statistical analysis.
	Cyanide	1	1	<0.04	<0.04	<0.04	<0.08 mg/L	0	Results below detection limit were considered to have a value of zero for statistical analysis.
	Nitrate	4	5	<0.01	<0.01	<0.01	<50 mg/L	0	Results below detection limit were considered to have a value of zero for statistical analysis.
	Nitrite	4	5	<0.01	<0.01	<0.01	<3 mg/L	0	Results below detection limit were considered to have a value of zero for statistical analysis.
	Aluminium	4	52	<0.005	0.014	0.002	<0.2 mg/L*	0	Results below detection limit were considered to have a value of zero for statistical analysis.

Scheme name	Parameter	No. of samples required to be collected (as per the approved DWQMP)	No. of samples actually collected and tested	Min.	Max.	Average (Mean)	Water quality criteria (i.e. ADWG guideline value)	No. of non-compliant samples	Comments
	Antimony	4	5	<0.001	<0.001	<0.001	<0.003 mg/L	0	Results below detection limit were considered to have a value of zero for statistical analysis.
	Arsenic	4	5	<0.001	0.002	0.001	<0.01 mg/L	0	Results below detection limit were considered to have a value of zero for statistical analysis.
	Cadmium	4	5	<0.0001	<0.0001	<0.0001	<0.002 mg/L	0	Results below detection limit were considered to have a value of zero for statistical analysis.
	Chromium	4	5	<0.001	<0.001	<0.001	<0.05 mg/L	0	Results below detection limit were considered to have a value of zero for statistical analysis.
Lake Julius and Lake Moondarra	Copper	4	13	0.001	0.003	0.002	<2 mg/L*	0	
	Iron	52	52	<0.05	0.06	0.001	<0.3 mg/L*	0	Results below detection limit were considered to have a value of zero for statistical analysis.
	Lead	52	52	<0.001	0.002	5.77x10 ⁻⁵	<0.01 mg/L	0	Results below detection limit were considered to have a value of zero for statistical analysis.
	Manganese	52	52	<0.001	0.047	0.003	<0.5 mg/L	0	Results below detection limit were considered to have a value of zero for statistical analysis.
	Nickel	4	5	<0.001	<0.001	<0.001	<0.02 mg/L	0	Results below detection limit were considered to have a value of zero for statistical analysis.
	Zinc	4	12	<0.005	<0.005	<0.005	<3 mg/L*	0	Results below detection limit were considered to have a value of zero for statistical analysis.
	Chloride	4	5	24	33	30	<250 mg/L*	0	

Scheme name	Parameter	No. of samples required to be collected (as per the approved DWQMP)	No. of samples actually collected and tested	Min.	Max.	Average (Mean)	Water quality criteria ADWG (i.e. health guideline value)	No. of non-compliant samples	Comments
	Fluoride	4	5	0.2	0.3	0.2	<1.5 mg/L	0	
	Hydrogen Sulphide	4	5	<0.010	<0.010	<0.010	<0.05 mg/L*	0	Results below detection limit were considered to have a value of zero for statistical analysis.
	Sodium	4	5	23	29	27	<180 mg/L*	0	
	Sulphate	4	5	14	21	17	<250 mg/L*	0	
	Total Trihalomethanes	12	13	0.022	0.091	0.056	<0.250 mg/L	0	
	Chloroacetic Acid	12	51	0.002	0.005	0.003	<0.15 mg/L	0	
	Dichloroacetic Acid	12	51	0.01	0.03	0.02	<0.1 mg/L	0	
	Trichloroacetic Acid	12	51	0.01	0.04	0.01	<0.1 mg/L	0	
	Bromoacetic Acid	12	51	<0.005	<0.005	<0.005	N/A	N/A	Results below detection limit were considered to have a value of zero for statistical analysis.
	Bromochloroacetic Acid	12	51	0.004	0.013	0.008	N/A	N/A	
	Bromodichloroacetic Acid	12	51	<0.001	0.009	0.005	N/A	N/A	Results below detection limit were considered to have a value of zero for statistical analysis.
	Dibromoacetic Acid	12	51	<0.001	0.003	0.002	N/A	N/A	Results below detection limit were considered to have a value of zero for statistical analysis.
	Dibromochloroacetic Acid	12	51	<0.01	<0.01	<0.01	N/A	N/A	Results below detection limit were considered to have a value of zero for statistical analysis.

Scheme name	Parameter	No. of samples required to be collected (as per the approved DWQMP)	No. of samples actually collected and tested	Min.	Max.	Average (Mean)	Water quality criteria ADWG guideline value	quality (i.e health)	No. of non-compliant samples	Comments
	Tribromoacetic Acid	12	51	<0.01	<0.01	<0.01	N/A		N/A	Results below detection limit were considered to have a value of zero for statistical analysis.
	Total Halo Acetic Acids	12	51	0.03	0.07	0.05	<0.1 mg/L**		0	
	2-Methylisoborneol (MIB)	1	1	5.5	5.5	5.5	N/A		N/A	
	Geosmin	1	1	1.3	1.3	1.3	N/A		N/A	
	Total Dissolved Solids	4	5	152	188	173	<600 mg/L*		0	
	Conductivity	52	53	239	339	293	N/A		N/A	
	Hardness	4	5	66	75	71	<200 mg/L*		0	Hardness as CaCO ₃

Table 10 - *E. coli* compliance with annual value

Drinking Water Scheme	Lake Julius and Lake Moondarra											
Year	2023 - 2024											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	7	4	4	5	4	5	5	4	5	5	4	5
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12-month period	62	61	61	60	59	60	59	59	57	57	56	57
No. of failures for previous 12-month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

7 Incidents reported

There were 5 events reported to the regulator during the FY 2023-2024. None of these incidents were related to adverse water quality.

Table 11 Summary of reported incidents.

Date of Incident / Event	Brief Description	Actions Undertaken	Status
27/10/2023	FIRE AT CLEAR WATER LAGOON Bush fire impacted areas in Clear Water Lagoon (CWL) site. Potential contamination risk.	Analyses undertaken reviewed by BecaHunterH2O. No adverse effects to raw water supply.	Closed
20/03/2024	SECURITY FAILURE AT CLEAR WATER LAGOON Member of the public gained access to CWL site as a result of failure of the automatic gate closing when contractors exited. Suspected due to inefficiently sized solar battery.	Upgraded the power supply (battery) to the automatic gate.	Closed
26/06/2024	MISSED pH ANALYSES 2022 Weekly pH analyses were not completed as per the monitoring plan due to equipment being damaged.	Reported in the 2021-22 annual report and was identified by the auditor during the 2024 audit as a reportable incident.	Closed
26/06/2024	MISSED TURBIDITY ANALYSES 2023-2024 Daily turbidity readings were not obtained as per the monitoring plan due to online equipment being relocated	Discussion with WSR to decrease the frequency of turbidity monitoring to weekly in Clear Water Lagoon to rectify committing to over monitoring.	Closed
26/06/2024	MISSED COLOUR ANALYSIS 2024 Colour analysis was not completed as per the monitoring plan by the external lab due to sample being impacted by logistics issue.	Nil.	Closed

8 Customer complaints

This section discusses details of any complaints received about the drinking water service.

MIWB did not receive any formal water quality complaints from its drinking water customer for the 2023-24 financial year.

Table 12 – Customer complaints about water quality

Scheme	Health concern	Dirty water	Taste and odour	Other
Lake Julius and Lake Moondarra	0	0	0	0
Total	0	0	0	0

9 DWQMP review outcomes

The two-yearly review of the plan was completed during the 2023-24 reporting period. As a result of the review, version 7.0 was submitted to the department on 2 August 2023. This version included changes to the monitoring plan. In the latter half of the reporting period MIWB applied to the water supply regulator following an assessment of the catchment risk to have the risk category reduced from 4 to 3 based on a quantitative microbial risk assessment that considered microbial data collected over a span of eight years. Following the approval for this risk category reduction a minor amendment of the DWQMP was completed to reflect the changes. The current version of the plan 7.2 was approved by the regulator on 8 May 2024.

10 DWQMP audit outcomes

The 4- yearly regular audit was completed on 25 June 2024. As required under section 95 of the *Water Supply Safety and Reliability Act 2008 (the Act)*, MIWB engaged an authorised external auditor to audit the DWQMP. The purpose of the audit is to:

- Verify the accuracy of the data supplied to the DRDMW;
- Assess MIWB's compliance with the DWQMP and conditions, and
- Assess the relevance of the DWQMP to the service provided.

The DWQMP audit included an assessment of 47 items under various auditable elements. The findings were graded into one of the three categories: conforms, improvement opportunity, and non-conformance.

Overall, the audit determined that MIWB's DWQMP is relevant to the service and that MIWB shows a high level of compliance with the DWQMP.

There were four non-conformances identified along with seven opportunities for improvement. Figure 1 below shows the audit outcomes and the number of items that have been addressed. All except one of the non-conformances were addressed immediately. The opportunities of improvement identified are also being addressed, which includes investigation of options to augment the treatment system to better validate the chlorine contact time.

Figure 3 Summary of 4-yearly audit outcomes

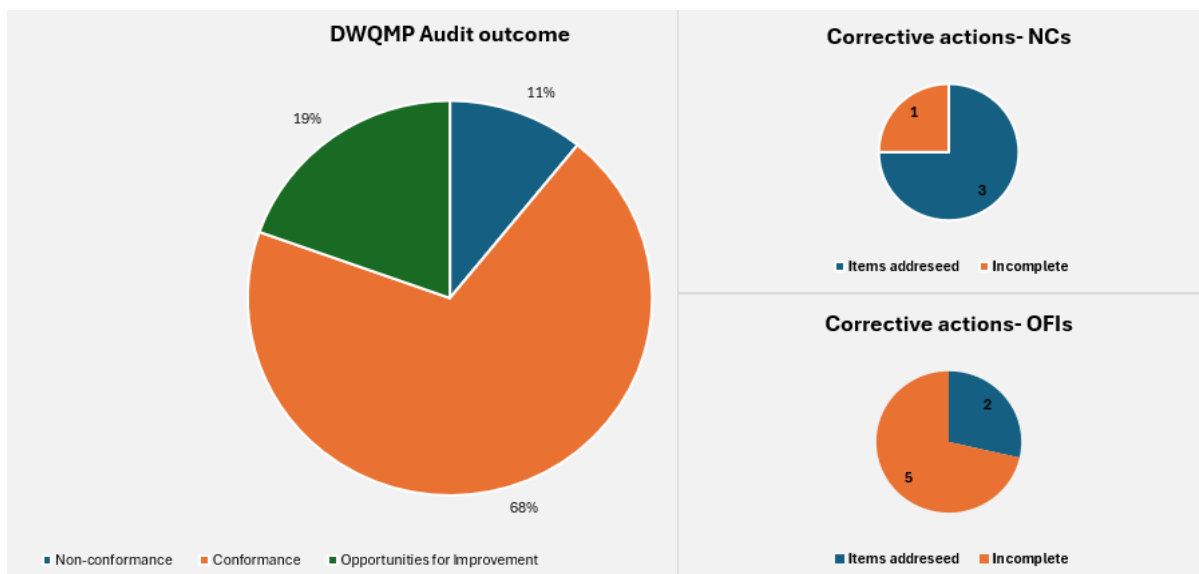


Table 13 Summary of non-conformances

Record Findings	of	Comment	Action	Status
Missed Samples		Multiple pH, turbidity and colour tests missed due to equipment and logistical failures (sample lost by courier). Staff unaware of requirement to report instrument failures and missed samples.	Missed samples reported.	Complete
Scheme Description		Overview schematic used that does not identify some pipework and valves.	Procurement completed to engage consultant to develop scheme description and diagram.	In progress
Documentation of critical control points (CCP), limits, and target criteria		Old superseded CCP documents in office and operator areas	CCP documents updated.	Complete
CCP Implementation		Alarms limits stated in CCP in DWQMP different limits in Supervisory Control and Data Acquisition (SCADA).	SCADA limits changed to reflect DWQMP, and authorisation limits changed to limit access.	Complete

Glossary

ADWG	Australian Drinking Water Guidelines (2011) Published by the National Health and Medical Research Council of Australia
BGA	Blue Green Algae
CCP	Critical control point is the process step to which control can be applied and is essential to prevent a safety hazard
CFU/100mL	Colony forming units per 100 millilitres
CWL	Clear Water Lagoon
DBPs	Disinfection by-products
DRDMW	Department of Regional Development, Manufacturing and Water
<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
HAA	Haloacetic acid, a disinfection by-product formed by the reaction of halogens and organic acids
HU	Hazen units
>	Greater than
<	Less than
mg/L	Milligrams per litre
MITR	Mount Isa Terminal Reservoir
NTU	Nephelometric Turbidity Units
MPN/100mL	Most probable number of microorganisms per 100 millilitres
NATA	National Association of Testing Authorities
RMIP	Risk Management Improvement Programme
RPZ	Reduced Pressure Zone
SCADA	Supervisory Control And Data Acquisition
µg/l	Micrograms per litre
THMs	Trihalomethanes, a disinfection by-product formed by the reaction of halogens and organic compounds