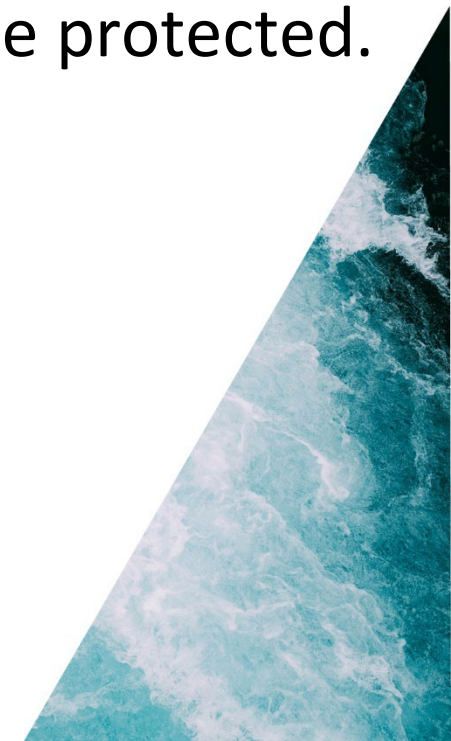
Rules and Standards post consultation – part 3

7 July 2022

Ko wai, ko au, ko tātou

Ko te wai ahau, ko ahau te wai.
He whakaaturanga tātau nō te wai.
Ko te ora te wai ko te ora o te tangata.
He taonga te wai me tiaki.
Ko wai tātou.
Ko wai tātou.

I am wai, wai is me.
We are reflections of our wai.
The health of te wai is the health of te tangata.
Wai is a taonga that must be protected.
Ko wai tātou.
We are wai. Wai is us.

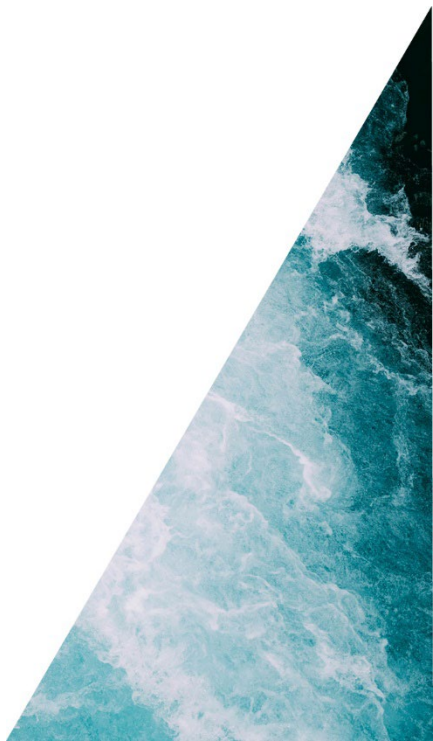


What we will cover today

- Key dates

- Drinking Water Quality Assurance Rules – Level 3
  - General (G) Rules
  - Source Water (S) Rules
  - Treatment (T) Rules
  - Distribution (D) Rules

- Pātai / questions



Key dates

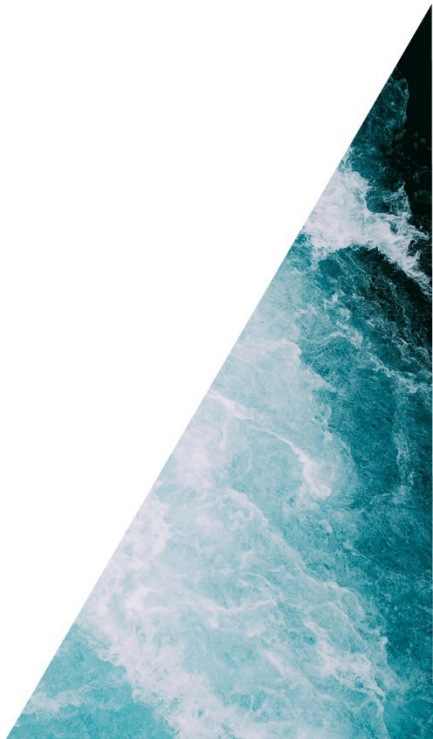
Timeframes

	Publicly available	Come into effect
Drinking Water Standards	9 June 2022	14 November 2022
Drinking Water Aesthetic Values	15 June 2022	14 November 2022
Drinking Water Quality Assurance Rules	25 July 2022 (anticipated date)	14 November 2022 (anticipate reporting in line with new rules from 1 January 2023)
Drinking Water Acceptable Solutions	August 2022 (anticipated timeframe)	Likely to be 14 November 2022
Drinking Water Network Environmental Performance Measures	30 June 2022	First reporting period begins on 1 July 2022

Drinking Water Quality Assurance Rules (the Rules)

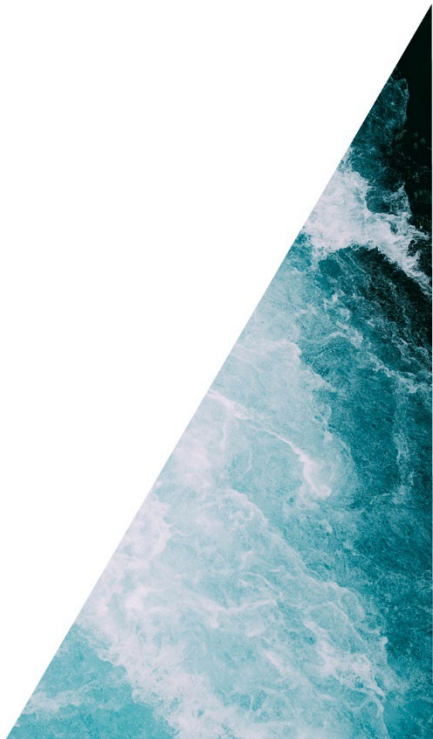
Categories of drinking water supply

- Very small community drinking water supplies (≤25 people)
- Networked Drinking Water Supplies
  - Small (26 – 100 people)
  - Medium (101 – 500 people)
  - Large (>500 people)
- Self-supplied Buildings
- Water Carrier Services
- Water Carrier Supplies
- Community Drinking Water Stations
- Planned Temporary Events



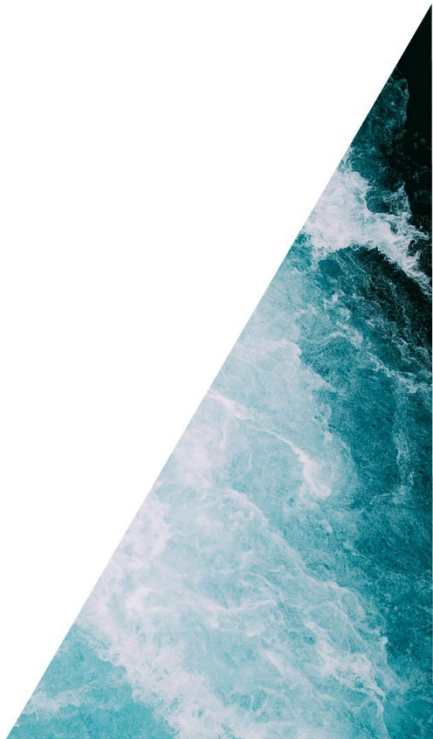
Rule modules

- **Rule Modules**
  - G = General
  - VSC = Very Small Communities
  - S = Source water (3 levels)
  - T = Treatment (3 levels)
  - D = Distribution (3 levels)
  - WC = Water Carrier Service
  - TDWS = Temporary Drinking Water Supply
  - VP = Varying Populations



Rule modules

G		
VSC		
S1	S2	S3
T1	T2	T3
D1	D2	D 3
WC		
TDWS		
VP		

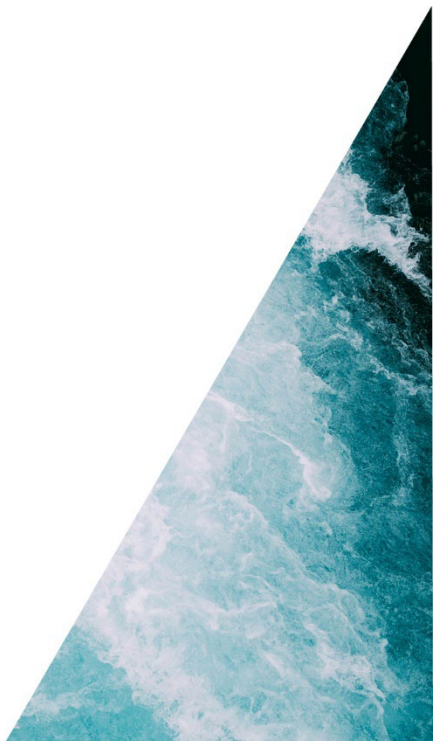


Application of the Rule modules

- Water suppliers must work out the base population for their supplies
- Rule modules match the different supply categories and suppliers must demonstrate compliance against the rules in those modules
    - E.g. Medium networked supply (101 – 500 people) G + S2 + T2 + D2
- A water supplier can elect to demonstrate compliance against a higher-level module
    - E.g. Medium networked supply (101 – 500 people) G + S2 + **T3** + D2
- Reporting requirements are set out in the General Rules and are based on the modules that water suppliers demonstrate compliance against
- Reporting periods – the interval that reporting covers
- Compliance periods – 1 Day, 1 Month, 1 Year
- Monitoring rules
- Assurance rules

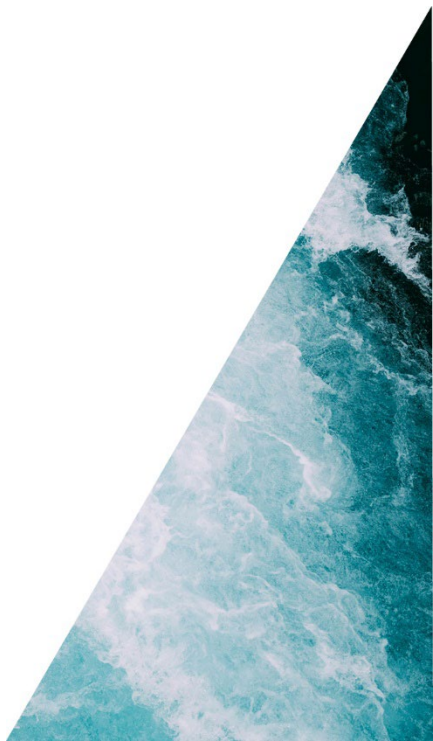
Supply Categories and Rule Modules

Categories of Drinking Water Supplies	Rule modules that compliance is demonstrated against
1. Very Small Communities (Up to 25 people, but up to 50 people for up to 60 days)	VSC
2. Networked Supplies	
Small (26 – 100 people)	G + S1 + T1 + D1
Medium (101 – 500 people)	G + S2 + T2 + D2
Large (>500 people)	G + S3 + T3 + D3
3. Self-supplied Buildings	
Small (26 – 100 people)	G + S1 + T1
Medium (101 – 500 people)	G + S2 + T2
Large (>500 people)	G + S3 + T3



Supply Categories and Rule Modules

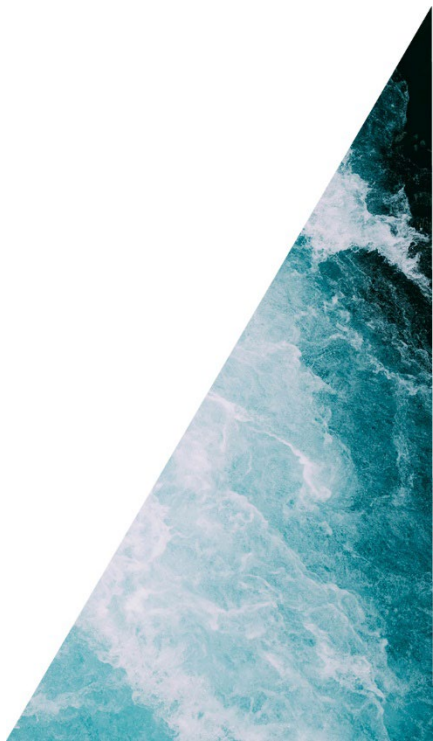
4. Water Carrier Services	
Any population size	G + WC
5. Water Carrier Supplies	
Any population size	G + S1 + T1
6. Community Drinking Water Stations	
Any population size	G + S1 + T1
7. Supplies with Varying Population	
Small and Medium Supplies (Networked Supplies or Self-supplied Buildings) for periods when the population exceeds 100 people but is less than 500 and for periods when population exceeds 500 people	required modules + VP
8. Temporary Drinking Water Supplies	
Any population size	G + TDWS



General (G) Rules

General (G) Rules

- Must report compliance for key parameters to Taumata Arowai
  - Level 3 Rules every month:
    - Bacterial compliance – (FAC, UV dose, Ozone residual)
    - Protozoa compliance – (Turbidity, Ozone C.t, UV dose)
    - Distribution zone – (FAC, *E. coli*, total coliforms).
- All other Monitoring Rules annually
- All Assurance Rules annually



General (G) Rules

- Laboratory samples must have identifiers, must use IANZ laboratories
- Micro samples to laboratory in 24 hours, not colder than zero degrees, not warmer than when collected
- Calibration of all instruments must be according to manufacturers' requirements
- Must prepare a hygiene code of practice for people working on water systems
- Continuous analysers used to demonstrate compliance with treatment rules (T1, T2, T3), separation of data records 1 minute
- For source water or in a distribution zone separation of data records 30 minutes
- Where continuous monitoring equipment fails – grab samples every 30 minutes

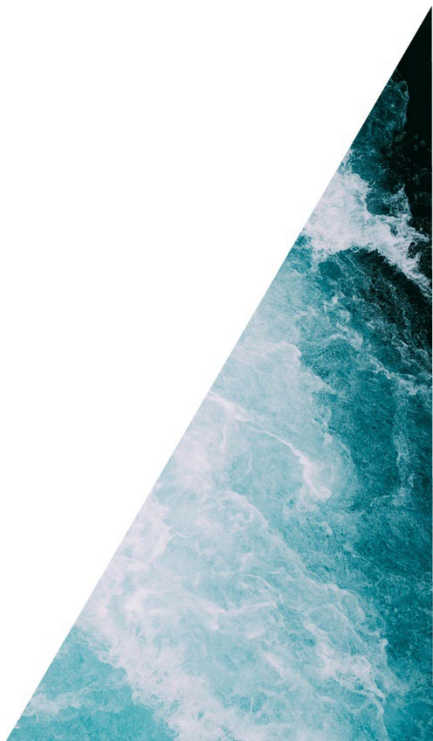
Level 3 Source Water (S) Rules

Protozoa log credit treatment requirements

- **Class 1.** 0-log. Groundwater >30m, sanitary borehead, *E.coli*, total coliforms not detected over 3 years (monthly samples)
- **Interim Class 1.** *E. coli*, total coliforms daily for 36 days, weekly for 52 weeks
- **Class 2.** 3-log. Groundwater between 30m and 10m
- **Class 3.** 4-log. Groundwater <10m, spring and surface waters
- **Class 4.** 3-log. Where Source Water Risk Management Plan (SWRMP) assesses protozoa risk as low

Sanitary bore head requirements

- Above ground
- Not in an area of ponding
- Casing sealed
- Concrete apron
- Apertures sealed
- Air vents etc screened and 0.5m above ground
- Reasonable security measures
- Fenced to five metres if farm animals present
- Backflow
- Monthly inspections



Source water monitoring rules

- Must determine class of source water
- Class 1 must document that it meets sanitary bore-head requirements
- Monitoring (minimum requirements)
- Extreme weather event monitoring
- Additional monitoring as per Source Water Risk Management Plan (SWRMP)
- Categorised as low, medium or high for cyanobacterial risk
- Medium and high risk must prepare a cyanobacteria/cyanotoxin risk management plan
- Must consider cyanobacteria/cyanotoxin monitoring if aware of presence of cyanobacteria in source water

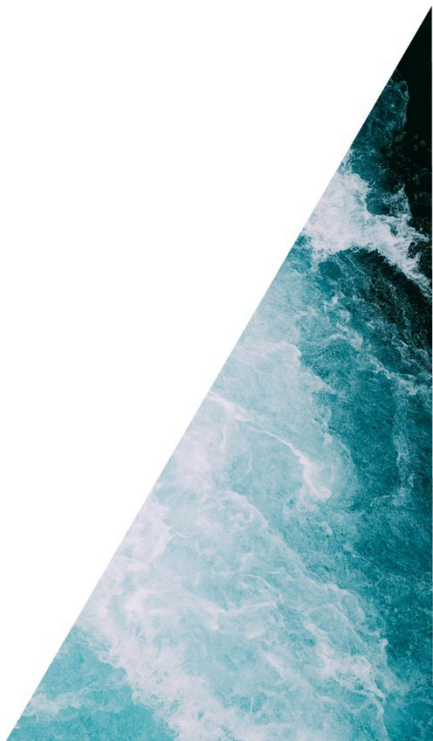
Source water monitoring rules

S3 Source Water Monitoring Determinands

Contaminant Group	Determinands monitored at each abstraction point	Sampling Frequency
Bacterial	*E. coli* and total coliforms	Weekly
Physico-chemical	Iron, manganese, colour, nitrate	Monthly
	Alkalinity, antimony, arsenic, barium, cadmium, calcium, chloride, chromium, copper, lead, magnesium, mercury, nickel, sodium, sulphate	Annually

S3 Class 1, Class 2 and Class 3 Groundwater Source Monitoring Determinands

Contaminant Group	Determinands monitored at each source	Sampling Frequency
Radiological	Gross alpha activity Gross beta activity	Every 10 years
Chemical	Potassium	Every 10 years



Source water monitoring rules

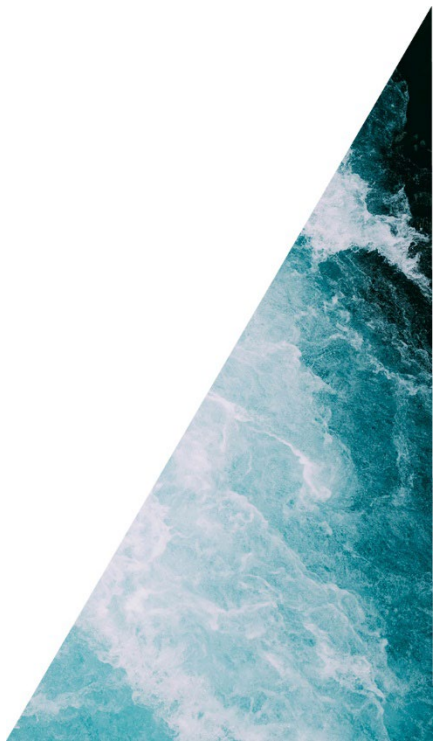
S3 Raw Water Monitoring Parameters

Parameters monitored in raw water from each source or combined sources		Sampling Frequency
Class 1 and Interim Class 1		
Physico-chemical	Conductivity, pH, Turbidity	Monthly for 12 months Every 6 months if there is no significant variation in the initial 12 months of samples
Classes 2, 3 and 4		
Physico-chemical	Conductivity, pH, Turbidity	Continuous

Level 3 Treatment Rules

T3 Bacteria rules

- Options are:
  - Disinfection with Chlorine
  - Disinfection with Chlorine Dioxide
  - Disinfection with Ozone
  - Disinfection with UV light

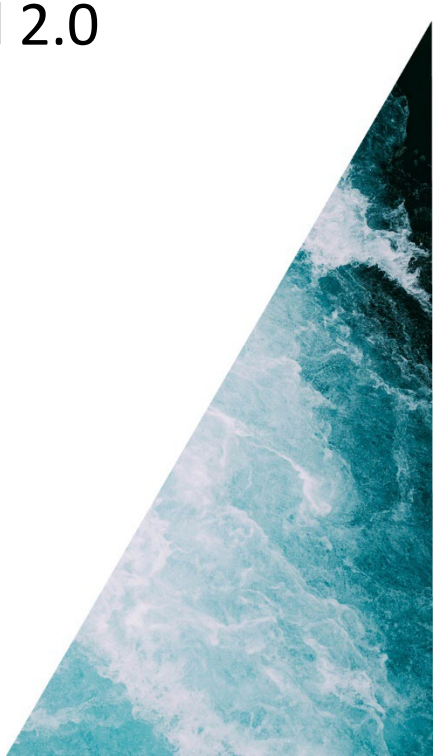


T3 Bacterial disinfection with chlorine

- Rules are:
  - Chlorine C.t value of 15min/mg/L
  - FACE of no less than 0.2mg/L
  - T_{10} contact time of at least 5 minutes
  - Turbidity must be less than 1 NTU for 95% of each day and not exceed 2.0 NTU for more than 15 minutes.

- Continuous Monitoring for: FAC, pH, Turbidity, Flow

- Continuously Monitored Values: FACE, T_{10} contact time, C.t

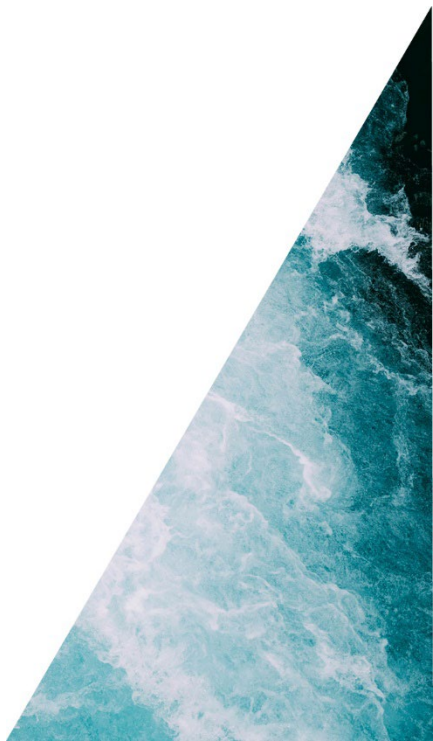


T3 Bacterial disinfection with chlorine dioxide

- Rules are:
  - C.t value of 15min/mg/L
  - T_{10} contact time of at least 5 minutes
  - Turbidity must be less than 1 NTU for 95% of each day and not exceed 2.0 NTU for more than 15 minutes.

- Continuous Monitoring for: Chlorine dioxide, pH, Turbidity, Flow

- Continuously Monitored Values: Total disinfectant, T_{10} contact time, C.t

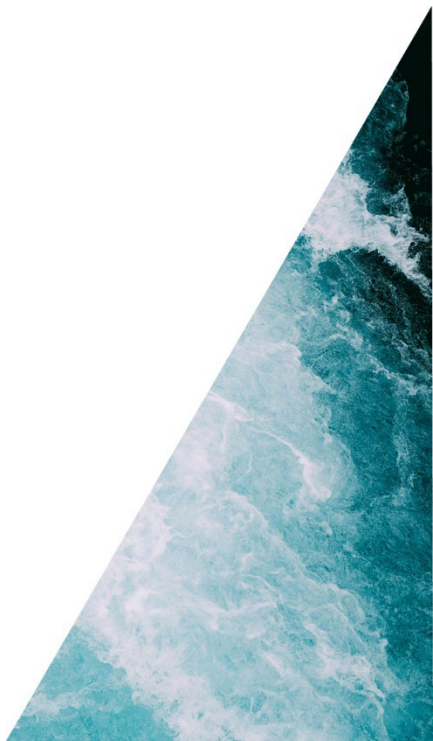


T3 Bacterial disinfection with ozone

- Rules are:
  - C.t value of 1.2min/mg/L for more than 95% of each day
  - Turbidity must not exceed 5 NTU the duration of any consecutive 15-minute period.

- Continuous Monitoring for: Ozone residual, Turbidity, Flow

- Continuously Monitored Values: T_{10} contact time, C.t

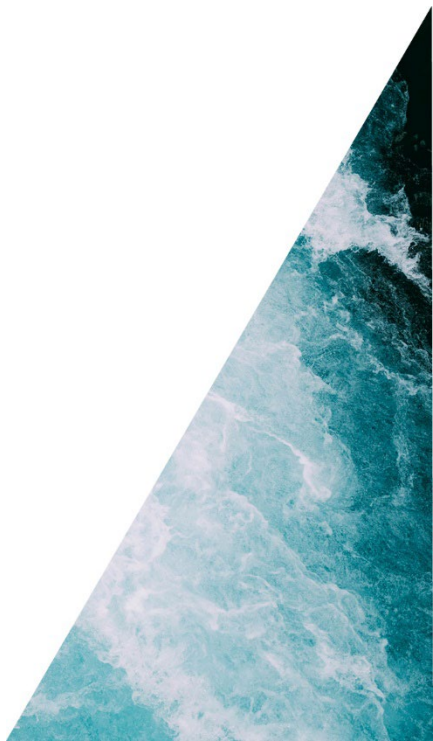


T3 Bacterial disinfection with ultra violet light

- Rules are:
  - RED dose of 40mJ/cm2 for not less than 95% of each day or any consecutive 15-minute period
  - Turbidity must not exceed 5 NTU the duration of any consecutive 15-minute period
  - UV reactors must be certified to USEPA, DVGW, ÖNORM, NSF/ANSI
  - Monitoring for UVT, UVI, flow depends on certification.

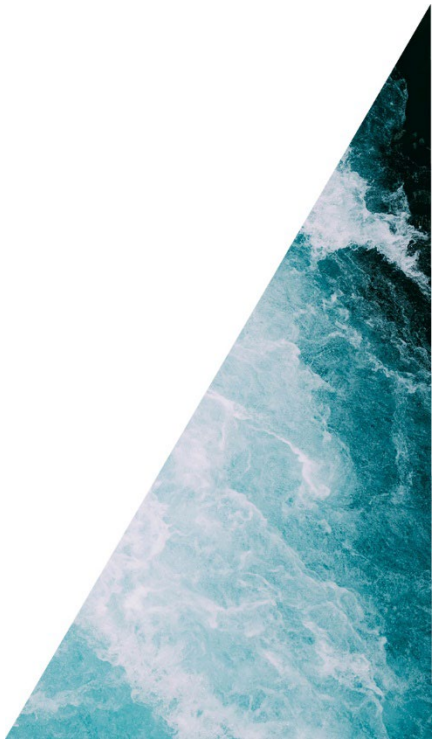
- Continuous Monitoring for: UVT, Turbidity, UVI or Dose, Flow

- UVI sensor checking



T3 Protozoa rules

- Options are:
  - Coagulation, flocculation and sedimentation without filtration [0.5]
  - Coagulation, flocculation and direct filtration [2.5-log to 3.5-log]
  - Coagulation, flocculation, sedimentation and filtration [3-log to 4-log]
  - Second stage filtration [0.5-log]
  - Slow sand filtration [2.5-log]
  - Membrane filtration [up to 4 log]
  - Cartridge filtration [2.0-log]
  - Ozone [0.25-log to 3.0-log]
  - Ultra violet light [up to 4-log].



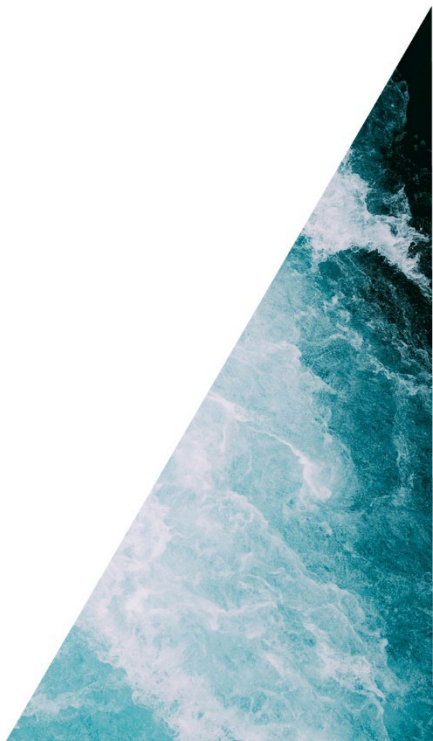
T3 Conventional treatment protozoa rules

- Rules are:
  - Coagulation, flocculation and direct filtration [2.5-log to 3.5-log]
  - Coagulation, flocculation, sedimentation and filtration [3-log to 4-log]
  - Log removal is determined by turbidity of water leaving the filters
  - Turbidity must be continuously monitored on water leaving each filter
  - Recycle of waste streams (excludes filter to waste on filter restart) not to exceed 10% of plant inflow. Turbidity monitoring required to demonstrate solids/liquid separation.
  - Recycling of waste streams in excess of 10% must be treated to kill or inactivate protozoa.

T3 Second Stage Filtration Protozoa rules

- Rules are:
  - Turbidity must not exceed 0.1 NTU for more than 5% or 0.3 NTU for the duration of any consecutive 15 minute period.

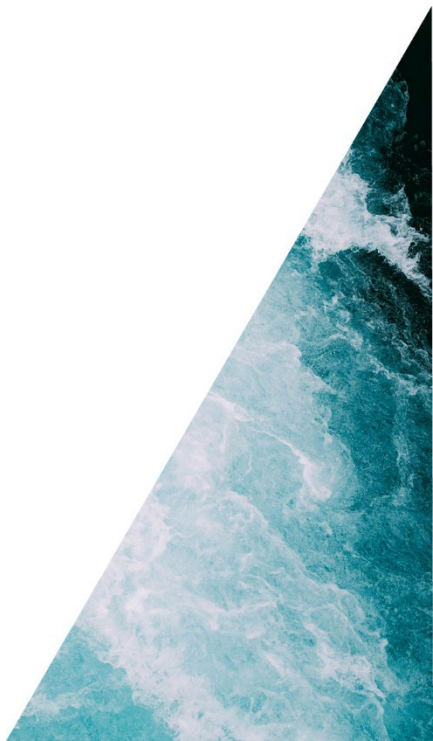
- Monitoring for: Turbidity



T3 Slow Sand Filtration Protozoa rules

- Rules are:
  - Filter must not dry out
  - Disinfection chemicals not to be used upstream of filter
  - When brought back into operation must be filter to waste until filter has be demonstrated to be effective
  - Surface loading rate or less than 0.35$m^3/m^2/h$
  - Water temperature must not drop below 6^oC
  - Turbidity must not exceed 0.5 NTU for more than 5% of each day.

- Continuous Monitoring for: Temperature, turbidity, flow
- Continuously Monitored Values: loading rate
- Recycling waste stream rules

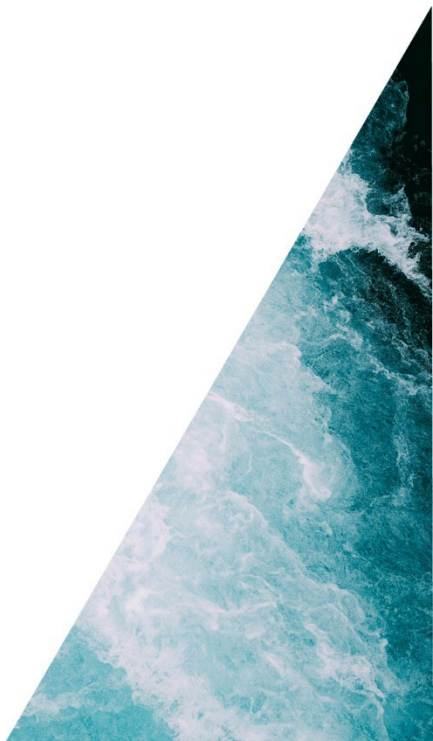


T3 Cartridge Filtration Protozoa rules

- Rules are:
  - No rapid pressure fluctuation
  - Turbidity must not exceed 1.0 NTU for more than 5% of each day or duration of any consecutive 15 minute period
  - Differential pressure monitoring

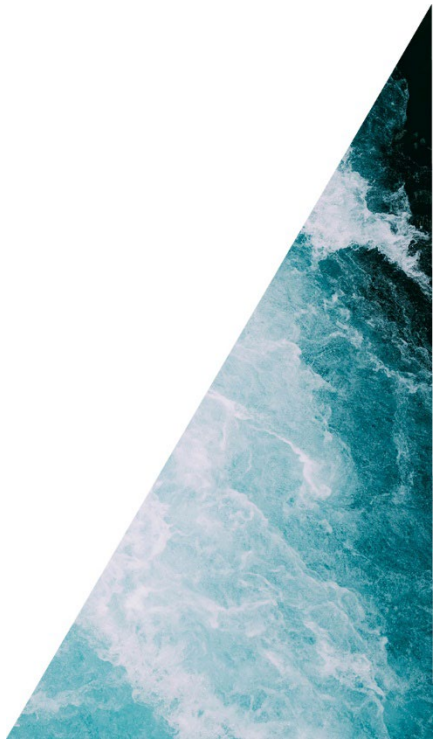
- Continuous monitoring for: Turbidity, differential pressure, flow

- Cartridges must be certified



T3 Membrane filtration protozoa rules

- Rules are:
  - Direct integrity testing at least daily
  - Turbidity must not exceed 0.1 NTU for more than any consecutive 15-minute period or 1 NTU at any time
  - Direct integrity test required if a membrane unit has been out of service for more than 6 hours.
- Continuous monitoring for: Turbidity
- Membranes must be certified
- Recycle of waste streams same as conventional treatment

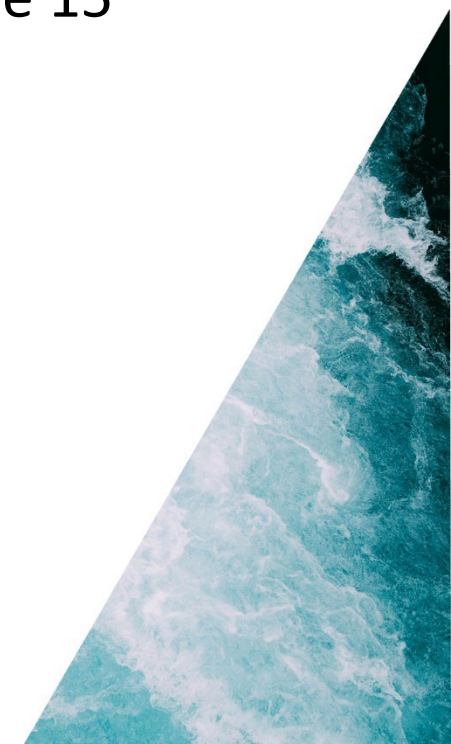


T3 Ozone protozoa rules

- Rules are:
  - C.t and water temperature must be achieved for more than 95% of each day
  - C.t and water temperature must not be less than 80% of values required for log credit for duration of any consecutive 15 minute period.
  - Turbidity must not exceed 5.0 NTU for the duration of any consecutive 15 minute period.

- Continuous monitoring for: Ozone residual, temperature, turbidity, flow

- Continuously monitored values: T_{10} contact time, C.t

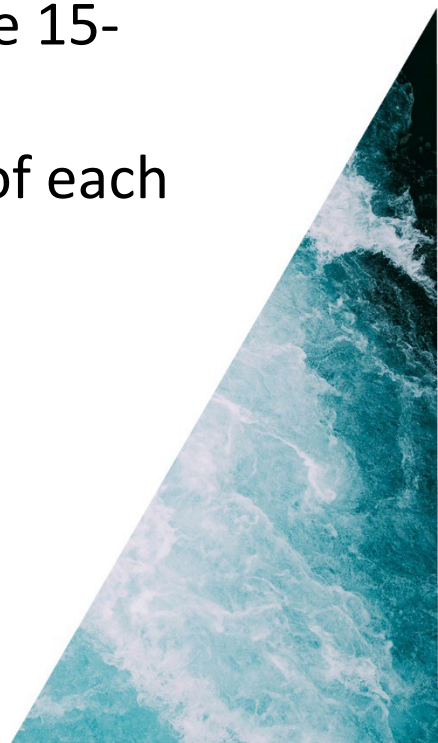


T3 Ultra violet light protozoa rules

- Rules are:
  - UV dose must meet or exceed that required for claimed log credit 95% of each day
  - UV dose must not be less than that required for claimed log credit for the duration of any consecutive 15-minute period
  - Turbidity must not exceed 5.0 NTU for the duration of any consecutive 15-minute period
  - UVT must meet or exceed 95% of for which reactor certified for 95% of each day
  - UV reactors must be certified to USEPA, DVGW, ÖNORM, NSF/ANSI.

- Continuous monitoring for: UVT, turbidity, UVI or dose

- UVI sensor checking



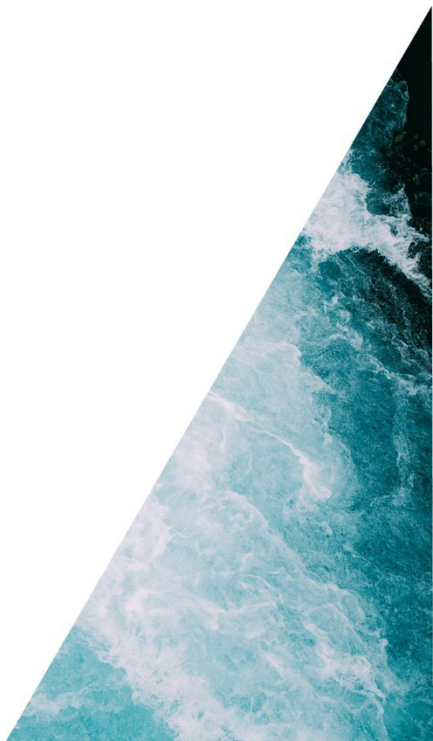
T3 Chemical rules

Must determine values for determinands that:

- Exceed 50% of MAV in source water
- Are added in the treatment process (including impurities)
- Are formed in the treatment process
- 15 samples over 12 months

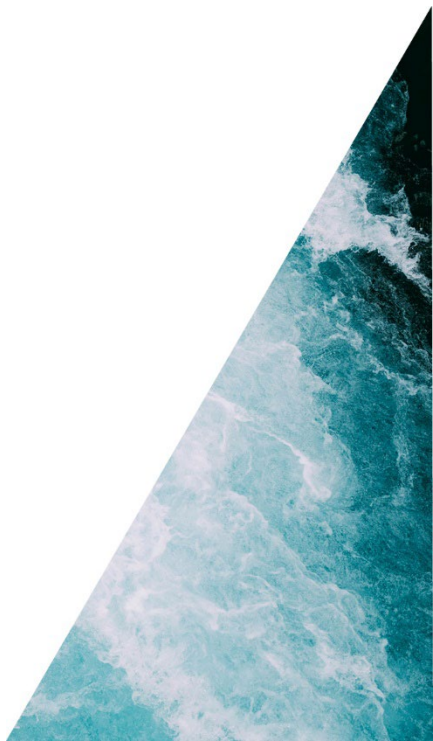
- Standard typical range (<50% MAV) – monitored annually
- Elevated typical range (>50% MAV) – monitored monthly

- If sodium hypochlorite used, chlorate must be monitored weekly*
- Fluoride monitored continuously
- FAC monitored continuously.



T3 Cyanotoxin rules

- If cyanotoxins identified in treated water testing must be undertaken in accordance with the supply cyanobacteria/cyanotoxin response plan or at least twice weekly



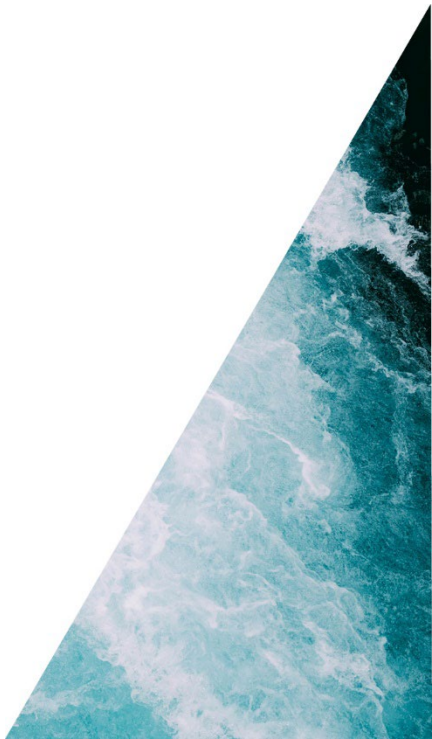
Level 3 Distribution (D) Rules

D3 Backflow protection rules

- Must prepare and implement a backflow prevention programme
- Periodic surveys of backflow risks to a distribution zone to identify medium and high-risk sites, every five years
- Ensure appropriate backflow devices are installed where there are backflow risks
- Testing annually of all testable backflow devices
- Register of all testable backflow devices (e.g., where, risk level, type, test results)
- Access via standpipes restricted to FENZ and water supplier where it is necessary for the operation of the supply

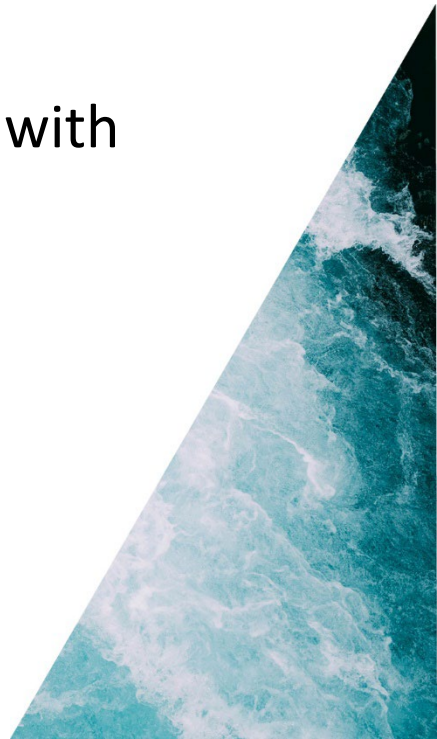
D3 New and repaired watermains hygiene procedure rules

- Before repairing a water main, must undertake a risk assessment to determine risk of contamination of the water main
- Materials free of visible contamination and protected from contamination
- Tools adequately disinfected
- Disinfection of mains must follow best practice
- Must develop SOPs



D3 Facilities operation, maintenance and disinfection rules

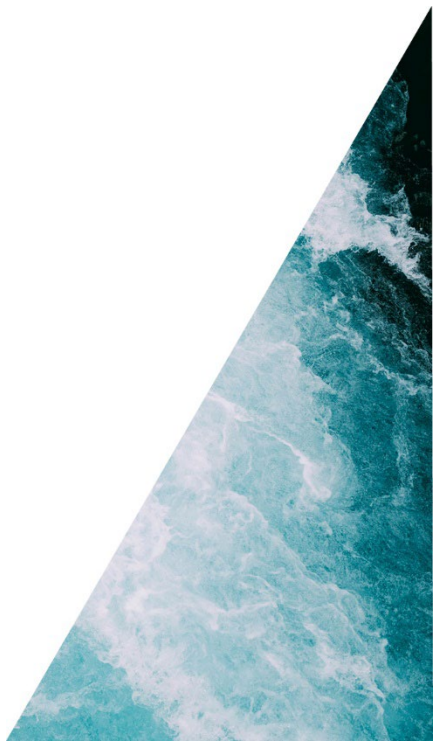
- Water storage management plan
- Annual security and contamination inspections
- Written disinfection procedures
- Cleaning, disinfecting and testing of storage facilities
- Materials used in storage facility interiors must be acceptable for contact with drinking water
- Disinfection of materials immediately prior to entering a storage facility



D3 Residual disinfection, disinfection by-product and plumbosolvent metal rules

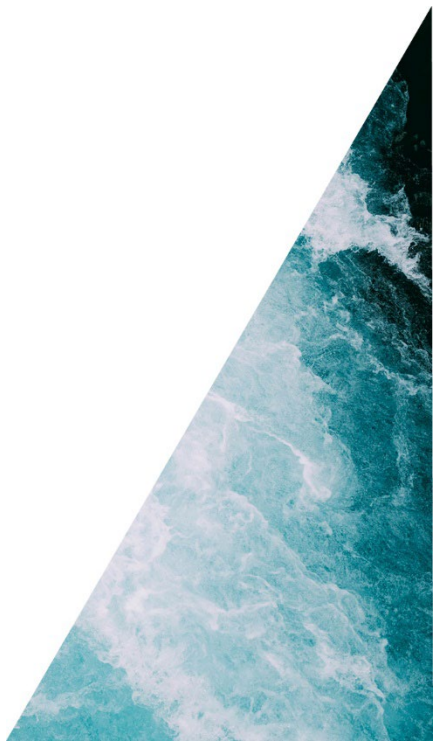
- A written sampling plan
- FAC of 0.2mg/L must be maintained in 80% of samples
- FAC must never be less than 0.1mg/L

- FAC testing
- DBP sampling (each distribution zone 1 sample/quarter)
- Plumbosolvent metal sampling (every 6 months)



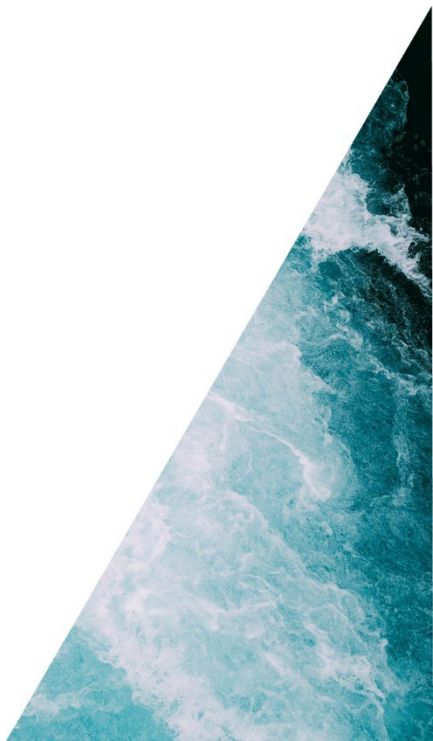
D3 Residual disinfection, FAC sampling per distribution zone

Distribution zone population	Number of samples per week	Maximum interval between samples (days)	Minimum number of days of the week used
<25,000	3	4	5
25,001 – 50,000	4	3	6
50,001 – 100,000	5	2	6 (at least two Saturdays and two Sundays sampled each year)
>100,000	6	2	7 (at least four Saturdays and four Sundays sampled each year)



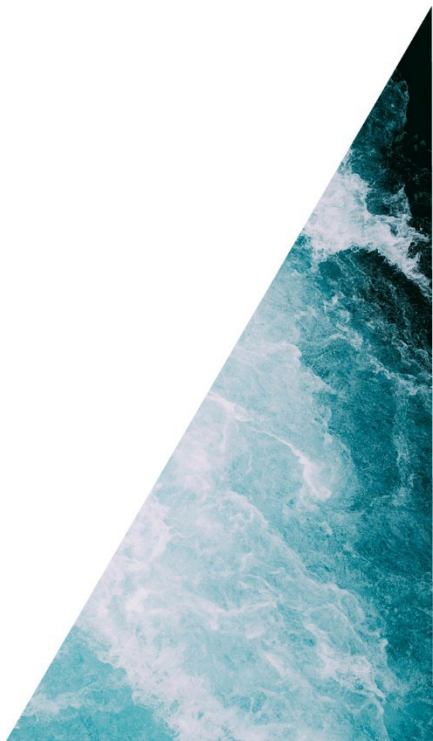
D3 Residual disinfection, FAC continuous monitoring per distribution zone

Zone population	Number of analysers
Up to 25,000	2
25,001 – 100,000	3
>100,000	4



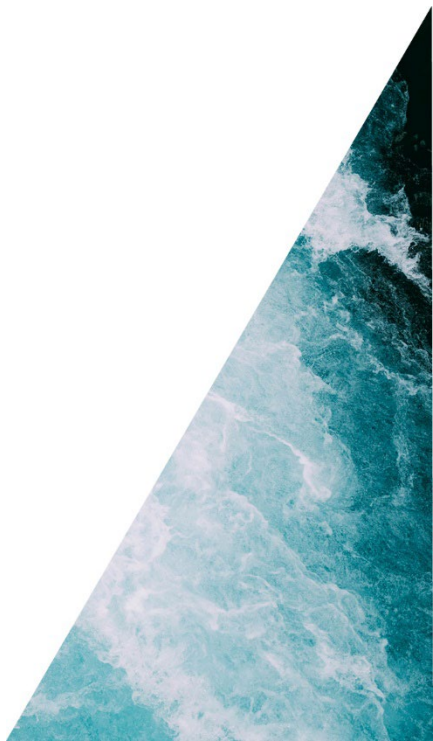
D3 Micro-biological monitoring rules

- A written sampling plan
- System map with sampling locations
- Response plan for positive results
- Representative sampling
- Written sampling protocols
- *E. coli* and total coliform monitoring in each distribution zone

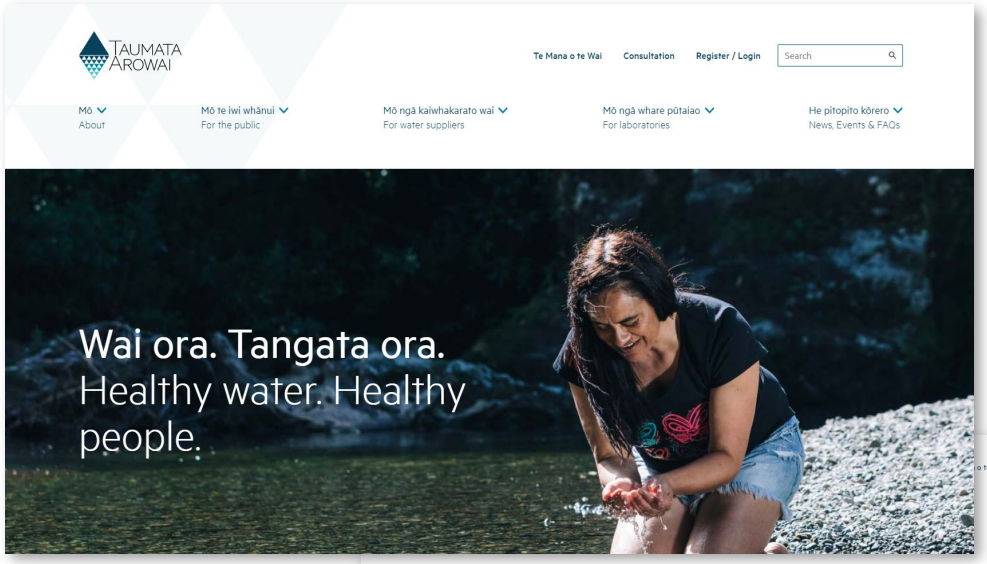


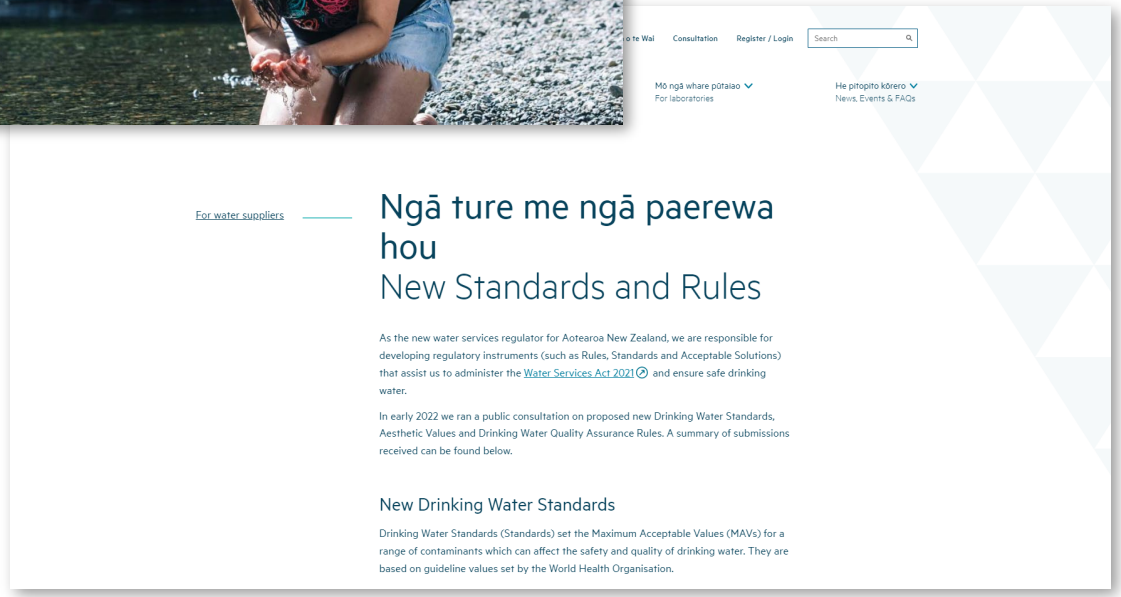
D3 Micro-biological monitoring rules

Distribution zone population	Number of samples per week	Maximum interval between samples (days)	Minimum number of days of the week used
<25,000	1	9	5
25001–50,000	1	9	6 (at least two Saturdays and two Sundays sampled each year)
50,001–100,000	2	5	7 (at least three Saturdays and three Sundays sampled each year)
>100,001	3	3	7 (at least four Saturdays and four Sundays sampled each year)



For more information





- We anticipate publishing the Rules on or about 25 July 2022
- Find out more at www.taumataarowai.govt.nz/for-water-suppliers/new-compliance-rules-and-standards/

Pātai | Questions?