

# Waimakariri District Council

## Utilities and Roading Committee

# Agenda

Tuesday 23 May 2023

9am

Council Chambers  
215 High Street  
Rangiora

**Members:**

Cr Niki Mealings (Chairperson)

Cr Robbie Brine

Cr Philip Redmond

Cr Joan Ward

Cr Paul Williams

Mayor Dan Gordon (ex officio)

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**A MEETING OF THE UTILITIES AND ROADING COMMITTEE WILL BE HELD IN THE COUNCIL CHAMBER, RANGIORA SERVICE CENTRE, 215 HIGH STREET, RANGIORA ON TUESDAY 23 MAY 2023 AT 9AM.**

Sarah Nichols  
GOVERNANCE MANAGER

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 the meeting of the Utilities and Roding Committee held on Tuesday 18 April 2023.**

8-21

*RECOMMENDATION*

**THAT** the Utilities and Roding Committee:

- (a) **Confirms** the circulated Minutes of the meeting of the Utilities and Roding Committee held on 18 April 2023, as a true and accurate record.

3.2 **Matters arising (From Minutes)**

3.3 **Notes of the workshop of the Utilities and Roding Committee held on Tuesday 18 April 2023**

22-23

*RECOMMENDATION*

**THAT** the Utilities and Roding Committee:

- (a) **Receives** the circulated notes of the workshop of the Utilities and Roding Committee, held on 18 April 2023.

4 **DEPUTATION/PRESENTATIONS**

Nil.

## 5 REPORTS

### 5.1 Water Quality and Compliance Annual Report 2021-22– Colin Roxburgh – (Project Delivery Manager)

24-56

#### *RECOMMENDATION*

**THAT** the Utilities and Roading Committee:

- (a) **Receives** report No. 201109150435.
- (b) **Notes** that the assessed percentage compliance against the bacterial and protozoal parts of the Drinking Water Standards for New Zealand was 99% and 92% respectively, and that the non-compliance issues were not considered to represent a safety risk to consumers, noting that the bacterial non-compliance was related to monitoring on the Ashley Gorge supply when the new Act came into effect, and the protozoal non-compliances were due to issues noted within the report related to verification and calibration of equipment used to demonstrate compliance of UV treatment equipment.
- (c) **Notes** that the 2021-22 period is the last period assessed against the now superseded 2018 revision of the Drinking Water Standards for New Zealand, and that the next assessment will be against the 2022 Drinking Water Quality Assurance Rules.
- (d) **Notes** that the anticipated compliance levels for the 2022-23 year are forecast to be less than 10% due to new requirements and the time taken to transition to these, and that a programme to implement UV treatment across the district is underway to bring the Council up to full compliance levels over the 2023-24 and 2024-25 years.
- (e) **Notes** that a complete renewal of all the Council's Drinking Water Safety Plans was undertaken over 2021-22, as well as the first set of Source Water Risk Management Plans, in order to meet obligations created under the Water Services Act.
- (f) **Notes** that there were no positive treated water *E. coli* samples detected over the 2021-22 compliance period, and no unexpected raw water *E. coli* samples.
- (g) **Notes** that the level of coliform detections increased marginally over the most recent results with 3.8% of treated water samples showing the presence of coliforms (relative to 3.2% in 2020-21), and that this is being managed through the use of emergency chlorination as required, as well as through detailed investigations to address any underlying issues.
- (h) **Notes** that there were two Level 3 incidents and four Level 2 incidents throughout the compliance year with investigations and assessment reports produced in each case to identify the root cause, manage the issue, and ensure lessons are learnt to minimise the likelihood of recurrence.
- (i) **Notes** that there were 141 complaints related to the Council's water supplies over the 2021-22 compliance period, equating to 7.8 per 1000 connections per year, with the largest category being related to taste (55 complaints), followed by low flow pressure (52 complaints).
- (j) **Circulates** this report to the Community Boards for their information.

**5.2 On-Demand UV Disinfection headworks site configurations – Rob Kerr (UV Delivery Manager) and Colin Roxburgh (Project Delivery Manager)**

57-68

*RECOMMENDATION*

**THAT** the Utilities and Roading Committee:

- (a) **Receives** report No 230503062533.
- (b) **Approves** the proposed site layout drawings for the UV treatment buildings at the water supply headworks located at Domain Rd, South Belt, Darnley Square and Peraki Street.
- (c) **Notes** that the Darnley Square building will have landscape treatment and/or artwork on the external pool facing façade developed in consultation with the Aquatics team.
- (d) **Notes** the locations at Domain Road, Peraki and South Belt and that staff consider the existing site conditions are sufficient to address any landscape and visual impacts of the new buildings.
- (e) **Notes** that other requirements may arise out of the resource consent process which will be implemented if required, and that this resource consent process is not expected to require notification.
- (f) **Notes** that this project is allowed for within the 2023/24 Draft Annual Plan.
- (g) **Circulates** this report to All Boards meeting for their information.

**6 CORRESPONDENCE**

Nil.

**7 PORTFOLIO UPDATES**

**7.1 Roading – Councillor Philip Redmond**

**7.2 Drainage, Stockwater and Three Waters (Drinking Water, Sewer and Stormwater) – Councillor Paul Williams**

**7.3 Solid Waste– Councillor Robbie Brine**

**7.4 Transport – Mayor Dan Gordon**

**8 MATTERS FOR INFORMATION**

**8.1 Spraying and Chemical Usage - Waterways and Roading Spraying Information– Angela Burton (Water Environment Advisor)**

(Report No. 230110001807 to the Waimakariri Water Zone Committee meeting of 6 March 2023).

69-195

**8.2 Appoint WDC Water Unit to procure pipe for CON 22/42 Ashley Gorge Trunk Main Upgrade – Rob Rankin (Project Engineer) and Tjaart van Rensburg (Reticulations Contracts Team Leader)**

(Report No. 230406048685 to the Management Team meeting of 17 April 2023).

196-209

**8.3 Extension of Contract 18/56 – Street Lighting Maintenance & Renewals – Kieran Straw (Civil Projects Team Leader) and Joanne McBride (Roading and Transportation Manager)**

(Report No. 230314034873 to the Management Team meeting of 17 April 2023).

210-214

**8.4 Oxford Water Main Renewals 2022/2023 – Park Avenue – Request to Sole Source Procure the Water Unit – Mark Henwood (Project Engineer) and Colin Roxburgh (Project Delivery Manager)**

(Report No. 230331045743 to the Management Team meeting of 26 April 2023).

215-225

*RECOMMENDATION*

**THAT** the Utilities and Roading Committee

(a) **Receives** the information in Item 8.1 to 8.4.

**9 QUESTIONS UNDER STANDING ORDERS**

**10 URGENT GENERAL BUSINESS**

**11 MATTERS TO BE CONSIDERED WITH THE PUBLIC EXCLUDED**

In accordance with section 48(1) 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 (or sections 6, 7 or 9 of the Official Information Act 1982, as the case may be), it is moved:

1. That the public be excluded from the following parts of the proceedings of this meeting:
  - Item 11.1 Report referred from Management Team meeting of 15 May 2023
  - Item 11.2 Report referred for ratification from Management Team meeting of 20 March 2023
  - Item 11.3 Report from Management Team meeting of 3 April 2023
  - Item 11.4 Report from Management Team meeting of 3 April 2023
  - Item 11.5 Report from Management Team meeting of 8 May 2023
  - Item 11.6 Report from Management Team meeting of 8 May 2023
  - Item 11.7 Report from Management Team meeting of 8 May 2023

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:

Meeting Item No. and subject	Reason for excluding the public	Grounds for excluding the public-
11.1 Public Excluded Minutes Utilities and Roading Committee meeting 18 May 2023	Good reason to withhold exists under section 7	To protect the privacy of natural persons, including that of deceased natural persons (s 7(2)(a)).
11.2 Report referred for ratification from Management Team meeting of 15 May 2023	Good reason to withhold exists under section 7	To carry on, without prejudice or disadvantage, negotiations (including commercial and industrial negotiations) (s 7(2)(i)).
11.3 Report from Management Team meeting of 24 April 2023	Good reason to withhold exists under section 7	To carry on, without prejudice or disadvantage, negotiations (including commercial and industrial negotiations) (s 7(2)(i)).
11.4 Report from Management Team meeting of 24 April 2023	Good reason to withhold exists under section 7	To carry on, without prejudice or disadvantage, negotiations (including commercial and industrial negotiations) (s 7(2)(i)).
11.5 Report from Management Team meeting of 24 April 2023	Good reason to withhold exists under section 7	To carry on, without prejudice or disadvantage, negotiations (including commercial and industrial negotiations) (s 7(2)(i)).
11.6 Report from Management Team meeting of 8 May 2023	Good reason to withhold exists under section 7	To carry on, without prejudice or disadvantage, negotiations (including commercial and industrial negotiations) (s 7(2)(i)).
11.7 Report from Management Team meeting of 17 May 2023	Good reason to withhold exists under section 7	To carry on, without prejudice or disadvantage, negotiations (including commercial and industrial negotiations) (s 7(2)(i)).

### **CLOSED MEETING**

*See Public Excluded Agenda (separate document)*

### **OPEN MEETING**

### **NEXT MEETING**

The next meeting of the Utilities and Roading Committee will be held on Tuesday 20 June 2023 at 9am.

**MINUTES OF A MEETING OF THE UTILITIES AND ROADING COMMITTEE HELD IN THE COUNCIL CHAMBER, RANGIORA SERVICE CENTRE, 215 HIGH STREET, RANGIORA ON TUESDAY 18 APRIL 2023 AT 9AM.**

**PRESENT**

Councillor N Mealings (Chairperson), Councillors R Brine, P Redmond, J Ward, P Williams and Mayor D Gordon (left at 10:21am)

**IN ATTENDANCE**

Councillors N Atkinson, T Fulton and J Goldsworthy.

J Millward (Acting Chief Executive), G Cleary (General Manager Utilities and Roading), D Young (Senior Engineering Advisor), K Straw (Civil Projects Team Leader), J Recker (Stormwater and Drainage Manager), C Button (Project Engineer), and C Fowler-Jenkins (Governance Support Officer)

**1 APOLOGIES**

Moved: Councillor Mealings

Seconded: Councillor Brine

**THAT** an apology for early departure be received and sustained from Mayor D Gordon who left at 10:21am.

**CARRIED**

**2 CONFLICTS OF INTEREST**

There were no conflicts declared.

**3 CONFIRMATION OF MINUTES**

**3.1 Minutes of the meeting of the Utilities and Roading Committee held on Tuesday 21 March 2023.**

Moved: Councillor Williams

Seconded: Councillor Brine

**THAT** the Utilities and Roading Committee:

- (a) **Confirms** the circulated Minutes of the meeting of the Utilities and Roading Committee held on 21 March 2023, as a true and accurate record.

**CARRIED**

**3.2 Matters Arising (From Minutes)**

There were no matters arising.

**3.3 Notes of the workshop of the Utilities and Roading Committee held on Tuesday 21 March 2023**

Moved: Councillor Mealings

Seconded: Councillor Redmond

**THAT** the Utilities and Roading Committee:

- (a) **Receives** the circulated notes of the workshop of the Utilities and Roading Committee, held on 21 March 2023.

**CARRIED**



## 4 DEPUTATION/PRESENTATIONS

### 4.1 Proposed Rangiora Town Cycleway

Representatives from Rangiora PAK'nSAVE, James Flanagan and Rebecca Parish, thanked the Mayor, Councillor Redmond and Rangiora-Ashley Board Member J Gerard for visiting the site during the weekend to understand their concerns around the roading challenges with the proposed cycleway. J Flanagan believed that the Council were pursuing an unsafe route and were making a decision based on securing funding. The Council had engaged WSP to undertake a Technical Note with the safety recommendation, however, PAK'nSAVE disagreed with the note as it offered little assurance that the cycle route was protected from large truck and trailer units. PAK'nSAVE believed that a complete Safety Audit needed to be conducted.

R Parish noted PAK'nSAVE was more than a key stakeholder as the proposed cycleway would impact its operations, and they believed that their operations being affected challenged their ability to feed North Canterbury. They, therefore, thought that the alignment and design of the route should include separation protection from heavy vehicles, and the heavy vehicles must be able to continue to operate. Curb separation and minimal distances would not stop accidents, and paint on the road would not stop heavy vehicles from taking the most available route.

Councillor Redmond questioned if there was any reason the heavy vehicles could not access the loading area on an anticlockwise movement. J Flanagan explained that the PAK'nSAVE building had been designed to allow heavy vehicles to be offloaded inside. However, if they were to reverse the flow, they would be forced to use forklifts outside on the road because some heavy vehicles were rear-loaded. R Parish noted that PAK'nSAVE had been through a publicly notified resource consent process where the traffic management was thoroughly assessed, and the Council determined that the best pathway was to go through the yard first.

Councillor Ward commented that securing safe passage for cyclists away from Southbrook Road was difficult. She enquired how many heavy vehicles, on average, visited PAK'nSAVE per day. J Flanagan noted that, on average, PAK'nSAVE would receive 25 to 30 deliveries per day, and the size of the heavy vehicle differed. Approximately eight to ten large, heavy vehicles were estimated to be moving through the site daily. They generally accepted deliveries up to 3pm, however, they did allow for deliveries up to 5pm. Most of the movements seemed to be from 7am to 11am.

Councillor Ward questioned if PAK'nSAVE would consider enlarging the turning area by removing one of the staff parking areas. J Flanagan noted that the car parks at the rear of the building were needed to ensure that a PAK'nSAVE complied with its resource consent.

Councillor Brine asked how many heavy vehicle movements PAK'nSAVE had during the weekend. J Flanagan advised that weekends were fundamentally very similar for large vehicle movements.

Councillor Goldsworthy questioned if PAK'nSAVE had any initial feedback regards the reprioritisation of Station and Railway Roads. Supplementary, he inquired if they had any initial feedback from the heavy vehicle drivers about the proposed plan. J Flanagan noted that considering their 23-metre vehicles could not manoeuvre around the lines on the ground even if they were painted, there was no way a large, heavy vehicle would be able to.

Councillor Fulton noted that given PAK'nSAVE was a busy site, however, they were by no means the largest PAK'nSAVE in the country. He asked if they had taken advice from other comparable sites with similar issues. J Flanagan reported that the advice he had from talking with his colleagues was that they needed to be very careful with allowing anything that compromised the site.

Furthermore, Councillor Fulton questioned what the practicality was of time shifting. J Flanagan noted that anything was possible, however, every heavy vehicle that they moved impacted several other Foodstuffs South Island outlet and suppliers.

J Flanagan noted that KiwiRail's technical team were unable to assess this plan from a safety perspective for at least a year. He asked what impact that had given the nature of the cycleway. D Young advised that the initial response from KiwiRail indicated that they wished queries to go through their formal process. Council staff had asked them to comment on whether an extradited process would be possible if the railways were not crossed, however, instead going parallel with the railway line, and they had yet to respond to that question. KiwiRail did indicate that they would be open to an on-site meeting.

## 5 REPORTS

### 5.1 Transport Choices Project 2 – Feasibility of alternative alignments – K Straw – (Civil Project Team Leader) and D Young (Senior Engineering Advisor)

D Young spoke to the report noting that staff were requested to conduct a Road Safety Audit on the proposed concept at the previous Utilities and Roading Committee meeting. Unfortunately, staff had not had time to do the Audit and, therefore, instead received the Technical Note. However, staff had analysed the alternative routes, and none could be implemented in the timeframe, nor were they any better than the proposed route. D Young noted that PAK'nSAVE had indicated that they were more interested in moving the route rather than making it safer, so staff did not see the need to further liaise with PAK'nSAVE while drafting this report. However, if the Committee approved the Scheme, Design staff would again meet with PAK'nSAVE to discuss safety issues.

Councillor Redmond asked how wide the carriageway of Railway Road behind PAK'nSAVE could be made. He noted that Railway Road was 3.5 metres wide at its narrowest point, and most heavy vehicles were 2.9 metres wide. D Young commented that one option staff considered was making the stretch of Railway Road a one-way, potentially doubling the carriageway.

Councillor Redmond questioned whether the shared path needed to be 2.5 metres wide or could be reduced in the area behind PAK'nSAVE. D Young acknowledged that staff could revisit the width of the cycleway as they would not try to achieve the 2.5 metres at the expense of much more important elements like safety.

Furthermore, Councillor Redmond asked if staff would likely seek extra budget to make their recommended route safer. D Young noted that the Council had a total budget of around \$7.2 million allocated to various subprojects that could be reallocated. K Straw had been collating estimates, however, staff had yet to compile a final budget. Nonetheless, staff knew that the full sealing of the Kaiapoi to Woodend Cycle route would require a significant part of the \$7.2 million.

Councillor Williams noted that staff recommendation (g) requested staff to work collaboratively with Foodstuffs South Island and their representatives to address their concerns and endeavour to reach a mutual agreement on safety mitigation measures. He enquired what would happen if a mutual agreement could not be reached. D Young explained that if the proposed route were approved, staff would engage with all concerned parties, especially PAK'nSAVE, to develop a detailed design that the Council would then recommend to tender. He noted that the engagement results with all parties would be reported as part of a future report. He did not anticipate that staff would return to the Utilities and Road Committee before that.

Councillor Williams commented that staff had already acknowledged that it was not an ideal route and that an alternative route could not be developed in the timeframe. He asked if that suggested that there may be a safer alternative route that may take a bit longer to develop. D Young believed that one amendment to the route could be considered in more detail - crossing at Marsh Road and coming back at Dunlops Road. However, he was not convinced that would be safer, as it brought in two additional hurdles of crossing the railway line and added a new bridge. He noted that if staff had another two years, then they would be open to further investigating that.

Councillor Ward enquired if it would be possible to place a traffic signal (red and green lights) for the cyclists to indicate when heavy vehicles were manoeuvring in this area. K Straw noted that traffic signals generally implied priority, as the heavy vehicles were not supposed to cross the proposed cycleway, the Council would not be giving heavy vehicles priority. Staff would, therefore, not support a traffic signal, however, there were options which could be considered, such as electronically activated signs or flashing amber lights for when a vehicle was coming across the intersection.

Councillor Goldsworthy asked if the cycleway was only intended for unaccompanied minors in terms of the safety requirements. D Young explained that the Council would install the cycleway assuming the lowest confidence level. In practice, they were expecting only a few school children to be going this way because it was a very small catchment for the school.

In response to a further question by Councillor Goldsworthy, D Young confirmed there was a high likelihood of people flagging it and going across the western side if the Council rerouted cyclists across the eastern side of the railway.

Moved: Mayor Gordon

Seconded: Councillor Brine

**THAT** the Utilities and Rooding Committee:

- (a) **Receives** Report No. 230322039767.
- (b) **Approves** the Rangiora Cycleway Scheme Design (Trim 230216020650[v2]) and Option Four of this report for the purposes of consultation.
- (c) **Notes** that alternative options to Railway Road past PAK'N'SAVE had been considered and were commented on in more detail below:
  - i. Southbrook Road (up to Coronation Street)
  - ii. Southbrook Road (up to Todds Road, and using Ellis Road)
  - iii. Southbrook Road (up to Mitre 10 and along South Brook)
  - iv. Railway Rd (as originally proposed)
  - v. Railway Road (utilising the eastern side of the rail corridor)
  - vi. Eastern Link alignment (between Marsh Road to Boys Road)
  - vii. Eastern Link alignment (between Lineside Road and Marsh Road)
- (d) **Notes** that a Technical Note from Road Safety Specialists had identified that it should be possible to establish a transport environment that would provide an acceptable level of safety and amenity for the various user groups in this area, provided a number of identified matters in the Note were addressed.
- (e) **Notes** that any option that included a level crossing, or alignment within the KiwiRail Corridor would need to follow KiwiRail processes, which at the moment they have indicated this could take "years to complete." This was due to staff shortages and a high workload within KiwiRail.

- (f) **Notes** that the landowner under the majority of the Rangiora Eastern Link land had advised that they do not support that option.
- (g) **Requests** that staff worked collaboratively with PAK'NSAVE, Foodstuffs South Island and their representatives to address their concerns and endeavour to reach a mutual agreement on safety mitigation measures.
- (h) **Notes** that staff would discuss the approved Scheme Design with all other directly impacted residents, businesses and stakeholders (including KiwiRail and Waka Kotahi) to ensure that issues and concerns were carefully considered and taken into account.
- (i) **Notes** that feedback from the consultation would be fed into the Detailed Design, and that the Detailed Design would be reported back to the Committee in July 2023.
- (j) **Notes** that a full Road Safety Audit would be carried out and the recommendations of that (including any intersection re-configuration) would be discussed fully with PAK'NSAVE and other impacted stakeholders, and then be incorporated into the Detailed Design for consideration by the Committee.
- (k) **Notes** the Scheme Design requires the removal of seven on street car parking spaces, and that the final approval of any parking spaces to be removed would be included within the detailed design report in July 2023.
- (l) **Notes** that any parking to be removed as result of the Scheme Design would be consulted directly with the immediate adjacent residents.
- (m) **Notes** that the scheme design requires the removal of 12 existing street trees, which were required to be replaced in alternative locations to be agreed with Greenspace, and that final approval of the removal of any street trees would be included within the detailed design report in July 2023.
- (n) **Notes** that this project is funded through the "Transport Choices" funding stream (which was still subject to final signing and confirmation), and this requires that all works was complete by June 2024.

#### **CARRIED**

Mayor Gordon commented that staff were working within the very tight timeframe set by the Central Government to access the Transport Choices Funding. He noted that when the Council approved the Cycle Network Plan in 2022, they knew the proposed routes required further work. He believed that working with PAK'NSAVE and other affected parties was critical, and he, therefore, visited the site so that he could see and understand PAK'NSAVE's concerns. Mayor Gordon noted that with the high number of heavy vehicle movements, he could understand PAK'NSAVE's concern about ensuring their business, employees and customers were safe. He stressed the importance of the businesses in the Waimakariri District, but believed that the safety concerns could be mitigated by working together.

Mayor Gordon commented that Southbrook Road averaged 26,000 vehicle movements per day, making it unsafe for cyclists. He noted that the Rangiora-Ashley Community Board supported the proposed route, and he was confident that staff would work best endeavours to come up with the best outcome that could be achieved. Mayor Gordon, therefore, supported the motion.

Councillor Redmond thanked all the parties for their work and especially the staff for having another look at the project as per the Committee's request. He believed that safety had to be the Council's primary concern for the heavy vehicle drivers and the cyclists/ pedestrians on the shared path. Councillor Redmond was satisfied that sufficient resources were available to the Council to ensure safety would not be compromised. He was also confident that the included recommendations would address the concerns of affected parties. The motion also made provision for the detailed design to be brought to the Utilities and Rooding Committee in July 2023. He was heartened to see several mitigation works that could be implemented and was comforted that if safety could not be addressed, the matter would return to the Committee. Councillor Redmond suggested that the option of utilising the eastern side of the rail corridor along Railway Road should still be investigated as a possible backup.

Councillor Williams was very heartened that staff had advised that if safety could not be addressed, the route would not be developed in this area. He expected that if consultation with PAK'N'SAVE could not resolve the safety concerns, it would mean that safety could not be adequately addressed and the matter to be brought back to the Committee.

Councillor Mealings thanked staff for their work and PAK'N'SAVE for raising their concerns with the Committee. She was encouraged to see that there would be some robust consultation and collaboration to agree on safety concerns. This was an essential part of the route, as it was the missing link between the Passchendaele Track and the rest of Rangiora.

Councillor Ward noted that whilst the Council were attempting to resolve a challenging situation, The Council must find a workable solution because, at present, cyclists were not safe travelling through Southbrook. The Council would address the Southbrook Road issues, however, it would take four or five years for the Eastern Link Road, which would incorporate a cycleway, to be developed. She believed that a solution would need compromise from all parties and working together.

In his right of reply, Mayor Gordon noted that he supported the Council exploring the development of the Eastern Link Road. However, the Council had to be realistic about the timing of its development as a vast range of issues needed to consider before the development. He commented that there was a range of holistic challenges in Fernside, Flaxton, Skewbridge and Woodend that the Council had asked staff to look at as they address traffic congestion in the district, and the proposed Eastern Link Road formed a part of that. Mayor Gordon commented that a better route may be identified in the future, but the Council had to work within the current parameters. He wished staff well and looked forward to them reporting back to the Committee on those outcomes.

## 5.2 **East Belt Rain Gardens** – C Button (Project Engineer) and J Recker (Stormwater and Drainage Manager)

J Recker updated the Utilities and Rooding Committee regarding the proposed East Belt Rain Gardens project in Rangiora and sought approval to proceed with the concept design. He noted that regular flooding at the intersection of East Belt and Keir Street in Rangiora had prompted the need for improved stormwater management. However, a conceptual design based on the Council's Engineering Code of Practice was unaffordable and impractical. Therefore, the existing garden areas at Rangiora High School were to be retrofitted into rain gardens and expanded where possible. The current budget for the proposed upgrade was \$90,000 for the 2022/23 financial year, including detailed and conceptual design, and \$210,000 for the 2023/24 financial year, including construction. The high-level cost estimate for this concept design was \$305,500, which was 3% above the available budget. However, through the detailed design process, this design would be refined to ensure the project was within the budget.

Councillor Williams noted that the report stated that when land to the east was developed, a transport link would provide a long-term solution to the flooding on East Belt. He requested staff to elaborate. C Button noted that the land to the east was marked to be developed in the future, and improved stormwater measures would be included.

Furthermore, Councillor Williams asked if there was a timeframe for this development and if it would resolve this long-term problem should the Council implement temporary measures. G Cleary explained that the timeframe was outside the Council's control. It was a link identified as part of the Development Plan for the eastern part of Rangiora. He noted that this work should not be seen as work that was happening instead of the future link, but rather in addition to it.

Moved: Councillor Williams

Seconded: Councillor Redmond

**THAT** the Utilities and Roading Committee:

- (a) **Receives** report No. 230404047292.
- (b) **Approves** the finalised concept design to be progressed to detailed design and construction in the 2023/24 financial year.
- (c) **Notes** that the high level cost estimate was 3% over the available budget, however, through the detailed design process the design and engineer's estimate would be refined to ensure the project was within budget.
- (d) **Notes** that the cost estimate would be further refined during detailed design with recent tendered rates and a reflection of the extent of the design that could be included within these rates.
- (e) **Circulates** the report to the Rangiora-Ashley Community Board for information.

**CARRIED**

Councillor Williams commented that every move to mitigate the flooding potential around the district should be supported.

Councillor Redmond was pleased that the engineers' estimate almost matched the budget, and he was hopeful that this work would be able to be completed well within the budget.

Councillor Mealings noted that she supported the motion and applauded the fact that staff had taken the opportunity to incorporate some educational opportunities by working with Rangiora High School. In addition, she was in favour of the opportunity to mitigate stormwater and simultaneously clean it.

### 5.3 **87 Dunns Avenue Bank Improvements** – J Recker (Stormwater and Waterways Manager)

J Recker spoke to the report, noting that approval was sought to carry out rock placement works along Kairaki Creek (Saltwater Creek) adjacent to 87 Dunns Avenue Bank in Pines Beach. The owners at 87 Dunns Avenue contacted the Council regarding the erosion along Kairaki Creek adjacent to their property. It was observed from a site visit that the property owner had previously attempted to stabilise the banks in two locations with chain fencing and rock. The property owner also purchased concrete blocks and was proposing to have them installed along the bank adjacent to his property to mitigate any further erosion, before installing these blocks, the property owner contacted Council regarding the required consent.

J Recker further advised that the Council obtained high-level advice from consultants with geotechnical and structural experience to review the proposed concrete block solution, explore alternative solutions, and the consenting requirements for all of those. The consultants advised the Council that the concrete block solution was not recommended. However, one of the options outlined by the consultants was rock placement which could be designed and constructed in accordance with the Canterbury Regional Council Code of Practice for Defence against Waters. It was determined that the placement of rocks along the bank would improve the ability of the Council to maintain this section of the waterway and may provide some mitigation against future erosion. The drainage maintenance allocation from the Better-off Funding would fund this work.

Councillor Redmond noticed from the aerial photos that the riverbank behind the Dunns Avenue property seemed very narrow. He asked how staff were proposing to get access to place these rocks. J Recker explained that they would access the site from the other side of Kairaki Creek with a digger.

Moved: Councillor Williams

Seconded: Councillor Redmond

**THAT** the Utilities and Roading Committee:

- (a) **Receives** report No. 230321039464.
- (b) **Approves** the Council carrying out the rock placement works along Kairaki Creek (Saltwater Creek) adjacent to 87 Dunns Avenue Bank in Pines Beach for a sum of \$25,000.
- (c) **Notes** that this work would be funded by the drainage maintenance allocation from the Better Off Funding.
- (d) **Notes** that \$1,050,000 of the Better-off Funding was previously allocated by the Council to 'Rural Land Drainage - Maintenance Projects prioritised by staff in response to Climate Change' (Trim 220911157300).
- (e) **Circulates** this report to the Kaiapoi-Tuahiwi Community Board for their information.

**CARRIED**

Councillor Williams commented that he had visited the site with staff, which was quite considerable. Unfortunately, the property frontage had been worn away over the years. He believed the Council should intervene as the erosion was getting close to the corner of the landowner's house. He thanked J Recker and his team for the work he had done.

Councillor Redmond commented that it was a low-cost solution and supported the motion..

5.4 **Patronage figures for Public Transport Boardings from Park and Ride Sites** – D Young (Senior Engineering Advisor) and P Daly (Journey Planner / Road Safety Coordinator)

D Young spoke to the report noting raw data was provided by Environment Canterbury (ECan), he analysed the data..

Councillor Williams noted that the Park and Ride facility on River Road in Rangiora was bustling and always seemed full. He was concerned that the Council would need to extend the facility in time, and sufficient land may not be available. D Young explained that the current River Road facility was developed on Council owned land.

Councillor Fulton asked if the Council had zone-based information about the number of passengers using public transport to travel to Christchurch City Central. D Young noted that the report only highlighted passengers using the Park and Ride facilities. However, staff could also look at neighbouring bus stops to capture the number of regular bus users.

Councillor Redmond questioned if getting all the bus patronage figures and trends was possible. D Young undertook to forward a memorandum with the raw data to Committee members.

Councillor Mealings enquired if ECan could track route user numbers by using bus cardholders' data. D Young undertook to enquire and report back to the Committee.

Moved: Councillor Mealings

Seconded: Councillor Ward

**THAT** the Utilities and Roothing Committee:

- (a) **Receives** Report No. 230308032102.
- (b) **Notes** the increase in boardings at these locations, over the past 18 months of Park and Ride operation.
- (c) **Circulates** this report to the Rangiora-Ashley and the Kaiapoi Tuahiwi-Community Boards for information.

**CARRIED**

Councillor Mealings commented that it was heartening to see that Park and Ride usage had increased even in the wake of Covid and that it seemed to be going from strength to strength, so much so that Council were looking at improving our Park and Rides and thinking about the future capacity needs. She was interested to see what other information staff could extrapolate from the reports regarding the usage of other bus routes.

Councillor Ward wondered that with the Central Government encouraging people to use public transport, if the Council should expand the Park and Ride operations to include areas such as Mandeville, Oxford, Pegasus and Woodend. She believed the Council should be lobbying Central Government for additional funding to get the vehicles off the road.

Councillor Redmond noted that the data was interesting, although the figures seemed relatively high, however, it was encouraging to see that patronage was increasing.

In her right of reply, Councillor Mealings commented that data was open to interpretation, however, looking at the total of all Park and Ride stops, for example, over the month of December of 4,259, even if you half that it was still 2,000 fewer cars on the road.

## **6 CORRESPONDENCE**

Nil.



## 7 **PORTFOLIO UPDATES**

### 7.1 **Roading – Councillor Philip Redmond**

- Butchers Road Culvert - all the sheet piling had been removed, but there was still work and a guard rail to be installed. It should be completed by the end of April 2023.
- Southbrook Road / Torlesse Steet / Coronation Street intersection – work was progressing well all new traffic signal poles had been installed and footpaths were being asphalted.
- Curb and channel renewals – work was complete on Good Street and would commence on Geddis Street.
- Mulcocks Road right turn bay – work was continuing. The sealing of the widened area had been completed and street signage was now being installed. The project was nearing completion. Also, the grass in the drainage areas had been sprayed.
- Pavement repairs had now been completed on Revells Road.
- Footpath renewals work was near complete on Otaki Street

Councillor Williams noted that the Council had received a complaint about the Butcher Road culvert not being large enough for the volume of water. He questioned if the culvert size had been increased. Councillor Redmond noted that he had spoken with contractors working on the site and confirmed that the metal culvert was severely rusted. G Cleary pointed out that the new culvert was designed to be the appropriate size for the catchment..

### 7.2 **Butcher Road culvert Drainage, Stockwater and Three Waters (Drinking Water, Sewer and Stormwater) – Councillor Paul Williams**

- Communications had gone out to the community regarding the chlorination and drop-in sessions planned for May 2023.
- A meeting would be held at the Woodend Waste Treatment Plant about funding and planting on 29 April 2023.
- A Mandeville diversion meeting with Cullen Avenue residents would be held on 27 April 2023.
- Colin Roxburgh had been appointed as the new Project Delivery Unit Manager.

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

- There was a fire in one of the rubbish pods at Southbrook, reportedly caused by a battery-operated vacuum cleaner. Site staff followed all the correct procedures, the fire was extinguished quickly, and the fire service was closed to ensure no further risk.
- On 11 April 2023, there was a break-in at Southbrook, the fence at the rear of the property was cut, the offender removed the side sliding window and attempted to remove the tills, but they were empty, the alarms went off, and Waimak Patrol was on site within five minutes, and Police attended.
- Staff were working with Waste Management to improve the provision of collection services, which had slipped in the last few months. The initial challenge was getting drivers over covid related factors. Additional drivers and vehicles would be brought in to assist. They also proposed making some changes to collection routes to even out the workload across the week.
- Curb side recycling bin audits would commence on 1 May 2023.
- Curbside recycling bin audits would commence on 1 May 2023.

- Eco Educate attended the Elevate Market to run a low-waste event, they achieved 88% diversion from landfill, with almost 73% going to compost and worm farms. 15.5% recycling and 11.5% going to landfill.
- Attending the Wasteminz Conference.

Councillor Fulton noted that in Methven, he saw the contractor around town picking up the public waste bins, marked in their colours waste, recycling and green. Then, all went in the environmental waste truck. He asked if this was the practice in the Waimakariri. Councillor Brine explained that if they believed there was likely to be a high level of contamination, there was only one place it could go: the landfill.

Councillor Mealings asked if Waimakariri had any of these bin stations with recycling, green and waste. Councillor Brine noted that there was one in Cust, and there would be a submission from Loburn wanting one there. Cust worked well and there was very little contamination.

#### 7.4 Transport – Mayor Dan Gordon

Mayor Gordon was not present for his update.

### 8 MATTERS REFERRED FROM THE WOODEND-SEFTON COMMUNITY BOARD

#### 8.1 Recommendation for proposed upcoming works at Norton Place, Woodend – T Matthews (Project Engineer) and J Recker (Stormwater and Waterways Manager)

J Recker spoke to the report noting that approval was being sought to proceed to detailed design and construction of upgrading the existing sump option at Norton Place in Woodend. Only one recorded property flooded in June 2019, during a 1-in-100-year weather event. The design intent was to capture the surface water before it flows towards Norton Place. The sump upgrade option involved installing additional double sumps upstream of Hewitts Road and a new double sump at the low point in Norton Place. A non-return valve would also be installed to prevent backflow from Hewitts Road to Norton Place, all at an estimated cost of \$165,000.

In response to a question from Councillor Redmond, J Recker confirmed that staff had not yet met with the affected property owner.

Councillor Williams noted that upgrading the sumps would only assist with blockages. He asked if the Council needed to extend the current stormwater system in that area. J Recker pointed out that the sump option was to meet the current level of the Council's Code of Engineering practice.

Moved: Councillor Williams

Seconded: Councillor Redmond

**THAT** the Utilities and Roding Committee:

- Receives** Report No. 230224025812.
- Approves** the recommendation to proceed with design and construction of the upgrading existing sump option in 2023/24.
- Notes** that there would still be an issue of lack of secondary flow path out of Norton Place for extreme events. However the 50 year level of service was maintained to prevent flooding of private property, by routine sump maintenance. It was likely Council would continue receiving complaints due to ponding in road reserve and the time it takes for the water to drain away.

- (d) **Notes** that this was a reduced scope of work from the previously accepted design of overland flow path through Norton Reserve and Hewitts Road and had come about due to the practical challenges and constraints of the current localised topography and construction estimate for this upgrade being beyond the available budget.
- (e) **Notes** that in events great than 1 in 100 years, overland flow path would continue to follow the natural low point towards the property.
- (f) **Notes** that this option can be integrated into any future stormwater upgrades along Hewitts Road.

**CARRIED**

Councillor Williams commented that it was a sensible solution as it was essential to protect the property.

Councillor Mealings agreed, and she noted that it was an excellent initial step to address the flooding in the area.

Councillor Redmond noted that the matter was discussed at the Woodend-Sefton Community Board. Unfortunately, there was no cost-effective solution for this one particular property. There had been a proposal to use the northern reserve as a retention basin, but consultation with the residents did not support that option.

## **9 MATTERS FOR INFORMATION**

- 9.1 **Request approval for Stop Controls on Powells Road at McJarrows Road / Victoria Street** – Shane Binder (Senior Transportation Engineer)  
(Report No. 230109001491 to the Oxford-Ohoka Community Board meeting of 6 April 2023)

Councillor Mealings noted that this had been discussed at the Oxford-Ohoka Community Board meeting, and the community was concerned about this dangerous intersection. There had recently been an accident at the corner, and due to the poor visibility, having it as a giveaway sign did not make much sense. Therefore, the Community Board moved that it be changed to stop control.

Moved: Councillor Mealings

Seconded: Councillor Redmond

**THAT** the Utilities and Roding Committee

- (a) **Receives** the information in Item 9.1.

**CARRIED**

Councillor Mealings commented that the intersection was not visible enough, and changing to a stop control therefore made sense.

Councillor Fulton noted that the resident had contacted him a few months ago and she had done an excellent job rallying the community, going through the process and interacting with the Community Board.

## **10 QUESTIONS UNDER STANDING ORDERS**

Nil.

**11 URGENT GENERAL BUSINESS**

Nil.

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

In accordance with section 48(1) 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 (or sections 6, 7 or 9 of the Official Information Act 1982, as the case may be), it was moved:

Moved: Councillor Brine

Seconded: Councillor Ward

1. That the public be excluded from the following parts of the proceedings of this meeting:

- Item 14.1 Report from Management Team meeting of 20 March 2023
- Item 14.2 Report from Management Team meeting of 3 April 2023
- Item 14.3 Report from Management Team meeting of 3 April 2023

The general subject of each matter to be considered while the public was 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 were as follows:

<b>Meeting Item No. and subject</b>	<b>Reason for excluding the public</b>	<b>Grounds for excluding the public-</b>
14.1 Report from Management Team meeting of 20 March 2023	Good reason to withhold exists under section 7	To carry on, without prejudice or disadvantage, negotiations (including commercial and industrial negotiations) (s 7(2)(i)).
14.2 Report from Management Team meeting of 3 April 2023	Good reason to withhold exists under section 7	To carry on, without prejudice or disadvantage, negotiations (including commercial and industrial negotiations) (s 7(2)(i)).
14.3 Report from Management Team meeting of 3 April 2023	Good reason to withhold exists under section 7	To carry on, without prejudice or disadvantage, negotiations (including commercial and industrial negotiations) (s 7(2)(i)).

**CLOSED MEETING****Resolution to Resume Open Meeting**

Moved: Councillor Williams

Seconded: Councillor Redmond

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

*The public excluded portion of the meeting commenced at 11.19am and concluded at 11.30pm.*

**NEXT MEETING**

The next meeting of the Utilities and Roding Committee would be held on Tuesday 23 May 2023 at 9am.

THERE BEING NO FURTHER BUSINESS, THE MEETING CLOSED AT 11.30AM.

**CONFIRMED**

\_\_\_\_\_  
Chairperson

\_\_\_\_\_  
Date

Unconfirmed

**NOTES OF A WORKSHOP OF THE UTILITIES AND ROADING COMMITTEE HELD IN THE COUNCIL CHAMBERS, 215 HIGH STREET, RANGIORA ON TUESDAY, 18 APRIL 2023, AT 11.30AM.**

**PRESENT**

Councillor N Mealings (Chairperson), Councillors R Brine, P Redmond, J Ward, P Williams and Mayor D Gordon (left at 10:21am)

**IN ATTENDANCE**

Councillors N Atkinson, T Fulton and J Goldsworthy.

J Millward (Acting Chief Executive), G Cleary (General Manager Utilities and Roading) H Downie (Senior Advisor Strategy and Programme), S Binder (Senior Transportation Engineer) and C Fowler-Jenkins (Governance Support Officer).

**APOLOGIES**

Mayor Gordon.

1. **Rangiora Cenotaph Corner Intersection Improvement Project** – H Downie (Senior Advisor Strategy and Programme) and S Binder (Senior Transportation Engineer)

Councillor Williams noted at the workshop held with the Rangiora-Ashley Community Board the preference was for a raised platform of the options that were presented but most members had said why fix something that was not broken, there had been no problems there. He thought this should go back to the Community Board for further discussion before it was furthered, and money was spent. Council needed to get the BZ Corner developed first and get the other shops leased, that alone would close in the intersection and make it more pedestrian friendly. H Downie noted that her takeaway was that there was a mix of opinion, there was quite a bit of support for the raised platform. She took on board that there were a few members who had said nothing needed to be done at the intersection. She noted that this was an implementation project that had come out of quite a long lead up through a strategy piece of work where staff had traffic and urban designers consider issues and options based on the town centre that was then adopted, it went through public consultation and Council. It included a high level implementation table that specifically committed the Council to this action which had then been budgeted so there was budget in the Long Term Plan to implement this project. There were a wide variety of options that Council could consider that had different impacts on the budget, there was \$250,000 in next years budget to implement. She commented that whether it did or did not work staff were still aware that there were issues that the intersection posed for the growth and expansion of the town centre and making the intersection as attractive as it could be for pedestrians to traverse.

Councillor Atkinson commented that he did not realise there was a problem. He accepted through strategies that there had been things talked about on that corner. He reinforced that Council had been involved with the sale of BNZ corner and really interested in the concept of what that looked like on this corner and how much of that concept was worked into what staff were thinking about here. He would like to know more about that. He asked under the speed limit review would this intersection not be reduced to 40km/h anyway without anything and right throughout the district staff were saying that magically you put up a sign and people would adhere to it so why did Council need to do anything else to that corner if indeed the speed limit was changed. He noted on the noise factor the main street in Kaiapoi with the raised platforms when trucks went through there it was quite loud. S Binder noted that the intersection at present worked in that it did convey vehicles and pedestrians in a relatively safe manner. This was trying to get pedestrian level of service which was more than just getting across the intersection. Council had received service requests at the intersection and commentary from the Waimakariri Access Group among others about the perception and challenges getting across the intersection by some of our residents who were not quite as able but that was their main ability to get to and from the east and west side of the town centre and the perception was that was a very challenging intersection to cross. This

was not necessarily supposed to be impacting the speeds because we already knew that speeds on Ashley Street were lower, staff did not expect this to markedly change the speeds. What it was doing was looking at options so if you were walking across there you were walking perhaps on a raised level, so you felt you had the priority, you recognised cars slowing down through the intersection perhaps with other additions.

Councillor Atkinson commented that if you went to Christchurch or other places now around suburbs in Christchurch, they had a timer on the pedestrian lights to get across the road. He asked if that would not be a simple answer to this where you gave pedestrians an extra ten seconds to get across the road. S Binder noted that staff had some brief discussions around the countdown timers, they could potentially be a good addition at the intersection. He did not think they would serve as a substitute based on some of the feedback he was getting, he realised part of it was a perception of time, part of it was also a safety perception.

Councillor Mealings noted that given this was a mixed-use area currently, there were people living above the intersection and the noise of the platforms. For instance, that had been raised as an issue in Oxford as to why they put raised platforms as crosswalks down Main Street. It felt as though this may be premature would we not want to wait until at least the development of the BNZ Corner and if that was not advisable then could we not phase the lights longer and/or review the speed limit and/or look at pedestrian refuge islands instead. This was a rather large solution staff were proposing at this point when we did not necessarily have the need yet. H Downie thought the staged approach could be a solution, some of the signal phase changes did not cost anything. The trouble with the signal phasing alone it did not give any visual cues to the user that there had been a change, you might feel differently as you were crossing.

THERE BEING NO FURTHER BUSINESS THE WORKSHOP CONCLUDED AT 12.01PM

**WAIMAKARIRI DISTRICT COUNCIL****REPORT FOR INFORMATION****FILE NO and TRIM NO:** WAT-03 / 230119006411**REPORT TO:** Utilities and Roothing Committee**DATE OF MEETING:** 23 May 2023**FROM:** Colin Roxburgh, Project Delivery Manager**SUBJECT:** Water Quality and Compliance Annual Report 2021-22**SIGNED BY:**  
(for Reports to Council,  
Committees or Boards)  
General Manager  
Chief Executive**1. SUMMARY**

- 1.1. This report is to update the Utilities and Roothing Committee the results of the annual water quality and compliance review. Also included are the results of the first two months of compliance reporting under the new Drinking Water Quality Assurance Rules (DWQAR) for January and February 2023.
- 1.2. An annual review has been undertaken since the 2018-19 compliance year of water quality and compliance results. This report outlines performance for the 2021-22 period. The updated scope of the report is outlined below:
- A summary of compliance against the Drinking Water Standards.
  - A summary of updates to the Council's Water Safety Plans, and any recommended changes or updates to these.
  - Evaluation of water quality results, and any conclusions drawn from these.
  - A summary of any incidents or investigations that have been undertaken throughout the year.
  - A summary of water quality or level of service related complaints, and how these have been responded to.
  - Any changes to legislation or policies, and impacts these may have had.
  - An update of leakage results across the District.
  - A preview of compliance for the first two months of reporting under the new DWQAR.
- 1.3. A summary of the performance against the above measures is given below:



<b>Table 1: Summary of 2021-22 Review</b>			
<b>Measure</b>	<b>Sub-Measure</b>	<b>Summary of Results</b>	<b>Follow up Actions / Recommendations</b>
DWSNZ Compliance	DWSNZ Compliance	<p>Compliance for the 2021-22 year was assessed against the now redundant 2018 revision of the DWSNZ. While Taumata Arowai had taken over as the regulator, they did not produce an assessment of each supplier's compliance for this period. As a result, the Council engaged an independent expert to assess this. The results of this assessment are summarised below:</p> <ul style="list-style-type: none"> <li>Bacterial Compliance: 11/12 schemes fully compliant (99% of population on Council scheme).</li> <li>Protozoal Compliance: 9/12 schemes fully compliant (92% of population on Council scheme).</li> </ul>	<p>The two key actions required to address the non-compliances in 21-22 are:</p> <ul style="list-style-type: none"> <li>Complete the Ashley Gorge connection to Oxford Rural No.2 which is budgeted for 23/24</li> <li>Ensure all water quality equipment verifications and calibrations are documented using Infrastructure Data software.</li> </ul> <p>It is noted that the actions above only address issues arising from the 21-22 compliance survey. A much larger package of works is required to achieve full compliance against the 2022 DWQAR.</p>
Drinking Water Safety Plan Review	Plans Submitted and Approved	As per obligations under the Water Services Act, all 12 Drinking Water Safety Plans were reviewed, updated and submitted to Taumata Arowai by the 15 November 2022 deadline.	Update in 2023 to align DWSP <sup>1</sup> s with SWRMP <sup>2</sup> recommendations and new DWQAR <sup>3</sup>
	Annual Review	An annual review was not undertaken during the 2021-22 year as a full renewal of the plans was underway. The first annual review will be undertaken by the end of 2023 (one year after the 2022 update).	Undertake review at end of 2023.
Water Quality Results	E. coli	There were 0 positive treated water samples for E. coli out of 2,147 plant and reticulation samples taken.	Nil
	Total coliforms	The incidence rate of total coliforms on treated water samples was 3.8%, which compares with the average of the last 3 years of 2.1 %.	Emergency chlorine implemented as part of addressing repeated or high coliform counts.
Investigations	NA	There were two incidents of Level 3 or greater during the year. These were followed up with Incident Reports as appropriate. In addition, there were four Level 2 incidents that were investigated and reported on.	Kaiapoi and Woodend total coliform incidents are ongoing, and managed in the meantime with temporary chlorination.
Complaints	NA	There were 141 complaints received during the year, which equates to 7.8 per 1000 connections. This is greater than the Level of Service performance measure of less than 5 per 1000 properties.	Continue work on improving response times, and be proactive with messaging around chlorination to minimise resultant complaints.

<b>Table 1: Summary of 2021-22 Review</b>			
<b>Measure</b>	<b>Sub-Measure</b>	<b>Summary of Results</b>	<b>Follow up Actions / Recommendations</b>
Legislation	Water Services Act	This new Act came into force on 15 November 2021. This triggered new requirements for SWRMPs and DWSPs, and introduced new DWQAR.	Implement project to ensure all supplies can achieve requirements of DWQAR.
Leakage	Percentage	The preliminary assessment of leakage across the district has an overall percentage of 22%, which is equivalent to the Council target performance measure. It is noted that the urban average is 12%, and further advice is sought to improve reporting on the rural restricted schemes.	Complete peer review of methodology before results are finalised.
Compliance with 2022 DWQAR	Percentage of population and schemes compliant	For January and February for 2023, the following points can be made with respect to compliance against the DWQAR: <ul style="list-style-type: none"> <li>• 42% of treatment plants achieved bacterial compliance for each month, representing 26% of the population</li> <li>• 25% of treatment plants achieved protozoal compliance, representing 7% of the population.</li> <li>• From 19% to 20% of distribution zones achieve bacterial compliance, representing 19% of the population.</li> </ul>	The key steps required to achieve compliance are: <ul style="list-style-type: none"> <li>• Complete project to install UV treatment at all treatment plants to achieve both bacterial and protozoal compliance. This is planned over the 2023/24 and 2024/25 financial years.</li> <li>• Either exemptions need to be obtained such that the Council is exempt on its urban supplies from having chlorine in place, or chlorine needs to be introduced in order to achieve bacterial compliance for all zones.</li> <li>• Some improvements to the monitoring and collection of data on schemes that have chlorine in place need to be made.</li> </ul>

1. DWSP = Drinking Water Safety Plan

2. SWRMP = Source Water Risk Management Plan

3. DWQAR = Drinking Water Quality Assurance Rules (replaced the previous Drinking Water Standards for New Zealand).

#### Attachments:

- i. External Audit Report of Drinking Water Standards Compliance (230119006445)
- ii. 2023 Monthly Compliance Summary for January and February

## **2. RECOMMENDATION**

**THAT** the Utilities and Rooding Committee:

- (a) **Receives** report No. 201109150435.
- (b) **Notes** that the assessed percentage compliance against the bacterial and protozoal parts of the Drinking Water Standards for New Zealand was 99% and 92% respectively, and that the non-compliance issues were not considered to represent a safety risk to consumers, noting that the bacterial non-compliance was related to monitoring on the Ashley Gorge supply when the new Act came into effect, and the protozoal non-compliances were due to issues noted within the report related to verification and calibration of equipment used to demonstrate compliance of UV treatment equipment.
- (c) **Notes** that the 2021-22 period is the last period assessed against the now superseded 2018 revision of the Drinking Water Standards for New Zealand, and that the next assessment will be against the 2022 Drinking Water Quality Assurance Rules.
- (d) **Notes** that the anticipated compliance levels for the 2022-23 year are forecast to be less than 10% due to new requirements and the time taken to transition to these, and that a programme to implement UV treatment across the district is underway to bring the Council up to full compliance levels over the 2023-24 and 2024-25 years.
- (e) **Notes** that a complete renewal of all the Council's Drinking Water Safety Plans was undertaken over 2021-22, as well as the first set of Source Water Risk Management Plans, in order to meet obligations created under the Water Services Act.
- (f) **Notes** that there were no positive treated water *E. coli* samples detected over the 2021-22 compliance period, and no unexpected raw water *E. coli* samples.
- (g) **Notes** that the level of coliform detections increased marginally over the most recent results with 3.8% of treated water samples showing the presence of coliforms (relative to 3.2% in 2020-21), and that this is being managed through the use of emergency chlorination as required, as well as through detailed investigations to address any underlying issues.
- (h) **Notes** that there were two Level 3 incidents and four Level 2 incidents throughout the compliance year with investigations and assessment reports produced in each case to identify the root cause, manage the issue, and ensure lessons are learnt to minimise the likelihood of recurrence.
- (i) **Notes** that there were 141 complaints related to the Council's water supplies over the 2021-22 compliance period, equating to 7.8 per 1000 connections per year, with the largest category being related to taste (55 complaints), followed by low flow pressure (52 complaints).
- (j) **Circulates** this report to the Community Boards for their information.

### 3. **BACKGROUND**

- 3.1. An annual review has been undertaken since the 2018-19 compliance year of water quality and compliance results. The purpose of the report is to keep the Utilities and Rooding Committee updated on the compliance levels and performance of the Council's water supplies.

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

- 4.1. This scope of the report is outlined below:
  - A summary of compliance against the Drinking Water Standards.
  - A summary of updates to the Council's Water Safety Plans, and any recommended changes or updates to these.

- Evaluation of water quality results, and any conclusions drawn from these.
- A summary of any incidents or investigations that have been undertaken throughout the year.
- A summary of water quality or level of service related complaints, and how these have been responded to.
- Any changes to legislation or policies, and impacts these may have had.
- An update of leakage results across the District.
- Preliminary reporting of performance against the 2022 DWQAR, based on the January and February compliance reports.

### **Drinking Water Standards Compliance**

4.2. The key results of the 2021/22 compliance report are summarised in the following table:

Table 2: Summary of Results for 2021-22 Compliance Period

Supply	Compliance Achieved				Notes
	Plant (Bacterial)	Plant (Protozoal)	Distribution Zones (Bacterial)	Chemical	
Ashley Gorge	No	No	No	Yes	Scheme was not previously required to be assessed until new requirements came in on 15 November 2021 under the Water Services Act, and sampling in accordance with requirements did not commence until December 2021 meaning bacterial compliance could not be claimed. No protozoal barrier in place. Upgrade is planned for 23/24.
Cust	Yes	Yes	Yes	Yes	
Garrymere	Yes	Yes	Yes	Yes	
Kaiapoi	Yes (Peraki)	Yes (Peraki)	Yes	Yes	
	Yes (Darnley)	Yes (Darnley)			
Mandeville-Fernside	Yes	No	Yes	Yes	Unable to provide evidence of every weekly turbidimeter calibration being completed. External assessor noted this did not represent a safety risk. New software system in place to better schedule and track this.
Ohoka	Yes	Yes	Yes	Yes	
Oxford Rural No.1	Yes (Rockford well)	Yes (Rockford well)	Yes	Yes	
	Yes (McPhedrons)	Yes (McPhedrons)			
Oxford Urban – Rural No.2	Yes	Yes	Yes (Urban)	Yes	
			Yes (Rural 2)		
Woodend - Pegasus	Yes	Yes	Yes (Pegasus)	Yes	
			Yes (Woodend)		
Poyntzs Road	Yes	No (plant offline from August 2021 onwards)	Yes	Yes	Poyntzs Road plant does not have a protozoal barrier. This plant was abandoned in August 2021 when Poyntzs Road was joined to West Eyreton, hence Poyntzs Road was part of a compliant scheme from August onwards.
Rangiora	Yes	Yes	Yes	Yes	
Waikuku Beach	Yes	No	Yes	Yes	Unable to provide evidence of every weekly turbidimeter calibration being completed. External assessor noted this did not represent a safety risk. New software system in place to better schedule and track this.
West Eyreton – Summerhill	Yes	Yes	Yes (West Eyreton)	Yes	
			Yes (Summerhill)		
<b>Total by Number of Schemes</b>	<b>12/13</b>	<b>9/13</b>	<b>12/13</b>	<b>13/13</b>	

- 4.3. The following key points can be made about the above:

Bacterial Compliance of Distribution Zones:

- 4.3.1. Bacterial compliance was achieved at all WDC distribution zones (or reticulation) within the district that operated during the compliance period, with the exception of Ashley Gorge which is a new supply from a compliance point of view, and had not been subject to assessment against the standards previously.
- 4.3.2. While sampling frequencies did increase in accordance with these new obligations for the Ashley Gorge supply, this did not occur until early December 2021, while the WSA took effect from 15 November 2021. Therefore, compliance could not be claimed for the full period that the Ashley Gorge supply was subject to the requirements of the WSA and DWSNZ.
- 4.3.3. It is noted that the way in which bacterial compliance of distribution zones can be gained going forward (under the 2022 DWQAR) is more challenging than under the now redundant 2018 DWSNZ, which is covered later in this report.

Bacterial Compliance of Plants

- 4.3.4. Bacterial compliance of the treatment plants is demonstrated by taking the required number of *E. coli* samples in accordance with a set of parameters defined in the DWSNZ, and the required amount of those samples being free of *E. coli*.
- 4.3.5. All samples were taken as programmed, and all were absent of *E. coli*. Like with the distribution zones, the only issue was related to the Ashley Gorge supply, for the same reasons. In effect, the key issue in this case was that the lead in time to start monitoring this supply in accordance with the DWSNZ was insufficient, and as such the required level of monitoring did not take effect until several weeks after the WSA came into effect.
- 4.3.6. It is noted that the way in which bacterial compliance of treatment plants can be gained going forward (under the 2022 DWQAR) is more challenging than under the now redundant 2018 DWSNZ, which is covered later in this report.

Protozoal Compliance of Plants:

- 4.3.7. The schemes with secure sources continued to achieve protozoal compliance (Rangiora, Kaiapoi, Woodend, Pegasus, Cust, West Eyreton, Oxford Urban-Rural No.2, Ohoka). It is noted that the secure section of the standards that these schemes relied upon does not exist in the 2022 DWQAR, and instead there are more stringent requirements to achieve Class 1 status of sources.
- 4.3.8. For the schemes that have treatment systems for protozoa (Mandeville, Waikuku Beach, Garrymere), only Garrymere was assessed as achieving full compliance for the 2021-22 year.
- 4.3.9. Mandeville and Waikuku Beach were assessed as not achieving full compliance for the 2021-22 year. While the plants operated within their required limits for the full year, the issue identified was surrounding the validation tasks completed on the turbidity meters. The data from the turbidimeters is part of the data submitted to prove compliance, and for this to be accepted, there needs to be evidence that the turbidimeters have been verified each week. While the verification of these meters is part of the normal tasks undertaken each week by Water Unit operators as part of their weekly site visits, evidence to prove this occurs was not able to be provided for each week of the year for each site. The assessor (Matt Molloy) who undertook a

review of Council's DWSNZ compliance noted that these compliance issues did not present a safety risk.

- 4.3.10. The need to provide more robust systems for providing evidence of validation tasks has been identified previously, which was part of the driver for the Council purchasing the Infrastructure Data (ID) software to manage all activities related to water quality and compliance. Part of what is now managed through this software is the tracking of each maintenance task through digital forms, with specific sections of the form set up to prompt operators to provide evidence of the validation tasks.
- 4.3.11. The Ashley Gorge water supply did not achieve protozoal compliance due to it not having any form of protozoal barrier in place, with chlorine being the only form of treatment in place. Design is underway in 2022-23 to supply Ashley Gorge from the Oxford Rural No.2 water supply, meaning the existing treatment plant could be abandoned. Construction of this upgrade is planned for 2023-24. This would effectively mean that Ashley Gorge stops being a water supply in its own right, and is just another property connected to the Oxford Rural No.2 supply, therefore addressing the current non-compliance for this supply.

### **Drinking Water Safety Plans**

- 4.4. All water supplies are required to have a Drinking Water Safety Plan (DWSP) in place to document what the risks are on a given water supply, and how they are managed. When the Water Services Act came into force on 15 November 2021, all water suppliers were given until 15 November 2022 to update and submit DWSPs for all their supplies.
- 4.5. For the first time, these DWSPs were required to sit alongside Source Water Risk Management Plans (SWRMPs). Therefore, between the months of July and November 2022, an updated DWSP and SWRMP was submitted to Taumata Arowai for each supply.
- 4.6. Under the Health Act, the Ministry of Health went through a process of reviewing and either approving or declining each DWSP submitted. Under the WSA, there is no approval process by the regulator, however Taumata Arowai may review the plans and provide feedback. As of yet, no feedback on the DWSPs or SWRMPs has been provided by Taumata Arowai, other than indirectly via the residual disinfection exemption process for the Cust supply. In this case, the feedback given on the Cust DWSP and SWRMP was only in the context of the residual disinfection (chlorine) exemption application process.
- 4.7. The following steps are underway with the SWRMPs and DWSPs in 2023:
- Recommendations from SWRMP process are being reviewed to identify which ones to adopt and carry through to the DWSP improvement project list.
  - Confirm if the DWSPs prepared to support chlorine exemption applications should be updated to reflect their proposed state (chlorine free) or their expected current state (chlorinated) following the initial assessment process. This affects whether the risk assessments and monitoring programmes reflect chlorine being in place or not.
  - Update all DWSPs to reference the new DWQAR (some of the DWSPs were prepared prior to the DWQAR being confirmed or operative, so still reference the 2018 DWSNZ).

- Undertake some further modelling of viruses in groundwater to better inform the SWRMPs, following feedback from Taumata Arowai on the first chlorine exemption application that was assessed.
- Make any other necessary updates to the DWSPs based on any other changes between when the plans were first drafted and the end of 2023, to ensure all plans remain current.

### Water Quality Results

- 4.8. Each year thousands of water samples are taken for analysis for a number of parameters. This is both to provide immediate information about water quality to trigger any immediate responses needed, but also to provide any information on emerging trends of patterns.
- 4.9. This report provides information specifically about the *E. coli* and total coliform results, which are the parameters most frequently tested for. The key reason that these are tested for more frequently than any other parameter is that bacterial contamination (which *E. coli* is an indicator for) can provide an immediate and acute health risk. Other parameters are more likely to present a chronic risk, if the contaminant of concern is consumed over a longer time period, which means that less frequent monitoring is sufficient to ensure the issue is responded to before any potential health risk eventuates.
- 4.10. Total coliforms is included in the reported because it is tested as part of each *E. coli* test, and because coliforms are seen as a possible pre-cursor to microbiological contamination, even though they do not present a health risk in their own right.

#### E. coli

- 4.11. The most critical water quality indicator is *E. coli*. While *E. coli* itself will not necessarily cause illness, it is an indicator that faecal contamination is present in the water supply, and hence that it is not safe for human consumption. The following table summarises the history of *E. coli* contamination events within the district from 2002 to the present.

*Table 3: Summary of E. coli sampling for 2021/22*

	2021-22			2020-21			2019-20			2018-19			2002-2018		
	Samples Taken	Positive Results		Samples Taken	Positive Results		Samples Taken	Positive Results		Samples Taken	Positive Results		Samples Taken	Positive Results	
Source*	528	16	3.0%	409	16	3.9%	389	0	0.0%	410	0	0.0%	2,195	41	1.9%
Plant	844	0	0.0%	844	0	0.0%	673	0	0.0%	551	0	0.0%	7,573	4	0.1%
Reticulation	1,303	0	0.0%	1146	2	0.2%	923	0	0.0%	808	0	0.0%	12,187	32	0.3%
<b>Treated Water Sub-total</b>	<b>2,147</b>	<b>0</b>	<b>0.0%</b>	<b>1990</b>	<b>2</b>	<b>0.1%</b>	<b>1,596</b>	<b>0</b>	<b>0.0%</b>	<b>1,359</b>	<b>0</b>	<b>0.0%</b>	<b>19,763</b>	<b>36</b>	<b>0.2%</b>

*\*Source samples excluded from totals as key measure for compliance is the quality of the treated water. Source water quality monitoring is important for ensuring treatment system matches source water quality.*

- 4.12. Over the last compliance year, there has been no *E. coli* detected in any of the 2,147 treated water samples taken.
- 4.13. The positive source samples were from sources where this is expected. These sources that tested positive for *E. coli* are summarised below:
- Garrymere bore and Two Chain Road bore where there are multiple treatment barriers (both have UV and chlorine, and Garrymere also has filtration), and;



- Backup bores such as Fernside, Coopers Creek, Rockford Road intake, West Eyreton Well 2, and Gammans Creek which are not currently used.

4.14. The *E. coli* results are an improvement on the previous year, in which there were two treated water samples that tested positive for *E. coli*. These two samples originated from the Cust water supply which has been chlorinated since the detections. The origin of the samples was traced back to the headworks, which has since been completely replaced, and UV treatment is in the process of being installed. The treated water *E. coli* sample results history is summarised in the figures below;

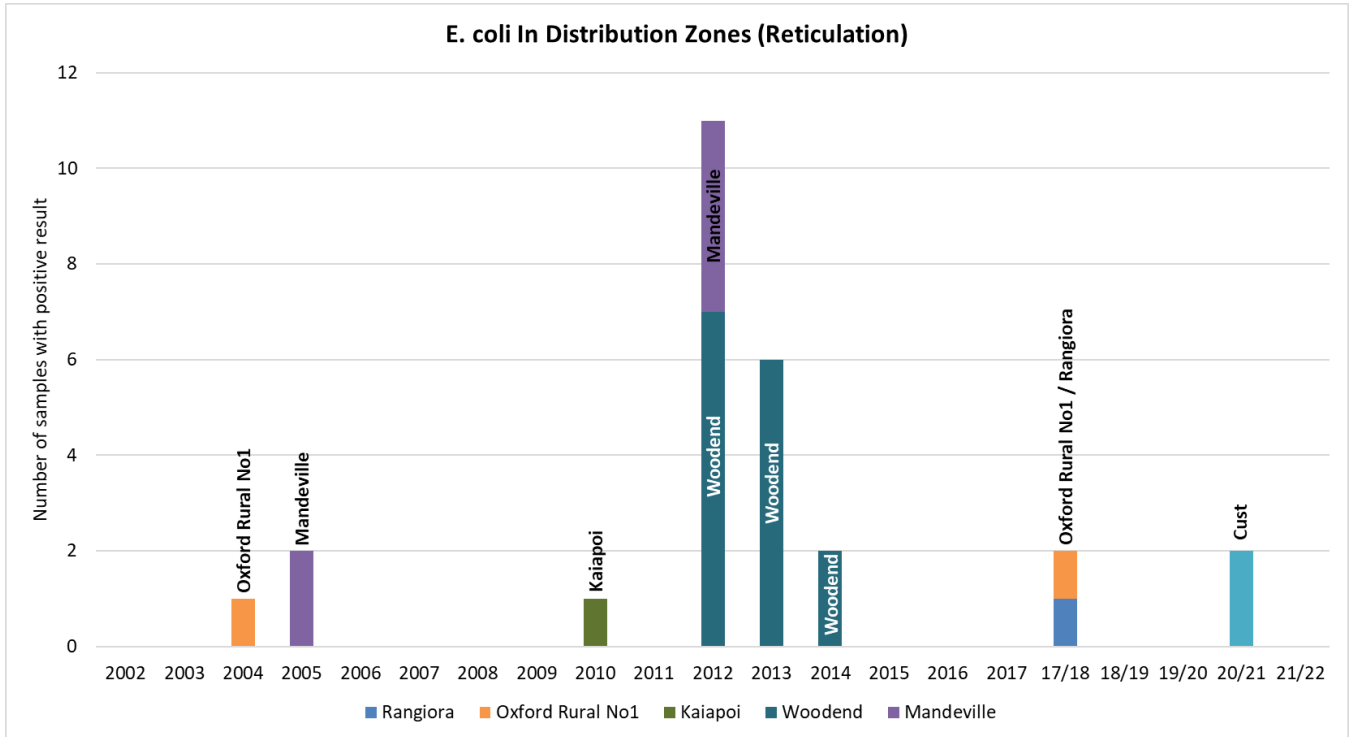


Figure 1: Summary of instances of *E. coli* being found in the distribution zone

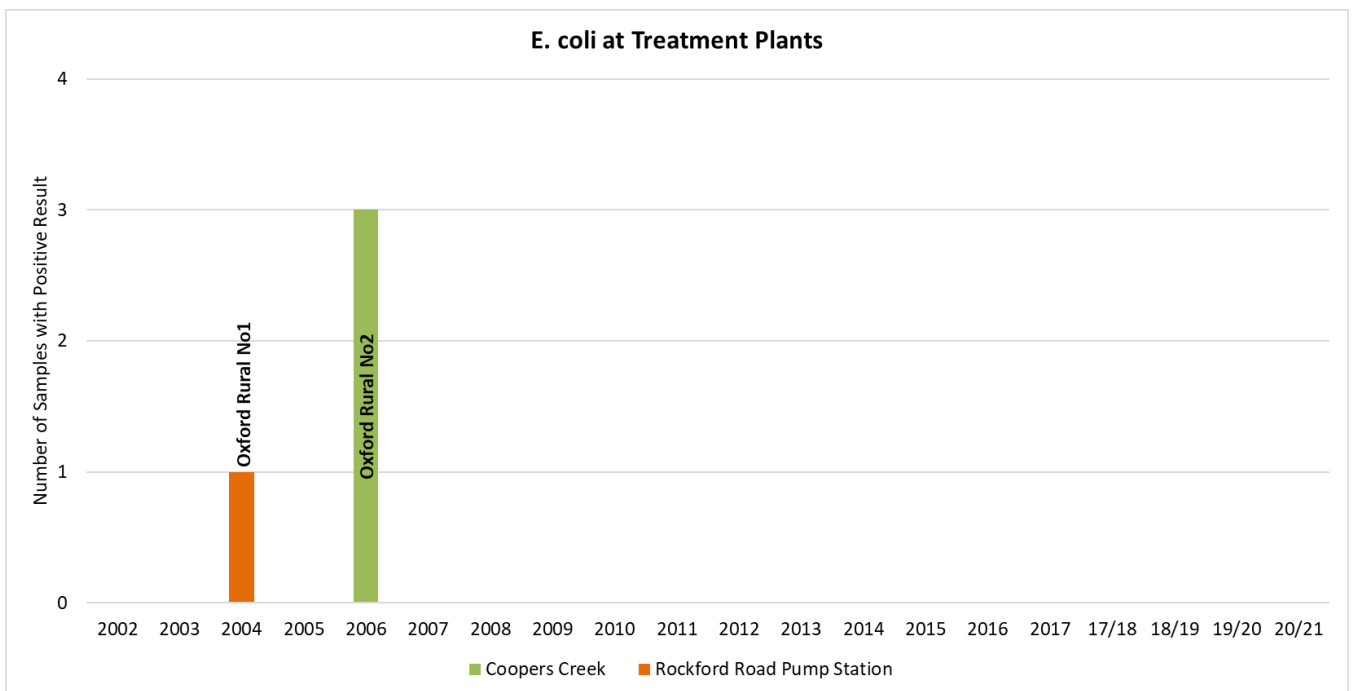


Figure 2: Summary of instances of *E. coli* being detected at treatment plants

Total Coliforms

- 4.15. A key indicator of water quality is total coliforms. There is no maximum acceptable value (MAV) for total coliforms in the DWSNZ, however they are required to be monitored and analysed to give suppliers a better understanding of the overall water quality picture. Total coliforms represent living organisms in the water supply, with *E. coli* being a subset of the total coliforms group. *E. coli* are living organisms that originated in the stomach of a mammal, and are therefore an indicator of faecal contamination.
- 4.16. A summary of the rate of total coliforms being present for the last compliance period relative to the long-term average is given below. The following figures present this data annually.

Table 4: Summary of total coliform sampling for 2021/22

	2021-22			2020-21			2019-20			2018-19			2002-2018		
	Samples Taken	Positive Results	%	Samples Taken	Positive Results	%	Samples Taken	Positive Results	%	Samples Taken	Positive Results	%	Samples Taken	Positive Results	%
Source*	528	44	8.3%	412	27	6.6%	389	2	0.5%	410	4	1.0%	2,025	105	5%
Plant	844	23	2.7%	844	18	2.1%	673	11	1.6%	551	1	0.2%	7,576	139	1.8%
Reticulation	1,303	59	4.5%	1,146	46	4.0%	923	19	2.1%	808	17	2.1%	12,187	504	4.1%
<b>Treated Water Sub-total</b>	<b>2,147</b>	<b>82</b>	<b>3.8%</b>	<b>1,990</b>	<b>64</b>	<b>3.2%</b>	<b>1,596</b>	<b>30</b>	<b>1.9%</b>	<b>1,359</b>	<b>18</b>	<b>1.3%</b>	<b>19,763</b>	<b>643</b>	<b>3.3%</b>

\*Source samples excluded from totals as key measure for compliance is the quality of the treated water. Source water quality is important for ensuring treatment system matches source water quality.

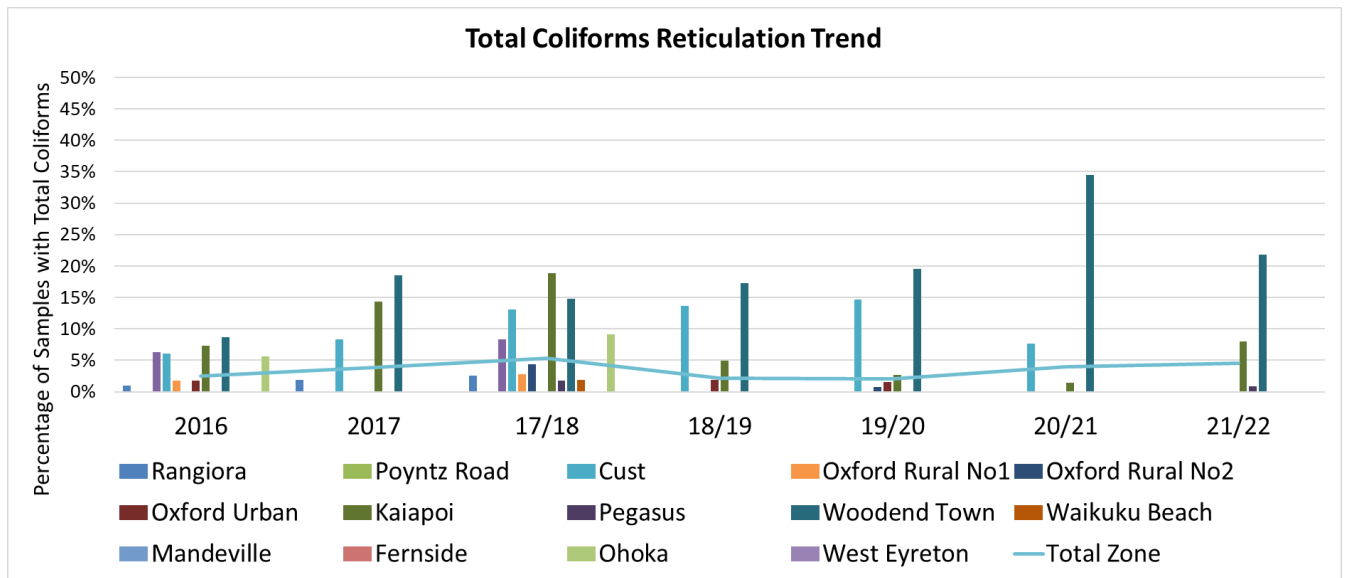


Figure 3: Percentage of Samples with Total Coliforms within Reticulation

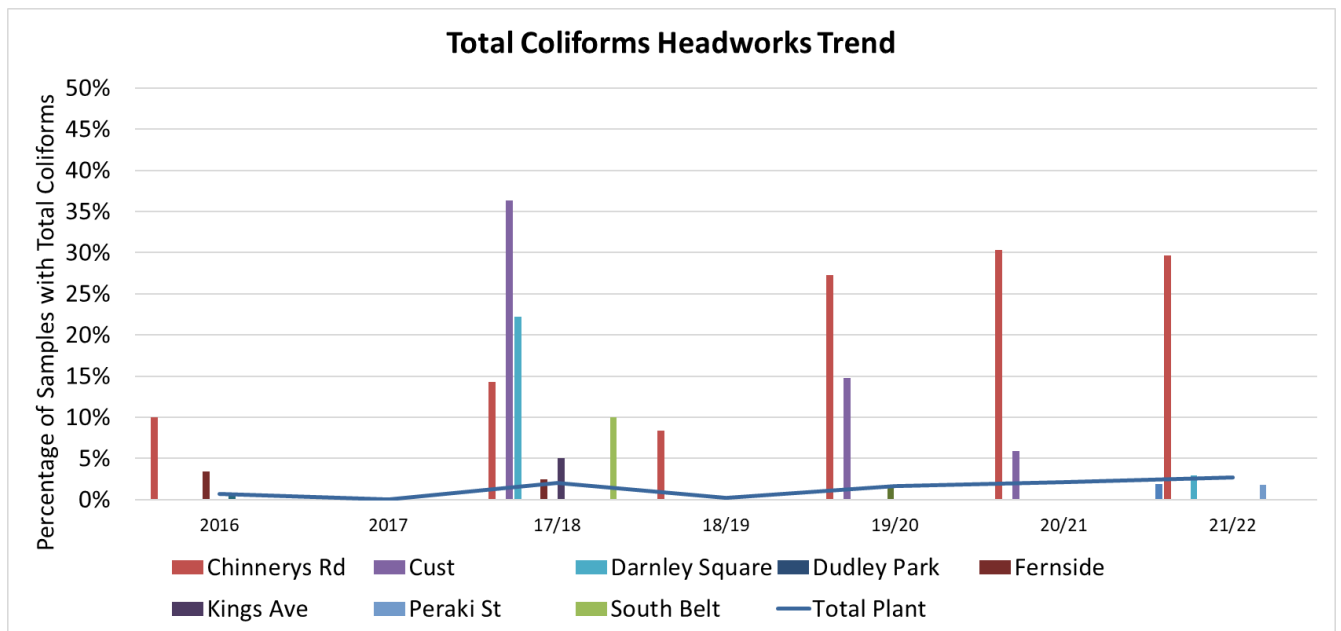


Figure 4: Percentage of Samples with Total Coliforms at Plants

4.17. The following key conclusions can be drawn from the above figures:

- It can be seen that the Woodend supply is the largest contributor to total coliforms being detected in treated water samples. Within the reticulation 21.8% of samples in Woodend showed the presence of total coliforms, while 29.6% of samples from the Chinnerys Road headworks showed the presence of coliforms. This suggests that the coliforms are originating either at the Chinnerys Road headworks or upstream of this point. While low level detections (1 – 2 coliforming units per 100mL sample) had been common historically, emergency chlorination was triggered in February 2022 after higher level detections (around 40 cfu / 100mL). This is discussed more under ‘Incidents and Investigations’.
- The other scheme that contributed towards the coliforms in the treated water samples was Kaiapoi, in particular the North Kaiapoi area. In this case, the detection level in the reticulation system (8%) was greater than at the headworks (1.8% and 2.9% respectively for Darnley Square and Peraki Street respectively). There were also some high level detections (>200 cfu / 100mL) in February 2022 that triggered emergency chlorination. This also is discussed further under ‘Incidents and Investigations’.
- To put into context the contribution of Woodend and Kaiapoi relative to other schemes, it can be noted that:
  - Of the 59 coliform detections across all distribution systems, 57 were from either Woodend or Kaiapoi. One of the other two detections one was from Ashley Gorge (1 out of 24 samples), and one from Pegasus (1 out of 121 samples taken).
  - Of the 23 total coliform detections at a treatment plant, 19 were from either Woodend or Kaiapoi. The four other treatment plant coliform detections were from Rangiora (1 out of 108), and Ashley Gorge (3 out of 49 samples).
- Therefore, while the total coliform detection rate across the district was 3.8%, excluding Woodend and Kaiapoi, the detection rate for the remaining schemes was 0.2% (6 detections out of 2,147 treated water samples). This shows that the

key to lowering the coliform detection rates across the district is to address the issues in Woodend and Kaiapoi.

### **Incidents and Investigations**

- 4.18. The Council's processes for addresses incidents, and undertaking investigations is outlined in Component 7 of Council's Water Safety Plan documentation. This sets different levels of investigation, and different scale of response to these levels. For any event of Level 3 or greater, an investigation is undertaken, and recommendations made. Examples of a Level 3 event is *E. coli* being detected, a chemical maximum acceptable value (MAV) being exceeded, or a water outage exceeding 8 hours.
- 4.19. All Level 3 events or greater are included in Council's incident register (TRIM 181129140491). This process was initiated in 2021, however results of past *E. coli* detection incidences entered dating back to 2010. Subsequent incident reports are produced using the template 210218028075.
- 4.20. In addition, investigations may be undertaken into Level 2 events. Level 2 events are events in which no drinking water standards limits have yet been breached, but there has been some kind of change operationally that requires a heightened level of action or vigilance to ensure the event does not escalate to a higher level. This may include total coliforms being detected above the threshold level, multiple taste complaints, or a treatment system triggering an 'action limit'.
- 4.21. The following Level 3 or greater events and subsequent investigations occurred within the 2021/22 compliance year:
- Woodend Water Taste Complaints: In 2021, numerous taste complaints started to be received on the Woodend part of the Woodend-Pegasus scheme. The volume of complaints, and the wide area they covered were sufficient to escalate this event to Level 3. Following an extensive review, it was concluded that the root cause was a process occurring within the biological filters at the Pegasus Water Treatment Plant, that did not present a health concern, however which caused significant aesthetic issues. This was resolved via super-chlorination of the filters, which is to be repeated approximately every two years.
  - Pegasus Reservoir Incident: As part of the programme of demonstrably safe reservoir inspections, evidence was found that birds had entered one of the Pegasus reservoirs. The bird remains were able to be immediately removed, and water quality parameters checked to confirm that there had been no detectable deterioration in the water safety. This incident highlighted the importance of the thorough inspection programme that was underway, as the defects leading to the issue were not visible during the normal routine inspections.
- 4.22. In addition to the two Level 3 incidents, there were the following four Level 2 incidents that were sufficient to trigger investigations. These are listed below:
- Kaiapoi reticulation total coliforms investigation February 2022. This event involved repeated high levels of coliforms which appeared to have originated in the distribution system. Temporary chlorination was implemented, the source investigated, and ultimately the chlorination removed again when the most likely cause was concluded to be non-pathogenic biofilm. After a period of time however the coliforms returned at high levels, and chlorination is in place again.
  - Woodend total coliforms investigation February 2022. This event involved high levels of coliforms being detected and traced back to repairs that were being done on a reservoir at Pegasus, that supplies Woodend. The repairs were completed,

and the chlorine removed. The scheme went through a period of low coliform detections following this, however coliform detections returned again in December 2022, and chlorine was re-introduced.

- Ashley Gorge low chlorine 2022. This event involved the target level of chlorine not being met for a period of time on this scheme. Actions were taken to remedy the situation, and reduce the likelihood of recurrence.
- Rangiora chlorination incident 2022. This event involved chlorinated water from a reservoir sterilisation process for an offline reservoir inadvertently flowing from that reservoir into the distribution system. An investigation took place, and the cause was identified as most likely being due to a leaking gasket on a filling pipe, and valves that had not been correctly isolated. Actions have been taken to ensure more barriers are put in place to separate drinking water from water that is intended to be offline from the live system, such that if one barrier fails, there are still further barriers in place to prevent a repeat of this type of event. No water quality parameters were breached as a result of this event, however it was considered a 'near miss'.

## Complaints

- 4.23. The rate of complaints is tracked, and can be used to determine trends or identify issues with water quality. Easily accessible data for comparison on complaints has been available from the 2016/17 year onwards, through the Council's Service Request system which is managed in TechOne.
- 4.24. The figure below shows the number of complaints received each year on the primary vertical axis, and this data converted to complaints per 1,000 properties on the secondary vertical axis.
- 4.25. The Council's performance measure for complaints is to be less than 5 per 1,000 connections per year. As can be seen, there was an upward trend in 2021/22 relative to the previous years, with 7.85 complaints per 1,000 connections.

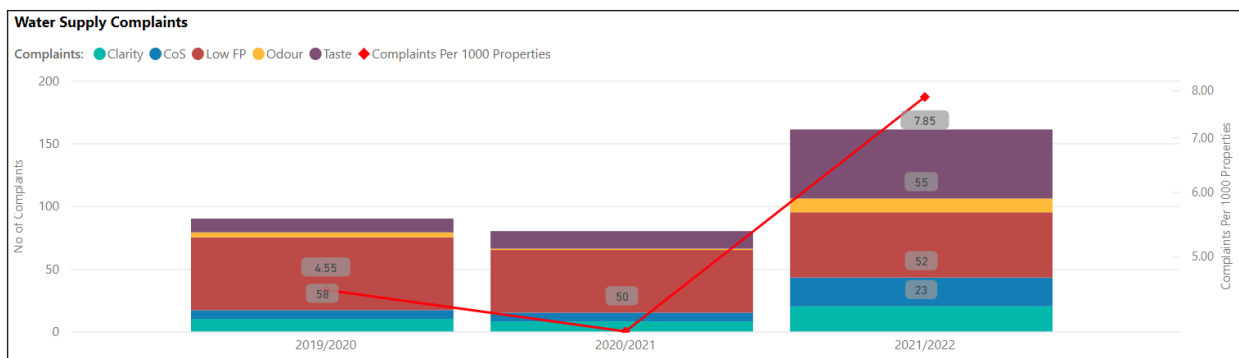


Figure 5: Water Supply Complaints by Scheme and Year and Complaint Type

- 4.26. The following key points can be made about the data above:
- A large number of complaints were associated with the Woodend taste event early in the reporting year. This has since been resolved.
  - The chlorination of Woodend and Kaiapoi also led to complaints from these schemes.

- It appears in previous years that not all low flow / pressure complaints were being picked up correctly by the reporting software. This issue was addressed for the 2021/22 reporting period, but it is likely there had been some under-reporting in the past.
- Figure 5 illustrates that the largest increase in complaint type is 'Taste' which is consistent with the introduction of chlorine, and the taste issues experienced on the Woodend scheme, as well as "Continuity of Supply" (CoS) complaints, which is consistent with the previous reporting errors that have now been resolved.

### **Preliminary Assessment of Compliance Against 2022 DWQAR**

- 4.27. As noted previously, new standards and compliance rules came into effect from November 2022, with the rules that compliance is assessed against known as the Drinking Water Quality Assurance Rules (DWQAR), also referred to as the Rules.
- 4.28. While previously compliance reporting was only completed annually (from July to June) compliance periods for the new Rules are as low as daily, up to annually, with reporting periods ranging from monthly to annually.
- 4.29. The first monthly reporting period commenced in March 2022, where it was required that suppliers report on compliance against the relevant rules for January and February of 2023. Going forward, monthly reporting is required 10 working days into each month of the year.
- 4.30. As noted previously, the new Rules are more challenging to meet than the previous Rules for the following reasons:
- Previously for bacterial compliance, suppliers had to simply demonstrate the water was absent of *E. coli* through sampling. Now it is required that a series of Rules are met to verify that there are adequate levels of bacterial treatment provided at all times, which typically requires either UV treatment, or certain chlorine levels to be provided combined with a certain level of contact time with the water. This means for any site that either does not have UV treatment, or where there is insufficient storage to provide the necessary contact time, compliance will not be achieved. It also means that for schemes which have no bacterial treatment (i.e. the currently unchlorinated schemes that don't have UV treatment), compliance cannot be achieved either, until UV projects are completed.
  - For protozoal compliance, previously compliance could be achieved via the 'secure groundwater' criteria, which was used for the majority of the supplies in the district. To meet this criteria, the borehead needed to be certified as secure by a suitably qualified party, and the source water needed to be absent of *E. coli*. In the DWQAR, the secure bore water section has been replaced with 'Class 1 bore water' in order to not require protozoal treatment. This requires that the bore head meet a series of more prescriptive criteria, as well as being absent of not only *E. coli*, but also total coliforms which are detected far more commonly than *E. coli*, making the new criteria far harder to meet. If the Class 1 requirements cannot be met, protozoal treatment must be provided (i.e. by UV treatment).
- 4.31. There are numerous other rules in addition to the Rules described above also, the above descriptions reflect only the Rules that have been reported against for the first period. Other Rules are required to be reported against on an annual basis (after the 2023 calendar year has been completed) and will be the subject of a future report.
- 4.32. The following key points can be made following the initial assessment of compliance for the Jan and February 2023 compliance reports. These bullet points summarise the results

that have been uploaded to the Hinekorako system, which is Taumata Arowai's software system for tracking drinking water registrations and compliance reporting.

- 42% of the assessed (T3) treatment plants achieved bacterial compliance. These were the three sites with UV treatment (Mandeville, Kings Avenue, and Waikuku Beach Campground), as well as Cust and Pegasus based on chlorine with sufficient contact time.
- 25% of the assessed (T3) treatment plants achieved protozoal compliance. These were the three sites with UV treatment.
- Between 42% and 25% of D3 distribution zones achieved chlorine levels of >0.2 mg/L in accordance with rule D3.19 for each month
- 67% of the assessed distribution zones had chlorine sampled at the correct frequencies. The schemes that did not meet this rule were those that do not have chlorine in place.
- 83% of schemes had E. coli sampling undertaken in accordance with the requirements of the Rules. Those that did not were West Eyreton and Poyntz Road. This is because they were originally assessed as being D2 zones (as their populations are <500), which was later clarified that they should have been assessed as D3 zones due to them being connected to a treatment plant serving a collective population > 500. As such, under the D2 rules they were not being sampled as often as they should have been under the D3 rules. This has now been rectified.

4.33. A table showing these results in greater detail has been attached. Also within the table are the actions that will be required to ensure compliance is achieved on an ongoing basis in the future. The two key steps required are:

- Complete the UV upgrades planned over 2022/23 to 2024/25, and;
- Either gain residual disinfection exemptions, or introduce chlorine into the distribution systems. This step is reliant on Taumata Arowai completing their assessments of Council's residual disinfection applications, with the Council currently working with Taumata Arowai on this process.

4.34. The Management Team have reviewed this report and support the recommendations.

## 5. **COMMUNITY VIEWS**

### 5.1. **Groups and Organisations**

5.2. No groups or organisations have been consulted regarding the annual compliance report or quality data analysis. Consultation is carried out with individual community boards and advisory groups for specific capital projects as required.

### 5.3. **Wider Community**

5.4. As above, specific community consultation has not been carried out regarding the compliance report as a whole, but targeted consultation exercises are carried out on specific schemes for specific projects.

- 5.5. There is community engagement underway in May of this year to bring the affected communities up to speed with the changes in regulations, including distribution of an information brochure and public drop-in sessions.

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

### **6.1. Financial Implications**

This report is not seeking any changes to budgets as these are covered in separate reports generally via the Annual Plan / Long Term Plan process.

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

This report does not have direct climate change or sustainability impacts, as it is simply reporting on quality and compliance data. However, it can be noted that the impacts of climate change must be taken into account in considering risks to water quality and compliance levels. Severe rain events have the potential to impact upon raw water quality, particularly for shallow sources. This highlights the importance both of Council's strategy of seeking to establish high quality groundwater where possible, but also of having multiple barriers to contamination in place to protect against any deterioration in source water quality as a result of weather events for example.

### **6.3. Risk Management**

There are inherent risks with public drinking water supplies. The Council takes a proactive risk management approach, with risks assessed via the Drinking Water Safety Plan process, and steps identified to address any unacceptable risks that are identified. In agreement with Taumata Arowai, the Council has agreed to continue to supply untreated water on some supplies as Taumata Arowai processes its residual disinfection (chlorine) exemption applications, but has emergency chlorine systems available to be used if and when required.

### **6.4. Health and Safety**

As above, compliant drinking-water is essential in ensuring the health and safety of the district's communities from water borne disease.

## **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 Health (Drinking-water) Amendment Act and Water Services Act are relevant in this matter.

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

The provision of safe drinking water relates to the following community outcomes:

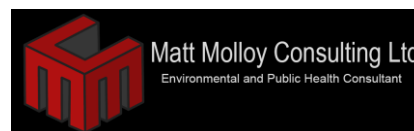
*Core utility services are provided in a timely and sustainable manner:*

- *Council sewerage and water supply schemes, and drainage and waste collection services are provided to a high standard.*



**7.4. Authorising Delegations**

No delegation is required to receive this report.



25 November 2022

Water Asset Manager -3 Waters  
Waimakariri District Council  
P O Box 1005  
RANGIORA 7440

Attention:  
Colin Roxburgh

**Review of Waimakariri District Councils water supply performance against the Drinking Water Standards for New Zealand 2005 (Revised 2018), for the period 1 July 2021 – 30 June 2022**

The assessment of performance of Waimakariri District Council (WDC), as the water supplier against the Drinking Water Standards for New Zealand 2005 (Revised 2018) [DWSNZ] has been completed for the period 1 July 2021 to 30 June 2022. The assessment was undertaken by Matt Molloy, an independent drinking water compliance specialist. The assessment followed the procedure previously employed by Drinking Water Assessors prior to the establishment of the new regulator, Taumata Arowai in November 2021.

The assessment reviewed overall compliance against Section 3 (Compliance and Transgressions), Section 4 (Bacterial Compliance), Section 5 (Protozoal Compliance), Section 7 (Cyanotoxin Compliance), Section 8 (Chemical Compliance), Section 9 (Radiological Compliance) and Section 10 (Small water supplies) of the DWSNZ. The assessment covered all WDC treatment plants and distribution zones. A brief report describing the process and results is attached to this letter.

The outcome for each treatment plant and distribution zone is summarised in the table below.

Water supply	Treatment plant			Distribution zone
	Bacterial	Protozoa	Radiological	Bacterial
Cust	√	√	√	√
Garrymere	Complies as a Section 10 supply.			
Kaiapoi -Darnley Square	√	√	√	√
Kaiapoi -Peraki Street	√	√	√	
Mandeville	√	X	√	√
Ohoka	√	√	√	√
Oxford rural 1 -McPhedrons Rd	√	√	√	√
Oxford rural 1 -Rockford Rd	√	√	√	
Oxford urban & rural 2 -Rural 2	√	√	√	√
Oxford urban & rural 2 -Urban				√
Pegasus	√	√	√	√
Woodend				√

Rangiora	√	√	√	√
Waikuku Beach -Kings Ave	√	X	√	√
West Eyreton -Poyntz Rd				√
West Eyreton -Summerhill	√	√	√	√
West Eyreton -West Eyreton				√

\*Chemical compliance has been met for all supplies by default and cyanotoxin compliance is currently not applicable.

If you have any questions or queries, please contact the undersigned.

Kind regards



**Matt Molloy**  
**Drinking Water Compliance Specialist**  
**Matt Molloy Consulting Ltd**



# **Review of Waimakariri District water supply performance against the Drinking Water Standards for New Zealand 2005 (Revised 2018)**

## **For the period 1 July 2021 – 30 June 2022**

Waimakariri District Council (WDC) had duties under the Health Act 1956 to comply with the Drinking Water Standards for New Zealand 2005 (Revised 2018) -DWSNZ. The drinking water part of the Health Act has been repealed and replaced with the Water Services Act 2021, which also has duties to comply with the drinking water standards.

Taumata Arowai is now the government Department responsible for the regulation of drinking water in NZ, replacing the Ministry of Health and Drinking Water Assessors. Taumata Arowai took over regulatory responsibilities in November 2021, however they did not undertake a review or assessment of drinking water standards compliance for the 2021/22 compliance period.

Matt Molloy Consulting have been asked to provide specialist drinking water expertise to independently review compliance with the Ministry of Health drinking water standards, which have been operative during the compliance period of 1 July 2021 – 30 June 2022. The system used for assessment will be the same system used by Drinking Water Assessors (DWA) in the past.

The system was referred to as “DWA Function 1: Assessing drinking water supplier compliance with Drinking Water Standards New Zealand 2005/18”. The DWSNZ 2005(Revised 2018) Compliance Recording Sheet is the same as that used by DWAs in the South Island.

The assessment details and process are in the Compliance Recording Sheet. The outcome for each treatment plant and distribution zone is summarised in the table on the page 2.

**Matt Molloy**  
**Drinking Water Compliance Specialist**

Matt Molloy Consulting Ltd  
022 4444662

## Compliance summary table

Water supply	Treatment plant			Distribution zone
	Bacterial	Protozoa	Radiological	Bacterial
Cust	√	√	√	√
Garrymere	Complies as a Section 10 supply.			
Kaiapoi -Darnley Square	√	√	√	√
Kaiapoi -Peraki Street	√	√	√	
Mandeville	√	X	√	√
Ohoka	√	√	√	√
Oxford rural 1 -McPhedrons Rd	√	√	√	√
Oxford rural 1 -Rockford Rd	√	√	√	
Oxford urban & rural 2 -Rural 2	√	√	√	√
Oxford urban & rural 2 -Urban				√
Pegasus	√	√	√	√
Woodend				√
Rangiora	√	√	√	√
Waikuku Beach -Kings Ave	√	X	√	√
West Eyreton -Poyntz Rd	√	√	√	√
West Eyreton -Summerhill				√
West Eyreton -West Eyreton				√

\*Chemical compliance has been met for all supplies by default and cyanotoxin compliance is currently not applicable.

\*Ashley Gorge was not part of the system for the entire year so was not assessed.

## DWSNZ 2005(Revised 2018) Compliance Recording Sheet

<b>Date</b>	November 2022
<b>Person completing assessment &amp; experience</b>	<p>Matt Molloy -Drinking Water Compliance Specialist</p> <p>Matt Molloy has over 25 years public health experience firstly with the Nelson Marlborough District Health Board and as a public health consultant over the last decade. Matt has specialised in drinking water compliance and consulted directly to many District Health Boards in New Zealand as a Drinking Water Assessor, to local authorities assisting with compliance/WSPs and also to the World Health Organisation as a Water Sanitation &amp; Hygiene Specialist. Matt has worked as a Drinking Water Assessor for over 15 years in most parts of the country, until DWAs were disbanded under the Water Services Act 2021 in November 2021. Matt now provides independent 3<sup>rd</sup> party audits of drinking water compliance.</p>
<b>Council audited or drinking-water supply name (private supplies)</b>	<p>Waimakariri District Council (WDC) have 12 water supplies;</p> <p>Ashley Gorge (ASH004) -previously self-supply under Health Act now registered under Water Services Act 2021. No protozoa barrier and monitored from Jan 2022.</p> <p>Cust (CUS001)</p> <p>Garrymere (GAR001)</p> <p>Kaiapoi (KAI003)</p> <p>Mandeville (MAN009)</p> <p>Ohoka (OHO001)</p> <p>Oxford Rural No 1 (OXF101)</p> <p>Oxford Urban – Rural No 2 (OXF103)</p> <p>Pegasus – Woodend (PEG001)</p> <p>Rangiora (RAN001)</p> <p>Waikuku (WAI011)</p> <p>West Eyreton (WES004)</p> <p>Poyntz Road, Eyrewell (POY001), Aug 2021 connected to West Eyreton so not further considered in this assessment. Ashley Gorge is also not assessed due to it not being part of the system until January 2022 and a full year is not available.</p>
<b>Information reviewed</b>	<p>The following information was reviewed as part of the assessment:</p> <ul style="list-style-type: none"> <li>• WDC Sampling Schedule 21-22 Full Year.xlsx (contains a full breakdown of each component of each supply and the monitoring required, including annual calendar)</li> <li>• Laboratory spreadsheet that contains all the monitoring information including field tests and bacterial results (includes records of 3902 tests undertaken from 1/7/21-30/6/22).</li> <li>• Infrastructure Data quarterly reports for all supplies. Contains source, plant and distribution zone samples.</li> </ul>

	<ul style="list-style-type: none"> <li>• Monthly summaries of UV compliance for Mandeville, Waikuku and Garrymere (also cartridge for this supply). Specific events checked including raw data.</li> <li>• Smith St bores radiological test results 9/8/11, 16/7/19 and 21/12/21</li> <li>• Springbank well#2 radiological test results 9/3/16</li> <li>• Bore security confirmation from DWA for Woodend 8/10/18</li> <li>• Bore security confirmation from DWA for Kaiapoi 23/11/18</li> <li>• Superseded TRIM 190524073592 - Ground Water Source Summary (bore security spreadsheet)</li> <li>• Oxford Rural No.1 2020 Radon sample result; 30/06/20</li> <li>• Oxford Rural No.1 2021 Radon sample result; 14/6/21</li> <li>• GNS residence time report from Pegasus EQ3 bore taken in Nov 2021</li> <li>• EQ3 minor works.docx (report on bore head security review identifying small improvements, Nov 2021)</li> </ul>
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## GENERAL COMPLIANCE

<b>Compliance assessment period</b>	1 July 2021 – 30 June 2022
<b>What is risk category of supply audited eg high risk?</b> – identifies priority for verification of data.	All of the WDC water sources are groundwater and not considered to be high risk. Most of the sources are secure groundwater under the DWSNZ 2005/18. The supplies that are not secure have minimum of UV (or chlorine).
<b>Method of data provision from water supplier to DWA</b> (DWO/Alternative electronic/paper/in person during visit – detail dates and reason for visit)	<p>Visited Waimakariri District Council on 15 &amp; 16 November 2022. The main purpose was to ask questions of the staff following a review of the compliance information. Focus was on confirming E.coli monitoring, protozoa compliance and bore water security.</p> <ul style="list-style-type: none"> <li>•E.coli results are in a spreadsheet</li> <li>-there are two spreadsheets, one that the Laboratory uses and enters results directly into and another one which contains the full annual sampling schedule for all supplies. If a sample is not taken as programmed an automatic email is sent to various staff advising them of these so alternative arrangements can be made if appropriate. Currently the results are manually imported into Infrastructure Data (compliance database) with the view of making this automatic in the future.</li> <li>•UV compliance summaries provided by WDC for Garrymere, Mandeville and Waikuku.</li> </ul>

	<ul style="list-style-type: none"> <li>• Garrymere contained UV and cartridge filtration summaries as this is a 4-log plant.</li> <li>• Mandeville only contained UV summaries as it is 3-log.</li> <li>• Waiuku only contained UV summaries as it is 3-log.</li> </ul>
<p><b>What data is audited over compliance assessment period? – Overview of:</b></p> <ul style="list-style-type: none"> <li>• What selection of data was chosen and why?</li> <li>• What parameters are audited</li> <li>• What timeframes will be audited</li> <li>• Which areas of compliance were chosen for audit and why?</li> <li>• Which supplies were chosen to select data from?</li> </ul> <p>Risk based approach used to determine this</p> <p><u>Within each section below is details around selection of data</u></p>	<p>Waimakariri DC:</p> <p>All E.coli results (for the entire assessment period) were checked along with the security status of the bores, as these are used to demonstrate bacterial compliance across all supplies.</p> <p>All protozoa compliance monthly summary reports were checked (Waikuku, Mandeville and Garrymere). Where there have been exceptions noted, the raw data has been checked and the decision verified.</p> <p>Rangiora radiological results were checked.</p>

<p><b>Compliance assessment based on:</b></p> <ol style="list-style-type: none"> <li>Whole compliance data set.</li> <li>Audit of selection of data records (state %)</li> </ol> <p>Note: this may be determined by what criteria they are trying to comply with (e.g. secure groundwater and crypto monitoring requires whole compliance data set)</p>	<p>Full dataset reviewed for all E.coli monitoring. Two examples of secure groundwater confirmation from the Drinking Water Assessor were also requested (Woodend &amp; Kaiapoi).</p> <p>Waikuku, Mandeville and Garrymere compliance summaries were reviewed and data verification undertaken on the exceptions.</p> <p>NOTE: Garrymere is being assessed as what is referred to as a ‘participating supply’. This allows supplies under 500 people to use the alternative compliance criteria outlined in section 10 of the DWSNZ. See specific determination near the end of this report for further details.</p>
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## TREATMENT PLANT

### Bacterial Compliance



<p><b>Record compliance criterion used.</b> – and compliance periods for these criterion (e.g 1, 2A, 2B etc)</p>	<ul style="list-style-type: none"> <li>• Criterion 1 <i>E.coli</i></li> <li>• Secure groundwater based on <i>E.coli</i> (section 4.4 DWSNZ)</li> <li>• Check if any supply uses UV for bacterial compliance (<i>checked an all E.coli based 15/11/22</i>)</li> </ul>
<p><b>What parameters and timeframe were audited and from which supplies?</b> – if not full data set must be minimum 10 different sampling days</p>	<p>Full year of <i>E.coli</i> reviewed for all secure groundwater supplies. This was done using the Infrastructure Data summaries for each supply and checking them against the quarterly summaries in the WDC spreadsheet. A selection of data from ID and the spreadsheet was compared to the laboratory spreadsheet. In all cases it lined up and actual laboratory monthly reports were shown as well.</p>
<p><b>Comments on whether compliance criterion met / not met and reasons</b></p>	<p>WDC use criterion 1 for bacterial compliance. The monitoring complied with the number of samples, days of the week to be used and the maximum interval between samples. This was manually confirmed.</p> <p><u>DWSNZ, Section 4.4 -Bore water security</u></p> <p>WDC have 34 bores (across 8 water supplies) which are considered secure under the definition in section 4.4 of the DWSNZ. The details of each are listed in a WDC spreadsheet (Superseded TRIM 190524073592 - Ground Water Source Summary). A recertification date is listed that is 5 years from the previous assessment by a DWA. One of the bores [Equestrian Well #3 (G02085)] was due for assessment in November 2021.</p> <p>Since November 2021 DWA’s were discontinued and regulatory functions for drinking water were replaced by Taumata Arowai. The DWSNZ remained operative until November 2022 but not the DWAs. There was no system in place with Taumata Arowai for the continued assessment and certification of bore water security.</p> <p>WDC have continued with the ongoing <i>E.coli</i> monitoring required to demonstrate compliance, along with undertaking the 5 yearly residence time testing and 5 yearly bore head security assessments.</p> <p>Equestrian Well #3 (G02085) was due for reassessment in November 2021. WDC took residence time samples in November 2021 and also undertook a bore head security assessment. <i>E.coli</i> monitoring has been ongoing approximately monthly (requirement is 3-monthly). Overall WDC have continued to claim bore security and given the evidence provided, it is fair and reasonable to accept this.</p>

	The following supplies are considered secure by WDC; Cust, Kaiapoi, Ohoka, Oxford Rural 1, Oxford urban -rural 2, Pegasus-Woodend, Rangiora and West Eyreton. Ongoing security is being demonstrated.
<b>Method of determining compliance</b> eg checked all raw data, used excel to graph data, other method – where is this data recorded?	Manually checked all E.coli monitoring (schedule and results). Reviewed DWA bore security confirmation for Woodend and Kaiapoi. This was compared to the WDC spreadsheet on bore security.

### Protozoa Compliance

<b>Record Log Credit required</b> - Catchment Risk Assessment or Crypto Monitoring used to achieve log credits?	The log requirement varies from 0-log secure groundwater to 4-log shallow groundwater.
<b>List treatment processes in place that meet DWSNZ criteria</b> – including compliance monitoring periods for those treatment processes.	<ul style="list-style-type: none"> <li>• Secure groundwater</li> <li>• UV disinfection</li> <li>• Cartridge filtration (Garrymere only)</li> </ul> <p>The compliance monitoring period for UV and cartridge filtration is one month. The compliance monitoring period for secure groundwater is annually for E.coli monitoring and 5-yearly for residence time and bore head security.</p> <p>A number of supplies also have chlorine but this is not used for compliance demonstration.</p>
<b>What parameters and timeframe were audited and from which supplies?</b> – if not full data set must be minimum 10 different sampling days	<p>Monthly summaries were provided for Mandeville, Garrymere and Waikuku, some issues were followed up and included the review of raw data for the following supplies and dates:</p> <ul style="list-style-type: none"> <li>• Mandeville 27-30 June 2022</li> <li>• Garrymere 15-19 January 2022</li> <li>• Waikuku (Kings Ave) 9/7/21 and 10/8/21</li> </ul>
<p><b>What log credits are possible for each treatment process?</b> – Which ones achieved those log credits and why?</p> <p><b>Total log credits achieved:</b> all treatment processes combined</p>	<p>Various log-credit requirements from secure groundwater to surface water. Secure groundwater is covered in the previous section. If bore water security is proven under section 4.4 of the DWSNZ then protozoa compliance is automatically gained.</p> <p><u>Garrymere</u> 5-log (3-log UV and 2-log cartridge filters) Continuously monitored UV intensity, UVT, flow, turbidity (before &amp; after filters) and pressure. Specific event in January 2022 investigated including checking of raw data. Pressure and</p>

	<p>turbidity spiked but did not exceed the DWSNZ compliance limit of 3 minutes.</p> <p><u>Mandeville 3-log UV</u> Continuously monitored UV intensity, UVT, flow and turbidity. Specific event on 30/6/22 investigated including review of raw data. Following manifold replacement and start up a period of 14minutes when turbidity was above 2NTU. Technically this is a non-compliance however considering the compliant flow at the time and also the fact that the UV dose was not affected (was 150% of minimum), supports WDC's claim that the water was safe. Turbidity spike thought to be entrapped air and not a true reflection of the raw water. The data, explanation and response were appropriate, however compliance was not claimed by WDC. If WDC were to claim compliance for this supply, based on these results, it would be a fair and reasonable action.</p> <p><u>Waikuku 3-log UV</u> Continuously monitored UV intensity, UVT, flow and turbidity. Specific event around UV reactor 1 flow meter from March-May 2022 investigated including review of raw data. The data, explanation and response were appropriate and compliance claimed. This is a fair and reasonable action.</p> <p>UV reference sensor checks done monthly (as required by the DWSNZ) and recorded in the compliance summaries. Turbidimeter weekly verifications and 3-monthly calibrations are recorded in the 'Headworks water quality data' spreadsheet. The spreadsheet is populated from the onsite log books, the instrument itself and the information from Infrastructure Data.</p> <p>A review of the information supplied has shown that there are no records for the following turbidimeter verifications or calibrations;</p> <ul style="list-style-type: none"> <li>• Waikuku 9/7/21, 10/8/21 and 27/5/22.</li> <li>• Mandeville 7/3/22 and between 15-28/3/22.</li> </ul> <p>An operator has been onsite in all cases and handheld turbidimeter reading were taken and compared with the online measurement. While this is a type of validation, it does not meet the requirements for verification and calibration of turbidimeters as outlined in the DWSNZ Appendix A2.3.3.</p> <p>Unfortunately, as a result Waikuku and Mandeville do not comply with the protozoa requirements of the DWSNZ. It should be noted that this is considered a technical non-compliance and would not have affected the safety of the water.</p>
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<b>Method of determining compliance</b> eg checked all raw data, used excel to graph data, other method – where is this data recorded?	Summarises for each plant (UV) were provided for each month and these were reviewed. Where there were potential issues identified further information was requested (as outlined above).
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### Cyanotoxin Compliance

<b>Cyanotoxin compliance</b> applicable or not applicable? Complies?	N/A, however WDC are undertaking further risk assessments of three shallow groundwater supplies to ensure that they are low risk and do not need further monitoring.
<b>Method of determining compliance</b> eg checked all raw data, used excel to graph data, other method – where is this data recorded?	N/A

### Chemical Compliance

<b>Plumbosolvent compliance determined</b> – notices sent out? – evidence?	6 monthly in local newspaper (the woodpecker). Sighted copy of notice and October 2021 Woodpecker with notice included on page 11.
<b>Does the treatment plant have P2's assigned? (list)</b> – if applicable	No
<b>Summary and comment on compliance monitoring gathered for report</b> whether or not data was assessed for this. Justification either way	Full compliance for all WDC supplies.
<b>Method of determining compliance</b> eg checked all raw data, used excel to graph data, other method – where is this data recorded?	Compliant by default

### Radiological Compliance

<b>Radiological compliance applicable or not applicable?</b> When was testing done	<p>Radiological testing is required every 10 years for groundwater. WDC supplies have all been tested within the last 10 years. The laboratory reports from ESR showing the radiological results from the Rangiora bores, dated 25/7/19 and 21/12/21 were sighted.</p> <p>Oxford Rural No.1 does have Radon above 50% of the MAV so is subject to annual testing. Results were sighted dated 23/6/20 and 27/5/21. Both samples remain below 50% of the MAV so the supply is compliant.</p>
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## DISTRIBUTION ZONE

### Bacterial Compliance

<b>Record compliance criterion used.</b> – and compliance periods for these criterion	DWSNZ section 4.3.1: criterion 6A using E.coli monitoring only.  There are a variety of population sizes being served by WDC's water supplies and monitoring is undertaken between 12-72 times a year. This is evenly spread throughout each month.
<b>Summary of results completed for inclusion in report (eg download data from DWO)</b> – What parameters and timeframe were audited?	Full year of <i>E.coli</i> reviewed for all supply distribution zones. This was done using the Infrastructure Data summaries for each supply and checking them against the quarterly summaries in the WDC spreadsheet. The data from ID and the spreadsheet were compared to the laboratory spreadsheet. In all cases it lined up. The actual laboratory monthly reports were shown as well.
<b>Comments on whether compliance criterion met / not met and reasons</b>	The routine monitoring samples, are in excess of the DWSNZ. The days of the week that were required to be monitored for each supply were met, along with the maximum interval between samples and the total number of samples. This was manually checked by reviewing the sampling schedule and the laboratory spreadsheet.  All supplies complied with the distribution zone monitoring requirements.
<b>Method of determining compliance</b> eg checked all raw data, used excel to graph data, other method – where is this data recorded?	Manually checked all E.coli monitoring (schedule and results).

### Cyanotoxin Compliance

<b>Does the distribution zone have P2 (Cyanotoxin) assigned?</b>	No
<b>Summary of monitoring results completed for report</b> whether or not data was assessed for this. Justification either way	N/A
<b>Method of determining compliance</b> eg checked all raw data, used excel to graph data, other method – where is this data recorded?	N/A

### Chemical Compliance

<b>Does the distribution zone have any chemical P2's assigned? (list)</b>	No
<b>Summary of monitoring results completed for report</b> Whether or not data was assessed for this. Justification either way	N/A
<b>Comment on compliance</b>	Compliant by default
<b>Method of determining compliance</b> eg checked all raw data, used excel to graph data, other method – where is this data recorded?	N/A

## SUPPLIES USING SECTION 10 FOR COMPLIANCE

The compliance requirements for being assessed as a section 10 supply are as follows:

1. A Drinking Water Assessor (DWA) must have approved a water safety plan, and the supplier must be implementing the plan.
2. Appropriate bacterial, protozoal and chemical treatment, as determined from the catchment assessment in the water safety plan, must be in use (table10.1).
3. Water suppliers must monitor water quality and ensure it meets the requirements of section 10.4.
4. Water suppliers must undertake remedial actions that have been specified in the water safety plan when a MAV is exceeded or treatment process controls are not met.

<b>Component</b>	<b>Comment</b>
<b>WSP approved &amp; implemented</b>	Garrymere WSP (revision 6) was assessed and approved by a Drinking Water Assessor in November 2021. Copy of DWA report dated 10/11/21 was sighted. It was standard DWA practice to assess implementation one year after the WSP was approved, however DWAs were ceased in November 2021 so no formal assessment was undertaken. Part of this independent compliance assessment included verifying that the monitoring had complied, which it is deemed to have.
<b>Appropriate treatment</b>	Supply has cartridge filtration (5 and 1 micron), UV disinfection (Wedeco spektron 30E) and chlorination (sodium hypochlorite). This is in excess of what is listed in Table 10.1 DWSNZ.
<b>Monitoring</b>	The monitoring of the filters, UV and chlorine is undertaken according to the WSP. This includes continuous monitoring of UV dose, turbidity and pressure. The E.coli monitoring is in excess of table 10.1 DWSNZ. The monitoring was verified and assessed in previous sections of the report.
<b>Remedial Actions</b>	None required

**Overall Section 10 compliance assessment**

Supply	WSP approved & implemented	Appropriate treatment	Monitoring	Remedial Actions	Overall compliance
Garrymere	√	√	√	√	√

**DATA AUDIT**

<b>Does the audited data align with data found in DWO?</b>	<p>Drinking Water Online (DWO) is not being used by Waimakariri District Council. It has been replaced with Hinekorako the Taumata Arowai database. This does not assess compliance like DWO did.</p> <p>WDC reported (and evidenced) compliance in a series of spreadsheets. Issues of potential non-compliance were specifically followed up and raw data checked. The raw data aligned with the compliance summaries.</p>
<b>If data doesn't align, what action is to be taken</b>	<p>WDC did claim protozoa compliance for Waikuku based on the results of the continuous monitoring. Unfortunately there were several turbidimeter verifications/calibrations missing so compliance was not able to be fully demonstrated. This is considered a technical non-compliance and did not affect the safety of the water.</p>
<b>Supplier informed of data audit result within 20 days?</b>	Yes.

### Attachment ii – 2023 Monthly Compliance Summary for January and February

Scheme	Plant Name	Plant				DZ Name	Distribution Zone Summary of D3.19, D3.20 / D3.25 and D3.29		Reason	Required Actions
		Bacterial		Protozoal			Jan	Feb		
		Jan	Feb	Jan	Feb					
Rangiora	South Belt	N	N	N	N	Rangiora	N	N	No treatment for bacteria or protozoa No FAC currently	Complete UV project Either gain chlorine exemption or chlorinate supply
Kaiapoi	Peraki	N	N	N	N	Kaiapoi	N	N	Chlorine only in part of scheme for part of time, and insufficient Ct at plants. No protozoal treatment	Complete UV project Either gain chlorine exemption or chlorinate supply
	Darnley	N	N	N	N					
Cust	Cust HW	Y	Y	N	N	Cust	N	N	Chlorine in place at plant, but no protozoal treatment Distribution zone not yet assessed	Complete UV project Either gain chlorine exemption or chlorinate supply
Ohoka	Ohoka HW	N	N	N	N	Ohoka	N	N	Chlorine in place at plant, But inadequate contact time. No protozoal treatment. Distribution zone not yet assessed	Complete UV project
Oxford Rural No.1	McPhedrons Rd	N	N	N	N	Oxford Rural No.1	N	N	Chlorine in place at plant, But inadequate contact time. No protozoal treatment. Continuous criteria not met for distribution zone.	Complete UV project Change to manual FAC sampling
Oxford Urban - Rural No.2	Domain Road HW	N	N	N	N	Oxford Urban	N	N	No treatment for bacteria or protozoa No residual in Oxford Urban	Complete UV project
						Oxford Rural No.2	N	N	Continuous criteria not met for distribution zone	Adjust compliance reporting for distribution zone to 30 minutes, rather than 1 minute
Pegasus Woodend	Pegasus HW	Y	Y	N	N	Pegasus Woodend	Y	Y	No treatment for protozoa, and bore heads do not meet sanitary criteria.	Complete UV project
West Eyreton- Summerhill- Poyntzs	West Eyreton HW	N	N	N	N	West Eyreton Summerhill Poyntzs	N	N	Plants	
Mandeville Fernside	Waikuku Kings Ave Beach Campground	Y	Y	Y	Y	Mandeville	Y	N	Continuous criteria not met for distribution zone all the time	Adjust compliance reporting for distribution zone to 30 minutes, rather than 1 minute
Ashley Gorge	Ashley Gorge Garrymere	T2 plants not yet assessed				Garrymere	N	N		
		T2 plants not yet assessed					N	N		
Amount Compliant		5	5	3	3		3	3		
Amount Not Compliant		7	7	9	9		12	13		
Percent of Zones / Plants Compliant		42%	42%	25%	25%		20%	19%		
Percent Compliant by Population		26%	26%	7%	7%		19%	19%		



**WAIMAKARIRI DISTRICT COUNCIL**

**FILE NO and TRIM NO:** CON202271/ 230503062533

**REPORT TO:** UTILITIES AND ROADING COMMITTEE


**DATE OF MEETING:** 23 May 2023

**AUTHOR(S):** Rob Kerr, UV Delivery Manager  
Colin Roxburgh, Project Delivery Manager

**SUBJECT:** On-Demand UV Disinfection headworks site configurations

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

  
General Manager

  
Chief Executive

## **1 SUMMARY**

- 1.1 The purpose of this report is to seek Utilities and Roading Committee approval for the proposed site layouts and building locations for the on-demand UV treatment buildings at the water supply headworks located at Domain Rd, South Belt, Darnley Square and Peraki Street.
- 1.2 In February 2023 the Council approved budget for UV treatment being included in the 2023/24 Annual Plan for the Council's on-demand water supplies that don't already have UV treatment (report 221202209325). Part of the motivation for the fast-tracking of these projects is due to commitments made by Council to Taumata Arowai as part of discussions on the Council's chlorine exemption applications in order to bring these schemes in compliance with new Drinking Water Quality Assurance Rules (DWQAR).
- 1.3 The project includes upgrading the existing headworks to incorporate UV treatment prior to reservoir storage in Darnley and Peraki heads works sites (Kaiapoi, South Belt (Rangiora), Domain Road (Oxford) and Pegasus (Pegasus/Woodend).
- 1.4 With the exception of Pegasus, which has space in the existing building, this involves construction of a new building at each site, and then installation of principal supplied UV reactors and associated pipework, electrical and mechanical equipment. Beca has been commissioned as the designer and a shortlist of six main contactors have been appointed. The main works are currently in design phase, with tenders to be issued in late June to the shortlist. The UV Reactors have been ordered and are forecast to arrive in October.
- 1.5 A key design decision made is that UV treatment will be immediately upstream of storage reservoirs as opposed to downstream of the reservoir. Council confirmed this design decision on 2 May 2023 (TRIM Ref 230418053440). This has operational and cost benefits as well optimises any chorine dosing system should it be required in the future for emergency disinfection.
- 1.6 The only remaining key design decision is the configuration of the new building on each of the four sites which required a new building to house the treatment system. In order to future proof the headworks, ensure safe operation, and ensure cost efficiencies, sufficient footprint is proposed to be provided for chlorine and fluoride should either or both be required in the future. For the avoidance of doubt, provision in the building footprint for these facilities does not assume that Taumata Arowai will not accept the emption request being pursued by Council, this is simply to future proof sites for any conceivable requirements that may be imposed upon the Council.
- 1.7 Each building is approximately 13m x 8m in area with the exception of South Belt which is slightly larger due to housing a third UV reactor. As such they are similar in scale to a secondary dwelling and will have the appearance of a concrete block buildings. Consent is required under the District Plan for the buildings on the basis that their purpose is something other than residential. These have been lodged and are classed as discretionary. They are not expected to be required to be notified.

Note that this paper relates to the Council's role as an infrastructure manager and not as a regulator under the Resource Management Act.

1.8 While the Domain Road site is rural and any new building will have minimal visual or landscape impact, the sites at Peraki, Darnley and South Belt are all located in residential areas. Staff consider that the visual impacts of the proposed building are minor and the controls in the District Plan are sufficient, however seek direction from the Committee if further mitigation should be developed to minimise any effects of the proposed building from neighbours.

1.8.1 The Darnley Square site is located on a grassed area which is part of the land parcel for the water site, but which some pool users may perceive to be part of the curtilage to the pool rather than within the Water Headworks land parcel. The size of the building and the flow path from wells, to reservoir, then to headworks means, that there is no practical alternative. It is proposed to work with the pools team to consider either landscaping and or artwork on the external façade of the building. The aquatics team have confirmed that there is ample outdoor space as part of the pools complex without requiring this land as well.

1.8.2 The Peraki Street building is proposed to be located on the north side of the site, which is currently an unutilised gravel area. This site was selected as it minimises disturbance to other services, as the alternative location immediately east of the reservoir has clashes with power cables, the existing water pipes, and would be required to be constructed in close proximity to an existing drain. Staff consider the existing site conditions means that no further visual or landscape mitigation is necessary, as the building will not differ significantly in appearance to other building types seen in residential areas such as this.

1.8.3 The proposed South Belt location is on the existing large carpark on the headworks site. The southern boundary of the site is shielding by a large, landscaped bund that was required as part of the resource consent for the site when it was originally developed as a headworks. The only view is from the west over Townsend Road. There is some existing minor landscaping along the road frontage and the building will be coloured as per the existing main building on site, hence staff consider the new building will blend into the site. A small amount of further landscaping to further screen the new building may be required by the Resource Consent, and could be accommodated relatively easily into the site plan.

1.8.4 Site layout drawings are included as attachment i.

1.9 Attachments:

i. Site Layout Drawings

## 2 **RECOMMENDATION**

That the Utilities and Roothing Committee:

- a) **Receives** report No 230503062533.
- b) **Approves** the proposed site layout drawings for the UV treatment buildings at the water supply headworks located at Domain Rd, South Belt, Darnley Square and Peraki Street.
- c) **Notes** that the Darnley Square building will have landscape treatment and/or artwork on the external pool facing façade developed in consultation with the Aquatics team.
- d) **Notes** the locations at Domain Road, Peraki and South Belt and that staff consider the existing site conditions are sufficient to address any landscape and visual impacts of the new buildings.
- e) **Notes** that other requirements may arise out of the resource consent process which will be implemented if required, and that this resource consent process is not expected to require notification.
- f) **Notes** that this project is allowed for within the 2023/24 Draft Annual Plan.
- g) **Circulates** this report to All Boards meeting for their information.

## 3 **BACKGROUND**

- 3.1 The Council is seeking exemption for the use of permanent chlorine disinfection from Taumata Arowai for many of the water supplies in the District. In parallel, Council has decided to progress with installation of UV disinfection in five headworks within the Kaiapoi, Rangiora, Pegasus and Oxford water supply schemes, having already completed installations in Cust, Garrymere, Waikuku Beach and Mandeville. It is noted that UV disinfection is required irrespective of the outcome of chlorine exemption applications.
- 3.2 The concept designs for each scheme were prepared by Beca in 2018 following appointment through a competitive tender process. The detailed design was advanced in 2018 by the Project Delivery Unit however, these staff have now left PDU and the expertise to complete the design is no longer available.
- 3.3 Beca have been commissioned to complete the detailed design (Contract 22/71) and this is underway and due 18 May 2023. Council approved the contract to award supply of the UV reactors due to their long lead time. Works are planned to be completed prior to June 2024 which will require a slightly compressed delivery timeframe. Award of physical works contracts is planned to be shortly after adoption of the FY23/24 Annual Plan.
- 3.4 A key design decision made is that UV treatment will be immediately upstream of storage reservoirs, rather than the alternative of having UV systems downstream of reservoirs. This decision was confirmed by the Council at their May 2023 meeting, at the time the purchase of the UV units was approved.

## 4 **ISSUES AND OPTIONS**

- 4.1 The other significant piece of work completed is an assessment of each site to determine the proposed site layout to confirm that there is existing space to accommodate the UV installations. To ensure sites are future proofed, this has also included consideration of other types of treatment that may be required in the future including fluoridation and permanent chlorination. This will ensure the site layouts are optimised not just for the current scenario, but also possible future requirements and minimise potential future costs.
- 4.2 For the avoidance of doubt, provision in the building footprint for chlorination facilities does not assume that Taumata Arowai will not accept the exemption request being pursued by Council and is considered on a prudent no-regrets basis. Similarly with allowance for fluoridation equipment in the building footprint; this is in acknowledgement of the ability the Director General of Health has to

instruct the Council to fluoridate any of its water supplies serving a population of greater than 500 people, despite the Council having no plans in place to do this, unless instructed to do so.

4.3 Each building is approximately 13m x 8m in area with the exception of South Belt which is slightly larger due to housing a third UV reactor. As such they are similar in scale to a secondary dwelling and will have the appearance of a concrete block buildings. Consent is required under the District Plan for the buildings on the basis that their purpose is something other than residential. These have been lodged and are classed as discretionary. They are not expected to be required to be notified. Note that this paper relates to the Council's role as an infrastructure manager and not as a regulator under the Resource Management Act.

4.4 While the Domain Road site is rural and any new building will have minimal visual or landscape impact, the sites at Peraki, Darnley and South Belt are all located in residential areas. Staff consider that the visual impacts of the proposed building are minor and the controls in the District Plan are sufficient, however seek direction from the Committee if further mitigation should be developed to minimise any effects of the proposed building from neighbours.

4.4.1 The Darnley Square site is located on a grassed area which is part of the land parcel for the water site, but which some pool users may perceive to be part of the curtilage to the pool rather than within the Water Headworks land parcel. The size of the building and the flow path from wells, to reservoir, then to headworks means, that there is no practical alternative. It is proposed to work with the pools team to consider either landscaping and or artwork on the external façade of the building. The aquatics team have confirmed that there is ample outdoor space as part of the pools complex without requiring this land as well.

4.4.2 The Peraki Street building is proposed to be located on the north side of the site, which is currently an unutilised gravel area. This site was selected as it minimises disturbance to other services, as the alternative location immediately east of the reservoir has clashes with power cables, the existing water pipes, and would be required to be constructed in close proximity to an existing drain. Staff consider the existing site conditions means that no further visual or landscape mitigation is necessary, as the building will not differ significantly in appearance to other building types seen in residential areas such as this.

4.4.3 The proposed South Belt location is on the existing large carpark on the headworks site. The southern boundary of the site is shielding by a large, landscaped bund that was required as part of the resource consent for the site when it was originally developed as a headworks. The only view is from the west over Townsend Road. There is some existing minor landscaping along the road frontage and the building will be coloured as per the existing main building on site, hence staff consider the new building will blend into the site. A small amount of further landscaping to further screen the new building may be required by the Resource Consent, and could be accommodated relatively easily into the site plan.

4.4.4 Site layout drawings are included as attachment i.

## 4.5 Options

4.5.1 Option 1 – No further mitigation other than what is required via the Resource Consent process, noting this may include some planting to screen the new South Belt building.

4.5.2 Option 2 – Landscape and/or artwork on poolside external façade at Darnley Square. No further mitigation at other sites other than other mitigations required by the Resource Consent process. This is the recommended option.

4.5.3 Option 3 – Further develop landscape and architectural design to minimise visual impact on neighbours at Peraki Street in addition to Option 2.

## 4.6 Implications for Community Wellbeing

- 4.6.1 There are implications on community wellbeing by the issues and options that are the subject matter of this report. While the decision to implement UV disinfection sits outside of this report, the visual appearance of the buildings and the way they fit in with the surrounding environment is an important consideration where buildings may be visible to the public. This report seeks to find an appropriate balance between the visual amenity of the sites and the impact they may have on the wider community versus the cost of any additional mitigations required.

## 5 COMMUNITY VIEWS

### 5.1 Mana whenua

- 5.1.1 Te Ngāi Tūāhuriri hapū are not likely to be affected by or have an interest in the subject matter of this report, although they do have an interest in the wider project as explained below.

### 5.2 Groups and Organisations

- 5.2.1 Mahaanui Kurataiao Limited have been engaged with to provide input on behalf of Ngai Tuahuriri and have given their support the chlorine exemption process, and the use of UV treatment in favour of chlorine if possible.

### 5.3 Wider Community

- 5.3.1 The wider community is likely to be affected by, or to have an interest in the subject matter of this report.
- 5.3.2 In particular, users of Darnley Pool may have an interest in the use of the land adjoining the pool and which can be seen from inside the pool complex. The Waimakariri Aquatics team have been engaged with and consider that the land proposed for the UV building is of little benefit to the pools site, and that there is ample outdoor land available as part of the Kaiapoi Aquatics centre site while still allowing this proposed new building to be constructed.
- 5.3.3 The neighbouring residents may be affected by the new buildings to each of the other sites, however the overall designs are considered to be consistent with other activity types typically allowed in these areas. For this reason, the proposed buildings are not considered to detract from the wider amenity of the areas.

## 6 OTHER IMPLICATIONS AND RISK MANAGEMENT

### 6.1 Financial Implications

- 6.1.1 The project budget is set out in the table below which includes provision for the buildings discussed in this report.

Cost item	Budget	Commitments	Forecast Final Cost
Project Management	\$ 108,487.80		\$ 108,487.80
Design reviews etc	\$ 28,775.00	\$ 10,000.00	\$ 28,775.00
Design and Technical Fees	\$ 499,452.25	\$ 544,065.00	\$ 544,065.00
MSQA	\$ 219,982.75		\$ 219,982.75
Site Investigations	\$ 28,775.00	\$ 20,000.00	\$ 28,775.00
Oxford	\$ 587,986.06	\$ 158,011.79	\$ 587,986.06
Rangiora	\$ 1,098,435.49	\$ 245,436.46	\$ 1,098,435.49
Peraki	\$ 743,059.30	\$ 245,436.46	\$ 743,059.30
Darnley	\$ 743,059.30	\$ 245,436.46	\$ 743,059.30

Cost item	Budget	Commitments	Forecast Final Cost
Pegasus	\$ 545,987.05	\$ 245,436.46	\$ 545,987.05
Contingency	\$ 1,151,000.00		\$ 1,106,387.25
	<b>\$ 5,755,000.00</b>		<b>\$ 5,755,000.00</b>

## 6.2 Sustainability and Climate Change Impacts

6.2.1 The recommendations in this report do have sustainability and/or climate change impacts. With changing weather patterns and increased frequency of flood events, the probability of impacts upon the source water of these events increases. While generally low risk for deep sources, the provision of UV treatment provides another barrier against any such change in source water quality as a result of the changing climate.

## 6.3 Risk Management

6.3.1 There are limited risks associated with this report in terms of the matters relating to site layout. There is however some risk associated with the supply of untreated drinking water, and the provision of UV treatment is intended to manage this risk by providing a multi-barrier approach.

## 6.4 Health and Safety

6.4.1 There are health and safety risks arising from the adoption/implementation of the recommendations in this report. The health and safety risks will be managed via the inclusion of Safety in Design (SiD) at the design phase, and through the construction phase using the Council's normal systems for managing these risks.

## 7 CONTEXT

### 7.1 Consistency with Policy

7.1.1 The value of the physical works for this project is a matter of significance in terms of the Council's Significance and Engagement Policy. For this reason, the investment required is being consulted on as part of the 2023/24 Annual Plan process. The outcome of this consultation process will be considered prior to adoption of the Annual Plan, and prior to the award of the physical works.

### 7.2 Authorising Legislation

7.2.1 The Local Government Act is relevant in regard to this decision. The Water Services Act is also relevant in this matter. For the avoidance of doubt, this paper is in relation to the Council role as an Infrastructure Manager and does not address the Council's role of regulator under the District Plan.

### 7.3 Consistency with Community Outcomes

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

- *Core utility services are sustainable, low emissions, resilient, affordable; and provided in a timely – manner*

## **7.4 Authorising Delegations**

- 7.4.1 There is no formal delegation to consider these site layouts, however this matter is considered to be in the general scope of matters considered by the Utilities and Roading Committee.

**APPENDIX i**

**Site Layout drawings**





Figure 1: Proposed South Belt Site Layout (blue line represents building outline)





Figure 3: Proposed Domain Road Layout (blue line represents building outline)

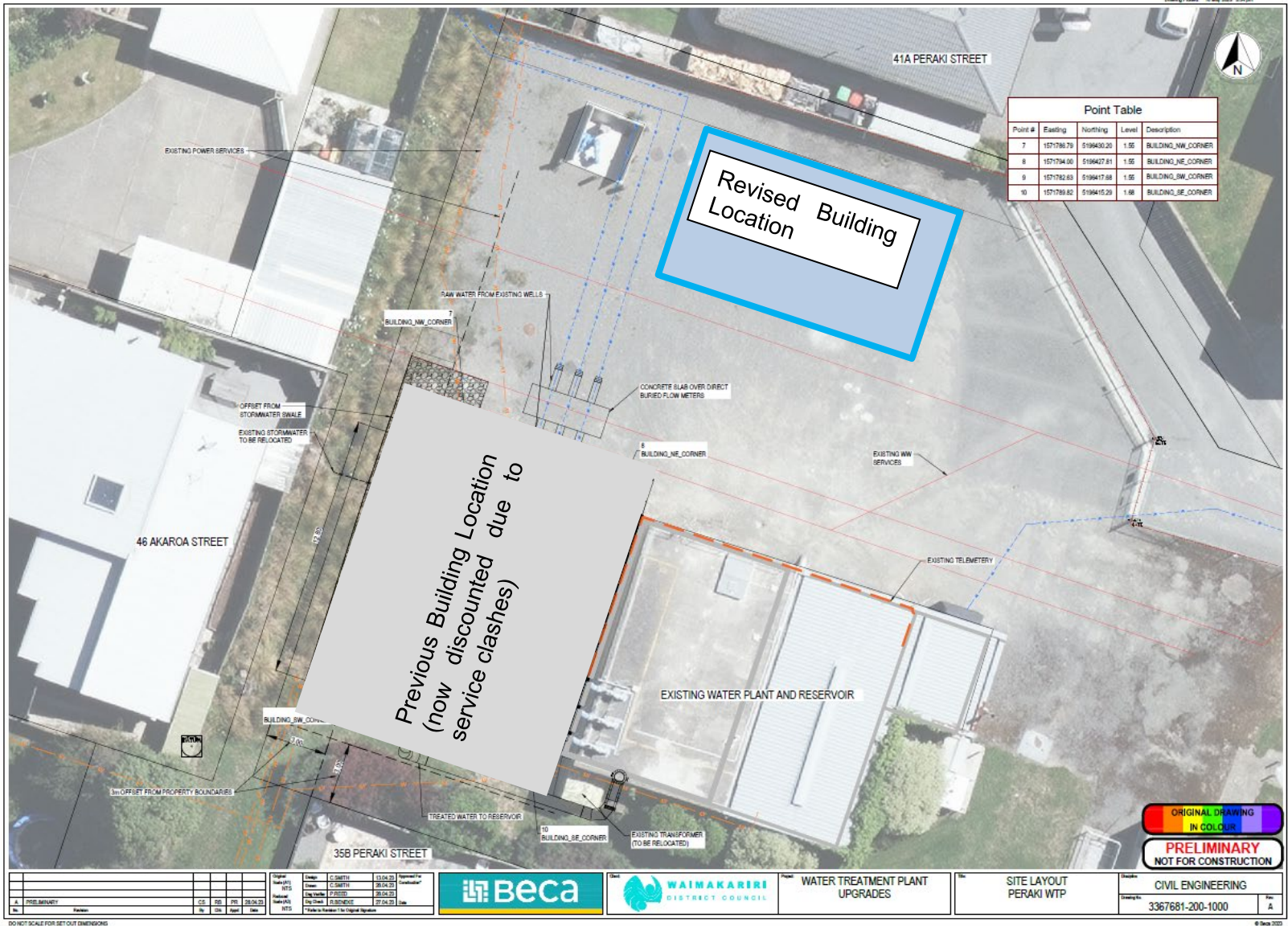


Figure 4: Proposed Peraki Street Layout (note blue outline represents proposed building outline, grey area shows previous location that has since been discounted)

**WAIMAKARIRI DISTRICT COUNCIL****REPORT FOR INFORMATION****FILE NO and TRIM NO:** 230110001807**REPORT TO:** Waimakariri Water Zone Committee**DATE OF MEETING:** 6 March 2023**AUTHOR(S):** Angela Burton – Water Environment Advisor**SUBJECT:** Waimakariri District Council Spraying and Chemical Usage - Waterways and Roadside spraying information.**ENDORSED BY:**  
(for Reports to Council,  
Committees or Boards)  
General Manager  
Chief Executive**1. SUMMARY**

- 1.1. This report provides a summary of chemical spraying practices in the Waimakariri District, summarising the types of chemicals used, approximate quantities of chemicals used last season and spraying management for roadside maintenance spraying, planting maintenance and waterways and drainage spraying.
- 1.2. Herbicides used for Council operations are only used where deemed necessary by Council staff and contractors, and other (non-chemical) weed control options are used where they are deemed more appropriate.

**Attachments:**

- i. **171011110252** - Carex Report: Persistence and ecological consequences of glyphosate to control aquatic weeds in Waimakariri lowland waterways.
- ii. **221014179468** - District Road Maintenance Contract 2020-2023 - CORDE No Spray Zone Register 21-09-22.
- iii. **111104051960** - CRC120402 Global Consent Discharge Herbicide Drains and Waterways.
- iv. **220907154926** - District Road Maintenance Contract - Annual Drain Spraying Letter 2022 to 2023 for Environment Canterbury.
- v. **111031050695** - CRC120402 Herbicide Spray Environmental Management Plan
- vi. **200728095074** - FINAL WDC Drainage Maintenance Management Plan 28 July 2020

**2. RECOMMENDATION****THAT** the Waimakariri Water Zone Committee

- (a) **Receives** Report No. 230110001807.
- (b) **Notes** that herbicides used for Council operations are only used where deemed necessary by Council staff and contractors, and other (non-chemical) weed control options are used where they are deemed more appropriate.
- (c) **Notes** that the budgets in the LTP have been based on continuing to use herbicides, including glyphosate, for weed control, where deemed necessary by Council staff and contractors.
- (d) **Notes** that the Waimakariri Zone Committee will be included in future notifications of annual spraying programmes.

- (e) **Notes** that Diquat is not used in any council spraying programme.
- (f) **Notes** that the Waimakariri District Council will continue to work toward keeping better records on chemical spraying within the district and will investigate the potential development of a chemical register and spraying decision parameters for contractors and staff.
- (g) **Circulates** this report to the Utilities and Roadings Committee and all Community Boards.

## **BACKGROUND**

- 2.1. The Waimakariri Zone Committee have received criticism and concern from the community regarding use of chemical spray practices and the impact of spray practices on waterways within the Waimakariri District. Specifically, a resident of the Waimakariri District in 2022 blamed the use of chemicals in watercourses and drains for the dieback of ecological factors in certain streams.
- 2.2. Due to community concerns the Council has minimised spraying aquatic vegetation such as watercress and monkey musk, preferring to use mechanical methods to manage excess weed growth. However, spraying of dry drain inverts and adjacent woody weed pest species has continued.
- 2.3. In September 2017 a study (Trim 171011110252, refer Attachment i) was undertaken by researchers from CAREX to understand the persistence of glyphosate in stream water and sediment and its short-term effects on freshwater invertebrates and fish following spraying of waterways in the Waimakariri District. From December 2016 – March 2017 five waterways near Rangiora were investigated to test the effect of glyphosate on aquatic weeds, stream invertebrates and fish. Glyphosate and AMPA (Aminomethylphosphonic Acid) were present in the water column for 1-2 days following spraying, but glyphosate quickly bound to sediment and broke down to AMPA. The study could not detect any effect of glyphosate on stream invertebrate species richness, metrics such as the MCI and SQMCI or fish. Given the small sample size of the study, the findings are limited, however they add to WDC understanding of drain maintenance effects on aquatic systems.

## **ISSUES AND OPTIONS**

- 2.4. Roadside Maintenance (Roding):
  - 2.4.1. The minimum level of qualifications for any person undertaking agrichemical application is an Introductory Growsafe Certificate. Chemical weed control in public areas is limited to chemicals with a toxicity rating equivalent to or greater than an acute oral LD50 of 2000 milligrams/kgs, except where this is required to control noxious weeds or in areas where specialist treatment is necessary, (for example playing fields and high-profile areas). In these areas, weed control will be undertaken using the least toxic effective chemical of a type approved by the Principal.
  - 2.4.2. The Waimakariri District Council continually adds to a “No Spray Register” which members of the public can opt in to have their frontages added to. The ‘no spray zone’ register is updated prior to spraying commencement every year. WDC currently hold contract with CORDE to undertake these spray works. (TRIM 221014179468 – refer attachment ii). The no-spray register holds private information and it not available to the public. There is currently no information regarding the no-spray register on the website, however, residents are given the option to opt out of frontage spraying if they ask directly.
  - 2.4.3. The roading spray operation relates to urban K&C spraying, rural spraying around street furniture (signs, poles, edge marker posts, etc), around culvert ends and

occasionally road drains. Overgrown vegetation that poses a roading safety risk (blind spots etc) at intersections and/or bridges is also sprayed.

2.4.4. CORDE – Waimakariri District Councils Roading Contractor provided quantities of chemical spraying undertaken in litres used last year for roadside maintenance. The types and amount of chemical used in the year prior to 25/11/2022 are as below:

- Li -1000 - 23.76 Litres
- Lion 490 DST - 147.8 Litres
- Tordon Herbicide - 47.09 Litres

2.4.5. Chemical Spray is only used when deemed necessary by the roading team. Landowners are encouraged to not use chemical spray on the banks of roadside drains and swales. An anti-drift additive is added to council roading chemical sprays to ensure minimal spray drift when applied. Spray is usually applied with the spray nozzle close to the ground to help reduce drift.

2.5. Planting Maintenance (Greenspace):

2.5.1. Glyphosate is used by the greenspace team for managing riparian areas which have been planted with natives. The practice is to target problem weeds that could compete with the natives. A backpack sprayer is used by a Growsafe Qualified person. This practice is a temporary measure for planting sites because as natives become established, they can prevent exotic weeds establishing on the margins, therefore reducing the need for chemical sprays over time.

2.5.2. It has been noted that without effective weed control the greenspace team cannot successfully establish native planting. This practice generally only requires a spot spray release until the plantings are successfully established. Establishment of plantings takes approximately two years. Whilst there will continue to be competition from exotic plants and weeds, the native seedlings can survive and become the dominant plant cover over time.

2.5.3. Between January 2022 and April 2022 approximately 27.1 litres of Glyphosate chemical was used for planting maintenance. Between June 2022 and October 2022 approximately 22.8 litres of glyphosate chemical was used for planting maintenance. The total amount of Glyphosate used between January 2022 and October 2022 by the greenspace planting maintenance team was 49.9 litres.

2.6. Waterways, Drainage and Water Race Spraying (3 Waters):

2.6.1. Section 7.3 of the WDC Drainage Maintenance Management Plan (refer attached vi) gives further details to the chemical spray processes and impacts on the environment for the chemicals used. Diquat does is not used for spraying in the Waimakariri District for waterways and drainage maintenance.

2.6.2. The active herbicide sprays that are used in the Drain and Water Race maintenance programme are:

- Glyphosate spray for grass and other weeds.
- Glyphosate gel for willow, either injected or cut and paste.
- Triclopyr (Grazon) for gorse and broom.
- Organo-silicone penetrant (Pulse Penetrant) used with other herbicides for faster penetration and uptake.

2.6.3. CORDE is Waimakariri District Councils Contractor for rural drainage, however in 2022 the work was sub-contracted out to Hide Spraying. CORDE and Hide

Spraying provided quantities of chemicals used last year for rural drainage maintenance. The types and amount of chemical used in 2022 are as below:

- Glyphosate 510 – 16 litres
- Triclopyr (Grazon) - 1.6 litres
- Organo-silicone penetrant (Pulse Penetrant) - 3 litres

2.6.4. Delta is Waimakariri District Councils Contractor for urban drainage. Delta was able to provide quantities of chemicals used between 27 September 2022 and 3 February 2023. The types and amount of chemical used in the timeframe given are as below:

- Glysohate 360 – 1.6 Litres

2.6.5. Council staff have discretion to determine whether to spot spray to remove pest plants from the riparian margin area or from the drain bed. Problem weeds may be sprayed if located on flat ground adjoining the drain, where there is a low risk of creating bank erosion and, for spraying of the banks, where the spray drift will not accidentally enter surface water. Care is also taken to reduce the risk of decomposing material from falling into the waterway following spraying.

2.6.6. Council contractors spray dry drains to control rank grass. They are instructed to spray only the invert of the drain and to leave the banks untouched. Usually, one spray per year is enough to keep the drains manageable. Dry drains in the district are maintained 'on-demand' and have no regular management schedule in place.

2.6.7. The dry drains that could be maintained by spraying fall within the following drainage rating schemes: Ohoka, Waikuku, Oxford Rural West, Oxford Rural East, Cust, Loburn Lea, Central Rural, Clarkville and Coastal, Rangiora and Kaiapoi.

2.6.8. Contractors spray wet drains with Glyphosate 360 using a vehicle mounted spray unit. A resource consent is held by Waimakariri District Council for this activity (CRC120402 – refer Attachment iii). When spraying aquatic emergent weeds, the practice is to spray the middle of the drain only and not the banks. It may not always be possible to prevent spray drift residue from entering the flowing water, however this is minimised by spraying only thick areas of emergent plants which are above the water. Glyphosate is only effective on emergent weeds as sprays are diluted beyond effectiveness when mixed with stream water

2.6.9. Council recommends private landowners/occupiers to minimise spraying of stockwater race banks and does not recommend landowners spray the side of the bank or directly into water when maintaining stockwater races.

2.6.10. The 2022/2023 spraying programme for spraying adjacent to Water Races and Council Public Drains commenced 1 September 2022 and will continue through to 30 April 2023. Spraying adjacent to water races is undertaken in accordance with the CRC120402 Global Consent.

2.6.11. Discharge of Herbicide near Drains and Waterways notices are issued yearly prior to commencement of the spray season (1 September). This information is published on the Council's website on an annual basis.

2.6.12. There have been concerns raised by the community over the use of sprays in spring fed drains in the past, and the council works toward minimising the spraying of aquatic vegetation such as watercress and monkey musk. Instead, the council preferring to use mechanical methods to manage excess weed growth. Staff are required to carefully consider options for reduction of the use of glyphosate, as a precautionary principle.

### **Implications for Community Wellbeing**



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

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

### **3. COMMUNITY VIEWS**

#### **3.1. Mana whenua**

Te Ngāi Tūāhuriri hapū are likely to be affected by or have an interest in the subject matter of this report.

#### **3.2. Groups and Organisations**

There are groups and organisations likely to be affected by, or to have an interest in the subject matter of this report.

#### **3.3. Wider Community**

The wider community is likely to be affected by, or to have an interest in the subject matter of this report.

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

#### **4.1. Financial Implications**

There are not financial implications of the decisions sought by this report.

This budget is not included in the Annual Plan/Long Term Plan.

#### **4.2. 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 not risks arising from the adoption/implementation of the recommendations in this report.

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

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

### **5. CONTEXT**

#### **5.1. Consistency with Policy**

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

#### **5.2. Authorising Legislation**

#### **5.3. Consistency with Community Outcomes**

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

- There is a healthy and sustainable environment for all.
- There is a safe environment for all.

#### **5.4. Authorising Delegations**

## **Persistence and ecological consequences of glyphosate to control aquatic weeds in Waimakariri lowland waterways**

Katie Collins , Jon S. Harding

Corresponding author: [carex@canterbury.ac.nz](mailto:carex@canterbury.ac.nz)

September 2017

### **Executive Summary**

This study and report was undertaken by researchers from CAREX and no payment was received for this work. Waimakariri District Council paid for commercial analysis of glyphosate and AMPA. The purpose of this study was to understand the persistence of glyphosate in stream water and sediment and its short-term effects on freshwater invertebrates and fish following spraying of waterways.

From December 2016 – March 2017 five waterways near Rangiora were investigated to test the effect of glyphosate on aquatic weeds, stream invertebrates and fish. In each waterway an upstream reach was left as an unsprayed control and a downstream reach was sprayed. Samples were collected in each reach before and after spraying. Glyphosate and AMPA (the product of glyphosate) were already present in the sediment at both the control and spray reaches before spraying even started. This implies that parties other than the Council are spraying waterways or nearby areas, and this makes determining the effects of spraying on animal life in these waterways difficult.

Glyphosate and AMPA were present in the water column for 1-2 days following spraying, but glyphosate quickly bound to sediment and broke down to AMPA. Glyphosate and AMPA were still present in the sediment at both the control and spray reaches 14 weeks after spraying. Weeds in the spray reaches were greatly reduced by glyphosate, being reduced from 90% cover to 20%, however 14 weeks after spraying weed cover in these reaches had returned to about 50%. We could not detect any effect of glyphosate on stream invertebrate species richness, metrics such as the MCI and SQMCI or fish. These waterways are highly modified environments, and invertebrates and fish that occupy them are tolerant of water quality in these systems. Given the small sample size (five waterways), the findings of the study are limited and add to our understanding of drain maintenance on aquatic systems.

## 1. Introduction

Excessive growth of aquatic macrophytes (weeds) is a significant problem in lowland agricultural waterways, including in the Waimakariri District. Management is undertaken by Councils to ensure drainage is maintained, most commonly using mechanical clearance, herbicide spray and hand weeding.

Glyphosate is one of the world's most effective and most frequently used herbicides. It is a non-selective, broad-spectrum herbicide commonly used on emergent (surface dwelling) and marginal (bankside) macrophytes, but following manufacturers instructions, spraying directly on the waterway should be minimised.

Concerns have been raised about the toxic effect of glyphosate on aquatic life. There are also concerns of secondary effects including depleted dissolved oxygen levels and release of nutrients from decomposing plants, and sudden changes in habitat influencing refugia and food sources for aquatic invertebrates and fish.

To respond to public concerns, an investigation was carried out by the University of Canterbury on behalf of the Waimakariri District Council on the use of glyphosate spray to control aquatic macrophytes. This investigation was undertaken between December 2016 and March 2017.

The aims of this study were to investigate:

- the persistence of glyphosate in the stream water and sediment following spraying
- the effect of glyphosate on the freshwater invertebrates and fish in sprayed waterways

## 2. Methods

### 2.1. Experimental design

The impact of glyphosate was tested in five waterways. In each waterway an upstream 200m reach was selected which was not sprayed (control reach) and a 200m reach downstream was sprayed (treatment reach). The five waterways were scheduled to be sprayed by the Waimakariri District Council as part of their annual weed control program. They were:

- Ashworths: Ashworths Road Drain, between Mill Road & Main Drain Road
- Ohoka: Ohoka Stream North Branch, between Mill Road & the first gate along the walkway
- Threlkelds: Threlkelds Road, upstream of Main Drain Road
- Easterbrook: Easterbrook Road, upstream of Hicklands Road
- Ashby's: No. 4 Drain, upstream of Hicklands Road

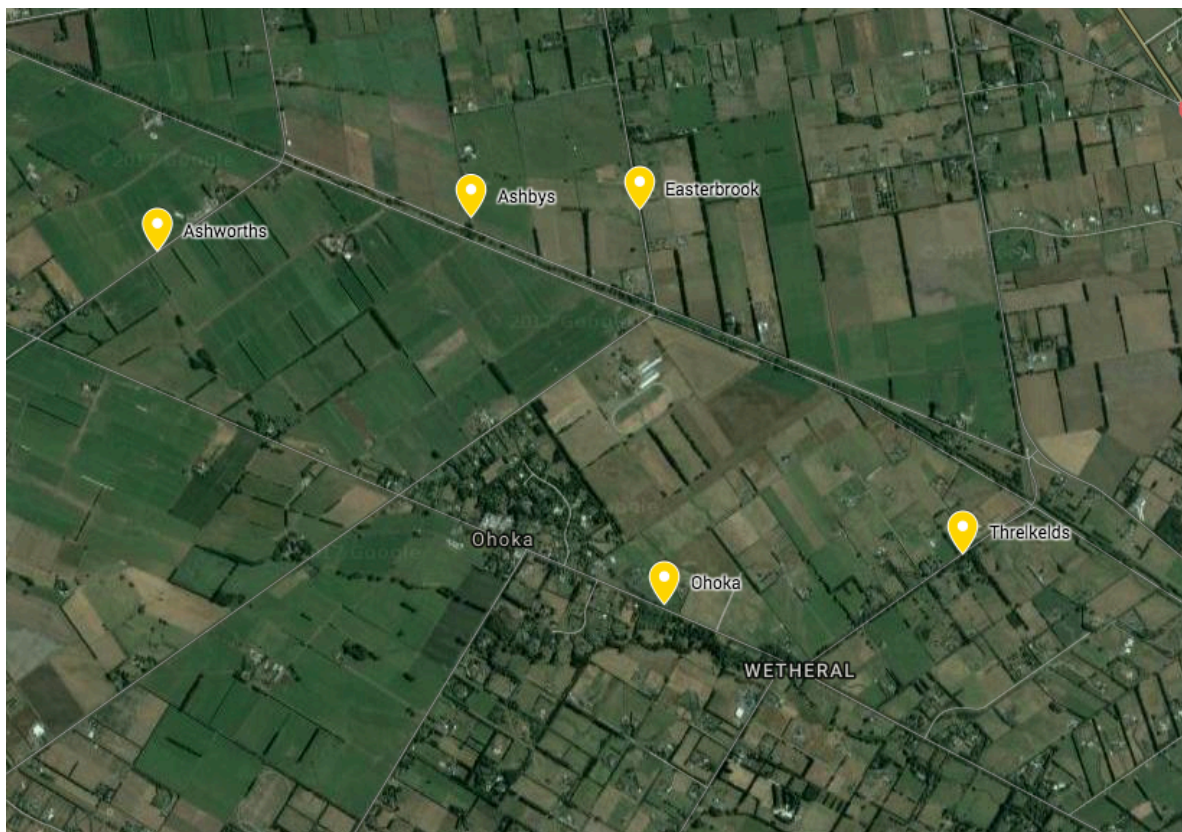


Figure 1: Location of the five waterways used in the spray trial.

A 200m stretch at the top of each reach was left unsprayed as a control reach. Macrophytes were sprayed from the 200m point downstream. Sampling of the control reach was undertaken 100m into the reach, and the spray reach was sampled at 400m (Fig 2).

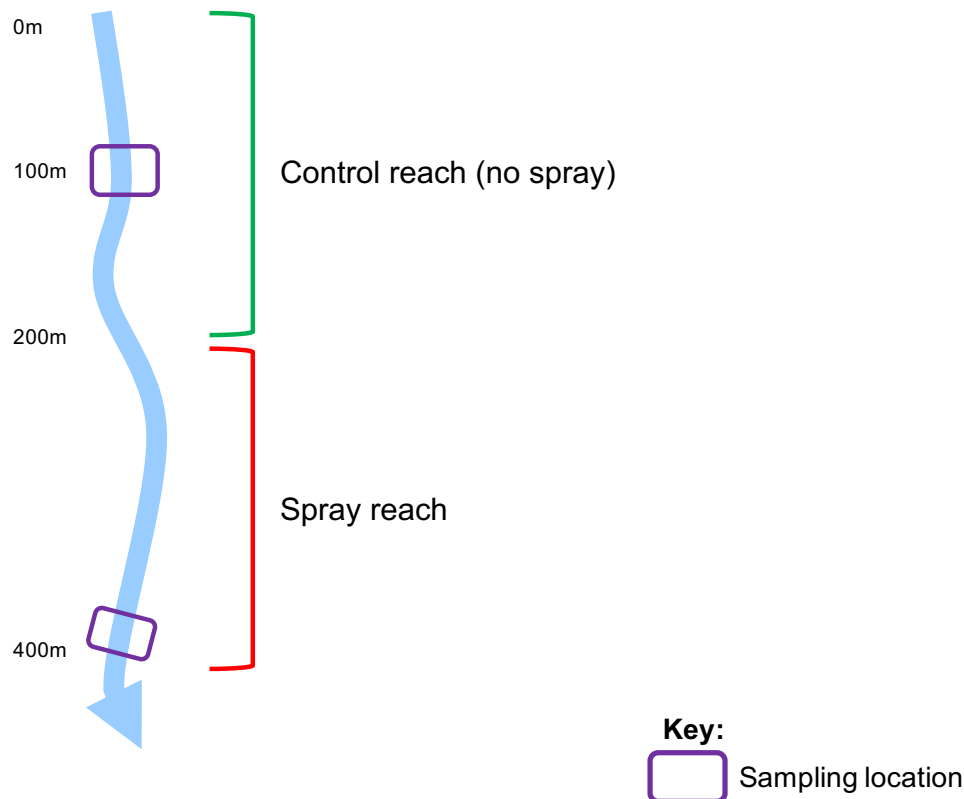


Figure 2: Spray trial experimental design used in all five waterways

Spraying was carried out by the Waimakariri District Council's contractor on 21 December 2016.

## 2.2. Weed monitoring

At each of the control (100m) and spray (400m) reaches, three macrophyte assessment cross-sections were set up. These cross-sections were measured before the spray trial (pre-spray), and 3, 6 and 14 weeks after spraying (post spray). On each cross-section, aquatic weed species and the height above the water surface were recorded every 10cm across the wetted width of waterway.

## 2.3. Glyphosate and AMPA sampling of water and sediment

When glyphosate contacts water, there are two major pathways of dissipation: binding to sediments, and microbiological breakdown. When sediments are present glyphosate rapidly binds to soil particles, bacteria and fungi in the water and sediment also breakdown glyphosate into aminomethylphosphonic acid (AMPA). AMPA can remain stable in sediments for some time. We measured both glyphosate and AMPA to better understand the persistence and breakdown time in these streams and sediments.

Glyphosate and AMPA samples of both stream water and stream bed sediment were collected and sent for analysis byASUREQuality (Wellington).

Water samples were collected pre-spray, the day of spraying (both control and spray reaches) and 1 and 5 days post spray (spray reaches only).

Samples of sediment were collected pre-spray (control and spray reaches) and 5 days, 3 weeks (spray reaches only) and 6 weeks post spray (control and spray reaches).

#### 2.4. Aquatic invertebrates

Aquatic invertebrates were collected at both control and spray reaches pre spray, 5 days and 6 weeks after spraying. In each reach a single invertebrate kick-net sample (500 µm mesh) was collected from five representative micro-habitats within the reach using the standard New Zealand protocols (Stark et al 2001). Samples were labelled and stored in 70 % ethanol.

In the laboratory the samples were sieved (500 µm Endecott sieve), and all invertebrates identified to the lowest practicable level (usually genus) using identification guides (such as Winterbourn 2006). Coded abundances of taxa were recorded as described by Stark (1998).

We then calculated several stream health metrics to determine the impact of the spray trial on aquatic invertebrates. The Macroinvertebrate Community Index (MCI) uses the presence or absence of taxa and their tolerance to pollution to indicate stream health. The MCI ranges from 0 – 200, scores of less than 80 indicate a severely polluted system while scores over 120 are considered healthy (Table 1). A second metric called the Semi-Quantitative Macroinvertebrate Community Index (SQMCI) was calculated using the pollution tolerances of taxa present and the coded abundance data. SQMCI's range from 0 – 10. Values less than 4 indicate a severely polluted system while values more than 6 indicate health systems.

Table 1: Interpretation of MCI and SQMCI values.

Water quality	Description	MCI	SQMCI
Excellent	Clean water	> 119	> 5.99
Good	Doubtful quality or possible mild pollution	100 – 119	5.00 – 5.90
Fair	Probable moderate pollution	80 – 99	4.00 – 4.99
Poor	Probable severe pollution	< 80	< 4.00

#### 2.5. Fish sampling

Freshwater fish were sampled with a portable (KAINGA EFM300) electric fishing machine by spot fishing in areas where aquatic weed cover was less than 40%. Electric fishing was undertaken at both control and spray reaches pre spraying and 3, 6 and 14 weeks post spray. However, this was problematic especially prior to spraying as weed cover was extensive and the high weed cover potentially confounded any results. Captured fish were identified to species level where

possible in the field. Very small fry (> 4 cm) were identified to family. Glass eels and elvers (Anguillidae) (>10 cm) were recorded as elvers.

Table 2: Timing of different sample collection over the experimental period.

Days since spraying	Water samples		Sediment samples		Macrophyte transects	Aquatic Invertebrates	Fish
	Control	Spray	Control	Spray	Control & Spray	Control & Spray	Control & Spray
Pre spray							
Day of spray							
Spray 1 day							
Spray 5 days							
Spray 3 weeks							
Spray 6 weeks							
Spray 14 weeks							

### 3. Results

#### 3.1. Glyphosate and AMPA in water

Prior to spraying no glyphosate was detected in the water but AMPA was found in water in the control sites. No glyphosate or AMPA were present in the water on the day of spraying at any control (non-sprayed) reaches (Fig 3A & B) whereas both glyphosate and AMPA were present in the water on the day of spraying at all spray (treated) reaches. On the day after spraying, glyphosate was detected in the water at all spray reaches at low concentrations. AMPA was only detectable in the water at the Easterbrook spray reach (Fig 3A & B). Five days after spraying, glyphosate and AMPA were both virtually undetectable in the water at all spray reaches (Fig 3A & B).

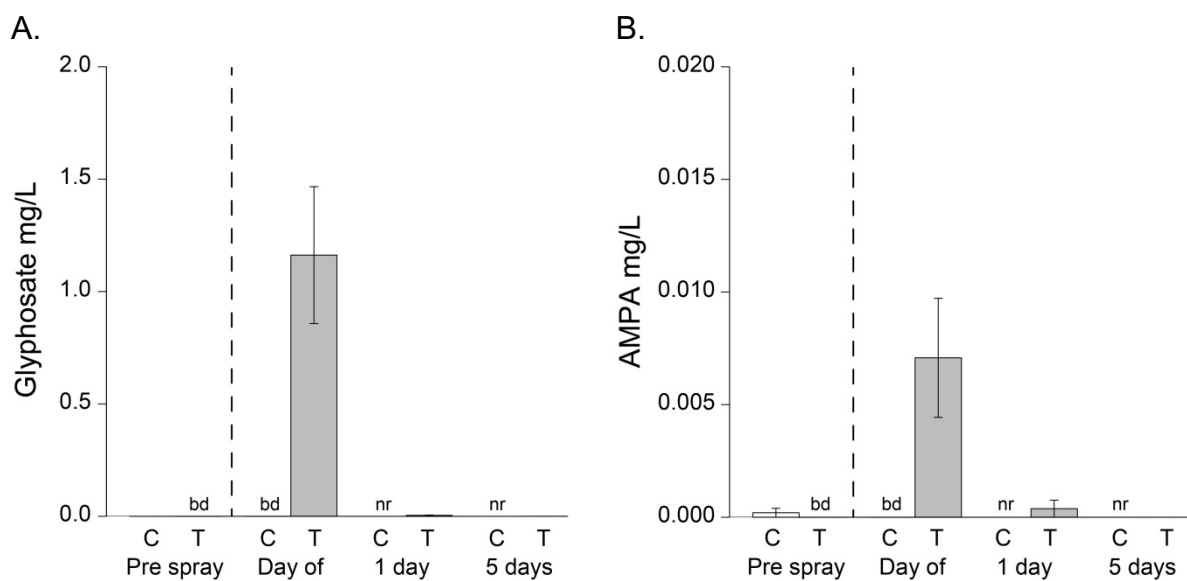


Figure 3: A. Mean glyphosate and B. Mean AMPA concentrations in water pre spraying, on the day of spraying, the day after spraying and 5 days after spraying. Control reaches are shown in white, treated (spray) treated reaches are shown in grey. Time of spraying is indicated by the dotted line. nr = sample not run, bd = sample result below detectable limit. Mean values are shown with  $\pm 1$  Standard error.

#### 3.2. Glyphosate and AMPA in sediment

Pre spraying, glyphosate and AMPA were detected in the sediment in both control and spray reaches (Fig 4A & B). Six weeks after spraying, glyphosate and AMPA were still detectable in the sediment in both control and spray reaches (Fig 4A & B).



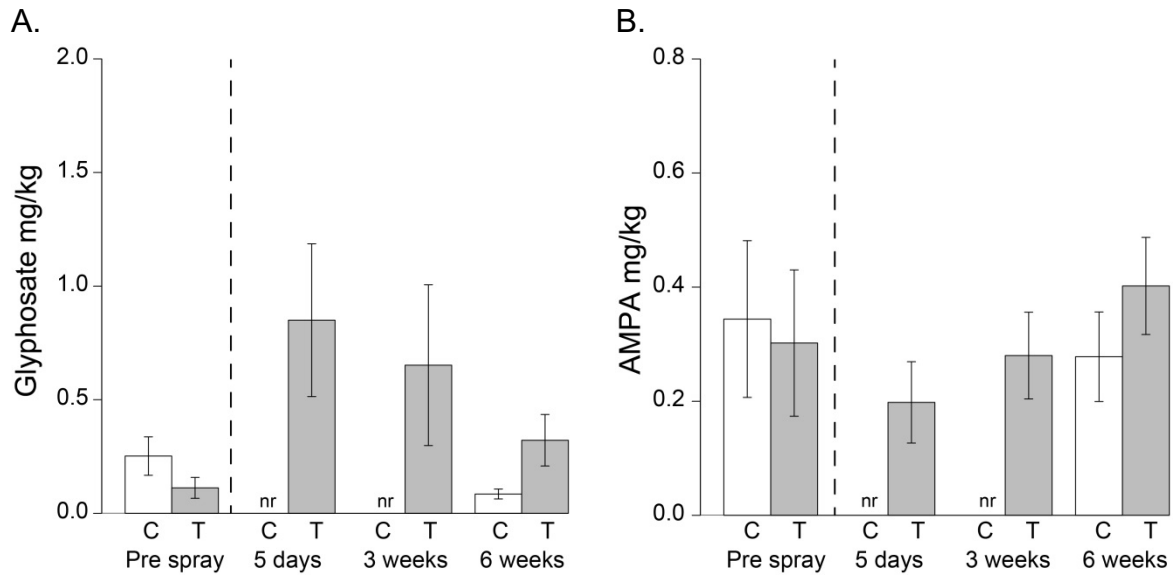


Figure 4: A. Mean glyphosate and B. Mean AMPA concentrations in sediment pre spraying, 5 days after spraying, 3 weeks and 6 weeks after spraying. Control reaches are shown in white, treated (spray) treated reaches are shown in grey. Time of spraying is indicated by the dotted line. nr = sample not run, bd = sample result below detectable limit. Mean values are shown with  $\pm 1$  Standard error.

### 3.3. Aquatic weed cover

Macrophyte cover was between 80 – 100 % pre spraying. Three weeks post spraying, macrophyte cover was greatly reduced in the spray reaches (Fig 5, Photos 1-3). Fourteen weeks post spraying, macrophytes were starting to grow back in sprayed reaches (Fig 5).

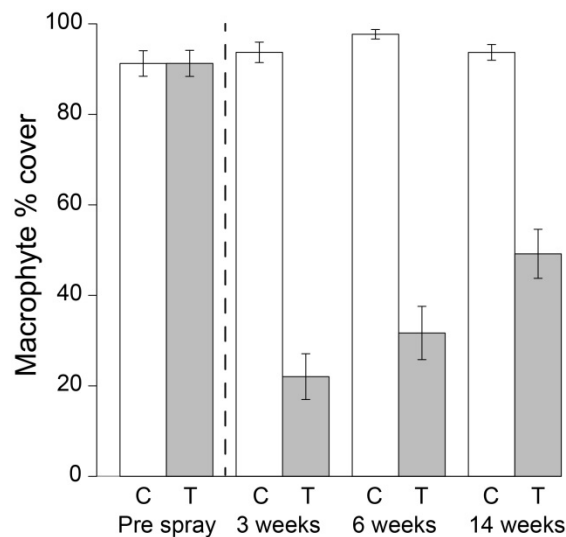


Figure 5: Mean macrophyte percent cover pre spraying, 3 weeks, 4 weeks and 14 weeks after spraying. Control reaches are shown in white, treated (spray) treated reaches are shown in grey. Time of spraying is indicated by the dotted line. Mean values are shown with  $\pm 1$  Standard error.



Photo 1: Threlkelds Road site pre spraying



Photo 2: Threlkelds Road control site 3 weeks after spraying



Photo 3: Threlkelds Road spray site 3 weeks after spraying

### 3.4. Invertebrate species richness, MCI and SQMCI

We compared mean values for invertebrate species richness, MCI and SQMCI and found no difference, suggesting these communities are not affected by the presence of glyphosate in the water or sediment (Fig 6A, B & C). MCI and SQMCI scores at all sites indicated probable moderate levels of pollution.

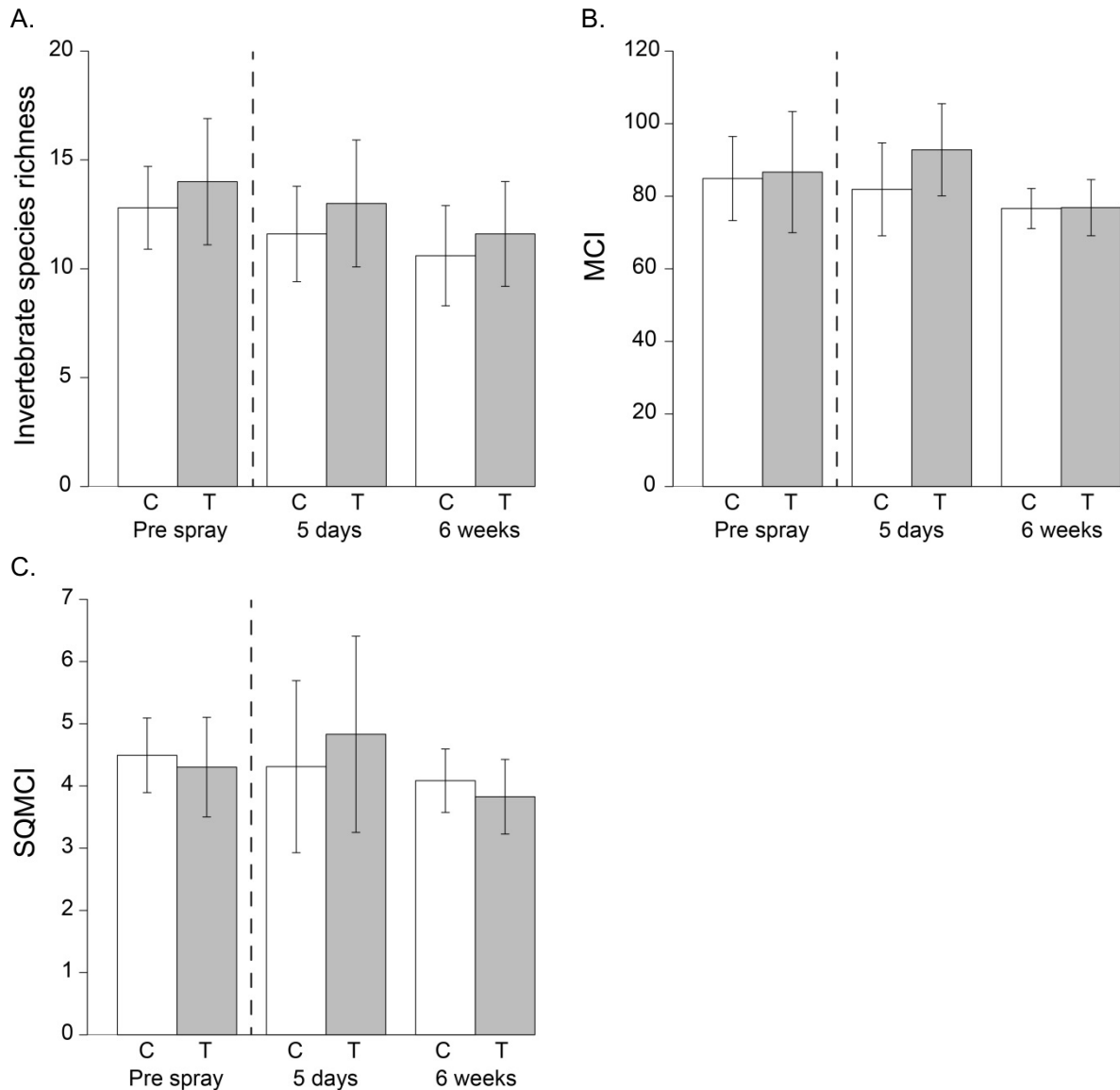


Figure 6: A. Mean invertebrate species richness, B. MCI and C. SQMCI pre spraying, 5 days and 6 weeks after spraying. Control reaches are shown in white, treated (spray) treated reaches are shown in grey. Time of spraying is indicated by the dotted line. Mean values are shown with  $\pm 1$  Standard error.

### 3.5. Fish species richness

Five fish species were observed in the five waterways, including: upland bullies (*Gobimorphus breviceps*), common bullies (*Gobimorphus cotidianus*), shortfin eels

(*Anguilla australis*), one longfin eel (*Anguilla dieffenbachii*) and juvenile brown trout (*Salmo trutta*).

Post spraying no differences were observed in fish species richness despite a declining trend. It seems unlikely individual fish species were directly impacted (Fig 7). Unfortunately, the high weed cover made accurate fish data difficult to collect.

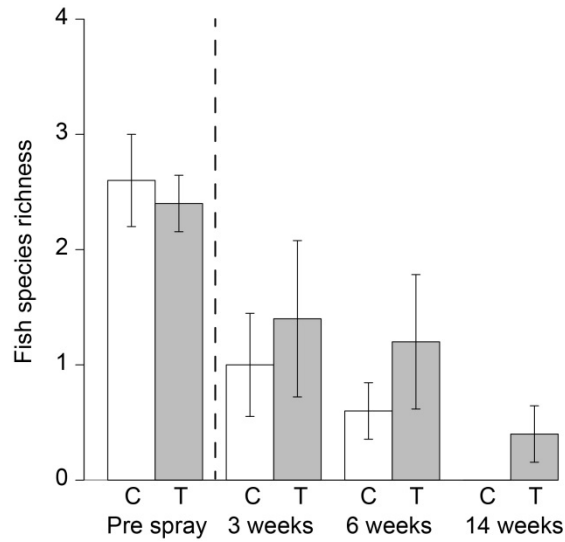


Figure 7: Mean fish species richness pre spraying, 3 weeks, 6 weeks and 14 weeks post spraying. Control reaches are shown in white, treated (spray) treated reaches are shown in grey. Time of spraying is indicated by the dotted line. Mean values are shown with  $\pm 1$  Standard error.

## 4. Final comments

- The purpose of this study was to understand the persistence of glyphosate in stream water and sediment and its short-term effects on freshwater invertebrates and fish following spraying of waterways.
- Glyphosate and AMPA were present in the water column for 1-2 days following spraying, but glyphosate quickly bound to sediment and broke down to AMPA
- Glyphosate and AMPA were already present in the sediment at both the control and spray reaches before spraying even started.
- Glyphosate and AMPA were still present in the sediment at both the control and spray reaches 14 weeks after spraying
- Spraying with glyphosate is an effective way to control aquatic weeds, however effectiveness is short lived and grow back is evident within three months
- Species richness of invertebrates and fish, MCI and SQMCI are not affected by the use of glyphosate to control emergent macrophytes. These drains are highly modified environments, and invertebrates and fish that continue to occupy them are tolerant of water quality in these systems.
- Glyphosate is commonly used for domestic purposes on lawns and gardens, and in agricultural landscapes. There are several ways it can enter waterways, including spray drift and direct runoff from sprayed land.
- This study was not designed to detect the sources of glyphosate in these stream systems. Our results show that either: glyphosate can persist in these systems between periods of drain maintenance, or the glyphosate in the system prior to commencement of this study was from other nearby sources.

## 5. Acknowledgements

This work would not have been possible without the field assistance of Hayley Devlin, Nicky Glenjarman, Will Keay, Alice West, Catherine Febria, Tina Clapham and Sarah and Nick Collins.

Thank you to Greg Bennett and the Waimakariri District Council for the support of this research, and to the District-appointed contractors who executed the spraying contract.

The glyphosate data presented here were paid for by the Waimakariri District Council.

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NO SPRAY ZONE REGISTER					
Area	House #	Road / Street Name	Location	Owner Name(s)	Comments
Ashley	818	Marshmans Road / Duffs Road	Culvert in front of property	Cameron Booker & Melissa Rowling	Market Garden
Bennetts	3000	Tram Road	Stockwater race along road	Russel William Werner & Courtney Sue Starbuck	
Cust	1	Howsons Road	Stockwater race along road and through property	Michael Grant & Leisa Luella Mackley	
Cust	1770	Cust Road	Property Frontage	Desmond Hide (@ # 1764)	Map attached
Cust	1880	Cust Road	Property Frontage	Mark & Christine Yorke	as per Desm
Cust	1888	Cust Road	Property Frontage	Elizabeth & Andrew Riley (Check new owners Philip & Jocelyn Nesbit)	Map attached
Cust	1958	Oxford Road	Stockwater race along road	Bridget Paula Parsonson & Anthony Richard Cottrell	
Eyrewell	89	Worlingham Road	Stockwater race through property	Wendy Ann & Linzi Kay Adams	Wendy phoned back to confirm 22/06/2020
Eyrewell	2585	South Eyre Road	Stockwater race through property	Gregory Raymond Keech	
Glentui	570	Birch Hill Road	Property Frontage	Terry Clemens	Dorper Lodge
Loburn	64	Loburn Whiterock Road	Property Frontage	Marion Brown (check spelling Marian?)	Edge Marker Post (EMP) - mow around it themselves
Mandeville	145	Mandeville Road	Mandeville Road Frontage - from Moffatts Road approx. 860m north	Annabelle Roulston - Eyredale Orchard (check new owners Mark & Amanda Saville)	Application letter attached
Mandeville Nth	1	Joy Place	Property Frontage, particularly on Wards Road / Makybe Road corner	Ann & Kevin O'Grady	Confirmed and added 08/09/21
Ohoka	361	Mill Road	Property Frontages on Mill Road and Jacksons Road	Brent, Brad, Lynda Thorpe	Spray it themselves
Ohoka	419	Mill Road	Property Frontage	Jilly Marshall	Footpath gets overgrown with grass
Oxford	286	Ashley Gorge Road	Property Frontage	Jeanette Wells	Glenmere Farm
Oxford	70	Bay Road	Property Frontage	Joanna Robertson (Richard Mahoney)	Boundary hedge
Oxford	613	Bay Road	Property Frontage	Christopher & Linda Pocock	Maintains the verge themselves
Rangiora	16	Golf Links Road	Property Frontage	Walter Goodwin (check owners Anthony & Sarah How)	Map attached
Rangiora	386	Oxford Road	Mt. Thomas Road intersection to end of property boundary	Neil & Marina Locke	Road signs, EMP's, intersection K&C and culvert at Mount Thomas Road
Rangiora	465	Johns Road	Property Frontage	Hugh & Deborah Hobby	Olive Grove
Rangiora	458	Rangiora Woodend Road	Property Frontage	John Brandts-Giesen	Maintains the verge themselves
Sefton	45	Pembertons Road	Property Frontage	Peter & Elizabeth Adcock-White	Maintains the verge themselves
Summerhill	111	German Road	Stockwater race along road	Bradley James Hands & Barbara Christiane Denne	
Swannanoa	1211	Patersons Road / Two Chain Road	Entire intersection and property frontage	Ross & Marie Antoniuk	Husband has multiple allergies, look after the area themselves
The Pines Beach	82	Dunns Avenue	Property Frontage	Gail Midgeley	286 Ashley Go
West Eyreton	59	School Road / Maindonalds Road	West of Intersection down to river	Silas Investment Trustee Ltd	Grows flowers in tunnel houses
Woodend	129	Gladstone Road	Property frontage (at cycleway)	Kathryn Nordmeyer	Establishing new garden along frontage

TRIM # 210916149196

New

Stockwater race

Added 4/04/22

Added 8/11/21

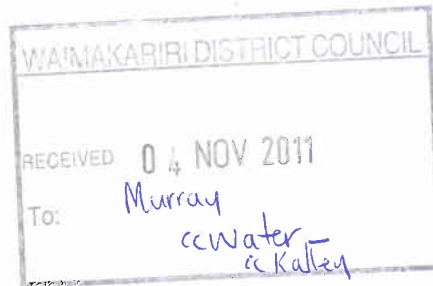
Added 16/09/21

Added 11/10/21

Customer Services  
P. 03 353 9007 or 0800 324 636  
PO Box 345  
Christchurch 8140  
P. 03 365 3828  
F. 03 365 3194  
E. [ecinfo@ecan.govt.nz](mailto:ecinfo@ecan.govt.nz)  
[www.ecan.govt.nz](http://www.ecan.govt.nz)

3 November 2011

Waimakariri District Council  
Attn: Mr Murray Binnie  
Private Bag 1005  
Rangiora 7440



**111104051960**  
**EXT-04-247**



TRIM Record Number

Dear Mr Binnie

**NOTICE OF RESOURCE CONSENT DECISION(S)**

**NUMBER(S): CRC120402**

**NAME: Waimakariri District Council**

The decision of Environment Canterbury is to grant your application(s) on the terms and conditions specified in the attached resource consent document(s). Your resource consent(s) commences from the date of this letter advising you of the decision. The reasons for the decision are:

- 1) Any adverse effects on the environment as a result of the proposed activity will be minor.
- 2) There are no persons considered to be adversely affected by the granting of this proposal.

For some activities a report is prepared, with officer recommendations, to provide information to the decision makers. If you require a copy of the report please contact our Customer Services section.

If you do not agree with the consent authority decision, you may object to the whole or any part. Notice of any objection must be in writing and lodged with Environment Canterbury within 15 working days of receipt of this decision.

Alternatively you may appeal to the Environment Court, PO Box 2069, Christchurch. The notice of appeal must be lodged with the Court within 15 working days of receipt of this decision, with a copy forwarded to Environment Canterbury within the same timeframe. If you appeal this decision, the commencement date will then be the date on which the decision on the appeal is determined. If you are in any doubt about the correct procedures, you should seek legal advice.

You can find online information about your consent document at <http://ecan.govt.nz/publications/General/YourConsentDocumentBooklet09.pdf> and also information regarding the monitoring of your consent at <http://ecan.govt.nz/publications/General/monitoring-your-consent-booklet.pdf>. If you have a resource consent for a **septic tank**, please also visit <http://ecan.govt.nz/publications/General/FlushedWithSuccess.pdf> for information about your on site wastewater treatment system. These booklets contain important information about your consent and answers some commonly asked questions about what will happen next in the life of your resource consent. There is an Annual Compliance Monitoring Charge associated with every consent. For details of this, please refer to page 10 of the "Monitoring Your Consent" booklet.

Environment Canterbury takes every measure to improve both applications and processes, and we appreciate your feedback as an important component in ensuring this occurs. You can complete a consents survey on-line at <http://www.ecan.govt.nz/services/resource-consents/pages/surveys.aspx>.

**Our Ref: CO6C/15618**

**Your Ref:**

**Contact: Customer Services**

Alternatively, you can call our Customer Services Section on 0800 EC INFO who will be happy to complete the survey with you.

Charges, set in accordance with section 36 of the Resource Management Act 1991, shall be paid to the Regional Council for the carrying out of its functions in relation to the administration, monitoring and supervision of resource consents and for the carrying out of its functions under section 35 of the Act.

Thank you for helping us make Canterbury a great place to live.

**For all queries please contact our Customer Services Section by telephoning (03) 353 9007, 0800 ECINFO (0800 324 636), or email [ecinfo@ecan.govt.nz](mailto:ecinfo@ecan.govt.nz) quoting your CRC number above.**

Yours Sincerely



Tania Harris

**SECTION MANAGER CONSENTS**  
on behalf of the Canterbury Regional Council

Enc



**RESOURCE CONSENT CRC120402**  
*Pursuant to Section 104 of the Resource Management Act 1991*  
**The Canterbury Regional Council (known as Environment Canterbury)**

<b>GRANTS TO:</b>	Waimakariri District Council
<b>A DISCHARGE PERMIT:</b>	To discharge liquid agrichemicals adjacent to stockwater races, drainage areas and roadside swales for the purpose of controlling weeds
<b>DATE DECISION:</b>	2 November 2011
<b>EXPIRY DATE:</b>	2 November 2031
<b>LOCATION:</b>	Various location, WAIMAKARIRI DISTRICT

**SUBJECT TO THE FOLLOWING CONDITIONS:**

- 1) The consent holder shall submit a current "Herbicide Spray Management Plan" to the Canterbury Regional Council prior to works commencing. The Herbicide Spray Management Plan shall include;
  - (a) a list of the methods to be used to ensure compliance with the conditions of this consent; and
  - (b) actions that will be taken to address any non-compliance with the conditions.
- 2) The herbicides to be applied shall be restricted to compounds containing diquat, glyphosate and triclopyr. Additives to these herbicides shall be restricted to Organosilicon, Pulse and Boost.
- 3) Only herbicides with current registration with the New Zealand Pesticide Board shall be used.
- 4) Herbicides and additives shall only be discharged along drains, races and roadside swales identified in "Schedule CRC120402" which forms part of this consent.
- 5) The application rate and concentration of herbicides shall not exceed the label recommendation for the product.
- 6) There shall be no aerial spraying of herbicides.
- 7) Spraying shall not occur when weather conditions may cause spray drift onto non-target areas.
- 8) All persons taking water for drinking water purposes from target areas shall be notified in writing at least five working days in advance of spraying and shall be provided with an alternative source of drinking water if necessary.
- 9) The consent holder shall advertise their spray programme in the public notices section of daily and weekly newspapers at least five working days in advance of spraying. The programme shall identify in detail the:
  - (a) Chemicals to be used;
  - (b) Areas of operation;
  - (c) Spray method to be used;
  - (d) Starting date and place;
  - (e) Likely duration of spraying; and
  - (f) Contact name and phone number for enquiries.
- 10) The consent holder shall advise all schools located within 250 metres of the perimeter of land to be sprayed, at least ten working days prior to spraying. Where practicable, spraying within 250 metres of schools shall be carried out during school holidays.

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- 11) No spraying shall be carried out within 250 metres of any public, community or private surface water supply draw off point (via surface water, infiltration gallery, or shallow well).
- 12) All mixing of spray chemicals and cleaning of equipment shall be sufficiently remote from any surface waterbody such that any spill does not discharge to any surface waterbody.
- 13) Herbicide shall be discharged in a manner that complies with the most recent version of the New Zealand Standards Management of Agrichemicals NZS 8409.
- 14) All persons spraying herbicide shall have attended a Growsafe Introductory Course, or equivalent NZQA accredited course for the application of agrichemicals, and shall be supervised by a person registered under the Pesticides Act 1979, including any amendments to this act, to undertake such work.
- 15) Herbicides shall not be discharged onto flood protection plantings or other vegetation planted for aesthetic or economic purposes.
- 16) Where herbicides are to be applied within 50 metres of flood protection plantings or other plantings, the person or authority responsible for the plantings shall be advised of the intention to spray at least five working days prior to application of herbicide.
- 17) When spraying areas of watercress, the consent holder shall erect signs warning the public against the gathering, for consumption, watercress for a period of at least seven days following spraying. The signs shall be erected in places of prominence (in and around all affected areas) to ensure that they are likely to attract the attention of all persons gathering watercress. The signs shall be able to be read from a distance of at least five metres, shall state the date of spraying and shall be maintained on site for a period of at least seven days.
- 18) Herbicide spraying may only take place between the months of September and April inclusive.
- 19) For waterways where flow is less than 1.5 litres per second, no more than one third of the channel width shall be sprayed at one time. Subsequent spraying of the same area shall only take place after a period of 10 days from the first spraying event.
- 20) Within 24 to 48 hours, and between two to four days after using a herbicide containing diquat, dissolved oxygen concentrations shall be measured using a device that has been calibrated against samples undertaken in an NZS/ISO/IEC 17025 accredited laboratory. Measurements shall be made from channels containing flowing water 10 metres upstream and immediately downstream of the spray zone. The results of these measurements, the name of the person taking the measurements, and the date and time at which the measurements were taken shall be provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Officer within ten working days of sampling taking place.
- 21) The exercise of this consent shall not reduce the concentration of dissolved oxygen immediately downstream of the spray zone to less than 80 percent of saturation concentration.
- 22) Herbicides containing Triclopyr shall not be sprayed within one metre of any waterway.
- 23) At least two representative water samples per year shall be taken immediately following the spraying of a herbicide containing triclopyr. Samples shall be taken from channels containing flowing water 100 metres upstream and 100 metres downstream of the spray zone. The samples shall be analysed for triclopyr by a laboratory accredited to NZS/ISO/IEC 17025 for its analysis. The results of these measurements, the name of the person taking the measurements, and the date and time at which the measurements were taken shall be provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Officer within ten working days of sampling taking place.

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- 24) The concentration of triclopyr 100 metres downstream of the spray zone shall not exceed 0.01 grams per cubic metre.
- 25) The consent holder shall provide a report to the Canterbury Regional Council by the 1st July of each year. This report shall identify in detail the weed spraying that has taken place in the previous 12 months including:
- (a) chemicals used;
  - (b) the areas of operation;
  - (c) spray method used;
  - (d) results from monitoring that has taken place; and
  - (e) the timing of the operation.
- 26) The consent holder shall submit a copy of the proposed annual spray programme to Crown Public Health Ltd, Te Ngai Tuahuriri Resource Management Committee and North Canterbury Fish and Game Council at least one calendar month before any spraying commences in any year. The programme shall identify in detail:
- (a) the chemicals to be used;
  - (b) the areas of operation;
  - (c) spray method to be used;
  - (d) starting date and place; and
  - (e) the likely duration of spraying.
- Where there are variations to the proposed spray programme, Crown Public Health Ltd, Te Ngai Tuahuriri Resource Management Committee and North Canterbury Fish and Game Council shall be notified of the variations at least five working days prior to the commencement of spraying.
- 27) A copy of this resource consent and the "Herbicide Spray Management Plan" attached this consent, shall be given to all persons undertaking activities authorised by this consent prior to commencing works.
- 28) The Canterbury Regional Council may once per year, on the last working day of any month of the year, serve notice of its intention to review the conditions of this consent for the purposes of:
- (a) dealing with any adverse effect on the environment which may arise from the exercise of the consent and which is appropriate to deal with at a later stage;
  - (b) requiring the adoption of the best practicable option to remove or reduce any adverse effect on the environment; or
  - (c) complying with the requirements of a relevant rule in an operative regional plan.

**Issued at Christchurch on 3 November 2011**

Canterbury Regional Council

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**SCHEDULE CRC120402****WAIMAKARIRI DISTRICT COUNCIL****REPORT****FILE NO:****DATE:** 21 October 2011**REPORT TO:** Canterbury Regional Council**FROM:** Drainage Asset Manager**SUBJECT:** Spraying Drains Resource Consent

The following is the schedule of drains as requested for the spraying consent.

1. All roadside drains in the district which play dual role of road and land drainage.
2. Rangiora Urban Drains - Ref Map Plan 2938 (Sheet 2 of 16)
  - Railway Drain
  - North Drain
  - West Drain
  - Geddis Drain
  - Northbrook Drain (Oxford Road to White Street)
  - Northbrook Stream (White Street to Northbrook Ponds)
  - Northbrook Ponds
  - Green Street Drain (South Belt to the Southbrook)
  - Park Drain
  - New Life Drain
  - Southbrook Stream (Soutbrook Park to Railway Ave)
  - South Southbrook Stream (Flaxton Road to Lineside Rd)
  - Middlebrook Stream (Martyn St to Railway)
  - Todds Road
  - # 7 Drain Flaxton Road (Todds Road to Fernside Road)
  - East Rangiora Stormwater Pond
  - South Rangiora Stormwater Ponds
  - All other unnamed drains shown on Plan 2938 (Sheet 2 of 16)
3. Kaiapoi Urban Drains - Ref Map Plan 2938 (Sheet 6 of 16)
  - Fuller Street Drain
  - Dudley Drain
  - Sunday School Drain
  - Hill Drain
  - Motorway Drain
  - Parnhams Drain
  - Cosgrove Drain
  - Feldwick Drain
  - Courtenay Stormwater Basin
  - Kaikanui Stormwater Pond
  - Moorecroft Stormwater Pond
  - Sovereign Palms Stormwater Ponds
  - Kaikanui Stream (Motorway to Courtenay Stream)
  - All other unnamed drains shown on Plan 2938 (Sheet 6 of 16)

4. Oxford Urban Drains - Ref Map Plan 2938 (Sheet 7 of 16)
  - Queen Street Drain
  - Victoria Street Drain
  - Church Street Drain
  - Findlays Drain
  - Pearson Drain
  - Flannigan Drain
  - High Street Drain
  - All other unnamed drains shown on Plan 2938 (Sheet 7 of 16)
  
5. Woodend Urban Drains - Ref Map Plan 2938 (Sheet 3 of 16)
  - McIntosh Drain
  - Eders Road Drain
  - Petries Road Drain
  - Cole Drain
  - Grange View Drain
  - Taranaki # 2
  - SH 1 Drain
  - Pankhurst Stormwater Pond
  - All other unnamed drains shown on Plan 2938 (Sheet 3 of 16)
  
6. Waikuku Beach – Ref Map Plan 2938 (Sheet 5 of 16)
  - Kings East Drain
  - Taranaki Stream
  - Gillmans Drain
  - Taranaki Diversion
  - All other unnamed drains shown on Plan 2938 (Sheet 5 of 16)
  
7. Pines Kairaki Urban - Ref Map Plan 2938 (Sheet 4 of 16)
  - Chichester Street Drain
  - Beach Road Drain
  - Featherston Ave Drain
  - All other unnamed drains shown on Plan 2938 (Sheet 4 of 16)
  
8. Coastal Rural - Ref Map Plan 2938 (Sheet 10 of 16)
  - McIntosh Drain
  - Raven Creek Drain
  - Saltwater Creek (Tutae Patu Lagoon to Lees Road)
  - Saltwater Creek (Tutaepatu Lagoon to Waikuku Beach Road)
  - Jelfs Drain
  - Dixon Drain
  - Taranaki Stream
  - Waiora Stream
  - Harris Drain
  - Gillmans Drain
  - Gressons Drain
  - Waikuku Stream
  - Stokes Drain
  - Little Ashley Drains
  - Morris Drain

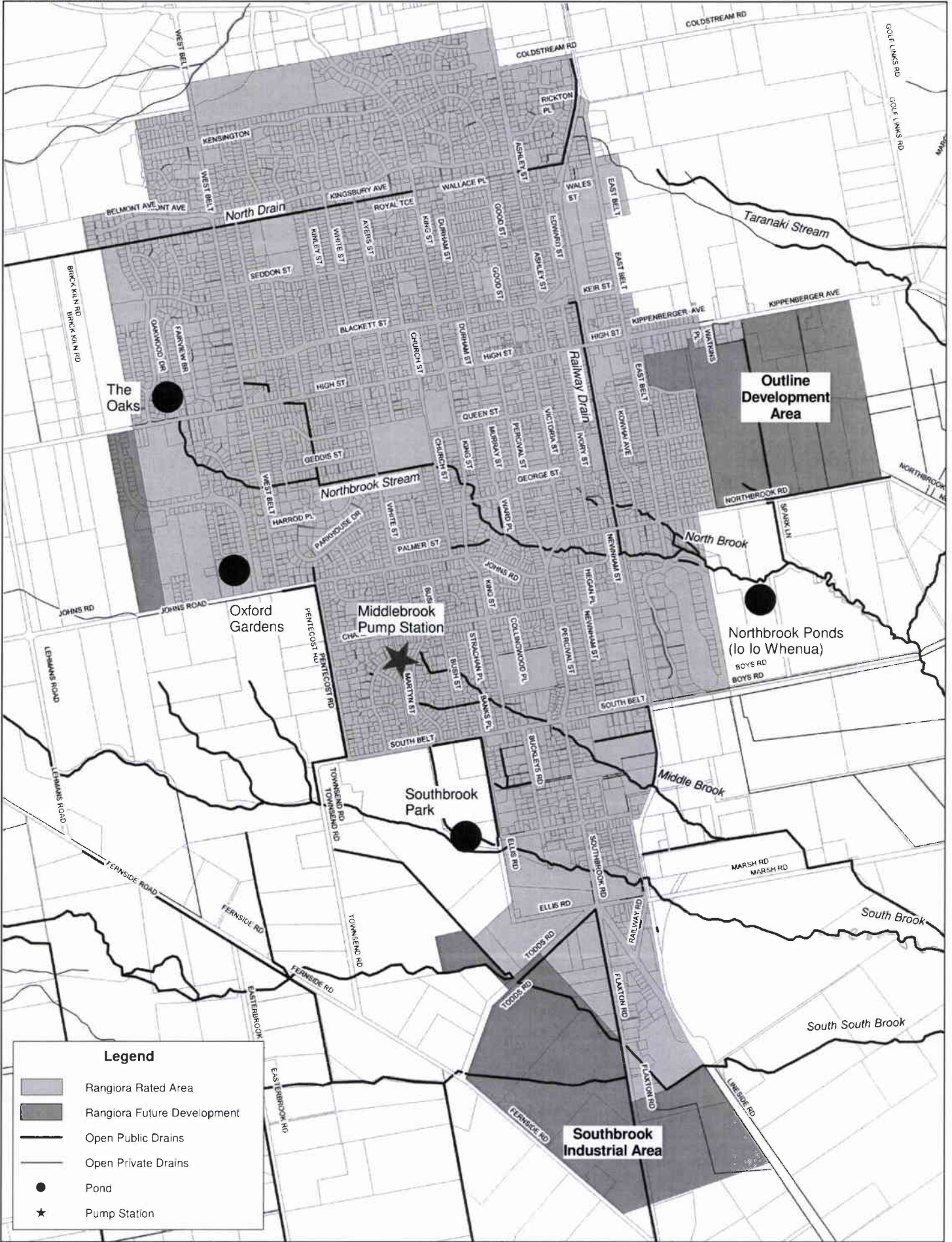
- All other unnamed drains shown on Plan 2938 (Sheet 10 of 16)
9. Central Rural – Ref Map Plan 2938 (Sheet 8 of 16)
- No 2 Drain
  - No 3 Drain
  - No 4 Drain
  - No 5 Drain
  - No 6 Drain
  - No 7 Drain
  - Stevensons Drain
  - Moore Drain
  - Power Road
  - Allens Drain
  - Keiths Drain
  - Hurley Drain
  - Box Drain
  - Maori Drain
  - Wilsons Drain
  - Rossiter Drain
  - Elmers Drain
  - Boys Drain
  - Cassidy Drain
  - Sunlea Gardens Drain
  - Townsend Drain
  - Dockey Creek
  - CRC Diversion
  - High School Drain
  - Northbrook Stream
  - Middlebrook Stream
  - Southbrook Stream
  - South Southbrook Stream
  - Cam River
  - All other unnamed drains shown on Plan 2938 (Sheet 8 of 16)
10. Cust Rural – Ref Map Plan 2938 (Sheet 11 of 16)
- McKeagues Drain
  - Robinsons Drain
  - Boundary Drain
  - Cyrils Drain
  - Glews Road
  - All other unnamed drains shown on Plan 2938 (Sheet 11 of 16)
11. Clarkville Rural – Ref Map Plan 2938 (Sheet 9 of 16)
- McFaddens Drain
  - Basils Drain
  - Bull Farm Drain
  - Short Drain
  - Tram East Drain
  - Wrights Road Drain
  - Barnards Drain
  - Rices Drain
  - Kaikanui Stream

- Smiths Drain
  - Taylors Road Drain
  - Greigs Drain
  - Courtenay Stream
  - All other unnamed drains shown on Plan 2938 (Sheet 9 of 16)
12. Oxford Rural – Ref Maps Plan 2938 (Sheets 12 and 13)
- Lewis Stream
  - Mounsey Drain
  - Terrace Drain
  - Holmwood Drain
  - Beaumont Drain
  - Crallans Drain
  - Phillips Drain
  - Bush Drain
  - Pearson Drain
  - Flannigan Drain
  - Findleys Drain
  - Norgate Drain
  - Race Drain
  - Victoria Drain
  - Colemans Drain
  - Bennetts Diversion
  - Victoria Drain
  - Sales 1 Drain
  - Sales 2 Drain
  - Powells Drain
  - Woody Gully Drain
  - Deep Creek Drain
  - Greenacres Drain
  - Wells Drain
  - Ashley Gorge Drain
  - Stubbs Drain
  - Main Drain (Oxford)
  - McJarrows Drain
  - Cust River
  - All other unnamed drains on Plan 2938 (Sheets 12 and 13)
13. Ohoka Rural – Ref Map Plan 2938 (Sheet 14 of 16)
- Inglewood
  - Evans
  - Threlkelds
  - Armstrongs
  - Bennetts
  - Bennetts No 2
  - Kimbers Drain
  - Dodges Drain
  - Rossiters Drain
  - Tram Road Drain (2)
  - Woods Drain
  - Edmonds Drain
  - Raddens Drain
  - Jeffs Drain
  - Englefeild Creek

- Wards Drain
  - Johnsons Creek
  - Millcroft Drain
  - Millbrook Drain
  - Barkers Drain
  - Ohoka Stream – all branches
  - All other unnamed drains shown on Plan 2938 (Sheet 14 of 16)
14. Loburn Lea – Ref Map Plan 2938 (Sheet 15 of 16)
- Retention Pond
  - Fergus Drain
  - Straight Drain
  - Loburn Lea Waterway
  - All other unnamed drains shown on Plan 2938 (Sheet 15 of 16)
15. Water Races (900km Total Length) – Ref Map Plan 1140.



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**WAIMAKARIRI**  
DISTRICT COUNCIL  
technical services

RISE	INVERSION
A	FIRST ROAD

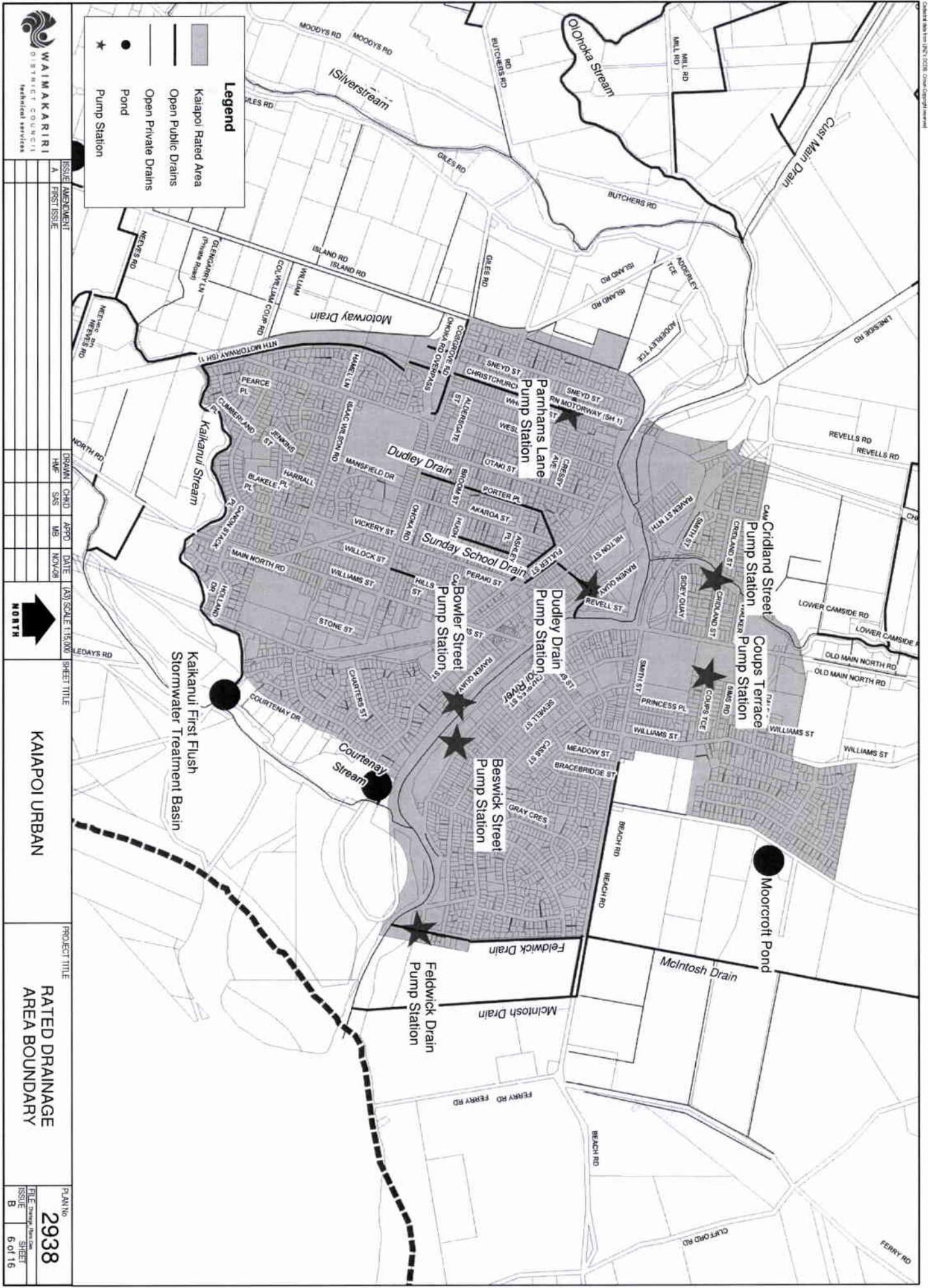
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**NORTH**

**RANGIORA**

PROJECT TITLE  
**RATED DRAINAGE AREA BOUNDARY**

PLAN No. **2938**  
FILE: Drainage\_Rangiora.dwg  
ISSUE B SHEET 2 of 16



**Legend**

- Kaiapoi Rated Area
- Open Public Drains
- Open Private Drains
- Pond
- Pump Station

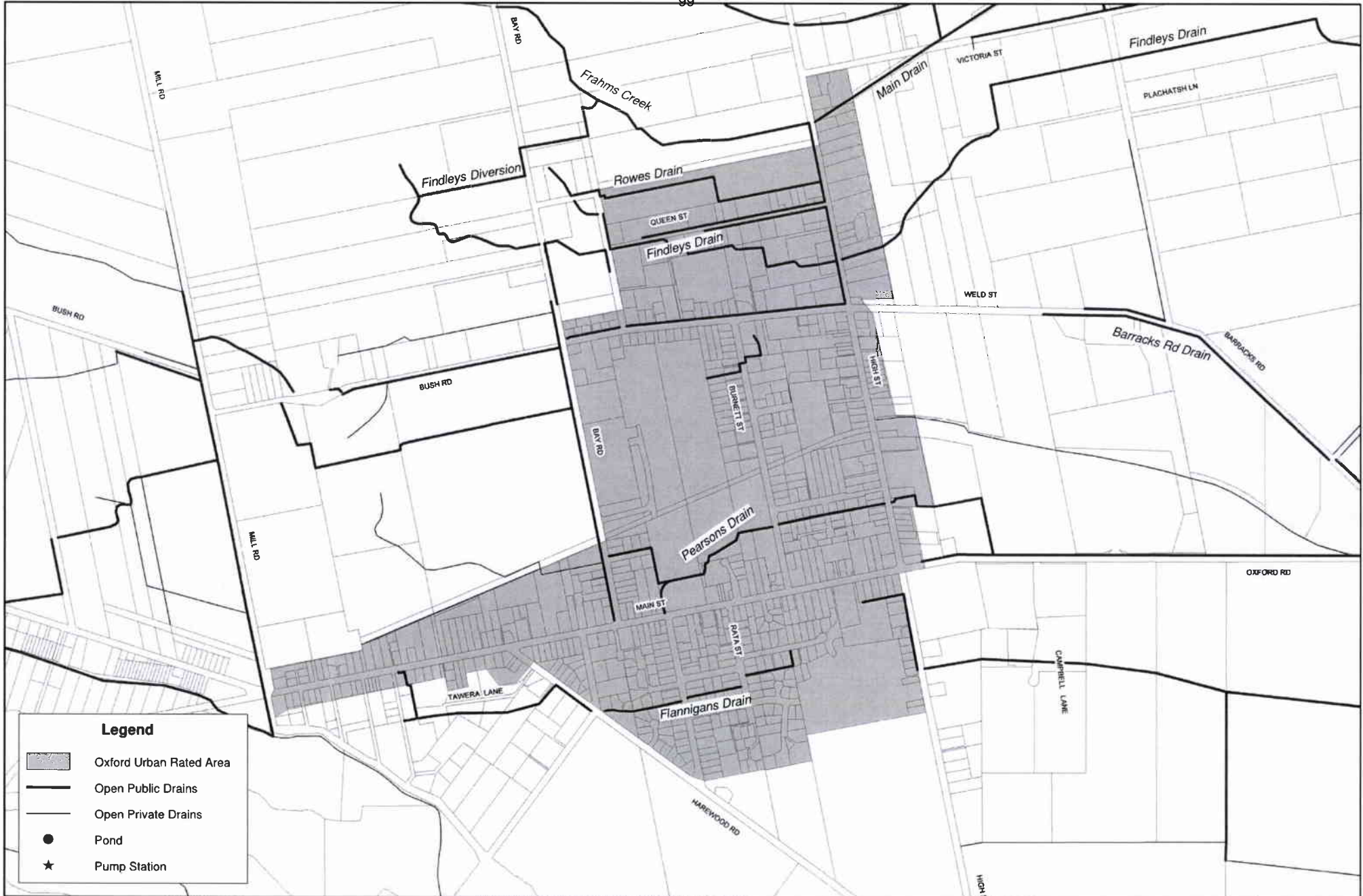


ISSUE AMENDMENT		ISSUE	DATE	BY	FOR
A		FIRST ISSUE			

**KAIAPOI URBAN**

**RATED DRAINAGE AREA BOUNDARY**

PLAN No	2938
FILE CHANGE	None
SHEET	5 of 16



**Legend**







- Oxford Urban Rated Area
- Open Public Drains
- Open Private Drains
- Pond
- Pump Station

<p><b>WAIMAKARIRI</b> DISTRICT COUNCIL technical services</p>	ISSUE	AMENDMENT	DRAWN	CHKD	APPD	DATE	(A3) SCALE 1:10,000	SHEET TITLE	PROJECT TITLE	PLAN No
	A	FIRST ISSUE	HMF	SAS	MB	NOV-08		<b>OXFORD URBAN</b>	<b>RATED DRAINAGE AREA BOUNDARY</b>	<b>2938</b>
										FILE: Drainage Plans.Dwg
										ISSUE B SHEET 7 of 16





**Legend**

-  Woodend Rated Area
-  Woodend Future Development
-  Open Public Drains
-  Open Private Drains
-  Pond
-  Pump Station



ISSUE	AMENDMENT	DRAWN	CHKD	APPD	DATE	(A3) SCALE 1:10,000
A	FIRST ISSUE	HMF	SAS	MB	NOV-08	



SHEET TITLE  
**WOODEND**

PROJECT TITLE  
**RATED DRAINAGE AREA BOUNDARY**

PLAN No	<b>2938</b>
FILE	MAP2938\2938.dwg
ISSUE	B
SHEET	3 of 16

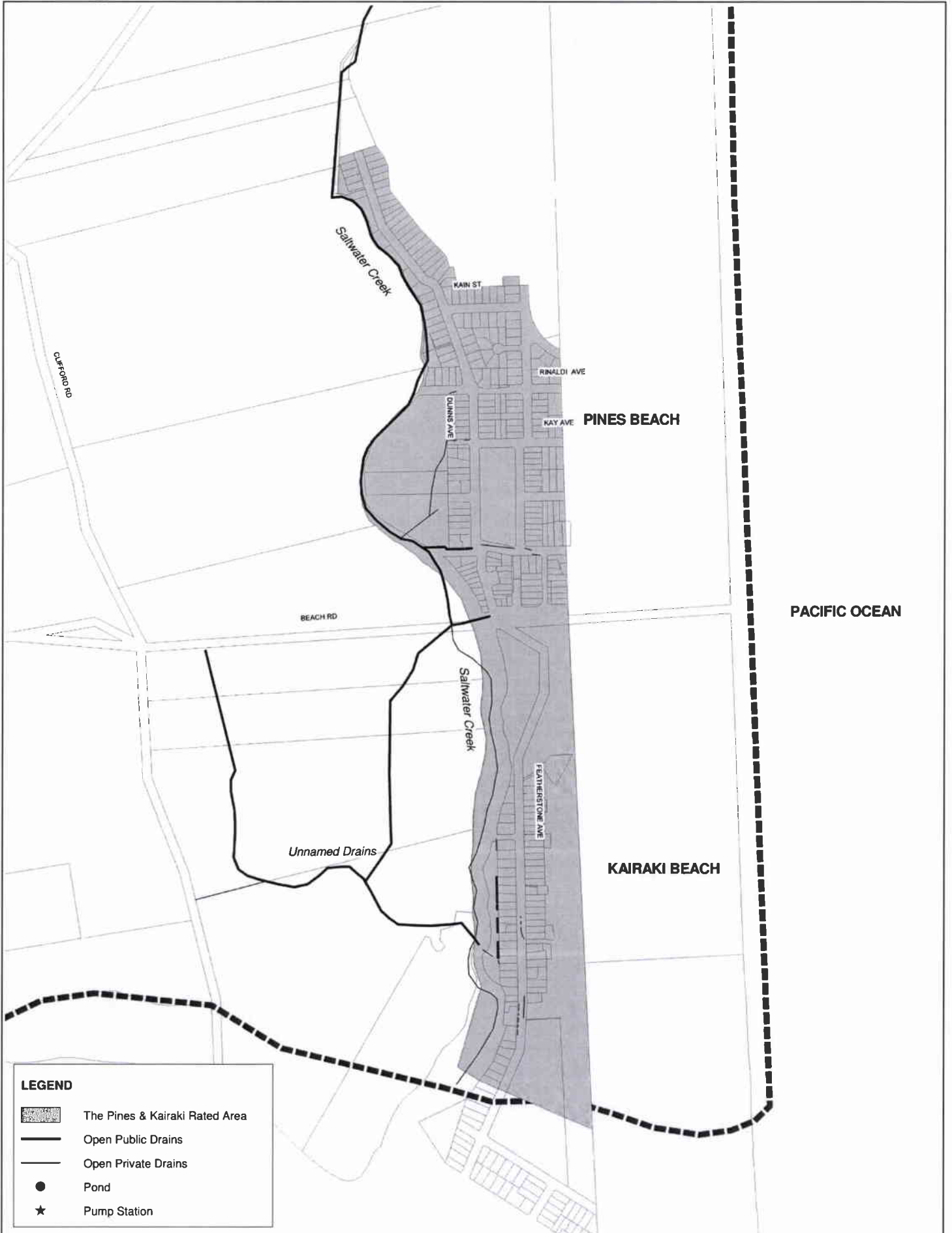


**Legend**

- Waikuku Beach Rated Area
- Open Public Drains
- Open Private Drains
- Pond
- Pump Station

<b>WAIMAKARIRI</b> DISTRICT COUNCIL <small>technical services</small>	ISSUE AMENDMENT	DRAWN	CHKD	APPD	DATE	(A3) SCALE 1:5,000   NORTH	SHEET TITLE  <b>WAIKUKU BEACH</b>	PROJECT TITLE  <b>RATED DRAINAGE AREA BOUNDARY</b>	PLAN No
	A FIRST ISSUE	HMF	SAS	MB	NOV-08				2938
									FILE: Change Plans Cms ISSUE B SHEET 5 of 16

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**LEGEND**


-  The Pines & Kairaki Rated Area
-  Open Public Drains
-  Open Private Drains
-  Pond
-  Pump Station



**WAIMAKARIRI**  
DISTRICT COUNCIL  
technical services

NO.	AMENDMENT
1	FIRST ISSUE

(A3) SCALE 1:7,500



**NORTH**

SHEET TITLE

**THE PINES BEACH & KAIRAKI BEACH**

PROJECT TITLE

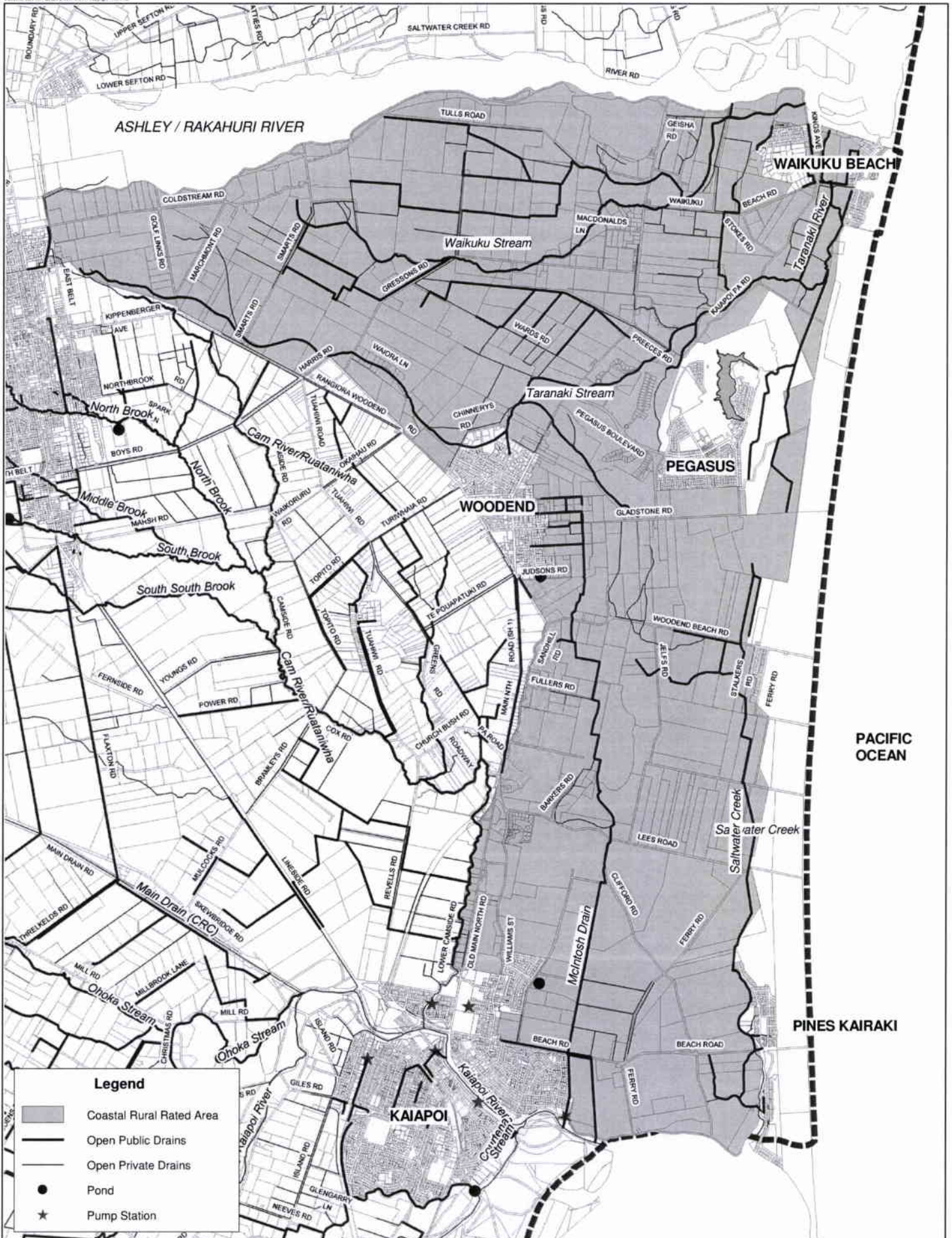
**RATED DRAINAGE AREA BOUNDARY**

PLAN No.

**2938**

ISSUE	SHEET
B	4 of 16

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**Legend**

- Coastal Rural Rated Area
- Open Public Drains
- Open Private Drains
- Pond
- Pump Station

FILE #	AMENDMENT	PROJECT NUMBER

(A3) SCALE 1:40,000

SHEET TITLE

**NORTH**

COASTAL RURAL

PROJECT TITLE

**RATED DRAINAGE AREA BOUNDARY**

PLAN No.	<b>2938</b>
FILE	Drainage Plans.Dwg
ISSUE	B
SHEET	10 of 16



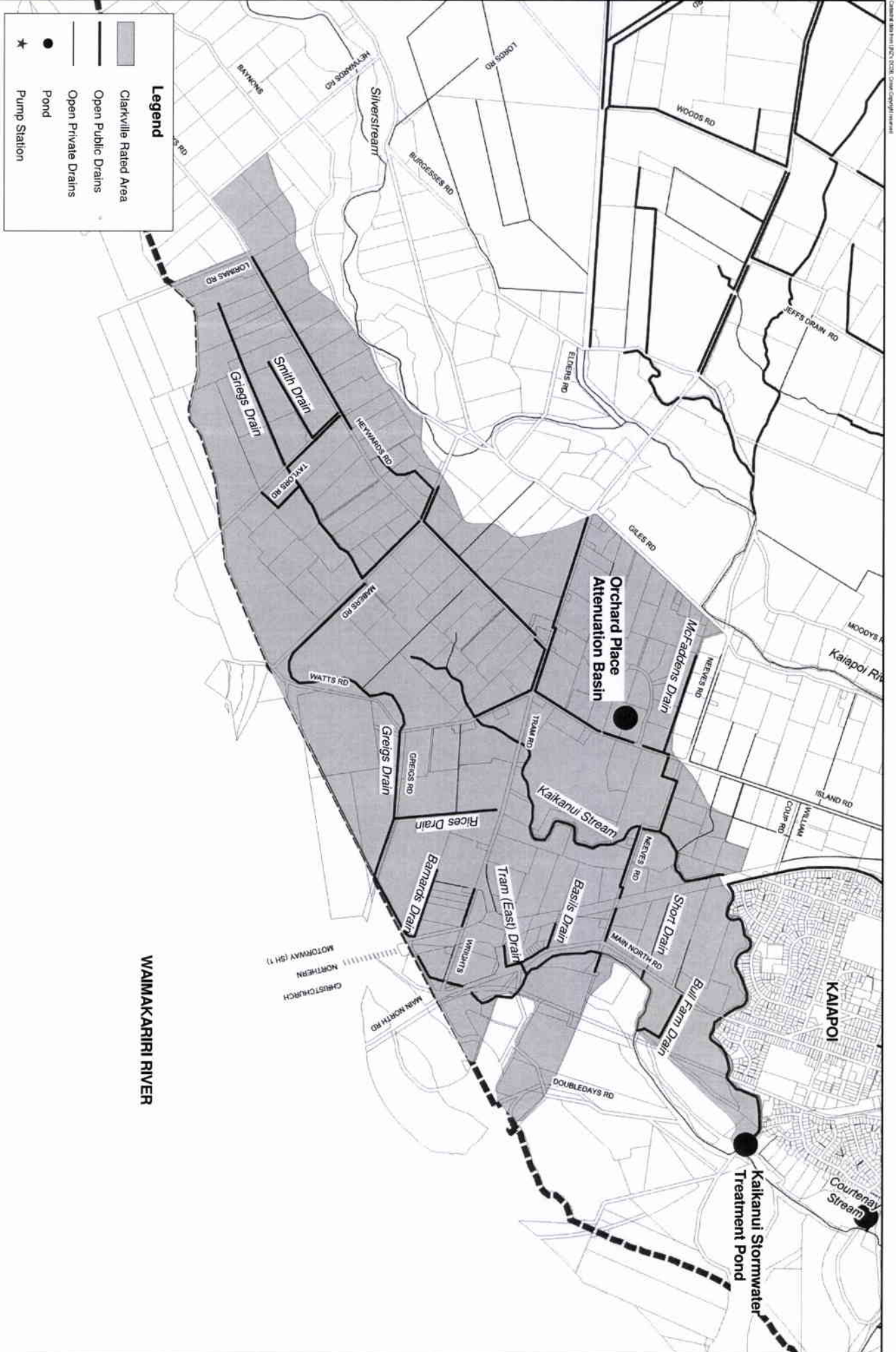


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**Legend**

- Cust Rated Area
- Open Public Drains
- Open Private Drains
- Pond
- Pump Station



WAIMAKARIRI  
DISTRICT COUNCIL  
Technical Services

ISSUE/AMENDMENT	NO.	DATE	BY	CHKD.	APPD.
A	FIRST ISSUE				

CLARKVILLE RURAL

RATED DRAINAGE  
AREA BOUNDARY

PLAN No  
**2938**  
SHEET  
9 of 16



**Legend**

- Oxford Rural West Rated Area
- Open Public Drains
- Open Private Drains
- Pond
- Pump Station

 <b>WAIMAKARIRI</b> DISTRICT COUNCIL <small>technical services</small>	ISSUE	AMENDMENT	DRAWN	CHKD	APPD	DATE	(A3) SCALE 1:15,000	SHEET TITLE	PROJECT TITLE	PLAN No
	A	FIRST ISSUE	HMF	SAS	MB	NOV-08	 <b>NORTH</b>	<b>OXFORD RURAL (WEST)</b>	<b>RATED DRAINAGE AREA BOUNDARY</b>	<b>2938</b>
										FILE Change Plans Draw ISSUE B SHEET 12 of 16



**Legend**

- Oxford Rural East Rated Area
- Open Public Drains
- Open Private Drains
- Pond
- Pump Station

<b>WAIMAKARIRI</b> DISTRICT COUNCIL <small>technical services</small>	ISSUE	AMENDMENT	DRAWN	CHKD	APPD	DATE	(A3) SCALE 1:50,000	SHEET TITLE	PROJECT TITLE	PLAN No
	A	FIRST ISSUE	HMF	SAS	MB	NOV-08		 NORTH	<b>OXFORD RURAL (EAST)</b>	<b>RATED DRAINAGE AREA BOUNDARY</b>
										FILE: Change Plans Case ISSUE: B      SHEET: 13 of 16





**Legend**

- Loburn Lea Rated Area
- Open Public Drains
- Open Private Drains
- Pond
- Pump Station

<p><b>WAIMAKARIRI</b> DISTRICT COUNCIL technical services</p>	ISSUE	AMENDMENT	DRAWN	CHKD	APPD	DATE	(A3) SCALE 1:5,000	SHEET TITLE	PROJECT TITLE	PLAN No <b>2938</b>
	A	FIRST ISSUE	HMF	SAS	MB	NOV-08				

## **CRC120402 HERBICIDE SPRAY MANAGEMENT PLAN**

### **1.0 ENVIRONMENTAL MANAGEMENT PLAN (EMP)**

All spraying work shall be carried out in accordance with Resource Consent conditions. In addition, the following actions shall be taken to mitigate the risks of any adverse environmental and health effects:

- 1.1 Herbicides are to be prepared and applied according to the manufacturer's instructions supplied or on the sides of formulation containers.
- 1.2 The preparation of herbicide solutions shall be carried out in such a manner to minimise the risk of back flow as per the Water Supplies Regulations 1961. At a minimum an air gap must be maintained at all times between the end of the hose and the herbicide solution in the tank.
- 1.3 Application shall be such that in the event of sudden, unexpected rainfall subsequent to spraying, there will be no risk to the environment from runoff. The operator must confirm latest weather predictions prior to commencement of spraying.
- 1.4 To avoid spray drift, herbicides shall not be applied to water races, drains and dry edges in conditions where the windspeed exceeds 5 m/s (10 knots).
- 1.5 In the event of spray drift occurring beyond the area identified to be sprayed in the public notices, the operator shall immediately notify all potentially affected parties. These at minimum shall include the water race supervisor (0800 855 559), the WDC (03 313 6136), affected landowners, the operators of public or private drinking water supplies in the vicinity of the spray drift, the Canterbury Regional Council (03 365 3828), if waterways may be affected Fish & Game New Zealand (03 366 9191), the local runanga within whose takiwa the incident occurred when areas for mahinga kai are in the area.
- 1.6 Herbicide application to water races and drains shall not occur when water is visually determined to contain too much sediment and/or mud.
- 1.7 Herbicides shall be sprayed as directly as possible (within 10 cm) onto the foliage of the target species so as to avoid downstream water contamination.
- 1.8 In the event of an accident resulting during the transportation or application of the herbicides, the following actions shall be taken:
  - (i) As soon as the operators become aware of an accident, they must immediately inform the WDC's Supervisor or the Contractor in Charge.
  - (ii) The WDC's Supervisor or Contractor in Charge must immediately assess the situation and take any urgent action that is necessary to prevent risk to

humans, losses of livestock/waterway fauna, damage to the environment or damage to property. In the case of humans, basic first aid must be applied.

- (iii) If required, the appropriate official emergency services must be alerted and/or summoned immediately.
- (iv) If stock are at risk, the owner should be contacted directly to take appropriate measures. If the WDC's Supervisor or Contractor in Charge cannot make immediate contact, staff must act promptly to prevent stock losses by moving them away from affected areas.
- (v) Do everything to contain spillage and prevent any herbicide from entering waterways, ponds, lakes, drainage systems or the sea. Spray vehicles shall be equipped with spillage containment materials including at least sand/sawdust, water and detergent.
- (vi) Any recovered material shall be disposed of at an approved waste disposal site.

As soon as an accident has been assessed by the WDC's Supervisor or the Contractor in Charge, and initial actions (defined above) have been taken, s/he must inform the WDC, High Street, Rangiora.

The WDC will take the Supervisor or Contractor in Charge's report and decide what other action or additional measures must be taken.

The Waimakariri District Council will also be responsible for notifying the following parties of any accident or emergency:

Canterbury Regional Council, telephone (03) 365 3828

S/he will also notify the Canterbury Community and Public Health, Medical Officer of Health, telephone (03) 364 1777, fax (03) 379 6125, regarding matters of poisoning of livestock, domestic animals, fish or the possible contamination of potable water. In the event of a spillage to water Fish & Game New Zealand (03 366 9191) shall also be notified.

- 1.9 Herbicide concentrates shall be kept in a separate container in a sealed compartment securely fastened to the operations vehicle.
- 1.10 Chemicals shall be stored in secure dangerous goods stores.
- 1.11 Surplus or expired chemicals and their containers shall be disposed of in a manner that prevents adverse effects on the environment. B J Dakins & Company Ltd are able to treat and dispose of diluted (rinse water) residues.



## **2.0 OPERATIONAL MANAGEMENT PLAN (OMP)**

The management of safety on site at all field operations is to be the responsibility of the WDC's water race supervisor or Contractor in Charge to carry out the work. Work shall be carried out in accordance with the Agrichemical users Code of Practice.

The following actions shall be taken to reduce or eliminate the potential for adverse effects against personnel, and the general public.

- 2.1 All applicators shall wear personal protective equipment. Respirator filters shall be changed regularly and suits and gloves thoroughly washed after each day of operation in a facility (e.g. shower or large washing basin) where washings can be diluted and flushed away.
- 2.2 Before application begins, the following tasks shall be carried out:
  - equipment calibration and inventory check;
  - confirm latest weather predictions especially with regard to spray drift potential and rainfall.
- 2.3 Application records shall be maintained daily. Information shall include chemicals sprayed, rate of application, location of spraying, and location of water sources used for preparing herbicide solutions and for cleaning spray equipment.
- 2.4 Scheduled service work shall be carried out at contractor depots/workshops.
- 2.5 If persons are encountered in a spraying location, the spraying personnel shall approach the people, explain their activity and request that they leave the area before continuing spraying.
- 2.6 In the event of an unresolved conflict with other persons arising, the spraying personnel shall:
  - cease spraying in the location of the conflict;
  - inform the WDC and CRC of the conflict;
  - not proceed with spraying in that area until given permission by the WDC.

## **3.0 QUALITY PROCEDURAL PLAN (QPP)**

The following quality procedural plan defines procedural aspects of spray operations:

- |     |               |  |
|-----|---------------|--|
| 3.1 | Location      | All of the Waimakariri District Council territory as defined by the Local Bodies Amalgamation of 1989. |
| 3.2 | Hours of Work | Monday to Saturday inclusive, sunrise to sunset (excludes all Sundays and Public Holidays).            |
| 3.3 | Description   |  |

- of Operations Weed control by spraying throughout Waimakariri District of water races, drains, roadways.
- 3.4 Key Personnel Drainage Manager Kalley Simpson  
 Manager, Utilities and Roding Gerard Cleary  
 Water Race Supervisor Phill Reid  
 Operators
- 3.5 Standard Operating Procedures QS-0383 General Maintenance Spraying
- 3.6 Implementation and Management All new field staff should review the EMP, OMP and QPP prior to commencement of seasonal work.
- 3.7 Correspondence All correspondence shall be documented and filed with the District Manager, Waimakariri District Council, Private Bag 1005, Rangiora 7740.
- 3.8 Measurement and Testing Regular auditing is required to monitor: vegetation condition between spraying rounds; and the quality of work following each spraying round. The Water Race Supervisor shall be responsible for ensuring these audits occur and are documented for the Water Races. The Drainage Manager will be responsible for these audits for Stormwater Drains, and the Manager, Roding will be responsible for audits associated with the Roding Network.
- 3.9 Compilation and Management of Records Work methods, and any variations to these if these occur shall be documented and filed with the Drainage Manager.
- 3.10 Non-Complying Work Non-complying work shall be identified via audits and through: complaints logged on the WDC Service Desk. Remedial work shall be carried out as soon as possible after non-complying work has been verified.
- 3.11 Auditing of Plans The Plans shall be reviewed at 12 month intervals. The review shall consider effectiveness of the plan, its implementation and any necessary changes. The Drainage Manager is responsible for ensuring reviews are performed and documenting any changes.
- 3.12 Spray Programme The Drainage Manager shall be responsible for: reviewing the programme as a result of vegetation condition reviews; and ensuring spraying work is completed in accordance with the programme.

### 3.13 Reports

The Drainage Manager shall be responsible for completing the quarterly report to the management team which shall include: summary of work; performance indicators; updates to programme; and financial summaries.

Our Reference: CON201152-02 / 220907154926

13 October 2022

Compliance Monitoring Officer  
Environment Canterbury  
PO Box 345  
CHRISTCHURCH 8140

Dear Sir/Madam,

**WAIMAKARIRI DISTRICT COUNCIL - PROPOSED ANNUAL SPRAY PROGRAMME  
2022/2023**

**Advice notice as required under Conditions 9 and 26 of Resource Consent CRC 120402  
for drains and water races in the Waimakariri District.**

**Public Drains**

Commencing 1 September 2022 through to 30 April 2023 inclusive, spraying will be carried out by Waimakariri District Council contractors for Council Public Drains.

In accordance with the Consent, notices will be inserted in the public notices section of daily and weekly newspapers at least five working days in advance of spraying. This information will also be published on the Council's website.

Drains or areas of drains will be sprayed according to need and not all public drains will necessarily be sprayed.

There have been concerns raised by the community over the use of sprays in spring fed drains therefore this season the Council will minimise spraying aquatic vegetation such as watercress and monkey musk, preferring to use mechanical methods to manage excess weed growth. Spraying of dry drain inverts and adjacent woody weed pest species will continue.

**Water Races**

Commencing 1 September 2022 through to 30 April 2023 inclusive, the spraying of vegetation adjacent to water races will be undertaken. This work will be undertaken by Waimakariri Irrigation Limited and their contractors.

Not all races will necessarily be sprayed. However, Map 1140 (Attached to Stock Water Race Bylaw 2019) indicates the races that may be sprayed.

The active herbicide sprays that may be used in the Drain and Water Race maintenance programme are:

- Glyphosate for grass and other weeds.
- Glyphosate gel for willow, either injected or cut and paste.
- Triclopyr for gorse and broom.

I would be pleased to answer any queries you may have.

Yours sincerely



Kalley Simpson  
3 Waters Manager

Copies to:

- North Canterbury Fish and Game, PO Box 50, Woodend 7641
- Te Ngai Tuahuriri Runanga, 219 Tuahiwi Road, Tuahiwi RD1, Kaiapoi 7696
- Environmental Advisor, Office of Te Runanga o Ngai Tahu, P.O. Box 13046 Christchurch
- Community & Public Health, P.O. Box 1475, Christchurch
- Brent Walton, Chief Executive, Waimakariri Irrigation Limited
- Hugh Martyn, Chairperson, Waimakariri Irrigation Limited, P.O. Box 556, Rangiora
- Tim Stokes, Chairperson, Waimakariri Water Race Advisory Group, Box 83 Cust
- Keith Vallance, Chairperson, Central Rural Drainage Advisory Group
- Andrew Marwick, Chairperson, Clarkville Rural Drainage Advisory Group
- David Eder, Chairperson, Coastal Rural Drainage Advisory Group
- Doug Nicholl, Chairperson, Ohoka Rural Drainage Advisory Group
- Kevin Mehrtens, Chairperson, Oxford Rural Drainage Advisory Group
- Brendon Ryder, General Manager, Corde North Canterbury
- Dan Gordon, Mayor, Waimakariri District Council
- Sandra Stewart, Chairperson, Land and Water Committee, Waimakariri District Council
- Robbie Brine, Chairperson, Utilities and Roding Committee, Waimakariri District Council
- Jeff Millward, Acting Chief Executive, Waimakariri District Council
- Gerard Cleary, General Manager Utilities and Roding, Waimakariri District Council
- Joanne McBride, Roding and Transport Manager, Waimakariri District Council



**CRC120402**  
**HERBICIDE SPRAY MANAGEMENT PLAN**

**1.0 ENVIRONMENTAL MANAGEMENT PLAN (EMP)**

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*MBB*

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| 3.2 | Hours of Work             | Monday to Saturday inclusive, sunrise to sunset (excludes all Sundays and Public Holidays).            |
| 3.3 | Description of Operations | Weed control by spraying throughout Waimakariri District of water races, drains, roadways.             |
| 3.4 | Key Personnel             | Drainage Manager                      Kalley Simpson   |



Manager , Utilities and Roding Gerard Cleary  
 Water Race Supervisor Phill Reid  
 Operators

- 3.5 Standard Operating Procedures QS-0383 General Maintenance Spraying
- 3.6 Implementation and Management All new field staff should review the EMP, OMP and QPP prior to commencement of seasonal work.
- 3.7 Correspondence All correspondence shall be documented and filed with the Drainage Manager, Waimakariri District Council, Private Bag 1005, Rangiora 7740.
- 3.8 Measurement and Testing Regular auditing is required to monitor: vegetation condition between spraying rounds; and the quality of work following each spraying round. The Water Race Supervisor shall be responsible for ensuring these audits occur and are documented for the Water Races. The Drainage Manager will be responsible for these audits for Stormwater Drains, and the Manager, Roding will be responsible for audits associated with the Roding Network.
- 3.9 Compilation and Management of Records Work methods, and any variations to these if these occur shall be documented and filed with the Drainage Manager.
- 3.10 Non-Complying Work Non-complying work shall be identified via audits and through: complaints logged on the WDC Service Desk. Remedial work shall be carried out as soon as possible after non-complying work has been verified.
- 3.11 Auditing of Plans The Plans shall be reviewed at 12 month intervals. The review shall consider effectiveness of the plan, its implementation and any necessary changes. The Drainage Asset manager is responsible for ensuring reviews are performed and documenting any changes.
- 3.12 Spray Programme The Drainage Manager shall be responsible for: reviewing the programme as a result of vegetation condition reviews; and ensuring spraying work is completed in accordance with the programme.
- 3.13 Reports The Drainage Manager shall be responsible for completing the quarterly report to the management team which shall

include: summary of work; performance indicators; updates to programme; and financial summaries.



# Drainage Maintenance Management Plan and Implications for Waterways

Prepared by Waimakariri District Council  
July 2020



**Prepared for:** Kalley Simpson                      3 Waters Manager

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on behalf of Project Delivery Unit, Waimakariri District Council

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1	Janet Fraser	Initial draft	3 April 2020
2	Sophie Allen, Greg Bennett, Dan Lewis, Chris Bacon	WDC staff review	16 April 2020
3	Kalley Simpson	Approval of draft for feedback	20 April 2020
4	Sophie Allen	Preparation of final draft from feedback. Presented to Council	7 July 2020
5	Sophie Allen	Minor amendments and finalisation	28 July 2020

## 1. Executive Summary

### Purpose of the Drainage Maintenance Management Plan

This Drainage Maintenance Management Plan (the plan) confirms how the Waimakariri District Council (WDC) will work toward achieving sustainable drainage systems management. It also assesses how proposed drainage maintenance management approaches and actions will achieve positive effects for downstream waterways.

There are areas of natural waterway where drainage maintenance is carried out by WDC. For simplicity these areas have been included in the term ‘drain’ in this plan. The plan applies to all waterbodies managed by WDC. However, WDC acknowledges these areas are to be managed as rivers, as defined under the Resource Management Act (1991). This plan responds to recent objectives and policies for freshwater management indicated by Government. It recognises a widespread community aspiration for clean, healthier waterways. The plan also supports the Waimakariri Water Management Zone Committee recommendation that the Council works towards meeting the Land and Water Solutions Programme Zone Implementation Addendum (ZIPA) outcomes, which are actions and strategies required to improve water quality in the zone. The plan is based on the “Waimakariri Drainage Review” which investigates options for future sustainable drainage systems management for the District, completed on 3 April 2020 (TRIM 200403042466).

The plan is a component of the Council’s application for a global drain management resource consent. It is intended to be a “live” document, to be updated and resubmitted from time to time through the term of the consent. The review provisions will enable implementation of new approaches and use of future technologies as these are trialled in coming years. Future plan updates will include results and effects of new methods as these are verified.

The plan includes a number of actions to redevelop Council drainage areas into more sustainable drainage systems. The proposed design options are intended to flush or reduce growth of aquatic weeds so that drainage areas can naturally self-clean and require less ongoing maintenance. Most of the recommended improvements incur a short term (one off) capital expenditure cost. These would be offset by medium and long term operating cost savings. The proposed changes could also improve hydraulic conveyance, cultural values, water quality, amenity, recreation and aquatic habitat diversity.

Many of the recommended actions within this plan have already been trialled by the Council in suitable locations. Enough success has been observed to date to now warrant expanded trials of these new approaches. These actions could continue to be implemented initially in selected drainage areas where the most frequent maintenance is currently undertaken and where sustainable design options could be implemented.

A summary table and suggested timeframe for the key proposed actions is included on the following page. Initially, the proposed actions could be trialled over the next few years to determine which approaches are practicable, best achieve a sustainable management approach and other desired outcomes, including maximising hydraulic capacity. Successful methods can then be implemented over the longer term (up to 35 years). An implementation approach is recommended in the proposed “*decision framework for drainage maintenance management*” flow chart.

The proposed decision framework encourages the Council to assess each current expenditure decision against its potential longer term benefits and costs. This involves comparing the following options: a) rehabilitation; b) reducing scheduled maintenance and accepting an option of less intervention (low impact management); or c) continuing the current maintenance management schedule. The “*decision framework for drainage maintenance management*” flow chart shows how each of these options could be applied in

practice. This assessment will determine which approach is most likely to reduce longer term costs and/or generate the best mix of additional future benefits. Actions proposed are intended to achieve natural flushing where possible. This approach intends, over time, for the drainage expenditure to be more likely to result in sustained conveyance improvements and environmental benefits.

The plan notes the role of the District Drainage Scheme Advisory Groups in advising Council about the most suitable actions for each of their schemes. It is intended the Advisory Groups will recommend the most appropriate action/s for each drain to the Council. This will take account of the different characteristics of each part of the network, including existing and desired future hydraulic capacity, level of fall, waterway characteristics and ground conditions.

### **Sustainable Drainage Systems via Intervention**

The plan reviews new and recent industry guidance on drain design and management options. It confirms, in response to availability of this new guidance material, that some changes are warranted to current practice.

Taking account of this guidance, it recommends that the Council gradually implements a proactive redesign programme for its wet drains (drains with a baseflow) which currently receive frequent scheduled maintenance. The recommendation is to redevelop these drains into sustainable drainage systems.

Actions for each drain include any combination of: a) adding increased shading using native plants; b) forming an increased velocity low flow channel by planting reeds, rushes or native grasses on the water margins at the toe of the banks; or c) bank stabilisation, including re-battering or redesign of existing poor channel form where required. These actions are primarily to improve drain conveyance, by increasing velocity and reducing weed density to reduce the need for ongoing aquatic weed removal. There are also complementary actions proposed to increase the diversity of in-stream habitat such as creating pools and riffles, and less frequent ecological disturbance. These actions could combine in future to create a more self-managing and self-sustaining network of wet drains. Maximising drain hydraulic capacity is a key component of every proposed action and will be included in design of all projects selected for implementation.

Implementing these recommendations recognises drains are a component of larger freshwater ecosystems throughout the district. The management approaches adopted may have significant effects including on downstream waterways. The proposed actions can generate potential benefits to the Council as a network operator, as well as communities and wider ecosystems.

### **Sustainable Drainage Systems via Reducing Maintenance (Less Intervention)**

The proposed decision framework also includes an opportunity to trial reducing regular scheduled drain maintenance on drains that are not prone to recurrent nuisance flooding, and then monitoring hydraulic capacity and environmental responses. This is recommended for selected frequently maintained drains, if nuisance historic flooding has not occurred and if climate change is not considered to pose a significant future risk. This is an alternative approach to achieving sustainable drainage systems management, as waterways tend to naturalise and become self-sustaining over time when intervention ceases.

The Council could allow natural seasonal temperature and light variation instead of scheduled maintenance to control weed growth. This trial would need to be supported by a communications programme with affected Drainage Advisory Groups and adjoining properties about their expectations for drainage maintenance management. It would need to examine with them if there is a perceived need for regular weed removal and the options available to create a more sustainable drainage system.

**Best Practice**

This plan also confirms best practice methods for undertaking drainage maintenance management and minor works in Canterbury waterways. This is prepared with reference to the Environment Canterbury *Defences Against Water Code of Practice 2019*. Also referenced are other local and regional industry guidance documents.

## 2. Summary of Proposed Actions

The following table summarises the key recommended actions:

Table 1: Summary of Recommendations

Recommendation	Rationale	Timeframe
<p><b>Identify preferred management option:</b></p> <p>The decision framework on the following page includes a process for determining when a drain could be reformed or rehabilitated to become more sustainable. Alternatively it identifies situations when continuing or reducing the scheduled maintenance may be appropriate.</p>	<p>The redevelopment of a drain with rehabilitation or enhancement works, including potential bank re-battering (if needed) and/or riparian planting to improve shade or to create a high velocity low flow channel are key recommendations. The decision framework suggests a basis to redevelop selected drains where this is considered likely to improve hydraulic capacity, reduce medium and long term management costs and meet wider community objectives.</p>	1-3 years
<p><b>Reduce scheduled maintenance trial:</b></p> <p>Consider a trial of less intervention for selected drains, allowing the drain to naturally become more self-managing over time.</p> <p>The literature review (included in the Drainage Review (see TRIM 200403042466)) shows that aquatic weed cutting of dense macrophyte growths in summer/ autumn does not have a material effect on drain hydraulic capacity in winter, for drains with predominant macrophyte species that usually die back over winter.</p> <p>It is recommended that the Council trial non-management of selected drains (e.g. less intervention), allowing natural seasonal temperature and light variation to control aquatic plant growth. The Council should monitor and evaluate the effects of this approach as a part of the trial.</p>	<p>This trial may be justified in drains that predominantly contain species that are known to die back in winter (such as watercress and monkey musk).</p> <p>Aquatic weeds may be hydraulically rough at low flow, thus significantly reducing drain flow, but at high flow plants may bend over and are hydraulically smooth. Plants that bend over in the channel with increased flow velocities cause less reduction of hydraulic capacity than more rigid plants. This should be taken into account in making management decisions on frequency of mechanical weed removal in summer.</p>	1-5 years
<p><b>Biosecurity (weed) management</b></p> <p>Target and control problem weeds</p>	<p>Survey and respond to water weeds (sweet reed grass, lagarosiphon etc.) and riparian weeds (gorse and broom) and species that are listed in the Regional Pest Management Strategy</p>	Ongoing
<p><b>Create low flow channel to increase drain velocity:</b></p> <p>Naturally form a “V” shape in the base of flat drains by planting reeds, rushes or Carex grasses along the water margin/s at toe of the drain banks</p>	<p>Depending on drain water depth, plant options could include:</p> <p>1) in the shallow or frequently wetted margins: <i>Schoenoplectus tabernaemontani</i> (sedge- grey clubrush – although may grow substantially and dominate small drains);</p>	1-35 years

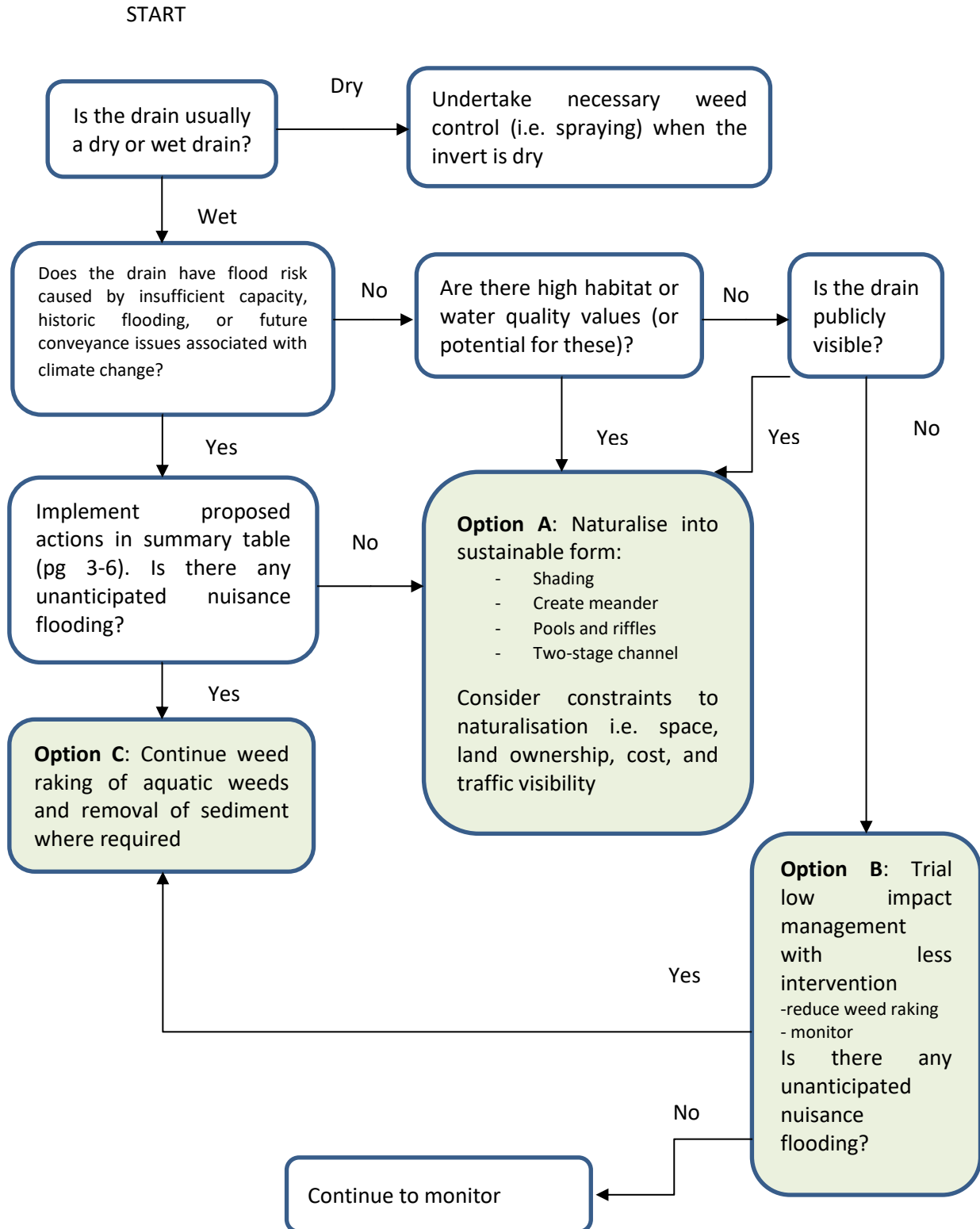


Recommendation	Rationale	Timeframe
<p>where this will not adversely affect hydraulic capacity.</p> <p>Bank battering along the upper sides of drains can compensate for any loss of capacity in the base, if required.</p> <p>A faster moving channel will naturally limit nuisance weed growth and reduce future maintenance requirements.</p>	<p>2) on the periodically wetted margins: <i>Juncus edgariae</i> (rushes – wiwi); <i>Apodasmia similis</i> (Oioi - rushes); or <i>Eleocharis acuta</i> (spike sedge); or</p> <p>3) on the occasionally flooded dry margins: <i>Carex virgata</i> or <i>Carex secta</i>.</p> <p>Addition of linear wetland plants within the drain bed itself will create a low flow and flood channel, creating the recommended “V” shape drain base. The plants will trap sediment along the margins, gradually lifting the riparian edges whilst filtering runoff from adjoining land. Cleanings from any future weed raking (if required) can be deposited behind the plants, further elevating the “V” shape and allowing rapid return of aquatic species to the waterway immediately following raking.</p>	
<p><b>Shading:</b> Add additional shading to the north bank of west – east wet drains with usual baseflow, prioritising drains which currently require the most frequent maintenance. Also consider shading options for drains with more of a north – south alignment. Native grasses should be used for shading in potential inanga spawning areas, rather than non-suitable spawning species.</p>	<p>Will naturally reduce proliferation of undesirable aquatic weeds, reducing future frequency of maintenance. Shading with native plants also stabilises banks, filters sediment in runoff and provides habitat for birds.</p>	1 - 35 years
<p><b>Install sediment traps:</b> Install purpose built sediment traps, or excavate natural sediment traps, in lower reaches of drains which require periodic fine sediment removal.</p>	<p>Reduce future adverse effects on aquatic habitat from sediment removal.</p>	2-3 years
<p><b>Delay seasonal timing of weed raking:</b></p> <p>Trial an option to delay weed raking of aquatic weeds where supported by ground conditions each year until March / April. This could both reduce the extent of regrowth that usually follows the mid-summer aquatic weed control, and could potentially reduce the overall scale of weed raking required. For instance, some aquatic weed may die back with the cooler temperatures, and be less likely to reestablish following late summer / autumn weed control.</p>	<p>Prolific weed growth usually peaks in the mid-summer period of December – January, however trout and salmon spawning does not commence annually until 1 May. This provides a window to undertake the weed raking in late summer or autumn.</p> <p>This option would not be appropriate in coastal inanga spawning drains due to the risk of disturbance of drain riparian vegetation with the weed rake.</p> <p>It would also not be appropriate in drains with silty ground or draining a high water table. These pug in wet weather and there is a risk of the weed rake machine causing bank collapse.</p>	1-5 years
<p><b>Protect critical source areas (CSA's):</b></p> <p>Fence off WDC drainage reserves from stock (working with adjacent farmers). Add wetland plants into rural tributary</p>	<p>Fencing for stock exclusion reduces sediment and faecal inputs. Wetland plants and bunding added to points where rural tributary drains, overland flow paths or low drainage points intercept</p>	5 + years

Recommendation	Rationale	Timeframe
drains, overland flow paths or drainage low points which intercept Council drains. Create bunds that slow the passage of water and nutrients from CSAs.	Council drains can assist to trap and treat contaminants in rural runoff, including filtering nitrogen and sediment in rural runoff.	
<b>Drain Reshaping:</b> Reform shape of existing square, flat base drains by bank reshaping. Where sufficient riparian margin is available, reshape steep drain sides with wide flat bases into two stage channels or bank battering of at least a 1:2 grade. With limited riparian space, create a V shape with narrow base and steeper graded banks (1:1 grade). These options will improve bank stability and enhance riparian vegetation, improving aquatic habitat.	Higher velocity flows in narrowed drain beds provide natural flushing of weed and sediment.  A two stage channel promotes high velocity weed reduction in the base, and trapping and treating of sediment during flood conditions.  Gently sloping banks can be stabilised, reducing erosion risk as native vegetation or grass is established.	1-35 years
<b>Add in - stream habitat into drain bed:</b> Increase diversity of in-stream habitat by allowing natural development or adding new riffles and pools within drains if fish are present. Trial the natural development of meandering sections, by placing rocks or creating/allowing an uneven cross-section to develop.	This will improve availability and range of habitat for fish species. Pools will increase sediment trapping. Riffles or other gravelled sections provide opportunities for trout and salmon spawning. Meandering creates a more natural channel, with hydraulic variation that provides more habitat variation and may flush sediment from some areas.	3 + years
<b>Willow cost / benefit assessment:</b> Assess areas of drain with significant remnant willow populations. An average cost of management per drain could be compared; and above average management costs could be a trigger to consider removal of willows and replacement with native plants.  A key consideration is whether the willow species (crack/grey willow) is present upstream and would re-establish in any cleared reach following willow control work. If not present upstream, removal of willows may assist to clear them from a catchment and prevent further spread.	Drains with significant willow populations could be proactively assessed. If the ongoing costs incurred for maintaining the drain are below those for an average drain, then retention of the willows may be appropriate. If above average drain management costs are incurred, particularly over a number of years, this may be a trigger to consider willow removal and replacement with native plants.  Assessment could also be made of whether the existing habitat provided by willows offsets the ongoing management expenditure incurred, and whether an alternative native planting programme might introduce a wider range of ecosystem services. A further factor is whether the water uptake requirement of willows is reducing baseflow in the affected drain or stream.	5 + years
<b>Gorse and broom risk assessment:</b> Adopt a pro-active gorse/broom removal programme and remove or encourage private landowners to	Removal of gorse from drain margins reduces transfer (cycling) of nitrogen into waterways. Gorse is also a pest species noted in the Regional Pest Management Plan and restricts access for maintenance works. Gorse is a widespread	5 + years

Recommendation	Rationale	Timeframe
<p>remove these species within 3m of drains.</p>	<p>nitrogen fixing plant which produces large quantities of litter debris which deposits in soils around the plants. Nitrogen may then leach from soils into ground and surface water during future rain events. Leaching potential of nitrogen into waterways from gorse debris is indicated to be significantly greater than the leaching potential from other common riparian plants likely to be present in or near the Waimakariri district drains. Broom is also a nitrogen fixing plant and could similarly be removed from close proximity to drains as a precaution to reduce transfer of nitrogen to waterways (refer report by Guna Magesan, Hailong Wang and Peter Clinton "<i>Nitrogen Cycling in gorse-dominated ecosystems in New Zealand</i>", November 2011, published online).</p> <p>In any decision to remove gorse/ broom, the benefits they provide should also be considered. These include provision of habitat for native lizards, or use as nursery plants enabling establishment of an understorey of juvenile native plants.</p>	

### 3. Decision Framework for Drainage Maintenance Management



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## 4. Glossary of Terms

Term	Meaning
Dry drain	Drain without a regular baseflow, invert is usually dry
EPA	Environmental Protection Authority
Inanga	( <i>Galaxias maculatus</i> ) smallest of 5 common whitebait species
Kākahi	Freshwater mussel
Kanakana	Lamprey
Kekewai	Blue Damselfly
Kōura	Freshwater crayfish
Macrophyte	Aquatic plant large enough to be seen by the naked eye
Mahinga kai	Ngāi Tahu interests in traditional food and other natural resources and the places where those resources are obtained
MCI	Macroinvertebrate Community Index - an index used in New Zealand to describe the tolerance or sensitivity of species (taxa) to organic pollution and nutrient enrichment; benthic invertebrate taxa are assigned a tolerance value ranging from 1 (very tolerant) to 10 (very sensitive)
MfE	Ministry for the Environment
SQMCI	Semi-Quantitative Macroinvertebrate Community Index (see MCI)
Tuna	Eel
Wet drain	Drain with a regular baseflow
ZIPA	Zone Implementation Programme Addendum (Waimakariri Land and Water Solutions Programme) – outlines the actions and tactics required to improve water quality in the zone

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## 5. Introduction

This plan reviews drainage management practices in the Waimakariri District. Its purpose is to identify any improvements to current practices. The plan is intended to:

- Maximise benefit of drainage management and minor works expenditure to the ratepayer.
- Work towards achieving a sustainable drainage system.
- Demonstrate the Council's response to recent objectives and policies for Freshwater Management indicated by Government, recognising 'Te Mana o te Wai' and a widespread community aspiration for clean, healthy waterways.
- Support implementation of district wide drainage resource consents.
- Work towards achieving Waimakariri Water Zone Committee outcomes, particularly Recommendations 1.7 and 1.14 of the Zone Implementation Programme Addendum (ZIPA).

### 5.1. Scope

The plan focuses primarily on rural drain management, minor works and roadside drain management activities, and their implications for waterways. It includes scheduled or unscheduled maintenance works and minor works such as bank or structure repairs in rural drains and bank reshaping and naturalisation projects. The plan excludes privately maintained drains. The plan includes all open drains which are currently or in future could be managed by the Council. There are areas of natural waterway where drainage maintenance is carried out by WDC. For simplicity these areas have been included in the term 'drain' in this plan, so the plan applies to all waterbodies managed by WDC.

Urban drains are included when they have programmed maintenance actions within the rural drainage maintenance contract. This is the case with some drains in Rangiora.

The plan identifies opportunities for improved practices and long term cost reductions. This is in terms of implementing improved management options that enable more efficient future drain conveyance. This includes identifying opportunities to improve environmental performance, maximise drain hydraulic capacity and community satisfaction with drainage management.

The review includes consideration of how to reduce management costs in the longer term. This may be through options such as including increased wet drain shading or bank / bed redesign in ways that make the drain more self-managing. New opportunities for drain management are identified and trials of new methods and approaches are recommended.

The roading and rural drainage "Contract for Services" is estimated to go out for tender in early 2020. There is an opportunity to insert recommendations from this management plan into this new contract, due to be signed around October 2020.

The consultation on the associated drainage review identified an option to improve rural drainage retention through installing facilities such as swales, in-drain wetlands, ponds, weirs or similar into Council managed drains. These facilities would capture and attenuate or retain peak sub-surface and surface flows in order to protect downstream communities from flooding. This idea is considered outside of the scope of the Drainage Maintenance Management Plan. However it is detailed in the accompanying District Drainage Review as an option that can be separately scoped by the Waimakariri Water Management Zone Committee in future.

## **5.2. ZIPA and ‘Maintenance and Minor Works in Waterways’ Consent**

### **5.2.1. ZIPA**

This plan works towards achieving Waimakariri Water Zone Management Committee outcomes. These include improving quality and abundance of mahinga kai, fish habitat, fish passage and recreation opportunities, in context of achieving an improved rural economy.

Recommendation 1.7 states:

That Environment Canterbury, Waimakariri District Council, and Ngāi Tūāhuriri review the waterway management and maintenance methods used in the Zone. The review which should be publicly reported, would include:

- a. Preparation of an inventory of the main methods, including chemicals and mechanical methods, used by public and private land and water managers in the Zone;
- b. The findings of recent work by EPA, MfE or other relevant New Zealand organisations reviewing the potential effects of the listed chemicals on waterway ecosystem health and of other methods;
- c. An assessment of the risk to soil biodiversity and waterway ecosystem health in the Zone from use of chemicals or other methods.

Recommendation 1.14 states:

That Environment Canterbury and Waimakariri District Council ensure waterway management and maintenance activities minimise contaminant losses to downstream waterbodies and loss of aquatic life, while maintaining flood carrying capacity.

### **5.2.2. Consent and Management Plan requirement**

The Waimakariri District Council has applied for a drainage “maintenance and minor works in waterways” land use and discharge resource consents from Environment Canterbury. As a condition of these draft resource consents, a drainage maintenance management plan is to be lodged with Environment Canterbury as soon as practicable.

This plan supports implementation of the consents. It will be a “live” document, to be amended from time to time and resubmitted to Environment Canterbury (via consent conditions). Amendments will include improved management practices and learnings from results of initial trials intended to be initially implemented via the consents during the next 3 years.

## **5.3. Exclusions**

The plan does not address private drain management in the district other than when identifying future public education opportunities. It does not include Environment Canterbury drain management, the management of the stockwater race network, or methods for improving urban stormwater quality.

## **5.4. Methods**

The methods used to prepare this management plan were:

#### Literature Review:

- Review of latest industry publications and drainage management guidelines, including Environment Canterbury drainage and waterway management guidelines
- Review Ngāi Tūāhuriri policies and plans, including the Mahaanui Iwi Management Plan and Ngāi Tahu Freshwater Policy Statement.

#### Semi-structured interviews:

- Drainage Team staff
- Drainage contractors
- Drainage team at Selwyn District Council
- River Engineers at Environment Canterbury (Waimakariri Area)
- Mahaanui Kurataiao Ltd and Ngāi Tūāhuriri (will seek feedback on this draft version )
- WDC Roding team
- Drainage Advisory Groups

## 5.5. Context

The Waimakariri drainage system is comprised of a combination of natural or artificial channels, sub-surface drainage systems and associated water control structures, including culverts and flood gates. These are managed for the purpose of draining surplus runoff from farmland, to lower the water table on rural land or to prevent the inflow of tidal waters into low lying drainage channels.

Many of these drains provide an important habitat for aquatic fauna. For instance, wet district drains are usually modified waterways that are known or understood as likely to provide various migration routes, temporary habitat, or spawning habitat for fish. Fish known to be present within the rural drainage network include inanga (whitebait), eels, upland bullies, trout and salmon. Other aquatic species present in the drains are freshwater crayfish and freshwater shrimp.

It is also possible that the wet drains in the east of the district could provide habitat for a much wider variety of fish which are known in the nearby larger streams and rivers in the Waimakariri District. These include common smelt, common bully, giant bully, black flounder and others. The species listed here are all fish found in drains and drainage canals in New Zealand studies (Hudson and Harding *Drainage Management in New Zealand: A review of existing activities and alternative management practices* 2004, p. 10) that are also referenced in various aquatic ecology studies in the Waimakariri District lowland streams.

## 5.6. Key Relationships

The management and minor works activities undertaken by the Council in the drainage network are of a great deal of interest to and have various impacts on the activities of key stakeholders such as Fish and Game. These activities are also of great importance to Ngāi Tūāhuriri.

This section is prepared taking account of key agency or stakeholder documents such as the Mahaanui Iwi Management Plan 2013 and Te Rūnanga O Ngāi Tahu Freshwater Policy. This plan also acknowledges the discussions currently underway between Te Rūnanga O Ngāi Tahu and the Crown over the Ngāi Tahu Rangatiratanga over Freshwater Strategy 2019. Taking account of these discussions, the Council undertakes to continue to involve Ngāi Tūāhuriri representatives in its various discussions over its future drain and associated freshwater management decisions and options, including those outlined within this management plan.

The document review is augmented with feedback from with Ngāi Tūāhuriri (to be carried out on this draft version) and various stakeholder representatives where available.

### 5.6.1. Te Ngāi Tūāhuriri Rūnanga

Te Rūnanga O Ngāi Tahu Freshwater Policy describes the primary management principle for Ngāi Tahu as being the management and enhancement of the mauri or life-giving essence of a resource.

With respect to waterways, it notes that *“mauri can be tangibly represented in terms of elements of the physical health of a river system. While there are also many intangible qualities associated with the spiritual presence of the river, elements of physical health which Ngāi Tahu use to reflect the status of mauri and to identify the enhancements needed include:*

- *Aesthetic qualities (e.g. clarity, natural character and indigenous flora and fauna);*
- *Life-supporting capacity and ecosystem robustness;*
- *Depth and velocity of flow;*
- *Continuity of flow from the mountain source of a river to the sea;*
- *Fitness for cultural usage; and*
- *Productive capacity”.*

In terms of this plan, it is noted that drain management can adversely affect any of these values. However there are actions the Council takes to protect these values, which form the best practice approach outlined within the plan.

A guiding consideration affecting intent for drainage management is stated in the Mahaanui Iwi Management Plan Policy WM 14.1, which states:

*“To require that drains are managed as natural waterways and are subject to the same policies, objectives, rules and methods that protect Ngāi Tahu values associated with freshwater, including:*

- (a) inclusion of drains within catchment management plans and farm management plans;*
- (b) riparian margins are protected and planted;*
- (c) stock access is prohibited;*
- (d) management methods are appropriate to maintaining riparian edges and fish passage; and*
- (e) drain cleaning requires a resource consent”.*

In terms of managing effects of the drainage management activities considered in this report, the IMP (WP14.2) also states:

*“To require and uphold agreements with local authorities to ensure that the timing and techniques of drain management are designed to avoid adverse effects on mahinga kai and water quality, including:*

- (a) Identifying drains that are or can be used for mahinga kai;*
- (b) Returning any fish that are removed from drains during the cleaning process to the waterway;*
- (c) Riparian planting along drains to provide habitat and shade for mahinga kai and bank stability while reducing the frequency and costs of management by reducing aquatic plant growth;*
- (d) Ensuring drain management/cleaning does not breach the confining layers;*
- (e) Use of low impact cleaning methods such as mechanical ‘finger buckets’, as opposed to chemical methods such as spraying, to minimise effects on aquatic life;*
- (f) Notification to tāngata whenua of any chemical spraying of drains used for mahinga kai or connected to waterways used as mahinga kai; and*

*(g) Involvement of tāngata whenua in drain management activities where there is a need to return native fish back to the drain (e.g. tuna (eels), kekewai (blue damselfly) and kanakana (lamprey)).*

Other guiding intent within the IMP, with implications for management of rural drains, is that the IMP recommends reconfiguring some of the river tributaries to re-establish historic wetlands. The IMP explains:

*“Before European settlement began in the 1850s, the lower reaches of the Waimakariri and Rakahuri (Ashley) connected with a maze of waterways and wetlands fed by underground springs of the purest artesian water, which nourished a wealth of mahinga kai rich in birdlife, eels, fish and natural vegetation” (Mahaanui Iwi Management Plan 2013, p.215).*

The IMP acknowledges that historically the Waimakariri and Rakahuri catchments were linked through extensive coastal wetlands, waipuna and waterways.

Te Rūnanga O Ngāi Tahu Freshwater Policy, page 22 also notes that *“Ngāi Tahu’s fishing rights were explicitly protected by the Treaty of Waitangi. Not only was the right to engage in mahinga kai activity confirmed, also included was the right to expect that such activity will continue to be successful as measured by reference to past practice. Unfortunately, adverse impacts on freshwater resources have resulted in adverse effects on the diversity and abundance of mahinga kai resources and harvesting activity”.*

The recommendations and best practice actions outlined in this plan are intended to improve habitat of mahinga kai species. Therefore the drain management activity and actions within the plan are viewed as consistent with the recommendations for drain management in the Mahaanui Iwi Management Plan 2013 and meet aspirations for improved mahinga kai abundance and diversity to match past practices as outlined in Te Rūnanga O Ngāi Tahu Freshwater Policy. Over time, the proposed actions should improve the abundance of future mahinga kai resources.

### **5.6.2. North Canterbury Fish and Game**

The drainage management activity needs to protect indigenous fish and trout and salmon species which have habitat within, or which spawn in or migrate through the district’s rural drains.

The main trout and salmon fishing season in the Waimakariri District is from October through April. The Waimakariri River, Kaiapoi River and Silverstream are a habitat for salmon, with a salmon hatchery on the Silverstream. Some of the drainage scheme’s tributary drains flow into these rivers may provide habitat for young trout.

In December and January there are runs of fresh silver sea-run brown trout that also converge on the tidal areas of the salmon rivers near the coast. There is known trout spawning habitat in many of the lowland streams in the east of the district where gravel substrate is present. It is possible that trout migrate through or obtain food within some of the rural drains that are tributaries of the lowland streams, where baseflow is present.

Therefore the wet drains with usual baseflow are likely to provide habitat of value. These environments are protected through the best practice undertakings and recommendations made within this review.

### **5.6.3. Environment Canterbury**

Environment Canterbury has prepared and published its most recent drainage guidance via its “*Defences Against Water Code of Practice*” (2019). That guidance has been referenced in many places within this plan and has assisted to form the recommended actions.

## **6. Background**

In pre-European times the eastern part of the Waimakariri District from the coast to approximately 15km inland, together with an inland area west of Oxford, were all predominantly swamp land. Early settlers drained these swamps, creating the majority of the drainage network that exists today.

A presentation on *Low Impact Drain Management in the Waimakariri District*, by the Council's Drainage Engineer Greg Bennett in 2012, noted that until approximately 2008 historic drain cleaning used high impact methods such as a weed/silt bucket, with little emphasis on sediment management, biodiversity, in-stream fauna protection or enhancement. It noted that over the last 10 years the drainage management activity has been refocusing on a wider range of low impact drain cleaning methods. These include drain raking in place of silt bucket and areas of drain naturalisation being introduced in places.

These changes, approaches, benefits, costs and options for further improvements are discussed in detail in this plan.

### **6.1. Past Drainage Management**

#### **6.1.1. History of Catchment Management Governance**

The 2012 presentation by Greg Bennett described the historic management of the extensive drainage network in the Waimakariri District as ad-hoc. It was managed under various river and roads boards and County Councils but mostly maintained by the landowners until the North Canterbury Catchment Board was formed in 1944.

Community evidence supplied to the Council states that, in the 1950's, torrential rain in the Alps caused minor flooding in the Clarkville area near where the motorway bridges are today. The Kaiapoi township was protected from this flooding by a major modification which had been made to the lower Waimakariri River in the 1930s. During the 30's the "north branch" was cut off to become the Kaiapoi/Silverstream system and the Eyre Diversion was created.

The diversion of the (lower) Eyre River into the Waimakariri River, and (lower) Cust River to the Kaiapoi River in the 1930's drained two swamps at Flaxton and Mandeville. Before the 1930's these rivers did not reach the coastal plains as they do today. Over time, as settlement of the area increased the demand for drainage also increased, through to the recent work around Mandeville and Mandelea.

Following this 1950's flooding, the Catchment Board created the Ohoka Drainage District and levied rates for drainage.

The North Canterbury Catchment Board was dissolved in 1989 during local government reforms and the responsibility for the drainage in the district was ceded to the Canterbury Regional Council and Waimakariri District Council. Environment Canterbury assumed responsibility for the major rivers. Approximately 420km of smaller creeks and network of land drains became the responsibility of the Waimakariri District Council.

#### **6.1.2. Historic Drainage Management Practices**

During the County Council period, drain cleaning was usually carried out annually whether the drain needed cleaning or not. Digger operators would take great pride in making the sides and invert as straight as possible; they would scrape the bucket down the far bank, across the bottom and up the near bank. Many of the waterways were over deepened and the spoil was left piled high on the banks. No consideration was given to sediment control or biodiversity values. It was common to allow stock access to the waterways.

## **6.2. Current Drainage Management**

The Council currently maintains a number of both wet and dry drains throughout the district. These are spread across a number of drainage management schemes, with their management funded by ratepayers within each scheme. These drains are shown at district overview level in the Appendices to this plan. Detailed maps are available in a separate file.

The dry drain management is undertaken “on demand”, meaning only when a specific issue arises.

Wet drains are more likely to have a regular management schedule. This may range from every 3-4 years to being maintained several times per annum.

The Council administers regulations regarding rural drains under the Stormwater, Drainage and Watercourse Protection Bylaw 2018.

### **6.2.1. Regular Scheduled Works – Overview**

Many drains are currently regularly or periodically cleaned of weeds and sediment build up with the intention to retain their conveyance. The growth of weeds drives the key current perceived requirement for drain management. Open drains and small waterways are encouraged to freely flow at all times without obstruction.

Drain cleaning is generally carried out as needed depending on weed growth. Some watercourses are cleaned three times per season, some are cleaned annually, some are cleaned once every few years and some not at all.

This scheduled drain clearance is outlined in the waterways management schedule attached to this plan, with locations shown in maps in the Appendices. Note these are indicative frequencies, put together for the purposes of contract pricing.

### **6.2.2. Reactive management – Dry Drains**

All of the dry drains in the district are maintained “on-demand” and have no regular management schedule in place. This translates to periodic (usually no more than annual) spraying of dry drains with glyphosate to control rank grass. Spraying of dry drains is undertaken in accordance with best practice requirements as outlined in the “*Chemical Weed Clearing*” section of the review.

These drains fall within the following drainage rating schemes: Ohoka, Waikuku, Oxford Rural West, Oxford Rural East, Cust, Loburn Lea, Central Rural, Clarkville and Coastal, Rangiora and Kaiapoi.

### **6.2.3. Scheduled management - Wet drains**

Wet drains are drains with usual baseflow, that are currently maintained at various frequencies. This ranges from longer return management periods of 3-4 years, to more frequent annual scheduled management. Several wet drains are maintained several times per year.

Some of these drains are however only maintained “on demand” when an issue arises.

These drains fall within the following drainage rating schemes: Ohoka, Clarkville, Oxford Rural East, Oxford Rural West, Central Rural, Coastal, Oxford, Cust, Rangiora and Kaiapoi.



The more regular management requirements on wet drains, as opposed to dry drains, indicates a tendency for more conveyance issues to occur in the wet drains. These issues include regular aquatic weed proliferation, sediment build up (which may in part be caused by trapping from weed proliferation) and regular blockages requiring maintenance.

Surface factors such as sunlight, excess sediment in runoff and nutrients entering the waterway during rainfall contribute to periodic prolific aquatic weed growth.

Drains with baseflow are also likely to be augmented at times with spring flows or resurgent groundwater. This indicates that high groundwater may be a factor in limiting surface drain conveyance and surface storage of runoff. With ground saturation more runoff is retained in surface channels rather than infiltrating into groundwater.

#### **6.2.4.      **Unscheduled Maintenance****

Issues such as windfall, bank erosion or scour, or excessive debris entering a drain during storm events can lead to a requirement for unscheduled maintenance, described as “on-demand” in the drainage schedule. There are various methods involved in managing effects of unscheduled maintenance activities which are outlined in detail in this plan.

## 7. Drain Management Activities

The main reason why the waterways are currently regularly maintained is because of the rampant growth of exotic aquatic weeds that infest them. The weeds directly block or reduce drain conveyance during summer and autumn, or trap sediment or storm debris which also reduces conveyance.

The aquatic weeds which proliferate in the District drains are notably *Nasturtium officinale* (Watercress), *Erythranthe guttata* (monkey musk), Veronica or water speedwell (*Veronica anagallis-aquatica*), *Elodea canadensis* (Oxygen weed), *Potamogeton crispus* (curly pondweed) and *Glyceria fluitans* (floating sweet grass) (Greg Bennett “*Low Impact Drain Management in the Waimakariri District*” Water New Zealand Stormwater Conference paper 2012).

The Council chooses the most appropriate methods to control aquatic and riparian weeds. It may apply mechanical, chemical, hand, or increasingly, stream shading or other low impact management options to reduce prolific weed growth or weed density, as outlined in the sections below.

This plan notes a recent growing community concern about the effects of chemical weed control on the environment. There is also increasing recent contractor concern about the safety of the hand weed control method. The current drainage contractor has confirmed that any hand weeding projects will now be subject to a site specific health and safety risk assessment because of safety concerns, including muscle strain and trip/slip hazards. Therefore the default main weed control method is now mechanical weed removal via weed rake.

A report to Council on 30 January 2018 titled “*Herbicide, Glyphosate Use for Waimakariri District Council weed control operations*” by Greg Bennett, Land Drainage Engineer and Gerard Cleary, Manager Utilities and Roding (TRIM 180111001840v2), compared the costs of mechanical versus chemical weed control for the drainage activity. The report showed costs of mechanical weed control to be in the order of 6-10 times greater than costs of chemical weed control for undertaking district drain maintenance. Actual costs depend on which alternative mechanical weed removal method is selected for any drain.

These reported costs are rough order estimates and not based on site specific assessments. The exact cost of the most suitable alternative weed control method for each site was not able to be identified for every site, due to the potential cost of gathering that level of information for the entire network. The cost estimates were instead based on extrapolations, from actual costs reported during mechanical weed control trials from recent years.

It can be seen that the cost of moving to a predominantly mechanical weed removal method is significantly greater than when using chemicals. In the 2018/2019 year the Council responded to public concerns by avoiding spraying with glyphosate where practicable around wet drains. Recent drainage budgets are now correspondingly greater than when spraying was more commonly undertaken. It is unclear that the Council could return to using chemical weed control in the current political environment; however there is now growing concern within Council about the increasing costs of the undertaking the drain maintenance activity using predominantly mechanical weed removal methods.

It is also unclear that scheduled summer weed removal is effective at reducing flooding which usually occurs later in the year, during winter rainfall. The literature review in Section 11 shows that for most plants prevalent within the District drains, there is no material effect from summer aquatic weed cutting on winter flooding or hydrology of drains during the winter season. This plan therefore examines the wider rationale for the weed control activity. It recommends some alternative design or low impact management options and approaches that could both mitigate flood risk whilst reducing the current intrusive and costly mechanical removal of weeds from drains.

Some waterways periodically require the removal of silt to maintain drain capacity. However with modern sediment control measures and the exclusion of stock from waterways, the removal of silt is no longer the main focus of drain cleaning. It is currently only undertaken on an ad-hoc basis to maintain drain capacity. Silt removal is usually commissioned as a result of a specific catchment drainage investigation where flooding of roads or property has recently occurred.

Current drainage management is driven by an emphasis on flood prevention. The corresponding enhancement of environmental and cultural values is now being increasingly integrated into the programme where practicable.

The various drainage management activities commonly undertaken by Council are described in the following sections.

## **7.1. Managing Drain Conveyance**

The management of conveyance capacity in the drains remains the key current driver for provision of the drainage management activity.

### **7.1.1. Maintaining conveyance - Effects**

Both scheduled and reactive drain maintenance are currently undertaken to maintain drain capacity. This includes periodic removal of built up sediment in drains where sediment commonly accumulates, and periodic removal of margin vegetation that may grow into the drain.

Aquatic weeds are also periodically removed in accordance with the maintenance schedule. Environmental effects associated with each of these maintenance methods are conveyed in detail in the following sections. This section therefore focuses on effects of unanticipated nuisance flooding on private property, including farm and lifestyle block management and safety for the transport network.

Inundation of private property can reduce safe access of homeowners to their dwellings and throughout their properties. Unplanned ponding increases risk of injury for those needing to provide essential maintenance to various parts of their properties.

Prolonged periods of ponding cause a reduction in productive capacity of farms and reduce grazing area and food availability for stock. Nuisance flooding therefore places pressure on farm and lifestyle block management and can adversely impact the health or safety of both stock and people.

Unplanned inundation of the transport network creates danger for motorists. It increases the risk of traffic accidents, particularly from flash flooding overnight which is not visible to approaching motorists. Unplanned road inundation can also cut off access to rural properties, which can impact supply of essential food or other supplies for people or stock.

### **7.1.2. Maintaining Conveyance – Best Practice**

The drainage contractor has contracted availability to respond to drain blockage issues immediately once reported via a service request. The response time for contractors to unblock drains where flooding of private or public property or roads may result is currently 2 hours for emergency works, and 24 hours for urgent works. These actions are specific requirements within the Drainage Maintenance Contract.

Maximising hydraulic capacity through the network is a key consideration of every drain management option and method considered in this plan. Implications of each action for hydraulic conveyance is considered further in the following sections.

## 7.2. Mechanical Weed Clearing

Mechanical drain cleaning best practice currently involves weed clearance with a rake.

### 7.2.1. Mechanical Weed Clearing - Effects

Mechanical weed clearance with weed rake temporarily destroys aquatic habitat and removes potential food sources for aquatic life from the reaches where the activity is undertaken.

All mechanical clearing is non-selective and desirable plant species including inanga spawning vegetation in coastal drains may be removed along with non-desirable aquatic weeds. Disturbance of inanga spawning vegetation may occur if coastal drain riparian vegetation is disturbed during weed raking of aquatic weeds. However in the Waimakariri District this is avoided as the banks in these locations are not usually maintained and weed raking is only of aquatic plants on the drain bed.

There is a risk of disturbance of Canterbury mudfish spawning habitat during weed raking of aquatic weed. However no drains included within the drain maintenance schedule have any recent record of providing Canterbury mudfish habitat. Additional Canterbury mudfish surveys were undertaken in rural drains near Oxford in early 2020 by WDC staff, at locations where mudfish had been historically identified in the 1950's. No mudfish were located during these recent surveys.

There is one rural drain where there could be mudfish (Drain C2) which has not been recently surveyed. This drain is very rarely cleaned- and should only be cleaned in future if absolutely essential. An ecological survey of the drain would be carried out before any maintenance, to establish if there are any Canterbury mudfish present, and mitigation measures or reassessment of the need for maintenance undertaken.

The activity also risks removal of fish and invertebrates from the watercourse. The activity risks mobilisation of fine sediment which further impacts aquatic habitat by interfering with fish gills and their behaviour, reducing food available for invertebrates or fish, and potentially mobilising contaminants (if present in substrate). Weed raking also reduces dissolved oxygen levels in the water from decomposition of plant material if weed is disposed of in the water column.

Conversely, some effects of not undertaking weed clearance are:

- During heavy rain events clumps of weed, especially watercress, can become unrooted, float downstream and build up to cause blockages at culverts, for example.
- Excessive weed is likely to reduce dissolved oxygen which adversely impacts fish habitat. This is due to overnight plant respiration removing oxygen from waterways – particularly those with dense plant cover.
- Macrophytes trap sediment or debris that reduces drain capacity, clogs stream beds, reduces habitat for open-water biota, and like a self-perpetuating system, enables more prolific weed growth.
- Excess weed will hinder the passage of some introduced and native fish populations.
- Detracts from the aesthetic appeal of a body of water.

### 7.2.2. Mechanical Weed Control - Options

The use of a rake for mechanical drain cleaning is considered the best practice method currently available to remove excess weed and sediment entrained within weed from waterways. The rake is less intrusive than the silt bucket method as metal spikes (tines) rather than a cutting bucket surface removes only the weed.

This reduces the disturbance of soil from the bed or sides of the drain and the drain substrate is usually not excavated. This method also avoids scraping up the drain banks. It lifts weeds up and over the sides of the

drains, allowing water and fauna to escape back into the waterway whilst minimising the disturbance of sediment.

The spacing between the tines on weed rakes the Council currently uses in drains is 165mm-270mm (see photo below):



**Figure 1: Weed Rake: Photo credit Greg Bennett**

This is in contrast to the width of the tines in a standard silt bucket with cutting edge which has spacing of only 40 - 50mm between tines (see photo on following page):



**Figure 2: Weed Bucket: Photo Credit Greg Bennett**

The cutting surface of this standard silt bucket, in combination with its narrowly spaced tines makes it challenging for aquatic fauna to escape the weed removal process.

The weed rakes now currently used by Council are considered a significant improvement in avoiding adverse effects of weed clearance, enabling escape of aquatic species through their widely spaced tines.

The weed rake method also avoids unnecessary removal of riparian vegetation including inanga spawning vegetation. It produces less disturbance of riparian bird habitat than other methods.

The operator is able to flick the cleanings on to the near or far bank without having to pivot, reducing disturbance of the drain bank. The raking operation overall is faster, with a lower cost and has less environmental impact than the bucket silt removal method.

Following raking, the channel is usually almost immediately available for aquatic fauna to re-establish, provided there has been minimal silt disturbance. Fauna that is collected with the cleanings is usually able to self-migrate or be relocated back into the waterway if cleanings are placed nearby on the bank.

However in recent years the development of the lifestyle property has introduced land owners wanting a tidy groomed road frontage and garden. Many property owners do not want stream cleanings spoiling their lawns and expect the Council's contractor to immediately remove the cleanings. The impact is that any fauna is totally removed from the stream and is unable to return.

The Council prefers to transport cleanings from a drain once these are dry. If wet cleanings are transported then sediment and water can drain onto roads during transport. This creates a further amenity issue of dust in future dry weather, or with sediment draining to waterways from road runoff in future rainfall events.

Feedback from consultation with the Selwyn District Council indicated that weed regrowth is reduced when aquatic weed removal is undertaken in late summer or autumn. Noting that trout and salmon spawning season is from 1 May to 31 October and prolific weed growth usually peaks in the period December – January, it is therefore recommended that an option to delay aquatic weed removal until March / April is considered.

### **7.2.3. Mechanical Weed Clearing - Best Practice**

The Environment Canterbury Defences Against Water Code of Practice includes various recommendations pertaining to vegetation removal from water. A summary of aspects most relevant to the drainage management activity, adapted to meet specific contractor, Ngāi Tūāhuriri, stakeholder and ratepayer requests are outlined below.

If mechanical weed clearance is deemed necessary to be undertaken to reduce flood risk then the Council will require the following:

- Use of a weed rake with spacing between its tines of at least 165mm, to maximise aquatic fauna escape back to the waterway
- Avoid excavating into the drain bed and drain banks to minimise disturbance of fine sediment and protect aquatic species habitat and refuge
- Inspect site where works intended and identify any features which should not be disturbed, including pools, riffles, woody debris, salmon/trout spawning gravels, watercress mahinga kai sites or threatened species habitats, and avoid these where possible

- Avoid works that damage native plants or riparian vegetation used for inanga spawning, or that disturb sediment in inanga spawning areas during the period 1 February to 1 June
- Avoid pulling roots where the bed is dominated by a fine sediment base (e.g. avoid dragging roots through fine sediment)
- Inspect debris vegetation for any captured fish that appear still alive, or koura or kākahi and return any found to the waterway where practicable. The Council will not remove any cleanings from the waterway until at least 24 hours after the mechanical raking is complete. The relocation of aquatic fauna is then undertaken in accordance with a specific agreement with Ngāi Tūāhuriri whom will usually visit the site on the afternoon or evening following the cleaning. Council staff or contractors will be trained to undertake the aquatic fauna relocation in the event that Ngāi Tūāhuriri are unavailable at any time to perform this function.
- Where there is a confining layer between the drain and groundwater, ensure drain cleaning does not breach this layer. This is not usually an issue in the Waimakariri drains which at the invert often already intercept resurgent groundwater – noting the high groundwater table present in the east of the district.
- It is recommended that an option to delay weed raking of aquatic weeds annually until March / April is considered. This would reduce the extent of weed regrowth that usually follows mid-summer weed control, and could potentially reduce the overall scale of weed raking
- The Council will only remove cleanings from drains once they are dry. This avoids dispersal of mud during transport of cleanings.
- Ensure any cleanings are deposited evenly along on the inside of the banks (near the top) and not below the water line. This will:
  - a) avoid any concentrated flows causing scour from drying weed stockpiles;
  - b) avoid blocking downstream structures from cut weeds deposited into waterways; and
  - c) avoid decomposition of weeds in waterways which cause adverse effects on aquatic habitat.

The Council's current practice, agreed with and implemented by its contractor, is to remove the weeds and deposit them inside the drain banks to an elevated area above the water line. It leaves the weeds within the drain for a period of at least 24 hours after cleaning so that aquatic fauna can escape or be relocated. It then returns at a later date to remove the cleanings for composting elsewhere. This addresses the amenity concerns of adjoining property owners and meets road drain cleaning requirements to remove cleanings, where necessary. Otherwise, wherever possible cleanings will be left within the upper drain channel to break down.

### **7.3. Chemical Weed Clearing**

The Council historically sprayed its drains periodically with glyphosate or other chemicals targeted to particular species to control weeds. However there has been recent community concern about use of herbicide in or near waterways. The advice from the Environment Protection Agency as of October 2019 is that glyphosate is considered safe, provided that all of the rules around its use are followed.

#### **7.3.1. Herbicide Spraying – Effects**

Spraying with glyphosate may have adverse effects on non-target species of flora and fauna. There is a risk of accidental spill of chemicals during operations, which can harm aquatic life. If sprayed plant debris enters a waterway, it can cause de-oxygenation of the water through plant decomposition. Spraying also removes aquatic and inanga spawning habitat.

### 7.3.2. Council Approach to Herbicide Use – Options

The Council drainage staff currently have discretion about circumstances and locations around the drains where herbicide may be used. Staff are able to continue to use glyphosate to control weeds within and adjacent to drains if this is the most appropriate option. However, no spraying with glyphosate was undertaken in the 2018/19 year due to public environmental concerns and only approximately 1km of drain along Tram Road was sprayed in 2019/20. The Tram Road spraying in 2019/20 is necessary as mechanical weed removal cannot be safely undertaken due to high traffic speed, high traffic count and the difficulty in working safely on the narrow road berm adjacent to this drain.

Council staff have discretion to determine whether to spot spray to remove pest plants from the riparian margin area or from the drain bed. Problem weeds may be sprayed if located on fairly flat ground adjoining the drain, where there is a low risk of creating bank erosion and, for spraying of the banks, where the spray drift will not accidentally enter surface water. Care is also taken to reduce the risk of decomposing material from falling into the waterway following spraying.

Council contractors spray dry drains to control rank grass. They are instructed to spray only the invert of the drain and to leave the banks untouched. Usually one spray per year is enough to keep the drains manageable.

Contractors spray wet drains with glyphosate 360 using a vehicle mounted spray unit. A resource consent is held by Waimakariri District Council for this activity (CRC 120402). When spraying aquatic emergent weeds, the practice is to spray the middle of the drain only and not the banks. It may not always be possible to prevent spray drift residue from entering the flowing water, however this is minimised by spraying only thick areas of emergent plants which are above the water. Glyphosate is only effective on emergent weeds as sprays are diluted beyond effectiveness when mixed with stream water. Historically approximately 8-10% of spring fed drains were sprayed every year.

Glyphosate gel is used to control willow and other woody debris along open drains and streams. The plant is either drilled and injected with the gel or the plant is cut and the stump pasted. These methods ensure no product enters the water.

Glyphosate is also used for managing riparian areas which have been planted with natives. The practice is to target problem weeds that could compete with the natives. A backpack sprayer is used. This practice is temporary because as natives become established they may prevent exotic weeds establishing on the margins.

There are no other herbicides in New Zealand that are approved to be sprayed over water for emergent weeds. Most of the organic products on the market contain fatty acids, pine and other oils that are toxic to stream fauna and flora and as such are not appropriate or approved to control in-stream emergent macrophytes. Other non-herbicide options require heavy, cumbersome equipment such as hot foam and electro-weeding equipment, that are not suitable for access to rural drains.

The report to Council "*Herbicide Glyphosate Use for Weed Control, 30 January 2018 (TRIM 180111001840[v2])*" prepared by Greg Bennett provides further details of Council's current approach to determining situations where it is appropriate to use glyphosate. The Council is working to reduce use of glyphosate in recent years, taking a precautionary approach.

Details of the most recent review of Council use of glyphosate are in report "*Glyphosate –Review of Council Practices*" 6 August 2019 (TRIM 190702093110[v2]), prepared by Grant MacLeod and Sophie Allen. This includes a provision that a 'No Spray' register is kept across all Council Departments. Landowners may register their property to not have glyphosate sprayed by Council contractors within the close vicinity (e.g.



5m) of their property. Staff are required to carefully consider options for reduction of the use of glyphosate, as a precautionary principle.

The Council holds a resource consent from Environment Canterbury to spray aquatic macrophytes, using diquat (CRC 120402). As at the date of publication of this review, it is current practice to not use diquat to control aquatic macrophytes, unless for control of an Unwanted Organism under the Biosecurity Act, such as *Lagarosiphon major*. The use of diquat is not a prioritised management option within waterways.

### **7.3.3. Environmental Protection Authority – Glyphosate and Public Health**

The Council previously sought advice from the Ministry of Health (MOH), Ministry for the Environment (MfE), Parliamentary Commissioner for the Environment (PCE) and the Environmental Protection Authority (EPA), on the impact of use of glyphosate and other sprays on public health and on the environment. Their responses are summarised here.

The EPA response referred Council to a recent report it had commissioned, titled *“Review of the Evidence Relating to Glyphosate and Carcinogenicity”*, published in August 2016. This report was prepared by toxicologists Dr Wayne Temple with contributions from Michael Beasley of the New Zealand National Poisons Centre. The report found that, *“based on a weight of evidence approach, taking into account the quality and reliability of the available data – glyphosate is unlikely to be genotoxic or carcinogenic to humans and does not require classification under HSNO as a carcinogen or mutagen”*.

The letter from the MOH referred the Council to the EPA as the most appropriate authority in New Zealand on assessing and regulating glyphosate use. Therefore the report prepared by Dr Wayne Temple is considered the most comprehensive and recent resource provided by the Government for New Zealand organisations to assess public health impacts of the use of glyphosate.

The MfE also concurred with the findings of the EPA report. It noted that the EPA has approved the use of glyphosate in New Zealand following consideration of the likely effects of glyphosate on both human health and on the environment. It concluded that *“both could be safeguarded by placing appropriate controls on the use of products containing glyphosate”*. It went on to state that *“the level of glyphosate in Kaiapoi, according to your own testing on 4 April 2016, is not at a level that would cause significant adverse effects for either humans or the environment.”*

Apart from a letter received to acknowledge the request for information no further correspondence has been received from the PCE.

Representatives from the Environmental Protection Authority visited Council in September 2016. They had no issues with the use of glyphosate by Council but cautioned against using more toxic alternatives available in New Zealand.

### **7.3.4. CAREX Study– Glyphosate and In-stream Aquatic Fauna Biodiversity**

In the summer of 2016 – 2017 the Waimakariri District Council partnered with the Canterbury Rehabilitation Experiment (CAREX) in a trial to understand the persistence of glyphosate in stream water and sediment and its short-term effects on freshwater invertebrates and fish following spraying of waterways. The results of the trial are summarised as follows:

- Glyphosate was present in the sediment before spraying had even started.
- Glyphosate was present in the water column for 1-2 days following spraying, but quickly bound to sediment and broke down.
- The study did not detect any effect of glyphosate used to control emergent macrophytes on stream invertebrate species or fish

- However it noted that species present in these drains may be already tolerant of existing water quality
- It found that re-growth of weeds following spraying with glyphosate fell from 90% cover prior to spraying, to 20% after spraying, to 50% after 14 weeks.

The study was titled “*Persistence and ecological consequences of glyphosate to control aquatic weeds in Waimakariri lowland waterways*”. It concluded “*We could not detect any effect of glyphosate on stream invertebrate species richness, metrics such as the MCI and SQMCI or fish*”. Results showed that both the unsprayed and sprayed reaches in the trial had a reduction in the invertebrate species richness, MCI and SQMCI, 6 weeks after spraying when compared with the pre-spray indices. This reduction can be attributed to natural seasonal changes affecting the drain habitat, rather than to the use of glyphosate.

It was concluded that as these drains are highly modified environments, invertebrates and fish that continue to occupy them may be already tolerant of existing water quality in these systems.

### **7.3.5. International Evidence – Glyphosate and Soil Biodiversity**

This review has also considered a number of international studies of effects of glyphosate use on soil biodiversity. This includes effects of glyphosate on soil function and effects on non-target soil organisms or microbes.

These studies mainly cover effects of glyphosate on soils used for cropping. Therefore they are not directly relevant to this review which covers effects of glyphosate in or adjacent to drains or waterways. However as they demonstrate the current knowledge base about general effects of glyphosate use on soil biodiversity the findings are discussed in this review.

A common theme within the international literature is that although extensive research has been done on short-term soil fauna and micro-flora response to glyphosate, relatively less information is available on its long term effects. There are many studies of soil organism or microbe response to one-off single treatments, but less information is available about potential gradual changes in soil function over time from effects of long term glyphosate use. Also, increasingly, there are more frequent glyphosate treatments applied across a reducing time span observed in recent international cropping trends, for which cumulative and long term effects are not well understood.

Many studies indicate that effects of a single use of glyphosate treatment on soil fauna and soil function are minor and transient. It is noted this is dependent on the actual rate and composition of the product used and on background characteristics of the soil, climate and other local environmental factors.

However, comparing results of recent studies reveals there is still uncertainty about the long-term impact of glyphosate on soil composition and functioning of soil micro-organism species and ecosystems. For instance, it appears that application of glyphosate to soils causes abundance of some microbial populations to increase and others to reduce. In the long term these changes could “*affect rhizosphere nutrient status*” (see Molli M.N. et.al. “*Glyphosate effects on soil rhizosphere-associated bacterial communities*”, in *Science of the Total Environment*, Volume 543, Part A, 1 February 2016, Pages 155 – 160).

This study by Molli et.al noted that “*Examining the effects of pesticides, such as glyphosate, on soil and rhizosphere microbial communities is important due to the critical role of microorganisms in driving biogeochemical processes and controlling pathogens....*”.

Further, there are potential effects on soils of other chemical substances that are added such as solvents and surfactants in commercial glyphosate products.

There are also studies which show adverse effects on certain soil fauna, including some earthworm species. These contrast with other studies of the same species which do not identify any adverse effects.

It is difficult to assess and weigh the available evidence about effects of glyphosate on soil biodiversity as published international sources provide varying and sometimes conflicting findings.

This desktop review therefore supports the need for a “precautionary” approach in applying glyphosate near rural drains and waterways. This approach acknowledges the limited information available internationally on the long term impact of glyphosate use on soil fauna and microflora.

### **7.3.6. Herbicide Application by Private Property Owners**

The use of herbicide by private property owners is outside the scope of this review. It may however be included in any future review of private drain maintenance practices.

Council advises private property owners who wish to spray their private drains to only spray dry drain beds and not the banks. Blanket spraying drain banks can cause bank destabilisation and soil erosion. Spot spraying rather than blanket spraying is encouraged.

### **7.3.7. Herbicide Application - Best Practice**

The Environment Canterbury Defences Against Water code of Practice April 2019 includes some requirements for use of chemical sprays to control aquatic and riparian weeds. A summary of these, where relevant to the drainage management activity is outlined below.

If chemical weed control using glyphosate is deemed to be necessary by staff, then the Council will require the following:

- Spot spraying only where necessary to control problem or nuisance plants, adopting a precautionary approach
- Spray only the invert of a dry drain or emergent plants in a wet drain, and avoid accidental spraying any drain banks if emergent weeds are the target
- Consider any practicable economic alternative management methods to spraying aquatic weeds (for example, hand or weed rake is preferred)
- Notify the Mahaanui Kurataiao Ltd main office administrator 10 days prior to use – the administrator will contact the relevant parties, including the Cultural Monitor or Runanga Executive members, as required.
- No cleaning or rinsing of equipment or containers:
  - Within 5 metres of a surface water body or bore
  - In the bed of the stream or drain, unless mixing or dilution takes place within a sealed, banded system that contains a volume of at least 110% of the largest spray tank to be filled, or the mixing or dilution is for a hand-held application technique or method
- Native vegetation must be avoided whilst spraying
- Undertake works in calm conditions as far as practicable to avoid spray drift
- Avoid spraying vegetation that could provide inanga spawning habitat between 1 January to 1 June.
- To avoid potential negative impacts on foraging bees, do not spray during the peak of the flowering season wherever possible

## **7.4. Hand Weed Clearing**

Hand clearance of weeds is a low impact method of drain weed control. However the method is labour intensive, with a high associated cost. It has relatively high safety risks for the contractor including of muscle strain and trip / fall hazard. The current contractor has indicated that any hand removal of weeds will only be approved subject to a site specific health and safety risk assessment.

### **7.4.1. Hand Weed Clearing – Effects**

As weeds may be intended to be pulled by the roots, it is possible that the rate of weed regrowth in cleared reaches is reduced relative to mechanical clearance with a weed rake. However as complete root removal is unlikely, weed species are usually not completely able to be removed from a stretch of drain. Root removal is also not desirable in areas with fine sediment on the drain bed.

Hand Weed Clearing can also have a direct effect on aquatic species in drains. This is particularly from boots on the drain bed crushing invertebrates underfoot, or from weeds removed from the root destabilising banks and suspending fine sediment into the channel.

### **7.4.2. Hand Weed Clearing – Options**

Small drains with sensitive mahinga kai populations or high habitat values are the most appropriate environments for hand clearance of weeds. These are likely to have good existing water clarity and available existing cobble. The hand clearance of weeds may be the lowest impact method of weed clearance. Due to its high cost this method is most justifiable in areas of high quality existing habitat.

In addition, areas of weeds around culverts or other physical structures in drains sometimes need to be removed by hand as the weed cannot practicably be removed by machinery. Hand removal of weeds from around culverts also avoids spraying. Culverts may provide aquatic habitat such as shelter for eels, therefore it is worth avoiding spraying them where practicable.

All hand weed removal projects in high quality habitat areas or around culverts or other physical drainage infrastructure are subject to a site specific risk assessment for contractor safety.

### **7.4.3. Hand Weed Clearing - Best Practice**

The Council will not prioritise the hand clearing of weeds during its usual drainage maintenance due to the high cost and safety risks of this method.

However specific weed clearing projects such as around culverts, other physical assets in drains, or in high value habitat areas are sometimes preferably undertaken by hand. This will be subject to a site specific health and safety risk assessment by the contractor.

Each proposed hand weeding task will be assessed for hazards. Resulting actions may be required to be undertaken to minimise the risks. Approval of site specific health and safety risk assessments, and requirements to undertake any associated risk reduction actions will be applied at the discretion of the contractor.

## **7.5. Sediment Removal**

The removal of sediment from drains is occasionally required to maintain drain conveyance.

Sediment removal can be undertaken either with an excavator with a self-draining weed/silt bucket (preferred), or with an excavator and solid bucket (alternative – not preferred). The self-draining bucket is the preferred option as it enables some aquatic species escape and return to the waterway and releases dewatering water directly to the stream.

#### **7.5.1. Sediment Removal - Effects**

As with mechanical weed removal, the removal of sediment with weed bucket or solid bucket temporarily destroys aquatic habitat and removes potential food sources for aquatic life from the reaches where the activity is undertaken. All mechanical clearing is non-selective and desirable plant species including spawning vegetation may be removed along with the sediment.

This activity also removes fish and invertebrates from the watercourse.

It also mobilises fine sediment within the watercourse, which further impacts aquatic habitat by, for instance, interfering with fish migrations and reducing food available for invertebrates or fish. It also potentially mobilises contaminants (if present in substrate) and reduces dissolved oxygen levels in the water.

#### **7.5.2. Sediment Removal - Weed/Silt Bucket Option**

The self-draining weed/silt bucket method is the best practice method available for drains where both sediment and weed removal is required.

The weed/silt bucket has a cutting edge that rapidly removes drain substrate and sides along with any weeds. This is the preferred method to use for drain widening (or deepening) particularly for large reaches of drain. The bucket enables cost effective removal of large reaches of legacy silt that accumulate in drains from time to time. The purpose of legacy sediment removal is usually to maintain drain flood conveyance, and also has ecological benefits for some macroinvertebrates and trout spawning for example.

The photo below is of a self-draining weed/silt bucket.



**Figure 3: Weed/Silt Bucket: Photo Credit Greg Bennett**

It is important not to over widen or excessively deepen channels. This can slow water movement which leads to more sediment deposition and weed growth. This is unless a sediment trap is being excavated into the drain downstream of a legacy sediment removal operation, or if a riffle/pool system is being purposely developed.

The weed/silt bucket cleaning option is not recommended for regular drain maintenance works if only weeds are required to be removed. This is because the relatively narrowly spaced teeth are more damaging to aquatic fauna, permitting less fauna escape and causing more damage to aquatic habitat than the alternative weed rake. The narrow slots and dish shape of the bucket cause any water scooped into the bucket to excessively slosh about hindering the cleaning operation and making a mess.

The operator can only deposit the soil/weed onto the nearest bank, meaning there are fewer locations to place cleanings than when using a weed rake. This leads to potential piling up of weeds and future soil mounds. This potentially adds a concentrated flow with scour risk for stockpiles of drying weeds and soil, and a future additional management requirement for ground levelling where the stockpiles mound over time. The machine also requires pivoting to deposit soil and cleanings outside of the drain and therefore causes more bank damage than the weed rake.

It is anticipated that legacy silt removal requirements will reduce in future as rural land management practices improve over time. This should occur as / when rural privately managed drains are increasingly fenced and/or planted. This is now increasingly required by regional plan rules and encouraged by rural advocacy organisations.

### **7.5.3. Sediment Removal Method - Solid Bucket Option**

This alternative option of sediment removal using excavator and solid bucket can be used to remove either: a) large areas of legacy sediment; or b) small areas of sediment that are blocking areas of drains. This method is not preferred as it does not allow for any escape of aquatic species which enter the bucket with the sediment. Further, it contains water which is likely to be deposited on banks for dewatering, which can cause scour and erosion during dewatering drainage.

### **7.5.4. Sediment Removal - Best Practice**

The Environment Canterbury Defences Against Water Code of Practice includes various requirements pertaining to silt removal from water. A summary including aspects most relevant to the drainage management activity is provided below.

If sediment removal is required to be undertaken then the Council will:

- Avoid disturbing inanga spawning habitat (banks and bank vegetation inundated by high tide) between 1 January to 1 June
- Inspect site where works intended and identify any features which should not be disturbed, including pools, riffles, woody debris, salmon/trout spawning gravels, or threatened species habitats, and avoid these where possible
- Retain small variations in streambed profile (do not level the stream bed) – these variations provide habitat diversity

- Avoid excavation works that damage native plants
- Reform areas of existing steep banks into areas with a gentle grade, or create a two stage channel or form the channel into a V shape, wherever practicable. This is subject to a site specific assessment of the likely soil response to bank grading and the resulting erosion risk. Note that there is contractor concern that a V shape is difficult to create with a digger bucket, and is harder to weed rake than a drain with vertical sides. Therefore site specific design of V shape drains will be required if formed from sediment excavation projects
- Do not unnecessarily scrape the bed or banks with the digger bucket. Bare banks are more prone to erosion and slumping, removing all bank vegetation removes habitat and refuges for fish and insects
- Inspect spoil material for any captured fish that appear still alive, or koura or kākahi and return any found to the waterway as far as practicable. This is undertaken through a specific partnering agreement with Ngāi Tūāhuriri who usually undertake fish relocation during the afternoon or evening following the sediment removal excavation. Fish relocation will be undertaken by trained Council staff or contractors if members of Ngāi Tūāhuriri are unavailable at any time to perform this function
- Where there is a confining layer between the drain and groundwater, ensure silt removal does not breach this layer. This is not usually an issue in the Waimakariri drains which at the invert often already intercept resurgent groundwater – noting the high groundwater table present in the east of the district
- If silt removed from the watercourse is to be dried near the worksite, the drying area shall be located and shaped, so it does not allow any sediment-laden water to enter the waterway directly. This may require contouring of the site and dewatering drainage treatment areas where sediment can settle out or drain to grass, to prevent runoff channels causing bank scour if flowing back to the waterway.
- Where practicable, only remove fine sediment from the channel. Where course substrate is present it provides valuable habitat for fish and invertebrates and has the added benefit of being a poor root environment for recolonising macrophytes
- Where possible, regrade banks and plant appropriate native riparian species to provide nutrient filtration and shading to work towards longer-term solution for excessive weed growth
- When removing large areas of legacy sediment from wet drains the Council will install a downstream sediment trap, or excavate a natural sediment trap, wherever practicable. Sediment trap design will be in accordance with the template sediment trap guidance and design in Henry Hudson's report "*Scoping Strategy for the Three Brooks and Channel Enhancements in the Middle Cam River and Tuahiwi Drain*" 2017. Alternatively the Council may excavate a natural trap downstream of an area where legacy sediment is being removed from a drain. In this context large areas of legacy sediment are defined as drain lengths of at least 100m.
- Isolated areas of sediment removal from wet drains will have the works area protected or isolated in channel by a silt fence/turbidity curtain, or similar sediment control method used within the flowing drain/stream where practicable. This is often constrained by the presence of the sediment already within the drain. The Waimakariri District Council will refer to the Erosion and Sediment Toolbox for Canterbury to select a suitable sediment control method for each activity.

## 7.6. Management of Cleanings

Cleanings are weeds that are removed from the drain to be discarded following the drain cleaning.

### 7.6.1. Removal of Cleanings – Effects

Following drain cleaning, the cleanings need to be removed from the water channel, as if left in the drain they will rot, reducing oxygen levels in the water. Adverse effects on water quality and aquatic fauna arise from decomposition of cut weeds that remain in the waterway.

Further risks are of blockages of downstream structures such as culverts and floodgates.

### 7.6.2. Removal of cleanings – Options

Landowners may not support the discarding of cleanings on the banks of drains on their properties due to visual effects or build-up of sediment mounds at the top of each drain over time. The Council can mitigate these objections by asking the contractor to disburse the cleanings evenly across rank grass so they do not pile up into mounds. Alternatively some cleanings may need to be removed into external composting facilities. This should be avoided whenever possible due to cost. Cleanings could also be transported to be deposited on other Council property or on nearby areas of Council drain margins in locations where the cleanings are less obvious to the private landowner.

No cleanings are allowed to remain on roadsides, so any cleanings deposited on road verges require removal from the drain. This is the current Council roading contract requirement, necessary to protect the road shoulder from deterioration from water or from decomposing vegetation.

### 7.6.3. Disposal of Cleanings – Best Practice

The Council will ensure cleanings are deposited evenly along on the banks adjacent to the works, above the water line. This will:

- Provide an easy path for aquatic fauna such as eels to escape back to the stream
- Avoid any concentrated flows causing scour from drying weed stockpiles;
- Avoid blocking downstream structures from cut weeds deposited into waterways; and
- Avoid decomposition of weeds in waterways which cause adverse effects on aquatic habitat.
- The Council will also arrange for the debris vegetation to be inspected for any captured fish that appear still alive, or koura or kākahi and return any found to the waterway where practicable. This is done by the Ngāi Tūāhuriri cultural monitor under a specific partnering arrangement or by trained Council staff/contractor, if the cultural monitor is not available. This partnering agreement should be regularly reviewed.
- The Council's current practice is to rake, capture and deposit weeds inside the drain banks to an elevated area on the bank sides above the water line. It leaves the weeds within the drain for a period of at least 24 hours after cleaning, enabling aquatic fauna to escape or be relocated. The contractor will then return at a later date to remove the cleanings for composting elsewhere if needed. This addresses any amenity concerns of property owners and meets the roading contract requirement of no cleanings left on the road reserve.
- Ideally cleanings are deposited on banks adjacent to the top of the drain, in a location where the weed cannot be easily conveyed back into the drain by rainfall or wind. The cleanings will then rapidly biodegrade into the riparian vegetation adjoining the drain (usually into rank grass).
- If cleanings are removed from the drain this will occur at least 24 hours after the maintenance operation is complete. The cleanings will be left on the bank for at least 24 hours to allow fish escape or relocation. The contractor will then return at a later date to remove the cleanings for composting.

The diagram below shows the preferred placement options for drain cleanings in relation to channel alignment:



## Drain Cleanings Diagram



Figure 4: Location to deposit cleanings

## 7.7. Management of Willows

Willows were historically planted along drain banks for many years to provide bank stability. Juvenile willows may currently still be permitted to grow where they provide bank stabilisation.

### 7.7.1. Willow Management– Effects

Intruding willow roots or dropped large branches can encroach into shallow drains or stream beds, causing loss of waterway conveyance or temporary unintended damming. Willow encroachment into drains sometimes causes flooding, bank instability and soil erosion. There is a risk of willows falling into drains in high winds.

Willows grow prolifically and in dry periods can uptake lots of water, reducing minimum baseflow in waterways.

The species grey willow (*Salix cinerea*) and crack willow (*Salix fragilis*) are common in the Waimakariri District drain sites and create a number of issues for drain management.

Grey willows in particular are a problem as these spread rapidly from windborne seeds, covering large areas of ungrazed land very quickly. It is recommended that the Council control female grey willows immediately to avoid seeding.

As crack willow is male it will only spread from broken off fragments which drift downstream and take root.

Willow roots seek out the nearest watercourse sometimes from several meters away and form a dense root mat that raise the invert and cause erosion of the nearby banks. The only recourse in these situations is to cut the root mat away. However the problem will repeat unless the trees are removed altogether and the stumps poisoned to prevent regrowth.

### **7.7.2. Shading with Willows or Native Plants– Options**

Willows are less desirable than native plants in providing riparian shading of waterways to reduce aquatic weed growth. This is because willows, although shading and possibly stabilising drain banks, are prone to eventually shedding branches (often directly into the waterway) and have root intrusion into the waterway, raising the invert, as well as deciduous shedding leaves before winter that can reduce oxygen levels in water. Native riparian planting, in contrast, once established, usually requires no ongoing management or further intervention. This avoids the ongoing need to operate heavy machinery near the waterways in future.

The drainage activity currently includes targeted removal of willows where these are encroaching on the waterway's conveyance, destabilising the banks or where windfall has occurred.

Areas where willows are removed are recommended to be replaced with native plantings to provide the same channel shading function. These native plants provide shade of the waterway (similarly to the willows) but also provide food for native birds, indigenous biodiversity values, better filtration of runoff and other ecosystem services. For instance, planting a combination of native grasses and taller shading plants in place of willows can help to intercept sediment and nutrients in overland flows from entering drains as well as providing shade to reduce nuisance weeds.

Native plantings can be configured to provide a dense, optimal riparian vegetation margin cover including at both the canopy, understorey and ground level. In contrast willows do not provide understorey or ground cover and so do not intercept runoff and may not be as effective at controlling proliferation of nuisance weeds, including on the drain banks. Native plantings introduce a wider range of environmental services at each of the canopy, understorey and ground levels, without ongoing costly management interventions needed to control unwanted root growth or windfall.

### **7.7.3. Willow removal – Options**

Willow control involves removing whole willows or branches, cutting away willow root mats, poisoning stumps and spraying regrowth. These activities can carry a significant cost. In the last decade willow control activities have consumed up to approximately 25% of the drainage management budget.

A key consideration is whether the willow species (crack/grey willow) is present upstream and would re-establish in any cleared reach following willow control works. If not present upstream, removal of willows may assist to clear them from a catchment and prevent further spread in the downstream drains.

Willow control should be undertaken in stages to enable biodiversity recovery in a cleared reach and creation of indigenous species refuges, prior to undertaking control in the next reach. This will minimise any adverse effects on species habitat of the works.

### **7.7.4. Management of stumps – Options**

Once a stump has been drilled and poisoned, it is usually left within the stream bank to stabilise it whilst newly planted replacement vegetation establishes. Over time many of the stumps left within drain banks will break down and be overwhelmed by the new native vegetation.

### **7.7.5. Bank stabilisation with felled trees – Options**

Felled trees employed in bank stabilisation are placed into a carefully prepared site and covered over. Sometimes the stream is corrected, such as when gravel shoals are moved to direct flow away from the repaired site.

Once a felled tree is placed within a drain bank, further bank stabilisation options will be assessed. This could be from any combination of the following: rocks, wire rope tie backs, geotextile cloth, mulch, re-grassing or riparian planting. This will be undertaken in accordance with the bank stabilisation and erosion and sediment control sections of this plan.

The Council considers it is able to mitigate and avoid any risk of felled trees used for bank stabilisation becoming subsequently dislodged.

### **7.7.6. Willow Control – Best Practice**

The Council may commission a future proactive network survey of willows on Council managed drains.

It may remove willows from drains where an above average drain management cost of repeat willow control has been required in recent years, and replace these with native plants.

Each assessment would consider whether the existing habitat provided by willows offsets the ongoing management expenditure incurred. It would consider whether an alternative native planting option might introduce a wider range of ecosystem services.

An average cost of management per drain could be compared; and above average management cost for willows would be a trigger to consider removal and replacement with native plants.

Other specific actions/assessments are:

- Control female grey willows immediately to avoid seeding.
- Determine whether the willow species (crack/grey willow) is present upstream and would re-establish in any cleared reach following willow control works. If not present upstream, removal of willows may assist to clear them from a catchment and prevent further spread in the downstream drains.

Large areas of willow removal should be staged to allow for recovery of biodiversity in the stream reach, and creation of refuges before the next stage of control commences.

## **7.8. Management of Other Problem Weeds**

The Council periodically removes nuisance exotic trees or weeds (willows are specifically addressed in the previous section) including gorse, broom and exotic woody weed species, where these interfere or could potentially proliferate to interfere with drainage conveyance in a waterway.

It also deals with a variety of noxious or problem weeds which require a specific management approach.

It also maintains grass and other vegetation by mowing and weed trimming (e.g. weed eating).

### **7.8.1. Gorse and Broom - Effects**

There is an ecological benefit of removing gorse before it grows into waterways. Gorse can potentially introduce nitrogen into a drainage system as it is a very widespread and invasive nitrogen fixing plant. It has a high rate of litter production which means it deposits nitrogen in soils around the gorse plant, which then leaches to ground or surface water during future rainfall.

Gorse produces large quantities of litter. N concentrations are generally higher in gorse litter than in the litters collected under other shrubs and trees. During and after litter decomposition, N is released into the surrounding soil, resulting in higher N concentration in the soils under gorse sites compared with under other species. This is due to the ability of gorse to fix N and produce large quantities of litter. The presence of gorse near drains creates a risk of nitrate pollution of groundwater and eutrophication of surface water (from report by Guna Magesan, Hailong Wang and Peter Clinton "*Nitrogen Cycling in gorse-dominated ecosystems in New Zealand*", November 2011, published online.

However any proposal to remove gorse from in or near a waterway requires firstly an assessment as to whether the gorse provides habitat for native lizards.

Lizards are known to inhabit gorse, broom, rank grass, native grasses and shrubs. Lizards inhabit rocky/stony outcrops and areas of berm not usually disturbed by either drain management or flood flows.

Selected spot removal of gorse, broom or other woody weeds is carried out. This occurs for vegetation which poses a risk to bank stability or drain conveyance. Risks with this vegetation occur when it grows inwards towards the drain channel, impeding the flow or causing slippage of the banks.

This work will not be carried out within the inanga spawning season within or near any inanga spawning site. Environment Canterbury provided inanga spawning maps to identify these sites. There are proposed conditions to prevent weed and tree removal in the inanga spawning riparian vegetation areas within CRC195065 - 67.

### **7.8.2. Problem Weeds – Effects**

There are a few plant pests that infest the drains within the district and many of them are listed in the National Pest Plant Accord: <https://www.mpi.govt.nz/protection-and-response/long-term-pest-management/national-pest-plant-accord/> and the Canterbury Pest Management Plan: <https://ecan.govt.nz/get-involved/news-and-events/2018/new-pest-plan-takes-effect/>. These plant pests can be split into two categories; aquatic and terrestrial.

Aquatic plant pests are weeds that grow within the flowing water and can be emergent, i.e. extend above the water surface or submergent, i.e. grow under the surface of the water. Once these pests are present in the waterway they are virtually impossible to eradicate. Therefore it is prudent to be familiar with these pests and take measures to prevent their spread to other waterways.

For example the oxygen weed *Lagarosiphon major* is present within the Silverstream and so far has not spread to the other streams within the district. This is probably due to the Silverstream being maintained by Environment Canterbury and the surrounding streams maintained by WDC. With separate management and machinery involved, fragments are not transferred via the machinery from the Silverstream to the nearby Council drains. Different contractors are responsible for maintaining these streams. Control of aquatic plant pests is currently undertaken mechanically and whilst the existing herbicide consent does permit the use of diquat for aquatic weeds, it is not currently used.

Terrestrial plant pests are weeds that grow along the riparian margins of the waterways. The establishment of native riparian planting also creates opportunities for these plant pests to establish and spread. Therefore

it is prudent to remove and ideally eradicate them before they become a bigger and more expensive problem. These pests can be targeted with spot spraying or mechanically removed.

In some situations immediate eradication may be required. If on the drain margins, this work would only be carried out within the inanga spawning season within or near any inanga spawning site as a last resort, by using targeted spot spraying or mechanical removal. Any eradication would be contained to the specific plant/s requiring immediate removal and care would be taken to avoid disturbance of the surrounding riparian vegetation. If this immediate eradication is required it would be undertaken in consultation with a qualified ecologist to identify the best approach to protect the spawning vegetation.

If immediate eradication of any problem riparian weed was required adjacent to a salmon spawning area or in any critical habitat of threatened indigenous freshwater species, this work would only be undertaken as a last resort using targeted spot spraying or mechanical removal. Any eradication would be contained to the specific plant/s requiring immediate removal and care would be taken to avoid disturbance of the surrounding habitat area. If this immediate eradication is required it would be undertaken in consultation with a qualified ecologist to identify the best approach to protect the spawning sites or habitats.

### **7.8.3. Rank Grass and Weed Mowing or Trimming - Effects**

The Council periodically mows and arranges trimming of weeds on Council drains. This is usually to improve amenity, improve visibility of drains or improve safety of access for drain cleaning.

This work will not be carried out within the inanga spawning season within or near any inanga spawning site, as inanga spawn in riparian vegetation. Environment Canterbury provides inanga spawning maps to identify these sites. There are conditions to avoid weed and tree removal occurring in the inanga spawning riparian vegetation areas within CRC195065 - 67.

### **7.8.4. Problem Weed Removal – Best Practice**

Removal of gorse reduces transfer (cycling) of nitrogen into waterways. This is because gorse is a widespread nitrogen fixing plant which produces large quantities of litter debris which deposit in soils from where these can leach nitrogen into ground and surface water. It can also restrict access to a drain. The Council has a pro-active gorse removal programme and where practicable will remove, or encourage private property owners to remove all gorse within 3m of Council drains.

The Council needs to continue to proactively remove other problem nuisance weed species that appear in any drain by either mechanical removal, spot spraying or with an aquatic spray for submergent weeds e.g. diquat, only if necessary to prevent a proliferation of a problem weed. These actions are required to prevent more invasive future weed proliferation.

If urgent noxious or nuisance weed removal is required in any inanga spawning season at an inanga spawning site, this would be undertaken by using targeted spot spraying, manual or mechanical removal. Any eradication would be contained to the specific plant/s requiring immediate removal and care would be taken to avoid disturbance of the surrounding riparian vegetation. If immediate eradication is required during a spawning season at a spawning site, it would be undertaken in consultation with a qualified ecologist to identify the best approach to protect the spawning vegetation.

## **7.9. Jetting of Culverts**

Typically culvert cleaning by WDC is reactive work, cleaning out of short roadside drain culverts that provide access to rural properties. Since the culverts are short, large amounts of silt are not mobilised. The cleaning moves already existing material a little downstream where it is able to be removed if required. This work is performed as required.

#### **7.9.1. Reactive Culvert Jetting - Effects**

For wetted drains with usual baseflow where fish are likely to be present, the jetting of culverts may have an adverse environmental effect on any aquatic species present. Jetting of culverts that releases silt into water can reduce oxygen levels in the water, and impair fish feeding and flight response.

Any material that is suspended during jetting of pipes in wet drains with usual baseflow will be captured via a turbidity curtain, sediment tube or similar sediment capture device at the downstream end. This may allow some of the jetted sediment to settle out and be collected (if any settlement has occurred). The sediment control device will be removed at a time when the waterway is in low flow during dry weather, following the removal of any sediment that has been collected by the device during the jetting.

For jetting of soil from culverts in dry / ephemeral drains, material flushed onto rank grass or soil will be removed where practicable without affecting the underlying bed/banks. Otherwise it will be left to revegetate.

#### **7.9.2. Culvert Jetting – Best Practice**

For jetting of soil from culverts in wet drains with usual baseflow, any material suspended during jetting will be captured where practicable via a turbidity curtain, silt tube or similar device at the downstream end. This may allow some of the jetted sediment to settle out and be collected (if any settlement has occurred). The sediment control device will be removed at a time when the waterway is in low flow during dry weather, following the removal of any sediment that has been collected by the device during the jetting.

For jetting of soil from culverts in dry / ephemeral drains, material flushed onto rank grass or soil will be removed where practicable without affecting the underlying bed/banks. Otherwise it will be left to revegetate.

## 8. Minor Works Activities

### 8.1. Naturalisation of Drains – Planting to Increase Shade and Velocity

The naturalisation of drains to provide waterway shade or to increase channel velocity is now a periodic component of the drainage management activity. The establishment of native plants to introduce shade along stream banks is a proven method to reduce macrophyte growth or density. Planting design should consider how to control weeds and rural fire risk.

Two large trials of note in the District involved naturalisation of the lower Ohoka and lower Waikuku Streams. These have been successful at reducing macrophyte density. The former was a Council-managed project whilst the latter was undertaken and managed by a private property owner. Both drains required regular maintenance prior to naturalisation. Following establishment of the native vegetation on the margins, no further drain cleaning has since been required. Other smaller areas of drain in parks and public places have also been naturalised in recent years, and effects are being monitored to inform selection of further locations.

With shading, in many cases, especially with an east – west aligned stream, the use of glyphosate and or weed raking can be completely eliminated.

Another option is to plant native reeds or grasses within the drain bed margins at the toe of the bank/s. This will increase drain velocity and naturally limit nuisance weed growth.

The type and height of vegetation required for shade is dependent on the width and cross-section of the drain. This means tailor-made planting programmes need to be developed for each drain.

New naturalisation areas identified for inclusion in the drainage maintenance contract are added from time to time. Naturalisation provides for filtering of nutrients and sediment, improves amenity and bank stabilisation. Naturalisation creates shelter and wind breaks, which increase local drain system humidity and can improve the microclimate in vicinity of drains. The shelter belts created also provide shelter for nearby stock.

A report by Hudson and Harding notes that *“several overseas reviews have indicated that more cost-effective and sustainable management can be achieved by naturalising the waterway... If left alone, channelized reaches will frequently return to their natural shape... In Denmark, three years following re-meandering of 580m of the Idom A Stream significant increases in the trout population were observed. In the re-meandered reach, trout populations had recovered to the levels observed in a natural reach downstream”* (Hudson and Harding *“Drainage Management in New Zealand: A review of existing activities and alternative management practices”*, 2004, p.28).

In particular, naturalisation adds shade to the drain, reducing proliferations of aquatic weed growth. Riparian planting is ideally undertaken on northern banks, to maximise shade that will reduce growth of aquatic weeds. Access for the weed raking excavator can be provided on the southern bank where native grasses can be planted to stabilise the bank edge. The excavator can reach over the grasses to provide future drain cleaning. Over time as the riparian species establish, less drain cleaning will be required. Public visibility of the drain can be retained by planting low growing carex plants, which will still stabilise the margins.

Planting of grasses or rushes/reeds inside the drain bed itself will naturally create a low flow channel. This speeds up flow velocity which will reduce nuisance weed growth.

Some general guidance for root protection is provided by Henry Hudson in the following diagram;

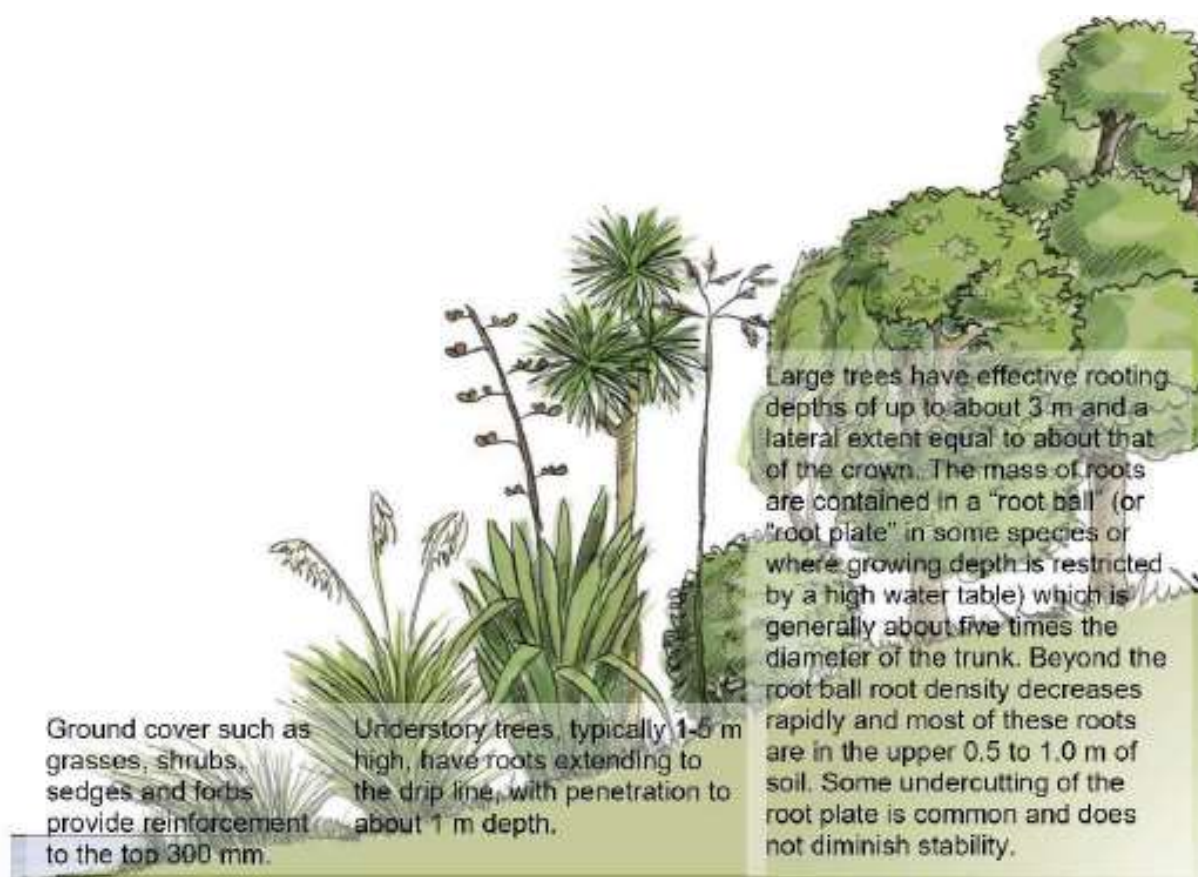


Figure 5: Riparian Plantings Guidelines

Source: Henry Hudson "Scoping Strategy for the Three Brooks and Channel Enhancements in the Middle Cam River and Tuahiwi Stream", August 2017.

The Environment Canterbury Defences Against Water Code of Practice adds further requirements for riparian waterway planting. These are:

- Introduction of planting of vegetation shall not be of a species listed in the Biosecurity New Zealand Unwanted Organisms Register or the Canterbury Pest Management Plan.
- Introduction of planting in, on or under the bed of any river or lake listed as a "high naturalness waterbody" in Sections 6 to 15 of the proposed Land and Water Regional Plan shall only be of indigenous plant species that occur naturally in the catchment.
- Where site conditions and funding allows, incorporate planting of appropriate native species.

#### 8.1.1. Riparian Planting - Drain Margins

Riparian planting has many benefits such as providing habitat and food for native birds, introducing shade to the waterway and filtering runoff of nutrients and sediment from surrounding land.

Native grasses can provide dense ground cover which intercepts nutrients and sediment in runoff.

*Carex secta* or *Carex virgata*, when encouraged to overhang the waterway, reduce water weed proliferation along the stream margins and can provide inanga spawning habitat.



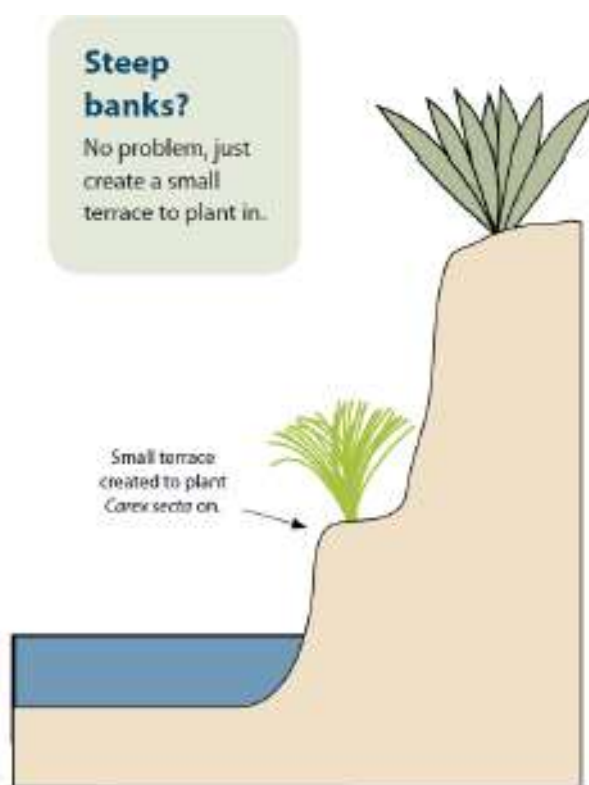
Flax plants (*Phormium* species) grow very large and have a shallow root base. They should only be planted on stable fairly flat ground. They should not be planted on steep bank sides or too near the water due to the risk of collapsing into the water and causing drain blockages.

Having areas of riparian planting with some low grasses enables an excavator with rake or bucket to reach over the plants into the drain in case future management is required.

For maximum benefits a width of 10m+ on either side of a waterway may be considered ideal for riparian planting. However this may not always be practical in a working landscape.

Technical advice on establishing riparian planting is provided by Henry Hudson in 2017, in his “*Scoping Strategy for the Three Brooks and Channel Enhancements in the Middle Cam River and Tuahiwi Drain*” report. He advised plants to be selected based on the purpose of the planting. This may be for biodiversity, erosion control; contaminant trapping; or for shading, and include assessment of the desired bank shape (profiles) and how frequently the zones are flooded.

A design option for planting narrow steep drains, if bank battering is not an option due to limited space, is shown in the following diagram:



**Figure 6: Riparian Planting on Steep Banks**

Source: Environment Canterbury Living Streams Handbook Part 3: Planting and Maintenance

The planted areas will range from the "margins" that are continuously wet (they intercept the groundwater table and are flooded by streamflow), to frequently wetted lower bank zones; and upland fringe zones that are flooded infrequently.

Further as also suggested in the Hudson Report 2017, the first priority will be to establish ground cover on the disturbed areas (e.g. regrassing). This grass will provide a high degree of protection against streamflow

and surface wash (rainsplash and runoff) in a short period of time. Following re-grassing, lower bank plants such as rushes, flax and toitoi; and shrubs and trees will be planted progressively further up the bank. Upper bank planting is also proposed, to provide a stream corridor that is biologically diverse.

Deep rooted plants may be required on benches and side slopes to control mass slope failure and provide additional erosion resistance where channel migration may occur. The advice from Henry Hudson (2017) was adopted within the Assessment of Environmental Effects (AEE) for the Environment Canterbury consent for stream planting and bank reshaping granted in 2019 for works in the eastern Waimakariri District.

### **8.1.2. Riparian Planting Small Tributary Drains, Gullies and Critical Source Areas**

Riparian planting can also be targeted to small farm inflow drains or channels and wet ground depressions to intercept the runoff at the point just before it enters the Council drain. This planting can be in or around the riparian area of the depression junction with the drain.

This will intercept surface runoff, slowing water movement and allowing sediment to drop out. Wetland plants intercepting the runoff will also directly uptake nitrogen from within the rural runoff and reduce enrichment and associated weed growth in downstream Council drains.

### **8.1.3. Increase Velocity - Create a Low Flow Channel with Toe Planting**

The Council may also trial naturally increasing the velocity of the drain base flow by planting reeds, rushes or Carex grasses in the water margin/s along the inside toe of the drain banks, in appropriate locations where hydraulic capacity will not be compromised. This naturally creates a “V” shape, considered suitable for the base of wide flat drain beds.

Bank battering along the upper sides of these drains can compensate for any loss of capacity in the base, if required.

A faster moving low flow channel will naturally limit nuisance weed growth and reduce future drain maintenance requirements.

Depending on water depth, plant options could include:

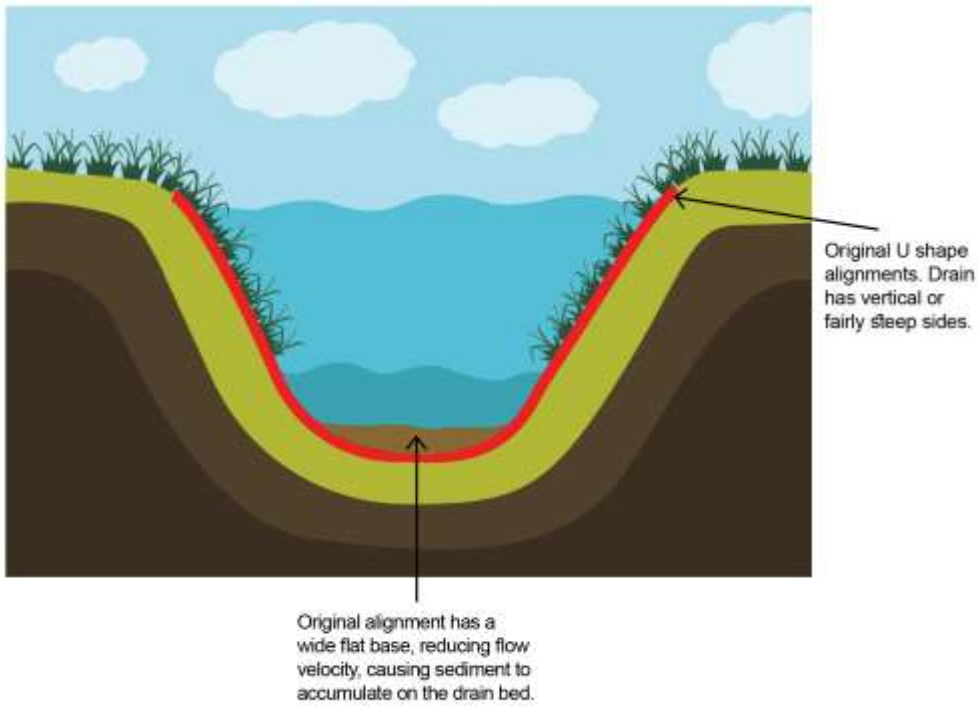
- 1) Shallow or frequently wetted channel: *Schoenoplectus tabernaemontani* (sedge- grey club-rush) - although may grow substantially and dominate small drains;
- 2) Periodically wetted margins: *Juncus edgariae* (rushes – wiwi); or *Apodasmia similis* (Oioi - rushes); or *Eleocharis acuta* (spike sedge); or
- 3) Occasionally wetted dry margins (*Carex virgata*).

Addition of linear wetland plants within the drain bed will create a low flow and flood channel (two stage channel) with “V” shape drain base. The plants will trap sediment along the margins, gradually lifting the riparian edges whilst filtering runoff from adjoining land.

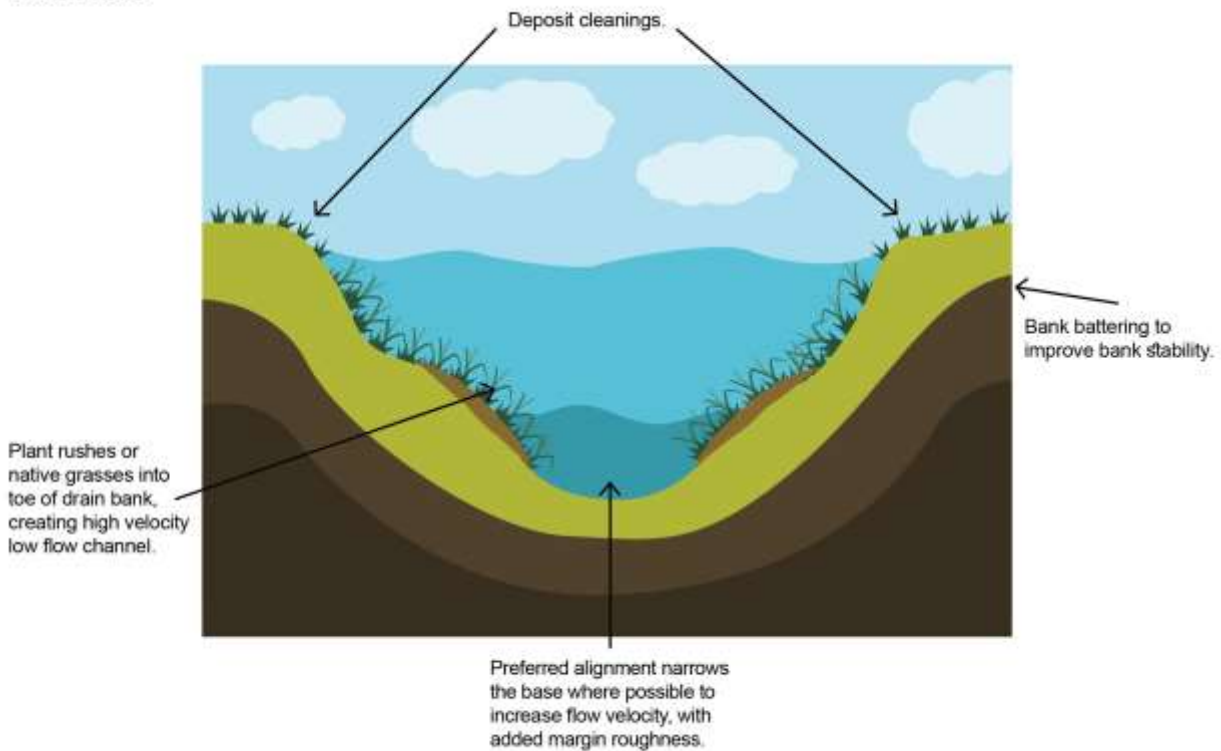
Cleanings from any future weed raking (if required) can be deposited behind the plants, further elevating the “V” shape and allowing rapid return of aquatic species to the waterway immediately following any drain cleaning.

This is shown in the following diagram:

**Before Work**



**After Work**



**Figure 7: Low Flow Channel Creation**

#### 8.1.4. Provision of Shade

Shading of the waterway reduces aquatic weed growth, reducing the future frequency required for drain cleaning. It also reduces water temperature which can increase levels of dissolved oxygen in the water, improving conditions for fish and other fauna.

Tall plants such as cabbage trees and flax can provide shade across much of the drain, particularly if planted on the northern bank.

The following photos indicate effects of shade provided by overhanging Carex and tall riparian plants on the banks of a channel. Aquatic macrophytes can remain more prolific in the less shaded areas. The effect of the overhanging vegetation and partial shading reduces density of aquatic macrophytes in the deeper main channel, establishing a more natural meandered low flow channel. The low flow channel achieved by this method improves velocity in the shaded reaches. Grass on the riparian margin of the top photo naturally forms a flood channel, where sediment will be trapped during high flows.



Figure 8: Riparian Shade and Meander

Source: Dr Henry Hudson “*Scoping Strategy for the three Brooks and Channel Enhancements in the Middle Cam River and Tuahiwi Stream*”, August 2017.



**Figure 9: Riparian Shade**

Shade at the point where the water meets the stream bank can reduce germination of weeds and the amount of weed growth spreading across the channel. This is also demonstrated in the above photos.

The aim is not to shade out all water weeds, as they provide habitat for many species. Planting for shade intends instead to reduce the areas of excessive and dense growth. A well designed buffer of vegetation will also reduce the amount of sediment reaching the drain, further reducing the need to clean.

If the main aim of riparian planting is to provide shade to the water, then for smaller deep channels, relatively narrow plantings of grasses and sedges will be sufficient. For larger drains, taller shrubs and trees (and time for them to mature) will be required.

Shading of drains may reduce plant biomass and density, and change the prevalence of the plant species present. Shading is shown to increase the prevalence of native aquatic plants.

A study by Hudson and Harding in 2004 found that *“In an 8 month trial in a small drain in the Waikato, Scarsbrook et al. (2000) reduced light levels by 90% with artificial shading. In this study there was no effect on the overall amount of plant cover that occurred across the stream. However there was a significant change in both the type and density of plants growing under the shade. During the summer months shading dramatically reduced the growth of the dominant aquatic plant Polygonum, and plant biomass was only 20% of that in an unshaded “control” reach. The shaded reach also supported a more diverse plant community with several native species being co-dominant (particularly Potamogeton and Nitella) in contrast the unshaded portion was almost entirely dominated by Polygonum”* (Hudson and Harding *“Drainage Management in New Zealand: A review of existing activities and alternative management practices”* 2004, p.27).

#### **8.1.5. Retention of Rank Grass/ Pasture Grass**

Rank grass retention is an alternative approach to riparian planting. Similarly to native plantings, rank grass stabilises stream banks and provides some filtration of rural runoff. It can provide inanga spawning habitat. However rank grass does not enable shading of the waterway, meaning that weeds can proliferate. It also does not provide additional biodiversity.

### **8.1.6. Meandering a Drain Channel**

Meandering a drain into a more natural, sinuous flow pattern may add both flushing and sediment deposition areas into the stream bed. Flushing may clean sediment to reveal gravel substrate, or gravel can be added to flushing areas which creates spawning habitat for trout and salmon. A meandered flow also creates a more diverse habitat for aquatic species. Meandering of a drain may not be feasible within space constraints such as land ownership and road boundaries.

A meandering channel can be established by adding rocks or overhanging grasses on one bank. This can be followed up by slightly widening alternate areas on opposing banks if required. Alternatively with restoration planting, drains are likely to naturally meander to some extent over time.

### **8.1.7. Drain Naturalisation – Best Practice and Recommendation**

It is recommended that the Council adds a proactive riparian planting programme each year into the drainage management programme. This would make each planted section of drain more self-maintaining in future. This adds shade that directly reduces nuisance weed growth and the associated need for ongoing weed control. Shading of drains reduces plant biomass and density, and increases the prevalence of native aquatic plants.

Trials are also recommended to increase velocity of the channel base flow. This is achieved by planting rushes, reeds or Carex grasses into the drain bed at the toe of the bank. Increasing velocity naturally reduces nuisance plant growth.

In addition, a meandering channel can be established by adding rocks or overhanging grasses, to increase habitat diversity for fish and invertebrates.

Naturalisation with planting provides for filtering of nutrients and sediment, improving amenity and bank stabilisation. It creates shelter and wind breaks, which increase local drain system humidity and can improve the microclimate in vicinity of drains. The shelter belts also provide shelter for nearby stock.

Shade at the point where the water meets the stream bank can reduce germination of weeds and the amount of weed growth spreading across the channel.

The aim is not to shade out all water weeds, as they provide habitat for many species, but to reduce the areas of excessive and dense growth.

The areas to be planted could be drains where most frequent repeat annual maintenance to control weeds is currently required. Also drains with good habitat values, or potential to provide good habitat for fish could be prioritised.

Critical source areas such as small rural tributary drains or overflow channels could also be intercepted with plants and/or bunds to assist to treat contaminated runoff before it enters the drain. These could be installed by the Council or landowner of adjoining privately-owned land.

## **8.2. Bank Stabilisation**

Bank stabilisation seeks to create a more gentle profile from the drain bed to the surrounding land. This replaces the historic approach to drain management of digging “square” bottom drains with flat beds and steep or vertical sides. Bank stabilisation creates drains with more gently graded sides with a narrow base,

which can also possibly incorporate a meandering / natural cross-section rather than strictly straight form into the design.

Banks of silt tend to be less stable than gravel and bedrock, thereby more likely to require bank stabilisation.

The relative stability of a range of drain slopes is presented in the following diagram:

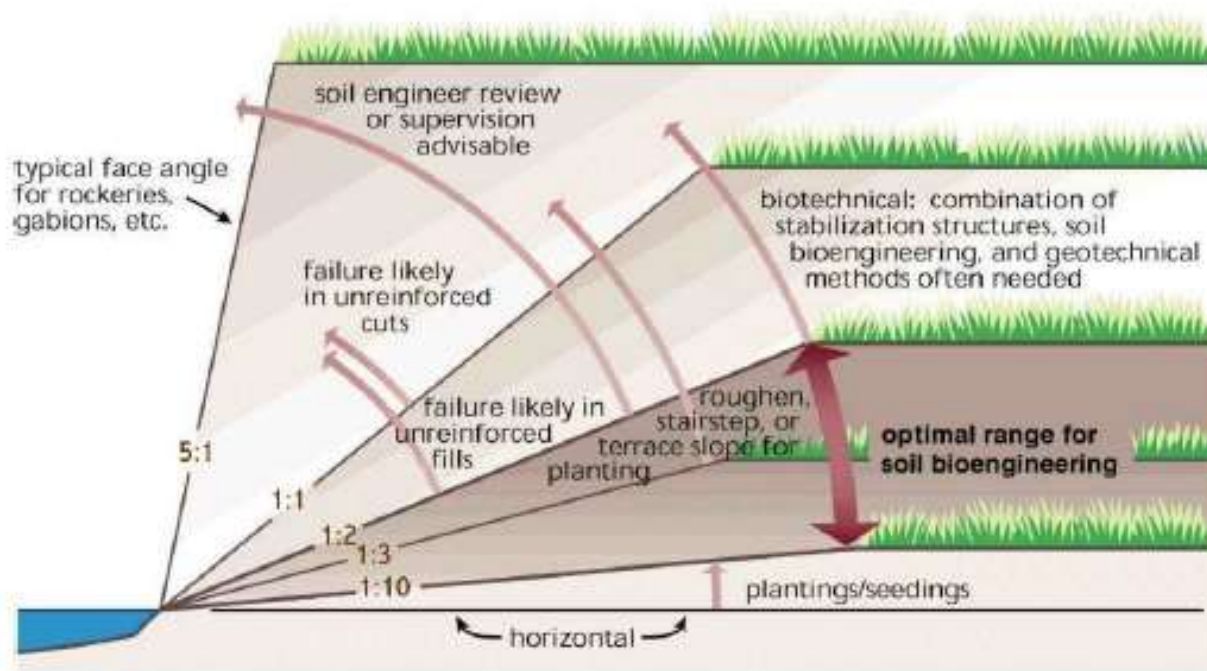


Figure 10: Bank Stability

Source: Dr Henry Hudson "Scoping Strategy for the Three Brooks and Channel Enhancements in the Middle Cam River and Tuahiwi Stream", August 2017.

Bank stabilisation is recommended in future to be combined with legacy sediment removal projects, or within drains where riparian land is available to enable bank battering.

Bank stabilisation will also be undertaken where required to stabilise any unstable, eroding or collapsing drain bank.

Bank stabilisation can create short term effects in wet drains, releasing sediment which may interfere with fish passage and create temporary disturbance of aquatic habitat and spawning vegetation. However, the outcome of bank stabilisation will reduce future incidences of bank erosion and improve spawning habitat (for coastal drains). This is by creating a gentle bank grade where suitable inanga spawning vegetation can more easily establish than on steep or vertical drain banks. The narrowing of a drain base channel will improve flushing of sediment and may expose areas of gravel suitable for trout or salmon spawning.

On completion, revegetation is required to be promptly undertaken to provide a protective surface to mitigate erosion and scour. This may be initially achieved with re-grassing followed by planting of larger native riparian plants.

The Council currently uses rocks in many locations to stabilise drain banks. It is recommended that stabilisation with rocks be accompanied with bank reshaping where suitable land is available. However for narrow drains with minimal land on the margin, and for drains immediately adjacent to roadsides, rocks may remain the most suitable stabilisation option.

### 8.2.1. Bank Stabilisation Techniques – Bank Grading

The creation of a bank batter with grade of at least 1:2 will reduce steep bank slopes thereby reducing the risk of future bank erosion. If insufficient land is available to achieve a 1:2 batter then a grade of 1:1 can be excavated, but these steeper sides may be more prone to slips. Bank battering is a component of drain naturalisation and is recommended whenever suitable riparian land is available to create the batter. This may require a widened margin between the drain bed and bank top. The resulting shallow grade reduces soil erosion into the drain and assists to retain and enhance flood carrying capacity.

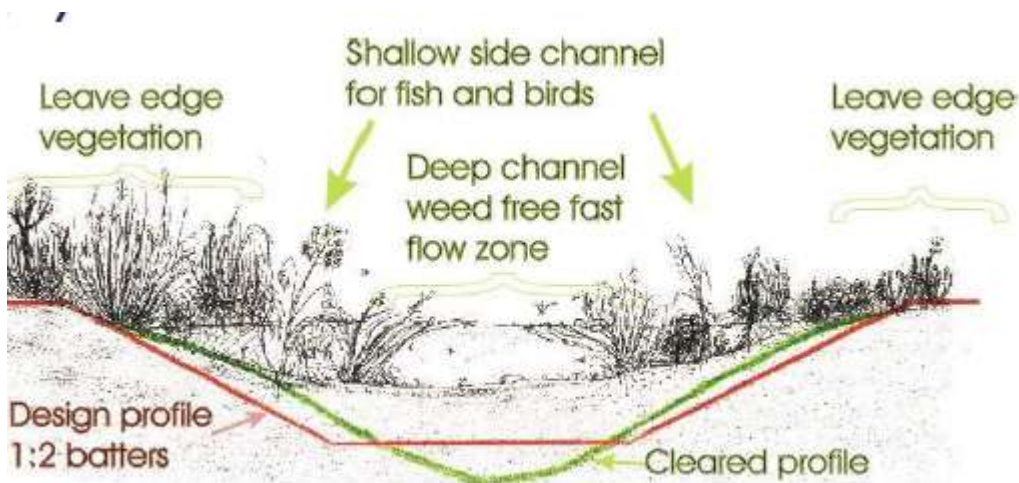


Figure 11: Drain Bed Profile

Source: Henry Hudson “*Scoping Strategy for Three Brooks and Channel Enhancements in the Middle Cam River and Tuahiwi Stream*”, August 2017.

### 8.2.2. Bank Stabilisation Techniques - V Shape Channel Creation

The creation of a V shape channel is recommended in situations where there is insufficient land available to achieve bank battering of at least a 1:2 grade or to create a two stage channel. A V shape can also be established just in the channel base, even if there is no room to batter the banks.

It is acknowledged that it may be difficult to excavate a V shape into existing drains and once excavated the V shape may be difficult to maintain with the weed rake. A modification to existing drain cleaning machinery may be required to assist to implement this method.

A V shape channel (e.g. aim for grade of a minimum of 1:1, or ideally, 1:2) will help bank stability and the establishment of vegetation. This will also create faster water flow in the narrowed centre of the channel which will reduce weed growth. Rebattering or reshaping of the banks can increase the flood capacity at times of peak flow and gently sloping banks can provide a platform to establish buffer vegetation.

### 8.2.3. Bank Stabilisation Techniques – Two Stage Channel Formation

The introduction of battering can include areas of two stage channel in locations where suitable riparian land is available adjoining the drain. The low flow channel is formed by excavating a narrow channel within the



existing drain base. The flood channel is formed as a component of bank battering. It is extended as a low shelf with gradual batter outwards from the toe of the bank.

The narrow “low flow channel” assists to flush sediment and weed from the faster flowing increased velocity base. The flood channel creates a shallow overflow swale adjacent to the narrow base. In the flood channel, planted riparian vegetation or rank grass can assist to trap and treat suspended sediment during flood conditions. It will also filter runoff from adjoining land. The banks above the swale can also be planted.

This option requires sufficient space to be available on the drain margins. A two stage channel design option is shown in the following diagram. The narrow low flow channel is excavated into the substrate (or formed by narrowing the original bed width profile), and a periodically inundated vegetated high flow channel is excavated or allowed to naturally form surrounding the narrowed base:

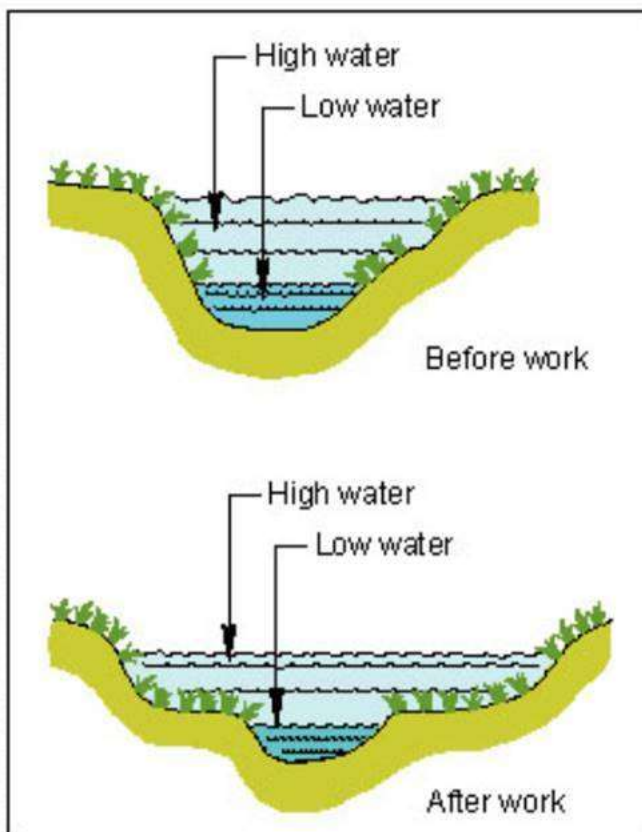


Figure: Construction of multi-stage channels.  
(Adapted from Cowx & Welcomme, 1998.)

Figure 12: Multi- stage Channel

Source: Dr Henry Hudson “Scoping Strategy for the Three Brooks and Channel enhancements in the Middle Cam River and Tuahiwi Stream” August 2017.

#### 8.2.4. Bank Stabilisation Best Practice and Recommendation

It is recommended that the drainage management programme include the following future activities:  
Reshape drains with high vertical banks and flat beds, either;

- Into a two stage channel (narrow low flow channel and wider, elevated flood channel possibly forming a shelf or swale);
- Bank battering (aim for grade of 1:2) into a wide V shape, in areas where wide channel margins are available; or

- Creation of a narrow V shape channel (typical grade 1:1) to reform straight deep channels with square flat bases, at locations where limited riparian land is available for creation of gentle bank battering.
- Excavation and future maintenance (if required) of a V shape channel may require modifications to existing drain cleaning machinery.
- Continue to use rocks where relevant to stabilise narrow steep drain banks.

### **8.3. Creation of In-stream Habitat**

Creation of riffles and pools, or two stage channels are great opportunities to improve in-stream habitat whilst undertaking general drain management activities. When an excavator with bucket/rake is present at a site for weed excavation it can also excavate areas of riffles and pools, or form a two stage channel within a stream bed.

Riffles create trout spawning areas and are a preferred habitat for insects and for elvers (baby eels).

The pool areas, when slightly deepened and widened will trap sediment in the drain. These also provide areas of deeper water which provide preferred habitat for some fish species.

#### **8.3.1. Riffle and Pool Method Creation**

Excavation of riffles and pools is achieved by excavating raised ridges and pool areas into a drain bed.

Each riffle, once excavated, could have gravel deposited which creates new fish spawning habitat. Riffles often naturally occur at about 6 or 7 channel widths apart.

Pools can be deepened and widened using an excavator between the riffles, so as to slow the velocity of the channel and trap sediment in these locations.

#### **8.3.2. Riffle and Pool Creation – Best Practice and Recommendation**

It is recommended that the drainage management programme include the following future activities:

- riffle and pool creation in drains that currently have fair or good water clarity, which provide or with potential to provide trout, salmon or native fish habitat

### **8.4. Repair of In Channel Physical Structures**

#### **8.4.1. Repair of Timber Drains or Retaining Walls**

The Council repairs timber walls, headwalls, retaining walls, slipped banks or damaged bank cladding as required. It is obtaining consent to undertake these activities through the consents CRC 195065 – 67.

Repair options include coffer dams, which involve building an enclosed dry area within a wet drain. This requires pumping to create a dry work environment.

Alternatively, silt fences or turbidity curtains can isolate a work area within the drain or along the banks, and reduce the dispersal of sediment into a flowing waterway.

The Council will follow the erosion and sediment control measures required by these consents during works, or refer to the Environment Canterbury Erosion and Sediment Control Toolbox for Canterbury.

#### **8.4.2. Repair of Utilities**

The Council repairs drainage or other utilities infrastructure intercepting drains as required. As with repair of retaining walls, it is obtaining consent to undertake these activities through the consents CRC 195065 – 67. It will follow the erosion and sediment control measures required by these consents during works, or refer to the Environment Canterbury Erosion and Sediment Control Toolbox for Canterbury.

#### **8.4.3. Repair or installation of rock riprap or gabions**

Occasionally the Council installs or repairs rock riprap or gabions in its drainage network. This is to provide bank stability and protection from scour, particularly for protection of lateral structures such as fences, roads, or management access strips.

As with repair of retaining walls, the Council is currently obtaining consent to undertake these activities through the consents CRC 195065 – 67. It will follow the erosion and sediment control measures required by these consents during works, or refer to the Environment Canterbury Erosion and Sediment Control Toolbox for Canterbury.

## 9. Addressing Drain Management Effects

### 9.1. Erosion and Sediment Control

Erosion and sediment control measures are required to manage many of the effects of drainage management. This is to minimise the disturbance of sediment and its discharge into waterways, and to avoid the potential for erosion to occur or be exacerbated as a result of the works.

There is a risk that sediment removal or other works in drains will cause stranding of fish, or disruption to fish passage. Drain management work areas will be designed so that a separate passage for fish can be provided around the activity wherever possible. In-channel protection of an area of clear water will be provided if feasible.

There is a risk that disturbance of drain beds, banks or riparian margins during drain cleaning or legacy sediment removal can cause a release of suspended sediment. This can clog up fish spawning gravels or affect fish passage, reduce food availability for fish, or lower oxygen levels in waterways reducing suitable habitat.

The Environment Canterbury Defences Against Water Code of Practice 2019 contains several specific requirements pertaining to erosion control associated with drainage management works. The Council will implement these approaches when undertaking any works which disturb sediment in drains. These are:

- For earthworks located near open water, erosion and sediment control measures implemented in accordance with the Erosion and Sediment Control Toolbox for Canterbury
- Avoiding nuisance effects of dust, including requirements when using dust suppressants
- Minimising area of disturbance
- Avoid clearance of native vegetation wherever possible
- Consider impacts of earthworks on lizard habitat (possibly on rocky areas of drain margins)
- Excavated material not removed from site stockpiled outside of flowing water while awaiting backfilling
- Stabilise disturbed areas as soon as possible after works. This may involve sowing grass, planting with appropriate native species, re grassing/hydro mulching or placement of appropriate erosion protection fabrics/mats
- Ensure vegetation cover is achieved as soon as practicable

Any machinery used for drain management activities needs to be kept out of the water as far as is practicable. If machinery is required to be used within a drain then a single crossing point will be used as far as practicable, with erosion and sediment control measures in place downstream of that point.

WDC undertakes to ensure that, for any works in wet drains, discharges of sediment, other contaminant or organic material from the site into a waterbody (as defined by the Resource Management Act) will not occur for more than 10 hours in any 24 hour period, or for more than 40 hours in any calendar month. Works in wet drains should only occur during dry weather, and machinery should be sited on the banks, not within the watercourse, wherever possible.

### 9.1.1. Sediment Controls During Weed Raking

The best erosion and sediment control options for use in conjunction with a weed rake are:

- Configure the rake to remove bed weeds whilst avoiding excavating into the drain banks and margins
- Disburse the cleanings as evenly as possible along the tops or elevated insides of the drain banks. This will avoid concentrated flows from drying weed stockpiles from creating scour as flows enter the watercourse

### 9.1.2. Sediment Controls During Silt Removal in Wet Drains

For large reaches of legacy sediment removal in wetted drains, the Council will add a sediment trap into the lower reach of the drain, or alternatively, excavate a natural trap, where practicable. This will trap suspended sediment released during the works and reduce its dispersal into the downstream waterway.

The Council will refer to relevant technical design guidelines available to design and construct sediment traps, from the Dr Henry Hudson report *“Scoping Strategy for the Three Brooks and Channel Enhancements in the Middle Cam River and Tuahiwi Stream”* 2017. The diagram below is of a conventional sediment trap “rule of thumb” design.



Figure 13: Sediment Trap Design

Source: Dr Henry Hudson *“Scoping Strategy for the Three Brooks and Channel Enhancements in the Middle Cam River and Tuahiwi Stream”*, August 2017.

Alternatively, a number of natural sediment traps have been identified in many of the district drains. These can be excavated out as needed when sediment removal is being planned in upstream drains, to provide some downstream sediment trapping.

During any legacy sediment removal activities in any drain, where practicable it is recommended that any steep drain banks will be simultaneously reshaped to provide a gentle grade, as proposed in the “bank reshaping” section. If limited land is available the Council will seek to reform any “U” shaped drain that has a flat bed and steep or vertical sides into a V shape. This should have a grade of at least 1:1 or more gentle (1:2) where possible. This will assist to stabilise drain banks in future, enabling riparian vegetation to more readily establish on less steep surfaces and reduce future erosion.

For isolated areas of sediment removal in wet drains, a combination of silt fences or turbidity curtains can isolate the areas of works, reducing sediment dispersal and retaining a clear area of fish passage. Alternatively a coffer dam may be constructed, if feasible, to enable works to be undertaken in dry conditions.

The measures used will be appropriate for the type and scale of activities in the particular area and include undertaking works in dry weather or low flows whenever possible. Works may include use of geotextile cloth and use of mulch on worked surfaces to stabilise them.

#### **9.1.3. Sediment Control During Works in Dry Drains**

Sediment removal in dry drains is best undertaken in an extended period of dry weather. This reduces the risk of disturbed sediment being dispersed into the waterway during rainfall over the time of the works. Disturbed surfaces will be reinstated as soon as practicably possible after the works are complete.

#### **9.1.4. Works Site Reinstatement**

Upon completion of any activity, all sites will be reinstated to similar or better quality than existed before the works.

All disturbed areas will be stabilised to minimise the chance of ongoing sediment generation. This may include replanting with grass, flood protection vegetation, or where site conditions and funding allow, native plant species. Revegetation responsibilities extend beyond the initial grassing and/or planting of areas and include sufficient time to achieve suitable grass strike or plant establishment.

#### **9.1.5. Erosion and Sediment Control- Best Practice**

During removal of large areas of legacy sediment from wet drains the Council will install a downstream sediment trap or excavate a natural sediment trap, where practicable. In this context large areas of legacy sediment are defined as drain lengths of at least 100m.

Isolated areas of sediment removal from wet drains will have the works area protected or isolated by a silt fence or turbidity curtain as a sediment control method used within the flowing drain/stream. Alternatively if practicable a coffer dam may be constructed. An area of clear water within the drain will be protected where practicable to provide for fish passage.

During any legacy sediment removal activities in any drain, the Council will consider whether it is feasible to reshape drain banks to provide bank battering to a gentle grade, in line with options proposed in the "bank reshaping" section. If limited land is available the Council may seek to reform any "U" shaped drain that has a flat bed and steep or vertical sides into a V shape. This should have a grade of at least 1:1, or grade of 1:2 (or even more shallow) is preferred, where practicable. This will assist to stabilise drain banks in future and enable riparian vegetation to more readily establish, reducing future erosion.

WDC undertakes to ensure that, for any works in wet drains, discharges of sediment, other contaminants or organic material from the site into a waterbody (as defined by the RMA) will not occur for more than 10 hours in any 24 hour period, or for more than 40 hours in any calendar month.

Works in wet drains should only occur during dry weather. Machinery should be sited on the banks rather than within the watercourse wherever possible.

The Waimakariri District Council will refer to the Erosion and Sediment Control Toolbox for Canterbury in determining a suitable erosion control method for each activity.

Sediment discharge will be monitored to ensure that except for the first 4 hours of the discharge, the change in visual water clarity or turbidity downstream of the discharge shall not exceed 20% after reasonable mixing.

Monitoring will be carried out 10m upstream of the activity and downstream after reasonable mixing. Reasonable mixing is defined as the Mixing Zone specified in Schedule 5 of the Land and Water Regional Plan.

Clarity will be measured using a secchi disc or clarity tube where practicable, or where turbidity is measured, portable probes shall be used, calibrated for NTU or FNU

Records will be included in the summary of annual works provided to Environment Canterbury.

## 9.2. Management of Fish Passage

Usual drain cleaning activity will disturb fish passage and fish habitat from time to time. Effects may include release of suspended sediment and also vibration and noise associated with operation of machinery.

A report on *“Ecological Values in the Waimakariri District; and their sensitivities to minor works in waterways”* by AEL 2017, p. 5 explains that sea access is critical for most of the fish species in the district. This can be easily inhibited by long culverts, various water control structures and weirs. They state that *“in respect to river works, extended periods of flow over-pumping and velocity traps caused by coffer dam intrusion into the channel can inhibit fish passage, to and from, the sea”*.

The management works for flowing drains discussed in this review will have impacts on fish passage. Therefore reducing the duration of these works wherever practicable will be beneficial.

A study referenced by Hudson and Harding described effects on aquatic fish species in streams six weeks after mechanical weed control treatment, when compared to surveys prior to treatment. The findings were that mechanical cleaning significantly reduced plant coverage but did not cause significant changes in individual fish species, or in water depth, velocity, or in median substrate size six weeks after treatment. No difference was found in fish species richness or density six weeks after treatment (Hudson and Harding *Drainage Management in New Zealand: A review of existing activities and alternative management practices”* 2004, p. 16).

However other studies they referenced, including effects of mechanical clearance on invertebrates found significant disturbance of benthic invertebrate communities, with potential for direct removal of large numbers of individuals, and increased drift rates (Hudson and Harding *Drainage Management in New Zealand: A review of existing activities and alternative management practices”* 2004, p.17). They noted that where bed disturbance occurred, invertebrate recovery may be slow, however if little or no bed disturbance occurred then rapid recovery has been recorded (p.17).

Fish require invertebrate fauna for food, therefore protection of invertebrate habitat is critical for the management of fish habitat. Minimising bed disturbance therefore improves availability of food for fish.

This finding implies that the effects of mechanical weed clearance are only experienced temporarily within each drain. Mechanical clearance has no lasting measurable impacts on its aquatic fauna provided bed disturbance does not occur. Therefore management of fish passage is appropriate in managing these temporary effects, in combination with applying the best practice mechanical drain cleaning techniques as outlined in the report. With these activities no long term adverse effects of mechanical weed clearance are anticipated in the district drains.

However, as the waterway velocity or water depth also did not change significantly six weeks after the completion of mechanical weed clearance when compared to velocity and depth prior to works, it is also unclear that the weed clearance activity itself is achieving its objective of reducing flood risk. This management plan also confirms that the Council intends to trial a “less intervention” approach, not undertaking its usual summer weed clearance in selected drains. It can instead allow natural seasonal

temperature and light level reductions to reduce the intensity of weeds during the winter when there is a higher risk of flooding.

When undertaking works in wet channels where fish are present, the Council will ensure that fish recovery is conducted for the duration of the works. Recovery is undertaken by Ngāi Tūāhuriri and is usually completed on the afternoon or evening of the day of the works. Where the fish recovery is not able to be undertaken by Ngāi Tūāhuriri it will instead be completed by trained Council staff or contractors.

Although Environment Canterbury recommend fish recovery continues up to at least one day after drain cleaning, this timeframe cannot be guaranteed by the Council. This is because the programme is directly managed and undertaken by Ngāi Tūāhuriri. Fish recovery will be conducted both instream (for suffocating fish) and bank side (for stranded fish). Recovered fish will be returned to an upstream area.

It may be possible to provide for fish passage around an area of debris, obstruction or legacy sediment removal in a stream or drain. This is by, for instance, isolating the works area from the main channel with a silt fence or silt curtain or similar sediment control device.

Fish spawning areas will be avoided during spawning periods whilst drain cleaning.

### **9.2.1. Management of Fish Passage – Best Practice**

Any stranded fish during drain cleaning works are recovered where practicable during or following the cleaning operation and returned to an undisturbed area upstream of the works. The cleanings on the drain banks are monitored by Ngāi Tūāhuriri after the cleaning work is completed. The extent and period of monitoring is determined by the cultural monitor as per agreed practice.

The preferred approach is to have Ngāi Tūāhuriri undertake the aquatic fauna relocation.

However, to avoid non-compliance with the pending consents CRC 195096 - 67, the Council will train and arrange for a suitable team of staff and /or contractors to be available to assist with aquatic fauna relocation as a backup option, if/when needed. This will follow a method as agreed with Ngāi Tūāhuriri, including relocating fish or invertebrates to an upstream reach of waterway on the afternoon or evening following raking, if Ngāi Tūāhuriri representatives are unavailable to perform this work.

Wherever practicable, fish passage will be provided around an area of debris, obstruction or legacy sediment removal in a stream or drain. This is by, for instance, isolating the works area from the main channel with a silt fence or turbidity curtain or similar sediment control device, or possibly with a coffer dam, if works need to be undertaken in a dry area to minimise sediment dispersal. The selected method will be determined considering effects of each, including extent of intrusion of the sediment control device into the channel, degree of protection provided, and extent of release of sediment and other effects. This will be undertaken in accordance with the Erosion and Sediment Toolbox for Canterbury.

### **9.3. Management of Fish Spawning Habitat**

The protection of fish spawning habitat is currently provided by local knowledge of the Council drainage staff and drainage contractor. Known spawning sites, as specified in the Canterbury Land and Water Regional Plan are avoided during the spawning seasons for the affected species (trout, salmon and inanga).



There are particular effects on spawning habitat of the various drain cleaning works for each fish species. These are described in the report *“Ecological Values in the Waimakariri District; and their sensitivities to minor works in waterways AEL”*, 2019, p.5, which summarises the following species specific effects:

**Brown trout:** Spawn from May to October, in stream bed gravel. The risk to spawning redds is that eggs are disturbed/killed by crushing from foot pressure or machinery contact with the drain bed, or high sediment loads released during drain cleaning. Emergent fry move into the riparian margins after hatching in October / November, where they congregate in large numbers. Maintenance and minor works during this period could disturb the fish and reduce fish refuge.

**Inanga:** Inanga are the adult life stage of the most common whitebait in Canterbury. Inanga spawn annually in the tidally-inundated riparian vegetation of lower rivers in the period February through to the end of May. Their spawning vegetation includes introduced grasses, native rushes, sedges or raupo thickets. The disturbance or removal of this vegetation can disrupt the spawning cycle.

The actual spawning location may change year to year, depending on the location of the upstream extent of the saltwater intrusion into freshwater. For instance, *“The saline wedge is regarded as an important cue for spawning inanga, therefore determining the location of the wedge with a conductivity meter is an important shortcut for finding the general location of spawning grounds...”*.

Spawning areas are located by an ecologist that will *“undertake an egg search once the high tide has sufficiently receded, starting at suitable vegetation near the upstream extent of the saltwater intrusion, and working downstream through suitable vegetation, mapping both the distribution of eggs and the distribution of suitable/unsuitable vegetation”* (*Ecological values in the Waimakariri District, and their sensitivities to minor works in waterways*; AEL Taylor and Marshall 2017, p. 7).

It is intended that protection of fish spawning habitat in future will be provided through compliance with the pending drainage management consents CRC 195096 -67.

### 9.3.1. Protection of Fish Spawning Habitat – Best Practice

Drainage management works will not be undertaken in the flowing channel at the spawning sites during the spawning season, identified on spawning maps held by the Council and as specified in consents CRC 195065 – 67.

This requirement applies during the trout/salmon spawning period of 1 May to 31 October for all watercourses. It applies at identified inanga fish spawning sites during 1 February to 31 May. These limitations and timeframes apply unless a work site specific spawning survey by a qualified ecologist indicates that there are no spawning sites present that would be adversely affected by the works.

The requirement for inanga spawning sites shall extend to include work on the banks. Work in January in areas identified as inanga spawning habitat will be restricted to instream weed removal only.

At least once every five years, the Council will generate a new spawning map based on any new spawning surveys undertaken. Its surveys will include all new spawning survey data published by the North Canterbury Fish and Game Council or other agencies in the previous five years.

Any new spawning survey prepared for the Council will be supplied to the North Canterbury Fish and Game Council and the Canterbury Regional Council compliance and enforcement team within 30 days of completion of the survey.

## **9.4. Management of Bird Nesting Habitat**

The protection of bird nesting habitat is currently provided by local knowledge of the Council drainage staff and drainage contractor. It is intended that protection of bird nesting habitat in future will be provided through compliance with the pending drainage management consent (CRC 195065 - 67).

The required protections usually relate to works on braided rivers. However bird nesting habitat protection is noted in this report as the Council may undertake periodic works on tributary drains near braided river beds and should be aware of any implications of works in these areas for nesting indigenous birds.

### **9.4.1. Protection of Bird Nesting – Best Practice**

Drainage management works will not occur within 100 metres of colonies of indigenous birdlife that are nesting or rearing their young in river bed gravels from 1 September to 31 January of the following year. This is unless a survey by a qualified ecologist indicates that there are no sites that would be adversely affected by the works.

There are no drains or braided river channels currently regularly maintained by the Council where nesting of rare or threatened indigenous bird species occurs (as defined by the Department of Conservation threat classification system). These conditions however apply when unplanned works occurs on a drain which is not regularly monitored. In these circumstances checks for bird nesting will be undertaken as required in the consent.

## **9.5. Management of Mahinga Kai, Wāhi Tapu and Wāhi Taonga**

The Council is actively working with Ngāi Tūāhuriri and Mahaanui Kurataiao Ltd to protect and enhance safe mahinga kai areas.

This takes into account the value of sites for previous generation's mahinga kai collection, current and potential value of the food resources available, distance from Tuahiwi, the water quality at the site and ease of access (e.g. public land or private Maori Reserve).

### **9.5.1. Ecosystem Values**

The Waimakariri drainage system includes a number of mahinga kai food resource areas and supporting ecosystems of great value to Ngai Tūāhuriri.

In terms of regular scheduled drainage management, key mahinga kai species which the Council discusses regularly with Ngai Tūāhuriri for purposes of protection and enhancement are koura, kākahi, eels, inanga and watercress.

The streams and rivers of the Kaiapoi River and Taranaki Stream catchments in particular were historically significant resource gathering areas and accessways for Ngai Tūāhuriri. Fish harvested from the rivers included tuna (eels), kanakana (lamprey), kōkōpu (giant kokopu), koukoupāra (bullies) and īnanga (whitebait).

Several bird species were also caught for food, such as pūkeko, putakitaki (paradise shelduck), pārerā (grey ducks) and weka.

Different areas (wakawaka) of the catchment were important for different kai species. Gathering rights were held by whanau or hapū groups, who lived in the kainga (settlements) of the area. Many of the kainga were

adjacent to the streams and rivers of the Kaiapoi catchment. Today, the township of Tuahiwi is adjacent to the Ruataniwha Cam River.

#### **9.5.2. Wāhi Tapu & Wāhi Taonga**

The Council is aware that some of the rural drains and waterways are located within Silent File areas where wāhi tapu or wāhi taonga sites are present.

The Council and contractor work proactively with Ngāi Tūāhuriri when undertaking works within Silent File areas. This includes making Ngāi Tūāhuriri aware of usual drain maintenance timeframes in summer, in order to plan dates for fauna relocation following weed raking.

It may be the wish of Ngāi Tūāhuriri to not publish the location of wāhi tapu or wāhi taonga sites, particularly if these are burial areas or are the location of other significant cultural activities. Therefore any minor works locations within Silent File areas will be advised to Ngāi Tūāhuriri in advance of the works. Plans of the activity will be provided so that Ngāi Tūāhuriri can advise the Council or contractor if there are any effects or sites to be avoided.

#### **9.5.3. Kōura (freshwater crayfish) and kākahi (freshwater mussels)**

Weed clearance, if required, will most likely be provided by mechanical weed rake in areas which have high mahinga kai collection value. This includes drains where kōura or kākahi are known to be present. One drain with significant habitat value is crayfish creek in Rangiora, where a high kōura population has been found.

Mahinga kai areas are also able to be cleared by hand by the drainage contractor, subject to a site specific health and safety risk assessment. However hand clearance can be disruptive if the contractor is required to walk within the bed of the drain. The preferred option is however to avoid undertaking any weed clearance on drains that have a high mahinga kai value. Instead the Council will seek to establish weed control for these drains via shading and naturalisation where practicable.

#### **9.5.4. *Nasturtium officinale* (Watercress)**

Watercress harvest sites have been identified by Ngāi Tūāhuriri located on Council or other public reserve land.

These sites, where managed by the Council, will be protected from future drainage management mechanical or chemical weed clearance as far as is practicable.

A location and access plan of the Cam River (Topito Road - Bramleys Road harvest site near Tuahiwi is included below:



**Figure 14: Watercress Harvest Cam River main stem (Topito Road - Bramleys Road) Location Plan**

The Council has confirmed it will provide signage for public access to the site. It will also ensure that no spraying is undertaken at this site.

There is a potential risk of cyanobacterial bloom and pathogen contamination when harvesting watercress from the Cam River mainstem (Topito Rod - Bramleys Road). As community awareness of this site's designation for watercress increases, more people may choose to harvest from the site. Notification of the health risks will be coordinated with Environment Canterbury via signs at the site and/or via an email to the Tuahiwi Marae office, when health alerts for these contaminants are in place, as necessary.

Ngāi Tūāhuriri members will weed out Monkey Musk from the site, if desired, as this weed is possibly competing with the watercress. They will also work with WDC to provide more suitable access for kaumatua, such as mowing a path or forming rough steps using a hand tool, cut into the upper river bank.

Planned future activities to improve water quality at the site include implementation of the Cam River Enhancement Fund projects and implementation of the Rangiora stormwater network discharge consent. These projects should assist to improve water quality in the Cam River over time.

In addition, management of bacteria input from farms and wastewater overflows from Rangiora are key components to enable safe future harvesting of watercress from the Cam River. The former is being managed by Environment Canterbury, whilst the latter is currently addressed through the Rangiora wastewater capacity upgrade and other ways.

### **9.5.5. Inanga spawning**

The Council has a Waimakariri Zone Implementation Programme Addendum (ZIPA) projects to improve inanga spawning areas such as in tributaries of the Kaiapoi River. This will support the future harvest of inanga (whitebait) in the Waimakariri / Kaiapoi system, which is a key fishing area for Ngāi Tūāhuriri. Drainage maintenance works that have the potential to disturb sediment or bank vegetation in inanga spawning areas, will not be undertaken during the inanga spawning season.

### **9.6. Management of HAIL sites or activities**

There are no known HAIL activities or LLUR sites directly affecting any of the drains that are currently part of the Councils' regular scheduled drain management programme, based on past visual observations of drain water quality, soil texture and any water or soil discolouration or odour observed during drain cleaning.

Within one year of the commencement of these consents (CRC 195065), all regularly maintained drains where scheduled maintenance is undertaken will be checked against the LLUR and the Canterbury Land and Water Regional Plan Schedule 3 HAIL activities list in accordance with the procedure below. The steps required to identify and manage contamination risk from such sites / activities will be followed in accordance with the procedure.

Every site where minor works or unscheduled drain maintenance is proposed to be undertaken will be checked, prior to commencement of works, against Environment Canterbury's LLUR. In addition, sites will be also be checked to determine whether the Schedule 3 Hazardous Industries and Activities list of the LWRP is triggered.

This check of potentially contaminated land will include any HAIL activity located up to 50m upstream or up-gradient of any proposed minor works or drain maintenance activity.

If identified, any LLUR sites or HAIL activities in the locations described above will be further investigated by a Suitably Qualified and Experienced Contaminated Sites Practitioner (SQEP), or advice will be sought from the Environment Canterbury Contaminated Sites Management team to determine if the site has been previously investigated.

For work proposed on any LLUR site or within 50m of a HAIL activity as specified above, a Preliminary/ Detailed Site Assessment will be undertaken by an SQEP. This is unless sufficient information is provided by or agreed with Environment Canterbury to indicate that the LLUR site is not contaminated, or the upstream HAIL activity does not pose any environmental risk in terms of commencing the proposed drainage activity.

The site details and any assessments undertaken will be recorded on or attached to the Site Assessment Notice.

If the SQEP determines that further onsite investigation is required prior to commencement of the activity, then the SQEP will inspect the works site prior to commencement. The SQEP will direct the collection of laboratory samples of TSS, heavy metals or other possible contaminants that could be associated with current or previous activities associated with the LLUR site or HAIL activity, as deemed necessary.

If a contamination risk is identified, the SQEP may direct mitigations or adjustment to the scope of the activity as deemed necessary to prevent any contaminated material from being re-suspended or recirculated into a waterway during the works. If suitable mitigation / amendment to the activity cannot be confirmed, then the activity will be excluded from the consent.

If contaminated soils are proposed to be removed from any stream margin or stream bed these will be disposed of at a facility that is licensed to receive contaminated material. The removal and disposal of any contaminated material will be overseen by an SQEP.

An Unexpected Soil Contamination Protocol will be included with all drainage contracts. This will ensure that the contractor can recognise contamination on site and also provide a procedure to manage any unexpected contamination.

Advice Note: A SQEP is defined as a person with a relevant tertiary qualification and at least 5 years' experience in contaminated land matters, including the identification and assessment of contaminated soils and groundwater. These procedures are referenced in conditions of CRC 195065.

## **9.7. Managing Effects of Climate Change**

The review acknowledges that climate change may cause an increase in future severe weather events in the Waimakariri District. This may cause an increase in flood frequency, and an increase in the severity of future flood events. This may in turn cause an increase in soil erosion and sedimentation of drains during future storms.

The consequences and risks of climate change are captured in localised district flood hazard modelling. These factors are also incorporated into the decision-making process for drain management options proposed in the review.

The review decision framework includes an assessment of hydraulic capacity of each drain. This considers all historic, recent and future potential flood risk for the drain including effects of climate change for that drainage scheme. All of these factors will be taken into account when determining options for future management options.

## **10. General Requirements**

### **10.1. Refuelling and Accidental Spills Procedure**

All refuelling and handling of hazardous materials is carried out to avoid the potential for fuel or hazardous materials to enter the drain. Any fuel or hazardous materials will not be stored within 20 metres of a drain.

#### **10.1.1. Accidental Spills Procedure**

For all management works involving fuel or hazardous materials storage, a written spill response plan will be provided by the contractor, and communicated to all persons responsible for fuel storage and refuelling on site. A copy will be kept on site at all times.

#### **10.1.2. Chemical Spills Removal Procedure**

If a spill occurs, the following steps should be undertaken, in addition to any actions required under the site's spill response plan:

- a) Be safe
- b) Identify the spilt material
- c) Put on the necessary personal protective equipment
- d) Stop the source if you can to prevent the spill getting any worse or spreading
- e) Try to soak as much of the spill up with appropriate absorbent material

- f) If the spill material has soaked into the ground, the area of the spill should be scooped up and removed off site and disposed of at a suitable disposal facility
- g) Complete the spill response form and send it to Environment Canterbury
- h) If the spill is more than 1 litre or has the potential to cause harm, contact the Incident Response Hotline immediately (0800 76 55 88).

## **10.2. Traffic Management Implications of Roadside Drainage Works**

The Council has an approved traffic management programme in place for its drainage management activity. This is documented within the drainage management contract specifications and required by Council to be adhered to by contractors.

The contract compliance with traffic management requirements is actively monitored by the 3 Waters Drainage operations staff.

## **10.3. Personal Qualifications**

The various components of the drainage management activity are undertaken by personnel with the appropriate skills, with certification documented as required.

Within the drainage maintenance contract, specific requirements apply for activities such as entering a waterway, operation of a chainsaw or operation of heavy machinery near a waterway. This is documented within the contract specifications and required by Council to be adhered to by contractors. The contractor compliance with all certification requirements is actively monitored by 3 Waters Drainage operations staff.

Any personnel using chemicals to undertake aquatic or riparian weed removal are required to hold current and appropriate certification.

## **10.4. Managing Fire Hazard**

In drought periods it is recognised that drain side riparian planting may contribute to a fire hazard. This will be managed by the following:

- a) Maintaining a set-back when planting adjacent to any utility or other structure on the road reserve.
- b) Creating a break between each planting area and adjoining exotic farm shelter belt.
- c) Ensuring any riparian drain plantings do not overhang any road shoulder or vehicle crossing area where they could be set alight by sparks from engines or during operation of rural farm machinery on nearby farm tracks
- d) Maintain fire-fighting access to wet drains near rural dwellings for use of flowing water as a backup water supply

## **10.5. Health and Safety**

All aspects of the drainage management activity involve various health and safety risks. These include risk of operating heavy machinery on unstable drain banks or on wet, saturated ground. There is a risk of an excavator sliding into or overturning within a drain.

These risks are managed through specific Council operating procedures or as requirements for operators set out within the Drainage Maintenance Contract.

## 11. Alternative Management Option – Reduce Scheduled Maintenance and Monitor

This section introduces discussion of a potential new management technique which could be incorporated into the drain maintenance activity. This is an option to reduce maintenance of rural drains that are not known to cause recurrent flooding. This option is currently being trialled by the Ohoka Drainage Advisory Group.

This “low impact” management option is recommended because the literature review (see attached Drainage Review for full discussion) shows that aquatic weed cutting of dense macrophyte growths in summer/autumn has no material effect on drain hydraulic capacity in winter, for plant species that usually die back over winter. It is recommended therefore that the Council trial non-management of selected drains (e.g. less intervention), allowing natural seasonal temperature and light variation to control aquatic plant growth. The Council should monitor and evaluate the effects of this approach as a part of the trial.

The literature review shows that the peak growth season and other physical characteristics (e.g. degree of plant stiffness) of dominant macrophytes in a drain or stream determines the flooding effects that may occur. Potential flood risk arises during times of peak macrophyte growth which causes increase in water level or loss of velocity. However these effects and their associated flood risk is not carried over to seasons when plant biomass is low.

From review of available New Zealand and international literature, there is consensus that macrophyte biomass during peak growing seasons increases water level and sedimentation and decreases flow velocity. However, the increased flood risk is limited to/contained within the same time period of the peak growing season of dominant plants in each drain or waterway. The literature review shows that flood risk in New Zealand associated with peak macrophyte biomass affects mainly the summer and autumn seasons for most plants studied. Most prevalent New Zealand south island aquatic plants were not considered likely to cause flood risk during winter and spring.

The exception is certain aquatic weeds such as *Lagarosiphon major* that do not die back in winter. The effects of *Lagarosiphon major* on water depth and velocity and associated flood risk continue year round as peak plant biomass does not seasonally decline.

The trial of reduced or ceased maintenance of some reaches of drain could be undertaken in combination with adding shade to other reaches to maximise aquatic habitat diversity.

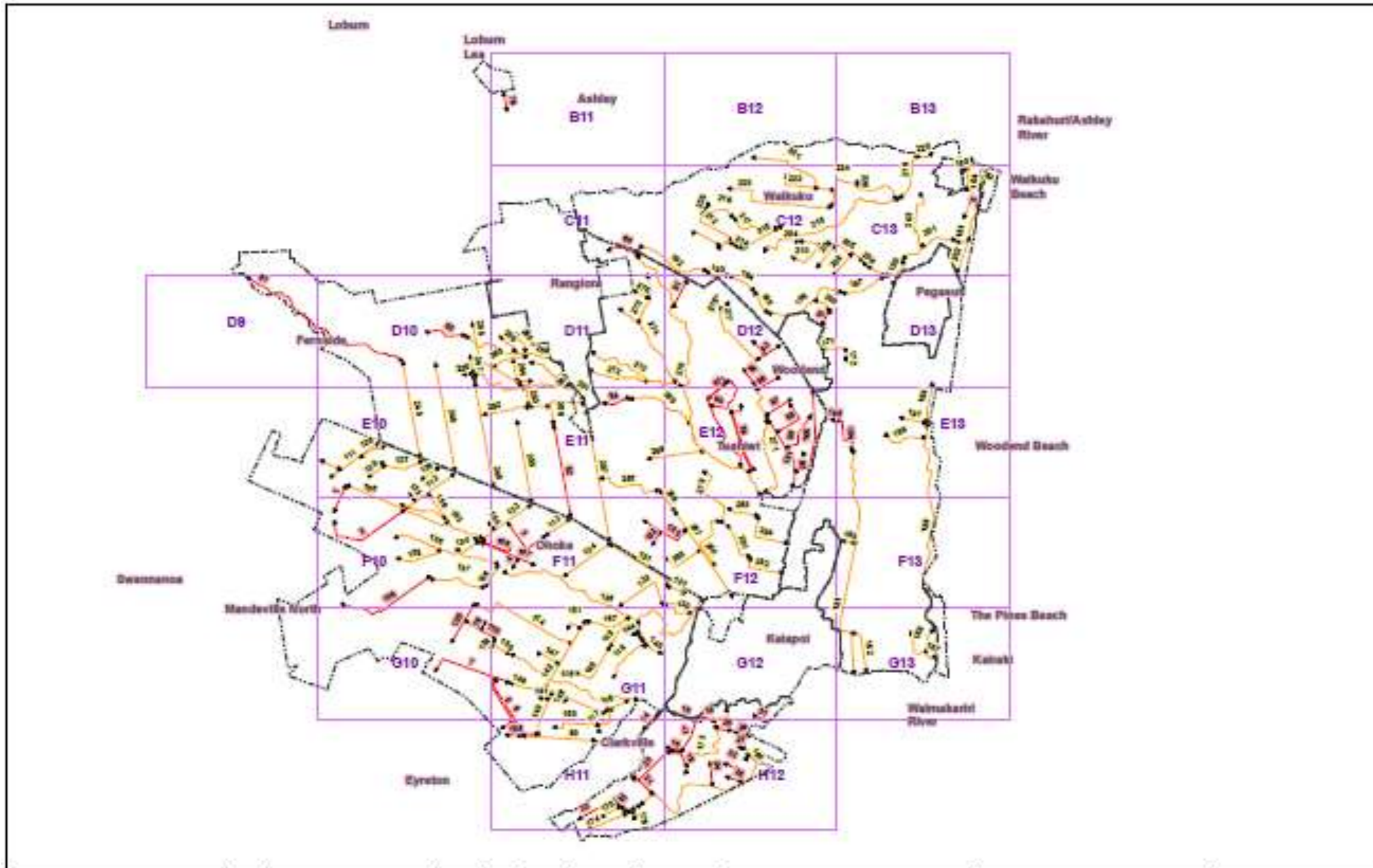
When combined these actions would: a) minimise long term management costs; b) enhance self-flushing of drains which would maximise hydraulic capacity within the existing drain footprint; and c) maximise aquatic biodiversity and range of habitat. These actions could assist to naturally establish the multi – stage channel concept endorsed within this plan. For instance, low flow channels of increased velocity would form in drain reaches where shading reduces some of the density.

This approach would allow drains to naturally become more self-managing, as drains tend to naturalise over time once human intervention ceases.

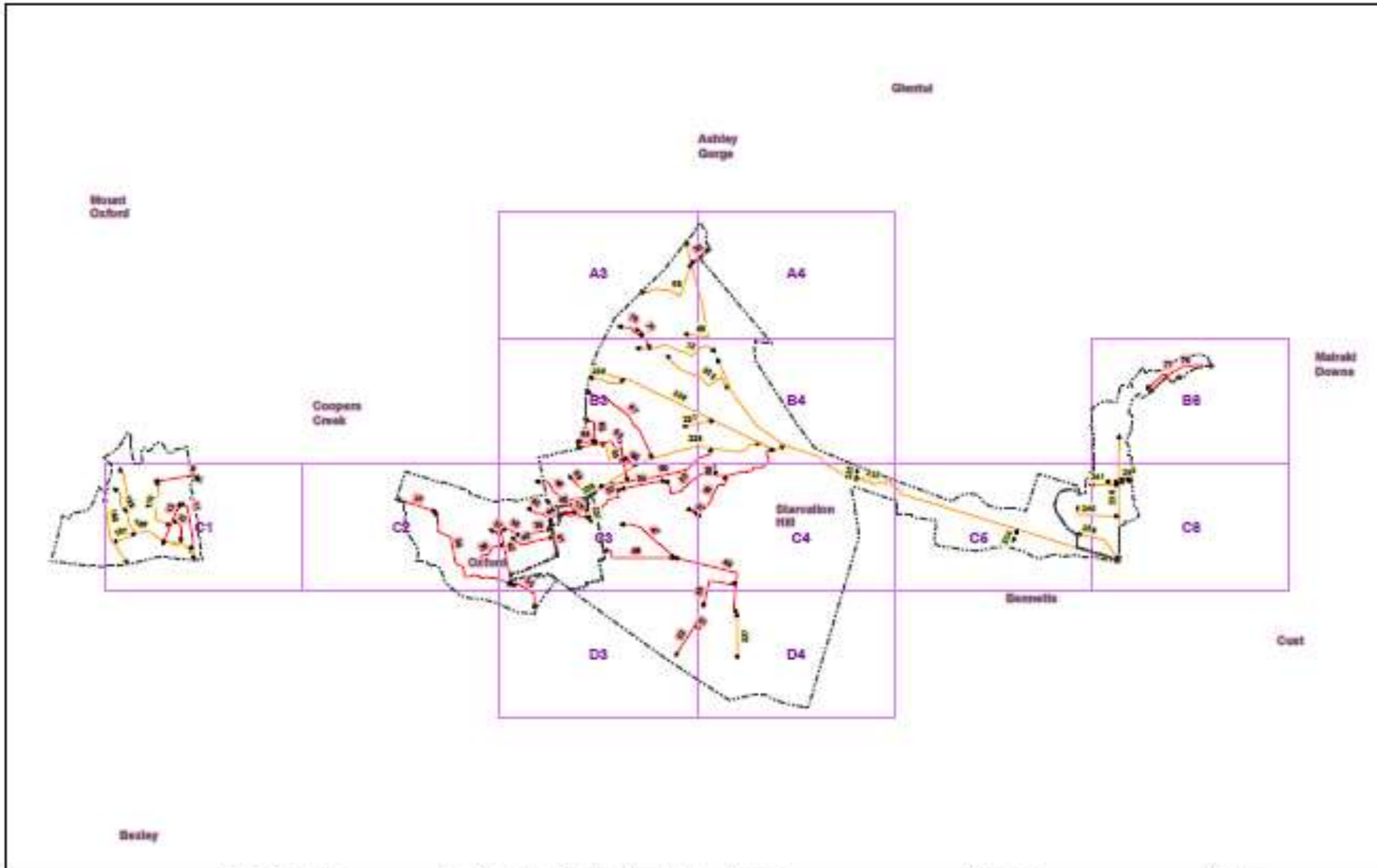
The Council should also maintain a high level of biosecurity monitoring. It should monitor the spread of *Lagarosiphon major* and other macrophytes which don't die back in winter. It should respond with aquatic weed removal where necessary to maintain drain hydraulic conveyance.







	ISSUE	AMENDMENT	DRAWN	CHEK	APPD	DATE	SCALE (A3)	SHEET TITLE	PROJECT TITLE	PLAN No	
	A	FIRST ISSUE	MC	JM	SKZ	11.01.2017	1:80,000			Aim Job: 3815	
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**WAIMAKARIRI DISTRICT COUNCIL****REPORT FOR DECISION**

**FILE NO AND TRIM NO:** CON202242-01 / 230406048685

**DATE:** 17 April 2023

**REPORT TO:** Management Team

**FROM:** Rob Rankin, Project Engineer  
Tjaart van Rensburg, Reticulation Contracts Team Leader

**SUBJECT:** Appoint WDC Water Unit to procure pipe for CON 22/42 Ashley Gorge Trunk Main Upgrade

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**1. Purpose**

- 1.1 The purpose of this report is to:
- a. Seek approval to engage the Waimakariri District Council's Water Unit to procure 1090m of 125mm OD PN16 PE100 pipe for a sum of \$32,181.60 excluding GST, to enable Separable Portion A of CON 22/42 Ashley Gorge Trunk Main Upgrade to commence in early May. Management Team's approval is required in order to comply with the Council's Procurement and Contract Management Policy.
- 1.2 CON 22/42 involves upgrading a section of pipe on Ashley Gorge Road and renewing pipe in private property, to increase the capacity and resilience of the network. The physical works of CON22/42 has been split into three separable portions (A, B & C).
- 1.3 To meet the timeframes for Separable Portion A, the pipework needs to be secured in advance of completion of tender and award to avoid supply lead time risk and ensure the materials are available for the project.
- 1.4 The supply of pipe for Separable Portion A was split out into a new Separable Portion, Separable Portion D.
- 1.5 As per the Procurement and Contract Management Policy, either 3 prices are required to be obtained for goods or services of between the value of \$20,000 and \$100,000, or Management Team approval gained. The value of pipe the Water Unit are procuring as part of this portion exceeds \$20,000, however only two prices were sought. The reason for this is that there are only two suppliers of this pipe type in the market. Therefore Management Team approval is required for the Water Unit's procurement process for the pipe.

**2. Recommendations**

**THAT** the Management Team:

- (a) **Receives** report No. 230406048685.
- (b) **Authorises** the Water Unit to procure the required pipe from **HYNDS Pipe systems** for the value **\$27,958.50 at \$25.65/m approx. 1090m** of following the process of inviting two suppliers to supply this product given there are only two suppliers available in the market, and noting that this was the lower of the two prices received.

- (c) **Authorises** Council staff to award Separable Portion D of Contract 22/42 Ashley Gorge Trunk Main Upgrade to the Waimakariri District Council's Water Unit for a sum of \$32,181.60 (excluding GST).
- (d) **Notes** that the reason for procuring the pipe separate to the main contract is due to the possible lead time on the pipe supply, which could delay the works from being completed within the current financial year if not procured in advance of the physical works contract being tendered.
- (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 D. The Procurement Plan outlining this approach is located at Trim 230310033640.
- (f) **Notes** that the planned 2022/23 work is funded from the Ashley Gorge Water Main Renewals and Water Growth budgets, and that there is sufficient budget available within the 2022/23 financial year.
- (g) **Notes** the report and outcomes shall remain public excluded until negotiations are concluded in accordance with the Local Government Official Information and Meetings Act 1987 part 2(h).
- (h) **Circulates** this report to the Utilities and Roading Committee for their information.

### 3. **BACKGROUND**

- 3.1. The proposed works for the Ashley Gorge Trunk Main Upgrade were designed in the 2022/23 financial year, with construction planned for the end of the financial year (April-June) with additional works taking place, and funded in, the beginning of the 2023/24 financial year.
- 3.2. The Contract will be tendered in four Separable Portions and includes water main renewals in the following streets:
  - Ashley Gorge Road between Sales Road and Powells Road (Separable Portion A)
  - Ashley Gorge Road for 440m north of German Road (Separable Portion B)
  - Ashley Gorge Road between Lees Valley Road and Ashley Gorge Holiday Park (Separable Portion C)
  - Supply of pipe for Separable Portion A (Separable Portion D)
- 3.3. Separable Portion A, and its attached Separable Portion D, have been designed primarily to facilitate growth on the Oxford Rural #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.
- 3.4. Separable Portions B and C have been designed primarily to connect the Ashley Gorge Holiday Park to the Oxford Rural #2 scheme. A 2022 WSP report ('Ashley Gorge Water Supply Options Report', Trim 221007174508) recommended the Holiday Park be connected to the Oxford Rural #2 water supply scheme in order to comply with recent regulatory changes, including the Water Services Act 2021 and Drinking Water Standards. This work will be funded in the 2023/24 year through a budget set by the Greenspaces Unit.

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

- 4.1. To meet the timeframes for Separable Portion A, the pipework needs to be secured in advance of completion of tender and award to avoid supply lead time risk and ensure the materials are available for the project.
- 4.2. The Water Unit obtained prices for the supply of pipework from the only two pipe suppliers available. The quotes from the two suppliers were analysed, the lowest priced supplier was identified and selected before the tender was submitted by the Water Unit.
- 4.3. Compliance with Procurement Policy

The Procurement and Contract Management Policy states:

*Three prices are required to be obtained for goods or services of between the value of \$20,000 and \$100,000. Where a deviation from the Council's procurement and contract management processes is deemed necessary Management Team approval is required.*

The Water Unit approached two suppliers for the supply of the pipe rather than three, for the following reasons:

1. There are only two suppliers in the market to provide the goods required;
2. An open tender process would therefore be ineffective in achieving better prices;
3. The timeframe for delivery means a compressed timeframe must be met to ensure the goods can be delivered by construction start this year; and
4. The rising costs of materials mean that securing prices now from suppliers may provide some savings and hence time is of the essence in procuring these items.
5. Competitive tension is still achieved through seeking prices from two separate pipe suppliers.

In order to achieve compliance with the Procurement and Contract Management Policy, Management Team approval is sought to gain approval for the Water Unit to procure the pipe after inviting two prices, rather than three for the reasons noted above.

- 4.4. Options:

The Management Team has two options:

- 1) Approve staff to engage the Water Unit to procure Separable Portion D of Contract 22/42 in the 2022/23 financial year, and approve the Water Unit to procure the pipe following the process of inviting two prices. This is the recommended option.
- 2) Reject the Water Unit price for Separable Portion D, and competitively tender the contract. This is not recommended, as the price received for Separable Portion D 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 the procurement of this pipe.

### 5.3. **Wider Community**

No wider community views have been sought specifically on the procurement of this pipe.

## 6. IMPLICATIONS AND RISK MANAGEMENT

### 6.1. **Financial Implications**

The Water Unit has provided a quotation of \$32,181.60 excluding GST to procure Separable Portion D of the Contract. The Engineer's Estimate for this Separable Portion (using rates derived from recent tendered contracts) is \$28,644.00 excluding GST.

The breakdown of this quote by separable portion of Contract 22/42 is given below:

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

Separable Portion	Scheme	Engineer's Estimate	Water Unit Price
D- Supply of pipe for SP A	Oxford Rural #2	\$28,644.00	\$32,181.60

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

Please note that Table 2 outlines cost incurred by Separable Portion D only, as no tender has yet been received for Separable Portions A, B and C. Based on the Engineer's Estimate for the total project works, costs are expected to be managed within the project budget. This will be confirmed in a later report when the tender is received for the other Separable Portions.

**Table 2: Comparison of Forecast Costs against Budget for Separable Portion D**

Funding Source	Expenditure to Date	Recommended Tender Price	Predicted Commitments	Total Projected Expenditure	Total Budget
100719.000.5104 (Renewals)	\$0.00	\$0.00	\$0.00	\$0.00	\$120,000.00
101719.000.5105 (Growth)	\$10,229.64 <sup>1</sup>	\$32,181.60	\$2,922.50 <sup>2</sup>	\$45,333.74	\$204,000.00
23/24 FY PJ <sup>3</sup>	\$0.00	\$0.00	\$0.00	\$0.00	\$515,000.00 <sup>4</sup>
Total	\$10,229.64	\$32,181.60	\$2,922.50	\$45,333.74	\$839,000.00

<sup>1</sup>Expenditure to date comprises professional design fees.

<sup>2</sup>Predicted Commitment is for GPR work undertaken in January 2023. This has not been paid out yet as the GPR company was acquired by another company prior to invoicing; PDU is working on getting this paid as soon as possible.

<sup>3</sup>This budget has been set, but the PJ code has not yet been provided.

<sup>4</sup>This budget also provides for civil works within the Holiday Park, which is separate from this contract.

The quotation received from the Water Unit has been assessed and Separable Portion D is deemed to represent good value, and is managed within 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 Ashley Gorge, 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**

**Water Unit Quotation (TRIM 230406048595)**

**To:**

Name: ROBERT RANKIN  
Waimakariri District Council  
215 High Street  
Rangiora 7440  
0800-965-468

**Quotation:**

Quote Number: 125ø PE Pipe Portion A 001  
Date: 6/04/2023  
Project Name: CON202242 Ashely Gorge  
Trunk Main Ext Portion A

**From:**

Water Unit  
Waimakariri District Council  
141 D Marsh Road  
Rangiora

Thank you for your enquiry for which we have pleasure in submitting the following quotation:

**Project Info: Procurement of 125ø PE100 PN16 SDR11 Full RC pipe**

**Tagged Out Items: Na.**

<b>Description:</b>	<b>Price:</b>
Water Unit - Personnel	\$0.00
Water Unit - Plant & Equipment	\$0.00
Supplier Products (Inc. Aggregate & Fill)	\$32,181.60
Contractor Plant & Equipment	\$0.00
Hire plant & Equipment	\$0.00
Traffic Management	\$0.00
Health & Safety Provision	\$0.00
<b>Project Total: (Exclusive of GST)</b>	<b>\$32,181.60</b>

**IF YOU WISH TO ACCEPT OUR QUOTATION PLEASE SIGN AND RETURN TO THE ABOVE ADDRESS.  
WORK WILL NOT COMMENCE UNTIL RECEIPT OF SIGNED QUOTATION.**

**Please Note:** This quotation includes supply and installation costs for the works listed above. It does not include any Financial or Development Contributions that may be payable associated with new connections to the Council's supplies. For details of any such costs, please refer to the Council's Utilities Unit.

**This quotation remains valid for 60 days from the date of issue, after which a revised quotation may be necessary.**

**APPROVED BY:**

Name:

TJAART VAN RENSBURG

Signature:



Date:

6/04/2023

**QUOTATION ACCEPTED (Third Party)**

Name:

\_\_\_\_\_

Signature:

\_\_\_\_\_

Date:

\_\_\_\_\_

Account Details:

\_\_\_\_\_

**ATTACHMENT B**

**Hynds Quote for Supply of Pipe (TRIM 230412050189)**

**Customer Account**

Waimakariri District Council  
WAI110  
Private Bag 1005

Rangiora

**Contact Name:**

Tjaart Vanrensberg

**Contact No:**

03 311 8900

**Customer Email Address:**

Tjaart.vanrensberg@wmk.govt.nz

**Job Ref:**

WDC ASHLEY GORGE RD

**Location:**

Ashley

**Delivery Address:**

Ashley Gorge Road

Ashley

**Delivery Method:**

Road transport

**Print Date:**

31-03-23

**Date Created:**

31-03-23

**Date Valid To:**

05-05-23

**Sales Rep**

Craig Cohen

**Quotation By:**

Richard Hale

Line No.	Item Code	Item Description	Order Qty	Item Unit	Unit Price
<b>WDC ASHLEY GORGE ROAD TRUNK MAIN SP A</b>					
<b>A2.1</b>					
30	2510.125PN16.12	Pipe PE100 Ø125 OD 12m PN16 Blue SDR11	1056	M	25.65
<i>This product is a non-stocked item and non-returnable.</i>					
<i>Lead times to be confirmed on placement of order.</i>					
<i>Fittings as/if required</i>					
60	EFC125GF	Coupler PE100 Ø125 SDR11 Electrofusion PN16 GF	1	EA	30.35
90	EFE12545GF	Elbow PE100 Ø125OD 45° Electrofusion SDR11 PN16 GF	1	EA	103.52
120	EFE12590GF	Elbow PE100 Ø125OD 90° Electrofusion SDR11 PN16 GF	1	EA	103.52
150	EFT125GF	Tee PE100 Ø125 OD Electrofusion SDR11 PN16 GF	1	EA	129.00
180	EFEC125GF	End Cap PE100 Ø125 OD Electrofusion SDR11 PN16 GF	1	EA	104.81
210	TDWLW50250	Warning Tape 50mmx250m Watermain Below Roll Wavelay Detecto	1	EA	116.52
<b>A2.2.1</b>					
240	2500.25.100	Pipe PE80 Ø25 OD 100m PN12.5 Coil Blue SDR11	100	M	2.02
<i>Fittings as/if required</i>					
270	ODF2510.25	Coupler Ø25mm Straight PN16 Plasson	1	EA	8.02
300	ODF2501.25	Elbow Ø25mm 90° PN16 Plasson	1	EA	9.45
330	ODF2504.25	Tee Ø25mm PN16 Plasson	1	EA	13.81
360	ODF2513.25	Coupler Ø25 20mm Male PN16 Plasson	1	EA	6.01
390	ODF2531.25	End Cap Ø25mm PN16 Plasson	1	EA	7.92
<b>A2.3.1</b>					
<b>Detail A</b>					
420	BWSF125GF	Stub Flange PE100 Ø125OD BW Long Spigot PN16 SDR11	2	EA	30.26
450	BWBRSS125	Backing Ring SS Ø125 BW	2	EA	217.58
480	DSSS10090P	Dress Set SS 100mm M16x100mm Bolts TD Blue EPDM Gasket	2	EA	37.26
510	VSDF-100-3	Sluice Valve Ø100 R Seated E3 Flanged Hawle ACC w/ Blue CAP	1	EA	382.82
540	VBS100MERCH	Valve Box Conc 450x450x100Hmm Surr Rnd Hole Each (Plt= 28)	2	EA	51.92
570	BVCIC	Valve Box CI 255x235mm C&F (V)	1	EA	194.09
600	HTALNZ-C	Hydrant without Frost Plug Tall NZS4522	1	EA	465.18
630	HR150-C	Hydrant Riser DI Ø150 Coated	1	EA	97.50

Line No.	Item Code	Item Description	Order Qty	Item Unit	Unit Price
660	DSGHP	Dress Set Galv 80mm M16x75mm Bolts HYD Blue EPDM Gasket	2	EA	16.45
690	THAF100-C	Hydrant Tee DI Ø100 All Flanged Coated	1	EA	233.10
720	HBS100MERCH	Hydr Box Conc 595x445x100Hm Surr Sqr Hole Each (Plt= 28)	2	EA	48.50
750	BFHCICH	Hydrant Box C&F 400x255mm Cast Iron Class D (FH)	1	EA	237.66
780	PMCSVH	Marker Post Conc SV Sluice Valve Fire Hydrant Each (Plt= 30)	1	EA	75.78
810	CATEYE	Cats Eyes Reflective Blue Hydrant	1	EA	10.97
840	DSG100P	Dress Set Galv 100mm M16x75mm Bolts TD Blue EPDM Gasket	1	EA	15.06
870	ODF2531.63	End Cap Ø63mm PN16 Plasson	1	EA	38.15
<b>A2.3.2</b>					
<b>Detail B</b>					
900	EFT063GF	Tee PE100 Ø63OD Electrofusion PN16 SDR11 GF	1	EA	39.02
930	VSFF050	Service Valve Ø50 Female BSP CC w/HW Hawle	1	EA	233.14
960	TOBYAFT	Toby Box Alloy 150mm Flip Top	1	EA	44.85
<i>Option</i>					
990	BVCIC	Valve Box CI 255x235mm C&F (V)	1	EA	194.09
1020	EFAMS06350GF	Transition Adaptor Male PE-SS Ø63-50mm EF SDR11 GF	2	EA	129.78
1050	BWR12563GF	Reducer PE100 Ø125-63 OD BW Long Spigot PN16 SDR11 GF	1	EA	56.97
1080	EFT125GF	Tee PE100 Ø125 OD Electrofusion SDR11 PN16 GF	1	EA	129.00
1110	VSDF-100-3	Sluice Valve Ø100 R Seated E3 Flanged Hawle ACC w/ Blue CAP	1	EA	382.82
1140	VBS100MERCH	Valve Box Conc 450x450x100Hm Surr Rnd Hole Each (Plt= 28)	2	EA	51.92
1170	BVCIC	Valve Box CI 255x235mm C&F (V)	1	EA	194.09
1200	BWSF125GF	Stub Flange PE100 Ø125OD BW Long Spigot PN16 SDR11	2	EA	30.26
1230	BWBRSS125	Backing Ring SS Ø125 BW	2	EA	217.58
1260	DSSS10090P	Dress Set SS 100mm M16x100mm Bolts TD Blue EPDM Gasket	2	EA	37.26
<b>A2.3.3</b>					
<b>Detail C</b>					
1290	EFT125GF	Tee PE100 Ø125 OD Electrofusion SDR11 PN16 GF	1	EA	129.00
1320	BWR12563GF	Reducer PE100 Ø125-63 OD BW Long Spigot PN16 SDR11 GF	1	EA	56.97
1350	EFR06332GF	Reducer PE100 Ø63-32 OD Electrofusion SDR11 PN16 GF	1	EA	38.00
1380	ODF2531.32	End Cap Ø32mm PN16 Plasson	1	EA	10.97
<b>A2.3.4</b>					
<b>Detail D</b>					
1410	BWSF125GF	Stub Flange PE100 Ø125OD BW Long Spigot PN16 SDR11	1	EA	30.26
1440	BWBRSS125	Backing Ring SS Ø125 BW	1	EA	217.58
1470	DSSS10090P	Dress Set SS 100mm M16x100mm Bolts TD Blue EPDM Gasket	1	EA	37.26
1500	830.065	End Cap PVC Ø65 Pressure	1	EA	21.36
1530	ODF2531.25	End Cap Ø25mm PN16 Plasson	1	EA	7.92

Line No.	Item Code	Item Description	Order Qty	Item Unit	Unit Price
<b>A2.3.5</b>					
<b>Detail G</b>					
1560	BF100-C	Blank Flange DI Ø100 Coated	1	EA	87.00
1590	DSSS10090P	Dress Set SS 100mm M16x100mm Bolts TD Blue EPDM Gasket	1	EA	37.26
1620	GIBMF100NP	Gibault DI Ø100 107-132mmOD Maxifit Plus	1	EA	113.38
1650	GIBMS100N	Gibault DI Ø100 107-132OD Maxicap	1	EA	86.56
<b>A2.4.1 - A2.4.2</b>					
1680	EFS125063GF	Branch Saddle PE100 Ø125-63 OD Electrofusion PN16 SDR11	2	EA	86.00
1710	BWR06332GF	Reducer PE100 Ø63x32 BW Long Spigot PN16 SDR11 GF	2	EA	16.81
1740	EFR03225GF	Reducer PE100 Ø32-25 OD Electrofusion SDR11 PN16 GF	2	EA	14.19
1770	ODF2510.25	Coupler Ø25mm Straight PN16 Plasson	2	EA	8.02
<p><i>Please note validity periods on this quote.</i></p> <p><i>If ordering outside of this validity period rates may need to be re-priced</i></p> <p><i>For all PE and PVC pipe, please note: Availability is to be confirmed at the time of order. Quoted prices are based on quoted quantities being ordered in full. Prices may be revised should there be a change in quantities.</i></p> <p><b>DELIVERY TERMS:</b></p> <p><i>These contract rates include delivery to site based on full truck and trailer loads, ex factory or bulk storage facility. The delivery terms allow for up to 60 minutes truck turnaround time on site. A delivery surcharge will apply if, for reasons beyond our control, a truck is delayed on site, for multiple drops or piloted loads.</i></p> <p><i>For any deliveries from a Hynds Sales Branch, freight charges will apply as per our published 'Christchurch Network Delivery Guidelines', unless otherwise agreed.</i></p>					

**PLEASE NOTE:**

1. These contract prices are valid for acceptance up till the Valid To date shown above after which we reserve the right to review prices.
2. Upon acceptance of the Quotation, supply of materials for this project at the contract rates below are valid for the 'Supply Period' shown above.
3. Refer to any Special Conditions contained in the Quote body, the Standard Quote Conditions shown below and Hynds Pipe Systems Ltd 'Terms & Conditions of Supply'.
4. This quote is based on the specifications and quantities provided by the Customer and Hynds cannot accept responsibility if any item or quantity is incorrect.
5. Storage and handling fees may be incurred for all products that cannot be delivered, or are not collected, at the date agreed at time of order.
6. If this quote includes customised special items that are required to be manufactured to the customers design, orders for these items will be subject to completion of a Specials Authorisation Form. Manufacturing or procurement of such items will not take place until the Authorisation Form is signed. Once manufacturing or procurement has commenced, the item will be deemed to be the property of the customer and is not eligible for return to us and/or credit.
7. Prices exclude G.S.T.

**DELIVERY TERMS**

These contract rates include delivery to site based on full truck and trailer loads, ex factory or bulk storage facility. The delivery terms allow for up to 60 minutes truck turn around time on site. A delivery surcharge will apply if, for reasons beyond our control, a truck is delayed on site, for multiplied drops or piloted loads.

For any deliveries from a Hynds sales branch, freight charges will apply as per our published 'Schedule of Freight Charges', unless otherwise agreed.



**1. APPLICABILITY**

Unless otherwise agreed in writing by Hynds, all quotes given by Hynds, and supply of Goods by Hynds to the Customer are governed by these terms and conditions (Terms) to the exclusion of all other terms and conditions or representations (including anything that may be stated to the contrary in the Customer's enquiries or on the Customer's orders). By making an order with Hynds for the supply of Goods, the Customer shall be deemed to accept these Terms. These Terms will not be deemed to be modified, cancelled or waived in whole or in part except by written amendment of Hynds.

Hynds may amend these Terms at any time. The amended Terms will apply in respect of any Goods that are provided by Hynds following the date the amended Terms are notified to the Customer.

If there is any inconsistency between a provision of these Terms and any provision in any other written agreement between the Customer and Hynds (being a written agreement signed by a duly authorized senior representative of Hynds), the provisions will apply in the following descending order of priority:

(i) the provisions in any written agreement between the Customer and Hynds; and

(ii) these Terms, provided that these Terms will prevail over any other terms and conditions stipulated by the Customer or included as part of any of the Customer's documentation (including orders for Goods).

**2. APPLICABILITY**

In these Terms: "Hynds" means Hynds Pipe Systems Ltd, Hygrade Products Limited or any other member of the Hynds Group, which supplies Goods to the Customer; "Hynds Group" means Hynds Limited and its subsidiary companies including any business divisions; "Customer" means any company, person or other body which orders or requests, either itself or through an agent, the supply of Goods from Hynds or makes an application for credit from Hynds in relation to any such supply; "Goods" means all products manufactured and distributed by Hynds including for drainage, watermain, environmental and rural applications, including, without limitation, fabricated products, concrete spun pipe and precast products, clay pipe systems, streetware and associated systems, water and wastewater management products and systems, pumps, fittings, valves and hydrants, plastic, steel and iron pipes and all associated services and hireage; "GST" means goods and services tax pursuant to the Goods and Services Tax Act 1985; "Guarantor" means any person or entity that at any time provides a guarantee to Hynds in respect of the Customer's obligations; "Insolvency Event" includes, in respect of any person, when that person commits an act of bankruptcy, makes an arrangement with any or all of its creditors for rescheduling of any indebtedness, has a receiver, liquidator or voluntary administrator appointed or is otherwise insolvent or deemed to be insolvent; "PPSA" means the Personal Property Securities Act 1999; "Security Interest" means a security interest as defined in the PPSA and "Signatory" means any person signing an order or credit application for or on behalf of the Customer.

**3. PRICES**

Prices and Price lists, with the exception of Hynds written quotations, are subject to variation by Hynds without notice prior to the confirmation of any order. Unless otherwise agreed by Hynds in writing, the price payable for the Goods is the price specified on the invoice for the particular delivery of Goods and is exclusive of GST and any other duty or taxes. Quotations may be withdrawn or modified by Hynds, at any time prior to receipt of written acceptance. Quotes are otherwise valid to the date stated on the Quotations header, or if no date is specified, for 30 days, and will lapse if not accepted in writing by the Customers within that time. All quotes must be kept confidential by the Customer

**4. PAYMENT TERMS, CREDIT AND INTEREST**

Unless otherwise agreed in writing by Hynds, all Goods must be paid for in cash on or before delivery. Individual deliveries may be invoiced separately and will be paid for accordingly. If Hynds grants credit to the Customer the following terms shall apply.

- a. Payments will be made in full without deduction or set-off no later than the 20th day of the month following invoice.
- b. Should the Customer default in payment of any monies due to Hynds or in the performance of any other obligation which it owes to Hynds or any associated company or should any Insolvency Event occur in respect of the Customer or any Guarantor then:
  - (i) All monies due by the Customer to Hynds shall immediately become due and payable.
  - (ii) Hynds may charge the Customer compounding interest at 2.00% per month on all overdue amounts, from the date payment was due until payment in full.
  - (iii) Hynds may suspend further deliveries of Goods to the Customer until the Customer has paid all monies due to the Customer to Hynds; and
  - (iv) Hynds may revoke all credit provided to the Customer and require that all further deliveries be on a cash on or before delivery basis.

c. Any expenses, costs or disbursements incurred by Hynds in recovering any outstanding monies including debt collection agency fees or legal fees, shall be recoverable from the Customer.

d. Hynds is entitled to request security from the Customer and shall be entitled to withhold the supply of Goods or credit until such security has been obtained.

**5. SET OFF**

The Customer authorises Hynds to apply (without prior notice or demand) any credit balance of the Customer on any account with any member of the Hynds Group or any money owed by any member of the Hynds Group towards satisfaction of any payment due and payable by the Customer to Hynds. This clause is intended to be relied upon by each member of the Hynds Group.

**6. RESERVATION OF TITLE**

All Goods supplied by Hynds shall remain the property of Hynds until payment in full by the Customer of all amounts owing is received by Hynds. Until property in the Goods passes to the Customer, the Customer shall hold the Goods as a bailee and shall be liable to Hynds accordingly. Without prejudice to Hynds' other rights and remedies, if the Customer breaches any of these Terms Hynds shall have the right (without giving notice) to retake possession of the Goods and the Customer authorizes Hynds or its representatives, servants, agents of employees to enter any premises upon which the Goods are stored for the purpose of retaking possession of the Goods. Hynds will have no liability to the Customer or any third party in relation to the entry, removal or repossession of the Goods pursuant to this clause and the Customer will indemnify Hynds against any claims, actions or costs that may arise as a result. In the case of Goods supplied under a Hynds Agreement for Hire, payment does not constitute transfer of property in the Goods, with title retained at all times by Hynds.

**7. WOODEN PALLET/DUNNAGE**

Where wooden pallet/dunnage are supplied by Hynds, Hynds may require the Customer to purchase such pallets/dunnage for such an amount as shall be at the sole discretion of Hynds. All wooden pallets/dunnage supplied by Hynds remain the property of Hynds until the Customer has paid all amounts payable by the Customer to Hynds. The risk of loss of, or damage to such wooden pallets/dunnage passes to the Customer upon delivery to a carrier or to the Customer or nominee, as the case may be. Hynds may, in its sole and absolute discretion, permit the Customer to return purchased wooden pallets/dunnage for credit, provided the Customer provides proof of purchase of the wooden pallets/dunnage.

**8. PERSONAL PROPERTY SECURITIES ACT 1999 (PPSA)**

The Customer acknowledges that the retention of title in these Terms creates a security interest (as defined under the PPSA) in favour of Hynds in all present and after-acquired Goods and all proceeds of such Goods (whether such Goods were provided to the Customer by way of supply, under a Hynds Agreement for Hire, or otherwise) as security for the due and punctual payment of the Goods and the Customer's performance of its obligations under these Terms or otherwise. The Customer undertakes to:

- (i) promptly do all things, execute all documents and/or provide any information which Hynds may reasonably require to enable Hynds to perfect and maintain the perfection of its security interest (including by registering a financing statement);
- (ii) give Hynds not less than 14 days prior written notice of any proposed change in its name and/or any other change of its details; and
- (iii) immediately on request by Hynds (and at the Customer's expense) obtain from any third party such agreements and waivers of any security interest that third party has in respect of the Goods to ensure that at all times Hynds has a first ranking security interest in the Goods.

In addition to the security interest created in the Goods above, in order to better secure the Customer's obligations to Hynds, the Customer grants to Hynds a security interest in all of the Customer's present and after acquired personal property. The Customer waives its rights to receive a copy of any verification statements under the PPSA and agrees that as between Hynds and the Customer:

- (i) the Customer will have no rights under (or by reference to) sections 114(1)(a), 116, 120(2), 121, 125, 126, 127, 129, 131, 133 and 134 of the PPSA; and
- (ii) where Hynds has rights in addition to those in Part 9 of the PPSA, those rights will continue to apply.

**9. TAXES**

GST and any duty or other tax, levy or impost on or relating to the Goods, is payable by the Customer to Hynds upon demand, in addition to the price of the Goods.

**10. CLAIMS**

Hynds shall not be liable in respect of any claim for defective Goods unless such claim is notified to Hynds in writing within 7 days of delivery of the Goods. The liability of Hynds for defective Goods shall be limited to (at Hynds' sole discretion) either repairing the defective Goods or delivering replacement product for the defective Goods (which, for the avoidance of doubt, shall not include any installation costs or other costs other than the costs of delivery of such replacement Goods). Hynds will not otherwise be liable for any loss or damage (including direct or consequential loss, or loss of profits) incurred by the Customer or any third party as a consequence of the Goods being defective. Hynds will not in any circumstances be liable for any loss of damage caused by willful or accidental damage, negligent or improper use, maintenance or storage by the Customer

or any other person or any other circumstances whether or not beyond Hynds' control. Hynds will not be liable for defects caused by the negligence of the Customer including where installation of the Goods has been carried out by personnel who are not competent or experienced in installing the Goods.

**11. CREDITS**

When Goods are supplied as ordered, the Customer does not have the right to return the Goods. However, Hynds may, at its sole and absolute discretion, permit the Customer to return Goods for credit, on the understanding, expressed or otherwise, that a handling fee of up to 15% of the purchase price of the Goods, plus any freight charges, plus GST, may be deducted from the value of the credit. No Goods will be accepted back unless they are returned to Hynds in first class resaleable condition, accompanied by adequate proof of purchase.

**12. DELIVERY**

Hynds will use reasonable endeavors to deliver Goods ordered within a reasonable time. Delivery dates are estimates only and Hynds shall not be liable for any damage or loss arising out of delay in delivery. All risks in respect of the Goods will pass to the Customer on delivery to a carrier or to the Customer or nominee as the case may be. If Hynds is requested to store Goods, or if Hynds is required to store Goods because of the fault of the Customer after the Goods are ready for despatch, the Customer shall pay all charges of and incidental to such storage. Such storage will be at the Customer's risk, and will not entitle the Customer to postpone payment of any sums due to Hynds. A receipted consignment note, bill of lading weigh bill or despatch advice, shall be conclusive proof of delivery unless otherwise stated, delivery costs will be paid by the Customer. Transit insurance to the Customer's account can be arranged by Hynds if requested by the Customer. Hynds shall not be liable to the Customer or any third party for short delivery, or loss in transit of the Goods. Any deliveries necessitating delivery outside the hours of 7.30am – 4.00pm on weekdays must be by special arrangement. Where the Goods are delivered by Hynds direct to the Customer or nominee, the Customer shall provide at its expense, safe hard roading suitable for use by usual road transport to deliver materials to the site specified by the Customer or to an area alongside such site, with sufficient clear hard space at all times for unloading and stacking and unless otherwise specified, shall supply all necessary cranes and other unloading facilities.

**13. ORDERS**

The Customer will place orders with Hynds for Goods in accordance with any process and minimum quantities specified by Hynds from time to time. Orders of Goods may be verbal or written. Each order will constitute an offer to purchase the Goods by the Customer which will only be accepted by Hynds by written confirmation of the order to the Customer or performance by Hynds of the order. Hynds will not be liable for any error in the Customers order and the Customer will be responsible for errors arising out of verbal orders not confirmed in writing. Cancellation of orders for Goods placed with and accepted by Hynds may be made only with the written consent of Hynds. Hynds will not be liable for any loss or damage suffered by the Customer or any third party as a result of cancellation of an order. The terms and conditions of any Customer generated purchase orders are not accepted unless there is written acceptance of those terms and conditions by the Chief Financial Officer of Hynds or designate. Notwithstanding acceptance of an order, Hynds may cancel or refuse to supply any order at any time in its sole discretion, provided that if Hynds cancels any order as a result of its unwillingness or inability to supply any order, Hynds will refund any deposit paid by the Customer to the Customer (excluding any accrued interest). Except as set out in this clause, any deposit paid by the Customer will be non-refundable.

**14. CONFIDENTIALITY**

All drawings, designs, specifications, technical data and other information which Hynds supplies in connection with a quotation, or order are confidential. All such information remains Hynds' property, and must not be disclosed to any third person without our written permission and shall be returned immediately upon Hynds' request.

**15. INTELLECTUAL PROPERTY**

The Customer acknowledges that as between the Customer and Hynds, unless expressly agreed in writing and signed by Hynds, Hynds will own all of the intellectual property rights (whether registered or unregistered) relating to the Goods and any intellectual property (Intellectual Property) and all right and title to any actual or possible development or improvement in the Goods or the intellectual property (Development IP). The Customer acknowledges that it will not at any time acquire any right, title or interest in any kind in the Intellectual Property or the Development IP. If Goods are supplied to the Customer's designs or specifications the Customer warrants that none of its designs or specifications infringe any copyright, patent or other intellectual property right. If the Customer's designs or specifications infringe, or are alleged to infringe any patent, registered design, copyright or other intellectual property rights, the Customer will indemnify Hynds for any liabilities incurred by Hynds as a result of the Customer's breach of this clause.

**16. TESTING**

If the Customer requires any Goods or material samples to be specially tested prior to delivery, arrangements may be made with Hynds, in writing, for the carrying out of such tests at the Customer's cost.

**17. CUSTOMER MATERIALS**

If the Customer supplies Hynds with its own materials for use in completing the Goods, the Customer undertakes that such materials will be in all respects suitable for the operation for which they are supplied. The Customer will at its own expense replace materials which in Hynds' opinion are unsatisfactory and will pay Hynds for the cost of work already carried out on such materials and for the cost of any damage incurred by Hynds as a result of such materials being unsatisfactory. Such materials remain the property of the Customer whilst in Hynds possession. The risk of loss of, or damage to, such materials will at all times be borne by the Customer.

**18. INVENTORY CONTROL**

Notwithstanding clause 10 of these Terms, if Goods are required at the request of the Customer prior to SEVEN (7) day strength being attained, Hynds shall not be liable for any defect or failure in the Goods and the Customer shall indemnify Hynds against any claims made in respect of any such defect or failure.

**19. FARM GRADE/SECOND GRADE GOODS**

Farm grade/second grade Goods are sold as such and marked accordingly. Under no circumstances should farm grade and/or second grade Goods be used as a substitute for first grade Goods and Hynds shall not be liable for any loss or damage caused by such substitutions or attempted substitutions.

**20. FORCE MAJEURE**

Hynds will not be liable to the Customer if delivery of the Goods is prevented or delayed, by reason of any circumstances beyond Hynds' reasonable control.

**21. CONSUMER GUARANTEES ACT 1993**

The Customer agrees that where it is buying the Goods for the purposes of a business the Consumer Guarantee Act 1993 does not apply. Sections 9, 12A, 13 and 14(1) of the Fair Trading Act 1986 and the implied conditions under the Sale of Goods Act 1908 do not apply to the supply of Goods by Hynds to the Customer. The Customer agrees and acknowledges that the provisions of this clause 21 are fair and reasonable.

**22. HEALTH AND SAFETY**

The Customer must comply with all health and safety legislative requirements, including the Health and Safety at Work Act 2015 and all related legislative instruments, guidance and codes of practice (Health and Safety Legislation). In the event that any employee, agent, contractor and sub-contractors engaged or employed by the Customer is required to attend a Hynds site, they must comply with Hynds' health and safety policies and procedures at all times. To the extent that they have overlapping duties, the Customer agrees to consult, co-operate and co-ordinate its activities so far as is reasonably practicable with Hynds. The Customer will, and will ensure that its employees, agents, contractors and sub-contractors (if any), comply at all times with all reasonable directions of Hynds and will notify Hynds of any identifiable hazards which come to its attention in relation to the supply of Goods. The Customer will provide all reasonable assistance to Hynds in relation to any investigation (whether conducted by the Customer, Hynds, or a regulatory agency) into a notifiable event at no cost to Hynds. The Customer will notify Hynds of any improvement or prohibition notice, enforcement proceedings or prosecution under Health and Safety Legislation against the Customer in relation to work done under these Terms. The Customer will, to the extent permitted by law, indemnify Hynds in respect of any claims brought against Hynds resulting from any breach by the Customer of its obligations under any Health and Safety Legislation, and/or any failure by the Customer to comply with its obligations under this clause.

**23. NOTICES**

Any notice or other document required to be served upon Hynds or the Customer under this agreement may be delivered:

- a. in the case of Hynds, by delivery to the registered office of Hynds or by email to the following email address: legal.notices@hynds.co.nz
- b. in the case of the Customer, by delivery to the registered office of the Customer or by email to the email address stipulated by the Customer on the Customer's most recent order for Goods or as recorded on the Customer's credit application form.

**24. CONTRACTS PRIVACY**

These Terms are for the benefit of, and are enforceable by, each member of the Hynds Group for the purposes of the Contracts (Privacy) Act 1982.

**25. GOVERNING LAW**

These Terms are governed by the laws of New Zealand. The Customer and Hynds submit to the exclusive jurisdiction of the New Zealand courts in respect of all matters relating to these Terms.

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

**FILE NO and TRIM NO:** CON201856 / 230314034873


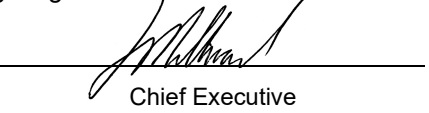
**REPORT TO:** MANAGEMENT TEAM

**DATE OF MEETING:** 17 April 2023

**AUTHOR(S):** Kieran Straw, Civil Projects Team Leader  
Joanne McBride, Roading & Transportation Manager

**SUBJECT:** Extension of Contract 18/56 – Street Lighting Maintenance & Renewals

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

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**1. SUMMARY**

- 1.1. This report is to seek Management Team approval to extend Contract 18/56 – Street Lighting Maintenance & Renewals by one year, to 30 March 2025.
- 1.2. The current contract for Street Lighting Maintenance and Renewals was let on a 3+1+1 basis and has been running for 3 years. The current contract expires on 30 March 2024 following the approval of the first annual extension which was issued in 2022.
- 1.3. This would therefore be the second, and final annual extension that extends the contract period to a total of 5 years. This provision complies with the NZTA Procurement Manual.
- 1.4. The Contract is a combined contract with three Road Controlling Authorities. Waimakariri District Council administers the contract, with Hurunui District Council, and Waka Kotahi Street Lighting also included within the contract. Both Hurunui, and Waka Kotahi have agreed to this extension.
- 1.5. The Contractor, Power Jointing Ltd have agreed to this extension.
- 1.6. Power Jointing Ltd's performance over the past year has improved over the previous year, and they have put in a substantial effort to improve the Councils asset database (RAMM), and assisted with Veritek, who have completed our energy consumption reporting audits.

**2. RECOMMENDATION**

**THAT** the Management Team:

- (a) **Receives** Report No. 230314034873;
- (b) **Approves** the extension of Contract 18/56 – Street Lighting Maintenance & Renewals for one year.
- (c) **Notes** that the revised Contract Completion date is 30 March 2025, and that there are no further rights of renewal remaining.
- (d) **Notes** that Power Jointing are currently performing well, and there are no concerns with their performance.
- (e) **Notes** that the original contract award was approved by Council in February 2020, and this contract allows for these extensions.

- (f) **Circulates** this report to the Utilities & Roading Committee for their information.

### 3. **BACKGROUND**

- 3.1. Report No. 191223181826 to Council on 4<sup>th</sup> February 2020 was approved by Council to award Contract 18/56 to Power Jointing Ltd for a sum of \$2,872,041.40 excluding GST.
- 3.2. The Council's contract for Street Lighting Maintenance was let on a 3+1+1 basis and has been running for approximately three years.
- 3.3. Report No. 220127010065 to Management Team in April 2022 was approved to extend the Contract by one year from 31 March 2023 to 30 March 2024.
- 3.4. The Contract includes the provision of labour and materials to maintain the District's Streetlights; install new streetlights; and upgrade obsolete fittings. This includes requirements for regular inspections of all lights and periodic electrical inspections of all fittings. In addition, the contract includes updating the lighting assets in the RAMM Database
- 3.5. The Contract is a joint contract with three Road Controlling Authorities, each with their own Separable Portion. The Contract is administered by the Waimakariri District Council, and the monthly costs for maintaining Hurunui and NZTA street lighting is on-charged each month to the other RCA's.
- 3.6. Should the Principal wish to terminate the contract at the end of the current period, the Principal is required to give three months' notice.
- 3.7. Three months is considered inadequate to prepare a replacement contract and tender the works. Therefore staff are seeking early approval to extend the contract to ensure all options are available to Management Team.
- 3.8. The Contract clause that relates to the extension of Contract states:

*The Term of this Contract will be from the Date of Commencement for a period of three years.*

*This Contract will include two optional extensions of one year (i.e., 3+1+1)*

*Extension of the Term will be at each Principals discretion and will be notified at least three months prior to the Current Date of Expiry.*

*In making the decision to grant the optional extension, each Principal will take the Contractors Performance, including any Key Performance Indicators or Response Timeframe Result into account.*

- 3.9. Power Jointing Ltd's performance over the past year has improved. They have put in a substantial effort to improve the Councils asset database (RAMM), and assisted with Veritek, who have completed our energy consumption reporting audits. Their response to service requests has been good, however, like many contractors in the current market, they have struggled to secure timely supplies of materials (while this is noted it is not something which a contractor has direct control over).

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

- 4.1. The Management Team have two options available for their consideration:
- 4.2. Option One: Approve the One-year contract extension:

This option allows for one further year extension of the contract and based on current performance is supported by staff of all parties involved in the contract, including Hurunui District Council, Waka Kotahi, and Power Jointing Ltd. If approved, there will be no further right of renewals, and the contract will end on 30 March 2025.

This is the recommended option.

#### 4.3. Option Two: Decline to extend the contract:

This option will result in the Contractor being informed that the current contract will be terminated on the 30 March 2024, and staff will need prepare and tender a replacement Street Lighting Maintenance and Renewals Contract.

There is adequate time to allow this option to be adopted, should the Management Team decide to do so, however Power Jointing Ltd performance has been to an acceptable level and there is nothing to indicate that retendering the contract will result in a better outcome for Council. This is particularly the case for the street light maintenance contract where historically low number of tenderers have been received for these contracts in the past, and the current contracting market that has seen high demand for labour and increasing costs.

Therefore, this is not the recommended option.

#### **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**

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 not likely to be affected by, or to have an interest in the subject matter of this report.

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

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

There are financial implications of the decisions sought by this report.

The indicative annual value of the contract, for the Waimakariri District Council's Separable Portion, is as per the table below:

<b>Budget Category</b>	<b>Estimated Value of Works (2024 / 2025)</b>	<b>Budget Allocation (2024 / 2025)</b>
Street Lighting Maintenance (GL 10.270.744.2500)	\$499,261	\$478,924
Carriageway Lighting Renewals (PJ 100184.000.5134)	\$167,337	\$187,674
LED Replacement (PJ 100337.000.5134)	\$40,349	\$40,349
Street Lighting Minor Improvements	\$30,000	\$30,000

(PJ 100185.000.5134)		
<b>Annual Total</b>	<b>\$736,947</b>	<b>\$736,947</b>

The estimated value of the Street Lighting Maintenance for the annual extension is based on the cost of routine street light maintenance carried out over the past twelve months.

The estimated value of the Renewals, LED Replacement, and Minor Improvements is based on the available budget, and the scope of works can be altered to fit the budget.

Based on the expenditure over the past twelve months, there is the possibility of an overspend in the maintenance budget (by approximately 4%), however this does depend on the number of callouts and faults experienced during the year. Any overspend will be balanced with an underspend in renewals to work within existing budgets.

These budgets are included in the Long Term Plan.

## 6.2. Sustainability and Climate Change Impacts

The recommendations in this report do not have sustainability and/or climate change impacts, however the LED replacement programme component of works results in more cost effective and sustainable street lighting.

## 6.3 Risk Management

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

There is a significant risk that retendering this contract in the current market conditions is likely to result in an increase in costs to maintain the districts street lighting network.

## 6.3 Health and Safety

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

Power Jointing Limited's Health and Safety record on this Contract is considered Excellent, and they have a SiteWise score of 94%

## 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

Not applicable

### 7.3. Consistency with Community Outcomes

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

***There is a safe environment for all.***

Harm to people from natural and man-made hazards is minimised.

***The distinctive character of our takiwā - towns, villages and rural areas is maintained.***

The centres of our towns are safe, convenient and attractive places to visit and do business.

***Transport is accessible, convenient, reliable and sustainable.***

The standard of our District's roads is keeping pace with increasing traffic numbers.

7.4. **Authorising Delegations**

Management Team has been delegated authority to approve the extension of this contract.

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

**FILE NO and TRIM NO:** CON202269-01 / 230331045743


**REPORT TO:** Management Team


**DATE OF MEETING:** 26 April 2023

**FROM:** Mark Henwood, Project Engineer  
Colin Roxburgh, Water Asset Manager

**SUBJECT:** Oxford Water Main Renewals 2022/2023 – Park Avenue – Request to Sole Source Procure the Water Unit

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

 General Manager

 Chief Executive

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**1. SUMMARY**

- 1.1 The purpose of this report is to seek Management Team approval to sole source procure Waimakariri District Council's Water Unit for the civil works for Contract 22/69 Oxford Urban Water Main Renewals – Park Avenue 2022/2023 in the 2023/24 financial year.

**2. RECOMMENDATION**

**THAT** the Management Team:

- (a) **Receives** report No. 230331045743.
- (b) **Notes** that the Engineer's Estimate of \$202,595 plus contingency for the Oxford Water Main Renewals 2022/2023 – Park Avenue of Contract 22/69 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 Contract 22/69 for the Water Unit for the civil works for Contract 22/69 Oxford Water Main Renewals 2022/2023.
- (d) **Notes** that according to Councils Procurement and Contract Management Policy, projects of this value require public tender unless approval is granted from the Management Team, and the Procurement PCG;
- (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.
- (f) **Notes** that the procurement plan has been circulated to the Procurement PCG for review on 20/04/2023.
- (g) **Notes** that the planned 2022/23 work is funded from the Oxford Urban Water Main Renewals and Water Growth budgets, and that there is sufficient budget available within the 2023/24 financial years.
- (h) **Circulates** this report to the Utilities and Roading Committee for their information.

### 3. **BACKGROUND**

- 3.1. The proposed works for the Oxford Urban Water Main Renewals were designed in the 2022/23 financial year, with construction planned in the first half of the 2023/2024 financial year (July - December).
- 3.2. The replacement has been designed primarily due to the asbestos cement water main and the DN50 PE rider main being identified as in poor condition. It has the added benefit of renewing some pipework connections to 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 drilling and open trenching.
- 4.3. There are well established trees located along both sides of the road of Park Avenue affecting the water main alignment options.
- 4.4. Options:

The Management Team have two options:

- 1) Management Team approve staff to approve the sole sourced tender process with the Water Unit to price and then construct Oxford Urban Water Main Renewals – Park Avenue of Contract 22/69 in the 2022/23 financial year. This is the recommended option.
- 2) Management Team to reject the sole sourced tender process with the Water Unit price for Oxford Urban Water Main Renewals – Park Avenue of Contract 22/69, and competitively tender this contract. This is not recommended, as the Water Unit is likely to provide good quality and reasonable value for the contract works.

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

Water services will be provided to the residents of Park Avenue to a good level of service.

### 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.

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

### 6.1. **Financial Implications**

For the Oxford Water Renewals there is a total budget of \$712,000 split across the 2023/2024 and 2024/2025 financial years. With 10 percent contingency applied there may be minor budget overspend. Please refer Table 1.

**Table 1: Oxford Water Renewals Budget and Park Avenue Estimate**

Budget elements	2023 /2024	2024 /2025	20 /20	Total
Total budget available per year	\$ 452,000	\$ 260,000	\$	\$ 712,000
Minus actual committed costs to date – fixed sums	\$ 381,125	\$ 0	\$	\$ 381,125
Minus other specific/identified costs (not yet committed)	\$ 15,000	\$ 34,522	\$	\$ 49,522
Balance available for this contract	\$ 55,875	\$ 225,478	\$	\$ 278,353
Engineers estimate	\$ n/a	\$ 202,595	\$	\$ 202,595
Proposed contingency	\$ n/a	\$ 20,260	\$	\$ 20,260
Unallocated balance remaining	\$ 55,875	\$ 2,623	\$	\$ 58,498
Contract Contingency:	\$ 20,260	10	%	
Reason for contingency level:	General 10% of contract works			

### 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 Park Avenue, Oxford.

### 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 approve this supplier selection method that does not comply with the Procurement Policy.

**ATTACHMENT A**

**2269 Oxford Urban Water Renewals 2022/ 2023  
Park Avenue Procurement Plan  
TRIM 230403045989**

**Is this procurement for a construction contract?** *(tick one)*  
**Yes - Complete Section 4**      **No - Skip Section 4**

*To be populated prior to committing to procuring construction.*

**Construction details**

**Specific project construction risks or constraints**

Site or project specific risks or constraints (e.g. time, cost, quality, sustainability):

**Construction procurement objectives and benefits sought**

Throughout this procurement, the following objectives will be achieved:

**Construction procurement risks**

ID#	Potential risks	How risks will be managed	Assigned to

**Construction scope**

Describe the project scope required in the construction contract, including intended achievement in each financial year:



List any non-standard contractual approaches: 222

Intended evaluation method (tick one)

Quality only      Price Quality method      Weighted attribute      Lowest Price Conforming

Intended Weighting percentage - only fill in those percentages that apply:

Price	Relevant Experience	Track Record	Management Skills	Technical Skills	Methodology	Other	TOTAL
%	%	%	%	%	%	%	100%

Tender Evaluation Lead: \_\_\_\_\_

TET Members: \_\_\_\_\_

Tender Secretary advised:    Yes    No    Probity representative required:    Yes    No

### 2 - Procurement by panel – detail

For all contracts where Panel procurement is intended, complete the following:

Service being sought: \_\_\_\_\_

Panel name: \_\_\_\_\_

All Panelists      As Per Panel Management Plan

List Panelists approached and why?

### 3 - Procurement by invited/selected tender or sole sourced – detail

For all contracts, complete the following:

Are these works being added to an existing contract?    Yes    No

Are these works rolling over an existing maintenance contract?    Yes    No

Service being sought: \_\_\_\_\_

Why invited/selected or sole sourced? \_\_\_\_\_

Who: \_\_\_\_\_

Why this provider? \_\_\_\_\_ 223 \_\_\_\_\_

Specialist skill set      Previous knowledge or experience

Other: \_\_\_\_\_

Conditions of contract: \_\_\_\_\_

**Key procurement milestones**

Choose the table that applies to this evaluation and edit accordingly.

Milestones for procurement	Date

**Budget details**

**Costs**

The budget codes are: \_\_\_\_\_

Please enter relevant financial year.

Budget elements	20 /20	20 /20	20 /20	Total
Total budget available per year	\$	\$	\$	\$
Minus actual committed costs to date – fixed sums	\$	\$	\$	\$
Minus other specific/identified costs (not yet committed)	\$	\$	\$	\$
Balance available for this contract	\$	\$	\$	\$
Engineers estimate	\$	\$	\$	\$
Proposed contingency	\$	\$	\$	\$
Unallocated balance remaining	\$	\$	\$	\$

Contract Contingency: \$ \_\_\_\_\_ %

Reason for contingency level: \_\_\_\_\_

## Approval to proceed with Construction Procurement <sup>224</sup>

Select a level to confirm that signatories have read and agreed with the procurement approach.

Note: By entering your name in the Signed box below you are giving your authority for this procurement plan to proceed.

### Level 1 Delegated Authority Approval

- <\$50,000 estimate AND
- In compliance with Table 1.

Name: \_\_\_\_\_ Position: Activity Manager  
(Delegated Financial Authority)

Signed: \_\_\_\_\_ Date: \_\_\_\_\_

### Level 2 Delegated Authority, plus Procurement Manager Approval

- \$50,000-\$249,999 estimate, AND
- In compliance with Table 1
- Examples of high risk project/procurement:
  - Politically sensitive
  - Significant disruption
  - Uncommon technology
  - Cross-council work element.

Name: \_\_\_\_\_ Position: Activity Manager  
(Delegated Financial Authority)

Signed: \_\_\_\_\_ Date: \_\_\_\_\_

Name: \_\_\_\_\_ Position: Procurement Manager

Signed: \_\_\_\_\_ Date: \_\_\_\_\_

### Level 3 Delegated Authority, plus Procurement PCG Approval

- >=\$250,000 estimate, AND
- In compliance with Table 1.

Name: \_\_\_\_\_ Position: Department Manager

Signed: \_\_\_\_\_ Date: \_\_\_\_\_

Name: \_\_\_\_\_ Position: Procurement Manager  
(on behalf of PCG)

Signed:  \_\_\_\_\_ Date: \_\_\_\_\_



**Level 4** <sup>225</sup> **Delegated Authority, plus Procurement PCG Approval, plus Management Team**

- Not in compliance with Table 1, OR
- Multi-year maintenance contract, OR
- Strategic multi-year programme of works, OR
- Significant CBD/Red Zone/Arterial road works, OR
- High risk project\*:
  - Politically sensitive
  - Significant disruption

\* Note: Applies to any value.

Name:	Position: Procurement Manager (on behalf of PCG and Management Team)
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Signed:	Date:
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<b>Management Team Approval Received</b>	Date:
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