

29 March 2022

Taumata Arowai,  
PO Box 628, Wellington 6140,  
New Zealand

Kia ora,

**DCC SUBMISSION: DRAFT DRINKING WATER QUALITY ASSURANCE RULES, STANDARDS, AESTHETIC VALUES AND DRINKING WATER NETWORK ENVIRONMENTAL PERFORMANCE MEASURES**

**Introduction**

1. The Dunedin City Council (DCC) thanks Taumata Arowai for the opportunity to provide feedback on the draft Drinking Water Quality Assurance Rules, Standards, Aesthetic Values and Drinking Water Network Environmental Performance Measures.
2. The DCC is committed to managing its water supply effectively to provide safe, high quality drinking water. The DCC supports the intent of the drafts and agrees with the need for a nationally consistent approach to improving the safety of drinking water.
3. As a territorial authority with responsibilities for three waters services, the DCC is keenly interested in the draft rules, standards, values and network environmental performance measures as they relate to DCC as a drinking water supplier.
4. This submission provides background on the DCC as a drinking water supplier, and DCC comments and recommendations on the draft rules, standards, values and network environmental performance measures.

**Background**

5. The DCC provides drinking water supply, wastewater and stormwater services to customers across Dunedin. The DCC 3 Waters Group manages the delivery of these services.
6. The DCC's water supply system collects, treats and delivers drinking water to customers. The system includes 21,000 hectares of water catchment, 1,386km of pipeline, 28 pumping stations, 63 reservoirs (for raw and treated water) and 6 active water treatment plants.
7. The DCC operates four registered drinking water supplies. Water is sourced from a variety of consented surface water takes. The DCC's registered drinking water supplies and their sources are:

REGISTERED SUPPLY	SUPPLY CODE	PLANT	PLANT CODE	SOURCE	SOURCE CODE
Dunedin City	DUN001	Mount Grand	TP00234	Deep Creek Deep Stream	S00999 S00141
Dunedin City	DUN001	Southern	TP00236	Silver Stream Taieri infiltration gallery Deep Creek Deep Stream	S00143 S01067 S00142 S00144
Dunedin City	DUN001	Port Chalmers	TP00237	Rossville Reservoir Cedar Farm Reservoir	S00145 S00869
Outram	OUT001	Outram	TP00245	Outram Infiltration Gallery Taieri Infiltration Gallery	S01068 S01067
Waikouaiti	WAI015	Waikouaiti	TP00250	Waikouaiti River	S00156
West Taieri	WES002	West Taieri	TP00244	Waipori River	S00867

**General comments: draft Drinking Water Quality Assurance Rules, Standards, Aesthetic Values and Drinking Water Network Environmental Performance Measures**

8. The DCC accepts there is a case for changing the way drinking waters services are regulated in New Zealand.
9. The DCC supports the overall objective of the draft Drinking Water Quality Assurance Rules, Standards and Aesthetic Values to strengthen and align national direction for protection and management of drinking water. The DCC foresees that, over time, the new rules, standards and values will lead to safer drinking water services across New Zealand and lower the risk of drinking water causing adverse effects on public health.
10. The DCC supports the structure of the new rules, standards and aesthetic values, which is clearer than the existing Drinking-water standards for New Zealand.
11. The DCC supports the new requirements in the draft Drinking Water Quality Assurance rules for regular testing of chemical determinands, including the requirement for regular sampling of plumbosolvent metals in the distribution network.
12. The DCC generally supports the proposal to introduce Drinking Water Network Environmental Performance Measures but has no specific comments or recommendations on these.

**Key DCC recommendations**

13. This section of the submission sets out the DCC's two key recommendations and the reasons for those recommendations. Further feedback and recommendations on specific draft rules, standards and aesthetic values are set out in Appendix 1.

***Recommendation 1***

The DCC recommends that Taumata Arowai adopts a staged approach to the implementation of new drinking water quality assurance rules, standards and aesthetic values, as follows:

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| <ul style="list-style-type: none"><li>a. 1 July 2022: new rules, standards and aesthetic values confirmed.</li><li>b. 1 July 2023: new rules, standards and aesthetic values come into effect (excluding quality assurance rule D3.6).</li><li>c. 1 July 2025: quality assurance rule D3.6 comes into effect.</li></ul> |
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#### *Reasons for recommendation 1*

14. The DCC notes the proposed commencement date for the new rules, standards and values is 1 July 2022. The draft rules, standards and values introduce significant framework changes to drinking water regulation.
15. The DCC submits that for many water suppliers, including the DCC, the proposed 1 July 2022 timeframe is unlikely to be achievable. This is because there is still a substantial amount of preparatory work to be done by Taumata Arowai, drinking water suppliers and accredited laboratories to enable the effective implementation of the new regulatory framework. It is not reasonable to expect drinking water suppliers to meet the new rules, standards and values before this preparatory work is complete.
16. A staged approach to implementation would provide drinking water suppliers with time to adjust their management approach and make informed investment decisions based on robust analysis of risks (both drinking water safety risks and compliance risks), benefits and costs. The drinking water supplier's analysis and subsequent approach would need to be informed by and/or apply:
  - the new rules, standards and values
  - Taumata Arowai's compliance, monitoring and enforcement strategy (due 15 November 2022)
  - water suppliers' new drinking water safety plans and source water risk management plans (due 15 November 2022)
  - any national guidance issued by Taumata Arowai.

Timelines expected of council drinking water suppliers need to align with local government annual and long-term planning processes. The next opportunity for councils to establish budgets and work programmes once the new rules, standards and values are finalised would be the 2023/24 annual plan development process. Alternatively, councils would need to either overspend, or reprioritise other work that may also be critical to drinking water safety.

17. Continuing with a 1 July 2022 start date may result in unintended, adverse consequences. It may, for example, drive drinking water suppliers to concentrate effort and financial resources on measures that have the greatest impact on improving regulatory compliance. However, this could come at the expense of considering other measures that may have a greater impact on reducing risks to drinking water safety (but where the impact on regulatory compliance is lower). Early introduction of new requirements may also have negative impacts on a water sector workforce that is already stretched, and exacerbate

recruitment and staff retention risks for drinking water suppliers. Even if drinking water suppliers had ready access to additional funding, at this stage it is unlikely they would be able to recruit staff and / or specialist advisors to implement improvement actions required to achieve compliance by 1 July 2022.

18. In addition to this, the introduction of quality assurance rule D3.6 on 1 July 2022 would require the DCC to stop contractors taking water using standpipes (while alternative solutions are developed), which would have a significant impact on local contractors.
19. The DCC's recommended staged approach would allow time for Taumata Arowai to develop national guidance where it is required, and for water suppliers to take this guidance into account when determining funding and resourcing needs, and when writing water safety plans. This includes guidance on drinking water safety planning and source water risk management plans that Taumata Arowai is currently developing, as well as guidance on other matters (as per recommendation 2 below).
20. The DCC's recommended staged approach would also provide time for drinking water suppliers and the wider water sector to develop plans to manage the impacts of a new requirements on an already stretched workforce, and reduce recruitment and retention risks.
21. Accredited laboratories across New Zealand will also need time to increase their resources to enable the delivery of an increased workload of analytical services that will result from implementation of the new rules, standards and values. Many drinking water suppliers (including the DCC) will also need to update their laboratory services contracts to account for an increased analytical workload. The DCC's recommended approach would allow time for this to be done in accordance with robust public sector procurement procedures, and for the laboratories to carry out necessary recruitment and training. The DCC also suggest some testing and analysis by water supply staff to reduce pressure on accredited labs and potentially provide critical results sooner.

### ***Recommendation 2***

The DCC recommends that Taumata Arowai issues national guidance on the following topics by 1 July 2022:

- a. training and experience requirements for personnel working on a drinking water supply
- b. water storage management plans
- c. new and repaired watermains hygiene procedures
- d. backflow prevention programmes
- e. cyanobacteria risk assessment framework and cyanobacteria/cyanotoxin response plans

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| <p>f. approach to acute and chronic toxicity resulting from the presence of different levels of chemical determinands in drinking water.</p> |
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*Reasons for recommendation 2*

22. The DCC understands that the Water Services Act 2021 and the draft drinking water quality assurance rules, standards and aesthetic values represent a major shift towards a management approach to drinking water regulation.
23. As part of this, there is an increased emphasis on drinking water safety planning. In addition, the draft quality assurance rules include a number of general assurance rules that require drinking water suppliers to prepare specific plans or programmes. One example is Rule D3.1: “Drinking water suppliers must prepare and implement a backflow prevention programme to protect their network against the risk of backflow.”
24. The DCC understands that, in theory, it is appropriate for a good drinking water supplier to determine what a backflow prevention programme for their supply looks like. However, the reality is that practices vary across New Zealand and there are well-documented skills shortages in the drinking water sector.
25. The provision of national guidance on the topics identified in recommendation 2 would support drinking water suppliers to meet new requirements more quickly, and promote a baseline level of national consistency.
26. In addition to the guidance Taumata Arowai is already developing on drinking water safety planning and source water risk management plans, drinking water suppliers need the guidance requested in recommendation 2 by 1 July 2022 to inform the development of drinking water safety plans by 15 November 2022 that identify how the drinking water supplier will meet legislative requirements.

***Recommendation 3***

The DCC recommends Taumata Arowai considers providing a mechanism in the Drinking Water Quality Assurance Rules or elsewhere (for example, an Acceptable Solution) that would enable drinking water suppliers to also use suitably qualified operational staff to undertake certain analysis, for example Free Available Chlorine (FAC) and pH analysis in distribution zones, instead of an accredited laboratory, where warranted.

*Reasons for recommendation 3*

27. Section 73 of the Water Services Act 2021 requires drinking water suppliers to use an accredited laboratory to analyse source water, raw water, and drinking water as part of any monitoring requirements in compliance rules. The DCC has taken this into account in developing the comments in this submission and assumed all analysis will be carried out by an accredited laboratory.

28. The DCC considers that in some circumstances, the use of an accredited laboratory may not always be practicable and beneficial for the drinking water supplier. Some testing and analysis, for example testing and analysis for Free Available Chlorine (FAC) and pH in distribution zones, can be done in the field with appropriate equipment and training. In these circumstances, there could be benefits of drinking water suppliers having the flexibility to use suitably trained operational staff to carry out testing and analysis. These benefits could relate to costs, and/or the drinking water supplier's ability to respond quickly to any issues raised by the analysis rather than waiting for results to be reported by the laboratory.

### **Other comments**

29. The DCC notes that new regulatory requirements will be a significant change for many smaller, private water suppliers that were previously un-regulated. The cost and administrative load of meeting new requirements may prove prohibitive. The Water Services Act 2021 amended the Local Government Act 2002 to include a requirement for territorial authorities to assess community access to water supplies, work with private water suppliers and potentially take over supply of drinking water where private suppliers are failing. The likely scale of the requirement for the DCC to support struggling small suppliers in future is currently unknown. However, fulfilling these requirements would require appropriate resourcing, process development and ongoing management. The DCC encourages Taumata Arowai to consider how it will work with councils to support small drinking water suppliers that struggle to meet the new requirements.
30. The DCC supports the urgent implementation of a review of current New Zealand plumbing standards, which would consider the implications of allowable lead levels in imported tapware and fittings and whether the current standards are sufficient to ensure public health is protected.<sup>1</sup>
31. The DCC notes that the draft Drinking Water Quality Assurance Rules, Standards, Aesthetic Values and Acceptable Solutions are not applicable to domestic self-suppliers. The DCC encourages Taumata Arowai to work with the Ministry of Health and other relevant agencies to establish and promote guidance to support domestic self-suppliers to ensure the safety of their drinking water.

### **Conclusion**

32. The DCC thanks Taumata Arowai once again for the opportunity to provide feedback on the draft Drinking Water Quality Assurance Rules, Standards and Aesthetic Values. The DCC looks forward to continuing discussions with the Taumata Arowai on measures to improve drinking water supplies.

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<sup>1</sup> The review of plumbing standards was recommended by Dr Heather Uwins-England and Dr Jill McKenzie in their 'Review of health response into Waikouaiti water supply lead contamination' (Final Report: 31 March 2021), which was commissioned by the Director General of Health. Dr Uwins-England and Dr McKenzie's recommendation was referenced in Mr Ross Tanner's 'Review of the Waikouaiti, Karitane and Hawksbury Village Water Response' (February 2022), commissioned by the Dunedin City Council.

33. The DCC would like to speak to its submission if there is an opportunity to do so.

Yours faithfully

A handwritten signature in black ink, appearing to read 'Aaron Hawkins', with a stylized flourish at the end.

Aaron Hawkins  
**MAYOR OF DUNEDIN**

**APPENDIX A: DETAILED DCC FEEDBACK ON DRAFT DRINKING WATER QUALITY ASSURANCE RULES, DRAFT DRINKING WATER STANDARDS AND DRAFT DRINKING WATER AESTHETIC VALUES**

<b>Table1 : draft Drinking Water Quality Assurance Rules</b>				
<b>Page in draft document with relevant information</b>	<b>Rule number</b>	<b>Rule description</b>	<b>DCC comment</b>	<b>Suggested solution, change or question</b>
N/A	General comment	General	The DCC supports the structure of the draft Drinking Water Quality Assurance Rules, including the breakdown of modules into source, treatment and distribution rules, and by size of the population supplied.	No change.
N/A	General comment	General	The DCC supports and acknowledges that the drinking water assessment and monitoring is now over 365 days a year for large supplies.	No change.
25	G2	Monitoring must be undertaken and reported for the determinands / parameters set out in Table 5.	For residual disinfection, FACE and pH monitoring should not be required. FAC should be monitored in the distribution system. FACE monitoring should only be a requirement for calculating C.t. Once bacteria are inactivated, the hypochlorite ion is sufficient to keep the network safe and the pH is less relevant.	The DCC recommends residual FAC should be required to be monitored in the distribution system, as opposed to FACE and pH.



25	G6	All work (planned or unplanned) on a water supply must be completed by suitably trained or experienced personnel.	The DCC considers there should be a consistent approach to training and experience requirements across drinking water suppliers.	See recommendation #2 in cover letter. The DCC recommends Taumata Arowai issues national guidance on training and experience requirements for personnel working on a drinking water supply.
43	S3.5	Source Water Risk Management Plan	The Water Services Act requires water suppliers to prepare a Source Water Risk Management Plan (SWRMP) by 15 November 2022, as part of the drinking water safety plan. The monitoring requirements in S3.5 depend on the outcome of the SWRMP.	See recommendation #1 in cover letter.  The DCC recommends that the assurance rules come into effect from 1 July 2023 to allow suppliers time to consider the outcomes of the SWRMP, develop a monitoring plan to address these, and put a work plan in place (including getting the required resources).
Multiple	S3.5; S3.6; S3.7; S3.8; Section 10.9.4; Section 10.6.6; T3.93; T3.94; T3.95	Cyanotoxin Rules	<p>The DCC notes the significant changes in regard to cyanotoxin rules that will require substantial additional resources.</p> <p>The current proposed timing for implementation of the rules (by 1 July 2022) would not allow for the development of a risk framework for cyanobacteria in the Source Water Risk Management Plans as required by draft Rules S3.5 and S3.6. Once catchments are identified as medium- or high-risk, development of fit-for-purpose cyanobacteria/cyanotoxin response plans must be prepared (draft Rule S3.7). The DCC would need to review its existing</p>	<p>See recommendation #1 in cover letter. The DCC recommends that the assurance rules come into effect from 1 July 2023 to allow suppliers (and laboratories) time to increase the resources required to carry out the testing.</p> <p>See recommendation #2 in cover letter. The DCC recommends Taumata Arowai issues national guidance on cyanobacteria/cyanotoxin risk assessment framework and response plans.</p>

			<p>cyanobacteria/cyanotoxin response plan to ensure it meets requirements.</p> <p>Development of these plans requires specific expertise and additional time once the Source Water Risk Management Plans are in place (required by 15 November 2022) and have determined the risk of cyanobacteria in specific drinking water catchments.</p> <p>Additional testing will be required at a substantial financial cost from an accredited laboratory, depending on the cyanobacteria/cyanotoxin response plan developed by the drinking water supplier. This testing is estimated at \$1,000 per sample and could require significant additional resourcing if it is determined that regular testing for cyanotoxins needs to occur in source and treated water.</p>	
61	T3.61	If the membrane unit has been out of service for maintenance or any other reason a direct integrity test must be completed before the unit is returned to service.	There is no definition of 'out of service' and this could be interpreted in different ways. For example, it is not clear whether the unit is deemed 'out of service' when a cleaning cycle (CIP) is performed; or whether the unit 'out of service' when the plant is not producing and in a standby mode.	The DCC recommends Taumata Arowai includes a definition of 'out of service' for clarity and to promote a consistent approach between drinking water suppliers.
72	T3.88	If sodium hypochlorite is used	The DCC understands there are limited (if any) laboratories in New Zealand that can	See recommendation #1 in cover letter.

		as a disinfectant, chlorate and percholate must be sampled weekly.	<p>provide perchlorate testing. This means that drinking water suppliers will find it difficult to get the testing done in the short term, and laboratories may need time to develop this service.</p> <p>However, the DCC supports adding perchlorate to the standards as well as the additional quality assurance rule for hypochlorite use.</p>	The DCC recommends bringing this rule into effect from 1 July 2023 to allow water suppliers and laboratories time to introduce perchlorate testing.
74-81	D3: Distribution Rules	Distribution zones	The DCC notes the significant changes in regard to distribution zones, in particular the increased level of distribution network monitoring required of large drinking water suppliers. For many, sampling frequencies for each distribution zone will increase from 1-3 times per week to daily.	<p>See recommendation #1 in cover letter. The DCC recommends that the assurance rules come into effect from 1 July 2023 to allow suppliers (and laboratories) time to increase the resources required to carry out the testing.</p> <p>See recommendation #3 in the cover letter. The DCC recommends that Taumata Arowai considers enabling suitably qualified operational staff of the drinking water supplier to undertake analysis Free Available Chlorine (FAC) and pH in the distribution network rather than an accredited laboratory, where warranted.</p>
75	D3.6	Access to a water network through use of a standpipe is not permitted except by Fire and Emergency New Zealand, other emergency services, the water supplier or	The DCC supports this rule in principle to reduce risks to drinking water safety. However, this will cause significant issues for the DCC (and contractors) if this rule is introduced in the short term. The DCC currently has around 40 contractors authorised to take water from around 50 designated hydrants, the majority of which	<p>See recommendation #1 in cover letter.</p> <p>The DCC recommends bringing this rule into effect from 1 July 2025 to allow water suppliers time to develop fit for purpose alternatives to standpipes (eg, designated filling stations) before stopping contractors from taking water.</p>

		<p>authorised contractors to the water supplier where it is reasonably necessary to access the network for the operation of the drinking water supply.</p>	<p>are not using the water 'for the operation of the drinking water supply'. To be compliant with the proposed rule, the DCC would need to:</p> <ul style="list-style-type: none"> <li>temporarily stop all currently authorised contractors from taking water using standpipes (where this is not for the operation of the drinking water supply), with significant impacts on local contractors</li> <li>install designated filling stations at substantial cost</li> <li>develop supporting processes, procedures and training to support the roll out of designated filling stations</li> <li>roll out the new filling station regime to contractors (estimate 2-3 years away).</li> </ul> <p>Ideally, the DCC would also modify existing hydrants (currently thousands) to ensure no unauthorised access, at substantial cost.</p>	
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75	D3.12	Water Storage Management Plan (WSMP)	Water Storage Management Plans would be required by the date the assurance rules come into effect. These are new plans and there is no industry guidance on what these should include. The DCC considers that these plans should be informed by risk assessments carried out at part of water safety planning (due to be completed by 15 November 2022) and national guidance.	<p>See recommendation #1 in cover letter.</p> <p>The DCC recommends bringing this rule into effect from 1 July 2023 to allow water suppliers time to prepare Water Storage Management Plans based on the outcomes of their water safety planning risk assessments and national guidance.</p> <p>See recommendation #2 in cover letter.</p> <p>The DCC recommends that Taumata Arowai issues national guidance on Water Storage Management Plans.</p>
77-79	D3.21; D3.26; D3.27	Free Available Chlorine and pH sampling	Based on the requirement of section 73 of the Water Services Act, daily Free Available Chlorine (FAC) and pH analysis would have to be carried out by an accredited laboratory, at substantial cost. The DCC considers that these samples could alternatively be analysed by suitably qualified operational staff because the testing is able to be done in the field with appropriate equipment. This could enable drinking water suppliers to react more quickly to any issues identified by testing, rather than waiting for results to be reported from the laboratory.	See recommendation #3 in cover letter. The DCC recommends that Taumata Arowai considers enabling suitably qualified operational staff of the drinking water supplier to undertake analysis of Free Available Chlorine (FAC) pH in the distribution network rather than an accredited laboratory, where warranted.

Table 2: draft Drinking Water Standards for New Zealand			
Page in draft document with relevant information	Feedback topic	DCC comment	Suggested solution, change or question
1	The Standards – third paragraph	The third paragraph, second sentence (p.1) refers to the “operational rules” but this term is not defined.	The DCC suggests “operational rules” be replaced with “Drinking Water Quality Assurance Rules” to avoid ambiguity.
2-6	Carcinogenic determinands	The draft standards do not identify “carcinogenic” determinands.	DCC suggest specifying which determinands are classified as “carcinogenic determinands” to avoid ambiguity as to which MAVs are established by this methodology.
2	Arsenic, Cyanide, Lead	The Draft Drinking Water Standards (2021) include MAVs for arsenic, lead and cyanide that relate to chronic (long term) effects. These determinands may also have acute (short term) effects.	<p>The DCC suggests that Taumata Arowai reviews its approach to setting limits and/or providing guidance for determinands where there are potentially both acute (short-term) effects and chronic (long-term) effects. Examples of these determinands include arsenic, cyanide, and lead. Where there is a potential short-term risk, Taumata Arowai should provide guidance on what this is and how to respond (noting there is often a significant delay of many days before drinking water suppliers receive test results).</p> <p>See recommendation #2 in cover letter. The DCC recommends Taumata Arowai provide national guidance on how to approach acute and chronic toxicity resulting from the presence</p>

			of different levels of chemical determinands in drinking water.
	Develop guidance on test methods for determinands	The Draft Drinking Water Standards (2021) do not specify the type of test method required for each determinand. For some determinands (particularly metals), different test methods can yield varying results on the same water sample.	The DCC suggests Taumata Arowai develops guidance for the industry on the differences between acid-soluble, dissolved, and total results and how this relates to determinands identified in the draft Drinking Water Standards.
2-6	Sub-classifications of determinands / layout of MAV tables	The draft Drinking Water Standards list determinands alphabetically. Addition of sub-classifications may make the Standards more accessible and informative for the general public and for staff of the drinking water supplier that are not water quality specialists.	<p>The DCC suggests adding sub-classifications of determinands within their broader classification as opposed to sorting alphabetically, a sub-classification could be added as a merged row in a column with text:</p> <ul style="list-style-type: none"> <li>a) For inorganic table, subclassifications could be “metals”, “Disinfection By-Products”, “Anions”, “Oxyhalides” and “Other Inorganics”.</li> <li>b) For the organic table, subclassifications could be “Cyanotoxins”, “Pesticides and Pesticide Metabolites”, “Disinfection By-Products”, “Other Industrial Chemicals”, and “Other Organics”</li> </ul>
2	Bromate and Monochloramine	The draft Drinking Water Standards do not note that Bromate and Monochloramine are potential disinfection by-products (DBP).	The DCCs suggest Taumata Arowai consider labelling bromate and monochloramine as disinfection by-products (DBP) in the notes column.

3	Nitrate and nitrite units	The units for nitrate and nitrite in the draft Drinking Water Standards are mg/L. Some environmental scientists use “as N” and the limit has been reported in “mg/L as N” in recent news articles. The general public may find these notations confusing. In addition, laboratories reporting “as N” could lead to inappropriate responses to results.	The DCC suggests Taumata Arowai clarifies whether nitrate and nitrite should be reported ‘as N’ or ‘as NO <sub>3</sub> /NO <sub>2</sub> ’.
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Table 3: draft Drinking Water Aesthetic Values			
Page in consultation document with relevant information	Feedback topic	Comments	Suggested solution, change or question
N/A	Inclusion of MAVs where applicable in Table 1 (draft Drinking Water Aesthetic Values)	Some determinands included in the draft Aesthetic Values are also included in the draft Drinking Water Standards. It is important for water suppliers to be able to quickly understand when a determinand may have both a MAV (under the standards) and acceptable range (under the aesthetic values).	The DCC suggests that Taumata Arowai considers noting in Table 1 of the Drinking Water Aesthetic Values when a determinand with an acceptable range (under the aesthetic values) also has a MAV (under the Drinking Water Standards).
N/A	Geosmin and 2MIB	Geosmin and 2 MIB are the most common taste and odour compounds in drinking water. While the threshold range varies significantly from person to person, thresholds would guide water suppliers to know whether these are the likely causes of taste and odour complaints.	The DCC suggests that Taumata Arowai considers adding an acceptable range for Geosmin and 2-MIB.
2	Chlorine	The DCC supports the change to the acceptable range for chlorine	No change.
2	Hardness	Presentation of determinand name and unit for hardness.	Consider moving “as CaCO <sub>3</sub> ” from the determinand column to the unit column.
3	Temperature	The DCC agrees that defining an acceptable range for temperature is useful. Shading reservoirs, selecting good sites for reservoirs, and keeping water cool (when possible) also reduces the chance of	No change.

		microbial growth in the network and slows the rate of disinfection by-product formation in the network.	
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