



**Drinking Water
Protection
Conference 2023**

From the source to the last flowing tap

GWE
CONSULTING ENGINEERS

**Streamlined Methodology for Source Water
Risk Management Plans:
*Enhancing Drinking Water Safety and Quality
in New Zealand***

Presented by
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water
NEW ZEALAND 
The New Zealand Water & Wastes Association Waiora Aotearoa

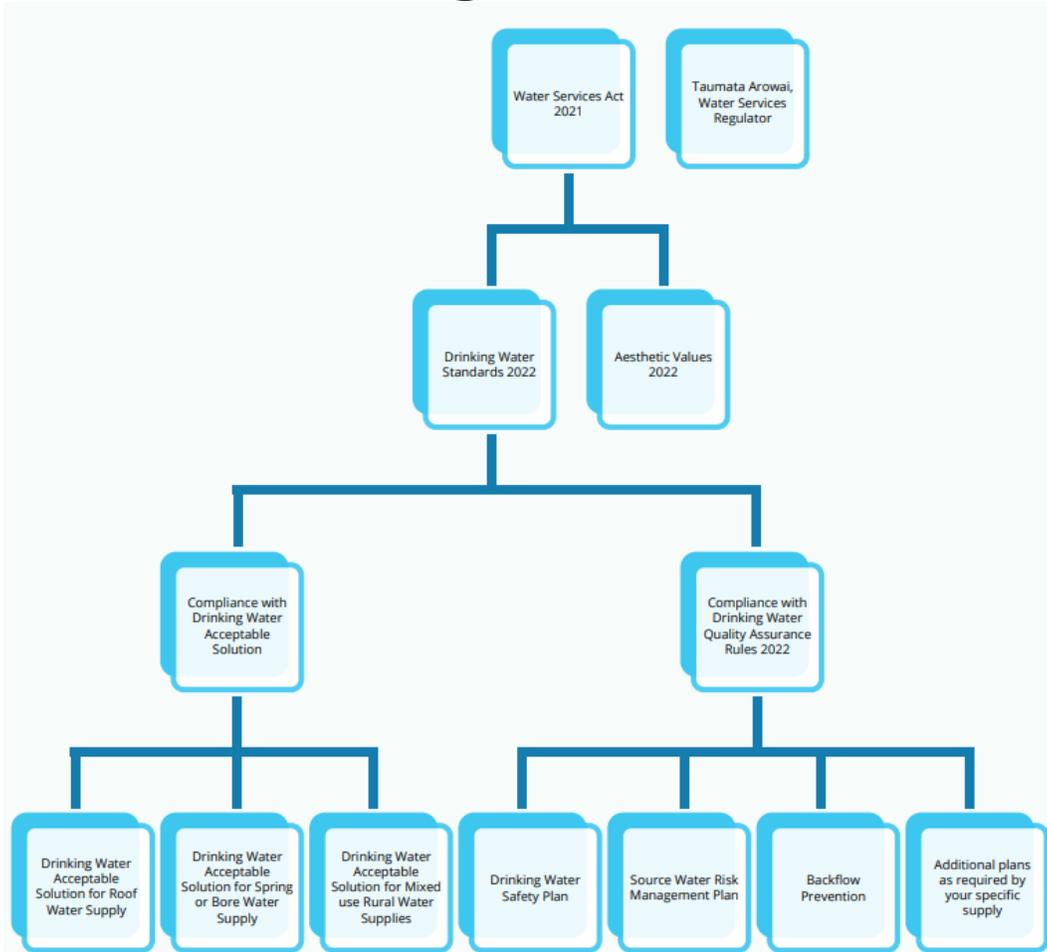
Context and Objectives

- Importance of source water protection for public health
- Context of water reforms
- NES-DW¹ and communication lines between Taumata Arowai, regional authorities and the Ministry for the Environment
- Challenges faced by suppliers in preparing Source Water Risk Management Plans
- Offer an easy-to-follow methodology for all suppliers, regardless of type, size, or compliance level
- Cover three types of sources: surface water, groundwater, and rainwater harvesting



1. Resource Management (National Environmental Standards for Sources of Human Drinking Water) Regulations 2007 (NES-DW).

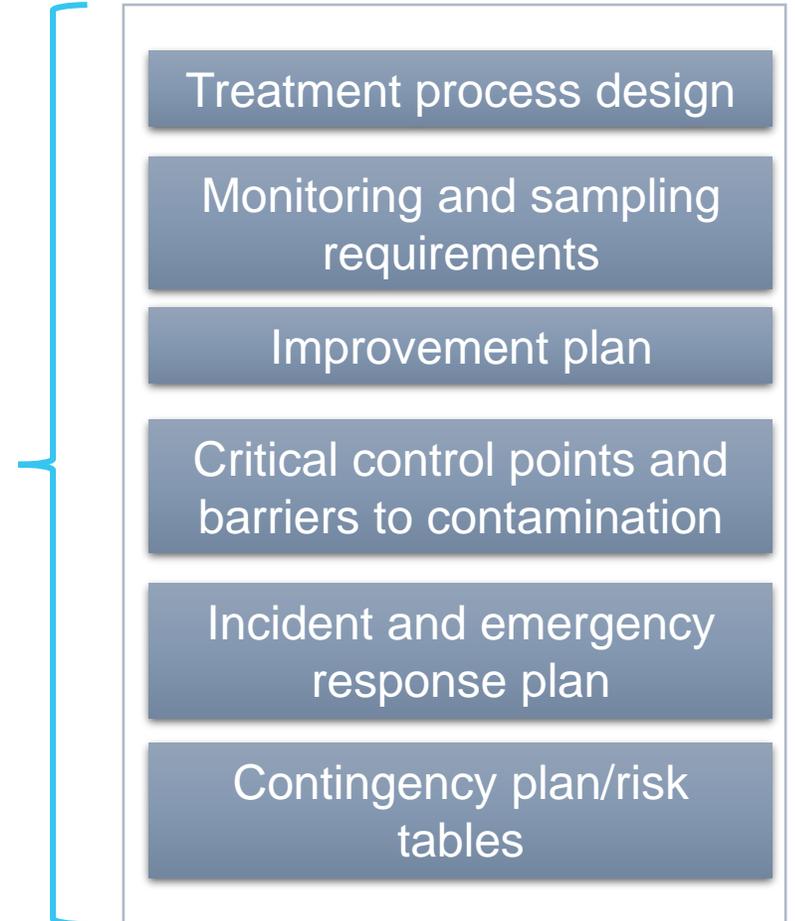
Water Safety Plans and Source Water Risk Management Plans



Source Water Risk Management Plan

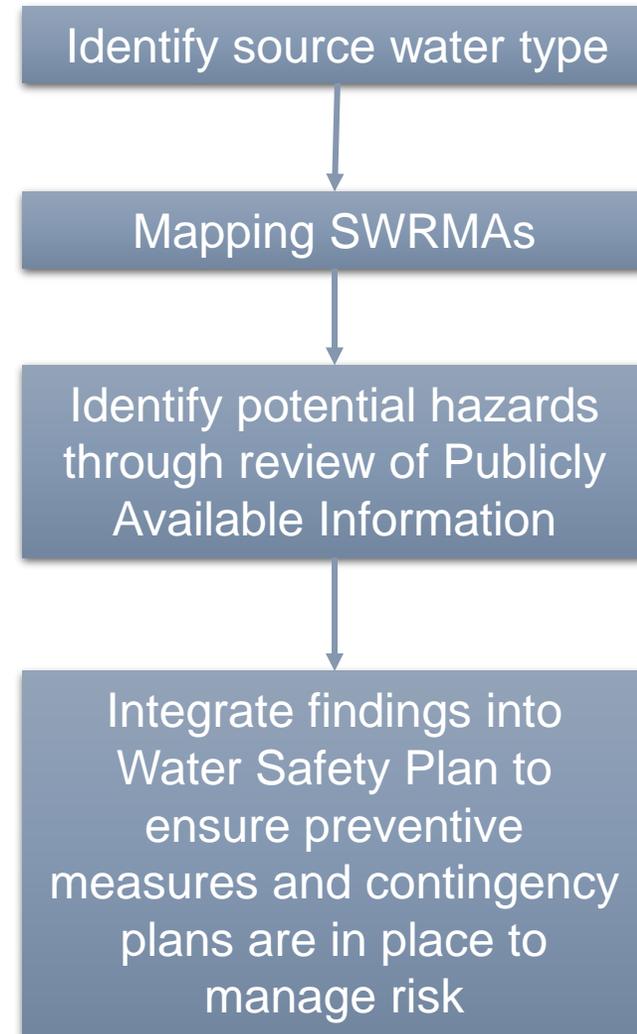


Water Safety Plan

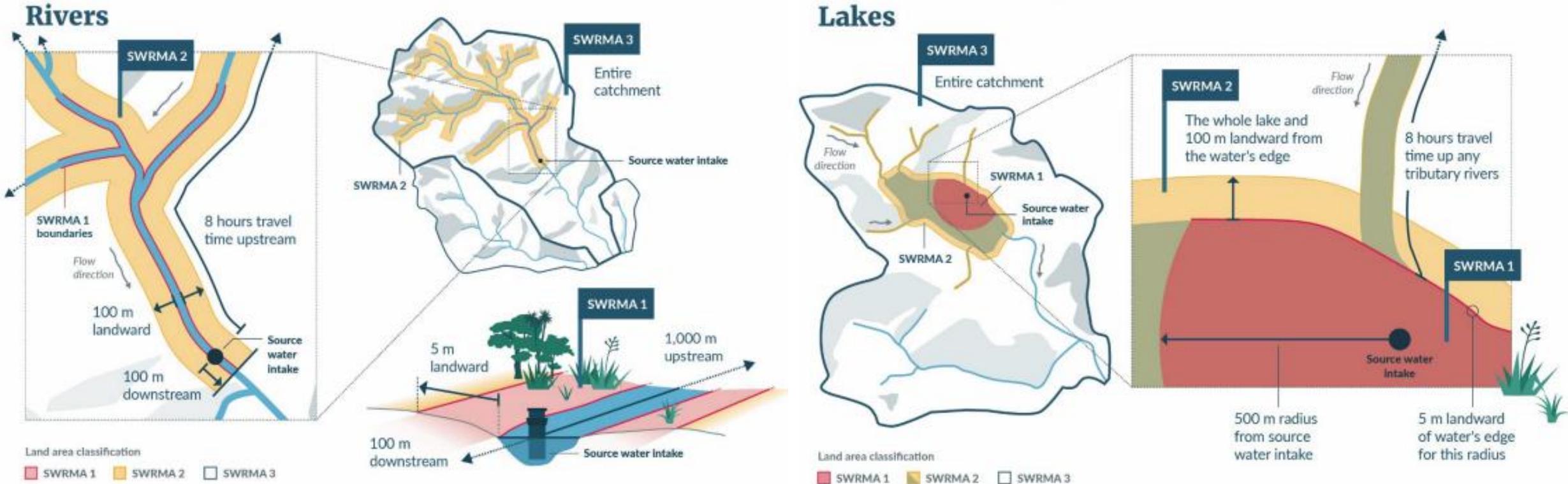


Method and Approach

- Mixed-methods approach: literature review, case studies, and stakeholder evaluation
- Mapping of Source Water Risk Management Areas (SWRMAs) based on the proposed changes to the NES-DW
- Review of publicly available information to inform source water hazards and risk
- Integration of Source Water Risk Management Plan into Water Safety Plan (risk assessments, contingency plans and incident and emergency response plans)



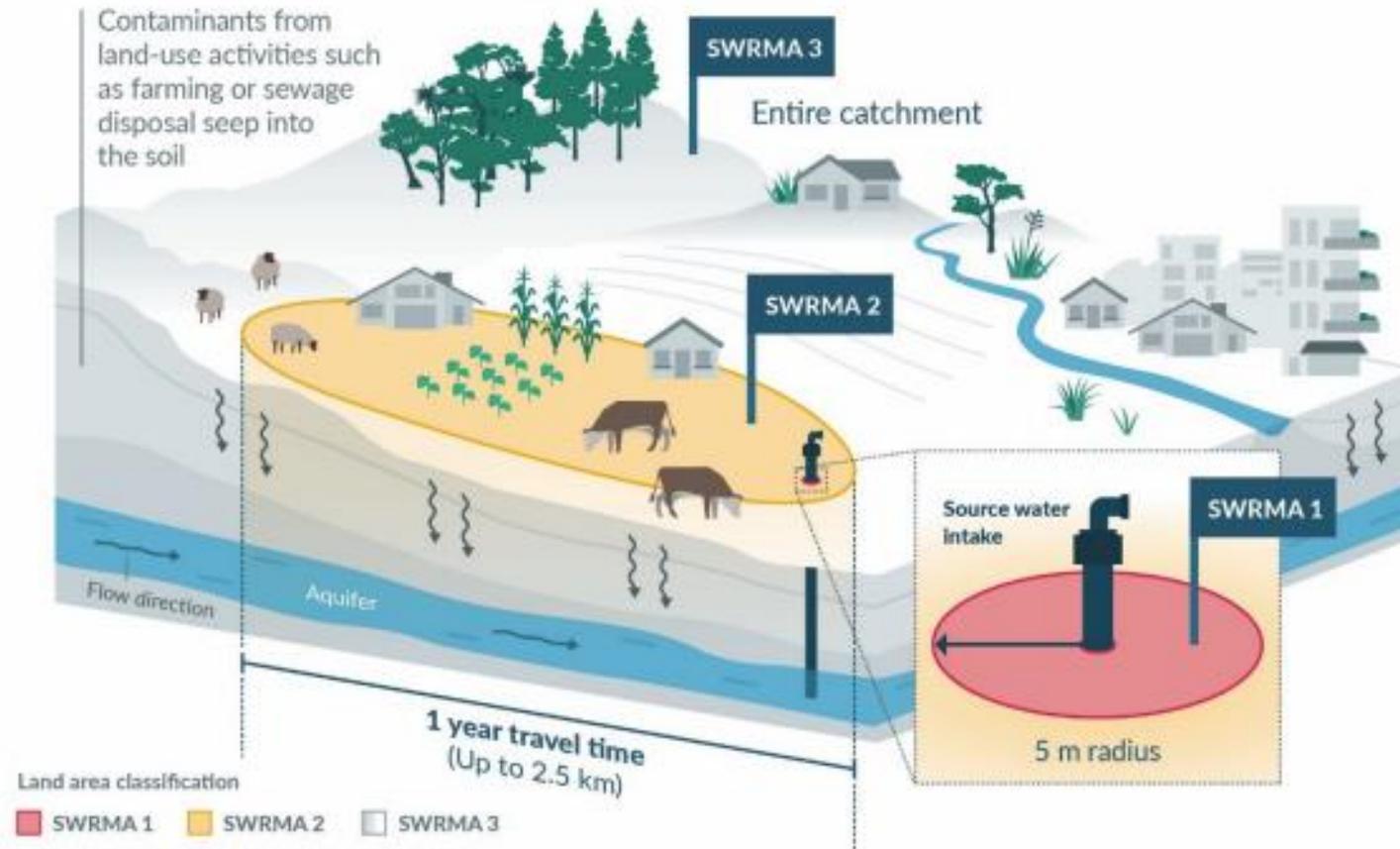
SWRMAs - Surface Water Sources



Source: Ministry for the Environment. 2022. *Kia kaha ake te tiakina o ngā puna wai-inu / Improving the protection of drinking-water sources: Proposed amendments to the Resource Management (National Environmental Standards for Sources of Human Drinking Water) Regulations 2007: Consultation document.* Wellington: Ministry for the Environment.

SWRMAs – Groundwater Sources

Aquifers



Source: Ministry for the Environment. 2022. *Kia kaha ake te tiakina o ngā puna wai-inu / Improving the protection of drinking-water sources: Proposed amendments to the Resource Management (National Environmental Standards for Sources of Human Drinking Water) Regulations 2007: Consultation document.* Wellington: Ministry for the Environment.

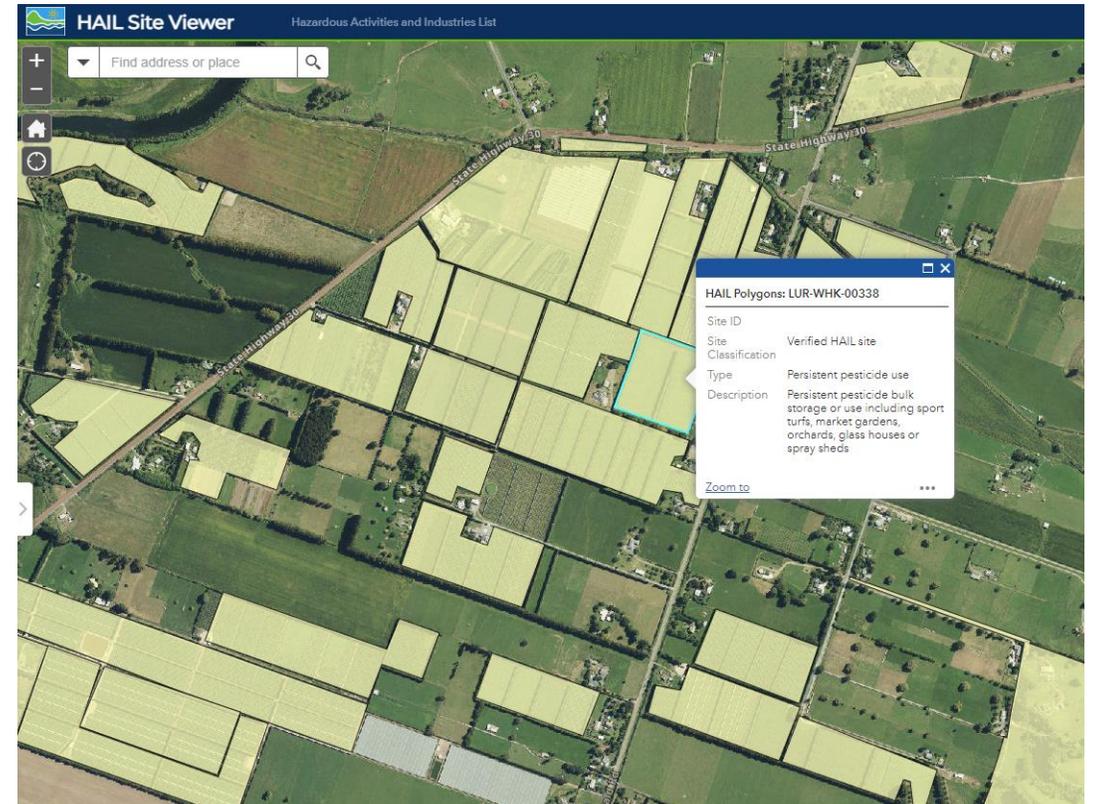


Publicly Available Resources

Identification of source water hazards using the following resources:

- Regional and district council provisions and rules relating to drinking water protection
- Land use
- Hazardous Activity and Industries List (HAIL) sites
- Consents
- Geology and hydrology
- Regional council state of environment monitoring data

Note: All regional and district councils generally have the same information readily available via online GIS maps or via official information requests.



Source: Bay of Plenty Regional Council Maps, accessed via: <https://maps.boprc.govt.nz/pages/map-gallery>



Current Consents

Summary

This map shows the location of current Bay of Plenty Regional Council (BOPRC) Consents.

- New
- Land Use
- Land Use - Beds
- Discharge
- Water Take
- Water Use
- Coastal

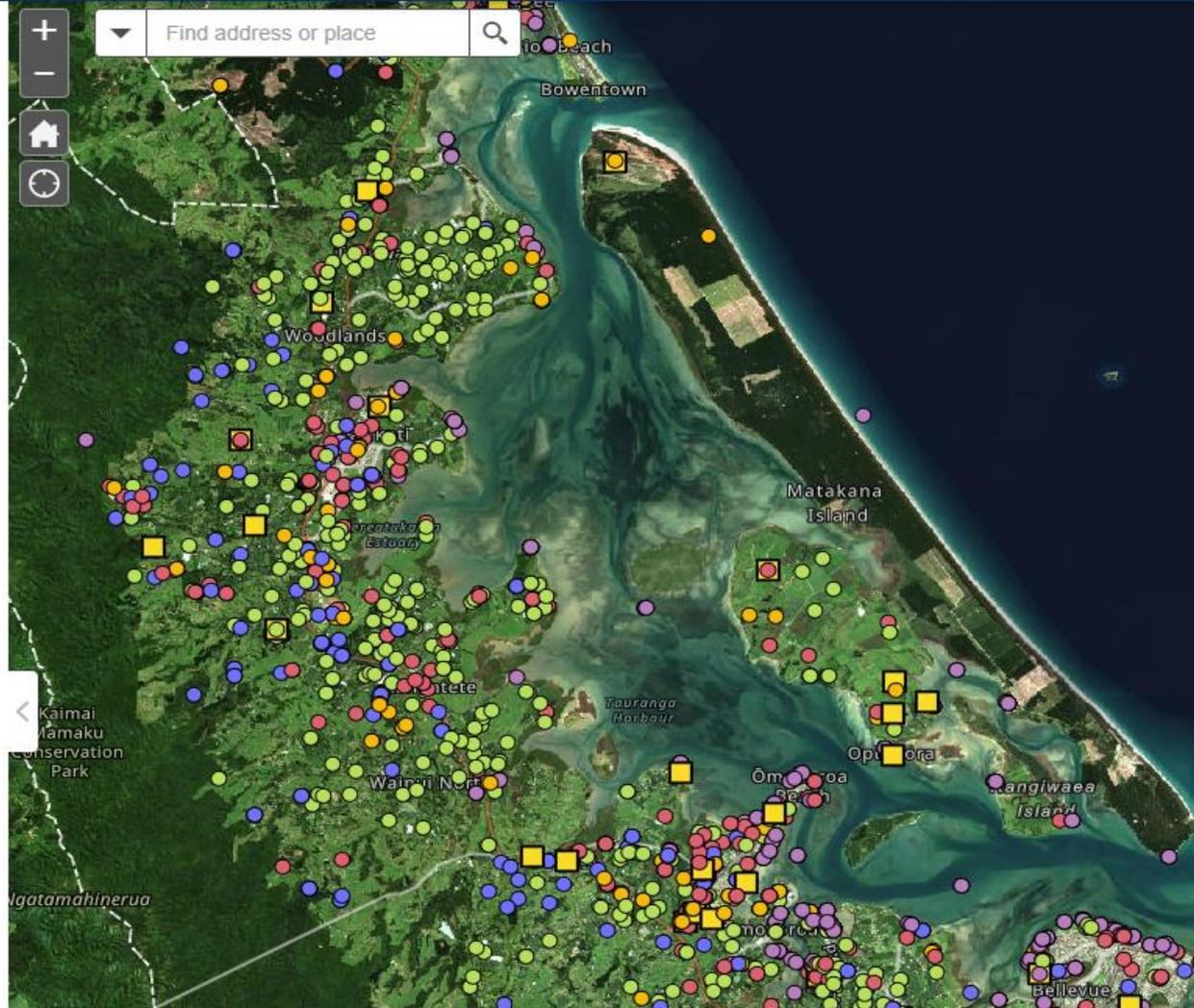
Subdivision and building consents are issued by District Councils and are not shown on this map.

The Resource Management Act 1991 (RMA) introduced a new system for managing the environment including a new system of consents which replaced the previous system of permits, licences and water rights.

The purpose of the RMA is to promote the sustainable management of natural and physical resources. Resource consents help to ensure that our natural and physical resources are allocated and used efficiently and sustainably.

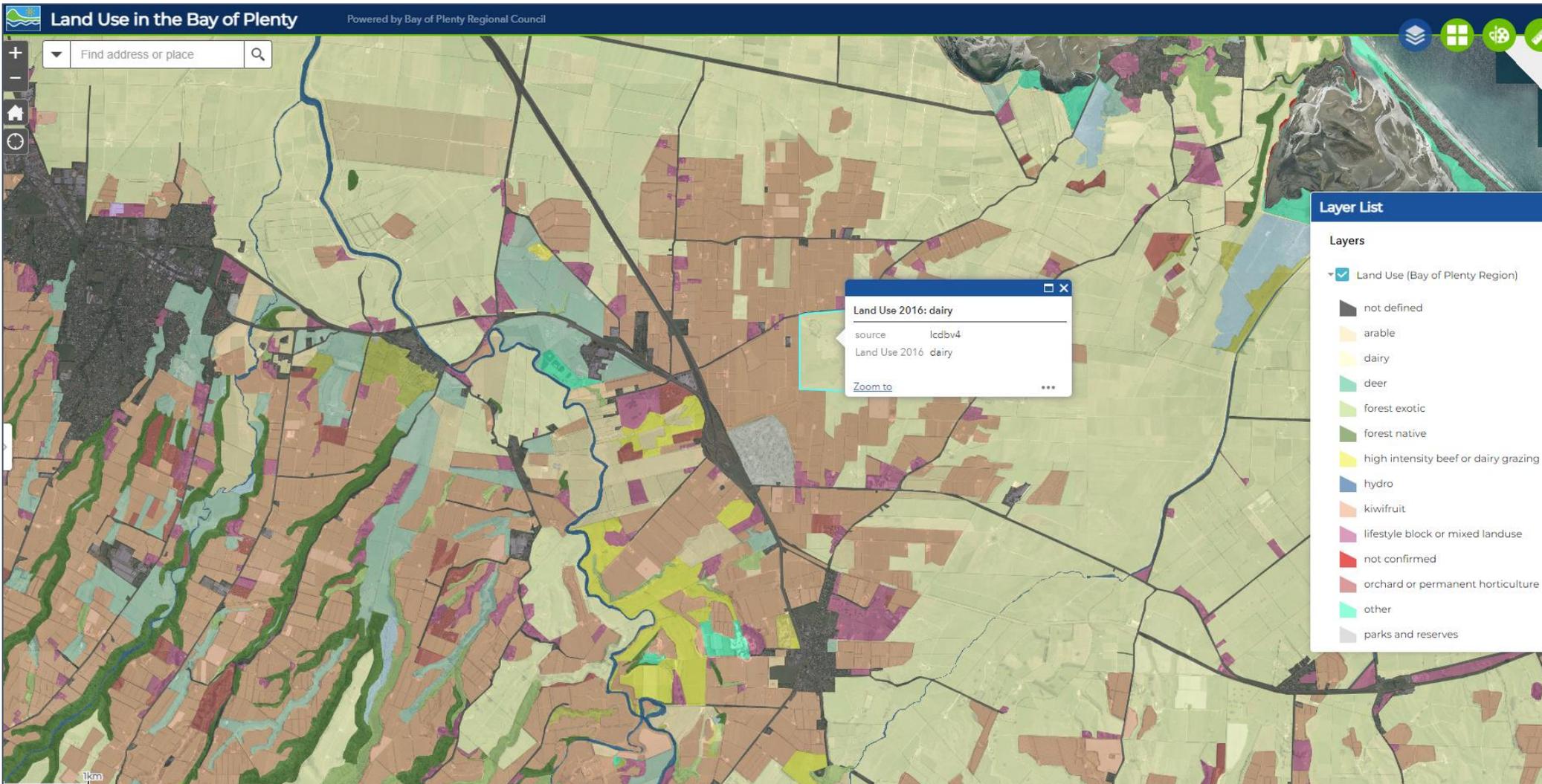
Use the search bar on the top left to search for a consent by typing in an address or a Consent ID.

For more information about what activities require a resource consent with BOPRC, please [visit our website](#).

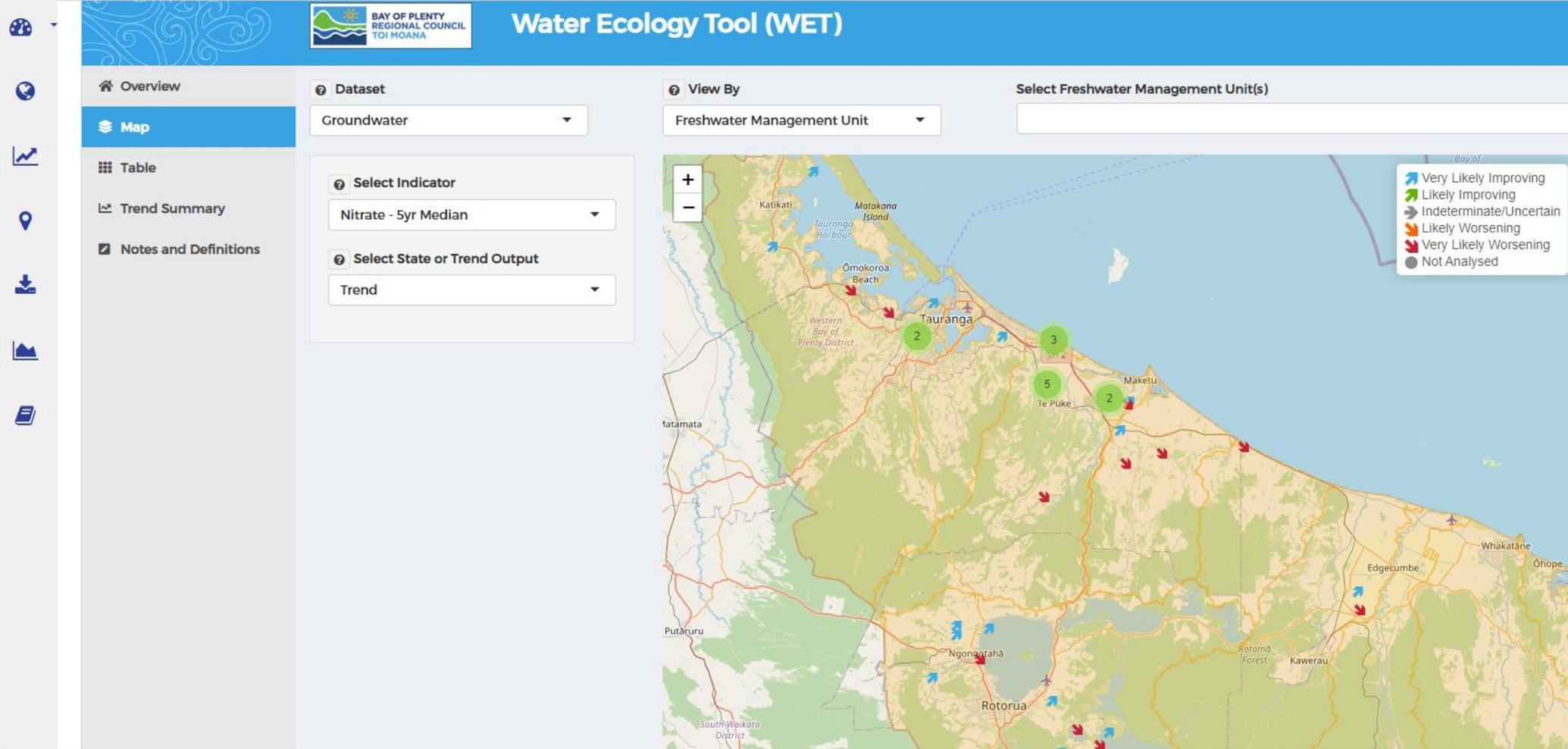


Source: Bay of Plenty Regional Council Maps, accessed via: <https://maps.boprc.govt.nz/pages/map-gallery>





Source: Bay of Plenty Regional Council Maps, accessed via: <https://maps.boprc.govt.nz/pages/map-gallery>



Source: Bay of Plenty Regional Council Environmental Data Portal, accessed via: <https://envdata.boprc.govt.nz/>

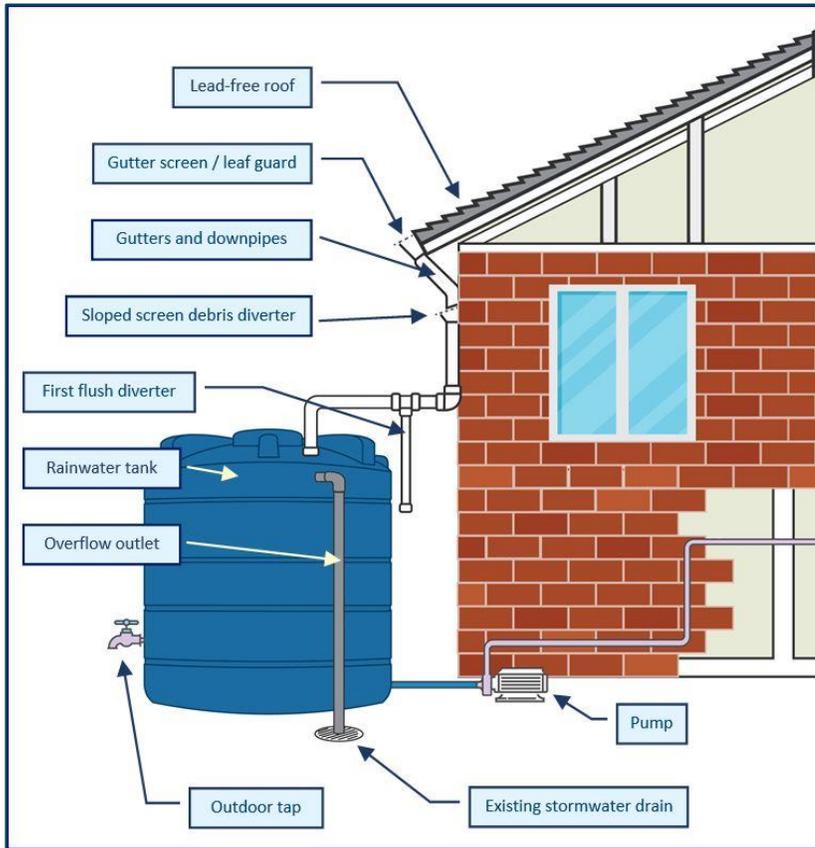
Other Key Information to Include in Source Water Risk Management Plan



- Sanitary bore head assessments (for groundwater sources)
- Source water quality data
- Te Mana o te Wai



Rainwater Harvesting Hazards and Risks



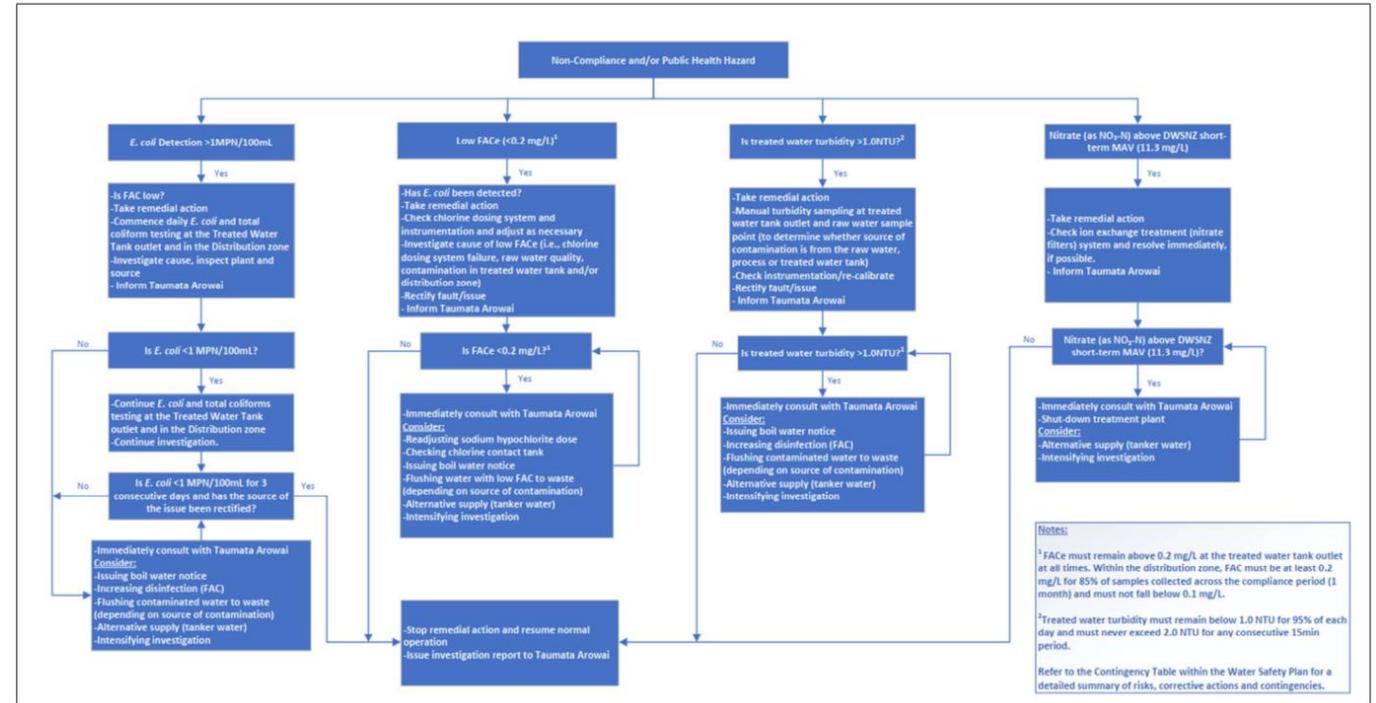
- No defined SWRMAs for rainwater harvesting
- Still potential hazards/risks that need to be considered such as:
 - On-site and nearby hazardous activities
 - Potential for suspended contaminants and deposition on roofs
 - Appropriate cleaning procedures
 - Composition of materials in contact with rainwater (i.e., roof, pipework, tanks)
 - First flush diverters
 - Insect/vermin proof tanks

Source: <https://www.aucklandcouncil.govt.nz/environment/looking-after-aucklands-water/rainwater-tanks/Pages/rainwater-tank-components-maintenance.aspx>

Risk Assessment and Contextualisation within Water Safety Plan

- Identification of potential hazardous events (within Source Water Risk Management Plan) and incorporation into the Water Safety Plan:

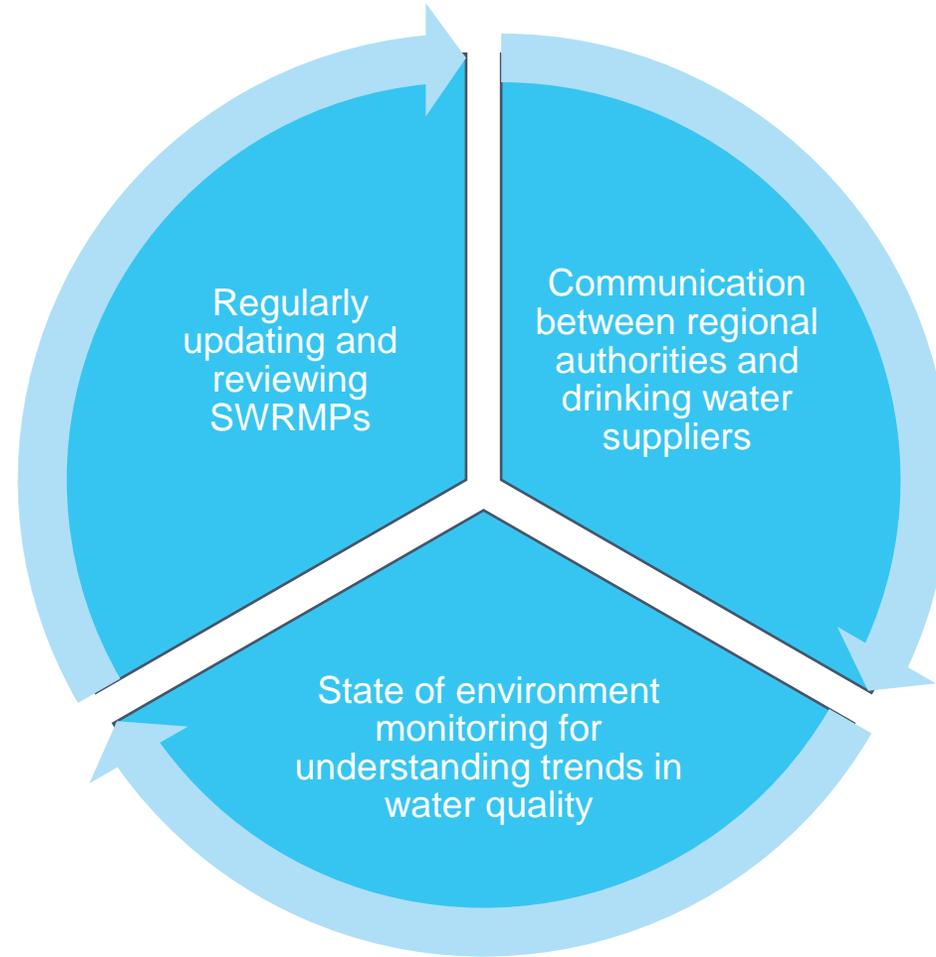
- Risk Assessments
- Contingency Plans
- Emergency and Incident Response Plans
- Transgression response flow charts



Water Safety Plan Risk Table Example

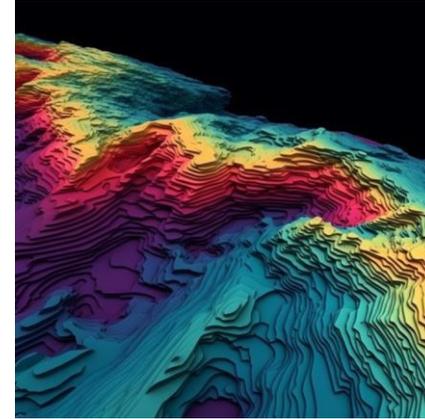
POTENTIAL HAZARDOUS EVENT	LIKELIHOOD	CONSEQUENCE	OVERALL RATING	WHAT TO CHECK AND SIGNS THAT ACTION IS NEEDED	PREVENTIVE MEASURES	CORRECTIVE ACTIONS	CONTINGENCY	COMMENTS/ IMPROVEMENTS
Groundwater Source (Bore) Example								
<p>Faecal contamination as a result of one or more of the following potential sources within the catchment:</p> <ul style="list-style-type: none"> Wastewater treatment systems (disposal to land) Unsanitary bore heads Poorly decommissioned bores Stock grazing 	Possible	Moderate	Moderate	<ul style="list-style-type: none"> Detections of <i>E. coli</i> in the raw water and/or treated water. Community illness. Public notification of illness within catchment area via Ministry of Health/Taumata Arowai and/or territorial authority. Changes in surrounding land use within the catchment. 	<ul style="list-style-type: none"> Bore draws water from a deep confined aquifer. Chlorination provides bacterial disinfection. Bore supply can be turned off and isolated from treated water storage. Water quality sampling. Territorial authority carefully manage land use and discharges within the catchment via a resource consenting process in accordance with the RMA to ensure source water protection. 	<ul style="list-style-type: none"> Investigate/stop source of contamination (if possible). Notify Taumata Arowai. Stop the bore pump if significant contamination is expected/drinking water becomes unsafe. Issue boil water notice if chlorine residual cannot be maintained/ provide a barrier to contamination or, source an alternative water supply (i.e. tankered water). If <i>E. coli</i> is consistently detected in the bore water, additional treatment may be required and a protozoa barrier added or an alternative water source investigated. Record incident and actions followed in response. 	<ul style="list-style-type: none"> Issue boil water notice if chlorine residual cannot be maintained/ provide a barrier to contamination or, source alternative water (i.e. tankered water). Note, where tankered water is used, ensure the service provider complies with the Water Carrier Service Rules outlined in the DWQAR. 	<ul style="list-style-type: none"> As part of the WSP annual review process, ensure the SWRMP is updated as required to include any new information i.e. State of Environment Monitoring trends, surrounding land use, HAIL sites, source water quality results.
Drought	Possible	Major	Major	<ul style="list-style-type: none"> Low water level or bore pump alarms. Low reservoir level. System pressure, potential for customer complaints regarding low pressure. Weather conditions. 	<ul style="list-style-type: none"> Regular monitoring of bore level. Start water conservation measures immediately. Plan for other water sources to provide additional water to the treated water tank (i.e. tankered water). Caution must be taken to ensure adequate residual FAC is present to provide disinfection in the distribution zone. 	<ul style="list-style-type: none"> Consider arranging alternative water supply (i.e., tankered water). Liaise with territorial authority. Record incident and actions followed in response. 	<ul style="list-style-type: none"> Consider activating a water restriction plan. 	-

Continuous Improvement and Monitoring



Considerations and Conclusions

- Aquifer modelling and real-time contamination event monitoring
- Integrating Source Water Risk Management Plans into Water Safety Plans
- Importance of Source Water Risk Assessment for all supplies, regardless of size
- Supporting water suppliers through training and resources
- Ensuring safe drinking water and public health in New Zealand communities



Questions? Patai?

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