



Drinking Water Quality Management Plan

Annual Report 2021-22

December 2022



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EXECUTIVE SUMMARY

Water suppliers in Queensland (QLD) are required under the *Water Supply (Safety and Reliability) Act 2008* (the Act) to operate under an approved Drinking Water Quality Management Plan (DWQMP) to protect public health. In addition, the preparation of a DWQMP report per financial year is required by the Act.

This DWQMP report documents the performance of Carpentaria Shire Council (Council) in implementing the DWQMP for the 2021-22 financial year.

Council is a registered service provider that manages the Normanton-Karumba drinking water supply scheme under an approved DWQMP. The water supply scheme is comprised of raw water sources (weir and bore), a water treatment plant, pump stations, service reservoirs and distribution network.

Council has undertaken effective risk management and water quality testing to ensure the supply of safe drinking water.

Various improvement actions have been undertaken and/or planned as continual improvement. The improvement actions have been identified through detailed risk assessment to ensure safe quality of drinking water.

The water quality verification results and assessment showed that Council supplied safe quality water to the customers, with 100% compliance against the Australian Drinking Water Guidelines and Public Health Regulation for the parameters tested.



No events or incidents were recorded in this reporting period. The absence of water quality related customer complaints indicated good customer satisfaction. It is noted that a dirty water event occurred in October 2022 which will be discussed in the 2022-23 annual report.

The DWQMP was reviewed on two occasions during the reporting period. Both reviews required updates to the DWQMP and approval of the amended DWQMP by the Regulator. The DWQMP amendments were approved by the Regulator without any issues.

A regulatory audit was also conducted in September 2021, the findings and outcomes are covered in this report.

1. INTRODUCTION

This is the Drinking Water Quality Management Plan (DWQMP) Annual Report for Carpentaria Shire Council (Council) for the financial year 2021-22.

The DWQMP has been established and is being adhered to in order to protect public health through the identification and minimisation of public health related risks associated with drinking water. Council is operating under an approved DWQMP, with the approval granted by the Department of Regional Development, Manufacturing and Water (DRDMW).

This Annual Report summarises Council's drinking water quality performance for the reporting period and progress on the implementation of the improvement plan. The report is made available to customers on Council's website and for inspection upon request at the Council office.

1.1. Scope

The report has been prepared to fulfil the legislative DWQMP reporting requirements set out in the *Water Supply (Safety and Reliability) Act 2008* (the Act).

1.2. Purpose

This annual report aims to:

- be a reference document for the Regulator, as well as customers, on Council's performance in relation to the DWQMP reporting obligations under the Act, for the reporting period
- provide a summary of Council's performance in implementing the DWQMP.

2. SCHEME OPERATED

With the introduction of the Act, water service providers are required to register as a drinking water service provider for the delivery of a drinking water service. Council is a registered drinking water service provider, with the service provider identification (SPID) number as 32.

Council manages the Normanton-Karumba drinking water supply scheme and distributes treated water to the communities of Normanton and Karumba respectively. The water supply scheme is comprised of raw water sources (weir and bore), a water treatment plant, pump stations, service reservoirs and distribution network.

3. DWQMP IMPLEMENTATION

The implementation of the DWQMP is discussed in this section, and also captured in the other sections that follow.

3.1. Risk management

The process of keeping drinking water safe is one of risk management. Through efficient operations and implementation of the DWQMP, Council has ensured effective risk management to assure safe quality of drinking water to our customers.

During the reporting period, Council supplied drinking water that complied with the water quality criteria set in the Australian Drinking Water Guidelines (ADWG). There was no major incident or event that comprised Council's ability to supply safe quality drinking water to customers.

3.2. Monitoring

Council maintains comprehensive monitoring programs to ensure that the quality of water supplied to customers is safe. The monitoring programs assist to identify any issue before it becomes a significant water quality incident. The results from the verification monitoring for the reporting period are discussed in Section 4.

Council also undertakes operational monitoring, which includes the planned sequence of measurements and observations to assess and confirm the performance of our preventive or control measures. Measurements are of operational parameters that indicate whether processes are functioning effectively.

Quality assurance is important to guarantee consistently reliable and legally defensible results and ensure customers are provided with the best quality water.

Council has the following quality management systems in place:

- microbiology samples, while tested in-house, are also sent to the Cairns Regional Council Water Laboratory, which is a NATA accredited laboratory, for quality assurance
- operations staff have been appropriately trained to undertake sampling

3.3. Implementation of Risk Management Improvement Plan

Council maintains a culture of continuous improvement and are implementing the Improvement Plan of the DWQMP and making progress towards strengthening the management of the water supply. During the reporting period, Council implemented a number of key actions including:

- Installed an online turbidity meter at Glenore weir.
- Additional online monitoring equipment was installed and is in operation.
- In-house *E. coli* testing is being carried out routinely for compliance monitoring.

Detailed status on the Improvement Plan implementation is presented in Appendix A.

4. VERIFICATION MONITORING

This section discusses the compliance with the water quality criteria. Council supplied safe quality drinking water to its customers during the reporting period as discussed in the following table.

A summary of the samples tested is included in Table 1. All parameters were compliant as per the ADWG and the Public Health Regulation 2018, as relevant.

Total coliforms and *E. coli* were tested in-house, but monthly samples were sent to an external laboratory as quality check. The monthly *E. coli* results from the external laboratory verified that the in-house testing results were acceptable. No *E. coli* was detected in the monthly samples tested by the external laboratory as well.

Table 1 Drinking water quality performance – verification monitoring

Location	Parameter	Frequency	No. of samples tested	Water quality criteria (spec)	No. of non-compliant samples	Comments
Normanton	Total coliforms (CFU/100mL)	Weekly	66	NA	NA	✓ Low, system is flushed as possible.
	<i>E. coli</i> (CFU/100mL)	Weekly	66	Not detected (ND)	0	✓ Compliant. <i>E. coli</i> rolling average for the reporting period was 100%, at least 98% is required by the Public Health Regulation 2018.
	Free Chlorine (mg/L) - Reticulation	Weekly	77	NA	NA	✓ Free chlorine is maintained in the network.
	Free Chlorine (mg/L) - WTP	Daily	365	NA	NA	✓ Adequate free chlorine leaves the WTP.
	Trihalomethanes (THMs) (mg/L)	6-monthly	3	0.25	0	✓ Compliant.
Karumba	Total coliforms (CFU/100mL)	Monthly	19	NA	NA	✓ Low, system is flushed as possible.
	<i>E. coli</i> (CFU/100mL)	Monthly	19	Not detected (ND)	0	✓ Compliant. <i>E. coli</i> rolling average for the reporting period was 100%, at least 98% is required by the Public Health Regulation 2018.
	Free Chlorine (mg/L) – Reticulation	Weekly	366	NA	NA	✓ Free chlorine is maintained in the network.
	Trihalomethanes (THMs) (mg/L)	6-monthly	3	0.25	0	✓ Compliant.

Variations:

- There were more samples tested in Normanton and Karumba reticulation for *E. coli* and chlorine than the minimum frequency. This was because at times Council undertakes multiple samples to ensure more coverage of the reticulation, which is best practice.
- Free chlorine is measured in-house daily in Karumba (spread across the sites). Free chlorine is measured daily in the final treated water at WTP in Normanton and also tested regularly across the reticulation sites.

The level of compliance for the verification monitoring data (relevant ADWG health-based values) is also displayed visually in Figure 1.



Figure 1 Verification Compliance

5. INCIDENTS REPORTED TO THE REGULATOR

There were no Events¹ or Incidents² to report for 2021-22 period. Water quality risks were proactively managed.

6. CUSTOMER COMPLAINTS

There were no formal water quality related customer complaints recorded for 2021-22 period.

7. DWQMP REVIEW OUTCOMES

There were two reviews of the DWQMP completed in the reporting period.

7.1. Review – Council Initiated

A review of the DWQMP was initiated by Council in October 2021. This was because *E. coli* testing was intended to be undertaken in-house in preference to only external testing at the Cairns laboratory. Samples were still planned to be sent to the Cairns laboratory monthly as regular quality assurance (QA) checks for the in-house testing.

As part of the review the following DWQMP documents were reviewed and amended:

- Risk Assessment Register – a new risk row was included and assessed in the Whole of System tab in relation to the in-house testing to be undertaken. The residual risk came out as acceptable, but process improvements were identified.
- Improvement Plan register – the improvement actions identified from the risk assessment of the new row were added to the Improvement Plan. The actions were related to documenting and establishing a detailed QA/QC framework, including operator competency training and testing procedure.
- Monitoring Plan – minor changes, being inclusion of in-house microbiological testing and related changes.
- Incident and emergency response plan (IERP) - minor changes related to reporting processes.
- DWQMP main document - minor changes to update supporting document references.

The minor amended DWQMP was submitted to the Regulator and approval was obtained by Regulator agreement on 19 October 2021.

7.2. Review – Regulatory

The DWQMP was required to be reviewed by 30 January 2022 as part of the DWQMP approval conditions. An external contractor was engaged to facilitate the review process. A review workshop was undertaken on 3 November 2021 and the review was completed on 9 November 2021 (within the required period).

The findings of the review are shown in Table 2.

¹ Potential to impact water quality

² Non-compliance against ADWG value

Table 2 DWQMP Review Details and Findings

Area reviewed	Details	Changes needed
Water Quality Data	Detailed analysis of water quality data (statistics, box plots and scatter plots) was undertaken to guide the DWQMP and risk assessment review to verify the risk profiles. Section 3 of the Drinking Water System Analysis Report (DWQMP supporting document) was updated in detail to include recent raw, operational and verification monitoring data. This was updated prior to the DWQMP review discussions, as a draft.	Finalise the Drinking Water System Analysis Report with the new data set.
Supply System	The process flow, operations and infrastructure details for the supply in the Drinking Water System Analysis Report were reviewed as a workshop to verify changes. This was undertaken on 3/11/21.	Minor updates to Figure 3 – two lines from Weir into the WTP and separate outlet from Water tower to town. Updates to Figure 4 – duplicate treatment train from inlet screen to clarifier outlet, inlet screen has a bypass, post soda ash is optional. Old clarifier processes are almost identical to new one – no material change to Figure 5. Minor changes to infrastructure details in Section 2.3 to reflect current operations.
Risk Assessment	The risk assessment for the supply was reviewed in detail as a workshop on 3/11/21. The risk team details are included in the Risk Register – relevant tab.	Finalise the risk assessment review based on the workshop discussions.
Improvement Actions and Audit Findings	Improvement actions and the 2021 audit findings were reviewed as part of the review workshop on 3/11/21.	Update the Improvement Plan following the workshop, including addition of new improvements actions identified from the review workshop.
Monitoring Programs	This was reviewed as part of the review workshop on 3/11/21.	Updates to sampling location names in Normanton (Albion Hotel to Council Admin) and Karumba (Sunset Tavern to Council Property). Addition of turbidity and pH (with chlorine) when <i>E. coli</i> sample is collected. Other minor edits – explained in the document history table.
CCPs	The CCP procedures were reviewed as part of the review workshop on 3/11/21.	Minor addition to clarify that any value out of target range will indicate need for corrective actions. Fluoride given a target range (0.55-0.65 mg/L), pH given a target range 7.4-7.8 and chlorine given a target range (1.4-1.8 mg/L). The 5 different CCP procedure documents to be compiled into one document for ease.
Incident and emergency response	This was reviewed following the workshop. There was no change to the response protocols (from the Oct 21 version), but minor updates were required to the contacts lists.	Update the contacts lists in Section 5.2. Other minor edits – explained in the document history table.
DWQMP main document - body	Reviewed following the review workshop.	Very minor updates required - Section 3.1 to be re-worded and reference made to the Incident and Emergency Response Plan, Appendix A to include only chemical suppliers, Tables 6 and 7 to be slightly updated and reference to 2019 supporting documents to be changed to 2021 across.

The outcome of the review was the need to update the DWQMP. The DWQMP was subsequently amended and submitted to the Regulator. The Regulator approved the amended DWQMP on 23 February 2022. The next formal review is due by 30 January 2024.

8. DWQMP AUDIT FINDINGS

A regulatory audit was required to be undertaken during the reporting period. A suitably qualified external contractor was engaged. The onsite audit was conducted on 8-10 September 2021 and the audit report was finalised on 27 September 2021. As required, the auditor shared the audit report with the Regulator as well.

Overall, the audit concluded that Council demonstrated an acceptable level of compliance, is adequately managing risks to public health, has reasonable processes for managing incidents and is progressing the improvement plan.

There were a small number of non-compliances identified with recommendations (RECs) provided, along with opportunities for improvement (OFIs³). The recommendations and OFIs from the audit were reviewed and considered during the review of the DWQMP (refer to section 7.2).

The recommendations related to the non-compliances and review outcomes are included in Table 3. Details of how the OFIs were considered are not included in this Annual Report, but are part of the Improvement Plan register, which was shared with the Regulator.

Table 3 DWQMP Audit Findings and Review

RECs	Audit Finding	Council's Review and Comments
REC 1	Install mesh to the whirlybird vent at the NWTP round CWS tank.	Discussed at the risk workshop on 3/11/21, is part of the Improvement Plan now and will be progressed from there.
REC 2	Order new turbidity standards and ensure that are ordered in anticipation of their use-by date.	Discussed at the risk workshop on 3/11/21, as new Whole of System risk on calibration. Is part of the Improvement Plan now and will be progressed from there.
REC 3	Undertake a regular check of operational calibration record checks to ensure that the instruments are being calibrated regularly and effectively.	Discussed at the risk workshop on 3/11/21, as new Whole of System risk on calibration. Is part of the Improvement Plan now and will be progressed from there.
REC 4	Item WQ6 was not completed by the due date, however, it is now complete	Nothing further to do on this. Improvement Plan now has a revised timeframe column. Not all actions can be completed by the original timeframe due to valid reasons. As long as the Improvement Plan and timeframes are regularly reviewed, it shows that it is being implemented.
REC 5	Obtain a copy of the previous audit report and ensure that the findings are being addressed. Include audit actions in the RMIP.	This was completed already. There is a DWQMP review report 2017 which shows how the audit findings were considered. Nothing further is required.

³ OFIs – auditor's opinion on process improvements for consideration, it is not related to non-compliance per se.

9. GLOSSARY

ADWG	Australian Drinking Water Guidelines (2011). Published by the National Health and Medical Research Council of Australia
DRDMW	Department of Regional Development, Manufacturing and Water
DWQMP	Drinking Water Quality Management Plan
<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
THMs	Trihalomethanes, a group of disinfection by-products that become a potential health risk in elevated concentrations.
Event	Means anything that has happened to the service that has escalated beyond the ability to control and there is concern that public health may be adversely impacted as a result.
Incident	Means a non-compliance with water quality criteria (e.g. exceeding an ADWG health guideline value).
Total coliforms	Group of bacteria whose presence in drinking water can be used as an indicator for operational monitoring.
mg/L	Milligrams per litre
CFU/100mL	Colony forming units per 100 millilitres

A. IMPROVEMENT PLAN PROGRESS

The improvement actions relevant for this reporting period are included in the Table below with relevant commentary on implementation status.

Ref	Source/Ref	Component	Improvement Actions	Status	Comments
WQ1	Improvement Plan 2013 Review	Whole of System	Investigate arrangement with relevant suppliers (Veolia and Endress Hauser) for maintenance and calibration visits every 2 years.	Completed	Replaced units, came with calibration verification kit
WQ2	Risk Review 2015 / C1	Normanton-Karumba scheme	Investigate source water protection (e.g. fencing off to keep stock away) as part of the Glenore weir upgrade project.	Completed	Weir was upgrade done, however, it is not possible, to undertake any fencing. The river is too long to have any real impact due to fencing off.
WQ3	Risk Review 2015 / C6, C7, DWQMP Review 2015, DWQMP Review 2017	Normanton-Karumba scheme	Modify water quality data spreadsheet to capture measurement for clarified water, filtered water and chlorine analyser from the respective online meter readings at least daily when grab samples are tested, and when there is a CCP breach. Include CCP targets and critical levels in the spreadsheet - colour code for breaches.	Completed	Done. SWIM Local
WQ4	Risk Review 2015 / C7	Normanton-Karumba scheme	Investigate improving filter performance (e.g. changing or upgrading filter media, air scour). Review filtered water turbidity targets following upgrade (turbidity off filters <0.2 NTU or combined filters <0.5 NTU).	Completed	Investigated and fixed.
WQ5	Risk Review 2015 / C14	Normanton-Karumba scheme	Karumba reservoirs - secure overflow pipes to ensure no access point for pests and vermins	Completed	Done
WQ6	Risk Review 2015 / C16, DWQMP Review 2017	Normanton-Karumba scheme	Investigate options to reduce THMs, e.g. re-configuration of Karumba reservoir pipeworks and optimising amount of re-chlorination. Consider relocating the rechlorination point.	Completed	Investigation complete. Reservoir has been re-configured and relocating the re-chlorination point is underway (pipework done), refer to action #44.
WQ7	Risk Review 2015 / WS3	Whole of System	Investigate raising weir storage capacity with the Glenore Weir upgrade project.	Completed	Done.
WQ8	Improvement Plan 2013 Review, Risk Review 2015 /C13, C15, WS4, WS5, DWQMP Audit 2017	Whole of System	Compile operating procedures for the service into a Manual, including reservoir cleaning (with schedule), jar tests, filter backwash, mains repairs, hygiene (tools, personnel), sampling, equipment calibration, flushing. This includes development of relevant checklist to record preventive measures undertaken.	Completed	This was delayed due to staff movement, but will be considered. Timeframe changed to reflect this.
WQ9	DWQMP Review 2015	Whole of System	Undertake staff training on CCPs and implementation. CCPs to be signed off by the MENG and operators. Ensure online meters are set on the correct alert and critical limit values for sending alarms and shut downs.	Completed	SCADA alarms set. Training to be provided, new action item included, WQ11.
WQ10	Monitoring Plan Review 2015	Whole of System	Undertake the first suite of chemical/physical testing of each source water as per the Monitoring Plan 2015, section 5.	Completed	This was delayed due to staff movement, however, has been completed now in Sep 17.

WQ11	DWQMP Review 2017	Whole of System	Develop a DWQMP implementation training package, including CCPs and deliver to relevant water staff, including operators.	Completed	Induction package
WQ12	DWQMP Audit/Review 2017	Whole of System	Implement a document transfer process from the Manager to the operators, including operators required to sign off on current DWQMP documents after receiving/reading them	Completed	Induction package
WQ13	DWQMP Audit/Review 2018	Whole of System	Consider adding structure to the InfoXpert system so documents and records can be stored in folder making them easier to find.	Completed	On SCADA PC, accessible via teamviewer
WQ14	DWQMP Review/Update 2019	Normanton-Karumba scheme	Improve vermin-proofing of reservoirs.	Completed	Done, further improvements identified, refer to #41.
WQ15	DWQMP Review/Update 2019	Normanton-Karumba scheme	Implement locking of reservoir hatches.	Completed	
WQ16	DWQMP Review/Update 2019	Normanton WTP	Rectify stormwater diversion on the 1.46ML reservoir.	Completed	Investigation and found that diversion pipe ran to overflow pipe and then to drain, no risk
WQ17	DWQMP Review/Update 2019	Normanton WTP	Aerate the ground water reservoirs.	Completed	Investigated, too expensive, other measures undertaken to reduce THMs risk
WQ18	DWQMP Review/Update 2019 DWQMP Review 2021	Whole of System	Investigate baseline PFAS, PFOS and PFHxS testing utilising a trained sampler. Discuss with QH. Undertake baseline testing for radiological parameters - gross alpha and gross beta. Include testing of Boron in the annual testing suite.	To Start	Discussion was done with QH on PFAS testing, to be progressed again.
WQ19	DWQMP Review/Update 2019	Raw Water	Install an online turbidity meter at the Glenore Weir.	Completed	Done
WQ20	DWQMP Review/Update 2019	Whole of System	Investigate installing an online free chlorine instrument near Normanton Sports Ground.	In progress	Investigation completed. But left as in progress. Building to house it in is to be constructed.
WQ21	DWQMP Review/Update 2019	Normanton WTP	Install a shade structure for the hypochlorite product tank.	Completed	Done
WQ22	DWQMP Review/Update 2019	Whole of System	Install "DO NOT DRINK" and "DANGER ELEVATED FLUORIDE LEVELS" warnings at bore sites.	Completed	Sign - Do not drink - non-potable water
WQ23	DWQMP Review/Update 2019	Normanton WTP	Implement interlock of the filtration system with an exceedance of the operational limit for settled water	Completed	Investigated. Installation of new clarifier equipment to be developed.
WQ24	DWQMP Review/Update 2019	Whole of System	Improve focus on backflow prevention measures by enabling water and waste staff to undertake and monitor the backflow prevention device testing program.	Completed	Marked as completed. This role is with the Plumbing Inspector, not enough capacity for operators to take this on board.
WQ25	DWQMP Review/Update 2019	Normanton WTP	Print CCP procedures and display in the control room of the plant.	Completed	Done
WQ26	DWQMP Review/Update 2019	Normanton WTP	Consider consolidating water quality records into three files (Normanton WTP, Normanton Reticulation, Karumba Reticulation).	Completed	Done

WQ27	DWQMP Review/Update 2019	Whole of System	Commence in-house E. coli testing as an operator training exercise at Normanton and Karumba. Consider amending verification monitoring plan once training is completed.	Completed	Done
WQ28	DWQMP Review/Update 2019	Whole of System	Undertake a baseline study of chlorate to determine typical levels using hypochlorite generator.	In progress	Initial analysis has been conducted.
WQ29	DWQMP Review/Update 2019	Normanton WTP	OMM for hypochlorite generator.	Completed	In place
WQ30	DWQMP Minor update Oct 2021 - Risk Register WS9	Whole of System	Document a detailed quality assurance and quality control framework for the in-house microbiological testing.	Completed	Additional information captured on sample register.
WQ31	DWQMP Minor update Oct 2021 - Risk Register WS9	Whole of System	Establish a periodic operator competency assessment for the in-house microbiological testing, including sampling.	In progress	Longer term operators have been trained. Newer operators to undertake formal training.
WQ32	DWQMP Minor update Oct 2021 - Risk Register WS9	Whole of System	Document the testing process as a Council procedure (adapt from the manufacturer's procedure). [This is best done when the QA/QC framework is completed or properly considered].	Completed	SOP has been completed.
WQ33	DWQMP Review Nov 2021 - Risk Register C-1	Glenoir Weir	Rectify the online turbidity meter issue at the weir.	Completed	Turbidity meter operational at Glenore Weir control room.
WQ34	DWQMP Review Nov 2021 - Risk Register C-6	Soda Ash	Investigate and upgrade batching and dosing system for pH (and hardness) correction e.g. investigate use of calcite contactor.	Completed	Investigation complete. Soda ash dosing system needs to be upgraded (CAPEX item). Council has quotes for budgetary consideration.
WQ35	DWQMP Review Nov 2021 - Risk Register C-7	Coag, floc, clarification	Modify the data spreadsheet to record water quality testing undertaken on both clarifiers.	Completed	spreadsheet updated
WQ36	DWQMP Review Nov 2021 - Risk Register C-9	Filtration	Investigate filter to waste option.	Completed	Investigation complete. Purchasing additional equipment to install over time.
WQ37	DWQMP Review Nov 2021 - Risk Register C-12	Chlorination	Investigate SCADA monitoring of the onsite generation system.	Completed	Investigation complete. Contractors engaged to undertake the integration.
WQ38	DWQMP Review Nov 2021 - Risk Register C-12	Chlorination	Investigate capacity increase for the onsite generation system (to supply 100% of the chlorine use).	Completed	Investigation complete. Contractors installing additional equipment to increase the concentration of product.
WQ39	DWQMP Review Nov 2021 - Risk Register C-14	Rechlorination	Investigate onsite chlorine generation system, with SCADA controls for the Karumba rechlorination system.	Completed	Investigation complete. Equipment procured and contractor engaged to complete the installation.
WQ40	DWQMP Review Nov 2021 - Risk Register C-16	Reservoirs	Formalise the reservoir cleaning program, including cleaning schedule	In progress	Slightly delayed as we have engaged with NWQROC QWRAP for regional collaboration.
WQ41	DWQMP Review Nov 2021 - Risk Register C-17	Reservoirs	Vermin proof the whirlybirds for the Normanton ground reservoirs.	In progress	Mesh has been purchased and is being installed over time.

WQ42	DWQMP Review Nov 2021 - Risk Register C-17	Reservoirs	Investigate undertaking periodic inspections (e.g. every 6 months) for all reservoirs in relation to integrity (vermin proof, rainwater ingress etc) using an appropriate checklist.	Completed	Checklist sheets have been developed for periodic inspections.
WQ43	DWQMP Review Nov 2021 - Risk Register C-18	Reticulation	Formalise the flushing procedure in the reticulation network.	Completed	Developed and implemented.
WQ44	DWQMP Review Nov 2021 - Risk Register C-19	Reticulation	Investigate moving the re-chlorination point in Karumba to the elevated reservoir. This may optimise the amount of re-chlorination and reduce potential for THMs formation	Completed	Investigation completed. A dosing point has been installed and will be used once the chlorine generators are fully commissioned.
WQ45	DWQMP Review Nov 2021 - Risk Register WS-4	Whole of System	Review and update the training package with amendments done to the DWQMP, as relevant.	Completed	Repeated as new staff come on board.
WQ46	DWQMP Review Nov 2021 - Risk Register WS-5	Whole of System	Review the disinfection procedure to include machinery disinfection prior to use (e.g. excavator).	To start	To be developed.
WQ47	DWQMP Review Nov 2021 - Risk Register WS-10	Whole of System	Investigate obtaining certificate of analysis for chemical batches and maintain as records. Document the chemical quality assurance processes.	In progress	Have commenced obtaining batch certificates.
WQ48	DWQMP Review Nov 2021 - Risk Register WS-11	Whole of System	Capture in-house calibration records, including process to trigger ordering of calibration standards. Establish a formal external calibration program/ schedule (e.g. calendar or spreadsheet).	Completed	Has been developed and incorporated into the daily logsheets.
WQ49	DWQMP Audit 2021	NA	Undertake a scenario exercise for drinking water incident management and response	To Start	
WQ50	DWQMP Audit 2021	NA	Develop a procedure to ensure that all drinking water materials purchased are certified to Australian Standards or are WaterMark approved	In progress	
WQ51	DWQMP Audit 2021	NA	Document a maintenance program for WTP assets	In progress	Council is looking to engage an asset manager.