



# Drinking Water Quality Management Plan Report

Richmond Shire Council

SPID: 111

2020-21

This report has been prepared in accordance with the Drinking Water Quality Management Plan Report Guidance Note.

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# 1 Introduction

This is the annual Drinking Water Quality Management Plan report for Richmond Shire Council for the 2020-21 financial year. RSC is a registered service provider with identification (SPID) 111 and operates under an approved DWQMP to ensure consistent and safe supply of quality potable water to protect public health.

The report documents the performance of Richmond Shire Council's Water Treatment Plants drinking water service with respect to;

- Water quality summary
- DWQMP review findings
- Progress implementing the actions and improvements identified in the Risk Management Improvement plan detailed in the DWQMP as required under the Water Supply (Safety and Reliability) Act 2008 (the Act).

The report is submitted to the Regulator to fulfil our regulatory requirement and is made available to customers.

## 2 Summary of scheme/s operated

**Table 1 – Summary of schemes**

	<i>Water Source</i>	<i>Treatment processes</i>	<i>Treatment capacity</i>	<i>Towns supplied</i>
Richmond	Great Artesian Basin	Oxidation (chlorine and aeration), coagulation/flocculation, filtration & chlorination.	6.5ML/D (WTP), 3ML/d (bores)	Richmond

### 3 DWQMP Implementation

The actions undertaken to implement the DWQMP are summarised below.

During the 2020-21 financial year Richmond Shire Council completed a review and amendment of the DWQMP and its implementation as required under the regulations. The review was completed in 2019-20 and the amended plan submitted for approval in May 2020. The amended plan was reviewed by DNRME and some further detail was requested regarding on 21<sup>st</sup> August 2021 with the below key information required;

- Detail of Chlorate Management Strategies
- Incident management plan notification improvements related to notification to vulnerable customers, for parameters with no guideline value and incidents which may have escalated beyond council's ability to control.
- Inclusion of naegleria and legionella monitoring in verification monitoring program and;
- Alignment of target chlorine residual measurements across tables where a conflict was noted.

A revised plan including the above amendments was submitted on 17 March 2021. Following review by the regulator, a second information requirement notice was issued on 17 June 2021 requesting further detail on;

- The potential use of Bore 7 in an emergency situation, including development of procedures and inclusion of notifications and alerts in the Incident and Emergency Management plan and the inclusion of bore 7 details in the infrastructure description section.
- Inclusion of Chlorate monitoring results in the DWQMP.
- Inclusion of detection of parameters with no ADWG guideline in the Incident and emergency Response Table.
- Description of why residual risk levels have not changed in the Risk assessment matrix despite a number of actions having been completed in the RMIP.
- Update of target dates in the RMIP where actions have exceeded their target date for completion.

A third amendment was subsequently submitted by the requested date of 17 July 2021. And again further information was requested via informal email on the 17 September 2021. The Amendment as submitted, revised and was formally approved on 13 October 2021, some 17 months after the original amendment application.

RSC has continued to action a number of 'opportunities for improvement' suggested in previous financial years external Audit, as well as progressing a number of improvement items identified in the Risk Management Improvement Plan (RMIP);

- All actions as requested following submission of the amendment in March 2020.
- Improvement to security of supply via the connection of Bore 8 the WTP and the development of an interim monitoring program to assess water quality risks for Bore 8 prior to and once connected.
  - The connection of Bore 8 has doubled raw water supply capacity and improved redundancy in the raw water supply systems, reducing and potentially eliminating the need to utilise Bore 7 as an emergency supply.

- Disconnection of bore 7 from the reticulation via blank ending interconnecting pipework requiring a pipe spool to be physically inserted to enable its use and eliminating any risk of the bore interconnecting valve being opened inadvertently.
- Ongoing development of procedures and record keeping systems.
- Inclusion of Naegleria and legionella analysis in the verification and operational monitoring programs at the request of the Regulator with the first samples being sent June 2021.
  - Unfortunately the laboratory incorrectly stored the naegleria and legionella samples in the initial sampling event (Stored in refrigerator) so re-samples were sent at the earliest possible time returning negative results (No detection) of Naegleria or legionella in either verification or raw water samples.

The progress linked to “high priority” actions undertaken to implement the risk management improvement program are discussed in Table 2.

***Table 2 – Risk management improvement program implementation status***

Please refer to Appendix A.

## 4 Verification monitoring - water quality information and summary

This section discusses the compliance with the water quality criteria. The Verification monitoring program was implemented in October 2018, including both internal and external verification analysis.

Richmond Shire Council has undertaken analysis in accordance with the DWQMP verification monitoring program detailed in the DWQMP. RSC Undertakes weekly internal analysis for Ecoli and coliforms and on a monthly basis sends these samples to an external NATA accredited laboratory for verification. The NATA laboratory also undertakes a range of chemical analysis on a monthly, quarterly and six monthly basis. This includes analysis of the raw water sources (not included in verification) to re-establish a level in confidence as to the quality of raw water and any risks that may be presented due to natural change in the source supply.

During the COVID 19 pandemic council has continued to be impacted by the reliability of freight to the laboratory where in September, October and December 2020 and January 2021 collected samples were not delivered to the laboratory within the required time period by the freight company, some samples taking up to 9 days to arrive at the laboratory or not arriving at all. These samples were therefore not analysed by the laboratory, however internal testing continued as per the program.

Richmond Shire has since made alternative freight arrangements and have had samples delivered consistently to the laboratory since February 2021.

**Table 3 – 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	Water quality criteria (i.e ADWG health guideline value)	No. of non compliant samples	Comments
Richmond	Ecoli	12 (external) + 52 (Internal)	8 (external), 50 (internal – 2 missed due to Staff Paternity Leave)	Not detected	0	100% compliant
	Chemical Parameters	12 x External (varying parameters)	8	Various	0	100% compliant
	Naegleria - Legionella	1	1	Not detected	0	100% compliant (Sampled June 2021)

Scheme name	Parameter	No. of samples required to be collected (as per the approved DWQMP)	No. of samples actually collected and tested	Water quality criteria (i.e ADWG health guideline value)	No. of non compliant samples	Comments
	Chlorate/DBP's	4	4	Various	0	100% compliant

**Table 4. E. coli compliance with annual value**

Drinking water scheme: Richmond

Year	2018 – 2019											
	Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
No. of samples collected (internal & External)	5	5	5	4*	4*	4*	4*	5	5	5	5	5
No. of samples collected in which E. coli is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	110	110	110	110	110	110	110	110	110	110	110	110

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											

*Freight services to laboratory did not get samples to the lab within the required period taking 5 to 9 days to be delivered so external samples in these months were missed, internal monitoring continued.*

## 5 Incidents reported to the regulator

No water quality incidents or non-compliances were reported to the regulator in 2020-21. A notification to the regulator was issued in May 2020 due to freight services being disrupted from Richmond to the laboratory and council were advised that this was not required for future issues with freight. Four samples failed to arrive at the laboratory within their specified holding time in the past financial year.

**Table 6 – Incidents reported to the regulator**

Incident date	Scheme / location	Parameter / issue	Preventive actions



## 7 DWQMP review outcomes

Richmond Shire Council undertook a review of the DWQMP and submitted an amended plan in August May 2020 which was updated following feedback from DNRME in September 2020, June 2021 and September 2021. The key amendments addressed in this ongoing review are detailed below.

### **Initial Ammendment May 2020 (Yet to be endorsed and accepted following subsequent requests for information).**

- Update system schematics – simplify and identify control points
- Simplify system descriptions (all) – consider table format.
  - Update population – demand details
  - Update reticulation details with new main replacements
- Simplify Information gathering – dot point
  - Update to include SWIM Local data base data entry and alerts.
- Water Quality Data analysis and Interpretation
  - Update data – Chlorine – turbidity – Iron - Manganese
  - Include last years external data and compare to internal records
- Catchment Characteristics
  - Update E.coli – coliform data to include 18-19 data
  - Simplify catchment description
- Operations and Maintenance
  - Simplify text to focus on risk-based operation/controls – remove bulk of descriptive text and develop and refer to “operation manual” as a separate document
- Update with recent mains replacements – upgrades and any new mains
- Hazard Identification and management
  - Update risk review workshop attendees and schedule following workshops
    - Remove from document and Attach as appendix
  - Detail cyber security risks/controls and include in Risk Assessment tables
  - Summarise risk profile – with and without controls detailing low-medium-high and very high risks as a percentage of the risk profile.
  - Develop control point tables identifying target, medium alert and high alert levels and associated actions and reporting requirements for key WQ parameters.
- Risk Management Improvement Program
  - Update to detail status of RMIP actions – complete - % progress – Not started
  - Include RMIP actions as raised in September Audit – Including progress.
  - Review risk assessment matrix and risk scores to reflect completed actions
  - Update to include any actions identified/recommended in September 2018 Audit
- Appendix A: Risk Tables and RMIP – Update following risk review workshop

### **Subsequent Review and Amendments, RFI issued August 2020, submitted 03-2021:**

1. Include councils Chlorate management strategies to minimize chlorate levels in the treated water into the DWQMP Risk assessment, as chlorate was detected in samples tested above the limit of Qld Health recommended health guideline value of 0.8 mg/L.
  - a. *A summary of management actions implemented has been included in the information gathering / water quality summary (Section 6.2) related to disinfection byproducts. Also noted in the Risk assessment tables related to Distribution. No Exceedances have been noted since two samples returned 0.844 at the WTP outlet and 0.836 at the verification monitoring site measured in January 2019. It is noted that, while the ADWG (2019) has no health guideline value for Chlorate based on there being insufficient data to establish a health-based limit, the WHO guidelines set*

*a provisional guideline limit of 0.7mg/L and subsequently state that difficulty in meeting the guideline value must never be a reason for compromising adequate disinfection. Also we are unable to locate any documented information via QLD health or DNRME websites as to the 0.8mg/L limit referenced and seek guidance from DNRME on publicly available notice of the guideline limit.*

2. In the Incident Management plan, include how the following notifications are made:
  - I. Vulnerable Customers during emergencies.
  - II. Detection of parameters with no water quality criteria, which the DWQMP can't manage and council is concerned public health may be adversely impacted; and
  - III. Events which may have escalated beyond Council's ability to control or are concerned that public health may be adversely impacted.
  - a) *It is noted in the Risk assessment and RMIP that Council does not have an Incident and Emergency Response Plan specific to the water supply scheme and significant incidents are managed under the Local Disaster Management Plan and associated communication strategies. This item has not been actioned in this amendment and the target completion date for development of such a plan in the RMIP has been set for January 2022.*
3. Include in the verification monitoring program, frequency and location of Naegleria and Legionella sampling, which have been identified as hazards in the DWQMP's Risk Assessment.
  - a. *These risks were incorporated into the Risk Assessment and RMIP at the direction of DNRME. The RMIP target date for implementation of sampling and testing for Naegleria and Legionella is end of June 2021. RMIP Has been updated to reflect progress to date which includes completion of sourcing of quotations for analysis and sampling/storage instructions to undertake the analysis. Council needs to develop a procedure to account for different sample storage and freight requirements required from existing analysis performed and is working to implement this by the June Target date as per the RMIP.*
4. Target chlorine system residual levels and alarms summary (Table 4.1) and Operational Control Point overview (Table 10.2) contradict documented operational alarm levels;
  - a. *Item has been addressed, and levels adjusted subject to a reduction in target chlorine residual levels made possible via the assessment performed relative to opportunity for improvement 1 – managing chlorate levels in the reticulation. Alterations made to Table 4.3 – Alarms Summary Table and 10.2 as requested (the referenced Table 4.1 relates to Bore Casing details not Operational alarm limits).*
5. The Regulator is aware works are planned or underway to bring new Bore 8 online as an additional drinking water source.

Once operational, the quality of Bore 8 water must be determined, via NATA accredited laboratory analysis and identified hazards must then be risk assessed to establish appropriate preventive measures, monitoring type, locations and frequencies and the corrective actions, when identified hazards are found to be not under control. If further measures are required to address any unacceptable risks associated with this new drinking water source, such will need to be included in the DWQMP's RMIP.

Council's DWQMP must then be amended to include this new drinking water source.

- a. *Bore 8 has been tested by an external NATA Laboratory returning results very similar to Bores 5, 6 and 7 as they are all drawing from a similar depth from the Great Artesian Basin and within approximately 1.5km from each other. Bore 8 is now in use and being tested monthly by the external NATA accredited laboratory. The RMIP has been updated to include the above actions which are proposed to be complete by*

March 2022 with 12 months of data to assist with quantifying risk and validating risk assessment rankings. Richmond Shire Council could not adequately undertake the risk assessments and amend the DWQMP at this time with the data available to date. All results are to be reviewed monthly on-going until sufficient data is available to validate and quantify risk.

#### **ADDITIONAL CONDITIONS**

1. Amend Drinking Water Quality Management plan to use Bore 7 as an emergency source of drinking water.
  - a. Conduct Monthly bacteriological and chemical sampling analysis of Bore 7 between 13 August 2020 and 12 February 2021.
  - i. *Referencing Councils Approved DWQMP prior to the current amendment which did not change operational or verification monitoring plans. Richmond Shire Council has been undertaking weekly internal microbiological sampling and testing for E-coli since 2019 as per the schedule, Council has also been undertaking external NATA analysis since December 2018 with the same parameters tested for bores 5 and 6. Council has reviewed this data and provided an additional appendix detailing the available data for Bore 7 which shows. No Positive results for E-coli from 81 internal tests and 11 external NATA accredited tests over the 13 month period. No other non-compliances with ADWG health limits for parameters tested. Total iron above ADWG Aesthetic threshold (not required to be reported), soluble iron below ADWG aesthetic limit. Manganese below ADWG Aesthetic (taste and staining) limit of 0.1, but slightly above the desirable limit of 0.05 averaging 0.06 mg/L (total) and 0.055 mg/L (soluble).*
  - b. Conduct Risk Assessment of identified hazards, associated with Bore 7 and amend its Approved Drinking Water Quality Management Plan accordingly.
    - i. *Risk Assessment conducted and Risk tables updated accordingly in the attached amendment.*
  - c. Update Appendix H – ‘Incident and emergency Response’ to detail under what circumstances and how Bore 7 will be used;
    - i. *Appendix H updated accordingly.*
  - d. Submit the amended Drinking Water Quality Management plan to the Regulator by 12 March 2021.
    - i. *Attached here-with.*

#### **ADDITIONAL ACTIONS UNDERTAKEN BY COUNCIL**

Richmond Shire council also amended the below;

- *System scheme schematic updated to include a new use of bore 7 for irrigation of the sports oval and some parks and median strips.*
- *Regarding Bore 8 - Council intends to amend the plan by March 2022 when there is sufficient data to appropriately assess the risks of bore 8, with that amendment other actions and opportunities for improvement noted by the regulator in the Information Notice that have not been addressed with this amendment will be addressed.*
- *Included Bore Casing Details for Bore 7 in Source, Treatment and Distribution Details Descriptions (Table 4.1 – Section 4.2 Raw Water Extraction and Delivery).*
- *Included additional Critical Control Point Summary table for Chlorine and pH for water treatment plant outlet (water to town) and Updated control point and alarm limits to reflect tables 4.3 and 10.2 as per above – (Appendix D – WTP Control Point and Alert Limit Tables).*
- *Completed new Amendment Application form (attached here-with).*

#### **Subsequent Review and Amendments, RFI issued June 2021, submitted 07-2021:**

#### **INFORMATION REQUIREMENTS**

Below summarises actions taken and information provided to address additional information requests as listed in section 6 of the Information Requirement Notice dated 17<sup>th</sup> June 2021.

- 6.1.1 – Additional Information required for bore 7 including location, type, production capacity and reliability.
  - Updated DWQMP Section 4 – Source, treatment and Distribution Details.
    - 4.2 Raw water Extraction and Delivery – Included brief description of bore7 and provided locality map for ALL bores. Included brief description of Bore 7, which is physically isolated from the reticulation via removal and blanking of section of pipe from outlet valve to reticulation. Requires physical reconnection before water can enter reticulation.
    - 4.4 System Capacity and Loading Summary – Updated Table 4.2 to include Bore 7 capacity and loading summary and included additional column detailing the reliability of each bore and ancillary components.
  - Updated Section 7.2 – WTP Modes of Operation – *Emergency water Supply Modes*
    - Included overview summary of circumstances where raw water may be supplied to town and reference to communication and notification alerts to level 3 (high risk incident).
    - Included in RMIP Action to assess relevance of including Bore 7 in the DWQMP as a raw water supply to stock and irrigation – consider permanently isolating and preventing reconnection to reticulation.
    - Included Action in RMIP to develop procedure detailing circumstances (catastrophic failure of ALL alternative existing supply options) under which bore 7 may be connected to the reticulation and actions that must be undertaken if it is in use as a town water supply. Viz.
      - Catastrophic failure of all other systems and supplies.
      - Detail regulatory and community notification requirements.
        - Boil water alert or other temporary health based measures.
        - Ongoing communication requirements – data sharing and consultation with advisory bodies (QLD Health - RDMW) (May be determined/agreed at time of incident).
      - Detail sampling requirements to increase frequency of monitoring during period of use.
      - Operational connection requirements (SOP for physically doing the job of reinstating the connection to reticulation).
      - Extended use (e.g. >2week outage of other systems). Recommend temporary installations that may be deemed necessary based on expected duration of event and results of pathogen monitoring (e.g. install temporary sodium hypochlorite dosing system at bore).
- 6.1.2 – Provide Chlorate Data and Summary.
  - Updated Section 6.2 Water Quality data Analysis and Interpretation – *Disinfection By-products* to include Data gathered since Chlorate monitoring began from the WTP outlet (reticulation entry – NON verification Site) and Verification Sites within the reticulation including a summary of compliance, overall, verification and WTP outlet.
- 6.1.3 – Update Appendix H to detail response if a parameter with no ADWG guideline , or Chlorate is detected above 0.8mg/L is detected.
  - Appendix H – Incident and emergency response Tale Updated to include response actions for the detection of a parameter with no ADWG guideline value or Chlorate greater than 0.8mg/L is detected.
- 6.1.4 – Operation and Maintenance Procedure List – Include procedure for operation of Bore 7 in an emergency.
  - Procedure scope and details added to Appendix I – O & M Procedure Documentation.
  - Procedure yet to be developed and RMIP Action added to develop procedure subject to decision from Council regarding retaining or permanently isolating bore 7 from the reticulation.

- 6.1.5 – RMIP Indicates that some tasks have been completed but the residual risk has not changed.
  - Appendix G – Risk Management Improvement Plan updated to reflect progress to date in line with annual review process. (Updates In **RED TEXT**).
    - Comment: Where pathogens are identified as the primary hazard, using the ADWG risk assessment matrix, if the consequence is Major (e.g. several people could fall ill and potentially die), no matter how much the likely hood is reduced, the risk cannot be classified as anything less than “High (refer table from ADWG Below). This means that where the consequence is Major the risk will always be unacceptable and reducing the likelihood does not reduce the consequence should that hazard eventuate despite the controls.

**Subsequent Review and Amendments, RFI issued September 10<sup>th</sup> 2021, submitted 17 September 2021:**

- Section 9.1 – Residual Risk management measures – Updated to include reference to ADWG Risk matrix and inability to get some risks below “High”, subject to review of controls risks may be deemed as low as reasonably practicable (ALARP).
- Appendix H – Incident and Emergency Response Table – Updated to include detection of Chlorate as an ADWG non compliance for a chemical parameter in level two incident.
- Appendix G - Risk Management Improvement plan – Updated Improvement action IP31 - Develop procedure for use of Bore 7 as Completed.
- Bore 7 Emergency Supply Procedure.

## **8 DWQMP audit findings**

No Audit was conducted in the 2020-21 reporting year.

## 9 Appendix 1 – Updated RMIP Table



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-%20RSC%20Risk%20