Water Supply

Raglan Supply Zones

DRINKING WATER SAFETY PLAN

2025

Community Code	**RAG001**
Source Code	**G00464**
Treatment Plant Code	**TP00128**
Zone Code	**RAG001RA**

Watercare

An Auckland Council Organisation

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Table 1: Document Control Record.

Version No.	Description	Author	Reviewer	Date	Authorised
1.0	Water Safety Plan	Abby Gordon	Parvati Patel	April 2015	Martin Mould
2.0	Water Safety Plan 2020 Revision	Jamie Wara, Bliss Pappachan **Water Quality Scientist**	Tatiana Derevianko **Principal Water Quality Scientist**	June 2020	Sharon Danks
3.0	Water Safety Plan 2021 Revision	Bliss Pappachan **Water Quality Scientist** Gil Miers **Operations Manager** Nigel Connolly **Operations Engineer**	Tatiana Derevianko **Principal Water Quality Scientist**	June 2021	Mathew Telfer **Operations Manager Waikato District**
4.0	Drinking Water Safety Plan 2022 update	Grant King **Water Quality Scientist**	Bliss Pappachan **Water Quality Scientist** Tatiana Derevianko **Water Quality & Science Manager**	October 2022	Mathew Telfer **Operations Manager Waikato District**
5.0	Drinking Water Safety Plan 2023 update	Bliss Pappachan **Water Quality Scientist**	Marieka van der Lee **Water Quality Scientist** Tatiana Derevianko **Water Quality & Science Manager**	November 2023	Mathew Telfer **Operations Manager Waikato District**
6.0	Drinking Water Safety Plan 2023 update	Mitchell Adams **Water Quality Scientist**	Tatiana Derevianko **Water Quality Compliance & Science Manager**	November 2024	Anin Nama **Head of Service Delivery – Waikato**
7.0	Drinking Water Safety Plan 2025 update	Cara Dreyer **Water Quality Scientist**	Tatiana Derevianko **Water Quality Compliance & Science Manager**	October 2025	Anin Nama **Head of Service Delivery – Waikato**

Table 2: Document Distribution List.

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Executive Summary

This Drinking Water Safety Plan (DWSP) has been developed using the *New Zealand Drinking Water Safety Plan Framework* and provides a comprehensive review of the Raglan water supply system. It outlines how public health risks associated with these supplies are managed to ensure the delivery of safe and reliable drinking water. It outlines how public health risks associated with these supplies are managed and summarises monthly compliance requirements required to ensure the delivery of safe and reliable drinking water.

The Raglan supply is owned by Waikato District Council (WDC) and operated by Watercare Services Limited (Watercare). This DWSP satisfies the legislative requirements of the *Water Services Act 2021* and must be viewed alongside the *Watercare Waikato General DWSP (Version 1.0; Appendix 1).*

WDC and Watercare adhere to the six principles of drinking-water safety, which are embedded into all systems, processes, and behaviours:

1) Embrace a high standard of care
2) Protect source water
3) Maintain multiple barriers against contamination
4) Change precedes contamination
5) Suppliers must own the safety of drinking-water
6) Apply a preventive risk management approach.

This DWSP will be reviewed and updated regularly to reflect changes in infrastructure, operations, or risk profiles, ensuring ongoing compliance and continuous improvement in drinking water safety.

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Amendments

Requests for amendments or revisions of the manual are submitted to the document controller, who is responsibility of reviewing requests and implementing changes to the document. Amendments and updates are documented in the *Table 1: Document Control Record.* Amendments or revisions of the document will result in a new version number and updated date in the footer.

1. Assessment of the Raglan Drinking-Water Supply

Table 3: Water Supply Details.

Supply Details	
Supply Name	Raglan
Hinekōrako Community Code	RAG001
Supply Owner	Waikato District Council
Population Served by Supply	6,130 (based on 2025 active metered connections)
Source Details	
Easting: 1763620	**Northing**: 5811839
Source	Omahina Spring
Hinekōrako Code	G00464
Consent	118341 - To take water from the Omahina Spring for domestic and municipal supply purposes.
Consent Expiry	15-Jan-34
Maximum Consented water take	3,100 m^3/day
Treatment	
Hinekōrako Code	TP00128
Treatment Processes	Cartridge Filtration, Ultraviolet (UV) Disinfection, Chlorination
Average Daily Volume	1,610 m^3/day (2024 - 25)
Peak Daily Volume	2,503 m^3/day (2024 - 25)
Distribution	
Hinekōrako Code	RAG001RA
Distribution Zone Population	6,130 (based on 2025 active metered connections)

Source Water Quality and Log Credit Requirements

The Raglan WTP abstracts raw water from Omahina Spring, which has been assessed as a 3-log protozoa risk based on catchment risk evaluation and protozoa monitoring data provided by Massey University (*Appendix 2*). To meet the *Drinking Water Standards for New Zealand (DWSNZ)* protozoal treatment requirements, the Raglan WTP must maintain a minimum of 3-log protozoal removal at all times. This requirement is met through validated ultraviolet (UV) disinfection.

Raglan Water Supply System Description

The Raglan WTP, located off Te Hutewai Road, supplies treated water to the Raglan township using cartridge filtration, UV disinfection, and chlorination. The distribution zone is primarily urban, with water delivered via a gravity-fed supply from storage reservoirs.

Intake:

Raw water from Omahina Spring flows into a catchment area and is diverted into a wet well, from which it is abstracted into the treatment plant via two duty/standby pumps. Abstraction is controlled based on the water level in the onsite treated water reservoir, using a variable speed drive to maintain optimal flow while sustaining spring weir level setpoints. Turbidity and conductivity are continuously monitored to assess incoming water conditions. Flow meters continuously monitor the abstraction rate, and backup power is available via a portable generator connection.

Filtration and UV Disinfection:

Raw water is filtered through two 3M High Flow 1-micron cartridge filters operating in duty/standby configuration before undergoing UV disinfection. A UV transmittance (UVT) meter and turbidimeter monitor the quality of the filtered water prior to disinfection. Differential pressure is measured across the filters to assess for clogging and determine when maintenance or replacement is required. Disinfection is provided by two WEDECO Spektron 250e UV reactors (duty/manual standby), which deliver a fixed UV dose of 40 mJ/cm² and are validated to UVDGM standards. Any deviation from the required UV dose triggers an alarm. Validation certificates are referenced in *Appendix 3*.

Chemical Dosing and Post Treatment Monitoring:

Chlorine gas, housed in two 70 kg cylinders is dosed via two chlorinators operating in a duty/standby configuration. The dosing system is controlled by a Proportional-Integral-Derivative (PID) controller, which automatically adjusts the dosing rate based on real-time feedback. Manual adjustments can be made using a venturi vacuum system. Treated water enters the 1136 m³ onsite high-pressure reservoir, where a minimum of 30 minutes contact time is provided. A water level meter monitors the reservoir level. When the high-level setpoint is reached, the wet well pumps are automatically tripped, ceasing production.

Final water quality is continuously monitored for flow, turbidity, chlorine, and pH. Monitoring data is telemetered to WDC, with equipment calibrated weekly and validated quarterly.

Reticulation and Reservoirs:

Water flows by gravity from the onsite treated water reservoir to the distribution system, with approximately two-thirds of the flow directed to the 1136 m³ low-pressure Bow Street Reservoir. Reservoir details are included in the *Reservoir Register (Appendix 4).*

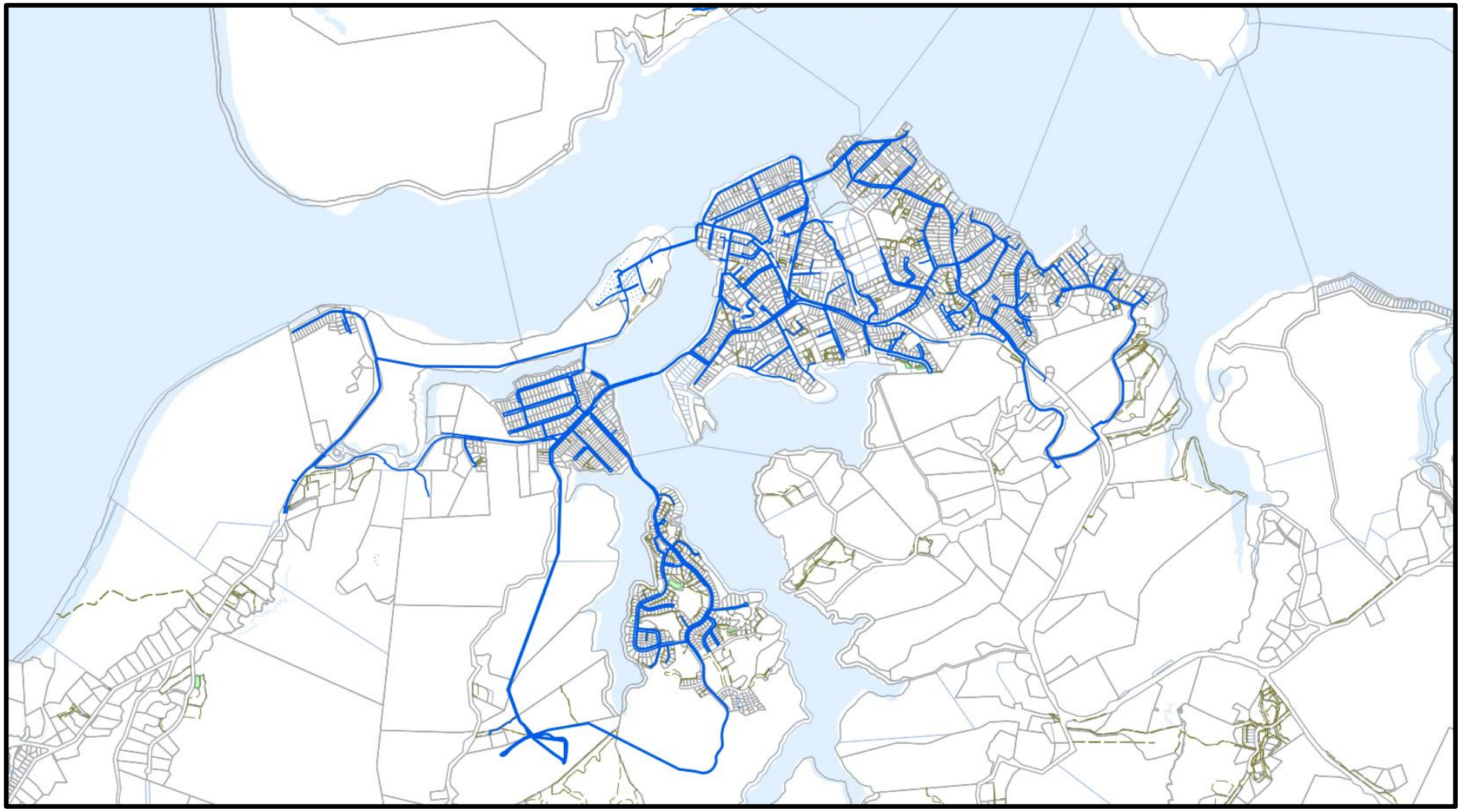

Figure 1: Raglan Water Supply Location.

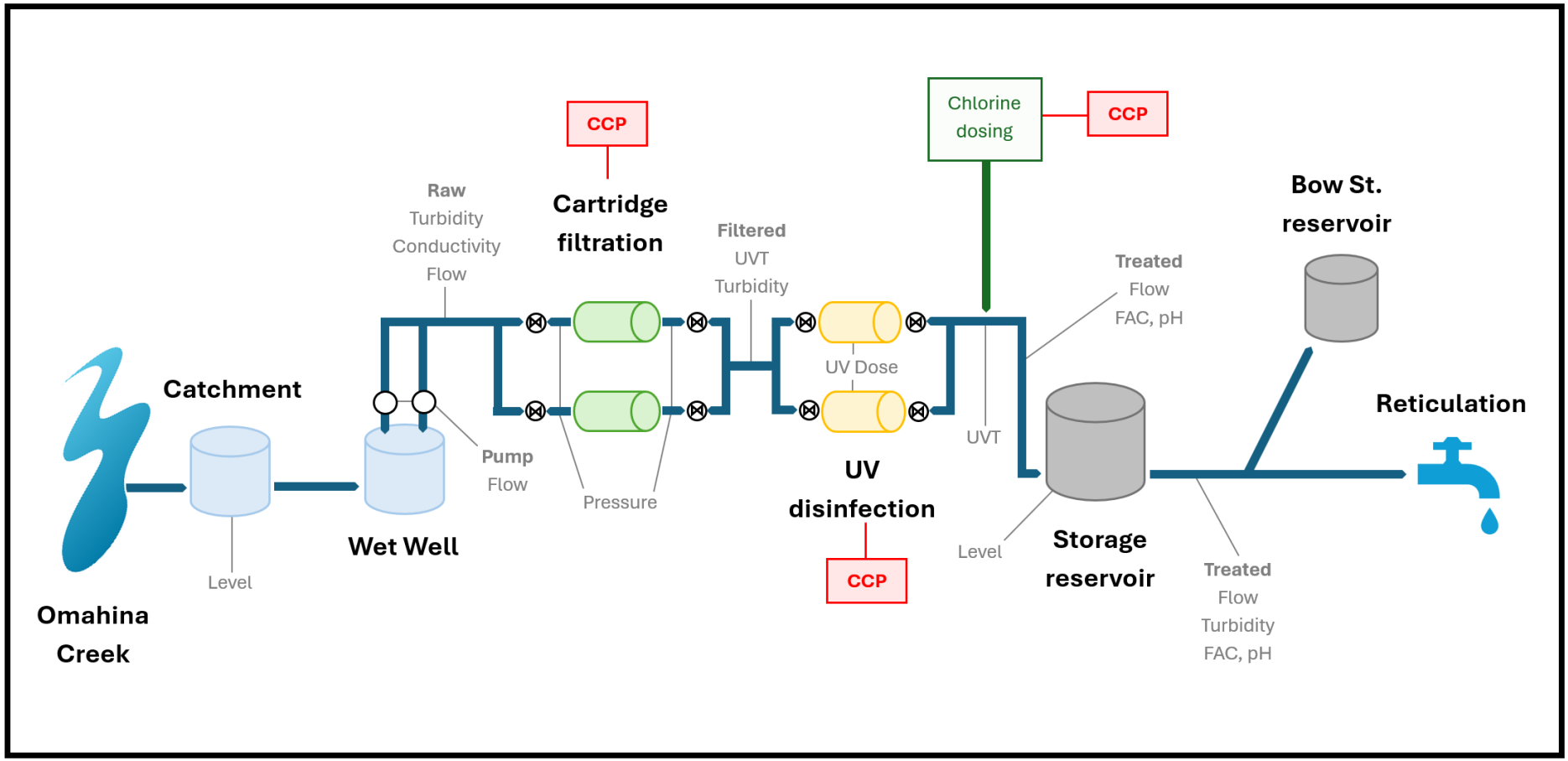

Figure 2: Raglan Water Supply Flow Diagram.

2. Risk Identification and Preventive Measures

A qualitative risk assessment of the Raglan water supply system is detailed in the *Water Supply Risk Table* (*Appendix 5*). The table identify potential public health risks across the entire supply system, with each hazardous event assessed based on its likelihood and consequence, and includes the following components:

- Catchment
- Intake
- Coagulation, Flocculation Sedimentation/PAC Dosing
- Filtration
- UV Disinfection
- Chlorination
- Clear Water Tank and Lift Pumps
- pH Correction
- Fluoridation
- Storage Reservoirs
- Reticulation
- Other

A multiple barrier approach is used to manage these risks. This approach ensures that if one barrier fails, others remain in place to maintain the safety and reliability of the supply. Key barriers include physical treatment processes, chemical dosing, operational monitoring, and system redundancies.

As part of this approach, Critical Control Points (CCPs) are established at key stages of the treatment process. These are process barriers and monitoring points designed to detect and respond to deviations that could compromise water safety. Each CCP has defined operational limits and is monitored at a frequency that ensures timely detection of any failures.

The location of CCPs are shown in the supply flow diagram and further details are included in *Critical Control Points (Appendix 6).*

Table 4: Barriers and Preventative Measures in place at the Raglan WTP.

Four Types of Barriers	Existing Preventive Measures Include:
Preventing hazards entering the raw water	• Isolated spring catchment, physical barriers around spring source.
Removing particles and hazardous chemicals from the water by physical treatment	• Cartridge filtration – CCP
Killing or inactivating pathogens in the water by disinfection	• UV disinfection – CCP • Chlorination with contact time – CCP
Maintaining the quality of the water in the distribution system	• Residual disinfection maintained. • Hygiene and construction codes of practice • Adequate network pressures maintained • Backflow prevention programme • Reservoirs protected from ingress • Online continuous SCADA monitoring and alarms

3. Compliance Monitoring and Reporting Requirements

The Raglan WTP is required to demonstrate compliance with the DWQAR Level 3. The reporting period is monthly, with compliance data submitted to Taumata Arowai within 10 working days following the end of each month. Determinands listed in Table 3 are reported via API transfers from Water Outlook to Taumata Arowai's compliance database, Hinekorako. The sampling plan is detailed in *Appendix 7*.

Population	Determinands	Compliance Limit	Associated Hazard	DWQAR Compliance Rule	Sampling Frequency
4,500	C.t	15 min.mg/L	Bacteria	4.10.1.1 - T3.2	Continuous
4,500	FACe	0.2 mg/L	Bacteria	4.10.1.1 - T3.3	Continuous
4,500	T_{10}	5 minutes	Bacteria	4.10.1.1 - T3.4	Continuous
4,500	Turbidity	1.0 NTU	Bacteria	4.10.1.1 - T3.5	Continuous
4,500	Turbidity	2.0 NTU	Bacteria	4.10.1.1 - T3.6	Continuous
4,500	UV Flow	265m^3/hr	Bacteria	4.10.1.4 – T3.15	Continuous
4,500	Reduction Equivalent Dose (RED)	40 mJ/cm^2	Bacteria	4.10.1.4 - T3.16, T3.17	Continuous
4,500	RED	95%	Bacteria	4.10.1.4 - T3.16, T3.17	Continuous
4,500	Turbidity	5.0 NTU	Bacteria	4.10.1.4 - T3.18	Continuous
4,500	UV Flow	265m^3/hr	Protozoa	4.10.2.13 - T3.85	Continuous
4,500	UV Dose	40 mJ/cm^2	Protozoa	4.10.2.13 - T3.86 4.10.2.13 - T3.87	Continuous
4,500	Turbidity	5 NTU	Protozoa	4.10.2.13 - T3.88	Continuous
4,500	Chemical Constituents (various)	DWQAR	Chemical	4.10.3 Tables 33 & 34	Various

APPENDIX 1: GENERAL WATER SAFETY PLAN (VERSION 1.0)

Addresses the ten fundamental components for the provision of safe and secure drinking water across all WDC-owned water supplies in alignment with the *New Zealand Drinking Water Safety Plan Framework.*
Available at: O:\Ops\Watercare Waikato\Water Safety Plans\1. DWSP General

APPENDIX 2: RAGLAN CATCHMENT RISK ASSESSMENT

Identifies potential sources of contamination within the water supply catchment and assess risks to drinking water quality. Supports proactive risk management and informs mitigation strategies.
Available at: O:\Ops\Watercare Waikato\Water Safety Plans\Catchment Risk Assessment

APPENDIX 3: UV VALIDATION CERTIFICATE

Confirms that the WEDECO Spektron 250e UV reactors at Raglan WTP are validated to UVDGM standards.
Available at: O:\Ops\Watercare Waikato\Water Safety Plans\1. DWSP Raglan

APPENDIX 4: RESERVOIR STORAGE MANAGEMENT PLAN

Details operational parameters and maintenance requirements for drinking water storage facilities, aligned with the *DWQAR D3.12*.
Available at: O:\Ops\Watercare Waikato\Water Safety Plans\1. DWSP Raglan

APPENDIX 5: WATER SUPPLY RISK TABLES

Summarises potential risks to drinking water quality for the Raglan supply, supporting control prioritisation and improvement planning. Available at: O:\Ops\Watercare Waikato\Water Safety Plans\1. DWSP Raglan

APPENDIX 6: CRITICAL CONTROL POINTS

Outlines key process barriers and monitoring points to manage drinking water quality risks with defined limits and response protocols to mitigate public health risks.
Available at: O:\Ops\Watercare Waikato\Water Safety Plans\1. DWSP Raglan

APPENDIX 7: DISTRIBUTION NETWORK SAMPLING PLAN

Outlines WDC's distribution network compliance monitoring schedule, reviewed annually per DWQAR D3.18 and D3.28. Available at: O:\Ops\Watercare Waikato\Water Safety Plans\1. DWSP Raglan

APPENDIX 8: OPERATOR MONITORING AND MAINTENANCE SCHEDULE

Outlines a defined set of performance criteria used to assess and verify the functionality of key components within the water supply system. The Operator Monitoring and Maintenance Schedule is included in the General Drinking Water Safety Plan.
Available at: O:\Ops\Watercare Waikato\Water Safety Plans\1. DWSP Raglan

APPENDIX 9: STANDARD OPERATING PROCEDURES (SOPS)

Step-by-step instructions for routine tasks, maintenance activities, and incident response, ensuring compliance with regulatory requirements and best practice standards.
Available at: O:\Ops\Watercare Waikato\1. CONTROL of WORKS\CONTROL OF WORKS\SOPs\Production\Water

APPENDIX 10: EXTERNAL STAKEHOLDER LIST

Available at: O:\Ops\Watercare Waikato\Water Safety Plans\1. DWSP Raglan