



# Utilities and Roading Committee

## Agenda

Tuesday 22 March 2022

3:30pm

*Via Zoom*

*Members:*

Cr Robbie Brine (Chairperson)

Cr Al Blackie

Cr Sandra Stewart

Cr Joan Ward

Cr Paul Williams

Mayor Dan Gordon (ex officio)

The Chairperson and Members  
**UTILITIES AND ROADING COMMITTEE**

**A MEETING OF THE UTILITIES AND ROADING COMMITTEE WILL BE HELD REMOTELY VIA ZOOM ON TUESDAY 22 MARCH AT 3.30PM.**

Recommendations in reports are not to be construed as Council policy until adopted by the Council

**BUSINESS**

Page No

**1 APOLOGIES**

**2 CONFLICTS OF INTEREST**

*Conflicts of interest (if any) to be reported for minuting.*

**3 CONFIRMATION OF MINUTES**

**3.1 Minutes of a meeting of the Utilities and Roading Committee held on Tuesday 22 February 2022**

6 -14

*RECOMMENDATION*

**THAT** the Utilities and Roading Committee:

- (a) **Confirms** the circulated Minutes of a meeting of the Utilities and Roading Committee held on 22 February 2022, as a true and accurate record.

**3.2 Matters arising**

**4 DEPUTATION/PRESENTATIONS**

Nil.

**5 REPORTS**

**5.1 February 2022 Flood Event – Update on Service Requests – E Klopper (Flood Team Lead), C Fahey (Water Operations Team Leader) and K Simpson (3 Waters Manager)**

15 - 35

*RECOMMENDATION*

**THAT** the Utilities and Roading Committee:

- (a) **Receives** report No. 220310034384.
- (b) **Notes** that 598 drainage service requests were received related to the significant rainfall event in May 2021, December 2021 and February 2022, which have all been responded to although some require further maintenance or investigation work.

- (c) **Notes** that there are currently 59 drainage assessments identified as set out in section 4.6 and this is likely to increase as the service requests are worked through.
- (d) **Notes** that a webpage has been setup on the Council's website to provide updates on the status of drainage works underway and targeted information will be sent out to the Waikuku Beach and Kaiapoi communities.
- (e) **Notes** that if further budgets are required for any capital works identified as part of the drainage assessment work, that these will be sought as part of the 2022/23 Annual Plan process.
- (f) **Circulates** this report to the Council and the Community Boards for information.

**5.2 Drinking Water Standards and Rules: Submission to Taumata Arowai – C Roxburgh (Water Asset Manager) and H Proffit (Water Safety and Compliance Specialist)**

36 - 85

*RECOMMENDATION*

**THAT** the Utilities and Roading Committee:

- (a) **Receives** Report No. 220309033938.
- (b) **Notes** that Taumata Arowai have prepared a suite of new documents associated with an updated version of the Drinking Water Standards for New Zealand, which they are seeking feedback on, with submissions closing on the 28<sup>th</sup> of March 2022, with relevant documents reviewed by staff and submissions prepared.
- (c) **Endorses** the following submissions prepared by staff to be submitted to Taumata Arowai, in response to the consultation questions asked:
  - i. Covering letter to Taumata Arowai
  - ii. Submission on Drinking Water Standards
  - iii. Submission on Quality Assurance Rules
  - iv. Submission on Aesthetic Values
  - v. Submission on Acceptable Solution for Spring and Bore Water
  - vi. Submission on Acceptable Solution for Rural Agricultural Supplies
- (d) **Notes** that the submissions will be made public by Taumata Arowai.

**6 CORRESPONDENCE**

Nil.

**7 REPORT REFERRED**

Nil

**8 MATTERS FOR INFORMATION**

- 8.1 OXFORD RURAL NO. 2 WATER MAIN RENEWALS 2021/22 – REQUEST TO ENGAGE WATER UNIT – Report to Management Team Meeting 28 February 2022– to be circulated to Utilities and Roothing Committee.**

86 - 91

*RECOMMENDATION*

**THAT** the Utilities and Roothing Committee receives the information in Item 8.1.

**9 PORTFOLIO UPDATES**

- 9.1 Roothing – Councillor Paul Williams**
- 9.2 Drainage and Stockwater – Councillor Sandra Stewart**
- 9.3 Utilities (Water Supplies and Sewer) – Councillor Paul Williams**
- 9.4 Solid Waste– Councillor Robbie Brine**
- 9.5 Transport – Mayor Dan Gordon**

**10 QUESTIONS UNDER STANDING ORDERS****11 URGENT GENERAL BUSINESS****12 MATTERS TO BE CONSIDERED WITH THE PUBLIC EXCLUDED**

*Section 48, Local Government Official Information and Meetings Act 1987*

*RECOMMENDATION*

**THAT** the public be excluded from the following parts of the proceedings of this meeting.

o

The general subject of each matter to be considered while the public is excluded, the reason for passing this resolution in relation to each matter and the specific grounds under section 48(1) of the Local Government Official Information and Meetings Act 1987 for the passing of this resolution, are as follows:

<b>Item No</b>	<b>Minutes/Report of:</b>	<b>General subject of each matter to be considered</b>	<b>Reason for passing this resolution in relation to each matter</b>	<b>Ground(s) under section 48(1) for the passing of this resolution</b>
12.1	Minutes of the public Excluded portion of Utilities and Roothing Committee meeting of 22 February 2022	Confirmation of Minutes	Good reason to withhold exists under Section 7	Section 48(1)(a)
12.2 – 12.3	Reports from Management Team meetings	Reports for information	Good reason to withhold exists under Section 7	Section 48(1)(a)

This resolution is made in reliance on section 48(1)(a) of the Local Government Official Information and Meetings Act 1987, and the particular interest or interests protected by section 6 or section 7 of that Act which would be prejudiced by the holding of the whole or relevant part of the proceedings of the meeting in public are as follows:

Item N°	Reason for protection of interests	Ref NZS 9202:2003 Appendix A
12.1 – 12.3	Protection of privacy of natural persons To carry out commercial activities without prejudice	A2(a) A2(b)ii

**CLOSED MEETING**

*See Public Excluded Agenda (separate document)*

**OPEN MEETING**

**NEXT MEETING**

The next meeting of the Utilities and Roading Committee is scheduled for 3.30pm, on Tuesday 26 April 2022.

**BRIEFING**

*At the conclusion of the meeting a briefing will be held to discuss:*

1. **Road Markings recommended for Southbrook Road** – (Shane Binder)
2. **Chlorination requirements of new drinking water standards.**  
(Colin Roxburgh)
3. **Kaiapoi and Woodend water supply, temporary chlorination and steps to remove this.** (Colin Roxburgh)

**WAIMAKARIRI DISTRICT COUNCIL**

**MINUTES OF THE MEETING OF THE UTILITIES AND ROADING COMMITTEE HELD IN THE COUNCIL CHAMBER, 215 HIGH STREET, RANGIORA ON TUESDAY 22 FEBRUARY AT 3.30PM.**

**PRESENT**

Councillor R Brine (Chairperson), Mayor D Gordon, Councillors A Blackie, S Stewart, J Ward and P Williams

**IN ATTENDANCE**

Councillors P Redmond, W Doody, N Mealings and N Atkinson  
J Harland (Chief Executive) (from 4.02pm) G Cleary (Manager Utilities and Roading),  
J McBride (Roading and Transport Manager), J Dhakal (Project Engineer), A Smith (Governance Coordinator)

**1 APOLOGIES**

There were no apologies.

**2 CONFLICTS OF INTEREST**

There were no conflicts of interest recorded.

**3 CONFIRMATION OF MINUTES**

**3.1 Minutes of a meeting of the Utilities and Roading Committee held on Tuesday 16 November 2021**

Moved Councillor Blackie

Seconded Councillor Williams

**THAT** the Utilities and Roading Committee:

- (a) **Confirms** the circulated Minutes of a meeting of the Utilities and Roading Committee held on 16 November 2021, as a true and accurate record.

**CARRIED**

**3.2 Matters arising**

There were no matters arising.

**4 DEPUTATION/PRESENTATIONS**

There were no deputations or presentations.

## 5 REPORTS

### 5.1 Ashley Street and Coldstream Road Upgrades – Further Information – J Dhakal (Project Engineer) and J McBride (Roading and Transport Manager)

J McBride and J Dhakal presented this report which provided further information on the estimated costs of upgrades to Coldstream Road and Ashley Street, as requested by Council during the recent Annual Plan meeting. These projects had not been included in the Annual Plan at this stage, and had not been prioritised against other needs of the district. The rating impact if these were included in the Annual Plan would be an increase on the roading rate of 0.5% and an overall increase to general rate of 0.1% in the 2022/23 year. It was noted that the staff report also provided alternate set of recommendations for this matter.

Councillor Redmond sought clarification on second sentence of paragraph 4.2 in the report, and J McBride confirmed it should read "*There is currently no budget allocated for this project.*"

Councillor Williams Moved recommendations (a), (d) and (e) in the staff report, but there was absence of a Seconder.

Moved Mayor Gordon

Seconded Councillor Blackie

**THAT** the Utilities and Roading Committee:

- (a) **Receives** Report No. 220209016725;
- (b) **Declines** the inclusion of the Ashley Street and Coldstream Road Upgrades Projects within the 2022/23 Annual Plan, for further consideration as part of the next Long Term Plan process;
- (c) **Notes** that this is the recommended option so that this project is considered as part of the next Long Term Plan process and can be prioritised against other needs within the district;

**CARRIED**

Councillor Williams against

Mayor Gordon pointed out that with the Council having just been through an Annual Plan process, this is not the correct time for these projects to be included. Mayor Gordon supported them being considered as part of the next Long Term Plan process.

Councillor Blackie endorsed the comments of the Mayor and that priorities need to be given consideration.

Councillor Williams, in opposing the recommendation, commented that as Ashley Street is one of the main entrances to the Rangiora township it was important for these improvements to be included in the 2022/2023 Annual Plan to improve the approach to the town. It was also pointed out that this was a recommendation from the Rangiora Ashley Community Board. Alternatively, Councillor Williams would have supported an amended recommendation approving funding for improvements along the roadside outside the A and P Showgrounds land only on Ashley Street.

Councillor Brine supported this recommendation and for this work to be undertaken in the future, but priorities need to be considered at this time.

Councillor Doody supports the comments of Councillor Williams with this entrance of Rangiora currently untidy and needing improvement.

Councillor Atkinson noted that the A and P showgrounds hosts events that attract thousands of people and suggested that it is not looked after well. He believes the Council should be better serving this area.

Mayor Gordon responded that at less expense, there could be a partnership agreement reached between the Council maintenance contractor and the A and P Association on improving the roadsides. This resolution is not seen as going against the Community Board and if the Rangiora-Ashley Community Board include this in their submission to the Annual Plan this would be considered as part of that process. Some mowing of the roadside and maintenance would provide a visual improvement of this area and suggested staff follow up with this.

## **5.2 Skewbridge Active Warning Signage – Concept Design – J Dhakal (Project Engineer) and J McBride (Roading and Transport Manager)**

J Dhakal and J McBride presented this report which provided information to the committee on the scheme design for Skewbridge Active Warning Signage Project. J Dhakal advised that this was to be a temporary measure while there are investigations into the potential upgrade of Skewbridge in the future. The project is estimated to cost \$285,000 which is within the budget of \$330,000. It is planned to proceed to detailed design following presenting to this meeting and engaging with Mainpower for the power supply for the active warning signs.

Councillor Ward suggested when discussions are being undertaken with Mainpower, if there could be included in the contract, any electricity provision required for the future upgraded bridge. J McBride said potentially power would only be required on the bridge if there was to be street lighting on the bridge, or if there was a cycle facility included which required lighting. As a comparison, it was pointed out that the Cones Road Ashley River Bridge had no street lighting or cycle way lighting. This is not a level of service that the Council would be looking to provide, but could include the ability to extend that in the future if that was needed.

Councillor Williams enquired about the cost of solar powered signage, noting there is a significant difference in this cost. J McBride responded that this project is not just lighting, but also includes thresholds, changing to the road marking and tactile indicators to assist in keeping people in their lanes. Because of the number of vehicles going through this site each day, the solar panels would not hold enough charge to keep working and required a permanent power supply which is more expensive. J Dhakal noted there is different sorts of batteries that could be used, but noted that the lithium batteries which are used in cars don't retain charge in zero degrees or less, which would make it difficult during frosty winter days. Councillor Williams noted there are battery powered road signs operating 24 hours per day through the Hundalees between Picton and Christchurch.

Councillor Blackie asked how much of the cost will be provided by Mainpower J Dhakal advised that a cost estimate has not been obtained from Mainpower as yet which would be based on the electrical design provided. Trenching is required for some of this portion which will be a cost included in the main construction contract. Regarding the lithium batteries, Councillor Blackie suggested that they could be insulated to protect against the cold temperatures. J Dhakal agreed to seek further advice from the supplier on this, but had previously been advised that permanent power supply was the best option for this location.

Following a question from Councillor Stewart on cyclists using the bridge,



J McBride said there wouldn't be the ability to provide specific facilities for cyclists with these improvements, but staff would be making sure that any new infrastructure would not use up any space in the shoulder that cyclists currently use. Councillor Stewart suggested that it would be a good alternative for cyclists to use Skewbridge Lane rather than still using Skewbridge. J McBride suggested this could be part of the network plan and the longer term plan for Skewbridge Bridge.

Councillor Doody asked about the signage and if it was to be similar to that installed in Tram Road. J McBride said this is similar, when cars approach it will activate warning and reminding drivers to slow down. Councillor Doody noted these electronic signs were very effective and supports installation of these.

Moved Councillor Brine

Seconded Councillor Williams

**THAT** the Utilities and Roading Committee:

- (a) **Receives** Report No. TRIM 211215200532.
- (b) **Notes** that the preliminary estimate for the physical works is \$285,000 and is within the budget of \$330,000.
- (c) **Notes** Waka Kotahi (NZTA) has approved 51% funding contribution of this project.
- (d) **Notes** that staff will proceed with detailed design stage.
- (e) **After** further investigation on batteries, procurement is proposed with direct engagement with Mainpower for the power supply works and open tender for the signage install and civil works.

**CARRIED**

Councillor Brine said this was not the final result that the Council had wanted for this bridge, but the Council was able to provide these safety measures. It was noted that NZTA are contributing 51% of the cost of these interim safety measures.

Councillor Williams supported this proposal but believes the battery option would incur considerably less cost for the Council and it is important to explore this option.

Mayor Gordon noted this was work had been considered for some time and there needed to be safety measures put in place as an interim step until the bridge replacement, which the Council will continue to pursue.

Councillor Ward suggested that accidents occurred on Skewbridge that were not being reported, and asked if there was information being provided to Council staff by residents near the bridge of any such accidents that are not being reported through injury. This information could be used to put the case to NZTA for the new bridge. J McBride said residents were very active in providing this information to Council staff. In recent times the injuries sustained from accidents on or near the bridge had been minor and there had been no fatalities but with the increased traffic volumes, the risk increases. NZTA Waka Kotahi unfortunately use death or serious injury statistics as the main driver for funding of projects. It was noted that although there have previously been fatalities at this site, these are beyond ten years, which is the criteria that NZTA use.

Following a question from Councillor Atkinson, J McBride confirmed that the signage would be able to be relocated to a different site, once it was no longer needed at Skewbridge.

**5.3 Wastewater Treatment Plant Fencing Contract Completion – J Dhakal (Project Engineer) and R Frizzell (Wastewater Engineer)**

J Dhakal presented this report which provided an update on this fencing contract that was award just prior to the first Covid-19 Lockdown in 2020. After some delay this work was completed prior to the end of June 2020 and the overall project expenditure was below the budget.

Moved Councillor Blackie

Seconded Councillor Williams

**THAT** the Utilities and Roading Committee:

- (a) **Receives** Report No. 220112002581.
- (b) **Circulates** to the community boards for their information.

**CARRIED**

**6 CORRESPONDENCE**

Nil.

**7 REPORT REFERRED FROM THE WOODEND-SEFTON COMMUNITY BOARD**

**7.1 Vaughan Street, Sefton – Approval of No-Stopping Restriction – S Binder (Transport Engineer)**

J McBride spoke to this report on behalf of the report writer. This requested installation of No Stopping restrictions on Vaughan Street, Sefton. There had been development on this street and these No Stopping areas will allow for safer traffic movements for the residents.

Following a question from Mayor Gordon on the hedge, G Cleary advised that the hedge would remain in place, which would stop the prevailing wind.

There were four property owners which staff would consult with and if there was any objection to the installation of the No Stopping zones, staff would provide a further report to the Committee.

Moved Councillor Williams

Seconded Councillor Blackie

**THAT** the Utilities and Roading Committee:

- (a) **Approves** in principle the installation of the following no-stopping restriction on Vaughan Street subject to engagement with the residents:
  - i. For 120m length north of Cross Street on the west side.
  - ii. For 105m length north of Cross Street on the east side.
- (b) **Notes** that staff have not consulted with property owners, but an information notice explaining the need for parking restrictions will be distributed to all residences prior to any works being undertaken.

**CARRIED**

## 8 MATTERS FOR INFORMATION

- 8.1 Request to engage Hannon Civil Limited for Works Coastal Urban Minor Stormwater Improvements 2021/22 – Report to Management Team Meeting 22 November 2021 – Circulates to Utilities and Roothing Committee.
- 8.2 Engage Water Unit for Mountain Road Mounseys Road Connection – Report to Management Team Meeting 29 November 2021 – Circulates to Utilities and Roothing Committee.
- 8.3 Innovating Streets Update and Consideration of Formalising the Right Turn Restriction From Denches Road – Report to Rangiora-Ashley Community Board Meeting 8 December 2021 – Circulates to Utilities and Roothing Committee.
- 8.4 Request to Continue Engaging Transcontinental New Zealand Limited for WDC Branded Rubbish Bag Supply – Report to Management Team Meeting 13 December 2021 – Circulates to Utilities and Roothing Committee.
- 8.5 Contract 21/23 Waikuku Beach Water Supply Campground Headworks Upgrade Tender Evaluation and Contract Award Report – Report to Management Team Meeting 8 February 2022 – Circulates to Utilities and Roothing Committee.
- 8.6 Request for Loading Zone on Railway Road – Report to Rangiora-Ashley Community Board Meeting 9 February 2022 – Circulates to Utilities and Roothing Committee.

Moved Councillor Blackie

Seconded Councillor Brine

THAT the Utilities and Roothing Committee receives the information in Items 8.1 to 8.6.

**CARRIED**

*Note: The links for 'Matters of Information' were separately circulated to elected members.*

## 9 PORTFOLIO UPDATES

### 9.1 Roothing – Councillor Paul Williams

The February rainfall caused damage to roads in the district. The gravel roads were not in good condition and Councillor Williams expressed concern with the number of complaints received on the condition of these. Councillor Williams had concerns with the level of service provided.

Councillor Williams noted the issue of the failing on Butchers Road culvert and Taffes Glen Road culvert also requires some work undertaken on it.

### 9.2 Drainage and Stockwater – Councillor Sandra Stewart

Councillor Stewart noted there had been 500 service requests as a result of May, December and February flooding events.

Property owners in the Woodend area on private water supplies had indicated they are experiencing high levels of contamination and wished to join with the Council water supply. These properties are adjacent to Ravenswood. Councillor Stewart would like to see this offer to join the Council scheme extended further.

There was an issue with high levels of gravel in Mounsey Stream, Oxford. This had been drawn to the attention of Ecan.

K Merhtens of the Oxford Rural Drainage Advisory Group, expressed disappointment with the drain maintenance work in the area.

### **9.3 Utilities (Water Supplies and Sewer) – Councillor Paul Williams**

Toxic algae is in the ponds south of Kaiapoi and complaints received from residents regarding the smell. Staff have been acting on this which has been effective. Pleased to report that there hadn't been any avian botulism this summer despite it being quite a hot summer to date.

### **9.4 Solid Waste– Councillor Robbie Brine**

The next meetings of the Canterbury Waste Joint Committee and Canterbury Regional Landfill Joint Committee are scheduled to be held in Christchurch on 4 April.

The inaugural meeting of the WDC Services Governance Group took place yesterday. Following discussion it was agreed to have two groups, an operational group which would meet more frequently, but the overall governance group would meet quarterly. Councillor Brine believes this was a beneficial meeting to discuss ways to move forward with a good working relationship. Staff would be considering how the Transfer Stations would be kept operational with a Covid outbreak, and this would be challenging for those tasked with this.

Councillor Williams asked if there was any way to reduce the queues at the Transfer Stations on the weekend, and Councillor Brine said staff are noting the key issues. G Cleary advised that lanes are now open without physical distancing, and there is also funding for future improvements to rectify this situation.

### **9.5 Transport – Mayor Dan Gordon**

Mayor Gordon spoke on the regional transport, noting the recent media reports on light rail, and there is possibly further investment in passenger transport that may be the priority for Canterbury. There was concern where the funding is going to come from for these work streams and there would need to be significant investment from the Crown. The Southbrook Road improvements are progressing with a lot of planning work already undertaken by staff.

Mayor Gordon acknowledged the work of the staff during the recent flooding events. These have presented a big challenge for staff and the contractors who have been out working for the community in difficult times.

## **10 QUESTIONS UNDER STANDING ORDERS**

There were no questions.

## **11 URGENT GENERAL BUSINESS**

There was no urgent general business

## 12 **MATTERS TO BE CONSIDERED WITH THE PUBLIC EXCLUDED**

*Section 48, Local Government Official Information and Meetings Act 1987*

Moved Councillor Brine                      Seconded Councillor Blackie.

**THAT** the public be excluded from the following parts of the proceedings of this meeting.

The general subject of each matter to be considered while the public is excluded, the reason for passing this resolution in relation to each matter and the specific grounds under section 48(1) of the Local Government Official Information and Meetings Act 1987 for the passing of this resolution, are as follows:

Item No	Minutes/Report of:	General subject of each matter to be considered	Reason for passing this resolution in relation to each matter	Ground(s) under section 48(1) for the passing of this resolution
12.1	Minutes of the public Excluded portion of Utilities and Roothing Committee meeting of 16 November 2021	Confirmation of Minutes	Good reason to withhold exists under Section 7	Section 48(1)(a)
12.2 – 12.12	Reports from Management Team Meetings	Reports for Information	Good reason to withhold exists under Section 7	Section 48(1)(a)

This resolution is made in reliance on section 48(1)(a) of the Local Government Official Information and Meetings Act 1987, and the particular interest or interests protected by section 6 or section 7 of that Act which would be prejudiced by the holding of the whole or relevant part of the proceedings of the meeting in public are as follows:

Item N°	Reason for protection of interests	Ref NZS 9202:2003 Appendix A
12.1 – 12.12	Protection of privacy of natural persons To carry out commercial activities without prejudice	A2(a) A2(b)ii

**CARRIED**

### **CLOSED MEETING**

#### **Resolution to resume in open meeting**

Moved Councillor Brine                      Seconded Councillor Williams

**THAT** the open meeting resume and the business discussed with the public excluded remains public excluded.

**CARRIED**

**OPEN MEETING**

**NEXT MEETING**

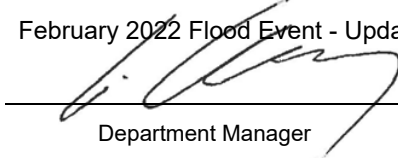
The next meeting of the Utilities and Roading Committee is scheduled for 3.30pm, on Tuesday 22 March 2022.

There being no further business, the meeting closed at 4.40pm.

CONFIRMED

\_\_\_\_\_  
Chairperson  
Councillor Robbie Brine

\_\_\_\_\_  
Date

**WAIMAKARIRI DISTRICT COUNCIL****REPORT FOR INFORMATION****FILE NO and TRIM NO:** DRA-16-03 / 220310034384**REPORT TO:** UTILITIES AND ROADING**DATE OF MEETING:** 22 March 2022**AUTHOR(S):** Emile Klopper, Flood Team Lead  
Caroline Fahey, Water Operations Team Leader  
Kalley Simpson, 3 Waters Manager**SUBJECT:** February 2022 Flood Event - Update on Service Requests**ENDORSED BY:**  
(for Reports to Council,  
Committees or Boards)  
\_\_\_\_\_  
Department Manager  
\_\_\_\_\_  
Chief Executive**1. SUMMARY**

- 1.1 The purpose of this report is to update the Utilities & Roading Committee on the status of the drainage service requests received related to the significant rainfall events that occurred over the 29<sup>th</sup> to 31<sup>st</sup> May 2021, 15<sup>th</sup> December 2021 and 12<sup>th</sup> February 2022.
- 1.2 A total of 598 drainage service requests were received related to these rainfall events. All service requests have been responded to although some require further follow-up maintenance or investigation work as set out in this report.
- 1.3 A Flood Team has been established, comprising of two external consultants and 3 Waters staff with support from the Project Delivery unit. All service requests have been triaged and grouped into focus areas requiring further assessment. A total of 59 areas have been identified for further assessment, which is going to take a number of months to work through.
- 1.4 The focus of this report is on the February 2022 event, however ongoing investigation work is also covered from the May 2021 and December 2021 events which was previously identified in other reports (refer TRIM 210909144676 and 211223205713).

**Attachments**

- i. Flood Team Prioritisation Methodology
- ii. May 2021 Flood Event - Update on Service Requests (TRIM 210909144676)
- iii. Response to December 2021 Flooding Event (TRIM 211223205713)

**2. RECOMMENDATION****THAT** the Utilities & Roading Committee:

- (a) **Receives** report No. 220310034384.
- (b) **Notes** that 598 drainage service requests were received related to the significant rainfall event in May 2021, December 2021 and February 2022, which have all been responded to although some require further maintenance or investigation work.

- (c) **Notes** that there are currently 59 drainage assessments identified as set out in section 4.6 and this is likely to increase as the service requests are worked through.
- (d) **Notes** that a webpage has been setup on the Council's website to provide updates on the status of drainage works underway and targeted information will be sent out to the Waikuku Beach and Kaiapoi communities.
- (e) **Notes** that if further budgets are required for any capital works identified as part of the drainage assessment work, that these will be sought as part of the 2022/23 Annual Plan process.
- (f) **Circulates** this report to the Council and the Community Boards for information.

### 3. **BACKGROUND**

- 3.1 The flood event that occurred on the 12<sup>th</sup> February occurred over an unusually wet period for February, when 200mm of rainfall occurred over a 2 week period in the eastern part of the District. This is approximately one third of the average annual rainfall. The previous 12 months have seen approximately 900mm of rainfall occur, which has only been exceeded twice in the last 20 years. The catchments in the District are currently very saturated and the groundwater levels are high, particularly in the coastal area.
- 3.2 The rainfall was higher in the coastal parts of the district (refer to Table 1 below). The critical duration of 24 hours meant that our larger drains (e.g.: Dudley Drain, Feldwick Drain and McIntosh Drain) and storage system were tested, however there were some more intense periods of rainfall that tested our piped systems and cause blockages at some locations.

Table 1 – Rainfall and Return Period 12<sup>th</sup> February 2022

Site	Total Rainfall	Return Period	Critical Duration	Rainfall For Critical Duration
<b>Kaiapoi</b>	98.4 mm	19 years, 0 months	24 Hours	94.6 mm
<b>Woodend</b>	107.8 mm	23 years, 1 months	24 Hours	101.4 mm
<b>Rangiora</b>	98.8 mm	13 years, 2 months	24 Hours	94.0 mm
<b>Mandeville</b>	68.6 mm	4 years, 1 months	24 Hours	64.2 mm
<b>Summerhill</b>	87.2 mm	5 years, 0 months	24 Hours	87.2 mm
<b>Oxford</b>	68.6 mm	2 years, 6 months	24 Hours	60.6 mm

- 3.3 Figure 1 below shows the total rainfall to have occurred in the previous 12 months. As mentioned above, the current total of over 900mm has only been previously exceeded twice in the last 20 years. It is expected that this figure will increase as we move into winter, which is typically a wetter time of the year in our District.
- 3.4 Figure 2 below shows the current groundwater levels in a monitoring bore M35/0143 to the west of Mandeville. When levels are above 10m below ground level the undercurrents are usually following in the District, which is currently occurring in the No.10 Road and Siena Place areas. It is expected that the undercurrents will continue to flow in the Mandeville area for at least the next two months.
- 3.5 Groundwater levels in the coastal area are also very high at the moment, which is impacting drainage systems, particularly soakage type systems, in Waikuku Beach, Pegasus, Woodend Beach and The Pines Beach.



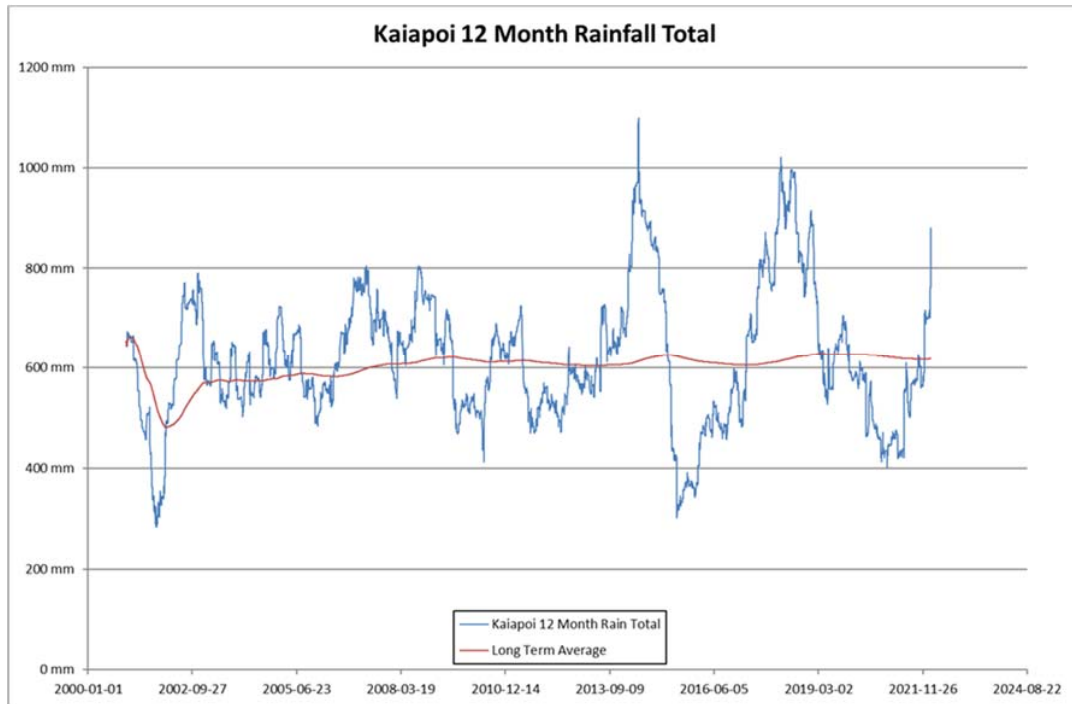


Figure 1 – Rainfall and Return Period 12<sup>th</sup> February 2022

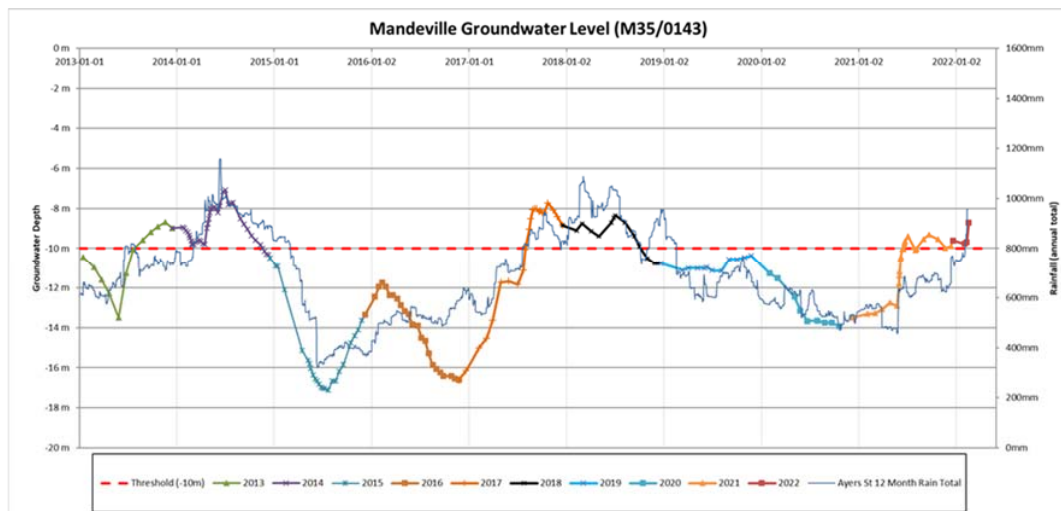


Figure 2 – Mandeville Bore (M35/0143) Groundwater Level

3.6 Analysis of the May 2021 Flood Event and December 2021 Flooding Event is included in previous reports (refer TRIM 210909144676 and TRIM 211223205713 respectively).

**4. ISSUES AND OPTIONS**

4.1. A total of 598 drainage service requests were received related to the three rainfall events. Typically Council receives about 800 drainage related services requests a year, so the 598 service requests therefore equates to approximately three quarters of a year’s requests. Additionally the Drainage team is experiencing an increase in service requests, given the saturated catchments and high groundwater level currently being experienced. There has been nearly 1,500 drainage service requests logged in the past 12 months, which is close to double what we typically receive. This has created a backlog that has to be worked through.

- 4.2. As a result of this backlog, a Flood Team has been established to focus on the flood event related service requests. The Flood Team comprises of two external consultants, working 3 days per week, and 3 Waters staff with support from the Project Delivery Unit.
- 4.3. All service requests have been triaged and grouped into focus areas requiring further assessment. A total of 59 areas have been identified for further assessment (refer Section 4.6 below), which is going to take a number of months to work through.
- 4.4. The 598 service requests have been triaged using a prioritisation methodology (refer Attachment i), which has been workshopped with the 3 Waters team. This included looking at the frequency of service requests, impact on the local network, and economic, environmental and human risk factors, as well as community drivers, low hanging fruit type solutions and discretionary outlier factors.
- 4.5. The spread of the 59 investigations across the District is shown in Table 2 below.

Table 2 – Investigations across the District

Scheme		Investigations – Focus Areas
1	Rangiora Urban	3
2	Kaiapoi Urban	17
3	Coastal Urban - Woodend	3
4	Coastal Urban - Waikuku Beach	4
5	Coastal Urban - Pines Kairaki	3
6	Pegasus	1
7	Oxford Urban	5
8	Ohoka Rural	4
9	Loburn Lea	0
10	Oxford Rural	1
11	Clarkville Rural	0
12	Coastal Rural	4
13	Rural Central	1
14	Cust Rural	2
15	Ashworths Rural	0
16	District Drainage	9
17	Stockwater / Irrigation	0
18	Wastewater	2
<b>Total</b>		<b>59</b>

- 4.6. It is expected that it will take a number of months to address the backlog of service requests and work through the investigations identified. It is noted that all 598 service requests have been responded to or acknowledged, however further follow up is required for those service requests where investigation work is required.

#### **Drainage Assessments**

- 4.7. The following areas have already been identified for further investigation. Some of these investigations are already underway. It is noted that additional localised areas may be added to the list as the service requests are worked through.

##### Rangiora (3)

- Newnham Street
- Ivory Street
- Strachan Place

Kaiapoi (17)

- Beach Road – Underway
- Mansfield Drive – Underway
- Williams Street / Golf Course
- Williams / Dale Street
- Sovereign Boulevard – Underway
- Old North Road
- Bracebridge Street
- Kalmia Place
- Feldwick Drive / Feldwick Drain and PS – Underway
- Williams / Cass Street
- Cridland Street West
- Fuller Street – Underway
- Porter Place / Dudley Drain – Underway
- Wesley Street
- Hamel Lane
- Williams Street / Courtenay Drive – Underway
- Main North Road / Courtenay Stream – Underway

Woodend (3)

- Woodglen Drive
- Norton Place – Underway
- Rangiora Woodend Road

Waikuku Beach (4)

- Broadway Avenue – Underway
- Reserve Road
- Kiwi Avenue
- Swindells Road – Underway

Pines / Kairaki (3)

- Beach Road – Underway
- Batten Grove
- Featherstone Avenue

Pegasus (1)

- Pegasus Main Street

Oxford Urban (5)

- Kowhai Street
- Bay Road
- Queen Street
- Burnett Street
- High Street / Church Street – Underway

Ohoka Rural (4)

- Mill Road / Ohoka village
- Mill Road Ohoka Stream – Underway
- McHughes Road – Underway
- Wilson Drive

Oxford Rural (1)

- Victoria Street – Underway

Coastal Rural (4)

- Main North Road (SH1) / Waikuku village
- MacDonalds Lane
- Stalkers Road / Woodend Beach
- Main North Road (SH1) / North of Pineacres – Underway

Central Rural (1)

- Skewbridge Road

Cust Rural (2)

- Cust Road / Earlys Road – Underway

- 1838-1842 Cust Road

#### District Drainage (9)

- Taaffes Glen Road – Underway
- Toppings Road – Underway
- Smarts Road – Underway
- Steffens Road
- Depot Road – Underway
- Upper Sefton Road
- Dixons Road
- Hodgsons Road
- Mt Thomas Road – Underway

#### Wastewater (2)

- Ranui Mews – Underway
- Kairaki PS – Underway

- 4.8. Regular programme and progress updates will be reported to the Utilities and Roading Committee at future meetings as this work progresses.
- 4.9. As we move into winter, Council staff will closely monitor groundwater levels and track weather events, and will proactively mobilise contractors and deploy temporary pumps and sucker trucks if necessary. Where there are areas of specific concern staff will contact residents directly in advance of any events to advise them of what they can be doing.

#### **Implications for Community Wellbeing**

Some of the locations of flooding have had flooding in the past and some residents have had to make insurance claims for flood related damage. This has a potential implication on community wellbeing for these residents.

- 4.10. The Management Team has reviewed this report and support the recommendations.

## **5. COMMUNITY VIEWS**

### **5.1. Mana whenua**

Te Ngāi Tūāhuriri hapū are not likely to be directly affected by this work. However they will have an interest in any future proposed works that may have an impact on waterways and rivers. Staff will update the Runanga at the executive meetings and where relevant on specific projects engage with MKT.

### **5.2. Groups and Organisations**

Community boards and drainage advisory groups will be updated on the investigation works and any specific future proposed works that come out of the assessment.

### **5.3. Wider Community**

A dedicated webpage was been set up for the May 2021 event and has been recently updated, refer:

<https://www.waimakariri.govt.nz/services/water-services/stormwater/drainage-works>

A community meeting was held for Waikuku Beach residents on 6 July 2021, however not all investigation work has been completed in this area. It is planned to release a targeted update to the Waikuku Beach community, either via a local newsletter flyer or dedicated flyer.

Target consultation is also planned for the Kaiapoi Community via the Shovel Ready programme of works which will address most of the issues experienced in the Dudley Drain, Feldwick Drain and McIntosh Drain catchments.

Additionally proactive communications will be released for what Council is doing and what the community can do as we approach the winter season.

## **6. OTHER IMPLICATIONS AND RISK MANAGEMENT**

### **6.1. Financial Implications**

The costs associated with this investigation work will be charged to existing Drainage asset management and operations budgets. Any physical inspection work such as pipe maintenance and CCTV inspection work will be charged to the maintenance budget for the relevant Drainage scheme.

If further budgets are required for any capital works identified as part of the drainage assessment work, that these will be sought as part of the 2022/23 Annual Plan process.

### **6.2. Sustainability and Climate Change Impacts**

The recommendations in this report do not have sustainability and/or climate change impacts.

### **6.3 Risk Management**

There are no additional risks arising from the adoption/implementation of the recommendations in this report. The improvements implemented as a result of the drainage assessment identified will reduce the overall risk profile to Council and the community.

#### **Health and Safety**

The health and safety risks associated with undertaking this investigation work will be managed by standard Council processes.

## **7. CONTEXT**

### **7.1. Consistency with Policy**

This matter is not a matter of significance in terms of the Council's Significance and Engagement Policy.

### **7.2. Authorising Legislation**

The Local Government Act 2002 sets out the power and responsibility of local authorities, including the Council's role in providing drainage services.

### **7.3. Consistency with Community Outcomes**

The Council's community outcomes listed below are relevant to the actions arising from recommendations in this report.

- *There is a safe environment for all*
- *Core utility services are provided in a timely and sustainable manner*

### **7.4. Authorising Delegations**

The Utilities and Roading Committee is responsible for activities related to Stormwater drainage.

## **Attachment i - Flood Team Prioritisation Methodology**

As part of the prioritisation and/or triaging of the Service Requests (SR), we need to assign a weighting to the request. Some criteria was developed to aid in assigning said weight. The selected criteria aims to balance out the various factors affecting the SR. These criteria and a short description can be seen below.

### **1. Frequency of SR – 2/15**

Various properties experienced some form of flooding during the flood events with subsequent SR's being logged. An assumption was made that certain properties and SR's should be prioritised above others should multiple SR's be logged at that particular property. That being said, it's worth noting that the scale of flooding and potential damage due to flooding doesn't necessarily correlate with the amount and/or frequency of logging a SR. As such the frequency category was allocated a weighting of 2/15.

When reviewing and analysing the frequency of SR's being reported/logged per property, the below was observed.

Frequency SR Logged	Properties	Weighting
1	421	0.5
2	47	1
3	9	1.5
4	2	2
5	1	2
Invalid Address	15	0
Total SR's Logged	570	

From the above table it can be seen that 421 properties logged 1 SR request, 47 logged 2 requests, 9 logged 3 SR's, 2 logged 4 SR's and 1 property logged 5 SR's. The above table also shows how the weighting distribution was split up. From the weighting distribution it can be seen that properties that had an "invalid address" received a "0" weighting. This is due to properties logging a SR without providing an adequate address cannot be prioritised above those that have as WDC staff will have no practical means to investigate the SR.

### **2. Impact on the local network – 3/15**

If, upon further investigation, it becomes apparent that certain SR's would have a significant impact on the larger local network, these SR's need to be prioritised above others as they might indicate a larger problem. Scoring/weighting for the SR's impact on the local network will be done in the following manner:

Scenario	No of Properties Affected	Road Classification Affected	Weighting (x/3)
1	1	Private Roads	0/3
2	>1 and <7	Local Roads	1/3
3	>7 and <15	Collector Roads	2/3
4	>15	Arterial and Strategic Roads	3/3

### **3. Risk – 3/15**

Risk was split up into three categories each with an equal weighting (see below). A simple yes or no answer was seen as sufficient for the purposes of prioritising the SR's.

- Economic Risk – 1/3
  - Does the SR relate to a flooding event which would cause economic damage such as damage to property?

- Human Risk – 1/3
  - Is there a risk to human and/or animal wellbeing?
- Environmental Risk – 1/3
  - Is there an environmental risk?

#### 4. Community drivers – 1/15

Certain locations of flooding have more impact on and awareness among the wider community. Community drivers include locations where flooding issues have been elevated on social media or to elected members, or may involve locations where the community is particularly vulnerable (e.g.: elderly residents). This factor was included to prioritise issues where there is greater community concern in trying to resolve persistent flooding issues.

#### 5. Low hanging fruit – 1/15

Low hanging fruit is defined as SR's that would, with relatively little effort, result in the issue to be resolved. Typical examples include rudimentary maintenance related works or even replacing damaged sumps and/or pipes.

#### 6. Discretionary Outliers – 5/15

If during the investigation and triaging phase certain SR's are identified which, to the best of the Flood Team's professional opinion, has an increased need to resolve, an added 5 points to the prioritisation score can be applied. These discretionary outliers will, per definition, be the minority and should only be allocated for the odd SR that truly needs to be prioritised above all others. This criteria is also intended to act as a pathway to certain SR's that would otherwise fall by the wayside due to a low frequency of submission and other criteria being underrepresented.

Weightings for the above criteria were therefore as follows:

Frequency	2
Impact on local network	3
Risk	3
Community Drivers	1
Low Hanging Fruit	1
Discretionary Outlier	5
Total	15

**WAIMAKARIRI DISTRICT COUNCIL****REPORT FOR INFORMATION**

**FILE NO and TRIM NO:** DRA-16-03 / 210909144676

**REPORT TO:** UTILITIES AND ROADING

**DATE OF MEETING:** 21 September 2021

**AUTHOR(S):** Caroline Fahey, Water Operations Team Leader  
Kalley Simpson, 3 Waters Manager

**SUBJECT:** May 2021 Flood Event - Update on Service Requests

**ENDORSED BY:**  
(for Reports to Council,  
Committees or Boards)

  
\_\_\_\_\_  
Department Manager

  
\_\_\_\_\_  
Chief Executive

**1. SUMMARY**

- 1.1 The purpose of this report is to update the Utilities & Roading Committee on the status of the drainage service requests received during or following the significant rainfall event that occurred over the weekend of 29<sup>th</sup> to 31<sup>st</sup> May 2021 and the following smaller event on 20<sup>th</sup> June 2021.
- 1.2 A total of 269 drainage service requests were received related to the rainfall events. All service requests have been responded to although some require further follow-up maintenance or investigation work as set out in this report.
- 1.3 The focus of this report is on the follow-up work required to address service requests that were lodged but not part of the response and emergency work undertaken which is covered in other reports (refer 210625103046 and 210817135255).

**2. RECOMMENDATION**

**THAT** the Utilities & Roading Committee:

- (a) **Receives** report No. 210909144676.
- (b) **Notes** that 269 drainage service requests were received related to the significant rainfall event in May 2021 and following smaller event in June 2021, which have all been responded to although some require further maintenance or investigation work.
- (c) **Notes** that there are currently 13 drainage assessments identified as set out in section 4.3 and this is likely to increase as the service requests are worked through.
- (d) **Notes** that a webpage has been setup on the Council's website to provide updates on the status of drainage works underway.
- (e) **Notes** that if further budgets are required for any capital works identified as part of the drainage assessment work, that these will be sought as part of the 2022/23 Annual Plan process.
- (f) **Circulates** this report to the Council for information.



### 3. **BACKGROUND**

- 3.1 The flood event that occurred over the weekend of 29<sup>th</sup> to 31<sup>st</sup> May 2021 was a significant rainfall event over a three-day period which resulted in damage to Council's infrastructure assets as outlined in the report presented to Council in July 2021 (refer 210625103046). A smaller scale rainfall event followed on 20<sup>th</sup> June 2021.
- 3.2 The rainfall was higher in the western parts of the district (refer Table 1 below) and was a longer duration event which had more of an impact on river flows, and infrastructure next to rivers, rather than our urban systems.

Table 1 – Rainfall Depths 29<sup>th</sup>-31<sup>st</sup> May 2021

Rainfall Totals				
	29 May (mm)	30 May (mm)	31 May (mm)	Total (mm)
<b>Oxford</b>	6	122.8	37.8	227.6
<b>Rangiora</b>	44.8	99.8	31.4	176
<b>Mandeville</b>	37	72.4	19.4	128.8
<b>Kaiapoi</b>	29.8	78.2	22.6	130.6
<b>Woodend</b>	36	71.2	34.8	142
<b>Summerhill</b>	54.5	105.2	30.8	190.6

- 3.3 The highest rainfall quantities in the Waimakariri District were recorded around the foothills of Oxford and Okuku, with coastal areas showing lower-level rainfall levels. Coastal areas however were affected by swollen river levels and high tides, causing backflow of flood water into lower lying areas.

### 4. **ISSUES AND OPTIONS**

- 4.1. A total of 269 drainage service requests were received related to the rainfall events. Typically Council receives about 800 drainage related services requests a year, so the 269 service requests equates to approximately one third of a year's requests received over a short period of time. This has created backlog that has to be worked through.
- 4.2. The 269 service requests have been classified into one of the following categories:
- 4.2.1. **Maintenance Undertaken** (21) – This relates to either clearing a blockage or maintaining a drain. This may have been undertaken during the event (e.g., typically clearing of blocked sumps) or over the following weeks post event (e.g., programmed drain maintenance).
- 4.2.2. **Maintenance Proposed** (120) – This relates to areas that require more assessment to confirm no maintenance is required or areas where more substantial maintenance works is required (e.g., cleaning of Mounsey Stream), which will require more planning.
- 4.2.3. **Signs Erected** (12) – This relates to requests where the only works requested or undertaken was to erect flooding signs.
- 4.2.4. **Advice Provided** (19) – This relates to either advice being provided on a private drainage issue or the status of our system (e.g., confirming that the water race system had been shut down).
- 4.2.5. **Drainage Assessment** (80) – This relates to service requests where further investigation and assessment is required to determine if there is an underlying issue with the drainage system. These areas are discussed further below.

- 4.2.6. **Roading Investigation** (15) – This relates to service requests where water is running off the road onto private property or roading infrastructure may not be operating adequately (e.g., soak pits).
- 4.2.7. **Subdivision related** (2) – This relates to drainage issues in development areas that are more to do with compliance (e.g.: erosion and sediment control).
- 4.3. It is noted that all 269 service requests have been responded to or acknowledged and closed off.

#### **Drainage Assessments**

- 4.4. The following areas have already been identified for further investigation. It is noted additional localised areas will be added to the list as the service requests are worked through.

##### Kaiapoi

- Kiln Place – Blue Skies Pipeline Investigation (Complete)
- Kaikanui Stream – Capacity Assessment (Underway)
- Cridland Street West – Pipeline condition and capacity assessment

##### Waikuku Beach

- Waikuku Beach Campground – Extension of stopbank (Complete led by Environment Canterbury)
- Swindells Road – Pipeline condition and capacity assessment (Underway)
- Collins Drive – Flapgate upgrade
- Waikuku Beach Road – Flooding assessment
- Kiwi Ave Reserve – Pipeline condition and capacity assessment

##### Oxford

- Church Street / Burnett Street – Drain capacity assessment
- Pearsons Drain (Bay Road & Burnett Street) – Drain capacity review
- Burnett Street – Strategy development
- High Street / Church Street – Drainage assessment (Underway)
- Weka Street – Drainage upgrades (Underway)

- 4.5. The above assessment work is being undertaken by 3 Waters and PDU staff with support from Stantec who have a resource seconded into the Water Operations Team 2 days a week for this work. It is expected that it will take until the end of November to address the backlog of service requests.

#### **Implications for Community Wellbeing**

Some of the locations of flooding have had flooding in the past and some residents have had to make insurance claims for flood related damage. This has a potential implication on community wellbeing for these residents.

- 4.6. The Management Team has reviewed this report and support the recommendations.

## **5. COMMUNITY VIEWS**

### **5.1. Mana whenua**

Te Ngāi Tūāhuriri hapū are not likely to be directly affected by this work. However they will have an interest in any future proposed works that may have an impact on waterways and rivers. Staff will update the Runanga at the executive meetings and where relevant on specific projects engage with MKT.

### **5.2. Groups and Organisations**

There are some drainage related issues that also relate to water races and irrigation races. Where this is the case staff are coordinating with Waimakariri Irrigation Limited.

### 5.3. **Wider Community**

A community meeting was held with the residents of Kiln Place the 11 June 2021 and a community meeting was held for Waikuku Beach residents on 6 July 2021.

A dedicated webpage has been set up, refer:

<https://www.waimakariri.govt.nz/services/water-services/stormwater/drainage-works>

## 6. **OTHER IMPLICATIONS AND RISK MANAGEMENT**

### 6.1. **Financial Implications**

The costs associated with this investigation work will be charged to existing Drainage asset management and operations budgets. Any physical inspection work such as pipe maintenance and CCTV inspection work will be charged to the maintenance budget for the relevant Drainage scheme.

If further budgets are required for any capital works identified as part of the drainage assessment work, that these will be sought as part of the 2022/23 Annual Plan process.

### 6.2. **Sustainability and Climate Change Impacts**

The recommendations in this report do not have sustainability and/or climate change impacts.

### 6.3 **Risk Management**

There are no additional risks arising from the adoption/implementation of the recommendations in this report. The improvements implemented as a result of the drainage assessment identified will reduce the overall risk profile to Council and the community.

#### **Health and Safety**

The health and safety risks associated with undertaking this investigation work will be managed by standard Council processes.

## 7. **CONTEXT**

### 7.1. **Consistency with Policy**

This matter is not a matter of significance in terms of the Council's Significance and Engagement Policy.

### 7.2. **Authorising Legislation**

The Local Government Act 2002 sets out the power and responsibility of local authorities, including the Council's role in providing drainage services.

### 7.3. **Consistency with Community Outcomes**

The Council's community outcomes listed below are relevant to the actions arising from recommendations in this report.

- *There is a safe environment for all*
- *Core utility services are provided in a timely and sustainable manner*

### 7.4. **Authorising Delegations**

The Utilities and Roading Committee is responsible for activities related to Stormwater drainage.

**WAIMAKARIRI DISTRICT COUNCIL****MEMO**

**FILE NO AND TRIM NO:** DRA-16 / 211223205713

**DATE:** 21<sup>st</sup> December 2021

**MEMO TO:** Utilities and Roading Committee

**FROM:** Kalley Simpson, 3 Waters Manager

**SUBJECT:** Response to December 2021 Flooding Event

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**Purpose**

The purpose of this memo is to provide some context to the Committee regarding the recent event, as well as provide information on how the staff are responding.

**What was the event?**

This table shows the details of the December 2021 rainfall event as recorded.

**December 15<sup>th</sup> 2021**

Site	Total Rainfall	Return Period	ARI (%)	Critical Duration	Rainfall For Critical Duration
Kaiapoi	112.2mm	70 years, 2 months	1.4%	12 Hours	91.8mm
Woodend	131.2mm	122 years, 11 months	0.81%	12 Hours	107.8mm
Rangiora	104.8mm	35 years, 10 months	2.8%	12 Hours	88.8mm
Mandeville	66mm	8 years, 1 month	12%	12 Hours	58.4mm
Summerhill	60.2mm	3 years, 1 month	32%	2 Hours	19.0mm
Oxford	40.2mm	0 years, 11 months	110%	12 Hours	29.4mm

To give a comparison, the following are the same details for the May 2021 event.

**May 30<sup>th</sup> 2021**

Site	Total Rainfall	Return Period	ARI (%)	Critical Duration	Rainfall For Critical Duration
Kaiapoi	133.6mm	18 years, 10 months	5.3%	48 Hours	121.8mm
Woodend	147.4mm	24 years, 10 months	4.0%	72 Hours	145.2mm
Rangiora	178.4mm	47 years, 8 months	2.1%	48 Hours	160.4mm
Mandeville	131.0mm	17 years, 1 month	5.8%	48 Hours	120.8mm
Summerhill	195.2mm	46 years, 0 month	2.2%	48 Hours	173.2mm
Oxford	232.2mm	129 years, 4 months	0.8%	72 Hours	229.2mm

Comparison of the two events shows that the December 2021 event was focussed on the coastal area of the District and had slightly less rainfall but over a shorter period of time. A more detailed analysis of both these rainfall events is set out in the attached memo (refer TRIM 211222205116).

### **How did the Council organisation respond?**

The U&R team were monitoring this weather event from early Monday afternoon. It became clear a day or two before the event that there was a significant rainfall expected. In response to this, the staff began contingency planning, and deployed contractors to check pump stations, inlet grills and flap gates, clean out key sumps and drains, and ensure known problem areas were inspected. Temporary pumps and sucker trucks were placed on standby.

On the day and night, the U&R department had teams inspecting the main geographical areas and reporting back on issues. In addition, service requests were being logged and contractor feedback was captured.

The majority of the issues were recorded in Kaiapoi, with lesser issues in Woodend, Waikuku Beach and Rangiora. The west of the District remained relatively trouble free.

Over the period of the 15<sup>th</sup> and 16<sup>th</sup> December, 171 flood event related service requests were received. On that day, and in the following days, the service requests were triaged. Those that were emergency issues were dealt with on the day. Others were collated for further assessment. Note that a number of these requests related to issues that also occurred in the May event. This places greater urgency on understanding the cause and determining solutions.

The Council's Civil Defence Emergency Management team was mobilised and provided coordination throughout the event, however, this is not covered in the scope of this memo.

### **What is still being carried out?**

The service requests have been allocated to individual staff, who have been contacting every submitter to discuss the issue raised, as well as assuring them that their issue has been captured and will be investigated to determine the appropriate response. It is noted that submitters have been advised that it will be several months before the issues have been investigated.

Staff have identified that there is insufficient internal resource to deal with the extra workload, given the current resource levels and workload.

It is intended that a flood response PCG will be set up comprising on internal and external staff in order to respond to this event. Staff have reached out to the external consultants, seeking assistance with a flood response lead engineer and also a flood response assistant engineer. These roles will be funded from existing budgets.

The external roles will be filled in order to investigate and report on the issues, including making recommendations by approx. May 2022. A report will be prepared for the Utilities and Roding Committee at that time making recommendations on further works.

### **Summary**

Staff are aware that this latest event has caused a number of issues around the District, some of which are repeat issues. We are working towards looking into the issues, considering options and reporting to the Committee with recommendations, but this will take time and extra resources. In the meantime, submitters are being contacted to assure them that their concerns are being looked at.

**WAIMAKARIRI DISTRICT COUNCIL**

**MEMO**

**FILE NO AND TRIM NO:** DRA-16 / 211222205116

**DATE:** 22<sup>nd</sup> December 2021

**MEMO TO:** Mayor, Councillors and Community Board Members

**FROM:** Jordan Cathcart, Project Engineer

**SUBJECT:** Rainfall Event Analysis – 15 December 2021

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**1. Purpose**

The purpose of this memo is to provide a summary of rainfall analysis carried out for the storm events of May 30<sup>th</sup> 2021 and December 15<sup>th</sup> 2021 and discuss key characteristics and comparisons between the two events.

**2. Summary**

In the 2021 year the Waimakariri District has experienced two storm events with significant rainfall intensity and volume.

The first event occurred on May 30<sup>th</sup> 2021 and was characterised by a long duration (48-72 hours) with the most significant rainfall located more inland (Oxford, Summerhill and Rangiora). The most critical recurrence interval was in Oxford, of 0.8% (129 years) across 72 hours.

The general flooding mechanism was widespread surface flooding due to primary and secondary stormwater networks at capacity combined with high river flows. In addition, outlet locations near rivers, coastal and main channels experienced flooding due to being unable to discharge due to high downstream water levels.

*Table 1 May 30<sup>th</sup> Rainfall Analysis*

Site	Total Rainfall	Return Period	AEP (%)	Critical Duration	Rainfall For Critical Duration
Kaiapoi	133.6mm	18 years, 10 months	5.3%	48 Hours	121.8mm
Woodend	147.4mm	24 years, 10 months	4.0%	72 Hours	145.2mm
Rangiora	178.4mm	47 years, 8 months	2.1%	48 Hours	160.4mm
Mandeville	131.0mm	17 years, 1 month	5.8%	48 Hours	120.8mm
Summerhill	195.2mm	46 years, 0 month	2.2%	48 Hours	173.2mm
Oxford	232.2mm	129 years, 4 months	0.8%	72 Hours	229.2mm

The second event occurred on December 15<sup>th</sup> 2021 and was characterised by a shorter duration of 12 hours with much more significant rainfall along the coastline (Woodend, Kaiapoi and to some extent Rangiora) rather than inland. The most critical recurrence interval was in Woodend, of 0.8% (122 years).

The general flooding mechanism was confined to the more coastal townships, with surface flooding due to primary stormwater networks at capacity. There was moderate

flows in rivers and main channels, however, was not expected to be causing significant impact on the ability of upstream networks to discharge.

Table 2 December 15th Rainfall Analysis

Site	Total Rainfall	Return Period	AEP (%)	Critical Duration	Rainfall For Critical Duration
Kaiapoi	112.2mm	70 years, 2 months	1.4%	12 Hours	91.8mm
Woodend	131.2mm	122 years, 11 months	0.8%	12 Hours	107.8mm
Rangiora	104.8mm	35 years, 10 months	2.8%	12 Hours	88.8mm
Mandeville	66mm	8 years, 1 month	12%	12 Hours	58.4mm
Summerhill	60.2mm	3 years, 1 month	32%	2 Hours	19.0mm
Oxford	40.2mm	0 years, 11 months	110%	12 Hours	29.4mm

### 3. Annual Exceedance Probability (AEP)

It is important to define the annual exceedance percentage (AEP) of the storm events above. This is also commonly expressed as the 'return period' or 'average recurrence interval'.

This is described by NIWA as being "*The inverse of probability (generally expressed in %), it gives the estimated time interval between events of a similar size or intensity.*"

*For example, the return period of a flood might be 100 years; otherwise expressed as its probability of occurring being 1/100, or 1% in any one year. This does not mean that if a flood with such a return period occurs, then the next will occur in about one hundred years' time - instead, it means that, in any given year, there is a 1% chance that it will happen, regardless of when the last similar event was. Or, put differently, it is 10 times less likely to occur than a flood with a return period of 10 years (or a probability of 10%)."*

The annual exceedance probability is estimated using a comparison to the High Intensity Rainfall Design System (HIRDSv4) developed by NIWA. HIRDSv4 uses a regionalised index-frequency method to allow for estimates of high intensity rainfall at any location throughout New Zealand for several return periods and durations. Although this tool is primarily used for use with designing infrastructure, an estimate of the expected recurrence interval of a storm post-event can be used as an indication of the severity.

The data used for the development of this tool is based on historic rainfall records in the area. When considering significant events such as experienced this year, there is comparatively little data to compare to i.e. for an event >100 years there is not necessarily rainfall records for the past 100 years in the area of interest. For this reason statistical analysis is relied upon to calculate the expected recurrence interval for events such as these.

As the HIRDS is developed additional rainfall records will form part of the dataset and influence future iterations.

Another important consideration is that the statistical analysis and corresponding annual exceedance probability is dependent on the location within the district. For example, 100mm of rainfall over 12 hours will return a different AEP for Oxford and Kaiapoi.

#### 4. **Event Comparison**

Although there are some similarities when viewing the annual exceedance probability in isolation, the rainfall experienced was quite different between the two events.

Key differences between these rainfall events can be grouped into the following.

- Location of rainfall
- Critical duration of the storm
- Time of year

Please note this is not considered to be an exhaustive list of factors affecting rainfall response.

##### 4.1. Rainfall Location

As presented in Tables 1 and 2, there can be significant variation across the district, with the location in which the bulk of the rainfall occurs having an impact on the response of the system.

For the May event, widespread rainfall fell across the district with higher intensity in the upper catchments of Oxford and Okuku. This mobilised surface runoff across all catchments, and affected the ability of downstream networks to discharge due to high water levels in main drainage channels and rivers.

This was not the case in the December event as relatively low amounts of rainfall fell inland, meaning there was a larger capacity available in river channels.

##### 4.2. Critical Duration

###### 4.2.1. Rainfall Critical Duration

The critical duration of a rainfall event represents the period of time in which the AEP/return period is most significant. This may not necessarily represent the full duration if there were periods of lighter, or no, rain.

###### 4.2.2. Catchment Critical Duration

The critical duration of a catchment represents the storm duration for a return period that will generate the largest peak runoff from that catchment.

This is the time taken for runoff to travel the length of the catchment and is generally related to catchment size and land cover. An example is that, for any given return period, the critical duration for an urban street or neighbourhood would typically be less than 1 hour. At a town level this is in the order of 6 hours and for larger catchments such as the Ashley River is around 24-48 hours.

Longer duration rainfall events accumulate a larger volume of rainfall, at a lower intensity compared to a shorter duration storm of the same return period. A longer duration can influence the capacity of the stormwater and land drainage at a much broader scale as there is more time for larger catchments to reach peak runoff whilst still raining.

This can be complex when considering an area of the district that is affected by smaller urban catchments and larger rural catchments, for example Rangiora and Kaiapoi with upstream rural catchments to the west. In addition, the ability for the Kaiapoi urban network to discharge to the river network can be significantly restricted when water levels are high.



This was experienced in May where the river levels and main drainage channels across the district were swollen due to the significant rainfall volume across a long period and large rural catchments.

In December the duration was shorter and river flows reached peak levels after the highest intensity rainfall had passed, meaning that surface flooding was not compounded by river levels.

Longer duration events are also more likely to coincide with one, or several, high tide cycles as was the case for the May event.

#### 4.3. Seasonal Variation / Antecedent Conditions

The time of year affects the ability for infiltration of stormwater to ground (antecedent moisture condition). The likelihood of higher groundwater levels, and preceding rainfall events affecting the antecedent moisture conditions are higher in the winter (May event) than summer (December event).

In May, due to a combination of antecedent conditions and a long duration event the infiltration or 'storage' had been exceeded causing a larger proportion of rainfall to be directed to surface flow. The effect of infiltration has less of an impact within urban areas with large impervious areas.

#### 4.4. Event Summary

##### 4.4.1. May 30<sup>th</sup> 2021

- Widespread surface flooding due to primary and secondary stormwater networks at capacity
- Long duration and high intensity rainfall in upper catchments caused high river flows
- High tide coinciding with peak river and rainfall
- Outlet locations near rivers, coastal and main channels experienced flooding due to being unable to discharge due to high downstream water levels.

##### 4.4.2. December 15<sup>th</sup> 2021

- Rainfall localised around coastal townships, with surface flooding within these areas
- Moderate flow in rivers and main channels
  - o Low rainfall in upper catchments mean less inflow to rivers
  - o Peak river flows after periods of most intense rainfall had passed
- High tide didn't coincide with peak rainfall
- Outlet ability to discharge was not significantly affected by downstream water levels.

## 5. **Conclusion**

Rainfall analysis forms an important tool to provide context to the severity of rainfall at various locations around the district, however, it is critical to consider all aspects of a rainfall event such as duration, location and antecedent conditions.

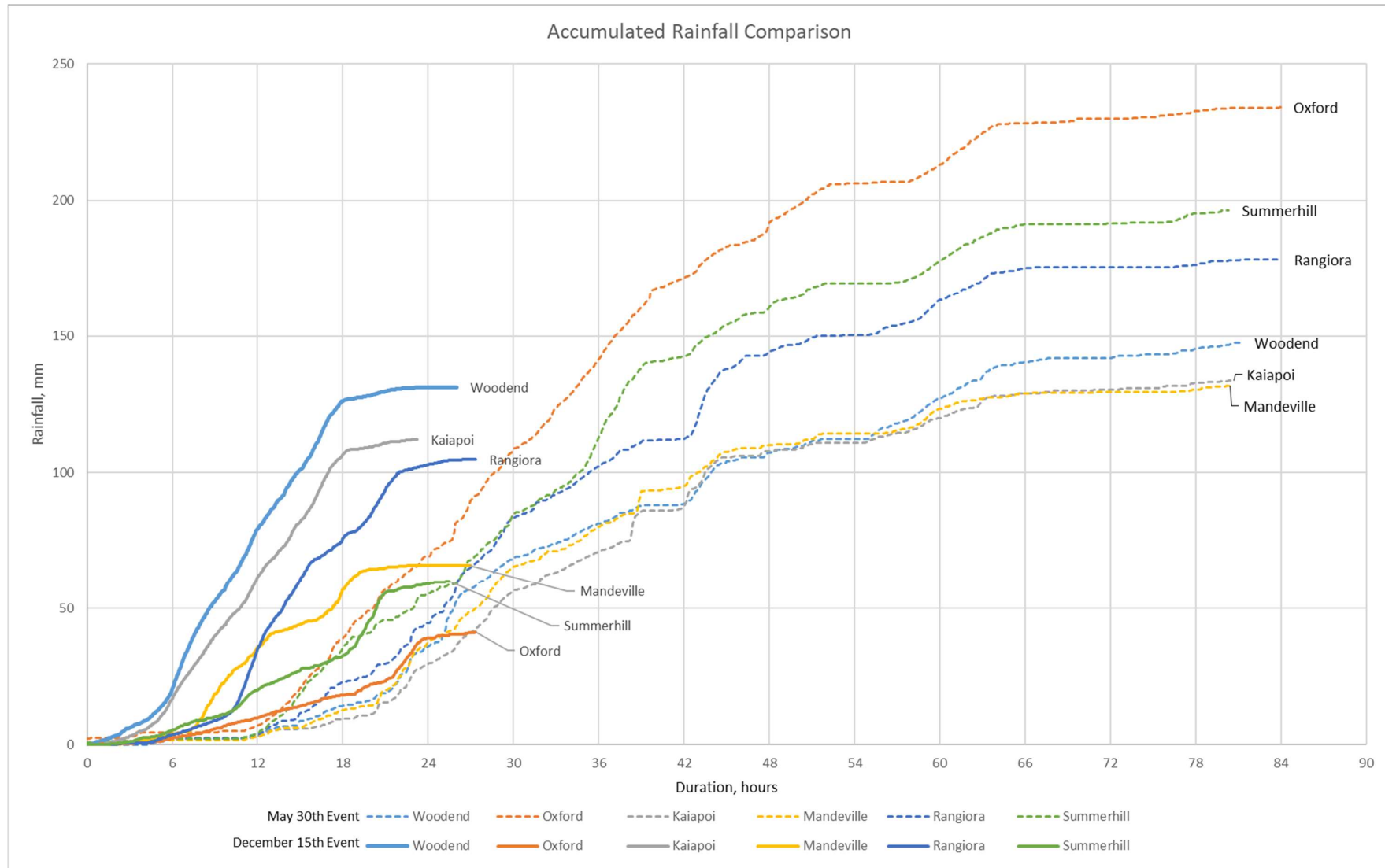
Although the May 30<sup>th</sup> and December 15<sup>th</sup> storms were estimated to have a return period of >100 years (<1%) in Oxford and Woodend respectively, the ability of the primary and secondary networks to convey stormwater was characterised very differently.

**6. References**

NIWA, <https://niwa.co.nz/natural-hazards/faq/what-is-a-return-period>

HIRDSv4 Technical Report, NIWA, August 2018,  
[https://niwa.co.nz/sites/niwa.co.nz/files/2018022CH\\_HIRDSv4\\_Final.pdf](https://niwa.co.nz/sites/niwa.co.nz/files/2018022CH_HIRDSv4_Final.pdf)

7. **Appendix A: Accumulated Rainfall**



**WAIMAKARIRI DISTRICT COUNCIL****REPORT FOR DECISION**

**FILE NO and TRIM NO:** WAT-03 / EXT-74 / 220309033938

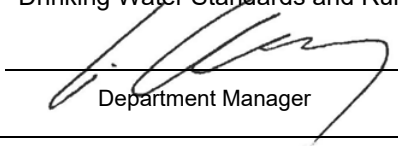
**REPORT TO:** UTILITIES AND ROADING COMMITTEE

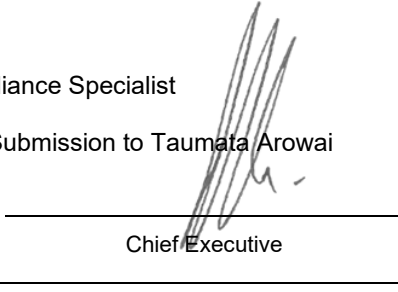
**DATE OF MEETING:** 22 March 2022

**AUTHOR(S):** Colin Roxburgh, Water Asset Manager  
Hayley Proffit, Water Safety and Compliance Specialist

**SUBJECT:** Drinking Water Standards and Rules; Submission to Taumata Arowai

**ENDORSED BY:**  
(for Reports to Council,  
Committees or Boards)

  
Department Manager

  
Chief Executive

**1. SUMMARY**

- 1.1. This report is to request the Council's endorsement of the proposed submission to Taumata Arowai on new Drinking Water Standards and Rules that have been proposed, and released for public consultation.
- 1.2. New Drinking Water Standards and Rules were proposed following the Havelock North Drinking Water contamination event in 2016, and subsequent inquiry. Since that time a new Drinking water regulator, Taumata Arowai, have been established, who have drafted proposed new Rules and Standards, which were released for public consultation on the 17<sup>th</sup> of January, with consultation closing on the 28<sup>th</sup> of March.
- 1.3. Key changes include:
- 1.3.1. The concept of secure groundwater no longer exists in the draft new standards.
- 1.3.2. The standards include the provision of chlorine, giving effect to the requirements of the Water Services Act, whereby all supplies will have chlorine unless they gain an exemption.
- 1.3.3. There are increased ongoing monitoring and more comprehensive sampling requirements, and more quality assurance rules, compared to the previous version.
- 1.3.4. There are significantly more reporting requirements, and the Rules more prescriptive in terms of what is expected and required of water suppliers.
- 1.4. Staff have reviewed and provided feedback on the updated standards, aesthetic values, quality assurance rules, and acceptable solutions for both spring and bore water supplies and rural agricultural supplies.

**Attachments:**

- i. Covering letter to Taumata Arowai (220309034014)
- ii. Submission on Drinking Water Standards (220309034002)
- iii. Submission on Quality Assurance Rules (220309034003)
- iv. Submission on Aesthetic Values (220309034006)
- v. Submission on Acceptable Solution for Spring and Bore Water (220309034010)
- vi. Submission on Acceptable Solution for Rural Agricultural Supplies (220309034013)

## 2. **RECOMMENDATION**

**THAT** the Utilities and Roading Committee:

- (a) **Receives** Report No. 220309033938.
- (b) **Notes** that Taumata Arowai have prepared a suite of new documents associated with an updated version of the Drinking Water Standards for New Zealand, which they are seeking feedback on, with submissions closing on the 28<sup>th</sup> of March 2022, with relevant documents reviewed by staff and submissions prepared.
- (c) **Endorses** the following submissions prepared by staff to be submitted to Taumata Arowai, in response to the consultation questions asked:
  - i. Covering letter to Taumata Arowai
  - ii. Submission on Drinking Water Standards
  - iii. Submission on Quality Assurance Rules
  - iv. Submission on Aesthetic Values
  - v. Submission on Acceptable Solution for Spring and Bore Water
  - vi. Submission on Acceptable Solution for Rural Agricultural Supplies
- (d) **Notes** that the submissions will be made public by Taumata Arowai.

## 3. **BACKGROUND**

- 3.1. New Standards and Rules were proposed following the Havelock North Drinking Water contamination event in 2016, and subsequent inquiry.
- 3.2. As of 15 November 2021, a new Drinking water regulator, Taumata Arowai, have been established, with one of their functions being to prepare and consult on a revised version of the Drinking Water Standards for New Zealand.
- 3.3. Taumata Arowai have drafted proposed new Rules and Standards, which were released for public consultation on the 17<sup>th</sup> of January, with consultation closing on the 28<sup>th</sup> of March.
- 3.4. It is noted that the Water Services Act, which sits above the Standards, is the piece of legislation requiring all water suppliers to have a residual disinfectant (chlorine). While the proposed new Standards includes the provision of chlorine, it is the Act that makes the use of chlorination mandatory, rather than the Standards. Therefore, there is limited opportunity through this consultation process to pass on to Taumata Arowai the community's preference for chlorine free water. This however was made clear in the Council's submission on the Water Services Bill, which became the Water Services Act.
- 3.5. There are two key items that have been the focus of this submission:
  - 3.5.1. The content of the Standards and Rules themselves, giving thought to the practicality of the proposed changes, and to ensure that the changes proposed will achieve their desired result of improving safety of the water delivered.
  - 3.5.2. To provide feedback on the transition timeframes. It has been signalled by Taumata Arowai that water suppliers should expect to be required to comply with the new Standards from July 2022, even though the final Standards likely won't be confirmed until some stage within May 2022, following consultation. Given the extent of changes required not only to operational monitoring rules, as well as the types of treatment required for different source types, this lead in time is considered impractical. The practicalities of transitioning are also a key focus of the submission.

#### 4. **ISSUES AND OPTIONS**

- 4.1. In preparing submissions to Taumata Arowai, 3 Waters staff have reviewed the material provided, consulted with some neighbouring council staff, and consulted with Water Unit staff from an operational perspective.
- 4.2. There is a large volume of feedback provided, with 6 different consultation documents each with a series of questions that have been reviewed and responded to. Not each point is covered in this report, however some key points are presented to highlight these to the Council:

##### Aesthetic Values

- 4.3. Aesthetic values are parameters that impact upon the taste, smell, clarity or feel of water, but which do not have a health impact.
- 4.4. Under the Health Act and previous revision of the Drinking Water Standards, there was no requirement to meet these values, and they were simply included as a guideline to minimise any aesthetic issues.
- 4.5. There is a significant change, in that under the Water Services Act water suppliers must take reasonably practicable steps to meet these aesthetic values. This change makes these values far more significant, as for any supply that does not meet them, upgrades could be triggered to achieve compliance. Key submission points have been made around two aesthetic values:
  - 4.5.1. The pH of water, which has a proposed lower limit of 7. Some supplies can have pH less than this, without any known aesthetic issue. Without amendment, upgrades could be made to raise the pH of the water, with no clear aesthetic improvement or benefit being achieved. This would result in money and resources being directed to areas without achieving a meaningful if any benefit, which could detract from areas that would benefit from further investment.
  - 4.5.2. Lower limit of chlorine. The aesthetic values includes a lower limit of chlorine of 0.3 mg/L. It is understood why an upper limit may be required for aesthetic reasons for chlorine, but unclear why there is a need for a lower limit, as the potential to create taste issues with water due to too little chlorine is unclear

##### Drinking Water Standards

- 4.6. The Drinking Water Standards themselves set out the maximum acceptable value (MAV) of any given parameter that may be present in drinking water.
- 4.7. In general, the values published in the standards are based on international World Health Organisation (WHO) values, and therefore there is little to submit on.
- 4.8. The key submission point included is that there is no differentiation within the standards as to whether a limit given causes health issues even with acute exposure (for example with E. coli), or whether there are only health issues expected if there were to be a lifetime of exposure for example. This distinction is critically important in determining what level of response is necessary if a MAV is breached. For parameters with acute impacts, the response must be immediate and significant, for long term exposure values, the response can be more considered and gradual, while still managing the public health risk.

##### Quality Assurance Rules

- 4.9. The following key submission points have been made:

- 4.9.1. Reporting on Assurance Rules: There are a number of new Quality Assurance Rules, which suppliers are expected to comply with and report on. It is however unclear in what format this reporting may be expected to take place, and what level of detail may be required to be included. It is submitted that the level of reporting needs to be made clearer, and that the frequency of reporting reduce from monthly to 3 monthly, to reduce the overall reporting burden, and ensure efforts can be focused on making meaningful improvements, rather than excessive reporting requirements being fulfilled.
- 4.9.2. Distribution System Monitoring: The Quality Assurance Rules require that FAC (chlorine) and pH be monitored daily within the distribution system for supplies with populations of 50 people, right up to populations of 20,000. This is a significant increase in monitoring in the distribution system, particularly given that many of the supplies at the smaller end of this scale previously required only monthly E. coli tests (i.e. shifting from monitoring once per month, to once per day). This is considered to be overly onerous, and not proportional to the risk presented, particularly for high quality sources with little chlorine demand. A reduction in this sampling rate is recommended.
- 4.9.3. Transition Timeframes: While changes to the Quality Assurance Rules are generally supported where they improve the safety of water delivered, a key point that needs further consideration is the transition from the current standards to the new revision. It has been signalled by Taumata Arowai that following consultation, the new standards may be confirmed in May 2022, and required to be complied with from July 2022. The proposed submission recommends a greater lead in period, with particular reference to a couple of key areas:
- Increased Sampling Requirements: As noted above, there are significantly increased sampling requirements across a number of parameters. These will require either additional staff to take the samples, additional monitoring stations to measure quality continuously, or both. Whichever of these pathways is followed (depending on what is required in the final adopted version of the standards), a significant number of months will be required to either recruit the required staff, or design, tender, install and commission the required equipment, across all schemes.
  - Changes to Protozoal Treatment Requirements: In the new Rules, either the Class 1 Source requirements must be met, and no protozoal treatment required, or protozoal treatment must be put in place. This will require either a significant investment programme in upgrading bore heads to meet the Class 1 requirements, or a programme installing UV treatment across all the relevant supplies. Each supply will also need a bacterial treatment barrier in place. If chlorine treatment is to be avoided, UV must be in place as the bacterial treatment barrier, and therefore would be used as the protozoal treatment barrier as well. However, if chlorine treatment is required anyway (due to an unsuccessful chlorine exemption application), then chlorine could be the bacterial treatment barrier, and upgrading bore heads would be preferential to installing UV treatment across all relevant supplies to achieve protozoal compliance.

Whichever pathway eventuates (once the outcome of chlorine exemption applications is known) will likely require in the order of one to two years to attain a position where full compliance with the updated Standards and Rules is achieved. The currently signalled transition period does not allow for this complexity of decision making process and resultant work streams that will follow.

- 4.9.4. Acceptable Solution for Spring and Bore Water: There is an acceptable solution proposed by Taumata Arowai with a pre-defined treatment system that can be used for populations up to 500 to achieve compliance, without following the full suite of Quality Assurance Rules. This solution involves cartridge filtration, UV treatment and chlorination. It is considered that while this solution may be appropriate towards the upper limit of the population threshold, a scaled back version is required for the <50 population size. Currently, there is no such distinction, and some of the requirements within this Acceptable Solution are considered overly onerous for some of the very small supplies that are covered by the Water Services Act. This could put a heavy compliance burden on these small (and generally private) water suppliers.

Acceptable Solution for Rural Agricultural Supplies: There is an acceptable solution proposed by Taumata Arowai for rural supplies where the majority of water is for non-domestic purposes, whereby treatment can be provided at each house, or group of houses, rather than centralised treatment being provided.

While the potential need for end-point treatment is understood with the very large number of small and private water suppliers picked up by the Water Services Act, it is proposed that the use of end-point treatment should be an option not only in a rural environment where a certain proportion of water is used for non-domestic purposes, but rather be an option available to any small supply where centralised treatment may not be appropriate. The “rural-agricultural” prerequisite seems an unnecessary pre-cursor for end-point treatment to be used.

#### **Implications for Community Wellbeing**

- 4.10. There are implications on community wellbeing by the issues and options that are the subject matter of this report. All community members on a public water supply have an expectation of receiving drinking water that is safe. The Drinking Water Standards and associated Quality Assurance Rules set out how water suppliers are to achieve and demonstrate this.
- 4.11. The Management Team has reviewed this report and support the recommendations.

### **5. COMMUNITY VIEWS**

#### **5.1. Mana whenua**

Te Ngāi Tūāhuriri hapū are likely to be affected by, or have an interest in the subject matter of this report. Staff are looking to prepare a proposal as to how Te Mana o to Wai will be given affect to with respect to the Water Services Act, and the provision of safe drinking water, and will then seek feedback from Te Ngāi Tūāhuriri on this proposal.

#### **5.2. Groups and Organisations**

There are not groups and organisations likely to be affected by, or to have an interest in the subject matter of this report.

#### **5.3. Wider Community**

The wider community is likely to be affected by, or to have an interest in the subject matter of this report. As noted under Implications for Community Wellbeing, the wider community is reliant upon receiving safe and reliable drinking water, and compliance with the Drinking Water Standards and associated Quality Assurance Rules are a key part of achieving this.

### **6. OTHER IMPLICATIONS AND RISK MANAGEMENT**

#### **6.1. Financial Implications**

There are financial implications of the decisions sought by this report. Some parts of the draft Quality Assurance Rules have been allowed for within current budgets (i.e. the provision of UV treatment, and some additional water quality monitoring stations), but



depending on what is ultimately adopted, and what timeframe is required for compliance, there may be some items for which additional budget is required.

This budget is partially included in the Annual Plan/Long Term Plan, however until the final Drinking Water Standards and Quality Assurance Rules are finalised, following the consultation process, the precise implications are unable to be quantified.

#### 6.2. **Sustainability and Climate Change Impacts**

The recommendations in this report do not have direct sustainability and/or climate change impacts. The ability to continue to supply safe and reliable water is however affected by climate change, with changing weather patterns having the potential to affect drinking water sources both in terms of the availability of water, and quality.

#### 6.3 **Risk Management**

There are risks arising from the adoption/implementation of the recommendations in this report. If the Drinking Water Standards and Quality Assurance Rules are adopted as they are written, and compliance is expected within the timeframes currently signalled, it may take approximately 2 years until all supplies meet the full requirements.

#### 6.3 **Health and Safety**

There are not health and safety risks arising from the adoption/implementation of the recommendations in this report.

### 7. **CONTEXT**

#### 7.1. **Consistency with Policy**

This matter is not a matter of significance in terms of the Council's Significance and Engagement Policy.

#### 7.2. **Authorising Legislation**

The Water Services Act is relevant in this matter.

#### 7.3. **Consistency with Community Outcomes**

The Council's community outcomes are relevant to the actions arising from recommendations in this report.

In particular:

- There is a healthy and sustainable environment for all;

#### 7.4. **Authorising Delegations**

The Utilities and Rooding Committee is the appropriate Council committee to approve this submission to Taumata Arowai.

Our Reference: EXT-74 / 220309034014

28 March 2022

Taumata Arowai

<https://www.taumataarowai.govt.nz/httpste-puna-korero-taumataarowai-govt-nz/>

## WAIMAKARIRI DISTRICT COUNCIL SUBMISSION TO TAUMATA AROWAI ON DRINKING WATER STANDARDS CONSULTATION

### 1. Introduction

- 1.1. The Waimakariri District Council (the Council) thanks Taumata Arowai for the opportunity to provide comment on the proposed new Drinking Water Standards, Quality Assurance Rules, Aesthetic Values, Acceptable Solutions, and Environmental Performance Measures.
- 1.2. The Council supports the Taumata Arowai's intent to ensure all New Zealanders have access to safe drinking water, which is consistent with our overarching intention as a water supplier.
- 1.3. We note that these Rules and Standards include the provision of residual disinfection (chlorine) in all supplies, which we note is opposed by the majority of our communities. We do acknowledge however that it is the Water Services Act, rather than these Standards and Rules, that create this requirement for residual disinfection and that this consultation process is therefore not the correct avenue to voice these views regarding chlorine, which we have already done as part of our submission to the Water Services Bill.
- 1.4. We have provided responses to questions asked in the consultation material on the following topics, which we have uploaded to the relevant portals on your website:
  - i. Submission on Drinking Water Standards
  - ii. Submission on Quality Assurance Rules
  - iii. Submission on Aesthetic Values
  - iv. Submission on Acceptable Solution for Spring and Bore Water
  - v. Submission on Acceptable Solution for Rural Agricultural Supplies
  - vi. Submission on Drinking Water Network Environmental Performance Measures
- 1.5. In addition to the full submission points included within the respective documents, we wish to draw your attention to several areas of concern which we believe are of particular significance within each of the documents we've reviewed:
  - **Drinking Water Standards:** It should be clear with each value that has a maximum acceptable value (MAV) whether this is a short term or long term health risk, to assist with decision making processes should a MAV ever be exceeded.
  - **Aesthetic Values:** There are two key parameters that rightly have upper limits, but also have lower limits included that do not appear to be of

significance to the aesthetic qualities of water, and which are inconsistent with values for the same parameters in the Quality Assurance Rules. These are the lower limits of pH and chlorine, which we submit should not be part of the Aesthetic Values, and only included in the Quality Assurance Rules.

- **Quality Assurance Rules:** There are some water quality monitoring requirements that are not considered to adequately give effect to the Water Services Act requirement to be “proportionate to scale, complexity and risk”, with similar monitoring requirements for some parameters in the distribution system whether the supply has 50 people on it, or 19,999. This point is made in particular with reference to the daily checks of parameters such as pH, chlorine and turbidity.
- **Acceptable Solution for Spring and Bore Water:** It is proposed that a scaled back version of this acceptable solution be created for a <50 population band (i.e. using similar population bands as for on-demand water supplies). This would also assist with giving effect to the Water Services Act requirement to be “proportionate to scale, complexity and risk”, with some of the requirements arguably appropriate for the 50 – 500 population bracket, but not for the < 50 bracket. This is of particular significance given the <50 population band will likely represent the greatest number of water supplies in the country, with a very large number of very small supplies covered by the Water Services Act.
- **Acceptable Solution for Rural Agricultural Supplies:** It is proposed that the use of end-point treatment should be an option not only in a rural environment where a certain proportion of water is used for non-domestic purposes, but rather be an option available to any small supply where centralised treatment may not be appropriate. The “rural-agricultural” prerequisite seems an unnecessary pre-cursor for end-point treatment to be used.
- **Transition Timeframe:** While we agree with the need for change to be made in a timely manner, it is unrealistic to expect and require that water suppliers make all the required changes to bore heads, treatment systems, and monitoring programmes in between the months of May (when it is signalled the new Standards and Rules will be finalised) and 1 July of this year (when it is signalled that compliance would be expected from). A staged timeframe for compliance with new requirements should be developed in coordination with the industry to ensure there are realistic and achievable expectations that water suppliers can work towards.

In addition to the points made above, there are detailed submission points made within each document we've uploaded, which we trust will be given careful consideration prior to adoption of the final set of requirements. We appreciate this is a highly complex topic, we commend you for the work you've put into the preparation of this material to date, and hope that the required level of care be put into considering each submission point before the final version is adopted.

Council would again like to thank the Taumata Arowai for the work that has gone into the development of these Standards, Rules and Solutions, and for the opportunity to provide this submission.

For any clarification on points within this submission please contact Colin Roxburgh – [colin.roxburgh@wmk.govt.nz](mailto:colin.roxburgh@wmk.govt.nz); Mobile 021 481 873.

Yours sincerely

Dan Gordon

**Mayor**

**Waimakariri District Council**

## Submission on New Zealand Drinking Water Standards

Name	Colin Roxburgh
Organisation (if applicable)	Waimakariri District Council

### Relevant documents;

[Drinking Water Standards - Summary \(181 KB, PDF\)](#)

[Drinking Water Standards – Summary of the proposed changes \(175 KB, PDF\)](#)

[Drinking Water Standards \(258 KB, PDF\)](#)

## Responses

You do not need to answer all the questions if you are only interested in some aspects of the consultation.

### Process used to review MAVs

The development process of the proposed Drinking Water Standards included a review of drinking water MAVs by ESR to ensure they were aligned with any changes that the World Health Organisation (WHO) have made to their guideline MAVs. Most of the MAVs are based on WHO guideline values which are calculated for a 60kg adult. The MAVs have been recalculated on for a 70kg adult, a weight closer to the average body weight of adults in New Zealand. For some MAVs this results in a small change to the MAV though for others it doesn't make a difference as the results are rounded.

ESR also considered whether MAVs were required for determinands that have never been detected in water in New Zealand. The Cawthron Institute was engaged to review the MAVs for cyanotoxins as this is one of their areas of expertise. The development process then included external technical input and review by reference groups established by Taumata Arowai. The reference groups included representatives from small water suppliers, Māori communities and local authorities water suppliers. The revised draft standards were then reviewed by the Ministry of Health.

Do you agree that the process used to review the MAVs for drinking water standards was appropriate?

Yes

Do you agree that the proposed MAVs will support the objective of ensuring that drinking water suppliers provide safe drinking water to consumers?

Yes

You do not need to answer all the below questions if you are only interested in some aspects of the consultation.

Do you agree with the proposed MAV for Aluminium?

Existing MAV - No MAV exists

Proposed MAV - 1 (mg/L)

Yes, based on WHO value makes sense.

**Do you agree with the proposed MAV for Barium?**

Existing MAV - 0.7 (mg/L)  
Proposed MAV - 1.5 (mg/L)

Yes, based on WHO value makes sense.

**Do you agree with the proposed MAV for Boron?**

Existing MAV - 1.4 (mg/L)  
Proposed MAV - 2.4 (mg/L)

Yes, based on WHO value makes sense.

**Do you agree with the proposed MAV for Molybdenum?**

Existing MAV - 0.07 (mg/L)  
Proposed MAV – No MAV is proposed

No comment in response to this, insufficient knowledge as to what the previous value was based on.

**Do you agree with the proposed MAV for Nitrite, long term?**

Existing MAV - 0.2 (mg/L)  
Proposed MAV – No MAV is proposed

Yes, it makes sense not to include a value where the uncertainty is too great, as is indicated.

**Do you agree with the proposed MAV for Perchlorate?**

Existing MAV - No MAV listed  
Proposed MAV – 0.08 (mg/L)

Yes.

**Do you agree with the proposed MAV for Selenium?**

Existing MAV - 0.01 (mg/L)  
Proposed MAV - 0.04 (mg/L)

Yes.

**Do you agree with the proposed MAV for Uranium?**

Existing MAV - 0.02 (mg/L)  
Proposed MAV - 0.03 (mg/L)

Yes.

**Do you agree with the proposed MAV for Anatoxins?**

Existing MAV

1. Anatoxins - a 0.006 (mg/L)
2. Anatoxins – a(s) 0.001 (mg/L)

Proposed MAV - 0.006 (m/L)

Yes, this appears to have simplified this parameter.

**Do you agree with the proposed MAV for Atrazine?**

Existing MAV - 0.002 (mg/L)  
Proposed MAV - 0.1 (mg/L)

Yes.

**Do you agree with the proposed MAV for Azinphos-methyl?**

Existing MAV - 0.004 (mg/L)  
Proposed MAV - 0.1 (mg/L)



Yes, it is trusted that the ESR advice is sound.

**Do you agree with the proposed MAV for Cylindrospermopsins?**

Existing MAV - 0.001 (mg/L)

Proposed MAV - 0.0008 (mg/L)

Yes.

**Do you agree with the proposed MAV for Homoanatoxin-a?**

Existing MAV - 0.002 (mg/L)

Proposed MAV – No MAV is proposed

Yes.

**Do you agree with the proposed MAV for Hydroxytriazine?**

Existing MAV – No MAV exists

Proposed MAV - 0.3 (mg/L)

Yes.

**Do you agree with the proposed MAV for MCPA?**

Existing MAV - 0.002 (mg/L)

Proposed MAV - 0.8 (mg/L)

Yes.

**Do you agree with the proposed MAV for Metalaxyl?**

Existing MAV - 0.1 (mg/L)

Proposed MAV - 0.3 (mg/L)

Yes.

**Do you agree with the proposed MAV for N-nitrosodimethylamine?**

Existing MAV - No MAV exists  
Proposed MAV - 0.0001 (mg/L)

Yes.

**Do you agree with the proposed MAV for PFHxS + PFOS?**

Existing MAV – No MAV exists  
Proposed MAV - 0.00007 (mg/L)

Yes.

**Do you agree with the proposed MAV for PFOA?**

Existing MAV – No MAV exists  
Proposed MAV - 0.00056 (mg/L)

Yes.

**Do you agree with the proposed MAV for Sodium dichloroisocyanurate (as cyanuric acid)?**

Existing MAV – No MAV exists  
Proposed MAV - 40 (mg/L)

Yes.

**Do you agree with the proposed MAV for Trichloroethene?**

Existing MAV - 0.02 (mg/L)  
Proposed MAV - 0.03 (mg/L)

Yes.

**Do you agree with the proposed MAV for 1080?**

Existing MAV – Long term MAV of 0.0035 (mg/L)  
Proposed MAV – Short term MAV 0.035 (mg/L)

Yes.

**Do you agree with the proposed MAV for Total alpha activity?**

Existing MAV – 1.0  
Proposed MAV - 0.5

Yes.

**Do you agree with the proposed MAV for Total beta activity?**

Existing MAV -0.5  
Proposed MAV – 1.0

Yes.

#### **Additional Feedback**

There is no clarity for the vast majority of parameters in the standards as to whether these represent a health risk from long term exposure, or an acute health risk. This information is critically important in determining next steps should a MAV ever be exceeded, and rather than water suppliers urgently trying to access this information after an exceedance, it would improve decision making and responses, and therefore public safety by having this differentiated and defined in the standards. Presumably when the WHO undertake studies to determine a recommended limit, they are either thinking from a long term or short term impact perspective, so it would make sense to research and publish this information.

## Submission on Drinking Water Quality Assurance Rules

Name	Colin Roxburgh
Organisation (if applicable)	Waimakariri District Council

### Relevant documents:

[Drinking Water Quality Assurance Rules - Summary \(188 KB, PDF\)](#)

[Drinking Water Quality Assurance Rules - Proposed changes \(163 KB, PDF\)](#)

[Drinking Water Quality Assurance Rules \(972 KB, PDF\)](#)

[Guidance to determine water supply populations \(194 KB, PDF\)](#)

[Description of Drinking Water Supply Types \(143 KB, PDF\)](#)

## Responses

**You do not need to answer all the questions if you are only interested in some aspects of the consultation.**

**Do you agree that the proposed Drinking Water Quality Assurance Rules support the objective of ensuring that drinking water suppliers provide safe drinking water to consumers?**

Agree. In general support the multiple barrier to contamination approach to drinking water safety described in the proposed Drinking Water Quality Assurance Rules (the Rules). However also note the increased level of prescription that is being built into this document, which is somewhat contradictory to the Havelock North Inquiry findings and Taumata Arowai's stated aim of moving water suppliers towards an effective risk management i.e. 'water safety planning' approach.

**The proposed Drinking Water Quality Assurance Rules have been prepared for the following water supply categories:**

- On-demand Networked Drinking Water Supplies With the following population sizes:
  - o < 50 (Very Small Supplies)
  - o 50 – 500 (Small Supplies)
  - o >500 (Large Supplies)
  - o Varying Population Size Supplies
- Trickle Feed Water Supplies
- Self-supplied Building Drinking Water Supplies
- Water Carrier Services
- Planned Event Temporary Drinking Water Supplies
- Community Drinking Water Stations/Water Carrier Supplies

**Do you agree that these categories are appropriate?**

**Reference to the consultation document – section 1.3, p.7-8.**

We agree the 'On Demand' categories are appropriate. We acknowledges population size as a key component of risk management in respect to water safety planning.

It is noted that there are minimal differences between a trickle feed supply, and an on-demand supply. Consideration could be given to including trickle feed within the on-demand Rules, and ensuring that backflow prevention from private tanks be covered under the wider scope of addressing backflow risk.

We agree that Self-Supplied Building Drinking Water Supplies should be covered under the Rules, noting the possibility of using an acceptable solution as an alternative.

**There is an option of having the general drinking water quality assurance rules associated with Planned Event Temporary Drinking Water Supply either recorded in the Drinking Water Quality Assurance Rules, with modifications as required in a particular permit, or have all the drinking water quality assurance requirements detailed in the temporary event permit that is issued.**

**Do you agree that the general drinking water quality assurance rules associated with a Planned Event Temporary Drinking Water Supply should be recorded in the Rules as reflected in the consultation document? The alternative is that the drinking water quality assurance rules would be detailed as a condition on each permit.**

We acknowledge the difficulties in prescribing 'one size fits all' condition for the wide range of temporary events, even as currently outlined in the Rules. Therefore, we support leaving this as a condition on the permit.

The proposed Drinking Water Quality Assurance Rules are structured as 'modules' for source water, treatment systems and distribution systems. There are different rules depending on the level of complexity for each module.

Do you agree with the proposed Drinking Water Quality Assurance Rules being structured in this manner?

Reference to the consultation document – section 1.4, p.8 to 9.

We agree this structure makes it easier for water suppliers to view the Rules relevant to their situation.

The proposed Drinking Water Quality Assurance Rules allocate to each class of supplier the modules that they must demonstrate compliance against.

Do you agree with the allocation of modules to On Demand Network Drinking Water Supplier – Very Small Drinking Water Supplies (namely G + S1 + T1 + D1)?

Reference to the consultation document – section 4.1, p.16, table 2.

While we support the principle that the level of monitoring required should be proportional to scale, which is supported by the modules being dependant on scheme size, the level of effort does not reduce much for the smaller population bands. (i.e. we support the modular approach, but not necessary all the specifics of each module). This is discussed later.

The proposed Drinking Water Quality Assurance Rules allocate to each class of supplier the modules that they must demonstrate compliance against.

Do you agree with the allocation of modules to On Demand Network Drinking Water Supplier – Small Drinking Water Supplies (namely G + S2 + T2 + D2)?

Reference to the consultation document – section 4.2, p.16, table 2

As above, the modular approach is supported, with the contents of each module commented upon through responses to other questions.

The proposed Drinking Water Quality Assurance Rules allocate to each class of supplier the modules that they must demonstrate compliance against.

Do you agree with the allocation of modules to On Demand Network Drinking Water Supplier – Large Drinking Water Supplies (namely G + S3 + T3 + D3)?

Reference to the consultation document – section 4.3, p.16 to 17, table 2.

As above, the modular approach is supported, with the contents of each module commented upon through responses to other questions.

The proposed Drinking Water Quality Assurance Rules allocate to each class of supplier the modules that they must demonstrate compliance against.

Do you agree with the allocation of modules to On Demand Network Drinking Water Supplier – Varying Population Size Drinking Water Supplies (less than 500 people) (namely G + S2 + T2 + D2)?

Reference to the consultation document – section 4.4, p.17, table 2.

As above, the modular approach is supported, with the contents of each module commented upon through responses to other questions.

Do you agree that On Demand Network Drinking Water Supplier – Varying Population Size Drinking Water Supplies (less than 500 people) must comply with Rule E1 in addition to modules G + S2 + T2 + D2?

Reference to the consultation document – section 4.4, p.17.

Rule E1 - When the population exceeds 500 people, increased daily and weekly monitoring must be undertaken at the frequencies set out in Table 3 for the day or week that the population increase occurs.

We agree that additional monitoring should be undertaken in accordance with population size. However, it is important to recognise the practical difficulties that may be presented by twice daily sampling, and it is questioned whether this level of additional monitoring is proportional to the risk. Hence, while additional monitoring is supported, the extent of additional monitoring is questioned.

Rule E1 also does not consider situations with population increases from supplies of <50 to >500 people (of which there are examples of in Canterbury) and the differences in treatment types and operational understanding and management complexities between these modules.

The proposed Drinking Water Quality Assurance Rules allocate to each class of supplier the modules that they must demonstrate compliance against.

Do you agree with the allocation of modules to On Demand Network Drinking Water Supplier – Varying Population Size Drinking Water Supplies (more than 500 people) (namely G + S3 + T3 + D3)?

Reference to the consultation document – section 4.4, p.17, table 2.

As previously noted, the modular approach is supported, with the contents of each module commented upon through responses to other questions.

Do you agree that On Demand Network Drinking Water Supplier – Varying Population Size Drinking Water Supplies (more than 500 people) that the distribution system monitoring requirements must increase according to the frequencies set out in the D3 rules for the periods that the population is increased above the base population

Reference to the consultation document – section 4.4, p.17 to 19, table 3.

As noted previously, while additional monitoring is supported, the extent of additional monitoring is high, and it is questionable whether this is proportional to the risk.

The proposed Drinking Water Quality Assurance Rules allocate to each class of supplier the modules that they must demonstrate compliance against.

Do you agree with the allocation of modules to Trickle Feed Water Supplies (namely G + S2 + T2 + D2)?

Reference to the consultation document – section 5, p.20.

While it is not necessarily clear why the level of monitoring should be different for a supply whereby the water trickles into a tank versus flows unrestricted (on-demand), it is understood that there is support for this module in the wider industry, so from this point of view it is accepted.

Do you agree that Trickle Feed Water Supplies (must comply with Rule F1 in addition to modules G + S2 + T2 + D2)?

Rule F1 - Water supply into the on-site storage tank must be via an air-gap, the tank overflow must be below the discharge point of the inlet and the overflow diameter must be larger than the inlet diameter.

Reference to the consultation document – section 5, p.20.

While agreeing it is important for water suppliers to consider air gaps on consumer onsite storage tanks as part of a backflow prevention programme, we support this aspect remaining as part of the suppliers' Drinking Water Safety Plan (DWSP) and other relevant documentation such as a Backflow Policy. This would allow suppliers the flexibility to adopt alternatives such as boundary protection if the situation warranted, rather than specific measures being prescribed in the Standards.

It is noted also that predominantly on-demand schemes can often have trickle feed connections at the periphery as well, which also supports trickle feed connections being treated simply as one type of connection to consider within the wider backflow prevention assessment for any type of water supply, rather than a unique enough issue to warrant a specific rule.

The proposed Drinking Water Quality Assurance Rules allocate to each class of supplier the modules that they must demonstrate compliance against.

Do you agree with the allocation of modules to Self-Supplied Building Drinking Water Supplies (suppliers serving less than 50 people) (namely G + S1 + T1)?

Reference to the consultation document – section 6, p.21.

We support the need to have Rules for this type of water supplier and consider the modules the most appropriate for this supply scenario.

The proposed Drinking Water Quality Assurance Rules allocate to each class of supplier the modules that they must demonstrate compliance against.

Do you agree with the allocation of modules to Self-Supplied Building Drinking Water Supplies (suppliers serving between 50 and 500 people) (namely G + S2 + T2)?

Reference to the consultation document – section 6, p.21.

We support the need to have Rules for this type of water supplier. Note this type of supplier may also have variations in population served and may only supply water intermittently, so query cost/benefit of having to comply with S2 and T2 modules. Consideration should be given to having one set of Rules only, with consideration to using S1 and T1 modules unless risk assessment determines higher need.

It is worth noting that self-supplied buildings would not have previously been captured at all by the previous Standards, so it is a significant increase in requirements to go from no obligations in terms of ongoing operations and monitoring, to the S2 and T2 rules. While the need to increase assurance around the quality of these supplies is absolutely supported, the level of increase requires careful consideration as to whether it is fit for purpose, particularly considering the current level of requirements for this supply type, and the step change that will be required.

The proposed Drinking Water Quality Assurance Rules allocate to each class of supplier the modules that they must demonstrate compliance against.

Do you agree with the allocation of modules to Water Carrier Services (namely G + WC)?

Reference to the consultation document – section 7, p.22.



Yes. Water suppliers and other consumers utilising water carrier services need the confidence that the drinking water that the Water Carrier supplies to them is 'safe'. The allocation of modules provides a mechanism to achieve this.

The proposed Drinking Water Quality Assurance Rules allocate to each class of supplier the modules that they must demonstrate compliance against.

Do you agree with the allocation of modules to Planned Event Temporary Drinking Water Supplies (namely G + PTE)?

Reference to the consultation document – section 8, p.23.

We support inclusion of details on a permit for this supply type, as detailed above.

The proposed Drinking Water Quality Assurance Rules allocate to each class of supplier the modules that they must demonstrate compliance against.

Do you agree with the allocation of modules to Community Drinking Water Stations and Water Carrier Supplies (namely G + S2 + T2 (excluding the T2 rules for chlorine disinfection))?

Reference to the consultation document – section 9, p.24.

This is generally supported, based on the assumption that most of these community drinking water stations will be part of a treatment plant that is likely on an on-demand water supply anyway (and therefore complying with the Rules regardless).

Section 10 of the proposed Drinking Water Quality Assurance Rules covers the Compliance Rule Modules.

Do you agree with the proposed Drinking Water Quality Assurance Rules in section 10?

See comments in following sections.

Section 10 of the proposed Drinking Water Quality Assurance Rules covers the Compliance Rule Modules.

Section 10.1 provides the General Rules.

Do you agree with the proposed General Rules?

Reference to the consultation document – section 10.1, p.25 to 27.

**G1 result reporting:**

It is unclear in the Rules how water quality monitoring information is to be reported, including whether the information will require qualitative description (as could be the case for some requirements under the D3 Rules) or just as numerical value reporting. If the intent is to consider the reporting exercise as a measure of implementation of a water supply's Drinking Water Safety Plan and require the provision of qualitative information, this should be made clearer to water suppliers well before reporting is required.

In addition, further consideration should be given to whether the 10 working day reporting timeframes stated under G1 are necessary, as this timeframe is out of step with the common statutory reporting timeframe of 20 working days. Given the volume of information to be compiled, 10 days may be challenging to achieve at a large scale, and the need to see this information within this short timeframe from a regulator's point of view is unclear.

As Drinking-water Standards MAV transgressions and other incidents should be notified to Taumata Arowai and addressed at time of occurrence, the water quality monitoring reporting should be 'no surprises'. It is also suggested for practical reasons that the T3/D3 reporting frequencies could be reduced to every 3 months as is proposed for S2/T2/D2.

**Rule G4 water sampling:**

Rule G4 notes that all water samples should be transported to the laboratory at a temperature of less than 6°C. It is noted that this Rule differs from that of the current DWSNZ requirement, which states that *“samples must not be frozen and must arrive at the laboratory at a temperature not higher than 10°C or not higher than the temperature of the water being sampled”*. The current DWSNZ requirement is in line with section 9060 B. b. of “APHA, Standard Methods for the Examination of Water and Wastewater (23rd Edition)”, which recommends to *“keep samples cold but unfrozen (<10°C) during transport to the laboratory”*. In our experience this proposed Rule change will be practically difficult to implement, especially if samples are collected and delivered to the in house testing laboratory shortly after. Further, it could have unintended consequences if enforced at 6 degrees, as samples could be unintentionally frozen in an attempt to achieve the 6 degree or less requirement, rendering them invalid.

Our suggestion is to retain the rule in the current DWSNZ for microbiological testing.

**Rule G8 continuous on-line monitoring compliance:**

Rule G8 does not provide definitions for the terms “calibration” and “verification” referred to under this Rule. These terms are not consistently defined in manufacturer documentation, so it is recommended that for clarity the terms are defined in the Rules instead.

The generic wording of the Rule in regard to calibration frequency also means that specific manufacturer guidance may not be taken into account. For example, while it is standard practice for water supply operators to periodically calibrate instrumentation such as online turbidimeter and chlorine analysers, this may not always be the case. Some equipment may not routinely require a full calibration (e.g. UVT analyser), but may instead require only regular verifications. In some cases, where calibrations are undertaken the manufacturer may recommend this to only be annual, and may require specialist technical expertise typically performed by the manufacturer rather than it being a task the water supplier can complete frequently themselves.

It is recommended that the Rules allow more flexibility to allow suppliers to maintain equipment with regard to only manufacturer requirements where appropriate, or alternatively amend the Rules to provide detail specific for each continuously monitored parameter.

**Leniency for non-compliance situations:**

No reference has been included in the Rules regarding leniency for non-compliance situations out of supplier’s control, e.g. courier delays impacting on water sampling testing times. It is considered that water suppliers could be unfairly penalised as being made non-compliant with the Rules and the Water Services Act under these circumstances, when in the majority of incidents operational monitoring has already advised the status of water quality and the public health risk created by a late sample may not be significant.

There may be other such examples where leniency is required and justified. For example, flow data to prove UV compliance may not be available from the time of failure to replacement, however generally other means might be available to prove the treatment system is still operating within its limits while this flow data is unavailable.

While consideration and application of leniency may be difficult from a resourcing point of view, an alternative would be to assign classes of non-compliance. For example, our Regional Council has different criteria for major non-compliances and minor non-compliances, and we have different level of service targets taking into account level of non-compliance. Without any grading system serious non-compliances may be hidden by a larger number of small minor non-compliances, so an appropriate grading system would help understand in greater detail how systems are performing, and the common types of issues leading to non-compliance.

Section 10 of the proposed Drinking Water Quality Assurance Rules covers the Compliance Rule Modules.

Section 10.2 provides the Source Water Rules for the S1 module.

Do you agree with the proposed Source Water Rules for the S1 module?

Reference to the consultation document – section 10.2, p.28 to 29.

We agree with the source water rules in general, with the following notes:

The first table requires a table number and header, to make it clear what types of sources the rules in this table applies to.

The difference between a surface water take and a bore must be clearly defined, so that there is consistency in the way these Rules are followed by different suppliers. A very shallow bore near a surface water could be considered to be a surface water take, but there comes a point where the separation (horizontally and vertically) is such that it becomes a groundwater bore with a hydraulic link to a surface water, rather than a surface water take. Without clear definition, suppliers will interpret the same types of situation differently to each other.

Consideration could be given to adding commentary to footnote 11 along lines of “..... *or if the supplier risk assessment determines the source to be at medium to high risk*”. As water supplies of less than 100 people were not subject to the same compliance requirements under the Health Act 1956, it is possible that source water characteristics are not well understood, and a three yearly grab sample may not suffice to detect any trends. Source water nitrate is one example, this determinand can vary in concentration depending on what time of year the source is sampled, and may also show a general increase over time. The suggested amendment would help address this situation, will still realising flexibility and cost considerations for this type of water supplier.

Section 10 of the proposed Drinking Water Quality Assurance Rules covers the Compliance Rule Modules.

Section 10.3 provides the Treatment Rules for the T1 module.

Do you agree with the proposed Treatment Rules for the T1 module?

Reference to the consultation document – section 10.3, p.30.

Yes.

Section 10 of the proposed Drinking Water Quality Assurance Rules covers the Compliance Rule Modules.

Section 10.4 provides the Distribution System Rules for the D1 module.

Do you agree with the proposed Distribution System Rules for the D1 module?

Reference to the consultation document – section 10.4, p.31.

Yes, but with following comment. The limited sampling regime described in Table 8 would give minimal confidence that the water provided to consumers is microbiologically safe. It is suggested that either monthly or quarterly sampling frequency for *E.coli*/total coliforms be considered for inclusion here. This would provide some more confidence in reticulation water quality without imposing any unreasonable requirements on the water supplier.

Section 10 of the proposed Drinking Water Quality Assurance Rules covers the Compliance Rule Modules.

Section 10.5 provides the Source Water Rules for the S2 module.

Do you agree with the proposed Source Water Rules for the S2 module?

Reference to the consultation document – section 10.5, p.32 to 33.

**Table 9 S2 Source water monitoring determinands**

Tables 9 and 10 specify monthly sampling frequencies for several parameters including *E.coli* and total coliforms. For water sources that are only used intermittently/part of the year or only under emergency circumstances, no specific clarification has been provided in the Rules. Noting that each water source is required to undergo additional downstream treatment steps, it is suggested that the Rules include provision for monthly sampling frequencies to be reduced for intermittent / occasionally used water sources. As an example we have emergency sources that have gone more than a decade without being used, but which would be required in an emergency. These are sampled from quarterly to 6 monthly depending on scheme size, but this sampling would of course increase to comply with the full Drinking Water Standards requirements if they were live.

Section 10 of the proposed Drinking Water Quality Assurance Rules covers the Compliance Rule Modules.

Section 10.6 provides the Treatment Rules for the T2 module.

Do you agree with the proposed Treatment Rules for the T2 module?

Reference to the consultation document – section 10.6, p.34 to 38.

**T2.3:** There should be a minimum number of annual samples specified, rather than just 45 days between samples. It is assumed the intention is to require 12 samples per year, but this is not clear, as 45 days gaps would allow only 8 samples per year to still be compliant.

**T2.12 and T2.14:** If bacterial compliance is achieved by other means at the treatment plant (i.e. UV) these rules are unnecessary. In these circumstances, there is no need for contact time with chlorine at the plant, as the purpose of chlorine would be for *residual* disinfection only, to treat contaminants that may enter the water after it leaves the plant. For a plant that UV treats the water and doesn't have storage, this rule would be impractical to achieve, as well as not being required for bacterial treatment at the plant.

**T2.17:** Possibly a 'do not consume' advisory rather than 'do not use', as presumably water with cyanotoxins could still be suitable for showering, clothes washing etc.

**Table 12, Footnote 16:** As Rule T2.5 requires a 1 micron absolute filter cartridge, the turbidity limit appropriate to this filter type should be the rule not the exception. It is unclear in what circumstances the 0.5 NTU limit would be used, as the 1 micron filter is always required.

Also, it is unclear why a limit of 1 NTU has been selected for the T2 treatment rules, while T3 rules allow a higher limit, and given that UV units will have been validated against higher turbidity limits and would alarm and shutdown if their target dose had not been achieved. This strict turbidity limit seems restrictive and not related to whether the UV unit is achieving the dose required to achieve adequate treatment, particularly given the protections put in place by the UV dose alarming and automatic shut-down.

**Table 12, E. coli and Total Coliforms:** It is unclear why there is no tolerance for any presence of coliforms, given there is no health limit or aesthetic limit in the Standards. It is strongly agreed coliforms are a useful indicator and should be monitored closely, and should trigger investigations and potentially incident response plans, however this response type is better covered through the Drinking Water Safety Plan and associated documents, rather than a Rule.

#### **Other Treatment Process Options**

The T2 Rules as proposed do not give water suppliers the option to use other treatment processes such as membrane filtration for protozoa compliance. Or if a water supplier is already using a non-specified treatment process, the Rules provide the water supplier with no choice but to comply with stricter T3 compliance requirements or include UV disinfection to provide the nominated protozoa barrier. As some treatment processes like membrane filtration can provide a suitable log reduction value for protozoa on their own accord, the addition of UV disinfection treatment may be both expensive and unnecessary from a public health risk perspective. It is proposed that the Rules are reworded to give water suppliers the flexibility to use other treatment processes against the module relevant to the size of the water supply.

#### **T2 Treated water monitoring requirements**

Table 12 refers to sampling for chlorate monthly if using sodium hypochlorite for chlorine disinfection. As chlorate formation is largely controlled by a risk management process, it would be expected that this risk should be adequately controlled by the water supplier over time. It is suggested that the Rules include provision for water suppliers to reduce sampling frequency for this determinand over time, if the monitoring results and the water supplier's risk assessment determine the risk to be low. Factors that can reduce this risk to be very low are low organic content in the source water, and good practice in the storage and retention times of chlorine. If these measures are in place, a high level of monitoring would be unnecessary.

Section 10 of the proposed Drinking Water Quality Assurance Rules covers the Compliance Rule Modules.

Section 10.7 provides the Distribution System Rules for the D2 module.

Do you agree with the proposed Distribution System Rules for the D2 module?

Reference to the consultation document – section 10.7, p.39 to 40.

#### **Rule D2.1 Distribution zone monitoring frequencies**

Rule D2.1 does not state how many sample sites require sampling each round. Presumably it is one sampling site per distribution zone per round, on an alternating basis to gain a representation of the full network over time. The intention and requirements of this Rule should be made clear.

**Table 13: D2 Distribution system monitoring**

The approach outlined in the D2 rules (Table 13) is not supported. The following amendments are recommended to address concerns:

- There is a lack of consistency between the lower limit of pH in this section versus the aesthetic standards. It can be understood as the aesthetic standards and the rules are trying to achieve different things, but as it submitted in response to the aesthetic standards consultation document, it is not clear there is any justification from an aesthetic point of view to have a lower pH limit, only an upper limit. Therefore, the recommended steps to address this inconsistency is to remove the lower pH limit from the aesthetic standards, and keep the lower pH limit in Table 13 as 6.5.
- The benefits of simplicity of not have a FACE calculation is understood, and will simplify the process in most cases. There should however be a footnote to say that if pH exceeds 8, FACE can be used as an alternative to complying with the values in Table 13. Therefore, the majority of suppliers would simply use the pH and FAC values in Table 13, and a small minority would be able to use FACE, without having to fully adopt the D3 rules.
- The daily grab samples for this scheme size is considered excessive and not proportionate to risk, for most source types in most circumstances. The need for daily pH and FAC checks in the distribution system may only be warranted in 'event based' or source specific circumstances in systems that may have high chlorine demand in their treated water that could continue to consume FAC after the water leaves the plant. Our experience with chlorinated deep groundwater supplies with large rural reticulation systems is that the likelihood is very low of FAC being unsuitable in the distribution system, when treated water is leaving the plant at the correct level. This is due largely to having high quality groundwater sources with little to no chlorine demand, and often no reservoirs downstream of the treatment plant. It is agreed that FAC and pH should be monitored to ensure that there is not something within the distribution system consuming chlorine, however daily checks for this sized supply is considered excessive and not proportionate to the risk, given our understanding of the likelihood of this, for high quality groundwater sources.

Finally to reinforce the above point, daily samples for D2 is the same requirement as for D3 up to 20,000 residents. This effectively means that for this parameter the monitoring frequency is the same for a population of 51 as it is for a population of 19,999, therefore is not considered to be sufficiently taking into the account of the requirement in the Water Services Act for the standards to be proportionate to scale.

**Rule D2.5 and D2.6 End Point Definition**

The term 'end point', as specified under Rules D2.5 and D2.6 is not defined. Complex or ring main design networks do not often have a clearly defined end point. The word 'extremities' may better explain what is intended with this Rule.

**Rule D2.7 Annual backflow risk assessment**

Some aspects of Rule D2.7 are unclear. While it is assumed that the words 'supply point' mean the same as the meaning of 'point of supply' in the Water Services Act, for consistency and clarity it is suggested that the terminology used in the two legislative instruments is the same.

The Rule is unclear as to exactly what level of detail is required to undertake and report on the annual risk assessment and the measures specified. This could potentially be a larger undertaking than the requirements for the Rules listed under section 10.10.1.

Section 10 of the proposed Drinking Water Quality Assurance Rules covers the Compliance Rule Modules.

Section 10.8 provides the Source Water Rules for the S3 module.

Do you agree with the proposed Source Water Rules for the S3 module?

Reference to the consultation document – section 10.8, p.41 to 45.

#### **Section 10.8.2 Source water type**

It is suggested that for each bore class section the following amendment is made: “(measured from the top of the *shallowest* screen)”, to provide more clarity regarding the risk a water source may represent.

It is noted that as written Interim Class 1 requires *E.coli* and total coliform monitoring daily for one month and then weekly for three years (approximately 186 samples total). Sampling at this frequency would mean significantly more samples are required than for bores that have already met the Class 1 requirements (36). Relief is sought for reduction of the Interim Class 1 sampling frequency, so there is consistency with the requirements of Class 1 (i.e. it should be the same number of samples, just over a condensed timeframe, such as daily for 36 days, or weekly for 36 weeks).

Secondly, it is noted that the intention of Class 1 source type is to preclude the need for protozoal treatment, but not preclude the need for bacterial treatment (as there would still be chlorine treatment in most cases to treat bacteria). It is therefore questioned why the indicator used to determine whether protozoal treatment is or isn't required is a bacterial indicator. It is thought the logic may be to achieve a multi-barrier approach for bacteria. If this is the case it is suggested that only the presence of *E. coli* as the immediate trigger to go to Interim Class 1, and total coliforms to need to be detected in 3 consecutive samples (for example) to trigger a change to Interim Class 1. The reason being that in terms of protozoal treatment requirements, there is a significant change between Class 1 and Class 2, and the occasional presence of coliforms alone does not seem like sufficient justification alone to take this next step, particularly when there will already be another treatment barrier in place (chlorine), and when *E. coli* is still being proven to be absent.

Class 2 should not necessarily require the full sanitary bore head requirements. There are for example some below ground bore heads constructed to a very high standard extracting water from deep and secure aquifers (under the current standards). There are good examples of these combinations of source and bore head are proven through extensive sampling history to present a far lower risk of having microbiological contaminants present than other sources that may have a sanitary bore head but be screened at only 11m below ground level. The way the Classes are defined currently would mean that the deep aquifer with a below ground bore head would require a greater level of treatment than a shallow bore with frequent presences of *E. coli*, purely because the shallow bore with *E. coli* meets the sanitary bore head requirements, despite the fact that it is drawing water from an aquifer with frequent contaminant detections.

Relief to this unintended outcome could be to have a Class 1 sanitary bore head, and a Class 2 sanitary bore head. It is acknowledged that for Class 1, where there intention is to preclude any presence of contamination (as there is no further barrier for protozoa), following the Sanitary Bore Head requirements makes sense, but this same approach does not make sense for Class 2,

where some contaminants would be expected given the shallow nature of the bores within this Class, irrespective of the bore head.

#### **Rule S3.2 Sanitary bore head determination**

Rule S3.2 appears to be worded to require water suppliers provide evidence regarding the determination of sanitary bore head for any water supply bore if requested. If a water supplier elects to opt for 4 log treatment in lieu of having a bore fulfil the 'sanitary' bore head requirements, it is given that this detail will be covered on in the supply Drinking Water Safety Plan risk assessment. It would appear surplus to requirement to need to provide this evidence twice. Rule S3.2. need only apply to bores where Class 1 or 2 status is claimed.

#### **S3.4 Monitoring In Response to Extreme Events**

It is agreed that there should be steps in place to monitor source water for changes in response to extreme events. In some cases for short term events (earthquake, flash floods, or short duration high intensity rain events), it may not be practical to undertake additional monitoring *during* events, and after the event may be more logical and practical. For sources with a greater separation of their source water and the surface, it may be unnecessary to undertake sampling during the event. Our current practice with wet weather event planning is to stage the sampling according to risk, with shallowest sources in the immediate timeframe after the event, followed by deeper sources with greater separation generally within the next day following the event. This allows for the lag of time between activities on the surface and deeper sources, and accounts for the practicalities of trying to undertake and resource extensive district wide sampling in the midst of an event, in addition to responding to the event in other ways. To address this, the Rule S3.4 could be modified to say "*...either during severe or extreme weather events, or immediately after the event finishes, with the timing of samples determined and outlined in the Water Supplier's Source Water Risk Management Plan*"

#### **10.8.3 Source Water Monitoring Rules**

Table 14 specifies weekly sampling for *E.coli* and total coliforms. For water sources that are only used intermittently/part of the year or only under emergency circumstances, no specific clarification has been provided in the Rules. Noting that each water source is required to undergo additional downstream treatment steps, it is suggested that the Rules include provision for weekly sampling frequencies to be reduced for intermittent / occasionally used water sources providing the water supplier's risk assessment of the source does not preclude this.

Table 14 also requires this class of water supplier sample for a range of selected determinands, without providing any further distinction between surface and ground water sources. It is likely that some determinands like total organic carbon (TOC) are generally only detected in surface water sources, and similarly iron and manganese is mainly seen in ground water sources, but only certain sources. Generally initial screening will determine whether parameters such as bromide, total organic carbon, iron and manganese are present, and it is very unlikely for most source types that these would change monthly. An annual test for these parameters is therefore considered appropriate, with an increased frequency if a threshold value is exceeded.

It is proposed that the Rules include provision for water suppliers to reduce sampling frequency over time for any determinands proven to be of low risk or presence.

Table 14 doesn't distinguish between surface water and ground water and different risks, refer above comments regarding sampling reduction over time for monthly sampling.



Table 14 doesn't distinguish between surface water and ground water sources in regard to Radiological testing. Surface water or shallow ground water (including sources hydraulically linked to surface water) should not need to be tested for Radiological determinands, and this should be reflected in Table 15.

Section 10 of the proposed Drinking Water Quality Assurance Rules covers the Compliance Rule Modules.

Section 10.9 provides the Treatment Rules for the T3 module.

Do you agree with the proposed Treatment Rules for the T3 module?

Reference to the consultation document – section 10.9, p.46 to 73.

**T3 Rule 3.17 for water disinfected with Ultraviolet light**

The change in approach to turbidity compliance for UV disinfection covered under Rule 3.17 is strongly supported, and more consistent with the way in which the UV units are validated.

**Table 19. T3 Requirements for UV disinfection.**

Flow need not necessarily be monitored as it enters or leaves the reactor, but simply so that it measures all water that passes through the reactor. If there is just one reactor in the plant, anywhere along the same pipeline as the reactor would achieve the desired outcome of proving flow is within the limits of the reactor. Without this amendment, suppliers will be forced to unnecessarily modify treatment plants to relocate flow meters.

**Table 19, UVT monitor calibration / verification.**

Some UVT meter manufacturers recommend that suppliers not undertake calibrations themselves, and that these only be undertaken by a supplier representative. Their recommendation is for frequent verifications, but only rare (for example annual) calibrations. The requirements in the table would not allow this. It is recommended that specific manufacturer requirements are carefully considered when specifying any verification or calibration requirements.

**Section 10.9.2 Protozoal Rules**

The change for allowing up to a 4 protozoa log credit is strongly endorsed. This is consistent with the validated capability of certified UV disinfection units.

**T3 Cartridge Filtration Rules**

T3.66 and T3.67: It is unclear why there is such a strict threshold for turbidity. It is entirely possible that some particles that are finer than 1 micron (and therefore would not be expected to be removed by the filter) could pass through the filter such that turbidity may be greater than 1 NTU, yet it is not clear that there is any link to say that this would indicate that the filter isn't providing the level of protozoal removal it was validated to achieve. Further, this level of turbidity reduction is not necessary for subsequent treatment steps (such as UV disinfection) to be effective.

It is recommended that it be ensured that the turbidity requirements for cartridge filtration align with the requirements that cartridge units have been validated against.

T3.69: It is recommended that a time threshold be given, similar to other protozoal treatment rules (i.e. refer to Rule T3.84 for UV compliance, or T3.68 for filtrate turbidity). There are many practical reasons why a single data point for flow may be higher than that for which the unit was

validated, without indicating the system was not operating correctly, and the way the Rule is drafted would not provide any tolerance for this.

Cartridge Certification: It is unclear why cartridge filters must have a certified (oo)cyst removal of at least 3-log, when they are only granted 2-log removal in the Rules. These two figures should align.

Section 10 of the proposed Drinking Water Quality Assurance Rules covers the Compliance Rule Modules.

Section 10.10 provides the Distribution System Rules for the D3 module.

Do you agree with the proposed Distribution System Rules for the D3 module?

Reference to the consultation document – section 10.10, p.74 to 85

#### **10.10.1 Backflow protection rules:**

It is unclear in Rules 10.10.1, 10.10.2 and 10.10.3 how these Assurance activities are to be reported, including whether the information will require qualitative description (as could be the case for some requirements under the D3 Rules) or just as numerical value reporting. If the intent is to consider the reporting exercise as a measure of implementation of a water supply's Drinking-water Safety Plan and require the provision of qualitative information, this should be made clearer to water suppliers well before reporting is required.

Rule D3.2 (surveys of customer premises) is not required if the highest level of backflow prevention (i.e. RPZ device) is already being provided. This should only be required for properties that have a device suitable to a medium hazard type only.

#### **10.10.2 Facilities operation, maintenance and disinfection rules and 10.10.3 New and repaired watermains hygiene procedures rules**

While the intent and content of these Rules is supported, it is questioned as to whether they have achieved the correct balance between the level of prescription of day to day work practices in the Rules, potentially leading to the over-prescriptive side which may introduce challenges in terms of collating data and reporting. A simplified version of these Rules could be considered to ease the compliance burden both on suppliers and the regulator.

#### **Rules D3.26 and D3.27 Continuous monitoring of FAC and pH in distribution zones**

We note that the requirement for continuous monitoring of FAC and pH in large water supply distribution zones is a significant new requirement. Whilst we agree that this is a more robust method of monitoring FAC residual than daily monitoring, this has significant resourcing implications in terms of ensuring continuous monitoring sites are established and functional and that there are staff available to maintain these new sites, within a short timeframe. Further comment on this aspect is provided in the 'Transition Time' question below.

Section 10 of the proposed Drinking Water Quality Assurance Rules covers the Compliance Rule Modules.

Section 10.11 provides the Water Carrier Service Rules.

Do you agree with the proposed Water Carrier Service Rules?

Reference to the consultation document – section 10.11, p82 to 85
The Rules as proposed appear to cover the basic requirements for water carriers
Section 10 of the proposed Drinking Water Quality Assurance Rules covers the Compliance Rule Modules.
Section 10.12 provides the Planned Temporary Events Rules for the PTE module.
Do you agree with the proposed Planned Temporary Events Rules for the PTE module?
Reference to the consultation document – section 10.12, p.84
Refer to comment above re permit details instead
Section 10.12 of the proposed Drinking Water Quality Assurance Rules provides the Planned Temporary Events Rules for the PTE module.
Section 1.3 defined a ‘Planned Event Temporary Drinking Water Supplies’ as a short-term event where people gather and where a water supply is required for the duration of an event which continues for a limited time of less than 60 days.
(p.7 of the consultation document).
Do you agree with the proposed definition of Planned Temporary Drinking Water Supplies?
Support in principle
Do you have any comments on the transition time required to adopt the proposed rules?
The Waimakariri District Council supports Taumata Arowai’s commitment that all New Zealand communities have access to safe drinking water every day, and has been taking every effort to stay informed of and plan for the proposed changes.
The draft Rules however include some significant new requirements that will take some time to fully comply with, once there is certainty as to what the finalised set of Rules are.
While we acknowledge that many of these new Rules have been well signalled, it is also understood that many water suppliers will be making submissions on the proposed Rules. Given that there will be a process for considering submissions and making amendments to the Rules before final adoption, there is still a lack of certainty as to what the final adopted version of the Rules will be, despite the content of the draft versions.
It is also noted that the signalled timeframe that the Rules will come into force has been amended over the last couple of years, and as such, there has been no certainty as to when the new Rules will be required to be complied with, in addition to knowing what the final adopted Rules will be.
With this in mind, there has not been the adequate high level of certainty in what the future Rules will be to prepare budgets and complete physical works in anticipation of some Rules, or to increase operational budgets and commence recruitment processes in response to others.
At present many of the Council water supply bores so not have treatment in place as they meet the Drinking Water Standards definition of ‘secure’ bore water status. The proposed Rules do not include provision for bore water ‘secure’ status, so considerable planning and budgeting for new treatment and other operational processes will be required. However, while changes and improvements are generally supported, the level of uncertainty has not allowed large investments in upgrades to take place without risking potentially millions of dollars being invested in a certain type of upgrade, which may or may not be the correct investment to have been made.

As one example, in order to comply with the protozoal requirements, either below ground bore heads will have to be raised above ground, or UV disinfection installed. Which option provides the optimum outcome however will depend on the outcome of residual disinfection applications, which is still an unknown. This is because, under a chlorine free pathway the following other decision would be triggered:

- Bacterial compliance achieved by UV disinfection
- Protozoal compliance achieved by UV disinfection

However, under a future pathway in which chlorine is required (i.e. a failed chlorine exemption application):

- Bacterial compliance achieved by chlorine disinfection
- Protozoal compliance achieved by Class 1 bore requirements (i.e. no protozoal treatment).

The above is one example of a significant body of work, which cannot be committed to until other unknowns are resolved, and could have a lead time in the order of 2 years to achieve full compliance, particularly if the UV disinfection pathway eventuates.

There are other examples of challenges regarding transition that it is expected a number of suppliers will be facing. With some of the sampling frequency changes, if adopted as written, there will need to be additional continuous monitoring stations established, or additional sampling staff to take a greater number of hand-held samples, or both. Putting budgetary provisions aside, the lead times for SCADA equipment, monitoring equipment, and contractors to install and commission this infrastructure can be in the order of 6 – 12 months, or when considering the same changes being required nationwide by a large number of water suppliers simultaneously, this could extend beyond a year.

While we are fully committed to complying with whatever the future adopted standards are, and support improvements to standards, any such changes will inevitably require a period of time for water suppliers to prepare and adjust, once the new standards are consulted on, submissions considered, and the final revision confirmed.

As the COVID 19 pandemic has caused significant disruptions with global supply chains, equipment availability and lead in times are now typically months rather than weeks. Water suppliers are unlikely to have sufficient time to obtain and install equipment from the time that the Rules are finalised. A national lack of availability of contractors and other suitably qualified technical personnel will likely compound this problem.

#### Additional Feedback

The Rules do not include definitions for key words or phrases that aren't already specified in the Water Services Act 2021, some examples of have been provided in the answers above. Definitions provide water suppliers with key interpretive information from both technical and statutory perspectives and it is recommended that these are reinstated in the Rules.

## Submission on Drinking Water Aesthetic Values

Name	Colin Roxburgh
Organisation (if applicable)	Waimakariri District Council

Relevant documents;

[Drinking Water Aesthetic Values – Summary \(176 KB, PDF\)](#)

[Drinking Water Aesthetic Values \(195 KB, PDF\)](#)

## Responses

You do not need to answer all the questions if you are only interested in some aspects of the consultation.

**Do you agree that the proposed range for determinands will be acceptable to consumers regarding appearance, taste and odour?**

Yes

**Do you agree with the proposed acceptable range for Chlorine?**

Existing guideline 0.6 – 1.0 (mg/L)

Proposed acceptable range - 0.3 – 0.6 (mg/L) as Cl<sub>2</sub>

No. There are considered to be issues with this acceptable range at both ends of the scale:

- It is unclear why there is any minimum chlorine value from an aesthetic point of view, as there does not appear any basis for water with low chlorine levels having objectionable taste or odour. Clearly, low chlorine is a critical point from a disinfection point of view, however this is outside the scope of aesthetic limits. Minimum chlorine levels are covered within the Quality Assurance rules, and there is no justification for inclusion within the Aesthetic Values.

- The maximum allowable chlorine level of 0.6 mg/L is an incredibly strict requirement, considering some parts of the Quality Assurance rules have a minimum acceptable chlorine level leaving the treatment plant of 0.5 mg/L. Even the most finely tuned and responsive chlorine dosing system would struggle to never be less than 0.5 mg/L, and never more than 0.6 mg/L. Given the Water Services Act requirements for water suppliers to take all reasonably practicable steps to achieve the aesthetic requirements, this would leave suppliers in very difficult if not impossible situation to stay within such a tight band at all times.

**The recommended relief to the points raised above is to have no minimum chlorine value, and a maximum chlorine level of 1 mg/L.**

**Do you agree with the proposed acceptable range for Iron?**

Existing guideline - 0.2 (mg/L)

Proposed acceptable range - ≤0.3 (mg/L)

Yes

**Do you agree with the proposed acceptable range for Temperature?**

**Existing guideline - Should be acceptable to most consumers, preferably cool**

**Proposed acceptable range - Preferably not more than 15°C**

Yes

**Th Do you agree with the proposed acceptable range for Turbidity?**

**Existing guideline – 2.5 NTU**

**Proposed acceptable range - ≤4 NTU**

This appears consistent with the lower level at which turbidity can be detected by the human eye, so appears a reasonable starting point for consideration.

Consideration should however be given to consistency with other parts of the standards. The Quality Assurance Rules allow turbidity up to 5 NTU for UV disinfection, however it would appear that in order to take all reasonably practicable steps to meet the Aesthetic values (as required by the Water Services Act), an upper limit of 4 NTU would supersede this maximum allowable value of 5 NTU for UV disinfection.

Taking a pragmatic approach from both a compliance and enforcement point of view, it would be simpler to align the two, and given the low consequences of small amounts of water being supplied in the range of 4 – 5 NTU which would be barely detectable to the human eye, the limit of 5 NTU is recommended.

**Do you agree with the proposed acceptable range for Colour?**

**Existing guideline – 10 TCU**

**Proposed acceptable range - ≤15 TCU**

Yes

**If you want to provide any feedback on transition issues to the proposed Drinking Water Aesthetic Values**

The stricter requirements with regard to chlorine and pH in particular may in some cases take time to transition to. Achieving the level of chlorine dose control to meet both Quality Assurance and Aesthetic requirements simultaneously (as noted above) will be extremely difficult, and could trigger investigation processes to re-design some chlorine dose and response systems, which from experience can be protracted and iterative, making a timely transition challenging.

Similarly, with the change from aesthetic values being 'guideline' values to values which suppliers must take reasonably practicable steps to comply with, the pH aesthetic range would require a reasonable transition period for some supplies. For supplies that do not meet the aesthetic requirements for pH, and which do not have on-site storage or available land or space within existing treatment plants to add on pH correction equipment, significant works would be triggered. This would include projects to obtain land, install storage and commission new

treatment equipment, which would typically be programmed over a minimum of 24 month period.

To be clear however, the recommended relief to the above points is not to allow sufficient time to transition to these values, but instead amend the Aesthetic Values so as not to create unnecessary challenges to meet the more restrictive requirements. See further discussion below.

#### **additional feedback on any acceptable ranges**

The lower limit of the acceptable range for pH does not appear to align with the definition of aesthetic at the beginning of the 'Drinking Water Aesthetic Values' document, which defines aesthetic properties of water as those concerning taste, odour, appearance or feel.

It is acknowledged that an upper limit of pH fits within the scope of the Aesthetic Values, for the reason noted (the potentially soapy feel of the water), and as such this upper limit value is supported.

However, the lower limit of pH does not appear to fit within the scope of aesthetic values. The way in which water with a pH of less than 7 could be detected by consumers in terms of the water's taste, odour, appearance or feel is unclear. The comments relating to low pH refer only to plumbosolvency. While plumbosolvency is important when considering the complete scope of the Drinking Water Standards, it has no relevance with the aesthetic parameters of drinking water. This is an outlier in terms of the justification provided for the other aesthetic parameters, where there is either taste, odour, or appearance identified as the justification for the value selected.

**The recommended relief to the points made above is to remove the lower limit of pH from the Aesthetic Rules, as the value has no relevance to the aesthetic parameters of drinking water.**

#### **Additional Feedback**

The Council wishes to reinforce comments made earlier. The new wording in the Water Services Act requiring suppliers to take "reasonably practicable steps to supply drinking water that complies with aesthetic values" creates a greater consequence of aesthetic values than those under the Health Act, which were guideline values only.

Therefore, the implications of such values should be given careful consideration, and where there appears to be no justification from an aesthetic point of view (i.e. low chlorine, or low pH), these values should be removed from this part of the standards, while still covered in the appropriate Quality Assurance Rules, as they already are.



## Submission on Drinking Water Acceptable Solution for Spring and Bore Drinking Water Supplies

Name	Colin Roxburgh
Organisation (if applicable)	Waimakariri District Council

Relevant documents;

[Drinking Water Acceptable Solution for Spring and Bore Drinking Water Supplies - Summary \(116 KB, PDF\)](#)

[Drinking Water Acceptable Solution for Spring and Bore Drinking Water Supplies \(361 KB, PDF\)](#)

## Responses

**You do not need to answer all the questions if you are only interested in some aspects of the consultation.**

**Do you believe that the proposed Drinking Water Acceptable Solution for Spring and Bore Water Supplies will provide assistance to water suppliers to comply with the Water Services Act 2021?**

We consider that this Acceptable Solution broadly aligns with section 10 in the 2018 version of the Drinking-water Standards, and also provides a clear path to compliance with the Water Services Act. Therefore, in general it provides a useful path to compliance for certain water supply types, however we consider that it is not suitable for all of the supplies it was intended to cover.

In particular, the Acceptable Solution for Spring and Bore Water Supplies is not suitable for very small supplies servicing 50 people or less, due to difficulty with compliance for water suppliers in this group who likely have previously been defined as domestic self-suppliers. Given that on-demand water suppliers have a <50 category, it is suggested that the same be included for this acceptable solution to ensure the requirements are proportionate to scale. In terms of the number of different water suppliers that are covered under the Water Services Act, it may be that the <50 category is by far the largest, so this warrants careful consideration in terms of what supplier of this size are required to do, rather than the current approach which seems to be to have designed a solution suitable up to 500 properties and assumed this would still be suitable down to the very small scale.

Difficulty with compliance for these very small, usually private suppliers relates to cost, lack of skills of the water supplier, and lack of a clear operator (i.e. often a shared voluntary role to maintain and operate a water supply). We propose as a solution that an additional Acceptable Solution for Spring and Bore Water Supplies is drafted for water supplies servicing less than 50 people that is similar to the Acceptable Solution for Rural Agricultural Water Supplies, particularly regarding provision of end point treatment as an option, rather than only offering a centralised treatment option. An exemption from chlorination should be considered by Taumata Arowai for water supplies that provide end-point treatment with UV and filtration, due to the complexities of having many thousand small suppliers across the country trying to chlorinate on a small scale, versus the safety benefit that would be achieved, particularly with a downstream treatment process in the case of end-point treatment systems.

This suggestion could be achieved by simply removing the association of the Acceptable Solution for Rural Agricultural Drinking Water Supplies with farming / rural activities, and simply make it an acceptable solution for end-point treatment, which can be used on water supplies up to a certain scale, as an alternative to centralised treatment. From a safety and risk perspective, it doesn't matter if the supply has a certain volume of water used for farming activities to make end point treatment either acceptable or not. It is noted that currently the draft Acceptable Solution for Rural Agricultural Drinking Water Supplies does not have an upper limit – if this were to be modified to an End Point Treatment acceptable solution, an upper limit of size may need to be considered (although even without this, the benefits of centralised treatment at scale would preclude End Point Treatment being used on very large scale anyway).

**This proposed Acceptable Solution for Spring and Bore Drinking Water Supplies has been prepared based on a centralised treatment solution.**

**Do you think the proposed Acceptable Solution would be more effective if it was based on an end-point treatment system rather than a central treatment plant?**

As noted above, in some circumstances having a centralised treatment acceptable solution will provide the best outcome for a given supply, however for other supplies, end point treatment will provide the best outcome.

Therefore, we do not consider it must be one or the other. Rather, there should be an option for an acceptable solution for both centralised treatment and end point treatment, and the supplier can then select the type of system that best suits their system.

Section 4 of the proposed Acceptable Solution for Spring and Bore Drinking Water Supplies sets the criteria that must be met for the adoption of the proposed acceptable solution:

- Water abstracted from a bore or spring is treated, then supplied to a distribution system.
- Water is provided to a consumers point of supply (toby).
- The population served by the entire drinking water supply is less than 500 people.
- All water provided is treated by a treatment system which meets the requirements set out in this drinking water acceptable solution.
- An adequate quantity of drinking water is provided to all connections at peak demand.

Do you agree with these proposed criteria?

Agree with the proposed criteria, except that this Acceptable Solution should apply for population of 50-499 people, with the following alternative options available:

- An additional Acceptable Solution for Spring and Bore Water Supplies drafted for water supplies servicing less than 50 people (or modifications to this acceptable solution to include different monitoring requirements, depending on scale).
- The allowance of end-point treatment as an alternative, without the supply needing to be rural, or have a certain volume of water used for agricultural purposes.

Section 6.1 of the proposed Acceptable Solution for Spring and Bore Drinking Water Supplies covers the requirements before the drinking water acceptable solution can be adopted by a supplier.

Do you agree that the proposed requirements before the drinking water acceptable solution can be adopted by a supplier are appropriate?

The requirements as proposed may limit which water sources water suppliers can use, and for some water suppliers there may not be any suitable alternatives. If a water supplier can demonstrate they can satisfactorily pre-treat the water source to make it suitable for filtration and subsequent disinfection, then we consider this Acceptable Solution should not limit their ability to do so, i.e. allowing testing of source water after pre-treatment for contaminants such as nitrate, iron and manganese.

Secondly, the limits provided are vague qualitative descriptors, rather than quantitative figures a supplier can easily assess themselves. It is likely even if suppliers engage consultants to tell them whether their source water meets the requirements of Section 6.1, they would likely get a range of different answers for the same source water type, leading to inconsistency and confusion. These factors should be set once by Taumata Arowai, rather than having thousands of water suppliers each trying to interpret them for themselves. In setting these values, it may be worth considering that some iron or manganese, even if less than ideal, doesn't necessarily preclude a certain source from being able to be used, but rather might require more frequent cleaning or bulb changes to ensure the target UV dose is consistently achieved. Therefore, there could be an

ideal range (to avoid more frequent bulb and filter changes), as well as an absolute upper and lower limit.

Nitrate contamination of groundwater is now widely observed across Canterbury. Iron and manganese and occasionally arsenic are other contaminants that water supplies require pre-treatment for in Waimakariri District. It is also suggested that any source water testing include testing for other determinands such as nitrate, as this determinand is hard to remove using conventional and affordable treatment processes.

Section 6.2 of the proposed Acceptable Solution for Spring and Bore Drinking Water Supplies covers the requirements the bore or spring source for the drinking water supply must meet before the drinking water acceptable solution can be adopted by a supplier.

Do you agree that the proposed requirements before the Acceptable Solution can be adopted by a supplier are appropriate?

These requirements consider the right types of parameters, however there are elements where a lack of clarity may lead to confusion and inconsistency. For example, it is unclear why pH or turbidity cannot vary, and what the difference might be between acceptable fluctuations and unacceptable variations. A simpler requirement would be an upper limit of acceptable turbidity.

Other types of activities to be considered could include land used for *intensive* agriculture or horticultural purposes, although it is acknowledged that this term would need to be well defined to be useful, as well as covering areas when the land is known to be contaminated with chemicals such as Per- and Polyfluoroalkyl substances (PFAS).

Section 6.3 of the proposed Acceptable Solution for Spring and Bore Drinking Water Supplies covers the treatment system requirements must meet before the drinking water acceptable solution can be adopted by a supplier.

Do you agree that the proposed requirements the treatment system must meet before the drinking water acceptable solution can be adopted by a supplier are appropriate?

The following comment is made with respect to the requirement to shut down in a power outage. UV treatment systems often have a generator or UPS built in to protect against power cuts or brownouts, so UV units may not need to shut off in these circumstances. However, it is agreed that for any gravity supplied systems that rely on UV treatment, the system must shut down in the event there is no power available for the treatment system to continue operating.

It is noted that there is a requirement to use sodium hypochlorite within 3 months of manufacture. This is more restrictive than the guidance given in the Water New Zealand – Supply of Chlorine for use in Water Treatment Document which notes “sodium chlorite typically has a shelf life of 130 days, but the FAC content will decrease during this time...”. It is thought that 130 days should be acceptable to be consistent with the Water New Zealand document, as any reduction in concentration will simply need to be addressed by the supplier by increasing their dose rate to achieve the target FAC.

It is unclear why 30 minutes of contact time with chlorine is required as part of the treatment system design. Filtration and UV disinfection achieve treatment of the source water, and chlorine is for residual disinfection purposes, therefore contact time is unnecessary at this point in the system. For supplies that do not have storage of treated water, this could introduce unnecessary challenges, and could have the reverse effect (this Rule would require some suppliers to introduce a storage system where it wouldn't otherwise be required, thereby introducing a new set of risks associated with storing water simply to achieve contact time for the chlorine when the water is

already sufficiently treated by the filtration and UV system). Therefore, the contact time requirement is considered detrimental to the overall safety profile of the system.

Section 7 of the proposed Acceptable Solution for Spring and Bore Drinking Water Supplies covers the operation and maintenance of the bore or spring drinking water supply, including the headworks and the treatment system.

Do you agree that the proposed requirements for the operation and maintenance of the spring or bore water supply including the headworks and the treatment system are appropriate?

In general, the scope covers what would be expected from an operation and maintenance perspective, however with some specific areas where comments have been provided.

It may be challenging for some smaller and particularly private suppliers to produce all the necessary training, qualification and competency documentation that is explained in 7.1. Potentially this is a reasonable expectation in the 50 – 500 category, but may be considered overly onerous in the <50 category. The same logic applies for some of the other requirements in 7.3 and 7.4, where a scaled back version may be more appropriate for supplies with a population of <50.

Section 7.3. does not refer to chlorine disinfection treatment, which should part of routine inspections. It is noted that chlorination is mentioned in 7.4 however.

The use of the word 'intact' for storage tanks does not adequately cover tank condition in my view. Suggest using words such as those used with the bore headworks inspections such as secure, watertight and in good condition

Section 7.4: It is considered reasonable that suppliers should visit the water supply monthly at a minimum, regardless of whether continuous monitoring is in place or not. Monitoring only covers treatment processes, not visual inspection of supply components like bore headworks or reservoirs. Should also refer to inspecting supply components if there has been a significant event (e.g. earthquakes, heavy rainfall) that may have impacted on the treatment processes.

UV lamps need not necessarily be replaced at a given interval (i.e. 12 months), if their dose rate is monitored and alarmed, such that a replacement will be triggered once the target dose is not achieved, irrespective of the age of the lamp.

Section 8 of the proposed Acceptable Solution for Spring and Bore Drinking Water Supplies covers the monitoring and testing the water supplier must undertake.

Do you agree with the source water monitoring requirements?

Rule SB2 notes that all water samples should be transported to the laboratory at a temperature of less than 6°C. It is noted that this Rule differs from that of the current DWSNZ requirement, which states that "*samples must not be frozen and must arrive at the laboratory at a temperature not higher than 10°C or not higher than the temperature of the water being sampled*". The current DWSNZ requirement is in line with section 9060 B. b. of "APHA, Standard Methods for the Examination of Water and Wastewater (23rd Edition)", which recommends to "*keep samples cold but unfrozen (<10°C) during transport to the laboratory*". In our experience this proposed Rule change will be practically difficult to implement, especially if samples are collected and delivered to the in house testing laboratory shortly after. Further, it could have unintended consequences if enforced at 6 degrees, as samples could be unintentionally frozen in an attempt to achieve the 6 degree or less requirement, rendering them invalid.

Our suggestion is to retain the rule in the current DWSNZ for microbiological testing.

Rule SB3 requires turbidity of source water to be < 20 NTU at all times: This is inconsistent with section 6.1 which states the source water turbidity must be < 1 NTU. The requirement in 6.1 seems overly restrictive, when cartridge filters will be in place to reduce the turbidity, followed by UV treatment which can still treat water at least up to 5 NTU, as per the Quality Assurance Rules.

Section 8 of the proposed Acceptable Solution for Spring and Bore Drinking Water Supplies covers the monitoring and testing the water supplier must undertake.

Do you agree with the treated water monitoring requirements?

SB7 and SB8: It is unclear why 30 minutes of contact time with chlorine is required prior to sampling. Filtration and UV disinfection achieve treatment of the source water, and chlorine is for residual disinfection purposes, therefore contact time is unnecessary.

SB8: It is not specified how FAC should be measured, whether a “dipstick” is sufficient, or whether a calibrated handheld meter is required.

SB8, SB9, SB10 and SB11: The daily sampling requirements are considered an excessive level of monitoring, particularly where the UV system is self-monitoring its dose rate being achieved. This is of particular relevance for the <50 supply size, even if its considered necessary for the 50 – 500 supply size.

SB10 and SB11: These requirements may introduce high costs of handheld monitoring equipment, which may be prohibitive for very small private suppliers. A reduced frequency of monitoring of these parameters may allow the outsourcing of these sampling costs by an external agency, at a lower frequency, rather than very small suppliers purchasing and maintaining all the handheld monitoring equipment themselves when they may only be serving as few as two houses.

Section 8 of the proposed Acceptable Solution for Spring and Bore Drinking Water Supplies covers the monitoring and testing the water supplier must undertake.

Do you agree with the distribution system monitoring requirements?

SB17: As with the comment made with respect to SB8, SB9, SB10 and SB11, daily monitoring seems overly onerous in particular with respect to the very small suppliers. This daily sampling of FAC and pH is similar to an on-demand supply serving a population of up to 20,000, and therefore is not considered that this Rule takes into account the ‘proportionate to scale’ requirement. This is particularly relevant when considering this acceptable solution could be applied right down to 2 connected houses, but even up to 500 people daily sampling is still considered excessive when bearing in mind that it is the same as a population of 20,000, and when comparing the step change with the current standards.

Section 9 of the proposed Acceptable Solution for Spring and Bore Drinking Water Supplies covers the incident or emergency response plan the water supplier must develop.

Do you agree that the incident and emergency response plan requirements are appropriate?

Generally covers main points. We recommend that Taumata Arowai provides support in the form of further guidance and/or templates to water suppliers for how to prepare an incident and emergency response plan, given the many thousand water suppliers that may adopt this acceptable solution, to ensure some degree of national consistency.

Section 10 of the proposed Acceptable Solution for Spring and Bore Drinking Water Supplies covers the training and awareness obligations of the water supplier.

Do you agree that the training and awareness obligations of the water supplier are appropriate?

This requirement is a necessary component of effective water supply management. We recommend that Taumata Arowai consider providing support in the form of training courses (free or at-cost), particularly for water suppliers of very small (less than 50 people) supplies, as this is the area where the most up-skilling is likely to be required (such as previous domestic self-suppliers who now are classed as water suppliers under the Water Services Act 2021). Without some form of national assistance in this area, it may be unrealistic to expect the many thousand generally private water suppliers in this category to meet these requirements.

Section 11 of the proposed Acceptable Solution for Spring and Bore Drinking Water Supplies covers the auditing obligations of the water supplier.

Do you agree that the auditing obligations of the water supplier are appropriate?

This is a necessary component of effective water supply management

Also suggest including alarm testing for online monitoring.

#### Additional Feedback

Chlorine exemptions are not provided as an option within this acceptable solution. We support a chlorine exemption option to be enabled by Taumata Arowai for smaller-sized water supplies from spring/bore where appropriate and there is sufficient other treatment, in particular at the very small end of the scale (<50) where the challenges and practicalities with implementing chlorine safely may outweigh the benefits achieved, particularly in a small distribution system, where there are already other treatment barriers in place at the plant. It is understood that consideration is being given to defining a 'distribution system' to make clear where the Water Services Act for requiring residual disinfection applies or not, but this acceptable solution should also only require chlorine where there is a 'distribution system', taking into account the definition that is developed for this.

This document uses term 'restrictor' rather than 'trickle feed' as per the DW QA Rules – it is recommended that a consistent term be used.

## Submission on Drinking Water Acceptable Solution for Rural Agricultural Water Supplies

Name	Colin Roxburgh
Organisation (if applicable)	Waimakariri District Council

### Relevant documents;

[Drinking Water Acceptable Solution for Rural Agricultural Water Supplies - Summary \(127 KB, PDF\)](#)

[Drinking Water Acceptable Solution for Rural Agricultural Water Supplies \(753 KB, PDF\)](#)



## Responses

You do not need to answer all the questions if you are only interested in some aspects of the consultation.

### Do you believe that the proposed Drinking Water Acceptable Solution for Rural Agricultural Water Supplies will provide assistance to water suppliers to comply with the Water Services Act 2021?

Yes, in certain circumstances this may provide a helpful alternative pathway to compliance.

Section 4 of the proposed Drinking Water Acceptable Solution for Rural Agricultural Water Supplies sets the criteria that must be met for the adoption of the proposed acceptable solution:

#### Drinking water use criteria

- Water is supplied through a network system to a farm (or farms) to support farm activities (e.g. stock water) but some of the water is used at households for domestic purposes.
- Up to 35 percent of the water from the supply may be used for domestic purposes (and therefore goes through a compliant treatment system). At least 65 percent of the water must be used for stock water, wash down, irrigation or other non-domestic uses.
- The water from any household treatment system must be used for domestic purposes only; i.e. drinking, food preparation, washing and oral hygiene for dwellings and farm accommodation or farm buildings.
- All water used within a building fitted with a treatment system must be treated by that system. Water provided for outdoor water use may be untreated but must be marked as non-potable in accordance with the Building Code (clauses G12 Water supplies and F8 Signs).

#### Water supply size criteria

- There is no upper or lower limit to the population served by the rural agricultural water supply.
- End point treatment systems, which comply with the requirements for this drinking water Acceptable Solution, are installed for each single dwelling or building (e.g. shearers' quarters) serviced with drinking water or one treatment system which supplies water for up to three buildings.
- Each property that is connected to the rural agricultural water supply that adopts the drinking water Acceptable Solution, can install treatment systems at ten or fewer dwellings or buildings. Properties connected to a rural agricultural water supply that serve more than ten buildings, require a dedicated, centralised treatment system to provide potable water to all those buildings.
- All dwellings and buildings requiring drinking water must be supplied with water from a treatment system. Individual buildings or dwellings cannot opt out.

#### Treatment system size criteria

- Any treatment system must serve no more than 30 people (within a single dwelling or building).
- Buildings serving more than 30 people require a treatment system specifically designed for the volume of water required.

Do you agree with these proposed criteria?

No. It seems unnecessary to have the criteria associated with farming / percentage of water used by certain activities as a pre-requisite to using end-point treatment.

If end-point treatment is considered an acceptable pathway to compliance, it should not be restricted such that only farmers may use it. It is proposed that this acceptable solution be modified simply to be an acceptable solution for end-point treatment.

Section 7 of the proposed Drinking Water Acceptable Solution for Rural Agricultural Water Supplies covers the requirements that must be met for both the rural agricultural supply, and any treatment systems located at houses or other buildings that receive water from the supply.

Section 7.1 covers the requirements before the proposed Drinking Water Acceptable Solution for Rural Agricultural Water Supplies can be adopted.

Do you agree that the proposed requirements for the use of the Drinking Water Acceptable Solution for Rural Agricultural Water Supplies are appropriate?

The limits provided are vague qualitative descriptors, rather than quantitative figures a supplier can easily assess themselves. It is likely even if suppliers engage consultants to tell them whether their source water meets the requirements of Section 7.1, they would likely get a range of different answers for the same source water type, leading to inconsistency and confusion. These factors should be set once by Taumata Arowai, rather than having thousands of water suppliers each trying to interpret them for themselves. In setting these values, it may be worth considering that some iron or manganese, even if less than ideal, doesn't necessarily preclude a certain source from being able to be used, but rather might require more frequent cleaning or bulb changes to ensure the target UV dose is consistently achieved. Therefore, there could be an ideal range (to avoid more frequent bulb and filter changes), as well as an absolute upper and lower limit.

Nitrate contamination of groundwater is now widely observed across Canterbury. It is suggested that any source water testing include testing for other determinands such as nitrate, as this determinand is hard to remove using conventional and affordable treatment processes.

Section 7 of the proposed Drinking Water Acceptable Solution for Rural Agricultural Water Supplies covers the requirements that must be met for both the rural agricultural supply, and any treatment systems located at houses or other buildings that receive water from the supply.

Section 7.2 covers the requirements the rural agricultural water supply must meet.

Do you agree that the proposed turbidity and backflow prevention device requirements are appropriate?

The common terminology for non-testable devices is 'dual check' rather than 'double check'. It is also noted that it is common for trickle feed manifolds to have a single check valve, rather than dual check valve (based on supplier's indicating to us that one check valve is removed to install the flow control unit). Therefore, for consistency with typical product availability, a 'non-testable single check valve' is considered a suitable minimum level of boundary protection, which is considered an appropriate management of risk for this scenario.

Section 7 of the proposed Drinking Water Acceptable Solution for Rural Agricultural Water Supplies covers the requirements that must be met for both the rural agricultural supply, and any treatment systems located at houses or other buildings that receive water from the supply.

Section 7.3 covers the end point treatment system requirements.

Do you agree that the proposed end point treatment system requirements are appropriate?

Most of the requirements are suitable, with the following exception.

- It is unclear why such a large volume of storage is required to be specified in the Acceptable Solution requirements. Given the water supplier will be working to ensure no outages of more than 8 hours, 96 hours appears excessive and possibly beyond the scope of what needs to be specified as part of this acceptable solution.

Section 7 of the proposed Drinking Water Acceptable Solution for Rural Agricultural Water Supplies covers the requirements that must be met for both the rural agricultural supply, and any treatment systems located at houses or other buildings that receive water from the supply.

Section 7.4 covers the end point treatment system configuration.

Do you agree that the proposed end point treatment system configuration is appropriate?

It is understood conceptually why there is a need to have a header tank (to allow for warm-up time with the UV system), but it is also noted that this is not conventionally how these systems have been installed by suppliers we are aware of, so this will likely require some form of education within the industry to explain the need for this, as many houses would not typically have a header tank, so this would likely need to be retrofitted.

It is also known that header tanks can provide another risk of a point for sources of contamination to enter the supply if not secure. Consideration could be given to the protection provided by these header tanks (to allow for UV warmup time) versus the additional risk introduced if they become contaminated. This is beyond my area of expertise, but if there was a type of domestic sized UV system that had a very short warm-up time, it may be beneficial to allow for this particular system type to be used without the header tank.

Section 8 of the proposed Drinking Water Acceptable Solution for Rural Agricultural Water Supplies covers the operation and maintenance for the installation, maintenance and testing of all household or building treatment systems installed under this drinking water Acceptable Solution.

Section 8.1 covers the operations and maintenance manual.

Do you agree that the proposed operations and maintenance manual requirements are appropriate?

Section 8 of the proposed Drinking Water Acceptable Solution for Rural Agricultural Water Supplies covers the operation and maintenance for the installation, maintenance and testing of all household or building treatment systems installed under this drinking water Acceptable Solution.

Section 8.2 covers the standard operating procedures.

Do you agree that the proposed operating procedures are appropriate?

No comment on this question.

Section 8 of the proposed Drinking Water Acceptable Solution for Rural Agricultural Water Supplies covers the operation and maintenance for the installation, maintenance and testing of all household or building treatment systems installed under this drinking water Acceptable Solution.

Section 8.3 covers the inspection procedures.

Do you agree that the proposed inspection procedures are appropriate?

No comment on this question.

Section 9 of the proposed Drinking Water Acceptable Solution for Rural Agricultural Water Supplies covers the monitoring and testing required under this drinking water Acceptable Solution.

Do you agree with the proposed household monitoring requirements?

No comment on this question.

Section 9 of the proposed Drinking Water Acceptable Solution for Rural Agricultural Water Supplies covers the monitoring and testing required under this drinking water Acceptable Solution.

Do you agree with the proposed supply monitoring requirements?

RA1 should allow for certain parameters (i.e. pH, turbidity, conductivity) to be measured by calibrated / verified field instruments as opposed to being required to be assessed exclusively by IANZ laboratories.

The frequencies for sampling under RA4 should vary with scale, with less frequent requirements for <50 and 50 – 500 compared to larger supplies.

RA6 should exclude E. coli, given this is covered by RA5.

Section 10 of the proposed Drinking Water Acceptable Solution for Rural Agricultural Water Supplies covers the incident or emergency response plan the water supplier must develop.

Do you agree that the incident and emergency response plan requirements are appropriate?

Generally covers main points. We recommend that Taumata Arowai provides support in the form of further guidance and/or templates to water suppliers for how to prepare an incident and emergency response plan, given the many thousand water suppliers that may adopt this acceptable solution, to ensure some degree of national consistency.

Section 11 of the proposed Drinking Water Acceptable Solution for Rural Agricultural Water Supplies Solution covers the training and awareness obligations of the water supplier.

Do you agree that the training and awareness obligations of the water supplier are appropriate?

This requirement is a necessary component of effective water supply management. We recommend that Taumata Arowai consider providing support in the form of training courses (free or at-cost), particularly for water suppliers of very small (less than 50 people) supplies, as this is the area where the most up-skilling is likely to be required (such as previous domestic self-suppliers who now are classed as water suppliers under the Water Services Act 2021). Without some form of national assistance in this area, it may be unrealistic for expect the many thousand generally private water suppliers in this category to meet these requirements.

Section 12 of the proposed Drinking Water Acceptable Solution for Rural Agricultural Water Supplies covers the auditing obligations of the water supplier.

Do you agree that the auditing obligations of the water supplier are appropriate?

This is a necessary component of effective water supply management.

Additional Feedback

**WAIMAKARIRI DISTRICT COUNCIL**

**REPORT FOR DECISION**

**FILE NO and TRIM NO:** CON202147-01 / 220224025448

**REPORT TO:** Management Team

**DATE OF MEETING:** 28 February 2022

**FROM:** John Stopford, Project Engineer  
Colin Roxburgh, Water Asset Manager

**SUBJECT:** Oxford Rural No.2 Water Main Renewals 2021/22 – Request to Engage Water Unit

**SIGNED BY:**

<b>(for Reports to Council, Committees or Boards)</b>	Department Manager	Chief Executive
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**1. SUMMARY**

- 1.1 This report is to seek Management Team approval to engage the Water Unit for the civil works for Contract 21/47 Separable Portion B Oxford Rural No.2 Water Main Renewals in the 2021/22 financial year.
- 1.2 The price received for Separable Portions B have been assessed to represent good value.

Attachments:

- A. Evaluated price assessment post close out of Tender Clarifications (Trim 220224025446 & 210907142848).

**2. RECOMMENDATION**

**THAT** the Management Team:

- (a) **Receives** report No. 220224025448.
- (b) **Notes** that a price has been received from the Waimakariri District Council's Water Unit for water main renewal works in Oxford Rural No.2, Separable Portion B of Contract 21/47 can be accommodated within the current financial year's budget.
- (c) **Authorises** 3 Waters staff to engage the Waimakariri District Council Water Unit to undertake Separable Portion B of Contract 21/47 for the Oxford Rural No.2 Water Main Renewals to the value of \$266,867.64 (excluding GST).
- (d) **Notes** that the price received for Separable Portion B was assessed to represent good value for undertaking this work.
- (e) **Notes** that reason for not externally tendering this work is because of the additional costs anticipated by tendering externally and the expectation that Council are unlikely to gain a better combination of price and quality through an alternative method for Separable Portion B.

- (f) **Notes** that the planned 2021/22 work is funded from the Oxford Rural No.2 Water Main Renewals and Water Growth budgets, and that there is sufficient budget available within the 2021/22 financial year.
- (g) **Notes** that the investigation, design and tendering of the renewal was more complex and the tender price was slightly higher than initially anticipated (due to escalation in material and labour costs), but sufficient budget is available to undertake Separable Portion B (Ashley Gorge Road).
- (h) **Circulates** this report to the Utilities and Roading Committee for their information.

### 3. **BACKGROUND**

- 3.1. The proposed works for the Oxford Rural No.2 Water Main Renewals were designed in the 2021/22 financial year, with construction planned for the end of the financial year (May / June). Due to some resourcing challenges at the investigations and design stage, there is a risk that the project may be carried over if there is any slippage in the programme, which has been signalled in the Council's capital reporting.
- 3.2. The Contract has been tendered with two Separable Portions and includes water main renewals in the following streets:
  - McPhedrons Road (Separable Portion A) – Oxford Rural No.1
  - Ashley Gorge Road (Separable Portion B) – Oxford Rural No.2
- 3.3. The McPhedrons Road portion on the Oxford Rural No.1 scheme has been assessed and awarded already. This was done initially to allow the Water Unit to proceed with the planning for this work, while further assessment was undertaken on the Oxford Rural No.2 portion.
- 3.4. The Ashley Gorge Road portion has been designed primarily to facilitate growth on the Oxford Rural No.2 scheme, by providing additional capacity. It has the added benefit of renewing some pipework, and removing some pipework and connections from private property as well. With the dual benefits identified, it is proposed to be funded from a combination of growth and renewal budgets.

### 4. **ISSUES AND OPTIONS**

- 4.1. Pipework and fitting installation, backfilling and reinstatement will be completed by the Council's Water Unit. This type of work is typical of work undertaken by the Water Unit.
- 4.2. The pipework in this Contract includes installation through open trenching, and mole ploughing.
- 4.3. The supply of pipework has been already awarded to the Water Unit, due to advice from pipe suppliers about upcoming price increases. The work being considered in this report is the supply of all fittings excluding the main pipe lengths, and the installation.
- 4.4. Water Unit obtained prices for the supply of pipework and fittings not already ordered from three suppliers (Hynds, Humes and Asmuss). The quotes from the three suppliers were analysed, the lowest priced supplier was identified and incorporated before the tender was submitted by the Water Unit.
- 4.5. The supply of all other materials and subcontractors are under \$20,000 and will be procured in accordance with the Council's Purchasing Policy.
- 4.6. Options:

The Management Team have two options:

- 1) Management Team approve staff to engage the Water Unit to construct Separable Portion B of Contract 21/47 in the 2021/22 financial year. This is the recommended option.
- 2) Management Team reject the Water Unit price for Separable Portion B, and competitively tender this portion of the contract. This is not recommended, as the price received for Separable Portion B represents good value.

#### **Implications for Community Wellbeing**

There are not implications on community wellbeing by the issues and options that are the subject matter of this report.

### **5. COMMUNITY VIEWS**

#### **5.1. Mana whenua**

Te Ngāi Tūāhuriri hapū are not likely to be affected by, or have an interest in the subject matter of this report.

#### **5.2. Groups and Organisations**

No community group views have been sought specifically on this project.

#### **5.3. Wider Community**

The Water Unit will prepare and deliver letters to residents surrounding the location of works in advance of construction to advise of short periods of reduced level of service.

Preliminary agreement has been reached with residents to upgrade / renew laterals within private property. These agreements are to be formalised in the coming weeks.

### **6. IMPLICATIONS AND RISK MANAGEMENT**

#### **6.1. Financial Implications**

The Water Unit has provided a quotation of \$321,979.49 excluding GST to undertake Separable Portion B of the Contract. The Engineer's Estimate (using rates derived from recent tendered contracts) is \$312,000 excluding GST.

The breakdown of this quote by separable portion of contract 21/47 is given below:

**Table 1: Summary of Price Submitted and Engineer's Estimate**

<b>Separable Portion</b>	<b>Scheme</b>	<b>Engineer's Estimate</b>	<b>Water Unit Price</b>
B – Ashley Gorge Road	Oxford Rural No.2	\$312,000.00	\$321,979.49*

*\*includes some "either/or" provisional items, not all of which will be required. Amount to be awarded to be less than this amount.*

A summary of total budget available versus projected expenditure is given in Table 2 below.



**Table 2: Comparison of Forecast Costs against Budget**

Funding Source	Expenditure to Date	Recommended Tender Price	Predicted Commitments	Total Projected Expenditure	Total Budget
100052.000.5104 (Renewals)	\$ 56,797.65	\$ 39,548.02	\$ 40,146.58 <sup>1</sup>	\$136,492.25	\$ 143,750.00
100930.000.5104 (Renewals)	\$ 0.00	\$ 114,000.00	\$ 0.00	\$ 114,000.00	\$ 114,000.00
100930.000.5105 (Growth)	\$0.00	\$ 113,319.62	\$ 52,680.38 <sup>2</sup>	\$ 166,000.00	\$ 166,000.00
Total	\$ 56,797.65	\$266,867.64	\$ 92,826.96	\$ 416,492.25	\$ 423,750.00

<sup>1</sup>Predicted Commitment 1 is for the expected professional fees for construction observation and project management. Also, includes \$20,000 estimate amount for Weld Street construction work, to be completed under a separate contract.

<sup>2</sup>Predicted Commitment 2 is the supply of pipe, which has been ordered already (outside of this contract) but not yet invoiced.

<sup>3</sup>Recommended tender price of \$266,867.64 is less than the total tender amount of \$321,979.49, as some provisional items were "either/or". Proposed not to award B2.3.6, B2.3.8, B2.3.10, B2.5.3, B2.5.4, with a combined value of \$55,111.85.

The quotation received from the Water Unit has been assessed and Separable Portion B is deemed to represent good value, and is similar to the available budget.

## 6.2. Community Implications

The need for this project is to renew old pipes and increase resilience, reliability and level of service for the supply of water to the properties in Oxford Rural No.2, and to allow for growth on the scheme.

## 6.3. Sustainability and Climate Change Impacts

The recommendations in this report do not have sustainability and/or climate change impacts.

## 6.4. Risk Management

The normal construction risks apply to this contract. There are no extraordinary risks over and above these normal risks.

## 6.5. Health and Safety

Health and Safety will be managed for this contract as per the Council's Health and Safety System.

## 7. CONTEXT

### 7.1. Consistency with Policy

This matter is not a matter of significance in terms of the Council's Significance and Engagement Policy.

### 7.2. Authorising Legislation

The Water Services Act and Local Government Act are relevant in this matter.

### 7.3. Consistency with Community Outcomes

The following community outcomes are relevant in this matter:

- There is a healthy and sustainable environment for all
- Core utility services are provided in a timely and sustainable manner

#### 7.4. **Authorising Delegations**

The Management Team has the delegated authority to award this contract.

# ATTACHMENT A

## Tender Schedule

Separable Portion B - Ashley Gorge Road						
NO	SCHEDULE ITEM	QUANTITY	UNIT		RATE	AMOUNT
<b>B1</b>	<b>PRELIMINARY &amp; GENERAL</b>					
B1.1	Site Establishment	100%	LS			\$ 3,167.73
B1.2	Survey & Setting Out	100%	LS			
B1.3	Erosion & Sediment Control	100%	LS			
B1.4	Traffic Management	100%	LS			
B1.5	Locate, Pothole and Protect Existing Services	100%	LS			\$ 1,610.00
B1.6	As-built Information	100%	LS			
	<b>SUB TOTAL</b>					
<b>B2</b>	<b>SUPPLY &amp; INSTALL WATER MAIN</b>					
<b>B2.1</b>	<b>180mm OD PE PN16 Water Main</b>					
B2.1.1	Supply and install 180mm OD PE100 PN16 Full RC in the grass berm. (DWG 4230 Sheet 2)	291	m	\$	181.66	\$ 52,862.37
B2.1.2	Supply and install 180mm OD PE100 PN16 Full RC in the sealed driveway/road. (DWG 4230 Sheet 2)	29	m	\$	244.86	\$ 7,100.85
<b>B2.2</b>	<b>125mm OD PE PN16 Water Main</b>					
B2.2.1	Supply and install 125mm OD PE100 PN16 Full RC in the grass berm. (DWG 4230 Sheet 3 to 5)	1286	m	\$	46.64	\$ 59,982.88
B2.2.2	Supply and install 125mm OD PE100 PN16 Full RC in the unsealed driveway/road. (DWG 4230 Sheet 3 to 5)	67	m	\$	66.20	\$ 4,435.56
B2.2.3	Supply and install 125mm OD PE100 PN16 Full RC in the sealed driveway/road. (DWG 4230 Sheet 3 to 5)	65	m	\$	96.18	\$ 6,251.55
<b>B2.3</b>	<b>20mm &amp; 25mm OD PE PN16 Water Main Laterals</b>					
B2.3.1	Supply and install 20mm OD PE PN16 in the grass berm (including private property)	35	m	\$	105.57	\$ 3,695.03
B2.3.2	Supply and install 20mm OD PE PN16 in the sealed road.	13	m	\$	166.10	\$ 2,159.32
B2.3.3	Supply and install 25mm OD PE PN16 in the grass berm	21	m	\$	134.37	\$ 2,821.74
B2.3.4	Supply and install 25mm OD PE PN16 in unsealed driveway/road	12	m	\$	123.24	\$ 1,478.86
B2.3.5	32 Victoria Street Option A. Supply and install 25mm OD PE PN16 in the existing DN65 PVC Pipe. (Provisional Item)	360	m	\$	41.38	\$ 14,895.77
B2.3.6	32 Victoria Street Option B. Supply and install 25mm OD PE PN16 through private property through open trenching and/or mole plough (Provisional Item)	360	m	\$	59.56	\$ 21,440.18
B2.3.7	56 Victoria Street Option A. Supply and install 25mm OD PE PN16 in the existing DN65 PVC Pipe. (Provisional Item)	427	m	\$	40.26	\$ 17,190.61
B2.3.8	56 Victoria Street Option B. Supply and install 25mm OD PE PN16 through private property through open trenching and/or mole plough (Provisional Item)	427	m	\$	57.66	\$ 24,621.89
B2.3.9	56 Ashley Gorge Road Option A. Supply and install 25mm OD PE PN16 in the existing DN150 & DN100 PVC Pipe. (Provisional Item)	120	m	\$	44.75	\$ 5,369.83
B2.3.10	56 Ashley Gorge Road Option B. Supply and install 25mm OD PE PN16 through private property open through trenching and/or mole plough (Provisional Item)	120	m	\$	66.77	\$ 8,012.64
<b>B2.4</b>	<b>Details</b>					
B2.4.1	Supply and install Detail A	100%	LS	\$	5,795.81	\$ 5,795.81
B2.4.2	Supply and install Detail B	100%	LS	\$	3,303.25	\$ 3,303.25
B2.4.3	Supply and install Detail C	100%	LS	\$	7,693.14	\$ 7,693.14
B2.4.4	Supply and install Detail D	100%	LS	\$	1,611.49	\$ 1,611.49
B2.4.5	Supply and install Detail E	100%	LS	\$	9,913.08	\$ 9,913.08
B2.4.6	Supply and install Detail F	100%	LS	\$	9,879.82	\$ 9,879.82
B2.4.7	Supply and install Detail G	100%	LS	\$	3,602.37	\$ 3,602.37
B2.4.8	Supply and install Detail H	100%	LS	\$	2,420.82	\$ 2,420.82
B2.4.9	Supply and install Detail I	100%	LS	\$	6,906.87	\$ 6,906.87
B2.4.10	Supply and install Detail J	100%	LS	\$	4,796.66	\$ 4,796.66
B2.4.11	Supply and install Detail K	100%	LS	\$	3,400.24	\$ 3,400.24
B2.4.12	Supply and install Pressure Reducing Valve (PRV) inside toby box of restricted service connection	8	Ea	\$	567.15	\$ 4,537.18
B2.4.13	Supply and install 180mm OD PE 90 degree pipe bend	1	Ea	\$	559.85	\$ 559.85
B2.4.14	Supply and install 125mm OD PE 45 degree pipe bend	2	Ea	\$	564.45	\$ 564.45
B2.4.15	Supply and install 125mm OD PE 22.5 degree pipe bend	1	Ea	\$	441.13	\$ 441.13
<b>B2.5</b>	<b>Upgrade and transfer service connections</b>					
B2.5.1	Move (If required), Upgrade and transfer existing urban service connection to new mains.	3	Ea	\$	1,000.09	\$ 3,000.26
B2.5.2	Move (If required), Upgrade and transfer existing restricted service connection to new mains.	8	Ea	\$	682.47	\$ 5,459.76
B2.5.3	Transfer existing service connection to new mains (Provisional Item)	1	Ea	\$	461.32	\$ 461.32
B2.5.4	Locate existing service connection and confirm with engineer prior to construction. (Provisional Item)	1	Ea	\$	575.82	\$ 575.82
<b>B2.6</b>	<b>Abandon and removal</b>					
B2.6.1	Cap and abandon pipes, remove hydrants and valves.	100%	LS	\$	5,370.67	\$ 5,370.67
	<b>SUB TOTAL</b>					
<b>B3</b>	<b>MISCELLANEOUS</b>					
	<b>Disinfection</b>					
B3.1	Sterilise, Flush and E.Coli Test all mains	100%	LS	\$	1,729.14	\$ 1,729.14
	<b>Pressure Testing</b>					
B3.2	Pressure Test PE100 PN16 - M7 Test (at test pressure of 1600kPa)	100%	LS	\$	977.56	\$ 977.56
	<b>PE Joint Testing</b>					
B3.3	Preconstruction PE Joint Testing / Certification: Electro fusion Weld and Butt Weld joints and quality records.	100%	LS	\$	1,223.32	\$ 1,223.32
B3.4	Construction PE Joint Testing / Certification: Electro fusion Weld and Butt Weld joints and quality records.	100%	LS	\$	1,223.32	\$ 1,223.32
	<b>SUB TOTAL</b>					
	<b>SPB TOTAL (GST exclusive)</b>					<b>\$ 321,979.49</b>