

Waimakariri District Council

Utilities and Roading Committee

Agenda

Tuesday 20 August 2024

9am

Council Chambers
215 High Street
Rangiora

Members:

Cr Paul Williams (Chairperson)

Cr Robbie Brine

Cr Niki Mealings

Cr Philip Redmond

Cr Joan Ward

Mayor Dan Gordon (ex officio)



WAIMAKARIRI
DISTRICT COUNCIL

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The Chairperson and Members
UTILITIES AND ROADING COMMITTEE

A MEETING OF THE UTILITIES AND ROADING COMMITTEE WILL BE HELD IN THE COUNCIL CHAMBER, RANGIORA SERVICE CENTRE, 215 HIGH STREET, RANGIORA ON TUESDAY 20 AUGUST 2024 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 16 July 2024.

8-18

RECOMMENDATION

THAT the Utilities and Roding Committee:

- (a) **Confirms** the circulated Minutes of the meeting of the Utilities and Roding Committee held on 16 July 2024, as a true and accurate record.

3.2 Matters arising (From Minutes)

4 DEPUTATION/PRESENTATIONS

4.1 Cattle Droving West Eyreton

Garth Free will be in attendance to discuss concerns regarding the droving of cattle on the public walk / cycle way on the south side of North Eyre Road in West Eyreton.

5 REPORTS

5.1 Proposed Project Scope and Timeframes for Oxford Wastewater Treatment Plant Project – Caroline Fahey (Water and Wastewater Asset Manager)

19 - 42

RECOMMENDATION

THAT the Utilities and Roading Committee:

- (a) **Receives** Report No. 240805129054.
- (b) **Approves** the proposed project scope and timeframes for the Oxford wastewater project.
- (c) **Notes** that the output from the project will enable Council to make an informed decision on the long-term strategic option for the Oxford wastewater scheme, to enable consenting and construction, prior to the existing consent expiry in August 2031.
- (d) **Notes** that the proposed project timeframe helps ensure that the Oxford community continues to have access to compliant wastewater services post consent expiry.
- (e) **Notes** that the intention is to obtain Council endorsement for the preferred option by December 2025, undertake project specific consultation including 3 Waters rating review with the public in 2026 and confirm the project construction budgets for the preferred option to be included in the 2027-37 LTP
- (f) **Circulates** this report to the Oxford – Ohoka Community Board for their information.

5.2 Proposed Roading Capital Works Programme for 2024/25 and Indicative Three-Year Programme – Kieran Straw (Civil Projects Team Leader) and Joanne McBride (Roading and Transport Manager)

43 - 56

RECOMMENDATION

THAT the Utilities and Roading Committee:

- (a) **Receives** Report No. 240624102322.
- (b) **Approves** the attached 2024/25 Proposed Roading Capital Works Programme (Trim No. 240624102120V2).
- (c) **Notes** the Indicative Roading Capital Works Programme for the 2025/26, 2026/27 and 2027/28 years.
- (d) **Notes** that the outcome of the National Land Transport Programme (NLTP) will not be known until September 2024, and as such it will not be known as to whether co-funding is available until that time.
- (e) **Notes** that if co-funding is not secured a further report will be brought to Council.
- (f) **Notes** that feedback from the Community Boards is discussed within section 5 of this report, and that the relevant changes have been made to the proposed programme of works for approval.
- (g) **Circulates** this report to all Boards for their information.

5.3 **Midge Management and Monitoring at Wastewater Treatment Plants
2023- 24 – Sophie Allen (Water Environment Advisor)**

57 - 94

RECOMMENDATION

THAT the Utilities and Roading Committee:

- (a) **Receives** Report No. 240701105929.
- (b) **Notes** the use of the larval disruption dredging, oil surfactant spreading and *Bacillus thuringiensis* (Bti) techniques that have been trialled at Kaiapoi and Woodend Wastewater Treatment Plants (WWTPs) for midge management.
- (c) **Notes** that Bti treatment trial at Woodend WWTP in November-December 2023 appeared effective at reducing midge densities in treated areas when applied at the recommended dosage rate, however the control area also saw a decrease in midge densities.
- (d) **Notes** that midge monitoring (and treatment methods when required) is intended to commence earlier in spring in 2024-25, i.e. September 2024, rather than in October in previous years, as complaints indicate that midges are emerging in September.
- (e) **Notes** that midge emergence trap monitoring is not able to demonstrate if the dredging management techniques reduces midge densities, at Kaiapoi WWTP therefore yellow sticky traps are proposed to be installed for monitoring as a replacement.
- (f) **Notes** the cost of midge management for Kaiapoi and Woodend WWTP is estimated to have been approximately \$29,480 (excl. GST) and \$12,100 (excl. GST) respectively for the 2023-2024 season, with an estimated additional cost of \$12,000 (excl. GST) for midge emergence trap and larval monitoring costs for both WWTPs, sourced from existing operational budgets, and is subsidised by avian botulism inspections that means that ecological contractors are already on-site.
- (g) **Notes** that WDC staff will continue to communicate proactively with affected residents about midge management.
- (h) **Notes** the intention to submit a new insect control management plan (entitled 'Midge Management Plan August 2024') focusing on non-insecticide control methods, to Environment Canterbury as fulfilment of a condition in consent CRC041049.

5.4 Avian Botulism Management 2023-24 – Sophie Allen (Water Environment Advisor)

95 - 101

RECOMMENDATION

THAT the Utilities and Roading Committee:

- (a) **Receives** Report No. 240701105914.
- (b) **Notes** the bird death numbers (431 birds) for the 2023-24 season at coastal Waimakariri District Council wastewater treatment plants (WWTPs), as collected by contractors, with a minor avian botulism outbreak at the Kaiapoi WWTP, and two birds collected at the Kaiapoi Lakes.
- (c) **Notes** that the WDC Avian Botulism Management Plan 2020, information leaflets and FAQ sheet will be updated with minor amendments before December 2024, including procedures if Highly Pathogenic Avian Influenza (such as H5N1) is suspected instead of avian botulism.
- (d) **Notes** that WDC staff and contractors will be advised of the low risk of avian botulism toxin being spread by contaminated clothing and footwear if standard hygiene practices are followed, so that appropriate actions can be taken if visiting poultry or dairy farms.
- (e) **Notes** that WDC staff will continue to proactively engage with any affected residents and/or concerned members of the public about avian botulism control.
- (f) **Circulates** this report to the Council, the Waimakariri Water Zone Committee, and the Community Boards for 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 Waikuku Beach Drainage Investigations Update – Jason Recker (Stormwater and Waterways Manager) and Kalley Simpson (3 Waters Manager)

(Report No. 240527085488 to Woodend Sefton Community Board Meeting 10 June 2024)

102 – 116

RECOMMENDATION

THAT the Utilities and Roading Committee

- (a) **Receives** the information in Item 8.1.

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:

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

- 11.1 Confirmation of Public Excluded Minutes from 16 July 2024.
- 11.2 Sole Source Ocean Outfall Pumps for Kaiapoi & Woodend Wastewater Treatment Plants - Report to Management Team Operations 29 July 2024.
- 11.3 Supplier Selection for Rangiora WWTP Aeration Basin trial upgrade - Report to Management Team Operations 29 July 2024.

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

| Item No. | Subject | Reason for excluding the public | Grounds for excluding the public. |
|----------|---|--|---|
| 11.1 | Confirmation of Public Excluded Minutes from 16 July 2024 | Good reason to withhold exists under Section 7 | As per Section 7(2)(h) of the Local Government Official Information and Meetings Act 1987, to "enable any local authority holding the information to carry on, without prejudice or disadvantage, commercial activities." |
| 11.2 | Sole Source Ocean Outfall Pumps for Kaiapoi & Woodend Wastewater Treatment Plants - Report to Management Team Operations 29 July 2024 | Good reason to withhold exists under Section 7 | Resolves that the recommendations in this report be made publicly available but that the contents remain public excluded as per Section 7(2)(h) of the Local Government Official Information and Meetings Act 1987, to "enable any local authority holding the information to carry out, without prejudice or disadvantage, commercial activities". |
| 11.3 | Supplier Selection for Rangiora WWTP Aeration Basin trial upgrade - Report to Management Team Operations 29 July 2024 | Good reason to withhold exists under Section 7 | Resolves that the recommendations in this report be made publicly available but that the contents remain public excluded as per Section 7(2)(h) of the Local Government Official Information and Meetings Act 1987, to "enable any local authority holding the information to carry out, without prejudice or disadvantage, commercial activities". |

CLOSED MEETING

See Public Excluded Agenda (separate document)

OPEN MEETING

NEXT MEETING

The next meeting of the Utilities and Roothing Committee will be held on Tuesday 17 September 2024 at 9am.

WAIMAKARIRI DISTRICT COUNCIL

MINUTES OF A MEETING OF THE UTILITIES AND ROADING COMMITTEE HELD IN THE COUNCIL CHAMBER, RANGIORA SERVICE CENTRE, 215 HIGH STREET, RANGIORA ON TUESDAY, 16 JULY 2024, AT 9AM.

PRESENT

Councillors P Williams (Chairperson), R Brine, N Mealings, P Redmond, J Ward,

IN ATTENDANCE

Deputy Mayor Atkinson, Councillors B Cairns, T Fulton

J Millward (Chief Executive), G Cleary (Utilities and Roading Manager), K Simpson (3 Waters Manager), J McBride (Roading and Transportation Manager), J Recker (Stormwater and Waterways Manager), J McSloy (Development Manager), A Smith (Governance Coordinator)

1 APOLOGIES

Moved Councillor Williams

Seconded Councillor Redmond

THAT an apology for absence be received and sustained from Mayor Gordon.

CARRIED

2 CONFLICTS OF INTEREST

Councillor Mealings declared a conflict with Item 5.1 *Proposed Amendments to Technical Practice Note on Flood Mapping, Freeboard and Floor Levels*, due to her role on the panel considering the District Plan Review.

3 CONFIRMATION OF MINUTES

3.1 Minutes of the meeting of the Utilities and Roading Committee held on Tuesday 18 June 2024.

Councillor Mealings noted a correction required in the spelling of Taumata Arowai.

Moved Councillor Mealings

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 18 June 2024, 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 18 June 2024.

Moved Councillor Brine

Seconded Councillor Mealings

THAT the Utilities and Roading Committee:

- (a) **Receives** the circulated Notes of the meeting of the Utilities and Roading Committee held on 18 June 2024.

CARRIED

4 DEPUTATION/PRESENTATIONS

There were no deputations or presentations.

5 REPORTS

5.1 Proposed Amendments to Technical Practice Note on Flood Mapping, Freeboard and Floor Levels – Amy Wilhelm (Finished Floor Level Officer) and Jennifer McSloy (Development Manager)

Councillor Mealings left the room during consideration of this item.

J McSloy and K Simpson presented this report which was seeking approval of the recommendation to Council to endorse the proposed updates to the Technical Practice Note on Flood Mapping, Freeboard and Flood Levels. As in the recommendation, the Practice Note will need to be updated once the Proposed District Plan was adopted to reflect the proposed changes to the natural hazards chapter. Most of the changes are considered minor except for two more proposed changes which are more substantial, and therefore need to be endorsed by the Council. This related to proposed changes to align the freeboard requirements for rural and rural residential properties.

Councillor Redmond suggested that there would be a significant difference between rural and rural/residential zoning, yet the proposal was to align the freeboard levels for properties in the low hazard category, to 500mm. J McSloy said it was more consistent to have these the same for these areas. There wouldn't be any notation on the LIM that these heights had changed and there hadn't been many consent applications come through that would be impacted by this proposed change.

Following a question from Councillor Williams it was confirmed that these new levels were being taken into consideration in the new pump stations being constructed in Kaiapoi.

Councillor Fulton asked if these level requirements would only apply to residential dwellings or was it all buildings constructed. It was confirmed that the levels applied just to residential dwellings. Though even if a building was not a residential dwelling, for instance a shed, staff would always give the advice to recommend building at that level.

Deputy Mayor Atkinson queried the date that any change would come into effect and how this can impact on people who had already had their plans drawn up and approved, and then in six months' time the height was changed. There may also be further incremental changes and would a certificate carry over to accommodate changes. Deputy Mayor Atkinson also queried if a person had submitted plans and in the ensuing six months (for example) the required floor height was changed, who was responsible for any costs that may be incurred with the need to have updated plans drawn up. In terms of responsibility, G Cleary responded that with any consenting process, be it a building consent or a resource consent, any advice that people get from the Council prior to the issue of that consent, was on a best endeavours basis. Council staff use their best endeavours to provide consistent advice and G Cleary advised that it was his understanding that the legal position was that the floor level requirements are what was required on the day a building or resource consent was issued. This was when the council had thoroughly reviewed the application with all the information made available and made its decision. At that point, the people

have absolute certainty that they have a consent, including floor level. With the proposed District Plan change, it was proposed that there would be a Floor Level Certificate that the Council would issue that would give people certainty for that period. If rules do change on anything relating to a building or resource consent, in between the public making an enquiry and plans being submitted, as a regulatory authority, the Council needed to apply the rules.

Councillor Redmond referred to a specific area on a map on agenda page 38, a grey corridor beside number 2.62 on the map— and questioned why there was no orange colour attributed to this area. Staff did not have an explanation for this but would refer to the Flood Management team to answer this query and provide a response back to the committee members.

Councillor Fulton referred to 6.6.1 and floor levels being higher in coastal areas and did this infer a risk greater for the Kaiapoi and coastal areas compared to the remainder of the district. G Cleary responded that there had been pumps installed in Kaiapoi for flood mitigation purposes. K Simpson also advised that the Otaki pump station had the facility for a generator to be wired into the site plus further modifications being made to the Beach Road pump station. To provide resilience and mitigate the more extreme weather events, there were measures in place to make sure that the infrastructure was working, including during power outages. Deputy Mayor Atkinson enquired how the infrastructure would be put in place if there was a weather event of significant magnitude. As part of the event preparation plans, K Simpson advised that weather events would be tracked by staff and pumps and generators would be deployed well in advance.

Councillor Williams asked if the floor levels of the pump stations were above the mean floor average. K Simpson wasn't able to confirm this but did confirm that the electrical components would be well above the flood levels. It was agreed that information on the pump station floor levels would be provided to the committee members.

Moved Councillor Brine

Seconded Councillor Williams

THAT the Utilities and Roading Committee:

- (a) **Receives** Report No. 240625103292.

AND

THAT the Utilities and Roading Committee recommends:

THAT the Council:

- (b) **Approves** the updated Technical Practice Note on Flood Mapping, Freeboard and Floor Levels (TRIM 240412057972).
- (c) **Notes** that the Practice Note will need to be updated in the future once the Proposed District Plan and Regional Policy Statement are operative, as both contain hazard chapters which will affect the document. If Council's flood models are updated, the Practice Note will also be reviewed and updated as required.

CARRIED

Councillor Brine referred to the risk factor and the need for the Council to ensure that any future developments are factored into. The Council had been proactive but noted that there was always going to be consequences and there needed to be mitigating factors put in place.

Deputy Mayor Atkinson said there needed to be a balance, and he had concerns that there may be people who go through the exercise of submitting plans to the Council for a building, and in time the rules for height change which would involve a total change in the plans. Deputy Mayor Atkinson did not believe the current legislation was operating right, and there needed to be

guarantees for the residents on what was being issued. He noted that this situation wasn't just affecting this Council, but all Councils throughout New Zealand.

Councillor Williams noted that this matter was referred to the Council and there were also some questions posed to staff today, with answers to be provided to members of the committee.

Councillor Redmond asked if this matter would have immediate effect once adopted by the Council, or if it could be deferred for six months, which would address the points made by Deputy Mayor Atkinson. He noted that there would always be an issue when rules were changed. This was an important decision for the Council and significant for development in the district.

5.2 July 2023 Flood Recovery Progress Update – Kalley Simpson (3 Waters Manager), Joanne McBride (Roading and Transport Manager), Pat Towse (Flood Team Lead)

K Simpson and J Recker were present for consideration of this report, which provided a progress update on the July 2023 Flood Recovery work programme, including investigation work and maintenance actions. There was also an overview of the physical works programme recommended by the investigations.

As at the 4 July of the 88 investigations, 72 had been completed and there were 16 still to be fully signed off, though the reviews had been completed. Many of these remaining investigations were complex and required additional work to confirm the recommended improvements. There were six non urgent maintenance actions to be completed over the coming months, with 120 maintenance actions already having been completed.

Work had commenced on three key focus areas that have experienced extensive flooding issues:

- Cam River – maintenance had all been completed and since the inspection, a fallen willow tree had been removed. There was also some minor works undertaken in the coming months. Ecan – undertaking survey work of the banks and beds downstream of Bramleys Road and were still to do the section upstream. This would identify any changes in bed levels or changes in stop bank levels that needed to be addressed. Results of this work were expected by the end of this calendar year.
- Tuahiwi Stream – significant heavy maintenance work had been undertaken in the Stream, including installation of a box culvert in the diversion drain, which would improve drainage in the Greens Road area. The work to be undertaken there is now going to be more substantial than first thought and was likely to take longer to complete.
- Waikuku Beach – work is continuing on the detailed assessment to determine the cause of flooding from the Taranaki Stream. This work was being coordinated with Environment Canterbury with modelling work due to be completed by the end of August.

Currently there had been \$3.6m spent of the total budget of just above \$4m and it was expected to complete the remaining work within the budget approved by the Council in October 2023.

Councillor Mealings question regarding the work on the banks of the Cam River, it was agreed that there would be referral to staff on any planting on the banks and coordinating planting.

Regarding the higher than expected flooding at Waikuku Beach, Councillor Mealings asked if it was possible that there was additional water resurfacing from the groundwater in the area. K Simpson responded that it hadn't been considered from this aspect, but the hydraulic modelling was done with conservative run off conditions. K Simpson noted that this question would be passed on to the team to consider.

Councillor Fulton referred to the "No Action" issues. K Simpson said there would have been several reasons for these, including that everything had operated as expected and there was no risk or health and safety issues. It would have also been that the problem was considered to be private, in which case, the Council staff would have provided some advice to the property owners on improvements they could make onsite on their property to improve the management of flood waters through their property. In some instances, the issue may spread over more than one property and who was responsible for addressing this issue was not easy to determine. In such cases, the Council may step in to make sure it was addressed. Most of the time though, the situations were clear cut and the information given from the Council was taken on as good advice.

Councillor Williams questioned the removal of trees along the Cam River, K Simpson advised that the contractor used for this was a contractor used by Environment Canterbury, who was a specialist contractor who solely work on vegetation works along stop banks and rivers. Staff had confidence on these contractors and if there were any concerns regarding trees that remained there, staff would follow up with this.

Moved Councillor Williams

Seconded Councillor Ward

THAT the Utilities and Roothing Committee:

- (a) **Receives** Report No. 240704109396.
- (b) **Notes** that all 88 investigations have been triaged, scoped, and investigated, 16 are being reviewed for approval and 72 are complete;
- (c) **Notes** that all 126 maintenance actions have been processed, 6 have works programmed, and 120 are complete;
- (d) **Notes** that the Flood Team has effectively been wrapped up and recruitment is currently underway for the Infrastructure Resilience Team, who will assist with progressing the remaining improvements works and implementing proposed future works.
- (e) **Notes** that the total cost estimate for the flood recovery work is \$4.055 million.
- (f) **Notes** that the expenditure to date is \$3,628,674 and the final forecast expenditure remains at \$4.055 million;
- (g) **Circulates** this report to all Community Boards for information.

CARRIED

5.3 **Adoption of Final 3 Waters, Solid Waste and Transport Activity Management Plans 2024 – Gerard Cleary (General Manager Utilities and Roothing)**

G Cleary presented this report seeking the Councils approval to adopt the Activity Management Plans for Solid Waste, Stock Water Race, Rural Drainage, Water Supply, Wastewater, Urban Drainage and Transportation. These are critical documents that work alongside the Infrastructure Strategy and the Long Term Plan and are renewed on a three yearly cycle as these two documents

are. These Activity Management Plans were a good reference point which were available to view on the Council website and show how Council schemes were run, what services were provided, what growth forecasts were, what the renewals programme was, what the risk assessment was and how the Council manages resilience and criticality of assets, this was a good reference point. The Plans showed how the Council managed approximately \$2 billion worth of assets on behalf of the community and the work done with them, even with incremental changes, are of major consequence when considering 150 year lifecycle assets and how these were managed.

These documents were held in high regard by other Councils around New Zealand. These Plans were also a significant reason for this Council to be twice being recognised with an AA rating by Local Government New Zealand.

Councillor Williams posed a question on the site of the former landfill on Williams Street Kaiapoi, with lakes located on both sides of the road and possible impact from contamination. G Cleary said the Council was responsible for these areas when they were retired from use and climate change was taken into consideration with asset management. The Kaiapoi landfills were generally elevated sites but noted that the Kaiapoi site was subject in the long term to groundwater level rise and flooding. There was also coastal inundation. The Council monitored this site in Kaiapoi for groundwater rise and undertake testing for any potential contamination. Staff would continue to do this.

Following a question from Councillor Fulton on groundwater levels at Garterys Pit. G Cleary responded that groundwater level was critical throughout the entire lifecycle of a gravel pit, even when excavating. There needed to be consistency with consent requirements and to be conscious of groundwater levels in extraction. Previously sites such as this would have been a general tip, but this was now purely used for hardfill. Again, these sites were subject to groundwater monitoring and the Council had responsibility for these sites.

Moved Councillor Redmond

Seconded Councillor Ward

THAT the Utilities and Roading Committee:

- (a) **Receives** Report No. 240613096204.
- (b) **Adopts** the following final Activity Management Plans:
 - i. Solid Waste Activity Management Plan (TRIM 221219218511)
 - ii. Stock Water Race Activity Management Plan (TRIM 221219218512)
 - iii. Rural Drainage Activity Management Plan (TRIM 230503062547)
 - iv. Water Supply Activity Management Plan (TRIM 230516070466)
 - v. Wastewater Activity Management Plan (TRIM 230710103391)
 - vi. Urban Drainage Activity Management Plan (TRIM 230726112895)
 - vii. Transportation Activity Management Plan (TRIM 240709111417)
- (c) **Notes** that progress on the AMP Improvement Programmes will be reported to the U&R Committee.
- (d) **Circulates** a copy of Report No. 240613096204 to all Community Boards for their information.

CARRIED

Councillor Redmond acknowledged the significance of these Management Plans and the valuable information provided in them. He requested to have a hard copy of the Transportation Plans, in relation to his role as Roading Portfolio holder.

There was no correspondence.

7 PORTFOLIO UPDATES

7.1 Roading – Councillor Philip Redmond

Focus areas for staff:

- Remetalling was continuing on unsealed roads. Maintenance grading was also continuing with a third grader currently on the network. Staff are continuing to inspect unsealed roads.
- Ice gritting was continuing on an as required basis.
- Drainage maintenance and culvert renewals was a current focus. Culvert renewals were being carried out on Barkers Rd and Woodside Rd.
- Digout repairs were also being carried out on South Eyre Rd.
- Pre-reseal repairs were being marked out on site ahead of the next reseal season.
- Replacement of damaged / missing edge marker posts was underway.
- Leaf fall sweeping was now largely complete for the season.

Capital:

- Capital projects including the Island Rd / Ohoka Rd Intersection and the Kerb and Channel renewal sites were all completed by the end of June.
- The focus had now moved to design for the 2024/25 financial year, however, works which had assumed co-funding through the NLTP will not proceed past design until such time as the outcome of the NLTP was known.

Other works:

- Doubledays Footbridge repair works had been completed and the bridge had reopened.
- Work was now complete on the undergrounding of the trunk watermain on Townsend Rd at the culvert. Pavement repairs at the culvert were being carried out this week.
- Work has begun to install water, stormwater and sewer mains through the Blackett St / King St roundabout. This was a continuation of the Rangiora Sewer Upgrade project. The roundabout would be closed for six weeks to allow this work to be undertaken. Minor changes to bus detour routes had been agreed with ECan and were being put in place.
- Pavement repairs were planned on Rangiora Woodend Road, east of Gressons Road. These would be carried out between 9am and 3pm.
- Island Road, Kaiapoi was closed between Audley Street and Greengrass Crescent for three weeks for service connections to The Sterling development.
- Chorus Fibre build was to be undertaken in Pines Beach starting in late July (approximately 20th). Chorus had indicated they will not be installing fibre in Kairaki at this time.
- SH1 night work to remove and repair a damaged overhead VMS sign was planned for this week. The VMS board was on a gantry over the state Highway on the northbound lane (south of the Waimakariri River Bridge). A detour would be in place via Main North Rd and the Old Waimakariri River Bridge while the closure was in place.

Road Safety:

- Planning was underway for the Kick Start Motorcycle Event, which was an annual collaboration between Christchurch City Council, Selwyn District Council and this Council. The event was planned to be held on 22nd September 2024.
- Councillor Redmond noted the recent change to Datascape and there was a new process for service requests.
- There was a new dashboard being created for Councillor Redmond's Portfolio meetings which would provide a snapshot of the current situation

and trends, in graph form. This would come to the committee either as a report, or in the Rooding Portfolio update.

Councillor Williams mentioned the current untidy state of the Old Waimakariri River Bridge, acknowledging that this was administered by Christchurch City Council. Councillor Redmond agreed this bridge was in a very unsatisfactory condition at the present and agreed to follow up with Christchurch City Council for an update. He mentioned that several months ago it had been indicated by Christchurch City Council that the railings would be replaced on the bridge.

Councillor Williams also enquired about the new seal which was lifting from the deck on the Waimakariri Gorge Bridge, and asked for an update on this, noting that this was managed by Selwyn District Council. G Cleary acknowledged the volume of traffic that uses this bridge and the impact of heavy vehicles. The bridge was rated to take these heavy vehicles, but there would always be this movement under these loadings. Fitting this modern day design on a 150 year old bridge had been challenging, and there had been work done to limit the movement of the bridge as much as possible. The best products available on the market had been used. In summary, G Cleary advised that the bridge itself cannot take the weight of a concrete deck.. This had resulted in some limitation in the products that could be used and acknowledged that with the movement, there had been challenges with the joints and chip seal. At each joint the chip seal had come away, and G Cleary noting that with the repairs being undertaken in the colder season, was partly the reason for this issue. Advice was being sought from the designers and this was still a work in progress, with the summer weather there would be another level of chip seal applied. There may also be other options available. It was agreed that a memo be shared with the committee as an update on this matter.

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

Water

- The works to underground the trunk water supply main on Townsend Road at the South Brook had been successfully completed. This was enabling works for the culvert bridge to be upgraded this financial year.
- Information on nitrates was now available on Council's website for each of our water supply schemes. This would be updated monthly with the most recent test results. The website also provides links to Taumata Arowai, Ministry of Health and Environment Canterbury websites for other information on nitrates.

Wastewater

- A site visit to the Kaiapoi WWTP was undertaken last week to show Michael Bate around the plant. A report would be brought to the U&R Committee in September to provide an update on planned works for desludging, wetland investigations, avian botulism management and midge management.

Drainage

- Cones Road Drain Upgrade was complete, except for the upstream weir modifications which would be completed by the end of this month.
- Washington Place work was underway and the culvert under Earlys Road would be upgraded in August.
- Tram Road drainage improvements had been awarded and would start in August.
- Woodfields Road culvert upgrades was also due to start on site in August.

Councillor Ward spoke on the requirement of have chlorine in the districts water supplies and was there any discussion with the new government on this remaining a requirement and could there be exemptions available.

K Simpson provided an update on this and the applications for exemptions. Staff were currently going through steps with Taumata Awawhai. A report would come back to Council, and what the pathway would be for chlorine free water.

Council Fulton mentioned that he had submitted a service request recently regarding the significant amount of rubbish in the drain in the commercial area along Flaxton Road. G Cleary agreed to follow up with this and to have the drains cleaned.

7.3 **Solid Waste– Councillor Robbie Brine**

- Monese has been working with to expand the 'small lane' collection area into a newly developed area in Pegasus.
- Our staff have received feedback from a few businesses in the Rangiora CBD that the audit team visits have been useful, as they have explained what can and can't go in their bins and have put new stickers on the bins.
- EcoEducate had been active with programmes in the school holidays, both in the libraries and in the Dudley Park Pavilion, and these had been well received.
- A new flyer had been developed highlighting the minimum spacing between bins, letterboxes, trees and so on and were working on a bin-lid sticker with the same message.
- Staff plan to support the nation-wide Love Food Hate Waste programmes that are coming up in August (leftovers), November (storage) and early in 2025.
- The Canterbury Waste and Canterbury Regional Landfill Joint Committees would be meeting on 5 August. 15 applications had come in for the \$112,000 contestable fund. The applications total over \$335,300, and regional staff met to assess the applications and were preparing a report to make recommendations based on that assessment.

7.4 **Transport – Mayor Dan Gordon**

Mayor Gordon was an apology for meeting.

8 **QUESTIONS UNDER STANDING ORDERS**

There were no questions.

9 **URGENT GENERAL BUSINESS**

There was no urgent general business.

10 **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:

Moved Councillor Williams

Seconded Councillor Ward

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

- 11.1 Confirmation of Public Excluded Minutes from 18 June 2024.
- 11.2 Report from Management Team Operations 17 June 2024.
- 11.3 Report from Management Team Operations 17 June 2024.

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

| Item No. | Subject | Reason for excluding the public | Grounds for excluding the public. |
|----------|---|--|---|
| 11.1 | Confirmation of Public Excluded Minutes from 18 June 2024 | Good reason to withhold exists under Section 7 | As per Section 7(2)(h) of the Local Government Official Information and Meetings Act 1987, to “enable any local authority holding the information to carry on, without prejudice or disadvantage commercial activities” and For reasons of protecting the privacy of natural persons and enabling the local authority to carry on without prejudice or disadvantage, negotiations (including commercial and industrial) negotiations and maintain legal professional privilege as per LGOIMA Section 7 (2)(a), (g) and (i). |
| 11.2 | Report from Management Team Operations 17 June 2024 | Good reason to withhold exists under Section 7 | As per Section 7(2)(h) of the Local Government Official Information and Meetings Act 1987, to “enable any local authority holding the information to carry on, without prejudice or disadvantage commercial activities” |
| 11.3 | Report from Management Team Operations 17 June 2024 | Good reason to withhold exists under Section 7 | Resolves that the recommendations in this report be made publicly available but that the contents remain public excluded as per Section 7(2)(h) of the Local Government Official Information and Meetings Act 1987, to “enable any local authority holding the information to carry out, without prejudice or disadvantage, commercial activities”. |

CARRIED

The meeting adjourned at 10.17am and reconvened in public excluded 10.27am.

CLOSED MEETING

Resolution to Resume in open meeting

Moved Councillor Williams

Seconded Councillor Redmond

THAT open meeting resumes and the business discussed with the public excluded remains public excluded unless otherwise resolved in the individual resolutions.

CARRIED

OPEN MEETING

11.3 **Procurement Methodology Approval for Services to Process Commingled Recycling** – K Waghorn (Solid Waste Asset Manager)
(Report to Management Team meeting of 17 June 2024.)

- (a) **Receives** Report No. 240604089494.
- (b) **Approves** staff commencing a sole-source procurement negotiation for services to process commingled recycling with Eco Central, the current service provider, for a 5 year term.
- (c) **Notes** the budget allowance over the total 5 year term for processing of commingled kerbside and facility recycling is \$3,855,385.
- (d) **Notes** that staff have undertaken a Section 17A Review of this service, and the outcome of this review was that there are currently no alternative “local” service providers with the capability and capacity to process the type and volume of commingled recycling from Waimakariri District’s kerbside collections and solid waste facilities.
- (e) **Notes** that the Procurement PCG supports a Sole-Source approach for this procurement.
- (f) **Notes** that staff will bring a separate report to the Management Team and Council to seek approval for the new contract on the successful conclusion of the proposed negotiations, subject to staff determining the service is good value to the Council.
- (g) **Circulates** Public Excluded Report 240604089494 to the Utilities & Rooding Committee for their information.
- (h) **Resolves** that the recommendations in this report be made publicly available but that the contents remain public excluded as there is good reason to withhold in accordance with Section 7(h) of the Local Government Official Information and Meetings Act; “enable any local authority holding the information to carry out, without prejudice or disadvantage, commercial activities”.

NEXT MEETING

The next meeting of the Utilities and Rooding Committee will be held on Tuesday 20 August 2024 at 9am.

There being no further business, the meeting closed at 11.32am.

 Chairperson
 Councillor Paul Williams

 Date

WAIMAKARIRI DISTRICT COUNCIL**REPORT FOR DECISION****FILE NO and TRIM NO:** SEW-03-09-05 / 240805129054**REPORT TO:** UTILITIES & ROADING COMMITTEE**DATE OF MEETING:** 20 August 2024**AUTHOR(S):** Caroline Fahey, Water & Wastewater Asset Manager**SUBJECT:** Proposed Project Scope and Timeframes for Oxford Wastewater Treatment Plant Project**ENDORSED BY:**
(for Reports to Council,
Committees or Boards)
General Manager
Chief Executive**1. SUMMARY**

- 1.1. This report seeks approval from the Utilities & Roading committee for the proposed scope and timeframes for the Oxford Wastewater Treatment Plant project to enable Council to make an informed decision on the long-term strategic option for the Oxford wastewater scheme.
- 1.2. The wastewater discharge consent for the Oxford Wastewater Treatment Plant (WWTP) expires in August 2031. Prior to consent expiry, Council will need to make a decision on the long-term strategic option for the Oxford wastewater scheme, and implement the chosen option, to ensure that the Oxford community continues to have access to wastewater services with a compliant consent.
- 1.3. To inform Council's decision, Staff are proposing to investigate two broad options which will form the main project scope:
 - Upgrade the existing WWTP at Oxford.
 - Consolidate the Oxford scheme into the Eastern District Sewerage System (EDSS) scheme by conveying wastewater from Oxford to be discharged at the Ocean Outfall.
- 1.4. The investigation will consider capacity and operational constraints at the existing WWTP, future growth demand, potential changes to consenting requirements, feedback from Rūnanga engagement, financial impact and rating options for the communities.
- 1.5. It is intended to obtain Council endorsement for the preferred option by December 2025, prior to undertaking consultation with the public in 2026 and confirming the project construction budgets for the preferred option to be included in the 2027-37 LTP.

Attachments:

- i. Utilities & Roading Committee Briefing Powerpoint Presentation (Trim 240516079114)
- ii. Proposed Oxford Wastewater Treatment Plan Project Timeline (Trim 240808132220)

2. **RECOMMENDATION**

THAT the Utilities & Roading Committee:

- (a) **Receives** Report No. 240805129054.
- (b) **Approves** the proposed project scope and timeframes for the Oxford wastewater project.
- (c) **Notes** that the output from the project will enable Council to make an informed decision on the long-term strategic option for the Oxford wastewater scheme, to enable consenting and construction, prior to the existing consent expiry in August 2031.
- (d) **Notes** that the proposed project timeframe helps ensure that the Oxford community continues to have access to compliant wastewater services post consent expiry.
- (e) **Notes** that the intention is to obtain Council endorsement for the preferred option by December 2025, undertake project specific consultation including 3 Waters rating review with the public in 2026 and confirm the project construction budgets for the preferred option to be included in the 2027-37 LTP
- (f) **Circulates** this report to the Oxford – Ohoka Community Board for their information.

3. **BACKGROUND**

- 3.1. The wastewater discharge consent for the Oxford Wastewater Treatment Plant (WWTP) expires in August 2031. Prior to consent expiry, Council needs to make a decision on the long-term strategic option for the Oxford wastewater scheme and implement it to ensure that the Oxford community continues to have access to compliant wastewater services.
- 3.2. The existing wastewater treatment plant is a modified activated sludge plant with effluent disposal to land via two centre pivot irrigators. The effluent irrigation field is located on the southern side of the Eyre River. There are some capacity constraints with the existing plant which results in occasional overflow during wet weather events. In addition, the plant incurs high operational costs mainly due to inadequate sludge treatment which results in high sludge disposal costs.
- 3.3. The growth prediction for the Oxford township is for a population increase of approximately 75% in 50 years. Based on existing capacity constraints at the plant, a capacity upgrade of the existing plant will be required to meet future growth demand for the scheme.
- 3.4. Renewal of the wastewater discharge consent is expected to trigger a tightening of the discharge consent requirements for the plant which will increase the level of wastewater treatment required. The increased requirement can be met by either an improvement to the existing wastewater treatment process at the plant and/or an increase in effluent disposal irrigation land area.

4. **ISSUES AND OPTIONS**

- 4.1. The proposed project scope is to investigate two broad options for the Oxford township:
 - Upgrade the existing wastewater treatment plant (WWTP) at Oxford.
 - Consolidate the Oxford wastewater scheme into the Eastern District Sewerage System (EDSS) scheme by conveying wastewater from Oxford to be discharged at the Ocean Outfall.
- 4.2. The following key issues and activities will be considered as part of the options assessment:
 - District Plan Review

To ensure that there is clear alignment with the District Plan with respect to the expected growth areas, potential servicing requirements from an infrastructure strategy perspective and possible development contribution revenues.

- 3 Waters Rating Review

The rating impact on the communities both local or district wide will need to be considered. It is intended that a preferred option will be endorsed by Council prior to undertaking the 3 Waters rating review and project specific community consultation in 2026.

- 4.3. Staff has previously considered a number of sub-options for the WWTP upgrade and the preferred sub-option based on a multi-criteria assessment is to upgrade the plant with the membrane bioreactor (MBR) technology.
- 4.4. For the pipeline option, it is proposed that two sub-options be looked into, i.e. pipeline from Oxford to Rangiora and pipeline from Oxford to Kaiapoi. The pipe will be designed to allow capacity for discharge from other towns along the alignment, including Cust and West Eyreton. However detailed assessment of Cust servicing in terms of cost to establish a local reticulation will be excluded from this scope to ensure fair comparison between the two broad options is achieved.
- 4.5. The focus of the investigation is to determine the best approach for the district without unfairly burdening Oxford from a financial perspective.
- 4.6. The following project activities to inform the options investigation are planned for the 2024/25 and 2025/26 financial years and will be funded through existing Oxford wastewater scheme budgets allowed for in the LTP:
 - Land irrigation site investigation for the WWTP upgrade
 - Pipeline to EDSS options
 - Rūnanga engagement
 - Business case
 - District wastewater strategy
 - 3 Waters rating review
- 4.7. The following table shows the proposed project timeframes that must be met to ensure that the options implementation will be completed prior to consent expiry. Refer to Attachment ii for proposed project timeline.

| Key Activity | Proposed Timeframe |
|--|--------------------------------|
| Options investigation | September 2024 – December 2025 |
| Preferred options adopted by Council | by December 2025 |
| Public consultation of preferred option including 3 Waters rating review | by August 2026 |
| Allocate project and construction budgets for preferred option | by October 2026 |
| Design and consenting of preferred option | 2026/27 – 2027/28 |
| Construct/Commission/Operate preferred option | 2028/29 – 2029/30 |
| Existing Consent Expiry | August 2031 |

Implications for Community Wellbeing

There are implications on community wellbeing by the issues and options that are the subject matter of this report.

It is important to the customers on the Oxford scheme that affordable wastewater services continue to be available and that any rate increases to fund the works required for the consent renewal is minimised as much as possible. Adopting the best option for the Oxford wastewater scheme considers the financial impacts will minimise impact on the wellbeing of the community.

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

5. COMMUNITY VIEWS

5.1. Mana whenua

Te Ngāi Tūāhuriri hapū are likely to be affected by, or have an interest in the subject matter of this report. The Rūnanga has expressed strong feedback to the location of the existing effluent disposal field due to the effluent crossing the Eyre River and therefore a high risk that the resource consent renewal will be opposed by the Rūnanga unless the land discharge location is moved to a location north of the Eyre River in the treatment plant upgrade option. This will be considered as part of options assessment for the project.

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.

There are budgets funded from Oxford wastewater scheme available in 2024/25 (\$50,000) and 2025/26 (\$250,000) for the following project activities:

- Land irrigation site investigation for the WWTP upgrade
- Pipeline to EDSS options
- Rūnanga engagement
- Business case
- District wastewater strategy
- 3 Waters rating review

6.2. Sustainability and Climate Change Impacts

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

6.3 Risk Management

There are risks arising from the adoption/implementation of the recommendations in this report. The key risks that have been identified are:

- Existing capacity constraints at the Oxford WWTP causing occasional overflows during wet weather event and consent breaches for the wet weather storage basin. In addition, there is high operational costs associated with sludge removal. This will continue to be the case until further work is carried out to resolve these issues.
- Incorrect cost estimates could lead to sub-optimal decision making and lead to cost of implementing the options exceeding original estimates. This will apply to both options being considered.
- With any biological treatment process, there is a risk of performance not being achieved as predicted in design. This is a risk specific to the treatment plant upgrade option.
- Decision on the effluent disposal field, whether it remains at the same site or moved to a different site. Both potentially face opposition by the Rūnanga or local community.
- Community opposition, consenting and rating impacts on communities will need to be carefully considered as it is a risk for both options.
- Delay to project timeframes due to programme slippage which will need to be well managed.

The wastewater consents for the Eastern District wastewater scheme including the Ocean Outfall expire in 2039 and it is expected that there will be significant capital works required for the consent renewal.

6.3 Health and Safety

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

7. **CONTEXT**

7.1. Consistency with Policy

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

7.2. Authorising Legislation

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

7.3. Consistency with Community Outcomes

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

7.4. Authorising Delegations

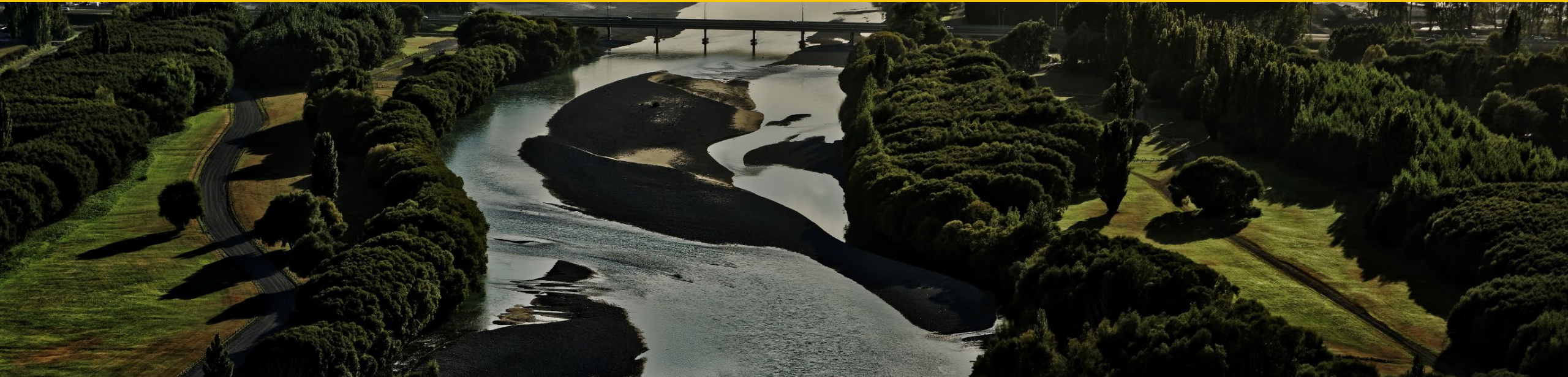
The Utilities & Roading Committee has delegated authority to approve the recommendations of this report.



Oxford Wastewater Scheme

Utilities & Roading Committee Briefing

18 June 2024



Overview

- **Purpose of Briefing**
- **Key Issues and Activities to Consider**
- **Proposed Project Scope**
- **Proposed Timeframes**
- **Identified Risks**
- **Next Steps**
- **Questions**

Purpose of Briefing

- **Gain Council's endorsement on proposed project scope and timeframes for Oxford Wastewater Scheme**
- **Recap of Previous Workshop**
 - Long term options for Oxford – 2 broad options (WWTP Upgrade vs Pipeline)
 - Opportunities to service Cust and other towns in the district
 - Costs and rating impact
 - Runanga engagement – river crossing & EDSS ocean outfall discharge
 - Historic Council land for effluent disposal

Key Issues and Activities to Consider

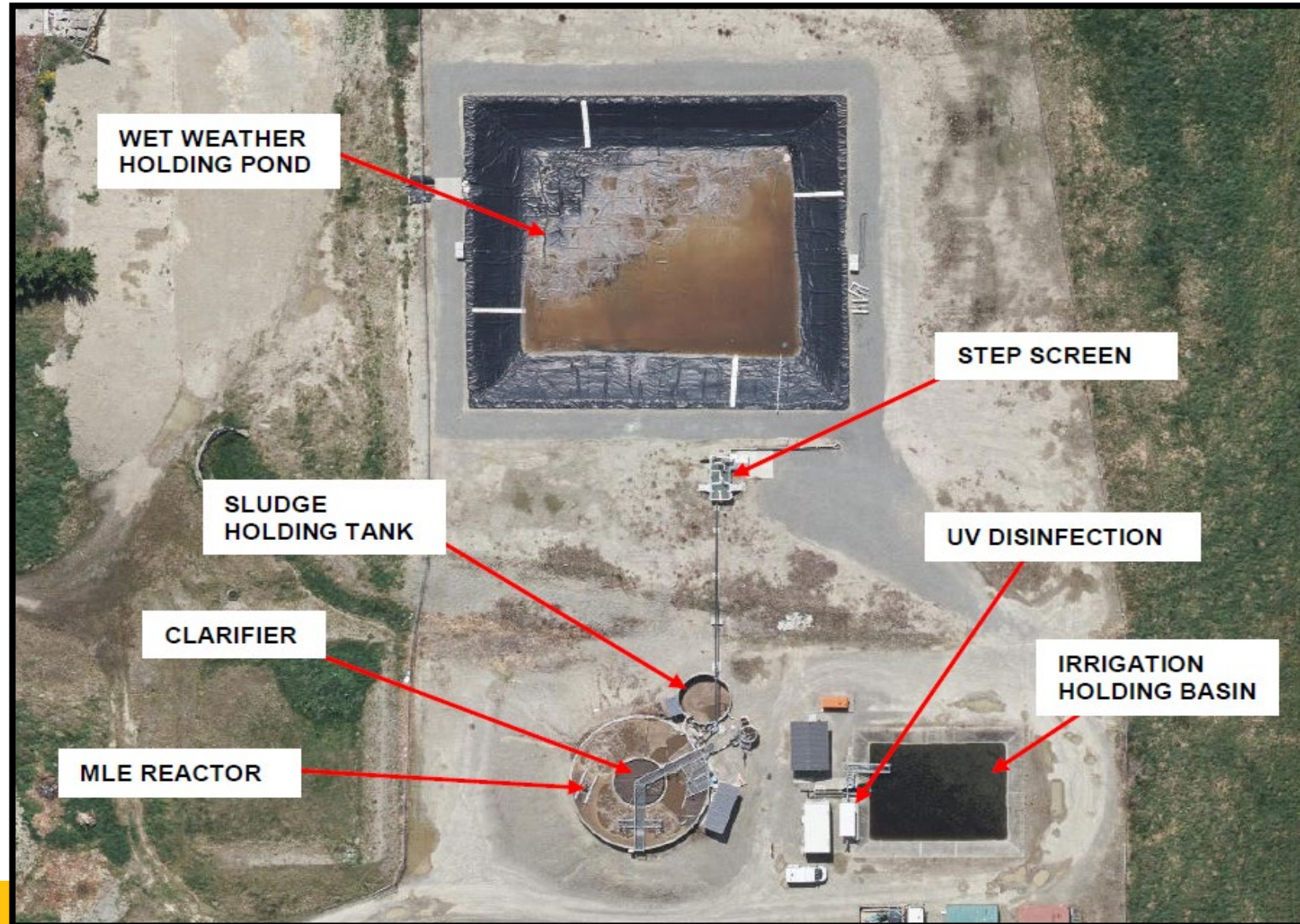
- **Consent Expiry**
 - Oxford WW discharge consent – August 2031
 - Expect more stringent consent conditions – Nitrogen and Phosphorus
 - Runanga engagement
 - Initial MKL feedback – objection to river crossing, disposal field location

Key Issues and Activities to Consider

28

Capacity and Operational Constraints at Existing Oxford WWTP

- Undersized clarifier – limit hydraulic capacity through plant (~75% growth in 50-year growth prediction)
- High Opex - sludge disposal
- Ongoing compliance challenges
 - Wet weather holding pond – overflow and 10-day hydraulic retention time
 - Demonstrating effluent application depth at irrigation field



Key Issues and Activities to Consider

- **District Plan Review**
 - Alignment with District Plan and growth
 - Confirm growth areas, servicing requirements (infrastructure strategy) and possible development contributions
- **3 Waters Rating Review**
 - Rating impact (local or district wide)
 - Community consultation

Proposed Project Scope

Investigate Long Term Options for Oxford

Option 1 - Oxford WWTP Upgrade

1. Retain existing effluent disposal site
2. Relocate effluent disposal site north of Eyre River

Option 2 - Pipeline to EDSS

1. Pipeline from Oxford to Rangiora
2. Pipeline from Oxford to Kaiapoi



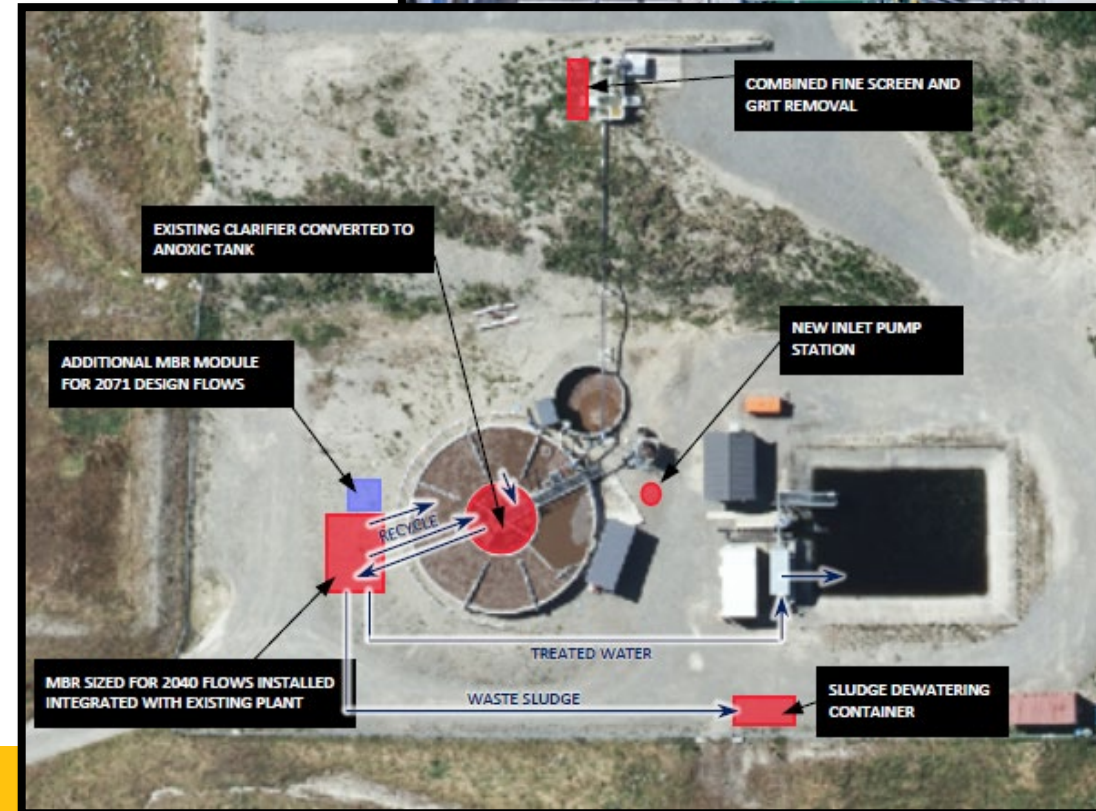
Oxford WWTP

**Effluent
Disposal Field**

Proposed Project Scope³²

Oxford WWTP Upgrade

- Number of sub-options for plant upgrade had been considered
- Preferred option is the Membrane Bioreactor (MBR) upgrade – based on MCA assessment
 - ease of O&M
 - ability to handle changes in WW quality
 - sludge management
 - nitrogen removal
 - suitability for phosphorus removal
 - additional irrigation area required
 - Opex
- **MBR technology widely used in NZ for over 20 years, generally good track record from operation and maintenance perspective**





Proposed Project Scope

Pipeline to EDSS

- Pipeline from Oxford to EDSS either via Rangiora or Kaiapoi to service Oxford
- Pipe sized to allow capacity for discharge from other towns along alignment (i.e. Cust, West Eyreton, (Kaiapoi - South Kaikanui)
- Detailed assessment of Cust servicing (localised retic) will be excluded from scope to ensure fair comparison between 2 broad options as to what's best for Oxford
- Determine best approach for district but not unfairly burdening Oxford

Desired Outcomes from Options Investigation

- **Identify best option to adopt for Oxford**
- **Identify cost of preferred option, impact on rates**
- **Identify potential funding options based on costs identified**

Review of historic decision to dispose of land acquired for land discharge in the district, pre-Ocean Outfall

- Raised in previous briefing as something to consider and understand about Council's decision-making process at the time
- Largely political and financial rather than opposition from Iwi
- There was a lot of local opposition to the ground disposal option
- Cost for land disposal were significant, Fonterra and other groups stated the land couldn't be used for dairying and other forms of feedstock
- Iwi were keen to see the existing disposal remedied so also supported the option for the outfall as it was better than the existing situation
- Not deem to be relevant to current decision making – Land disposal vs Ocean Outfall

Proposed Project Scope

Activities funded by Oxford WWTP budget (\$50k in 24/25; \$250k in 25/26)


- Land irrigation site investigation
- Runanga engagement
- Pipeline to EDSS options
- Business Case
- Project Management and aligning inter-dependencies

Proposed Project Timeframes

Options Investigation, District Plan Review, 3W Rating Review, District Wastewater Strategy, Business Case, Runanga Engagement
Completed by December 2025



Adopt Preferred Option (1 July 2026)
Public Consultation (27/37 LTP)



Design and Consenting 26/27 - 27/28



Construct/Commission/Operate 28/29 - 29/30
Consent Expires August 2031

Identified Key Risks

- **Existing Plant**
 - Capacity constraints (wet weather storage and overflows) and high operating costs
- **Incorrect cost estimates**
 - Could lead to sub-optimal decision making and cost exceeding original estimates
- **Treatment plant performance**
 - With any biological treatment process, risk of performance not being achieved as predicted in design
- **Effluent disposal options (for WWTP Upgrade option)**
 - If remain at same site, lwi opposition
 - If move to different site, difficulties in finding/purchasing land, local opposition
- **Consenting/Community**
 - Community opposition is a risk for all options
 - Consenting is a risk for all options
 - Rating impacts on communities - 3W rating review

Next Steps

- **Report to U&R Committee in August 2024 for approval of proposed project scope and timeframes**

Questions



Proposed Oxford Wastewater Treatment Plant Project Timeline

TRIM: 240808132220

| TASK | START | END | 2024/25 | 2025/26 | 2026/27 | 2027/28 | 2028/29 | 2029/30 | 2030/31 | 2031/32 |
|---|--------|--------|---------|---------|---------|---------|---------|---------|---------|---------|
| Options Investigation | | Dec-25 | | | | | | | | |
| Broad Option 1: WWTP Upgrade | Sep-24 | Dec-25 | | | | | | | | |
| Broad Option 2: Pipeline to EDSS | Sep-24 | Dec-25 | | | | | | | | |
| Runanga Engagement | Sep-24 | Dec-25 | | | | | | | | |
| 3 Waters Rating Review (Internal) | | Dec-25 | | | | | | | | |
| Council Adopt Preferred Option | | Dec-25 | | | | | | | | |
| Public Consultation on preferred option and 3 Waters Rating Review (Public) | | Aug-26 | | | | | | | | |
| Allocate project and construction budgets for preferred option in LTP | | Oct-26 | | | | | | | | |
| Project implementation | | Jun-30 | | | | | | | | |
| Design and Consenting of preferred option | Jul-26 | Jun-28 | | | | | | | | |
| Construct/Commission/Operate preferred option | Jul-28 | Jun-30 | | | | | | | | |
| Existing Consent Expiry | | Aug-31 | | | | | | | | |

WAIMAKARIRI DISTRICT COUNCIL**REPORT FOR DECISION****FILE NO and TRIM NO:** RDG-08-09-01 / 240624102322**REPORT TO:** UTILITIES & ROADING COMMITTEE**DATE OF MEETING:** 20th August 2024**AUTHOR(S):** Kieran Straw – Civil Projects Team Leader
Joanne McBride – Roothing & Transport Manager**SUBJECT:** Proposed Roothing Capital Works Programme for 2024/25 and Indicative Three-Year Programme**ENDORSED BY:**
(for Reports to Council,
Committees or Boards)
General Manager
Chief Executive**1. SUMMARY**

- 1.1 This report seeks approval of the proposed 2024/25 Roothing Capital Works Programme and notes the indicative three-year programme from 2025/26 to 2027/28, as shown in the tables in Attachment (i).
- 1.2 The programme was circulated to the Boards by way of memo (Trim No. 2406241020350 and has been presented at the recent round of Community Board meetings. Feedback from these meetings has been incorporated into the final Roothing Capital Work Programme for approval by the Utilities and Roothing Committee.
- 1.3 The Roothing Capital Works Programme being considered are the categories where a general allocation is provided for in the Council's Long Term Plan (LTP), where community input is beneficial to achieving the required outcomes.
- 1.4 Renewal programmes are determined following a condition assessment of assets which have reached the end of life and are due for replacement, or where infrastructure is failing to provide an adequate level of service. While part of the prioritisation process considers asset life other factors including road hierarchy, high demand areas (e.g., schools or town centre areas) are also considered.
- 1.5 All major improvement projects which are specifically listed in the Long Term Plan (LTP) are not considered within this report, as these are consulted on through the LTP process.
- 1.6 Minor Safety Improvements and Public Transport Infrastructure are also included in the proposed programme.

Attachments:

- i. Proposed Roothing Capital Works Programme for 2024-25 and Indicative Three-Year Programme (TRIM No. 240624102120V2)

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

- (a) **Receives** Report No. 240624102322.

- (b) **Approves** the attached 2024/25 Proposed Roding Capital Works Programme (Trim No. 240624102120V2).
- (c) **Notes** the Indicative Roding Capital Works Programme for the 2025/26, 2026/27 and 2027/28 years.
- (d) **Notes** that the outcome of the National Land Transport Programme (NLTP) will not be known until September 2024, and as such it will not be known as to whether co-funding is available until that time.
- (e) **Notes** that if co-funding is not secured a further report will be brought to Council.
- (f) **Notes** that feedback from the Community Boards is discussed within section 5 of this report, and that the relevant changes have been made to the proposed programme of works for approval.
- (g) **Circulates** this report to all Boards for their information.

3. **BACKGROUND**

- 3.1 The Roding programmes being considered are for those categories where a general allocation only is provided in the Council's Long-Term Plan (LTP). These categories have some flexibility and as such community input is beneficial to achieving the required outcomes.
- 3.2 Major Roding Improvement projects are not included in this report as they are specifically listed in the LTP and consulted on through the LTP.
- 3.3 Categories considered within this programme are:
 - Kerb and Channel Renewal
 - Footpath Renewal
 - Minor Improvements
 - New Footpaths
 - Public Transport Infrastructure (New bus shelters & seats)
- 3.4 Other general categories such as road rehabilitation, road resealing, unsealed road re-metalling, signs renewal and street light renewal are not included as these programmes are developed purely on technical grounds and for asset condition reasons.
- 3.5 The process for finalising and approving the 2024/25 Roding capital works programme has included circulating a memo with the draft programme to the Community Boards ahead of taking separate reports to each of the Community Boards. Feedback from the memo and the meetings has been considered, and agreed amendments made to the proposed programme.
- 3.6 The roading network is managed as a total network across the whole district and as such projects are prioritised district wide. Also, as the majority of expenditure on the network is subsidised by New Zealand Transport Agency Waka Kotahi, their requirements must be met to secure co-funding. Asset condition and safety are the key drivers for the programme and the aim is to minimise lifecycle costs.
- 3.7 Projects are identified in terms of the Roding Activity Management Plan and are being done to ensure the levels of service identified in the LTP are met. Asset renewal projects are identified and programmed based on asset condition to ensure that lifecycle costs, and hence the cost to the community, are minimised.
- 3.8 In developing the programmes, a range of factors are taken into account. Asset condition is the main driver for renewal projects, however other key factors are community feedback,

and the coordination of the work with other programmes (such as water main renewal, drainage improvements and Utility Provider undergrounding) especially when deciding which year a particular work should be done. As asset deterioration is gradual there is some flexibility to bring forward or delay specific projects where required.

- 3.9 Inputs used to develop the programmes are condition rating and inspections, RAMM reports, reports from the maintenance contractor, crash records, network safety inspections, reviews of maintenance costs, feedback from the public via service requests etc. All identified deficiencies are entered into a database, reviewed and then prioritised to fit within budget levels and to ensure they address a defined level of service issue.

- 3.10 Utility Authorities, the 3 Waters Team and the Greenspaces Teams are consulted to ensure there are no conflicts with their programmes and to identify possible synergies in the programmes.

3.11 Condition Assessment

To better understand the condition of the kerb and channel and footpath assets a condition rating is carried out every three years on these assets. The most recent rating was completed in 2022 to feed into the 2024 Transportation Activity Management Plan and the Long Term Plan. The next condition rating is due to be completed in 2025.

3.12 Kerb and Channel Replacement

Kerb and channel replacement is primarily focussed on the replacement of old-style dished channels which are in a poor or very poor condition. This is subject to the kerb and channel warranting replacement and meeting NZTA requirements. In many cases the footpath is replaced at the same time as the kerb and channel, however this only occurs where the footpath condition also warrants the renewal. Some old kerb and flat channels are in poor condition, and these will be included in the programme as required.

The kerb and channel replacement are prioritised district-wide and the condition of the channel must be such that replacing it is the lowest maintenance cost treatment. Waka Kotahi has reasonably strict requirements that have to be met in order for the work to qualify for financial assistance, such that the poor condition of the channel is resulting in damage to the carriageway due to water ingress. Replacement for aesthetic reasons only will not be approved by Waka Kotahi.

3.13 Footpath Renewals

This category is for the resurfacing and reconstruction of footpaths. The programme is determined by the footpath surface condition, and the purpose is to provide safe and comfortable footpaths and to minimise lifecycle costs.

As mentioned above all footpaths were condition rated in 2022. From this rating the worst condition streets were identified and inspected. From that inspection and taking into account community feedback and other programmes. Including the previous approved programme, the draft renewal programme has been developed.

The footpath renewal programme is coordinated with the kerb and channel programme to ensure the end of the footpath life coincides with the end of the kerb and channel life so replacement can be done at the same time. This offers more options to design a comprehensive street upgrade when the renewal takes place. The next condition rating assessment is due to be undertaken in 2025.

3.14 Minor Improvements Programme

For the minor improvement programme, safety is the main factor considered.

This programme has some flexibility, and opportunities exist to carry out a range of safety related improvement works. The proposed programme includes a number of safety issues and concerns that have been raised through various avenues and feedback from the Board(s) is an important input in confirming this programme.

3.15 New Footpaths

This programme looks to install new footpaths in urban areas where there currently are none. A programme has been developed and prioritised and delivery of these new paths are continuing. The Programme for 2024/25 has been approved by Council and funding brought forward as part of the Long Term Plan, to allow for both Lees Road (Kaiapoi) and East Belt (Rangiora) to be delivered in the 2024/25 financial year.

It is also noted that staff are continuing to work through options with Council on the delivery of shared paths which had been previously agreed under the Transport Choices funding, which was subsequently withdrawn. This includes the Woodend to Ravenswood connection. Once the outcome of the National Land Transport Programme funding application is known, a further report will be taken to Council.

3.16 Public Transport Infrastructure

This programme of work includes the installation of bus shelters and real time displays at stops along public transport routes.

As part of the Passenger Transport Futures Business Case which was prepared for and endorsed by the Greater Christchurch Partnership (including Waimakariri District Council), a report was developed which recommended investment at key stops throughout the district. The programme that has been developed takes into account both these recommendations, and the ECan bus boarding numbers.

4. ISSUES AND OPTIONS

- 4.1. The draft programme was pre-circulated to the Community Boards with a memo, then followed up with a report to each Community Board. Feedback has been taken at each meeting and included within this report (refer attachment i).
- 4.2. This report is seeking approval of the attached programme (revised following the Community Board meetings), which will then allow for work to proceed promptly in September once the outcome of the National Land Transport Programme (NLTLP) is known.
- 4.3. The indicative three-year programme for the following three years is more flexible and as it is reviewed annually to allow consideration of programme delays, any emerging issues and to provide an opportunity to make changes to this programme.
- 4.4. The following options are available to the Committee:
 - 4.4.1. Option One – Approve the Proposed Programme as Recommended:
The attached programme takes into account feedback from the boards as discussed in Section 5.

This is the recommended option as it allows for work to begin on planning / design for projects early in the new financial year.
 - 4.4.2. Option Two – Decline the Recommendation and ask Staff to make further changes:
This is not the recommended option as staff have spent considerable time reviewing these programmes of works and confirming that this programme is not in clashes with other Council programmes.

4.5. **Implications for Community Wellbeing**

There are implications on community wellbeing by the issues and options that are the subject matter of this report.

The programmes contribute directly to meeting levels of service as well as public transport and safety outcomes, all of which have an impact on the Community.

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

5. **COMMUNITY VIEWS**

5.1. **Mana whenua**

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

Staff will liaise with Te Ngāi Tūāhuriri in regard to specific projects within the programme as required. Where individual projects are agreed upon, then the appropriate groups and residents will be consulted with.

5.2. **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.

5.3. **Wider Community**

The wider community is likely to benefit from these safety improvements, improved infrastructure, and installation of shelters. Improved safety reduces the risk of harm to the public. Safety, Public transport and renewal of infrastructure supports the whole community.

Renewal of infrastructure results in a good level of service for the community and reduces the risk of failure which could put the Community at risk. Providing shelter at bus stops increases the appeal of catching the bus and reduces congestion for other road users.

Staff will communicate impacts with directly affected residents as required.

5.3.1 **Woodend-Sefton Community Board Feedback**

The Woodend-Sefton Community Board endorsed the programme at the Board meeting on 8th July, with the requested following change:

- The Board agreed that seating at the SH1 stop should be prioritised over the Infinity Drive stop.

Staff have reviewed the programme and confirmed pricing of Real Time Displays, which does result in a small amount of budget being available. This can be utilised for installing a concrete pad and seat. The concrete pad will be constructed such that a shelter can be installed over the seat in the future, once the plans for the Woodend Bypass are clearer.

5.3.2 **Rangiora-Ashley Community Board Feedback**

The Rangiora-Ashley Community Board endorsed the programme at the Board meeting on 10th July, with the requested following change:

- Bringing forward the footpath resurfacing of Holcroft Court into the 2024 / 25 year. In order to accommodate this, Grove Place, and Fraser Place sites were moved into the 2025 / 26 programme to keep the overall 2024 / 25 programme within the available budgets.

Several additional questions were raised prior to the Community Board meeting. These questions were answered, however no further changes to the programme were requested at the Community Board meeting.

5.3.3 Kaiapoi-Tuahiwi Community Board Feedback

The Kaiapoi-Tuahiwi Community Board endorsed the programme at the board meeting on 15th July without any requested changes to the programme.

The Board did however voice their desire to extend the programmed footpath renewal on Charles Street to include a new section of footpath extending to the Coast Guard entranceway.

Staff have completed an estimate for this work, which has an estimated value of \$20,000, and will endeavour to complete this additional programme in conjunction with the renewal using, and possible savings within the Minor Improvement Programme. The shortfall may in part also be able to be funded from the Kaiapoi Town Centre Regeneration budget, however this is yet to be confirmed. Staff would need to bring this option to the Board for a decision, and this could be done in conjunction with the approvals required for the Charles Street renewal project.

Other issues raised but not included within this programme were:

- Fuller Street – Request for new K&C. This not currently in any programmes.
- Mill Road, Cust – Need to protect this route which floods and is the only access for some residents.

5.3.4 Oxford-Ohoka Community Board Feedback

The Oxford-Ohoka Community Board had the following feedback, which was agreed at the board meeting on 7th August.

The Board sought clarity on future projects however did not request any changes be made to the proposed programme. One question raised at the meeting was why Mill Rd / Ashworths Rd was included in the high-risk intersection treatments. This has been reviewed and is in the top 20% of high-risk intersections in the district. This is calculated on a number of factors including the crash history / ADT of the road / approach angles and visibility at the intersection etc. The programme of proposed low-cost improvements is taking a proactive approach to upgrading these high-risk intersections, and the intervention will be targeted to suit each location. Clarification was also sought on what was proposed with the Oxford Threshold signs. As discussed, this is improving the threshold treatments at the edge of the township.

6. **OTHER IMPLICATIONS AND RISK MANAGEMENT**

6.1. **Financial Implications**

There are no financial implications of the decisions sought by this report. Programmes are set to meet budget allocations for each category.

This budget is included in the Long Term Plan. It is also noted that the budgets included in the attached proposed programme exclude inflation and that the Long Term Plan budget figures include inflation.

There is a risk around funding as the outcome of the National Land Transport Programme (NLTP) will not be known until September 2024, and as such it will not be known as to whether co-funding is available until that time. As such work will not progress until the outcome is known.

6.2. **Sustainability and Climate Change Impacts**

The recommendations in this report do have sustainability and/or climate change impacts. Providing good quality assets such as footpaths encourages alternate modes such as walking. Increased Public Transport use has the impact of reducing carbon emissions.

6.3 Risk Management

There are risks arising from the adoption/implementation of the recommendations in this report.

There is a risk that the programme may not meet expectations. This is mitigated by ensuring public feedback is taken into consideration when developing the programme. The programme is also circulated to the Community Boards and feedback is sought.

There will remain a funding risk until such time as the outcome of the NLTP is known.

6.4 Health and Safety

There are health and safety risks arising from the adoption/implementation of the recommendations in this report.

Any contractors undertaking condition assessment or physical works contracts will be required to be SiteWise registered and meet minimum score requirements appropriate for the risk of the work being undertaken.

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 Land Transport Act is relevant to this matter.

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.

Transport is accessible, convenient, reliable and sustainable.

- The standard of our District's roads is keeping pace with increasing traffic numbers.
- Communities in our District are well linked with each other, and Christchurch is readily accessible by a range of transport modes.
- Public transport serves our District effectively.

7.4. Authorising Delegations

Utilities & Roothing Committee has the delegation to approve works that are within the Council budgets.

| Proposed Roading Capital Works Programme for Community Boards - 2024/25 and three indicative years | | | | | | | |
|---|-------------|-------------|---------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| | | | 24/25 | 25/26 | 26/27 | 27/28 | 28/29 |
| Project Name | Side | Town | Proposed Programme | Indicative Programme | Indicative Programme | Indicative Programme | Indicative Programme |
| Kerb and Channel Renewal | | | | | | | |
| Professional Fees | | | \$ 85,000 | \$ 85,000 | \$ 85,000 | \$ 85,000 | \$ 85,000 |
| Charles Street (Outside Paris for the Weekend) | West | Kaiapoi | \$ 20,000 | | | | - |
| Alfred St (Victoria St - Ivory St) | South | Rangiora | \$ 45,000 | - | - | | - |
| Ashgrove St (Seddon St - No.62) | East | Rangiora | \$ 120,000 | - | - | | - |
| Akaroa Street (Hugh St - Ashley Pl) | Both | Kaiapoi | \$ 245,000 | - | - | | - |
| Leech Pl (Bush St - end) | North | Rangiora | - | \$ 30,000 | - | | - |
| Thorne Pl (Ivory St - end) | South | Rangiora | - | \$ 30,000 | - | | - |
| Green St (Johns Rd - 22) | East | Rangiora | - | \$ 115,000 | - | | - |
| Akaroa Street (Ashley Pl - Alpine Ln) | Both | Kaiapoi | - | \$ 140,000 | - | | - |
| Seddon St (White St to Ayers St) | North | Rangiora | - | \$ 55,000 | - | - | - |
| Seddon St (Kinley St to White St) | South | Rangiora | - | \$ 30,000 | - | - | - |
| White St (Johns Rd - Palmer St) | East | Rangiora | - | \$ 40,000 | - | - | - |
| Otaki St (Ohoka Rd - Broom St / no. 21) | East | Kaiapoi | - | - | \$ 70,000 | - | - |
| Otaki St (Ohoka Rd - Broom St / no. 21) | West | Kaiapoi | - | - | \$ 135,000 | - | - |
| Johns Rd (Green St - Bush St) | South | Rangiora | - | - | \$ 12,000 | - | - |
| Johns Rd (Bush St - King St) | South | Rangiora | - | - | \$ 60,000 | - | - |
| Denchs Rd (Southbrook Rd - New Life School) | North | Rangiora | - | - | \$ 50,000 | - | - |
| Edward St, No. 14 - Wales St | East | Rangiora | - | - | - | \$ 165,000 | - |
| Bush St (South Belt - no. 29 - Kindergarten) | West | Rangiora | - | - | - | \$ 125,000 | - |
| Bush St (Charles St - Watson Pl) | West | Rangiora | - | - | - | \$ 45,000 | - |
| Kingsbury Ave (Windsor Crt - Regent Ave) - V Channel | South | Rangiora | - | - | - | \$ 50,000 | - |
| Other Commitments | | | \$ 45,000 | \$ 45,000 | \$ 45,000 | \$ 45,000 | \$ 45,000 |
| To be Allocated | | | \$ 10,907 | \$ 907 | \$ 113,907 | \$ 55,907 | \$ 133,907 |
| Value of Work Programmed | | | \$ 560,000 | \$ 570,000 | \$ 457,000 | \$ 515,000 | \$ 437,000 |
| Total Available Budget (including fees) | | | \$ 570,907 | \$ 570,907 | \$ 570,907 | \$ 570,907 | \$ 570,907 |
| | | | | | | | |

| | | | 24/25 | 25/26 | 26/27 | 27/28 | 28/29 |
|--|-------|----------|--------------------|----------------------|----------------------|----------------------|----------------------|
| Project Name | Side | Town | Proposed Programme | Indicative Programme | Indicative Programme | Indicative Programme | Indicative Programme |
| Footpath Renewal | | | 24/25 | 25/26 | 26/27 | 27/28 | 27/28 |
| Professional Fees | | | \$ 40,000 | \$ 40,000 | \$ 40,000 | \$ 40,000 | |
| Alfred St (Victoria St - Ivory St) - with kerb & channel | South | Rangiora | \$ 25,000 | - | - | - | - |
| Charles Street (outside Paris for the Weekend) | West | Kaiapoi | \$ 25,000 | - | - | - | - |
| Princess Pl (Smith St - end) | East | Kaiapoi | \$ 47,000 | - | - | - | - |
| Ashgrove St (Seddon St - No.62) - with kerb and channel | East | Rangiora | \$ 55,000 | - | - | - | - |
| Akaroa Street (Hugh St - Ashley Pl) - with kerb and channel | Both | Kaiapoi | \$ 102,000 | - | - | - | - |
| Blackett Street (north-east quadrant at King Street roundabout - No. 216 King St) | North | Rangiora | \$ 15,000 | - | - | - | - |
| Ashley St (Jennings Pl - No. 71/73) | West | Rangiora | \$ 70,000 | - | - | - | - |
| Parkhouse Dr (Treffers Ave-End) | West | Rangiora | \$ 53,000 | - | - | - | - |
| Treffers Ave (Johns Rd - Parkhouse Dr) | West | Rangiora | \$ 30,000 | - | - | - | - |
| Kippenberger Ave (East Belt - end) | North | Rangiora | \$ 60,000 | - | - | - | - |
| Wilson Dr (Mill Rd - end) | East | Ohoka | \$ 35,000 | - | - | - | - |
| Holcroft Crt (Seddon St- End) | Both | Rangiora | \$ 40,000 | - | - | - | - |
| Fraser Pl (No. 2 - end) | South | Rangiora | | \$ 20,000 | - | - | - |
| Grove Pl (Kingsbury Ave - Rex Pl, including walkway) | East | Rangiora | - | \$ 27,000 | - | - | - |
| Victoria St (No. 67 - Alfred) | West | Rangiora | - | \$ 22,000 | - | - | - |
| Leech Pl (Bush St - end) - with kerb and channel | North | Rangiora | - | \$ 20,000 | - | - | - |
| Green St (Johns Rd - No. 22) - with kerb and channel | East | Rangiora | - | \$ 40,000 | - | - | - |
| Akaroa Street (Ashley Pl - Alpine) - with kerb & channel | Both | Kaiapoi | - | \$ 60,000 | - | - | - |
| Kingsbury Ave (Windsor Crt- Regent Ave) | North | Rangiora | - | \$ 20,000 | - | - | - |
| Seddon St (White St to Ayers St) - with kerb & channel | North | Rangiora | - | \$ 25,000 | - | - | - |
| Seddon St (Kinley St to White St) - with kerb & channel | South | Rangiora | - | \$ 20,000 | - | - | - |
| Williams Street (Beach to No 232) | East | Kaiapoi | - | \$ 10,000 | - | - | - |
| Park St (High St - end) | West | Rangiora | - | \$ 40,000 | - | - | - |
| Courtenay Dr (Stone St - Williams St) | North | Kaiapoi | - | \$ 30,000 | - | - | - |
| Burt St (Albert - Ashley) | Both | Rangiora | - | \$ 35,000 | - | - | - |
| White St (Seddon St - Kingsbury Ave) | West | Rangiora | - | \$ 75,000 | - | - | - |
| Upper Sefton Rd (no. 537- Railway St) | North | Sefton | - | \$ 35,000 | - | - | - |
| Thorne Pl (Ivory St - end) - with kerb & channel | South | Rangiora | - | \$ 15,000 | - | - | - |
| White St (Johns to Palmers) - with kerb & channel | East | Rangiora | - | \$ 20,000 | | - | - |
| Otaki St (Ohoka Rd to Broom St / no. 21) - with kerb & channel | West | Kaiapoi | - | - | \$ 40,000 | - | - |
| Johns Rd (Green St - Bush St) - with kerb & channel | South | Rangiora | - | - | \$ 45,000 | - | - |
| Johns Rd (Bush St - King St) - with kerb and channel | South | Rangiora | - | - | \$ 30,000 | - | - |
| Blackett St (Ashley St to Railway) | North | Rangiora | - | - | \$ 20,000 | - | - |
| Hewitts Rd (Appleton Pl - No. 27/29) | South | Woodend | - | - | \$ 50,000 | - | - |
| Hewitts Rd (Woodglenn Dr - Appleton Pl) | South | Woodend | - | - | \$ 30,000 | - | - |
| Fuller St (Peraki St - No. 65) | South | Kaiapoi | - | - | \$ 50,000 | - | - |
| Buckleys Rd (45-63) | West | Rangiora | - | - | \$ 20,000 | - | - |
| Denchs Rd (Southbrook Rd - New Life School) (Opp. Marshall Rd) - with kerb & channel | North | Rangiora | - | - | \$ 25,000 | - | - |

| | | | 24/25 | 25/26 | 26/27 | 27/28 | 28/29 |
|--|------|----------|--------------------|----------------------|----------------------|----------------------|----------------------|
| Project Name | Side | Town | Proposed Programme | Indicative Programme | Indicative Programme | Indicative Programme | Indicative Programme |
| Edward St, No. 14 - Wales St | East | Rangiora | - | - | - | \$ 15,000 | - |
| Bush St (Charles St - Watson Pl) - with kerb & channel | West | Rangiora | - | - | - | \$ 30,000 | - |
| Bush St (South Belt - no. 29 - Kindergarten) - with kerb & channel | West | Rangiora | - | - | - | \$ 60,000 | - |
| To be Allocated | | | \$ 13,061 | \$ 56,061 | \$ 260,061 | \$ 465,061 | \$ 475,061 |
| Value of Work Programmed | | | \$ 597,000 | \$ 554,000 | \$ 350,000 | \$ 145,000 | \$ 135,000 |
| Total Available Budget (including fees) | | | \$ 610,061 | \$ 610,061 | \$ 610,061 | \$ 610,061 | \$ 610,061 |
| | | | | | | | |

| | | | 24/25 | 25/26 | 26/27 | 27/28 | 28/29 |
|---|------|--------------|--------------------|----------------------|----------------------|----------------------|----------------------|
| Project Name | Side | Town | Proposed Programme | Indicative Programme | Indicative Programme | Indicative Programme | Indicative Programme |
| Minor Improvement Projects | | | | | | | |
| Lighting | | | | | | | |
| Oxford Lighting Deficiencies | | Oxford | \$ 40,000 | - | - | - | - |
| Oxford Lighting Deficiencies (includes carry-over from 2023/24) | | Oxford | \$ 20,000 | - | - | - | - |
| High Street Pedestrian Crossing Lighting | | Rangiora | - | \$ 30,000 | - | - | - |
| Easterbrook / Fernside Rd | | Fernside | - | - | \$ 25,000 | - | - |
| Harewood Rd / South Eyre Road | | Oxford | - | - | - | \$ 25,000 | - |
| Other Lighting Projects (TBC) | | | - | - | - | - | \$ 30,000 |
| Intersection Improvements | | | | | | | |
| Harleston Rd / Broad Rd Intersection | | Sefton | \$ 50,000 | - | - | - | - |
| South Eyre Rd / Browns Rd | | Swannanoa | \$ 40,000 | - | - | - | - |
| Tram Rd / Earlys Rd Splitter Island | | West Eyreton | \$ 40,000 | - | - | - | - |
| Swamp / Hodgsons / Stonyflat | | Loburn | - | \$ 50,000 | - | - | - |
| North Eyre Rd / Logan Road | | Mandeville | - | \$ 50,000 | - | - | - |
| Birch Hill Road / Bald Hills Road | | Okuku | - | - | \$ 50,000 | - | - |
| Easterbrook Rd / Fernside Rd | | Fernside | - | - | \$ 50,000 | - | - |
| Ashley Road / Summer Hill Road | | Cust | - | - | - | \$ 50,000 | - |
| Ashley Gorge Road / Glentui Bush | | Glentui | - | - | - | \$ 50,000 | - |
| King Street / Charles Street | | Rangiora | | | | | |
| Budget to be Allocated | | | - | \$ 30,000 | \$ 30,000 | \$ 30,000 | \$ 130,000 |
| School Safety Project | | | | | | | |
| Kaiapoi North School (includes carry-over from 2023/24) | | Kaiapoi | \$ 90,000 | - | - | - | - |
| Rangiora High School | | Rangiora | \$ 50,000 | - | - | - | - |
| Clarkville School (Carry Over) | | Clarkville | \$ 40,000 | - | - | - | - |
| Pegasus School (Solander Road) | | Pegasus | - | - | \$ 40,000 | - | - |
| Other School Projects (TBC) | | | - | \$ 25,000 | \$ 20,000 | \$ 50,000 | \$ 50,000 |
| Speed Treatments | | | | | | | |
| Cosgrove Street Traffic Caliming | | Kaiapoi | \$ 25,000 | - | | - | - |
| Oxford Speed Thresholds | | Oxford | - | \$ 40,000 | \$ 40,000 | - | - |
| Other Speed Projects TBC | | | - | - | - | - | \$ 50,000 |
| Minor Works | | | | | | | |
| Milton Ave Entrance to Rangiora - Speed Treatment | | Rangiora | \$ 30,000 | - | - | - | - |
| Speed Indicator Signage - Ground Sockets | | Various | \$ 10,000 | - | - | - | - |
| Ashley Street footpath outside cemeteray | | Rangiora | - | \$ 20,000 | - | | - |
| Soverign Palms & Arlington - Roundabout Signage | | Kaiapoi | - | - | - | \$ 25,000 | - |
| Ford Signage | | Various | \$ 15,000 | \$ 20,000 | \$ 20,000 | - | - |
| Blacket St Median | | Rangiora | - | - | - | \$ 30,000 | - |
| Other Minor Works | | | \$ 10,000 | - | \$ 20,000 | \$ 50,000 | \$ 110,000 |

| | | | 24/25 | 25/26 | 26/27 | 27/28 | 28/29 |
|--|------|--------------|---------------------|----------------------|----------------------|----------------------|----------------------|
| Project Name | Side | Town | Proposed Programme | Indicative Programme | Indicative Programme | Indicative Programme | Indicative Programme |
| <u>Walking and Cycling Projects</u> | | | | | | | |
| East Belt Footpath (Grey View Pl to Kippenberger) | | Rangiora | \$ 35,000 | - | - | | |
| Rangiora Roundabouts Pedestrian Improvements | | Rangiora | \$ 40,000 | \$ 20,000 | \$ 20,000 | - | - |
| King Street Pedestrian Cut-downs (at George St) | | Rangiora | \$ 15,000 | - | - | - | - |
| Pegasus Bay Cycle Trail - On Road Connections Signage | | Various | \$ 10,000 | - | - | - | - |
| Rangiora Town Centre Pedestrian Crossings | | Rangiora | \$ 20,000 | - | \$ 20,000 | - | - |
| South Belt Pedestrian Refuge | | Rangiora | \$ 25,000 | - | - | - | - |
| South Belt - Ped Refuge (Btwn Southbrook / King St) | | Rangiora | - | \$ 20,000 | - | - | - |
| Woodend Footpath Improvements (widening) | | Woodend | - | \$ 40,000 | - | - | - |
| Pegasus Footpath Connections | | Pegasus | - | \$ 30,000 | - | - | - |
| Southbook Cycle Lane Safety Improvements - Delineation | | Rangiora | - | - | \$ 20,000 | - | - |
| Peraki St / Carew St Ped Cutdowns | | Kaiapoi | - | - | \$ 15,000 | - | - |
| Pegasus Cycle Lanes at roundabouts | | Pegasus | - | - | \$ 20,000 | \$ 50,000 | \$ 30,000 |
| Sneyd / Cosgrove St Ped Cutdowns | | Kaiapoi | - | - | - | \$ 15,000 | - |
| Kings Ave Waikuku - Path link from Waikuku Beach Intersection to existing path | | Waikuku | | | | | |
| Other Walking & Cycling Projects | | | - | - | - | \$ 50,000 | \$ 120,000 |
| <u>Roadside Hazard Removal</u> | | | | | | | |
| Dixons Rd - Guardrail (RP1125) - includes carry over from 2023/24 | | Loburn | \$ 290,000 | \$ 200,000 | - | - | - |
| Dixons Rd - Bridge 2802 (RP2540) | | Loburn | - | - | \$ 200,000 | - | - |
| Upper Sefton Rd- Remove Concrete Headwall (RP9490) | | Sefton Rural | - | - | - | \$ 200,000 | - |
| <u>High Risk Intersection treatments</u> | | | | | | | |
| Oxford Road - Mertons Road - Plasketts Road | | | \$ 20,000 | | | | |
| South Eyre Road / Poyntz Road | | | \$ 20,000 | | | | |
| South Eyre Road / Two Chain | | | \$ 20,000 | | | | |
| Tram Road / No. 10 Road | | | \$ 20,000 | | | | |
| Tram Road / South Eyre Rd / Giles Road | | | \$ 40,000 | | | | |
| Depot Road / Woodstock Road | | | \$ 20,000 | | | | |
| Mill Road / Ashworths Road | | | \$ 20,000 | | | | |
| Two Chain Road / Swannanoa Road / Boundary Road / Main Drain Road | | | \$ 20,000 | | | | |
| Tram Road / Earlys Road | | | \$ 20,000 | | | | |
| To be allocated | | | | \$ 200,000 | \$ 180,000 | \$ 180,000 | \$ 180,000 |
| <u>Cattle Underpass</u> | | | | | | | |
| Underpasses to be allocated | | | - | - | - | - | - |
| Budget to be Allocated | | | \$ 6,728 | - | \$ 5,000 | \$ 15,000 | \$ 220,000 |
| Value of Work Programmed | | | \$ 1,095,000 | \$ 775,000 | \$ 770,000 | \$ 805,000 | \$ 700,000 |
| Approved Annual Budget | | | \$ 1,101,728 | \$ 775,000 | \$ 775,000 | \$ 820,000 | \$ 920,000 |
| | | | | | | | |

| | | | 24/25 | 25/26 | 26/27 | 27/28 | 28/29 |
|--|------|----------|--------------------|----------------------|----------------------|----------------------|----------------------|
| Project Name | Side | Town | Proposed Programme | Indicative Programme | Indicative Programme | Indicative Programme | Indicative Programme |
| New Footpaths | | | | | | | |
| Lees Road (Williams St to west of Bayliss Dr) | | Kaiapoi | \$ 135,000 | - | - | - | - |
| East Belt (north of Wales to Coldstream) | | Rangiora | \$ 155,000 | - | - | - | - |
| Chinnerys Road (Reserve east entrance – Woodglen Dr) – west side | | Woodend | - | - | \$ 70,000 | - | - |
| Redwood Place (Start to end) | | Oxford | - | - | \$ 30,000 | - | - |
| Ranfurly Street (Dale St to Cridland St) – east side | | Kaiapoi | - | - | - | \$ 60,000 | - |
| Matai Place (Start to end) | | Oxford | - | - | - | \$ 40,000 | - |
| Knight Street (Start to end) | | Oxford | - | - | - | - | \$ 60,000 |
| Woodfield Place (Start to end) | | Woodend | - | - | - | - | \$ 40,000 |
| Church Street - Past Anglican Church | | Rangiora | - | - | - | - | - |
| To be allocated | | | \$ 54,800 | - | - | - | - |
| Value of Work Programmed | | | \$ 290,000 | - | \$ 100,000 | \$ 100,000 | \$ 100,000 |
| Total Available Budget (including fees) | | | \$ 344,800 | \$ - | \$ 100,000 | \$ 100,000 | \$ 100,000 |
| * 2024/25 footpath programme has been approved by Council | | | | | | | |

| | | | 24/25 | 25/26 | 26/27 | 27/28 | 28/29 |
|---|------|----------|--------------------|----------------------|----------------------|----------------------|----------------------|
| Project Name | Side | Town | Proposed Programme | Indicative Programme | Indicative Programme | Indicative Programme | Indicative Programme |
| | | | | | | | |
| Bus Shelter Programme | | | | | | | |
| Pegasus Main St near Motu - Real Time Display | | Pegasus | \$ 13,000 | - | - | | |
| Northern Park and Ride (River Rd) - Real Time Display | | Rangiora | \$ 13,000 | - | - | | |
| Kaiapoi Central Park and Ride - Real Time Display | | Kaiapoi | \$ 13,000 | - | - | | |
| South Blt near Bush St - Real Time Display | | Rangiora | \$ 13,000 | - | - | | |
| Kaiapoi South Park & Ride - Real Time Display | | Kaiapoi | \$ 13,000 | - | - | | |
| Ohoka Rd (Kaiapoi High School) - north | | Kaiapoi | \$ 20,000 | - | - | | |
| Ohoka Rd (Kaiapoi High School) - south | | Kaiapoi | \$ 20,000 | - | - | | |
| Pegasus Blvd near SH1 - south - SEAT ONLY | | Pegasus | \$ 10,000 | - | - | | |
| Bush St (near Watson Pl) | | Rangiora | - | \$ 20,000 | - | | |
| Main North Rd (near Hewitts Rd) | | Kaiapoi | - | \$ 20,000 | - | | |
| Williams St (near Davies St) | | Kaiapoi | - | \$ 20,000 | - | | |
| Main North Rd (near School Rd) | | Woodend | - | \$ 20,000 | - | | |
| Pegasus Blvd near Pegasus Main St - Real Time Display | | Pegasus | - | \$ 15,000 | - | | |
| West Belt at BUPA Retirement Home | | Rangiora | - | \$ 20,000 | - | - | |
| Island Rd (near Barnard St) | | Kaiapoi | | \$ 20,000 | - | | |
| King St (near Seddon St) | | Rangiora | | \$ 20,000 | - | | |
| Kaiapoi (opposite McDonalds) - Real Time Display | | Kaiapoi | | | \$ 15,000 | | |
| Southbrook Rd (near Coronation St) | | Rangiora | - | - | \$ 15,000 | - | |
| Williams St near Coups - east | | Kaiapoi | | | \$ 20,000 | - | - |
| Williams St near Ohoka Rd - east | | Kaiapoi | | | \$ 20,000 | - | - |
| Main North Rd near Holland Dr (east) | | Kaiapoi | | | \$ 20,000 | - | - |
| High St near King St (north) | | Rangiora | | | \$ 20,000 | - | - |
| Pegasus Blvd (north) - near infinity | | Pegasus | | | \$ 20,000 | - | - |
| Main North Road (near Williams Street) - 42260 | | Kaiapoi | | | \$ 20,000 | | - |
| Main North Rd near Holland Dr (east) | | Kaiapoi | | | \$ 20,000 | | |
| Adderly Tce near Sneyd St | | Kaiapoi | | | \$ 20,000 | - | |
| Ashley St near Coldstream Rd (west) | | Rangiora | - | - | | \$ 20,000 | |
| Ashley St near River Rd (west) | | Rangiora | | | | \$ 20,000 | - |
| Main North Rd (north of Woodend Rd (west) | | Woodend | | | | \$ 20,000 | - |
| Main North Road (near Williams Street) - 42241 | | Kaiapoi | | | | \$ 20,000 | - |
| To be allocated | | | \$ 10,000 | \$ 45,000 | \$ 10,000 | \$ 45,000 | \$ 125,000 |
| Value of Work Programmed | | | \$ 115,000 | \$ 155,000 | \$ 190,000 | \$ 80,000 | - |
| Approved Annual Budget (including fees) | | | <u>\$ 125,000</u> | <u>\$ 200,000</u> | <u>\$ 200,000</u> | <u>\$ 125,000</u> | <u>\$ 125,000</u> |

WAIMAKARIRI DISTRICT COUNCIL**REPORT FOR INFORMATION**

FILE NO and TRIM NO: SEW-03-01-05 / 240701105929

REPORT TO: UTILITIES AND ROADING COMMITTEE

DATE OF MEETING: 20 August 2024

AUTHOR(S): Sophie Allen – Water Environment Advisor

SUBJECT: Midge management and monitoring at wastewater treatment plants 2023-24

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


Department Manager


Chief Executive

1. SUMMARY

- 1.1. This report details work to control the nuisance of non-biting midges, such as the native species *Chironomus zealandicus*, for localised neighbours of the Kaiapoi and Woodend wastewater treatment plants (WWTPs).
- 1.2. Midge management plans prepared for Kaiapoi WWTP historically focused on insecticide usage. Due to environmental concerns of insecticide usage, insecticide resistance, costs and other practicalities, alternative methods to insecticides have been trialled; namely larval disruption dredging in summers the 2020-24 at the Kaiapoi WWTP, vegetable oil surfactant spraying 2021-24 and *Bacillus thuringiensis* serotype *israelensis* (Bti) 2023-24 at the Woodend WWTP.
- 1.3. This report summarises;
 - 1.3.1. the costs and benefits of the larval disruption dredging, vegetable oil surfactant and Bti management techniques that have been trialled at the Kaiapoi and Woodend WWTPs.
 - 1.3.2. midge monitoring results for the summer of 2023-24 from Woodend and Kaiapoi wastewater treatment plants following the installation of midge emergence traps and larval counts.
 - 1.3.3. the proposed midge monitoring and management for 2024-25 and beyond.
- 1.4. Bti treatment trial at Woodend WWTP in November-December 2023 appeared effective at reducing midge densities in treated areas when applied at the recommended dosage rate from larval count and midge emergence count data, however the control area also saw a decrease in midge densities indicating the environmental or climate conditions may have impacted the reduction in midge densities.
- 1.5. Results to-date have anecdotally supported the successful results of the larval disruption dredging and vegetable oil surfactant from reports from neighbours. Midge emergence monitoring does not show a strong correlation of midge population reduction with dredging or oil surfactant treatment. However problems with assessing control versus treatment areas for the dredging and oil surfactant applications has made correlation of any effect of these treatments difficult to assess. This issue will partially addressed with the proposal to replace midge emergence traps with on-shore yellow sticky traps monitoring at Kaiapoi WWTP, and allocating a control area at Woodend WWTP for oil surfactant application for a trial in 2024-25.

- 1.6. A replacement insect control management plan has been drafted for Kaiapoi WWTP and Woodend WWTP, focusing on non-insecticide control methods of larval disruption dredging and vegetation screening, to submit to Environment Canterbury as an update of the plan required to satisfy the conditions of consent CRC041049 regarding Kaiapoi WWTP.

Attachments:

- i. Midge Management Plan (August 2024) TRIM 240801127732

2. **RECOMMENDATION**

THAT the Utilities and Roothing Committee

- (a) **Receives** Report No. 240701105929.
- (b) **Notes** the use of the larval disruption dredging, oil surfactant spreading and *Bacillus thuringiensis* (Bti) techniques that have been trialled at Kaiapoi and Woodend Wastewater Treatment Plants (WWTPs) for midge management.
- (c) **Notes** that Bti treatment trial at Woodend WWTP in November-December 2023 appeared effective at reducing midge densities in treated areas when applied at the recommended dosage rate, however the control area also saw a decrease in midge densities.
- (d) **Notes** that midge monitoring (and treatment methods when required) is intended to commence earlier in spring in 2024-25, i.e. September 2024, rather than in October in previous years, as complaints indicate that midges are emerging in September.
- (e) **Notes** that midge emergence trap monitoring is not able to demonstrate if the dredging management techniques reduces midge densities, at Kaiapoi WWTP therefore yellow sticky traps are proposed to be installed for monitoring as a replacement.
- (f) **Notes** the cost of midge management for Kaiapoi and Woodend WWTP is estimated to have been approximately \$29,480 (excl. GST) and \$12,100 (excl. GST) respectively for the 2023-2024 season, with an estimated additional cost of \$12,000 (excl. GST) for midge emergence trap and larval monitoring costs for both WWTPs, sourced from existing operational budgets, and is subsidised by avian botulism inspections that means that ecological contractors are already on-site.
- (g) **Notes** that WDC staff will continue to communicate proactively with affected residents about midge management.
- (h) **Notes** the intention to submit a new insect control management plan (entitled 'Midge Management Plan August 2024') focusing on non-insecticide control methods, to Environment Canterbury as fulfilment of a condition in consent CRC041049.

3. **BACKGROUND**

- 3.1. The presence of native non-biting midge species, *Chronomus zealandicus*, has generated service requests and unofficial complaints from neighbour residents of the Kaiapoi and Woodend WWTPs, where the midges are breeding. The complaints are particularly from residents on the western sides of both plants, which is likely due to the prevalent wind direction from the north-east.
- 3.2. There is an Environment Canterbury consent requirement to have an insect control management plan under consent CRC041049 for the Kaiapoi WWTP. An insect control management plan was lodged with Environment Canterbury in February 2006. Under consent CRC041049 for Kaiapoi WWTP the consent holder (WDC) shall supply to the

Canterbury Regional Council within three months of granting of the consent an Insect Control Management Plan. This plan shall include but not necessarily be limited to:

- 3.2.1. Surveillance methodology
- 3.2.2. Control methodology
- 3.2.3. Trigger levels
- 3.2.4. Consultation with community
- 3.2.5. Reporting
- 3.2.6. Review
- 3.3. A Kaiapoi Wastewater Treatment Plant – Midge Control Plan was prepared by CH2M Beca in December 2017 (see TRIM 180307023727). The report recommended the usage of insecticides s-methoprene, etofenprox and spinosad, as well as implementing monitoring using emergence and light traps. This plan was primarily not enacted, due to concerns of insecticide effectiveness and resistance, and cost concerns raised by the Wastewater Asset Manager at the time.
- 3.4. A memo with selected options for non-chemical control was presented to the Wastewater Asset Manager in November 2018 (TRIM181123138028), which proposed modifications to private houses, vegetation screening, and creating deliberate flyways among other options. Modifications to private houses, such as decreasing or screening night-time lighting, is only possible with the cooperation of the private landowners, however is potentially a cost-effective measure.
- 3.5. Due to the expense, environmental concerns, and resistance of midges to repeat insecticide treatment, WDC staff have conducted a trial of a range of alternative management options in 2020-2024, namely midge larvae dredging habitat disruption which drowns midge larvae, application of a vegetable oil surfactant which can prevent midge emergence of adults from the water surface due to oil coating their wings, and Bti application (a bacterial control agent) which produces a chemical that stops the development of larvae, leading to their death.
- 3.6. Additional midge management techniques underway or planned for Kaiapoi and Woodend WWTPs include vegetation screening to prevent neighbouring house lights from being visible. A shade cloth fence was installed at Kaiapoi WWTP which provides some screening. Bunding and native planting has been carried out for the western side of the Woodend WWTP in 2022-4. Flood-lighting has been increased on the south side of the Kaiapoi WWTP wetlands beside the outlet pump shed as an attractant to divert midges away from the neighbours to the west.

4. ISSUES AND OPTIONS

Midge concerns by neighbours

- 4.1. One neighbour on Ferry Road (opposite the western side of the Kaiapoi Wastewater Treatment Plant) has contacted WDC multiple times, since purchasing the property in 2016, to complain of high midge numbers causing nuisance issues. This neighbour is on the western side of the Wastewater Treatment Plant. With the prevailing wind direction from the north-east, it is assumed that this western direction is most effected by midges from the WWTP due to being downwind.
- 4.2. A handful of property owners on the western side of the Woodend Wastewater Treatment Plant raised concerns about increased midge numbers over the summers of 2021-24. This increase is highly likely due to the removal of pine vegetation at the WWTP site that was shielding attractant lights of the neighbours' houses and providing shelter for the midges

during wind. Native planting has been installed for screening in 2023-24, planted on top of a bund, however this planting requires growing time in order to provide screening.

Midge management methods

Larval disruption dredging

- 4.3. Dredging of sediment has been successfully trialled by Christchurch City Council at Bromley WWTP. Due to a greater depth, a jet boat is used at Bromley WWTP to pull the dredge. Due to a shallower depth at Kaiapoi WWTP wetlands an excavator is used. Figure 1 shows the midge dredge that is used within the wetlands at Kaiapoi WWTP to stir up the bed, resulting in drowning of the midge larvae who lose their breathing tubes.
- 4.4. Due to the fast lifecycle of midges in the summer months, which can be as short as two weeks, ideally dredging frequency would be every few weeks, particular with warm settled weather. Over the summer of 2023-24, dredging was carried out 10 times (mid October – mid March), at a cost of \$2,948 (excl GST) per time at a total cost of \$29,480.
- 4.5. Dredging has not been used for the wetlands at Woodend WWTP which has extensive wetland planting, as an area of open water is required for the excavator and dredge to be able to manoeuvre.

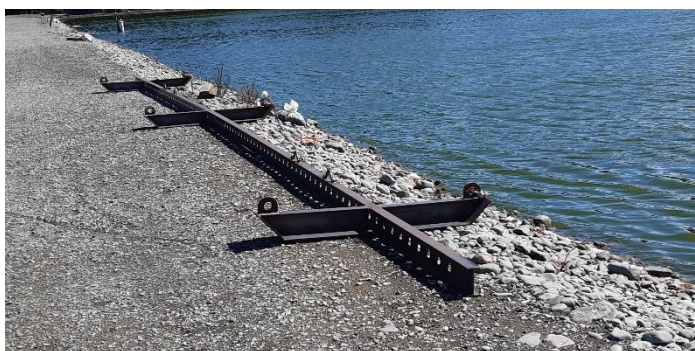


Figure 1: The dredge that has been designed by 3 Waters staff for use at Kaiapoi WWTP, and nicknamed the 'the Midge-buster'



Figure 2: Larval disruption dredging in action, otherwise known as 'midge-busting'

Vegetable oil surfactant spreading

- 4.6. A small amount of vegetable oil has been applied to the constructed wetland areas each summer 2021-24 at Woodend WWTP. The oil spreads out very thinly over the surface of the water, creating a film that can prevent emerging midge adults from being able to fly by coating their wings. The cost per application (including the vegetable oil) was \$378 excl GST in 2023-24, and was applied 13 times at a cost of \$4,914 excl GST.

- 4.7. Over 2023-24 vegetable oil was applied fortnightly 8 September – 6 October, then weekly until 15 December 2023, until after the completion of the Bti trial upon which oil application was stopped, as Bti control appears more effective. Ideally the oil this product should be applied at least weekly and preferably prior to periods of still weather, due to the oil dispersing quickly. During times of high midge numbers, additional control methods (i.e. Bti) are recommended, such as during October-November 2023 when there were midge complaints from neighbours, despite application of vegetable oil weekly.
- 4.8. The oil surfactant is more suitable for use in areas with wind protection that prevent the oil being blown towards one end of the wetland, decreasing effectiveness. Therefore, oil surfactant is not recommended to be spread at Kaiapoi WWTP because the large area of the wetland receiving high wind fetch.

***Bacillus thuringiensis* serotype *israelensis* (Bti)**

- 4.9. Bti is very specific for mosquitoes and black flies, and has some toxicity toward certain other dipterans, including midges. Bti is commonly used for mosquito control because of its low toxicity to non-target species. Bti bacteria produce a protein crystal that restricts larvae development from entering the pupa and adult life stages.
- 4.10. Bti was trialled for the first time by WDC in 2023-24 at the Woodend WWTP. This was in response to nuisance complaints about the midge numbers from neighbours, despite application of weekly vegetable oil surfactant. All of the constructed wetlands (except the control area and planted areas) were applied with the recommended dosage by drone on the 21/11/23, 28/11/23 and 5/12/23 (see Figure 3). After the trial, only edge areas were sprayed weekly with the recommended Bti dosage with a spray boom from a vehicle from 28/12/23 -21/3/24. The change to edge spraying only was to verify if a reduced dosage could maintain lower midge densities at a lower operational cost, and due to drone spraying being less reliable than a spray boom, as the drone can only apply the Bti during still weather or light winds.



Figure 3: Control and treatment areas for the Bti trial at Woodend WWTP. The orange areas were not sprayed with Bti as there is dense plantings with little open water midge habitat.

Vegetation screening and bunding

- 4.11. Kaiapoi WWTP is proposed to have pine trees along the western boundary next to the infiltration wetland harvested in 2025-26 due to the pines being mature to harvest, and health and safety risks from older pines during high wind events. This strip of pines will be replanted with natives that will provide screening, and an opportunity to be used for spraying of contact insecticide if desired as a future control method. A strip of pines will remain alongside Ferry Road to provide some screening until native plants have had at least five years to grow and provide screening to the residential properties to the west.
- 4.12. Native vegetation screening and bunding at Woodend WWTP has been installed on the western boundary 2022-24 following the removal of pines trees for harvesting in 2021 (see Figure 4). The removal of the pines led to an increase in complaints from neighbours about an increase in midge numbers around their houses. Natives have been selected as suitable for the sandy soils, provide light screening and a surface for contact insecticide to be applied if further control of midges is needed, and are available in bulk at restoration grade pricing from nurseries.



Figure 4: Woodend WWTP bund and planting on 21/6/24

- 4.13. The WDC Property Team also oversaw the planting a 10 metre-wide strip of low-flammable natives to provide screening of users of a recreational track from the neighbouring properties on Gladstone Road. This track screening will provide some screening of light from the neighbouring houses to prevent the attraction of midges. The initial planting struggled to establish, potentially due to frost damage, however had infill replanting in 2023 with expected plant survival rates and low attrition to-date.

Environmental considerations of management methods

- 4.14. It has been raised that larval disruption by dredging reduces the food supply available for waterfowl, as midge larvae is a common food source. However other factors such as habitat might be a limiting factor for waterfowl populations, rather than food supply. Christchurch City Council ecological monitoring of the wider Brooklands Lagoon bird population has not identified any reduction in the waterfowl population at Kaiapoi WWTP, therefore food supply is not thought to be a limiting factor, and dredging is potentially not a concern for bird populations except for the temporary disturbance of the excavator.

Midge Monitoring

- 4.15. Feedback and complaints have been received by neighbours to the west of both the Kaiapoi and Woodend WWTPs. This information is very useful to assess when midges are causing issues, and also whether treatments have potentially reduced midge populations.

Feedback has been generally positive for the larval disruption dredging, however the oil surfactant spreading treatment alone did not provide adequate control in 2023-24, hence Bti was trialled in addition to vegetable oil application in November-December 2023. In 2024-25 onwards, all complaints will be asked by WDC staff to be lodged formally as Service Requests (not just via email or phone call), as this simplifies the monitoring data compilation process.

- 4.16. Midge emergence traps (see Figure 5) have been deployed over the spring-autumn months in 2020-24 to capture midges as they transform from larvae in the sediment to flying adults. A sticky paper collects the emerged adults at the top of the trap, and allows for a density count of how many midges are emerging over time. It is assumed, due to the short lifespan of the adults (of a maximum of 5 days), that midge trap numbers can be used to indicate the density of the adult population.



Figure 5: A midge emergence trap

- 4.17. In Kaiapoi WWTP four midge emergence traps were originally assigned to small 'no-dredge' control areas, and four traps to the main 'dredged' area (see Figure 6), however due to the proximity of the traps to the bank (a maximum of 4m), none of the traps were far enough from the shore to be located in areas that were actually able to be dredged. Therefore there is no midge monitoring data that has been capturing the effect of the midge dredging i.e. the current midge emergence traps can only indicate a trigger when midge dredging should commence, but not what effect the dredging is causing. To partially rectify this, shore-based yellow sticky traps are recommended to be installed at Kaiapoi WWTP, with decommissioning of the midge emergence traps there. These are sticky papers which midges are attracted to and become trapped. Yellow sticky traps would more accurately indicate the level of adults midges emerging from the infiltration wetland at Kaiapoi WWTP as a whole than the midge emergence traps, but are also not able to provide a control versus treatment analysis for the midge dredging.



Figure 6: Midge emergence trap locations of the eight traps at Kaiapoi Wastewater Treatment Plant. Pink areas indicate the proposed 'no-dredge' control areas, however all eight midge emergence traps are not able to be dredged as they are too close to the bank, and cannot easily be set further out.

- 4.18. Four midge emergence traps were placed at Woodend WWTP in the 2023-24 season (Figure 7). One was moved from position W2 to W5 part of the way through the season to allow for better pairing for comparison of data for the Bti Trial (2 traps in the control area, 2 in a Bti treatment area with similar habitat). Eight sites (L1-L8) were monitored for midge larval counts within sludge samples using a sample container on a stick that was then sieved to separate out larvae.

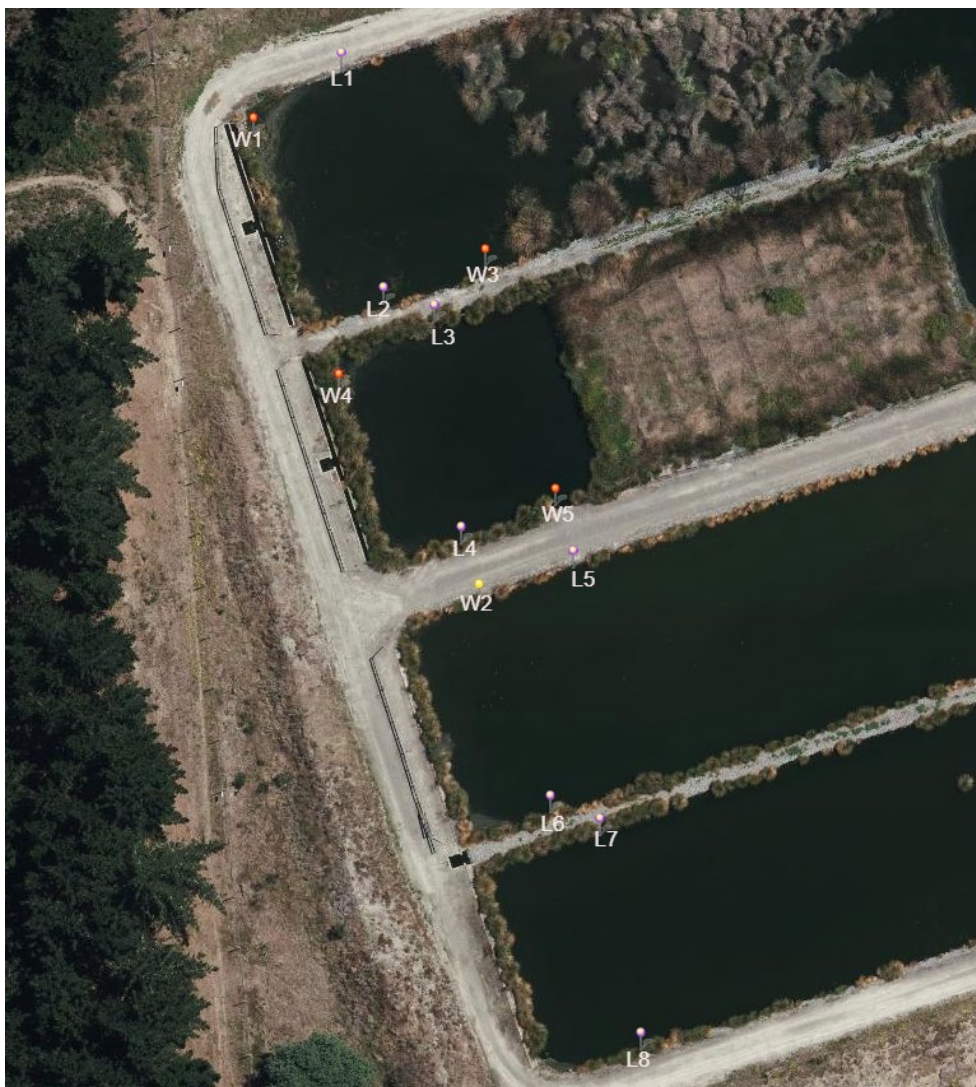


Figure 7: Midge emergence trap locations (W1-5) and larval count locations (L1-8) at Woodend Wastewater Treatment Plant during the summer and autumn of 2023-24.

Kaiapoi WWTP monitoring results and discussion

- 4.19. Midge emergence data for the traps at Kaiapoi WWTP in 2023-24 generally showed a gradually decrease over time, with peaks for midges in spring and early summer (late December). Trap 8 was broken and not able to be fixed for the majority of the season, and Traps 3 and 4 became stuck and unable to pull ashore during the monitoring season (see Figure 8).
- 4.20. It is recommended that midge monitoring commences earlier in spring, i.e. September, as complaints have been received by the neighbour on the western boundary in October of previous years, and midge trap data indicates that the start of the midge emergence season is not being captured currently.
- 4.21. For dredging the contractor generally dredges all of the infiltration wetland that is accessible. However close to shore has not been possible to dredge. This led to an inability to follow the experimental design of some midge traps within the dredged areas and some within a no-dredge control area. In reality all traps were not located far enough away from shore to be in the dredged areas in the 2023-24 season. Therefore unfortunately no comparison of control and treatment areas can be made. Dredging was carried out approximately fortnightly at Kaiapoi WWTP from October 2023– March 2024.

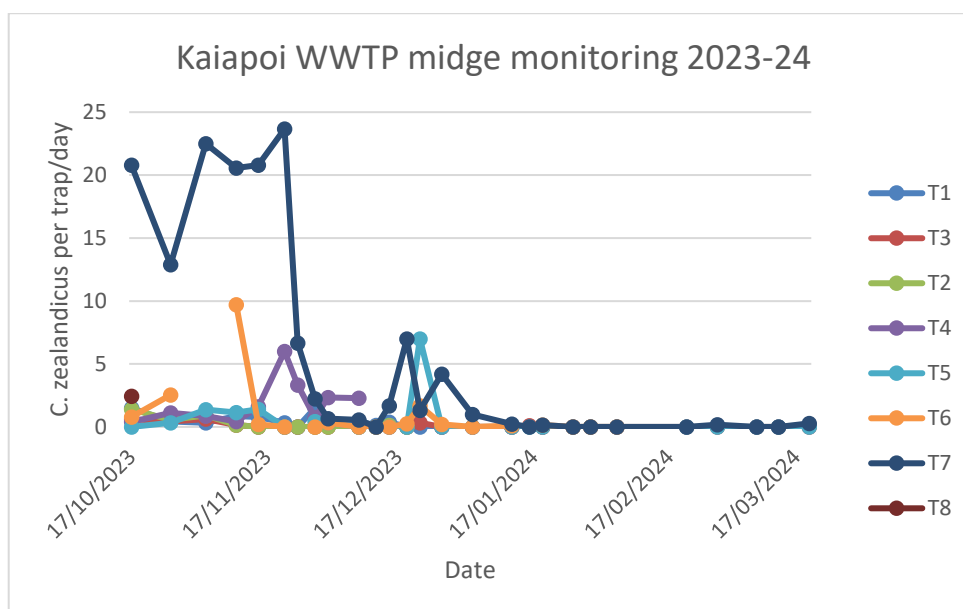


Figure 8: Midge emergence trap results for 2023-24 at Kaiapoi WWTP. Note that trap no.8 (T8) was broken for most of the season, and occasionally other traps were not functional.

Woodend WWTP monitoring results and discussion

- 4.22. Bti is a biocontrol agent which is commonly used to target mosquito larvae, and has also been used for midge species, primarily overseas. However, as the use of Bti for the New Zealand midge species *C. zealandicus* is more experimental, additional midge monitoring of both larval and emergent adults was carried out at Woodend WWTP in 2023-24 to assess the effect of the Bti.
- 4.23. Woodend WWTP experienced an early peak in midge numbers (i.e. mid-October until the end of November, then a peak again in mid-December- early February see Figures 9 and 10). The low levels in late November and early December coincide with the Bti trial (applied 21/11, 28/11 and 5/12). Note that low midge numbers were also recorded in the control wetland, therefore the low levels of midges in late November and early December may not primarily be the effect of the Bti, or the control wetland may have received some Bti spray drift from the drone even though located up-wind.

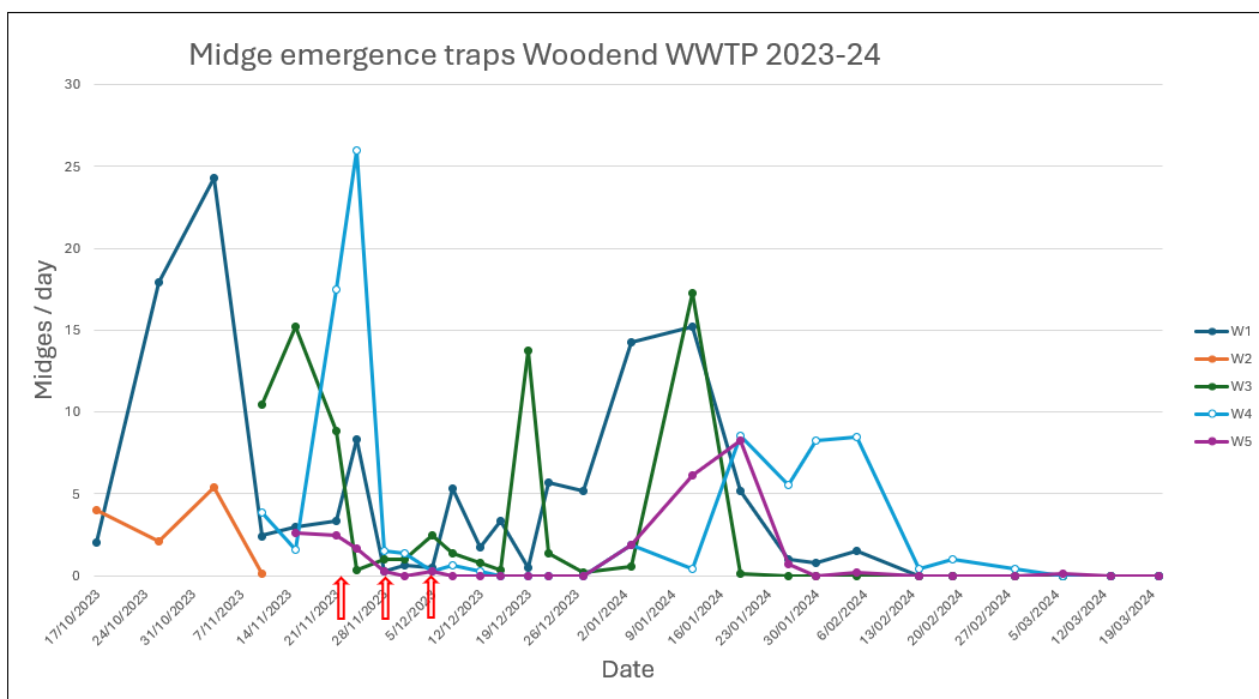


Figure 9: Midge emergence trap results for 2023-24 at Woodend WWTP. Red arrows indicate when the Bti was applied for the trial.

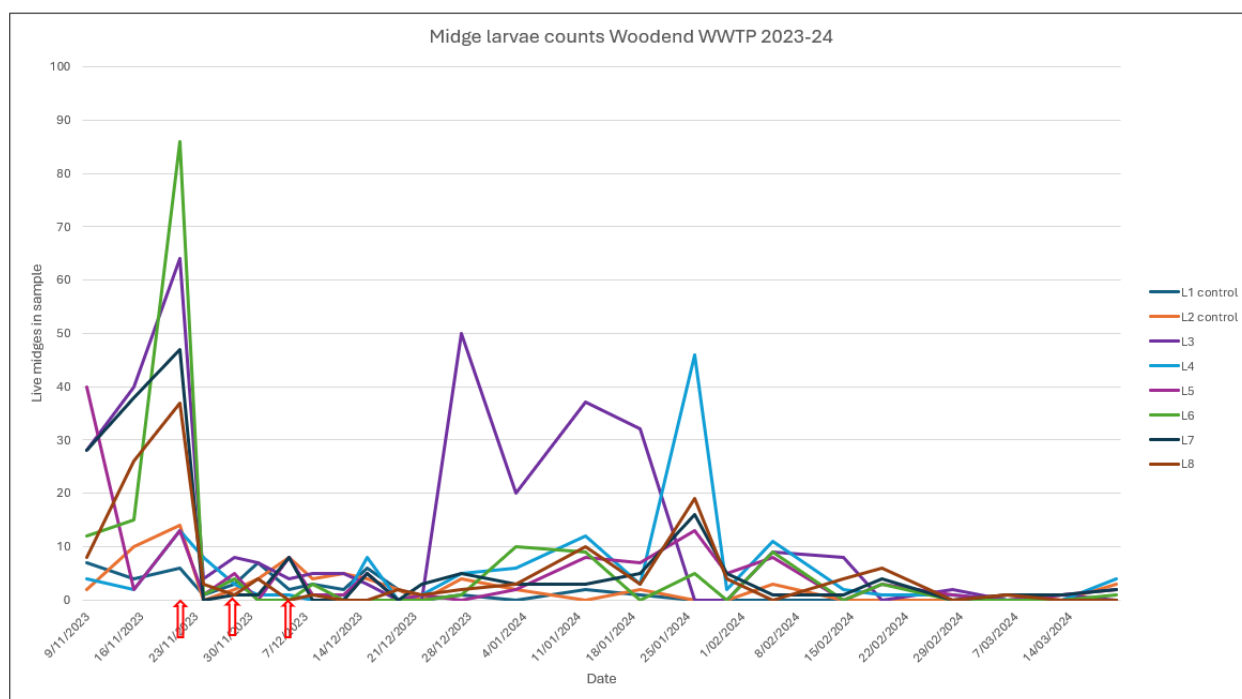


Figure 10: Midge larval count results for 2023-24 at Woodend WWTP. Red arrows indicate when the Bti was applied for the trial.

- 4.24. Oil surfactant was applied at Woodend WWTP in 2023/24 fortnightly from 8 September - 6 October 2023, then weekly until Mid-December 2023.
- 4.25. Bti was applied at Woodend WWTP for the trial at a total cost of \$2,173 ex GST for the Bti, and \$1,500 ex GST for the drone application. Commencing 28/12/23 Bti was applied weekly to a reduced area from the shore with a spray boom (\$378 ex GST per time for

application, and approximately \$75 ex GST for the Bti product) to test whether this reduced application could maintain midge populations low, potentially providing an on-going treatment solution that is more cost-effective and easier to apply. Drone application is reliant on dry and still conditions. Midge densities however, did not appear to be reduced by this application to only edge habitat with a spray boom, with a midge peak in January

- 4.26. A summary of the key improvements to the future midge monitoring and management for 2024-25 and beyond is provided in Table 1.

Table 1: Future midge monitoring and management improvements

| Site | Improvement |
|---|---|
| Woodend WWTP and potentially Kaiapoi WWTP | Baseline larvae survey in spring 2024 to identify areas of high midge population to target |
| Woodend & Kaiapoi WWTP | Midge monitoring to commence earlier in spring (i.e. September) to ensure the midge emergence season is captured |
| Kaiapoi WWTP | Switch from midge emergence traps to yellow sticky traps |
| Woodend & Kaiapoi WWTP | Refine trigger levels of when treatment methods should commence based on monitoring results (i.e. before complaints are received from neighbours) |

Implications for Community Wellbeing

- 4.27. There are implications on community wellbeing by the issues and options that are the subject matter of this report, particularly for the localised neighbours to the western side of each WWTP.
- 4.28. The Management Team has reviewed this report and support the recommendations.

5. COMMUNITY VIEWS

5.1. Mana whenua

- 5.1.1. Te Ngāi Tūāhuriri hapū are likely to be affected by, or have an interest in the subject matter of this report, such as midge management treatments that are used and in particular any environmental benefits or costs of the management treatment on the wider ecosystem.

5.2. Groups and Organisations

- 5.2.1. There are localised neighbours to the Kaiapoi and Woodend wastewater treatment plants that are affected by and have an interest in the subject matter of this report. The Woodend neighbours of the WWTP have created a consultation group with 3 Waters staff regarding wider WWTP consultation, which includes on-going discussion of midge management.

5.3. Wider Community

- 5.3.1. 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

- 6.1.1. There are no financial implications of the decisions sought by this report. Midge management is covered by existing operational budgets for the WWTPs. A midge management budget is already provided for in the Annual Plan for 2024-25.

6.2. Sustainability and Climate Change Impacts

- 6.2.1. The recommendations in this report do have sustainability and/or climate change impacts. The consideration of environmental effects of on-going midge management measures, such as reduction of food

6.3 **Risk Management**

- 6.2.2. There are risks arising from the adoption/implementation of the recommendations in this report that midge management will not result in sufficient midge number reductions for neighbours. Midge management is likely to be an on-going issue to manage.

6.3 **Health and Safety**

- 6.2.3. There are no new specific health and safety risks arising from the implementation of the recommendations in this report. Contractors are required to access the wastewater treatment plant wetlands, which contain treated effluent. Therefore contractor site induction and other specific health and safety measures appropriate to the hazards present are carried out.

7. **CONTEXT**

7.1. **Consistency with Policy**

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

7.2. **Authorising Legislation**

- 7.2.1. There are requirements for insect control under consent issued under the Resource Management Act (1991).

7.3. **Consistency with Community Outcomes**

- 7.3.1. The Council's community outcomes are / are not relevant to the actions arising from recommendations in this report.

7.4. **Authorising Delegations**

- 7.4.1. This report is for information only. No delegations apply.



Midge Management Plan – Kaiapoi and Woodend Wastewater Treatment Plants

Prepared by Waimakariri District Council
August 2024



Prepared for: Caroline Fahey

Client Title: Wastewater Asset Manager

Prepared by: _____ Sophie Allen

Water Environment Advisor

on behalf of the 3 Waters Team, Waimakariri District Council

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1. Executive Summary

This plan sets out the scope and cost for implementation of monitoring and control methodology at the Kaiapoi and Woodend Wastewater Treatment Plants.

The Kaiapoi Wastewater Treatment Plant (WWTP), which is operated by the Waimakariri District Council, has received complaints regarding insect swarms from a neighbouring residential property. This species has been confirmed to be *Chironomus zealandicus*, a native non-biting midge that has caused nuisance issues at several wastewater treatment plants around New Zealand. Neighbours of the Woodend WWTP and Pegasus wetland complex have noted the presence of midges, also *C. zealandicus*, with formal complaints received in early summer of 2021 onwards from Woodend WWTP neighbours after the removal of pine trees to the west of the WWTP.

An integrated midge management plan for the control of *C. zealandicus* has been developed for the Kaiapoi And Woodend WWTPs based on practices employed at the two largest WWTPs in NZ (Mangere and Bromley, Christchurch) as well as methods detailed in literature. This management plan is summarised below in Table 1.

Table 1: Summary of Midge Management Plan methods

| Method | Description | Frequency |
|--|--|--|
| Baseline survey | Larval counts and yellow sticky traps on and around bodies of water onsite and surrounding waterbodies | Larval counts – 1 round during high midge densities Yellow sticky traps – Checked 5 days in a row |
| Routine monitoring | Kaiapoi WWTP: Yellow sticky traps around bodies of water onsite Woodend WWTP: Emergence traps or yellow sticky traps around bodies of water onsite. Optional larval counts | Weekly for at least 5 months (Sep-Jan) |
| Complaint monitoring | Recording and compilation of Service Request and any other formal complaints data | Annual reporting and as required |
| Vegetation screening | Western sides of Kaiapoi and Woodend WWTP | Kaiapoi WWTP: To be planted 2025-27 Woodend WWTP: Planted 2022-24 |
| Larvae control via physical disturbance Kaiapoi WWTP only | Dredging of midge larval habitat in the bed | Fortnightly over spring and summer months Commence when routine monitoring indicates an average of ≥ 2 midges/day per yellow sticky trap |
| Adult control with oil surfactant Woodend WWTP only | Control of emergent adults by coating wings with oil | Commence when routine monitoring indicates an average |

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|--|--|---|
| | | of ≥ 2 midges/day per yellow sticky trap/emergence trap |
| Larvae control with Bti Woodend WWTP only | Bio-control with bacterium <i>Bacillus thuringiensis israelensis</i> (Bti) | As required from routine monitoring. Commence when over an average of ≥ 10 midges per larval count or an average of ≥ 5 midges/day per yellow sticky traps |
| Larvae control with insecticide – OPTIONAL | S-methoprene dosing of water margins via a spreader from the bank | Fortnightly to monthly over the spring and summer months |
| Adult control with insecticide– OPTIONAL Kaiapoi WWTP only | Establish native vegetation 'kill zones' where contact insecticide is sprayed Spray vegetation with etofenprox rotated with spinetoram (Yates Success Ultra Insect Control) | Establish vegetation 'kill zones' at Kaiapoi WWTP on the western side 2025-27 Fortnightly to monthly over the spring and summer months – when vegetated kill zones established |

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2. Introduction

This report outlines a midge management plan for midge control at the Kaiapoi and Woodend Wastewater Treatment Plants (WWTPs). This plan includes baseline and routine monitoring and multiple methods for midge control as an integrated midge management plan. Integrated midge management plans are considered best practice as they target multiple stages of the midge lifecycle and also creation of a physical barrier to prevent becoming a nuisance to the public.

The Kaiapoi WWTP is operated by the Waimakariri District Council (WDC), treating wastewater from Kaiapoi and Kairaki Townships, see Figure 1. At the WWTP the wastewater is screened before passing through an aeration pond and two waste stabilisation ponds. Following these ponds, the wastewater is discharged to an infiltration basin before being split once again to flow through two constructed wetlands in parallel. Subsequent to these wetlands, the wastewater undergoes UV disinfection (if required) prior to discharge through the Eastern District Sewerage Scheme ocean outfall. Wastewater from the Rangiora WWTP is also discharged to the Kaiapoi WWTP wetlands for further treatment and UV disinfection.

The WDC has been notified from a resident in close proximity, located west of the Kaiapoi WWTP that midges *Chironomus zealandicus* present a nuisance issue. Kaiapoi WWTP has significant areas of shallow water which presents a habitat for larvae. The majority of these habitats appear to be present within the WWTP, however a roadside swale and Jockey Baker Creek and wetland area (entering into the Waimakariri River) may also present a suitable habitat for midge larvae, see Figure 1.

The Woodend WWTP is operated by the Waimakariri District Council (WDC), treating wastewater from Woodend and Pegasus townships, see Figure 2. At the Woodend WWTP the wastewater is screened before passing through three aeration ponds and two waste stabilisation ponds. Following these ponds, the wastewater is discharged through two constructed wetlands. Subsequent to these wetlands, the wastewater undergoes UV disinfection (if required) prior to discharge through the Eastern District Sewerage Scheme ocean outfall.

Additional habitats for *C. zealandicus* include Tūtaepatu Lagoon and the surrounding Eastern Conservation Management Area.

This plan provides background on the midge problem and discusses options for monitoring, larvae control (larviciding), and adult control (adultaciding).



Figure 1. Kaiapoi Wastewater Treatment Plant and surrounding waterbodies overview



Figure 2. Woodend Wastewater Treatment Plant and surrounding waterbodies overview. The ECMA is the Eastern Conservation Management Area

3. Background

The control of *C. zealandicus* midges has proven necessary in a number of locations around New Zealand due to their tendency to form large swarms which can create a nuisance to nearby residential populations dating back to the 1960s (Burns & Craig, 1963) (Spiller, 1964). Typically this nuisance can include invasion of buildings, disruption of outdoor activities and accumulation around exterior lighting (NIWA, 2005). Midges are easily blown by the prevailing wind, and they are attracted to lights, particularly noticeable around houses in the evening.

It is difficult to predict if midges will proliferate to the point of becoming a nuisance around a WWTP pond. For example, the treatment ponds operated in the Tasman District, Marlborough District and Blenheim have not generated midge related complaints from nearby residents. Conversely, residents in proximity to the Christchurch and Mangere WWTPs regularly lodge midge complaints during the spring and summer months almost every year.

The *C. zealandicus* midge lifecycle begins as eggs in a capsule, often at the water surface. After two to four days the eggs sink to the sediment at the bottom of the water body, hatch and begin the first of four larval instars (development stages) where they build tubes into the sediments. After the fourth instar stage, the larvae leave the tubes and spend one to two days undergoing pupation, after which the pupae rise to the surface and emerge as an adult. In total, larval development can take between 20 to 40 days for water temperatures of 22°C to 15°C respectively (Watercare Services Ltd, 2016). Following emergence, the adult midges often fly to the shore and wait in cool shaded areas until there are sufficient numbers in order to swarm and mate. After mating, the females will move to the water surface where they can immediately lay their eggs. Midge swarms typically congregate at dawn and dusk and are believed to be triggered by changes in light (Watercare Services Ltd, 2016). Adult midges do not feed (and therefore do not bite), and have a short lifespan of three to five days.

In areas such as WWTP ponds and stormwater drains, midges have an advantage over sediment and sublayer organisms due to their resistance to pollutants, the ability of the larvae to inhabit low-oxygen environments and their ability to rapidly produce large numbers of offspring (Failla, Vasquez, Fujimoto, & Ram, 2015). Higher WWTP pond organic loading rates above 40 kg BOD ha⁻¹ d⁻¹ (per hectare per day) have been shown to be sufficient in controlling midge breeding. However, even with a high loading rate, the pond banks (where a facultative state is not achieved) can still provide a suitable habitat for midge larvae (Watercare Services Ltd, 2016).

Research into similar midge problems, most notably the Mangere WWTP in Auckland, suggests that a comprehensive and integrated management plan is required for adequate control. The main principles of an integrated management plan focus on pest prevention and pesticide is used only as needed (U.S. EPA, 2016), with the aim of achieving effective and environmentally sensitive control.

4. Routine monitoring methodology

4.1. Introduction

Potentially the most critical component of an integrated management plan, monitoring allows an organisation undergoing pest control to adjust the intensity and extent of their response to pests based on fact and evidence. An ineffective alternative to the direct monitoring of a midge related nuisance problem are public complaints, which can be subject to a range of subjective influences.

Monitoring techniques in use at the Mangere and Christchurch WWTPs include emergence traps, light traps and weather monitoring. Broza et al. (2003) found that yellow sticky traps were safer, easier and more convenient to employ for large scale monitoring. An action threshold was determined based on public complaints that were correlated with the numbers of midges caught by yellow sticky traps.

4.1.1. Midge emergence traps

The emergence traps are a simple pyramid structure capable of floating on water surfaces with netting and a container to capture midges as they emerge (see Figure 3). Situated inside the container is a piece of yellow sticky paper ('stickies' available from Mitre 10), or preservative such as ethanol, to further trap midges and the traps can be attached to a pulley to allow them to be drawn to the banks of a water body for sample removal. Multiple traps can be situated on suspected larval habitats to identify problem areas and concentrate chemical dosing efforts. Typically midges are counted twice weekly.



Figure 3. Aquatic Fly Emergence Trap. Note that the design has been modified slightly to make the traps more suitable for a wastewater environment

4.1.2. Light traps

Light traps are comprised of a post, light and yellow sticky trap (see Figure 4). These are situated on the banks of ponds to monitor adult midge populations. Concurrent weather monitoring is required for these traps to correlate adult midge behaviour with changes in environmental conditions and account for changes in the sample caused by strong winds.



Figure 4. Example of a light trap with a plywood panel for the yellow sticky trap – Photo Courtesy of Adam Twose (Christchurch Wastewater Treatment Plant Manager)

4.1.3. Yellow sticky traps

Yellow sticky paper traps are a simple and effective way to monitoring adult midge numbers (Broza *et al.* 2003). They are similar to light traps, but without a light mechanism. The yellow colour of the trap is an attractant to the midges. They are readily obtainable from garden centres, such as 'EasyTRAP – eco-friendly flying insect stickies' available from Mitre 10 as an insect control product. The yellow sticky traps are fixed to a post at 1.2m high, 1m from the shoreline facing the water. As with light traps, concurrent weather monitoring is required for these traps to correlate adult midge behaviour with changes in environmental conditions and account for changes in the sample caused by strong winds.

Routine monitoring at the Kaiapoi and Woodend WWTPs is recommended to be carried out using a mix of emergence traps and yellow sticky traps/light traps, with optional larval counts. This will allow problem areas to be identified and midge control around these areas established.

Traps used should ideally be sampled as frequently as possible. Due to financial and contractor limitations, samples will be trapped at least weekly, and counted on-site in the spring to summer months, September – end of January at least, or longer (5 months minimum). The current contractor for this work is Keystone Ecology Ltd. This frequency will allow WDC to respond to shifts in midge population and respond to extreme emergence events.

4.2. Baseline survey methodology

Baseline surveys are able to ascertain which midges or other insects are present, and at what level. This will allow problem bodies of water to be identified and midge control around these areas established. The survey needs to determine which waterbodies produce different species of midge. It is known that species such as *Chironomus zealandicus* will often dominate more homogenous man-made oxidation ponds whereas *Tanytarus* species are more associated with natural wetland type water bodies.

A baseline survey around any other local bodies of water beside the WWTPs should be included, alongside WWTP sites, to determine whether or not these locations are contributing to the midge population.

The baseline monitoring includes components of juvenile midge monitoring, midge emergence monitoring and/or adult midge surveillance, as described in Kingett Mitchell (2004). The methodology is summarised below. All sampling points are GPS referenced so that the data can be mapped.

4.2.1. Juvenile midge baseline survey

The Kaiapoi and Woodend Wastewater Treatment Plants and surrounding wetland areas (see Figures 1 and 2 and Table 2) will be surveyed for larval midge development using a grab sampler to obtain representative samples from the sediment.

If access to within the ponds is possible, each waterbody will be divided into roughly equal or representative areas and transects will be allocated across each area. Grab samples will be obtained from points equidistant along each transect (e.g. every 5, 10, or 20m depending on the size of the area). This survey requires a team of two suitably qualified personnel and the use of waders for access to the ponds. Health and safety should be considered thoroughly before entering wastewater treatment ponds.

Each grab sample will be sieved to 1 mm and all larval midges remaining in the sieve will be counted and identified to species level, or lowest taxonomic unit as practicable.

To allow comparison with other sites, the abundance of larval midges will be standardised by converting the abundance into a number per square metre.

Auxiliary information including water depth, water temperature, and dissolved oxygen concentrations will be recorded at the same time as the grab samples are collected.

Table 2: Additional baseline sampling locations

| Location | Additional baseline sampling locations |
|-----------------|--|
| Kaiapoi WWTP | The infiltration wetland areas, roadside swale on Ferry Road, cut-off drain, and Jockey Baker Creek wetland area |
| Woodend WWTP | Tutaepatu Lagoon, Eastern Conservation Management Area (multiple sites) |

4.2.2. Midge emergence baseline survey (OPTIONAL)

The infiltration wetland areas of the Kaiapoi and Woodend WWTPs and additional areas in Table 1 can be surveyed for midge emergence using floating emergence traps.

Each water body is be divided into roughly equal areas and traps are allocated to each area.

The emergence traps are then examined either daily or every second day for a period of no less than a week to obtain robust data.

All adult midges found inside the emergence traps will be counted and identified to a species level.

A constraint with this baseline survey technique is the large number of emergence traps required, ideally all at the same time. Therefore this survey is optional.

4.2.3. Adult midge baseline survey (OPTIONAL)

Light posts with near-UV light and yellow sticky traps will be used to monitor adult midge populations. Solar-powered LED lights are available from outlets such as ECOLAB Pest Control.

Traps can be located so they obtain a representative sample of the midge population from the site. Alternatively they can be placed to maximise midge catch to provide warning that midge densities may be rising.

Some traps can be located in the flight path between the treatment ponds and residential area to help determine the cause of nuisance complaints.

Traps should be installed and maintained by suitably qualified personnel (such as the Water Unit).

The yellow sticky cards within the traps should be removed and replaced at a frequency where the sticky card does not become full, and fails to trap midges (potentially weekly to align with contractor visits).

All fly species on the sticky cards will be counted and identified, to the lowest taxonomic level practicable, to ensure records of nuisance flies, apart from midges, are kept.

The baseline surveillance will be carried out in spring (i.e. October-November) or summer (i.e. January-March) to coincide with past records of peak midge numbers.

4.3. Complaints Monitoring

Complaints regarding midges at the WWTPs will be lodged as Service Requests containing the following information:

- The name, contact details and address of the complainant (unless they wish to remain anonymous);
- The Service Request Number (if lodged as a Service Request)
- The time and date of the complaint;
- The name of the WDC staff member receiving the complaint;
- The intensity and nature of the complaint;
- Weather conditions (such as wind directions) at the time the complaint was issued.

Complaints that are received through other means, such as email or phone call will be requested to be lodged as Service Requests for ease of compiling information. Annual reporting will compile complaints reported for each financial year.

4.4. Routine Monitoring

Routine monitoring at the Kaiapoi and Woodend WWTPs is recommended to be carried out using a mix of larval counts, emergence traps and yellow sticky traps/light traps. Refer to section 4.2 for details of these methodologies.

Traps used should ideally be sampled as frequently as possible. Due to financial and contractor limitations, samples will be trapped at least weekly, and counted on-site in the spring to summer months, September – end of January at least, or longer (5 months minimum). The current contractor for this work is Keystone Ecology Ltd. This frequency will allow WDC to respond to shifts in midge population and respond to extreme emergence events.

Routine adult monitoring can be used to monitor the midge populations for triggers to initiate control methods. Routine monitoring should be particularly focussed during the late spring and summer months, especially early in the season (starting September).

The Christchurch WWTP has installed 20 emergence traps in various locations in the six oxidation ponds (approximately 230 ha of water surface) with an additional 10 light traps situated around the ponds' banks.

Kaiapoi WWTP trialled midge emergence traps from 2020-24 however the emergence traps were not able to be located far enough offshore where dredging is carried out. Therefore this method is not able to assess the effect of this treatment. Additionally the emergence traps were prone to damage or getting stuck on the pulley system. Kaiapoi has approximately 40 ha of water surface area, and Woodend WWTP has a surface area of 6 ha. Therefore WDC staff recommend removal from 2024-25 of the Kaiapoi emergence traps with replacement by 10 yellow sticky traps (or light boards with yellow sticky traps). See Figure 5 for the recommended installation sites.



Figure 5: 10 yellow sticky trap locations proposed for Kaiapoi WWTP wetlands

The 10 yellow sticky traps (or light traps) at Kaiapoi WWTP will be focussed around the western and southern sides of the WWTPs (with a prevailing wind from the north-east). WDC could further consult a pest control specialist further regarding the best location for the traps, as well as the total number required.

Adult surveys will be at least weekly for a period of at least five months e.g. September-January inclusive. Survey timing will need to be flexible to account for varying weather conditions. High humidity and high temperatures promote a rapid midge lifecycle whereas strong winds can be responsible for blowing midge towards residential areas. Nuisance complaints are often associated with strong winds.

All adult monitoring (yellow sticky trap or light trap) data should be assessed in conjunction with weather data (namely wind speed and direction) to account for the influence of environmental conditions on midge behaviours.

Timing and frequency of yellow sticky trap / light trap routine monitoring would be re-assessed after the first season of results has been analysed.

Woodend WWTP is recommended to continue with 4 midge emergence trap sites (see Figure 6) with an optional extra of larval counts at 8 sites that were commenced in 2023-24.

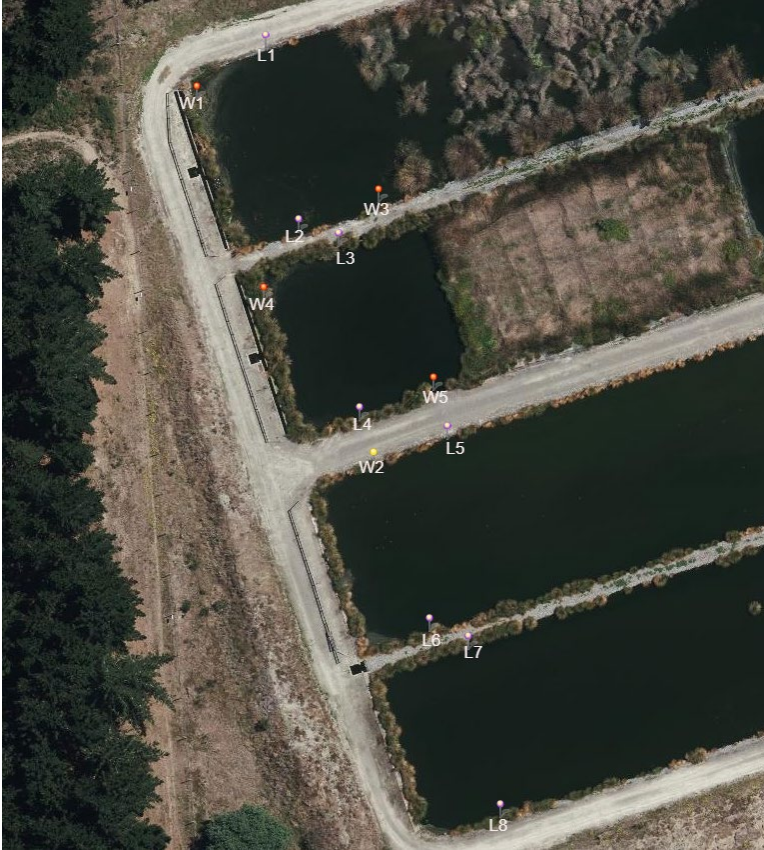


Figure 6: Four midge emergence trap sites (W1,W3,W4,W5) at Woodend WWTP and eight larval count sites (L1-L8). W2 has been retired as a site.

5. Control Methodology

5.1. Introduction

Options for control can be categorised into three main sections: larviciding, adulticiding and non-chemical or additional methods. For an integrated management plan, these should be used in conjunction, while also considering pesticide resistance management. In order to prevent or delay the development of resistance to insecticides, varying insecticides with different modes of action is key (IRAC, 2017).

Of the numerous techniques to control midges, chemical control has been the most practiced internationally over the last 50 years (Ali, 1996). The two primary types of chemical control involve larviciding and adulticiding. Within larviciding, the main groups of compounds are insect growth regulators (IGRs), microbial pesticides and organophosphates. IGRs include a further subsection of juvenile hormone analogues (JHAs). Adulticiding primarily focuses on contact insecticides.

IGRs such as s-methoprene, pyriproxyfen and diflubenzuron have proven desirable for midge control as a result of their superior selectivity and environmental sensitivity to a number of other organophosphates and larvicides. The following sections will present and discuss a selection of insecticides found reoccurring in literature and in use at New Zealand WWTPs.

5.2. Toxicology

All of the chemicals included in this midge management plan have controls put in place under the Hazardous Substances and New Organisms Act (1996) as well as controls stipulated by the NZ Environmental Protection Authority. These substances should only be handled and applied by an experienced and approved pest control specialist in adherence to these controls.

5.3. Larval Control

5.3.1. *Bacillus thuringiensis* serotype *israelensis* (Bti)

Bti is very specific for mosquitoes and black flies, and has some toxicity toward certain other dipterans, including midges. Bti is commonly used for mosquito control because of its low toxicity to non-target species. Bti bacteria produce a protein crystal that restricts larvae development from entering the pupa and adult life stages.

As the use of Bti for the New Zealand midge species *C. zealandicus* is more experimental, additional midge monitoring of both larval and emergent adults was carried out at Woodend WWTP in 2023-24 to assess the effect of a Bti trial. A dosage rate of approximately 3.8 L per acre was applied of the product SELECT-Midge (available from Parklink Ltd).

Drone spraying (Drone Spray Ltd) was used to apply SELECT-Midge as evenly as possible after an approximately 1:1 dilution with unchlorinated water. Another possibility for application is via spray gun with a greater dilution (e.g. 1:100) with unchlorinated water, which is applied from a vehicle from the shore. The vehicle option is potentially less constrained by windy conditions than the drone spraying, due to operational requirements for the drone and less spray-drift from being lower down.

SELECT-Midge is recommended to be applied weekly for at least 3 weeks. Fortnightly application may be possible after the initial weekly application for 3 weeks, to control midges due to the lifecycle of the midge larvae, however this fortnightly option will need to be tested to be validated to provide effective control.

Spraying of just the edges of the ponds with Bti in 2023-24 following the Bti trial did not appear to provide enough of a maintenance dose to continue suppression of midge numbers, and is not recommended for future control. The recommended dosage of SELECT-Midge was likely not met with the spraying of the pond edges only, due to diffusion of the product into the remainder of the pond.

5.3.2. S-methoprene

Reduction in a midge population through larvae control is typically achieved by dosing chemicals directly into the larval habitat (in this case a wetland, pond or other body of water). In New Zealand, s-methoprene is commonly used for this duty and has been used at the Mangere and Christchurch (Bromley) WWTPs. This chemical alters the hormonal activity of larvae, causing the larvae to fail to pupate and eventually die. It is available in a range of formulations, including pellets, boluses and briquettes. It has a short half-life in water (less than ten days) and is rapidly degraded by UV light (AgResearch, 1999).

S-methoprene is highly selective and is not considered to be significantly ecotoxic when used appropriately. Consequently it is suitable for use in an environment containing other aquatic organisms and birds. The low risk nature of s-methoprene is such that the World Health Organisation has recommended its use in the drinking water supplies of developing countries to control container breeding mosquitoes.

For larvae control via insecticide at the Kaiapoi WWTP if employed, it is recommended that slow release s-methoprene pellets are used on the following basis:

- Proven effectiveness at the Mangere and Christchurch WWTPs;
- Resistance in midge larvae is slow to develop;
- Has reportedly low ecotoxicity when used appropriately.

The timing for s-methoprene dosing should be from late spring to the end of summer on a two to four weekly basis depending on how quickly the methoprene pellets dissolve and there is a measured impact on midge numbers. The rate and intensity of s-methoprene dosing should be based on midge monitoring results.

Dosing can be carried out using either a mechanical spreader mounted on a boat or potentially an excavator or a pellet blower used from the shore. The exact details of applying the pellets should be the responsibility of the pest control specialist employed to carry out the dosing.

5.3.3. Physical disturbance

Physical disturbance of the top sediment layers, is thought to disturb the breathing of larvae, potentially leading to death. Physical disturbance with dredging by chains behind a jet boat, at a frequency of every 10-14 days has been trialled at the Christchurch WWTP, with some success.

This treatment is recommended to be repeated every 14 days at Kaiapoi WWTP for a five-month period from late spring-summer. This frequency hypothetically allows for at least one dredging treatment of each generation of larvae.

Waimakariri District Council prepared a bespoke trial dredge for a trial in the summer of 2020-21, which is formed from a 15m wide 'I' beam with holes inserted to reduce drag. The I-beam dredge is able to be dragged across the flat surface of the infiltration wetland at Kaiapoi WWTP by an excavator. There were not any in-water structures to avoid when dredging identified by the 2020-21 trial, but there some potential snag points, and areas with uneven base. Edge areas are not able to be dredged due to potential snag points and sludge build-up in some areas. The approximate depth of the infiltration wetland is 0.4m, with a confirmed sandy

base, which permits an excavator to pull the dredge, rather than a jet boat, as in the case of Christchurch WWTP where depth is prohibitive for vehicles.

5.4. Adult Midge Control (OPTIONAL)

Once adult midges emerge from a body of water, they often rest on the underside of vegetation to shade themselves from sunlight, evade strong winds, or shelter from rain, prior to forming mating swarms. This can be used in a pest control scheme by applying contact insecticides to vegetation to kill the sheltering midges. Contact insecticides are toxic to insects upon direct contact and usually have minimal residual activity.

Mangere WWTP has used etofenprox (a sodium channel modulator), which is applied to strategic plantings of vegetation every three to four weeks. The Christchurch WWTP has also trialled etofenprox. Bifenthrin (another sodium channel modulator) has also been used at the Mangere WWTP prior to being replaced by etofenprox. The reason for this replacement is unknown.

Alternative contact insecticides to etofenprox are spinetoram and spinosad, which act as nicotinic acetylcholine receptor allosteric modulators (NIWA, 2005). It is understood that spinetoram is used at the Omaha WWTP. These substances disrupt the midge nervous system, paralysing and killing adult midges.

It is recommended that both spinetoram and etofenprox are both used as insecticides to control the adult midge population at the Kaiapoi WWTP. The reasons for this choice are:

- Etofenprox has been used successfully at the Mangere WWTP;
- Although etofenprox is ecotoxic, no impact on crustacean life at Mangere has been noted and the ecotoxicity can be managed by following the controls stipulated by the New Zealand Environmental Protection Authority;
- Spinetoram has been used at the Omaha WWTP;
- Similarly to etofenprox, spinetoram is ecotoxic but again can be controlled by adhering the requirements of the New Zealand Environmental Protection Authority.

The vegetation around the WWTP should be sprayed (or fogged) every three to four weeks with contact insecticide from late spring to the end of summer, by a pest control expert. Resistance to spinetoram develops quickly in midges. Because of this, it is recommended that spinetoram use is rotated with etofenprox because the two have different modes of action with regard to killing midges (IRAC, 2017).

6. Costs and staff resourcing

Baseline survey-

Five site visits by two staff or contractors will be required over a one week period. This survey is a one-off occurrence and will form the baseline for all future monitoring.

Routine Monitoring –

Approximately 23 site visits will be required by one person over a five month period (weekly visits). This is currently a role for a specialist ecological contractor to carry out, but could be carried out by the Water Unit or the Water Environment Advisor role.

Costs for midge emergence traps are approximately \$400 to manufacture on demand from Cebelio Ltd. Yellow sticky traps have a low nominal cost of the post/waratah installation (an estimate of \$50-\$200 depending on the type of post selected). Yellow sticky traps are available for purchase from Mitre 10 from

the gardening department or from other suppliers. Larval counts have low costs of the purchase of the sampling equipment which WDC has already acquired (sieve, sampling stick and container, tweezers etc).

The cost for excavator hire for dredging of the Kaiapoi Wastewater Treatment Plant wetlands is \$3,730 ex GST per round for 2024-25 (Ongrade Drainage and Excavation Ltd). If this treatment is repeated every 14 days for a five-month spring-summer period, the estimated cost is \$50,000 per season.

Costs are summarised in Table 3. Some assumptions of chemical costs, staff resourcing and other costs have been made, therefore costs should be considered preliminary. Some costs have not been updated since quoted in 2018 and will be higher.

Table 3 – preliminary costs for midge management activities

| Activity | Cost | Note |
|---|--|---|
| Emergence trap | \$400 NZD per trap | Supplied by Cebelio Ltd |
| Yellow sticky trap | \$50-200 per trap | Depends on the type of post selected to hold the trap at 1.2m |
| Light trap installation (OPTIONAL) | \$3,500 NZD per trap installed | Supplied and installed by Redpaths. Cost estimate from 2018, so needs updating |
| S-methoprene dosing | \$4,400 – 8,800 USD/dose Supplied by Southern Monitoring Solutions | Cost estimate from 2018, so needs updating |
| Etofenprox spraying | \$0.85 – 0.95 NZD/L (diluted) A trial at the Christchurch WWTP indicated an application rate of 3m of densely vegetated bank per litre of diluted etofenprox. | Supplied by Southern Monitoring Solutions. Cost estimate from 2018, so needs updating |
| Yates Success Ultra spraying | \$0.725 NZD/L (diluted) Assuming an application rate of 3m of densely vegetated bank per litre of diluted product | Supplied by Bunnings. Cost estimate from 2018, so needs updating |
| Establishment of native vegetation 'kill zones' | Depends on area of planting established. | Estimate of \$10 per plant for plant purchase, guards, planting and plant maintenance |

S-methoprene (marketed as 'Strike') is readily available from Southern Monitoring Solutions Ltd as a slow release pellet at a price of \$110.00 USD/kg (price from 2018). Generally it is recommended that s-methoprene dosing occurs across a 10m swathe along the bank of water bodies acting as a midge habitat. Approximate supply costs for s-methoprene dosing have been provided in Table 4.

Table 4. Approximate S-methoprene Supply Costs for a Range of Dosing Scenarios (prices from 2018)

| Waterbody | Bank perimeter (m) | Swale surface area, (ha) | Dose rate (kg/dose) | Cost, (USD/dose) ^(a) |
|------------------------|--------------------|--------------------------|---------------------|---------------------------------|
| Infiltration Wetland | 4,100 | 4.14 | 23-46 | \$2,600-\$5,100 |
| Constructed wetland 1A | 520 | 0.52 | 2.9-5.8 | \$320-\$640 |

| | | | | |
|------------------------|-----|------|---------|---|
| Constructed wetland 1B | 570 | 0.57 | 3.2-6.4 | \$350-\$700 |
| Total ^(b) | | | | \$3270-\$6,440 (Equivalent to NZD \$5,413 - \$10,661 NZD (Aug 2024)) |

Based on a 2018 supply cost of \$110.00 USD/kg (excl GST). These costs do not include contractor fees. The supply cost in USD has been used here as suppliers often charge out on this basis to allow for exchange rate fluctuations.

(b) These costs do not include dosing the roadside swale or the stream south of the Kaiapoi WWTP. Midge control around these potential habitats would depend on baseline survey results.

Etofenprox can be purchased as a 5L solution from Southern Monitoring Solutions Ltd. Prior to application, etofenprox should be diluted at a 1:20 ratio with water. Hence 5L of solution can be made up to 200L of diluted insecticide.

Spinetoram can be purchased from department stores (such as Bunnings Warehouse) as Yates Success ULTRA Insect Control. It is available as a 200mL solution and is diluted with water at a 1:200 ratio with water. For example, 200mL of the Yates solution makes-up to 40L of diluted insecticide.

The exact cost of spraying contact insecticide depends on the possible future arrangement of plantings at Kaiapoi, as well as the results of monitoring. Preliminary cost information has been compiled in Table 3.

6.1. Native vegetation ‘kill zones’

Establishment of kill zones with contact insecticide is recommended for the Kaiapoi WWTP. The Mangere WWTP employs two 3m wide ranks of plantings around bodies of water that act as a midge habitat, separated by a mown strip, in the following configuration:

Rank 1: Closely planted flax (*Phormium tenax*)

Rank 2: Karo (*Pittosporum crassifolium*), karamu (*Coprosma robusta*), ngaio (*Myoporum laetum*), pohutukawa (*Metrosideros excelsum*), cabbage tree (*Cordyline australis*) and manuka (*Leptospermum scoparium*).

This method supplements contact insecticide spraying by concentrating midges as they shelter from strong winds and sunlight prior to mating. Furthermore, kill zones can be positioned sufficient distances from water bodies (approx. five to ten metres) to reduce the risk of the insecticide entering the aquatic environment.

It is recommended that a landscaping plan be developed for the Kaiapoi WWTP than provides vegetative kill Zones when existing pines are removed from 2024-25 onwards. For any new plantings, species suitable for the Kaiapoi Woodend WWTPs, adapted for the southern climate, could include:

Rank 1: Closely planted flax (*Phormium tenax*)

Rank 2: Karamu (*Coprosma robusta*), ngaio (*Myoporum laetum*), Myrsine australis (Māpou), Whauwhaupaku /five-finger (*Pseudopanax arboreus*), cabbage tree (*Cordyline australis*) and manuka (*Leptospermum scoparium*).

7. Trigger Levels

Trigger levels are proposed for this midge management plan which indicate when control measures should commence for the season, or increase if there is indication of a spike in midge numbers. The trigger level for Woodend WWTP are based on the levels of midges from monitoring recorded in 2023-24 (refer TRIM 240701105929) which approximately correlates to indicating a spike in midge numbers (resulting in the effect of neighbours lodging complaints).

As a new monitoring method of yellow sticky traps is proposed for Kaiapoi WWTP from 2024-25, i.e. changing from the use of emergence traps, the trigger level to commence control (an average of ≤ 2 midges/trap/day) will need to be calibrated to feedback from the effected neighbour in 2024-25 to check that it is appropriate.

Woodend WWTP has two levels of control proposed. Control with oil surfactant application is proposed to commence when midge levels are on average ≤ 2 midges/emergence trap/day. Bti control is proposed to commence in addition to oil surfactant application if emergence trap data exceeds an average of ≤ 5 midges/emergence trap/day. These trigger levels are proposed to be continually refined, based on monitoring data and neighbour feedback. Woodend WWTP may also transition to yellow sticky trap monitoring from midge emergence traps, if successful with their use at Kaiapoi WWTP. Therefore a new trigger level for this monitoring method would need to be calibrated to feedback from the effected neighbours.

8. Consultation with Community

Annual meetings are proposed with Woodend WWTP neighbours or as required. These meetings are occurring already for midge management and discussions about other issues with these neighbours. An annual meeting with the Kaiapoi WWTP neighbour affected by midges is proposed, as well as regular communication during the midge season particularly for feedback on success of control measures.

9. Reporting

Annual reporting will summarise results for the period 1 July – 30 June of each year for reporting to the WDC Utilities and Roading Committee.

10. Review

A review of this plan is proposed to be carried out at least every five years, or when there are significant advances in midge control or monitoring techniques. A technical review of this midge monitoring plan could be carried out, for improvement suggestions to methodologies. This has not currently been budgeted for.

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WAIMAKARIRI DISTRICT COUNCIL**REPORT FOR INFORMATION****FILE NO and TRIM NO:** SEW-03-01-04-13.01 / 240701105914**REPORT TO:** UTILITIES AND ROADING COMMITTEE**DATE OF MEETING:** 20 August 2024**AUTHOR(S):** Sophie Allen (Water Environment Advisor)**SUBJECT:** Avian Botulism Management 2023/24**ENDORSED BY:**
(for Reports to Council,
Committees or Boards)
General Manager
Chief Executive**1. SUMMARY**

- 1.1 This report summarises the occurrence, costs and management of avian botulism during the 2023-24 season at the Waimakariri District Council Wastewater Treatment Plants (WWTP) and Kaiapoi Lakes.
- 1.2 There was a minor outbreak at the Kaiapoi Wastewater Treatment Plant (WWTP) with a total of 375 birds for the 2023-24 season collected by ecological contractors. Other coastal Waimakariri District Council wastewater treatment plants had low numbers of birds collected by ecological contractors, with no avian botulism outbreak detected; Rangiora WWTP (53 birds), Woodend WWTP (4 birds) and Waikuku WWTP (1 bird), and Kaiapoi Lakes (2 birds).

2. RECOMMENDATION**THAT** the Utilities and Roding Committee:

- (a) **Receives** Report No. 240701105914.
- (b) **Notes** the bird death numbers (431 birds) for the 2023-24 season at coastal Waimakariri District Council wastewater treatment plants (WWTPs), as collected by contractors, with a minor avian botulism outbreak at the Kaiapoi WWTP, and two birds collected at the Kaiapoi Lakes.
- (c) **Notes** that the WDC Avian Botulism Management Plan 2020, information leaflets and FAQ sheet will be updated with minor amendments before December 2024, including procedures if Highly Pathogenic Avian Influenza (such as H5N1) is suspected instead of avian botulism.
- (d) **Notes** that WDC staff and contractors will be advised of the low risk of avian botulism toxin being spread by contaminated clothing and footwear if standard hygiene practices are followed, so that appropriate actions can be taken if visiting poultry or dairy farms.
- (e) **Notes** that WDC staff will continue to proactively engage with any affected residents and/or concerned members of the public about avian botulism control.
- (f) **Circulates** this report to the Council, the Waimakariri Water Zone Committee, and the Community Boards for information.

3. **BACKGROUND**

- 3.1 An update on avian botulism and its management was presented to the Utilities and Roding Committee on 15 August 2023 (230601080981[v2]), 21 June 2022 (220420060318), 24 September 2019, (190905124322[v2]), 21 August 2018 (180719080426) and December 2015 (160301016953). These reports detailed the identification and management response of the disease at the Kaiapoi, Woodend, Rangiora and Waikuku WWTPs, and surrounding waterbodies.
- 3.2 Avian botulism is a paralytic disease of waterfowl, caused when toxin is released by bacteria commonly found in the substrates of lake and pond beds, including wastewater oxidation ponds. This toxin accumulates in aquatic invertebrates, which are then consumed by birds. The bacterium *Clostridium botulinum* is widespread in soil and requires warm temperatures, a protein source and an anaerobic (i.e. no oxygen) environment in order to become active and produce toxin. Decomposing vegetation and invertebrates combined with warm temperatures can provide ideal conditions for the botulism bacteria to activate and produce toxin.
- 3.3 Botulism is an intoxication (i.e. food poisoning) rather than an infectious disease. The affected birds show several consistent symptoms including weakness, lethargy and a progressive paralysis, which initially affects the legs and neck. Walking becomes difficult and paralysis of the neck means birds cannot hold their heads erect. For birds sitting on the water this inevitably leads to death by drowning.
- 3.4 Carcasses of dead birds are subsequently fed on by flies and their larvae, which then concentrates the botulinum toxin within the larvae and the bird-toxic maggot cycle commences. This leads to the deaths of subsequent waves of birds as they feed on the maggots in, and around, the dead bird carcasses.
- 3.5 Providing mildly affected birds with fresh water, shade and protection from predators may help them recover from the intoxication. Avian botulism antitoxin is available (potentially only overseas, such as in the USA), but requires special handling and must be given early in the intoxication. Birds that survive a botulism outbreak are not immune to future exposure to botulism toxin.
- 3.6 Avian botulism Type C, as identified at the Kaiapoi Wastewater Treatment plant, is not thought to be a risk to human health. Avian botulism Type E, which has not been identified in the Waimakariri District, does affect humans in rare cases.
- 3.7 Work boots, clothes and vehicles if contaminated with bird carcass material has been identified as a potential risk to poultry and dairy farms for spreading botulinum toxin, however this risk is much lower than the risk of contaminated feed or bedding material for example. WWTP staff and contractors are recommended to be advised of this low risk, so that appropriate actions can be taken if visiting poultry or dairy farms.

4. **ISSUES AND OPTIONS**

- 4.1. Figure 1 shows bird carcass numbers that have been collected by contractors at WWTPs and sometimes other ponds managed by WDC from 2013-24. In 2023-2024, 433 birds in total were collected from four WWTPs, primarily mallards and paradise shelducks, but also species such as New Zealand scaup were also collected. Note that cause of death is not confirmed by autopsy. There has been no significant outbreak of avian botulism since 2018-19 in the Waimakariri District. However, avian botulism is thought to have caused significant number of deaths (i.e. defined as an outbreak) in 2013/14, 2014/15, 2017/18 and 2018/19.

- 4.2. The species of each carcass collected is recorded by Keystone Ecology Ltd, who are experienced in bird identification. No species that are listed as rare or threatened by the Department of Conservation threat classification system were collected in 2023/24 or in previous year since species records have been collected. Department of Conservation classifies the royal spoonbill as naturally uncommon but increasing in range.

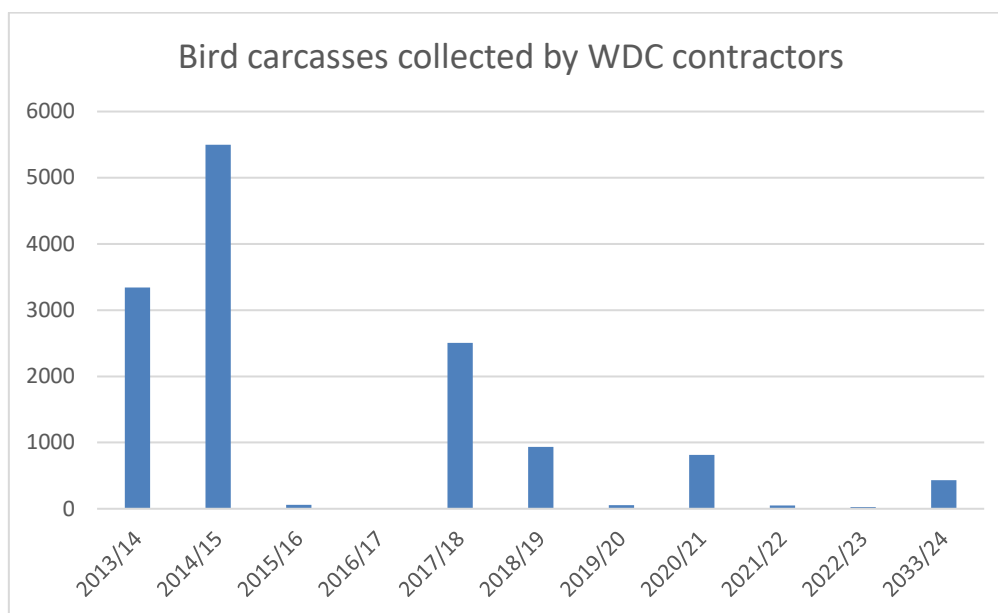


Figure 1: Bird carcasses collected 2013-24 by WDC contractors at all sites. NB data value may be slightly incorrect for the 2015-16 year, due to varying reports.

- 4.3. The first noted outbreak in the Waimakariri District was at the Kaiapoi Wastewater Treatment Plant (WWTP) in the summer of 2013/14. In total there were 3,336 birds that died at the Kaiapoi WWTP and 7 at Woodend WWTP. Most of the dead birds were paradise shelducks and mallards. The second outbreak in the summer of 2014/15 was more significant with a total of 5,499 dead birds over the summer period. The incidence of avian botulism was also more widespread with birds affected at the Kaiapoi, Woodend, Rangiora and Waikuku Beach treatment plants, at the Kaiapoi Lakes public area, the Pegasus wetlands and the Tūhaitara Coastal Park wetlands (Tutaepatu Lagoon).
- 4.4. In 2017/18 there were an estimated 2,505 bird carcasses collected by Council contractors. Any outbreaks in the summers of 2015/16, 2016/17, 2019/20, 2020/21, 2021/22 and 2022/23 were negligible (see Figure 1), due to likely factors such as weather (temperature and wind direction for example) that have not been analyzed. 2023/24 has been called a minor outbreak at the Kaiapoi WWTP with a total of 375 birds collected.

Amendments proposed to the Avian Botulism Management Plan 2020

- 4.5. The WDC Avian Botulism Management Plan 2020 (Trim 201103147380), information leaflets and FAQ sheet will be updated with minor amendments before December 2024, including;
- 4.5.1. Procedures if Highly Pathogenic Avian Influenza (such as H5N1) is suspected instead of avian botulism.
 - 4.5.2. Recommended measures for WDC staff and contractors to minimise any risk of the spread of avian botulism toxin to poultry or dairy farms.
 - 4.5.3. An update on bird rehabilitation centre contact details.

Avian Influenza (Bird Flu)

- 4.6. Highly Pathogenic Avian Influenza (HPAI) is a disease that is highly contagious and often deadly in poultry, caused by highly pathogenic avian influenza A (H5) and A (H7) viruses; it is also known as bird or avian flu. HPAI viruses can be transmitted by wild birds to domestic poultry and other bird and animal species, including occasionally to humans. Strains of HPAI have been circulating globally for many years, with many countries having seasonal outbreaks in poultry every year.
- 4.7. In 2020, a new H5N1 strain of the virus emerged in both domesticated and wild birds across the northern hemisphere. It established in wild birds and began to spread, including to the United Kingdom, Europe, and the United States. In 2023, H5N1 was detected in the southern hemisphere. Since then, it has spread down through South America to the sub-Antarctic islands and the Antarctic peninsula near South America.
- 4.8. Although not currently in New Zealand, it is anticipated the H5N1 will reach New Zealand at some stage. Symptoms in birds can be similar to avian botulism symptoms, therefore ecological contractors handling dead birds have health and safety and reporting practices in place if HPAI is suspected.

Waterbird survey results from Kaiapoi WWTP and Brooklands Lagoon/ Waimakariri River mouth coastal wetland system).

- 4.9. Christchurch City Council undertook a wading bird survey at the Brooklands Lagoon/Lower Waimakariri, including at the Kaiapoi WWTP on 27/06/2024. As this was a wintertime survey, it cannot be compared to previous summary surveys that have been carried out in 2021-23 and which were reported in 2023 to the Utilities and Roding Committee as many species are migratory.

Avian Botulism monitoring at Bromley Wastewater Treatment Plant

- 4.10. Over the 2022-23 summer, Christchurch City Council confirmed that approximately 321 dead waterfowl were collected from Bromley WWTP wetlands as part of their annual avian botulism monitoring. It was also confirmed that 11 live waterfowl were taken from Bromley WWTP for recovery.
- 4.11. Since the summer of 2011/12, there have sometimes been avian botulism Type C outbreaks in the Bromley Wastewater ponds in Christchurch. In summer 2012 there was a large outbreak with 6,300 birds collected, with death attributed to avian botulism within the Bromley Oxidation ponds. The actual estimated number of bird deaths was over 7,000 due to a number unable to be recovered.
- 4.12. In 2013/14, two years after the Bromley WWTP outbreak, WDC experienced the first noted avian botulism outbreak for the District at Kaiapoi WWTP. It was speculated that the avian botulism outbreak at the Kaiapoi WWTP was related to the outbreak at Bromley spreading to the wider area, such as through the movement of sick waterfowl between the two locations.
- 4.13. The bacterium that causes avian botulism is naturally occurring and is likely always present at all WWTP wetland sites at low levels in sediments, so is not necessarily a new infection that is spread between sites. It is rather that an outbreak at one site, such as Bromley WWTP, leads to concentrated toxins being passed on via the 'carcass-maggot cycle'. This cycle is where birds eat the maggots of a carcass that has passed away from avian

botulism, where the toxin has accumulated then moves to another site before dying and producing maggots with the accumulated toxin.

Implications for Community Wellbeing

- 4.14. There are not implications on community wellbeing by the issues and options that are the subject matter of this report. An information pamphlet on Avian Botulism has previously been prepared (refer TRIM 190204012544) to address the community's concerns regarding the disease.
- 4.15. The Management Team has reviewed this report and support the recommendations.

5. COMMUNITY VIEWS

5.1. Mana whenua

Te Ngāi Tūāhuriri hapū are likely to be affected by or have an interest in the subject matter of this report as some waterfowl are taonga species, collected for mahinga kai.

5.2. 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 such as Te Kōhaka o Tūhaitara Trust, North Canterbury Fish and Game, the SPCA, Community and Public Health, Department of Conservation, and Christchurch City Council.

5.3. Wider Community

- 5.3.1. Although there is no legislative requirement, there is a social expectation of the Council to prevent outbreaks spreading to other wetland and lake areas, such as in the Selwyn District and Hurunui District (e.g. Lake Forsyth/Wairewa, Te Waihora/ Lake Ellesmere) or to poultry and dairy farms within Canterbury.
- 5.3.2. Gamebird hunters i.e., duck shooters may have reduced opportunities for hunting, and require clear communication on the severity and locations of outbreaks.
- 5.3.3. Birdwatchers, bird lovers and the general public could be saddened to see sick and dead birds at public locations. Rare or threatened birds could be affected, though no rare or threatened bird deaths have been recorded to date.
- 5.3.4. Opportunities for mahinga kai (customary food gathering) of waterfowl and tuna (eel) may be reduced. Clear communication is needed with appointed Tangata Tiaki (customary fisheries officers).
- 5.3.5. 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

- 6.1.1. There are no financial implications of the decisions sought by this report. This report is for information only.
- 6.1.2. This budget is an existing budget included in the Annual Plan for the operational cost of the wastewater treatment plants.
- 6.1.3. The cost of avian botulism management for 2023-24 was an estimated \$20,000 excl GST. A total of amount of \$32,273 was spent on avian botulism, midge emergence trap and midge larvae monitoring, which is carried out by the contractor Keystone Ecology Ltd in the same visit. The cost in 2022-23 was \$11,502, 2021-22 was \$19,525, 2018-19 was \$45,829, and 2017-18 was \$41,980 excl. GST for the bird collection by a contractor. The variation in cost per year

relates generally to an increased number of visits and/or hours required to retrieve bird carcasses.

- 6.1.4. The cost for bin rental, collection and disposal in 2023-24 was \$893 excl GST. The cost in 2022-23 was \$826, 2021-22 was \$1,070, \$3,081 for 2018-19, and \$5,773 excl. GST for 2017-18 for the waste disposal contractor. A change of contractor was made for 2023-24 which has likely led to cost savings, despite the minor outbreak at Kaiapoi WWTP.
- 6.1.5. Costs to-date have come from within WDC Wastewater budgets, including for areas such as stormwater ponds and reserve areas. This may need to be re-evaluated if significant costs arise from outside of WWTP areas.
- 6.1.6. The cost of management is thought to be reduced by efficient monitoring, quick response and a coordinated response with other parties, such as the Christchurch City Council.

6.2. **Sustainability and Climate Change Impacts**

- 6.2.1. The recommendations in this report do not have sustainability and/or climate change impacts. However, climate change will have a likely effect on avian botulism outbreaks in the future if there are warmer temperatures for longer durations for example.
- 6.2.2. WDC staff monitor for weather predictions of warmer winters and summers, to enact management options early, and reduce risk of a larger or widely dispersed outbreak.

6.3 **Risk Management**

- 6.2.1. There are no risks directly arising from the adoption/implementation of the recommendations in this report.

6.3 **Health and Safety**

- 6.2.1. There are no specific health and safety risks directly arising from the adoption/implementation of the recommendations in this report.
- 6.2.2. Health and Safety documentation and practices such as a Site-Specific Safety Plan will continue to be in place and reviewed when appropriate for WDC staff and contractors.
- 6.2.3. Risks to human health can be minimised by clear communication of risks to staff i.e. promoting the use of gloves when in contact with bird carcasses and implementation of contractors' Health and Safety Plans.
- 6.2.4. In 2014/15 eels in Tutaepatu Lagoon are thought to have consumed some of the carcasses, which led to over 20 observed eels deaths. This raises a potential health and safety issue, due to the fact eels are gathered as a food source.
- 6.2.5. Collection of bird carcasses from wetlands is restricted to retrieval of wind-blown birds from the water's edge due to the risk for humans to enter the wetlands with treated effluent. This can reduce the efficiency and timeliness of bird carcass collection, with some areas are unable to be safely accessed for carcass removal.
- 6.2.6. Outbreaks should be re-confirmed to be avian botulism Type C by the Ministry of Primary Industries at regular intervals, particularly if symptoms presented are atypical, particularly due to the possibility of High Pathogenicity Avian Influenza strain H5N1 arriving in New Zealand.

7. **CONTEXT**

7.1. **Consistency with Policy**

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

7.2. **Authorising Legislation**

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

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.

- There is a healthy and sustainable environment for all.

7.4. **Authorising Delegations**

7.4.1. This report is for information only. No delegations apply.

WAIMAKARIRI DISTRICT COUNCIL**REPORT FOR INFORMATION****FILE NO and TRIM NO:** DRA-06-10-01 / 240527085488**REPORT TO:** WOODEND-SEFTON COMMUNITY BOARD**DATE OF MEETING:** 10 June 2024**AUTHOR(S):** Jason Recker, Stormwater and Waterways Manager
Kalley Simpson, 3 Waters Manager**SUBJECT:** Waikuku Beach Drainage Investigations Update**ENDORSED BY:**(for Reports to Council,
Committees or Boards)_____
Department Manager_____
Chief Executive**1. SUMMARY**

- 1.1. The purpose of this report is to update the Woodend-Sefton Community Board on progress with various drainage investigations underway in the Waikuku Beach area.
- 1.2. As a result of flooding in the May 2021, December 2021, February 2022 and July 2023 storm events, several areas were identified for further investigation in Waikuku Beach. The current status of these investigations and any proposed further work is summarised in the table below:

| Investigation | Status |
|---|--|
| July 2023 Immediate Works: 31 Broadway Ave, 10 Beach Crescent, Rotton Row | The following urban stormwater projects were identified at 31 Broadway Avenue, 10 Beach Crescent and Rotten Row as requiring immediate works. These works were allocated budget as part of the flood recovery approved by Council at the October 2023 Council meeting. The works at 31 Broadway Ave are complete and the works at 10 Beach Crescent and Rotten Row are in the design phase. |
| Swindells Road | A temporary pump has been procured and is expected to be delivered in June. It will be stored at the Water Unit yard in Rangiora and used to pump water from a sump, which will drain the area by pumping it over the stopbank and discharging it into the Ashley River. Swindells Road drainage upgrades design has been finalised and is anticipated to be tendered in June with construction commencing in August 2024. These works include stormwater pipe and grass swale along stopbank in the Swindells Road area of Waikuku Beach. |
| Waikuku Beach Domain | An options assessment is being completed that considers short to long term options to improve the drainage of the Waikuku Beach Domain. The next steps are to coordinate with Greenspace team on potentially adopting one of the options from the assessment. |
| Reserve Road | A CCTV investigation revealed that the two pipes crossing Bridge Street are in poor condition. The report recommended replacing them with a 300mm culvert with a backflow prevention valve. This project will be funded by the annual Coastal Urban minor stormwater improvements budget in the 2024/25 financial year. |

| | |
|------------------------------|--|
| 39 Kings Avenue | Construction is underway for wastewater, roading and stormwater improvements at Kings Ave, Waikuku Beach. The project includes installing a new stormwater pipe (225mm to 300mm), three sumps, an outfall, a reinforced concrete lid over the existing pump station, and a new road layout with signage and markings to reduce vehicle speeds. |
| Northside Drive | Works have been programmed for this financial year to install back-flow prevention on the existing DN375 culvert. This will hydraulically isolate the pond from backflow, preventing excess flood water from reaching it and causing it to overflow through 63 Northside Drive. |
| Kings Avenue Culvert Upgrade | A flood investigation report for Allin Drive, completed in March 2023, identified the Kings Avenue culvert as undersized. It recommended replacing the twin 375mm culverts with a 1500mm by 500mm box culvert. The project is expected to go to tender in June 2024, with construction starting in the 2024/25 financial year. |
| Waikuku assessment | A detailed modelling assessment is underway to determine the cause of flooding from the Taranaki Stream which was higher than expected, although will take some months to complete. This work will be coordinated with Environment Canterbury and will look at factors such as the operation of the flood gate, upstream development, and the catchment hydrology, including any recharge from the Ashley River. The results of the modelling assessment will be provided to the Woodend-Sefton Community Board for information. |

- 1.3. It is important to note that Waikuku Beach was originally established as a bach community, with drainage services developed informally and without a specific level of service. The works described in this report aim to address drainage and flooding issues with practical solutions. While these measures will not eliminate future flooding or the ongoing risks associated with climate change, they will provide improvements to the current level of service.

Note: TRIM references have been included for documentation purposes. This report stands alone without the references.

2. **RECOMMENDATION**

THAT the Board:

- (a) **Receives** Report No. 240527085488
- (b) **Notes** the following progress on several areas identified for further investigation in Waikuku Beach:
 - **July 2023 Immediate Works** –
 - 31 Broadway Avenue – Install of two non-return valves was completed in August 2023.
 - 10 Beach Crescent and Rotton Row – Design being finalised and coordinated with campground works.
 - **Swindells Road** – Temporary pump procured. Drainage upgrade to commence construction in August 2024.
 - **Waikuku Beach Domain** – An options assessment was completed (TRIM 240528085817) with short to long term options to improve the drainage at this location.

- **Reserve Road** – Works to upgrade culverts crossing Bridge Road will be implemented as part of the Coastal Urban minor drainage improvements budget in 2024/25 financial year.
 - **39 Kings Avenue** – Construction is underway for wastewater, roading and stormwater improvements at Kings Ave, Waikuku Beach.
 - **Northside Drive** - Works have been programmed for this financial year to install back-flow prevention on the existing DN375 culvert.
 - **Kings Avenue Culvert Upgrade** - Culvert upgrade works to commence construction in 2024/25 financial year.
 - **Waikuku Assessment** - A detailed modelling assessment to determine the cause of flooding during the July 2023 event is underway and is expected to be completed by August 2024.
- (c) **Notes** that a report will be brought to the Woodend-Sefton Community Board for feedback on the proposed upgrading works in the Swindells Road.
- (d) **Circulates** this report to the Utilities and Roading Committee for their information.

3. **BACKGROUND**

- 3.1. Waikuku Beach is located in a low-lying coastal area that can experience high groundwater levels. The village is protected from fluvial flooding by the Ashley River stop bank system. The Taranaki Stream and Waikuku Stream, which serve large upstream catchments, discharge into the Ashley River in the vicinity of the Waikuku Beach village.
- 3.2. The existing drainage systems predominantly comprise of basic roadside swales, sumps and soakpits and piped outfalls which discharge either to local drains connected to the Taranaki Stream or directly to the Ashley River. Drainage in Waikuku Beach is challenging when ground water levels are high and when tailwater levels in the Taranaki Stream and/or Ashley River are high.

February 2018 Event (Cyclone Gita)

- 3.3. Widespread flooding was experienced across Waikuku Beach and the wider district in the February 2018 storm event. As a result, several drainage maintenance and investigation works were undertaken, as previously report to the Community Board (refer TRIM 191216177546.) A permanent solution for the Kings Avenue issue has since been implemented, however the Waikuku Beach Domain work remaining outstanding.

May 2021 Event

- 3.4. Following the May 2021 flood event a public meeting was held and a presentation given by staff (refer TRIM 210716117056). The following areas were identified for further investigation work:

- Waikuku Beach Campground
- Swindells Road
- Collins Drive
- Waikuku Beach Road
- Kiwi Avenue Reserve
- Waikuku Beach Domain

December 2021 and February 2022 Events

- 3.5. Flooding was subsequently experienced at the following locations as a result of the December 2021 flood event and/or the February 2022 flood event, which required investigation work (refer TRIM 220419059444).

- Swindells Road
- Kiwi Avenue Reserve / Broadway Avenue
- Reserve Road / Broadway Avenue

- Kiwi Avenue

- 3.6. A Flood Team was formed to look into all the flooding issues in the district after the May 2021, December 2021 and February 2022 major rain events. A total of approximately 600 service requests were received during those events, of which 27 related to issues experienced in Waikuku Beach.

July 2023 Event

- 3.7. The district experienced a significant rainfall event over the weekend of 22-24 July 2023, with the coastal area around Woodend receiving approximately 150mm of the rainfall over a 48 hour period. The event was estimated to be more than a 50 year event for Woodend, yet less than a 10 year event for the inland areas of Summerhill and Oxford. Further background on the July 2023 flood event can be found in the previous report to Council (refer TRIM No. 230824130649).

4. ISSUES AND OPTIONS

- 4.1. This section provides an update on several areas identified for further investigation in Waikuku Beach, as a result of flooding in the May 2021, December 2021, February 2022 and July 2023 storm events.

July 2023 Immediate Works

- 4.2. The following urban stormwater projects were identified as requiring immediate works and were allocated budget as part of the flood recovery approved by Council at the October 2023 Council meeting (TRIM 230921147926):

Broadway Ave, Waikuku Beach

- 4.3. These works include the install of two non-return valves and providing a new stormwater lateral connection. These works were completed in August 2023.

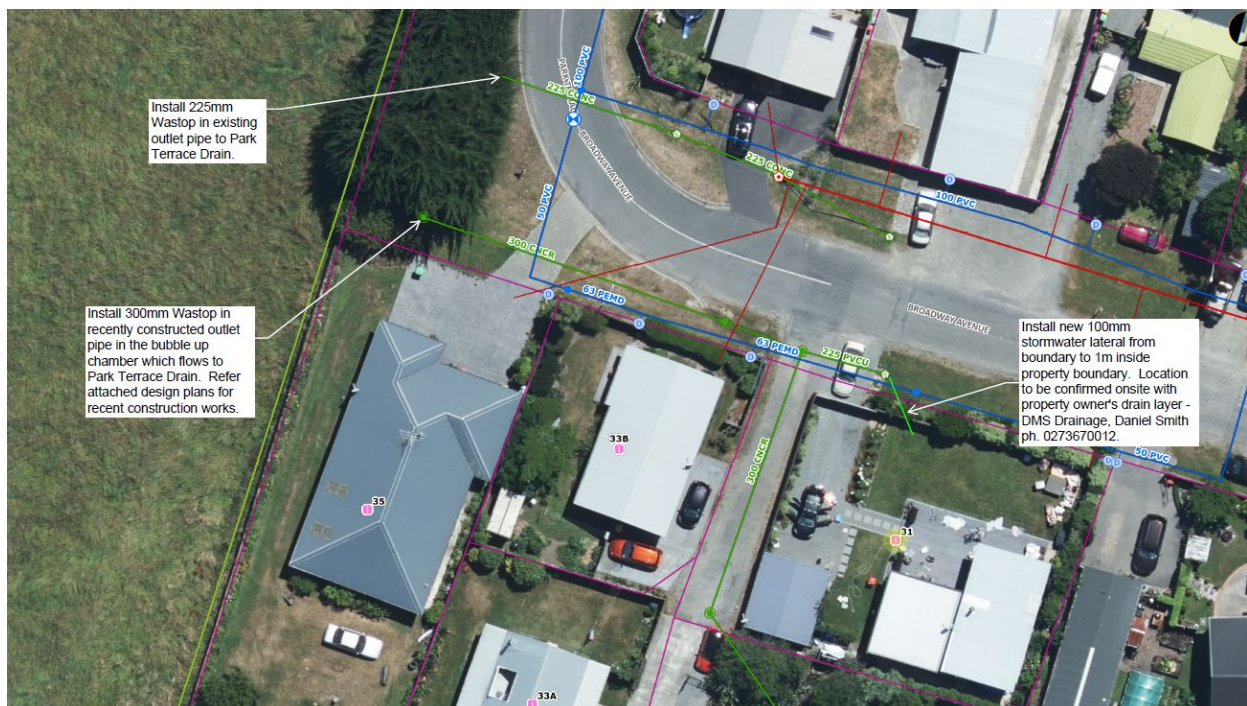


Figure 1 - 31 Broadway Avenue immediate works

10 Beach Crescent and Rotten Row, Waikuku Beach

- 4.4. **10 Beach Crescent, Waikuku Beach** – These works potentially include the install sumps and pipework to connect existing low points to a new pump chamber in the

campground and install a discharge main through to the sand dunes for the discharge from a portable pump.

- 4.5. **Rotten Row, Waikuku Beach** – These works potentially include undertaking localised improvements, bunding and ROW reshaping, to reduce the likelihood of water entering garages.



Figure 2 - Flooding Extents: Beach Crescent (left) Rotten Row (right)

- 4.6. The projects at 10 Beach Crescent and Rotten Row are currently in the design stage. Unrelated work is also being planned for the Waikuku Bach Holiday Park Campsite. Coordination between the Council's property team and the three waters team is underway to ensure alignment with the future plans for the campsite.

Swindells Road

- 4.7. Flooding on Swindells Road occurred during the storms in May 2021, December 2021, and February 2022. Additionally, flooding was previously experienced in February 2018, prompting maintenance work in April 2019 to improve flow through the swales and driveway culverts (refer to TRIM 191216177546).
- 4.8. An options memo was prepared in July 2023 (TRIM 230607083756) that assessed several options. Based on the options memo recommendations and the available construction budget of \$400,000 for the 2023/24 financial year, it was decided to implement the following options:
1. **Temporary pump** - Purchase a surface mounted pump with trailer to pump the water out of the existing manhole over the stopbank and discharge into the Ashley River.
 2. **Low point stormwater reticulation** - Drain the water away from the worst affected areas by installing an 80m pipe with two sumps along the stopbank, as close to the property boundaries and far away from the stopbank as possible.
- 4.9. A temporary pump has been procured and is expected to be delivered in June (Figure 3). It will be stored at the water unit and used to pump water from a sump, which will drain

the area by pumping it over the stopbank and discharging it into the Ashley River. The pump will be deployed as needed during heavy rainfall events.



Figure 3 - Temporary pump procured for Swindells Road area - Atlas Copco PAS 200HF

- 4.10. The Swindells Road drainage upgrades design has been finalised and is anticipated to be tendered in June with construction commencing in August 2024. These works include stormwater pipe and grass swale along stopbank in the Swindells Road area of Waikuku Beach (see Figure 4).

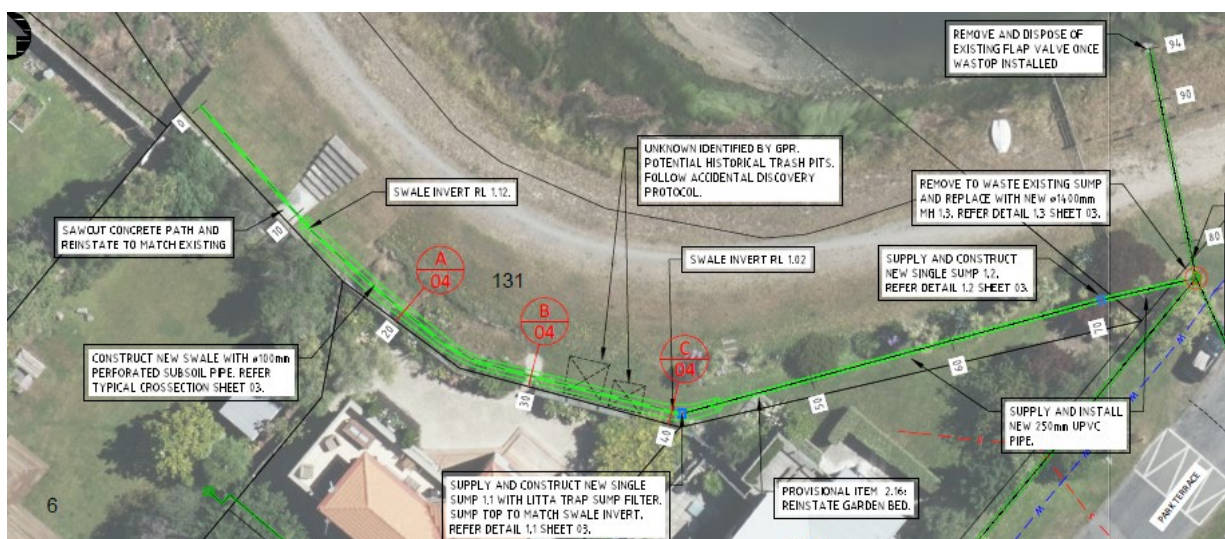


Figure 4 - Swindells Road drainage upgrades.

Waikuku Beach Domain

- 4.11. An area of the Waikuku Beach Domain near the flying fox can experience ponded water for an extended period of time following significant rainfall events. The ponded water is stagnant with no outlet and can produce odour issues in the summer. This issue was experienced following the February 2018 and May 2021 events, however has not been as problematic following the more recent December 2021 and February 2022 events. The current condition of the area is shown in Figure 5 below.



Figure 5 - Area prone to ponding adjacent to the flying fox in the Waikuku Beach Domain

- 4.12. An options assessment is being completed that considers short to long term options to improve the drainage at this location. The potential options that could be considered include:
1. Fill low areas and grade from Bridge Street to Taranaki Stream to improve drainage.
 2. Install soakage pits or trenches at low points.
 3. Converting area to a permanent wetland or pond.
 4. Conduct soil testing for potential removal.
 5. Installing a pipework to drain the low area.
 6. Creating a swale to drain the domain.
 7. Connecting to the existing stormwater network.
- 4.13. The next steps are to coordinate with Greenspace team on adopting one of the options from the assessment. At this stage, it is too early to determine if any of the potential options listed above are viable from a practical or financial perspective.

Reserve Road

- 4.14. During the 23 July 2023 heavy rainfall event 29 Reserve Road reported land and access flooding (see figure 6).



Figure 6 -- View from Reserve Road during 2023 heavy rainfall event.

- 4.15. 29 Reserve Road is located in a low point in Waikuku Beach. The existing drainage consists of two soak pits outside 29 and 28 Reserve Road. Soak pits discharge directly to ground and during significant rainfall may not have sufficient capacity. Additionally, their effectiveness can be constrained by elevated groundwater levels.
- 4.16. The Flood Team investigation report determined that there was likely two sources for the flooding:
1. Backflow of the existing drainage system from the Waikuku Domain lagoon.
 2. The run-off from the road and neighbouring properties which are all higher than the affected property.



Figure 7 - CCTV report pipe locations and outlets

- 4.17. A CCTV investigation was implemented as part of the Flood Team investigation and revealed that the condition of the two pipes crossing Bridge Street were in poor condition.
- 4.18. The report recommended the installation of a 300mm culvert with a backflow prevention valve to replace the existing pipes crossing Bridge Street.
- 4.19. The annual Coastal Urban minor stormwater improvements budget will fund these works in the 2024/25 financial year.

39 Kings Avenue

- 4.20. 39 Kings Avenue across from a wastewater pump station is at a low point and requires drainage, sewer and roading improvements (Figure 8).



Figure 8 - Kings Avenue wastewater and water pumpstation and project area.

4.21. Construction is currently in progress for the roading, wastewater and drainage improvements to the existing wastewater pump station at Kings Ave, Waikuku Beach (see Figure 9). The works involved in this project are:

- New stormwater pipe (225mm to 300mm), three sumps and outfall for improved drainage.
- New reinforced concrete lid spanning over the existing pump station lid.
- New road layout and signage: a narrowed section by the pump station, formed by new buildouts either side, intended to reduce passing vehicle speeds by 'side friction'.
- New road markings & signage

4.22. The work is intended to help prevent over-land flow from entering the existing wastewater wet-well during rain events, and at the same time, reduce the traffic speeds on Kings Ave past both the wastewater wet-well, and the water pump station.

Northside Drive

4.25. A Flood Team memo that assessed the Northside Drive flooding issues titled “29, 53 and 63 Northside Drive, Waikuku July 2023 Flood Investigation”, was completed in November 2023 (TRIM 231116185039).

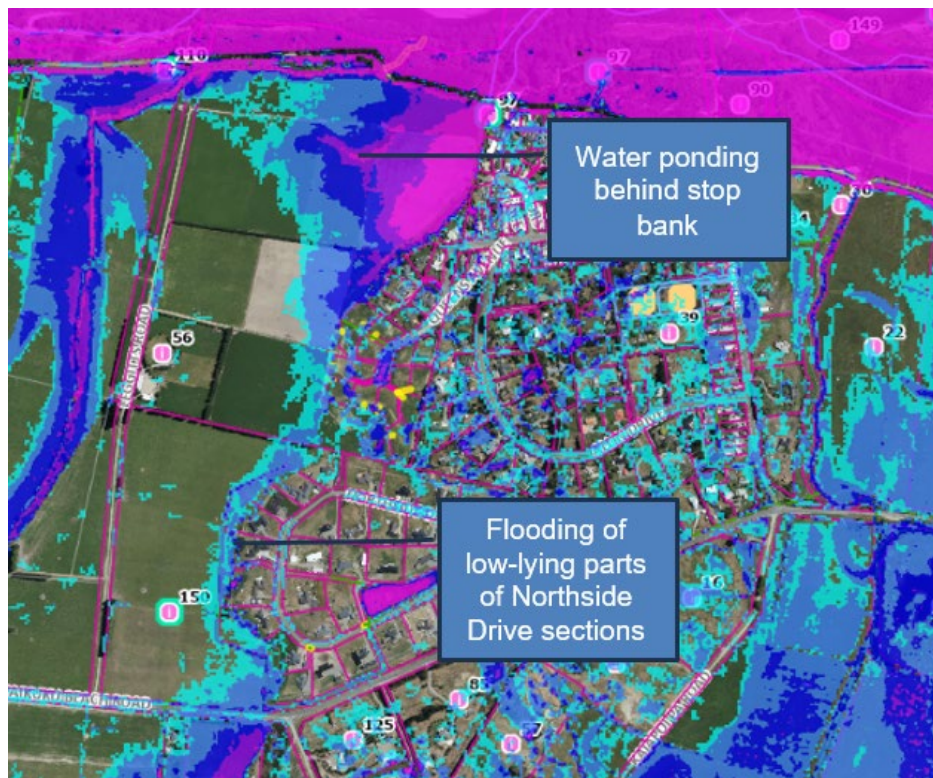


Figure 10 – 100-year localised flooding depth

- 4.26. During the July 2023 heavy rainfall event, the stormwater channel (SW002894) overtopped, flooding the adjacent rural-residential property. The pond north of 63 Northside Drive also overflowed, flooding the property (see Figure 11).



Figure 11 - Pond Overflow Path

- 4.27. The Flood Team investigation determined that there was likely two sources for the flooding:
1. Water cannot discharge through the flap gate when the Ashley River is high.

2. The new culverts installed as part of the Leggitts Park subdivision development are back-flowing during flood events (see Figure 12).

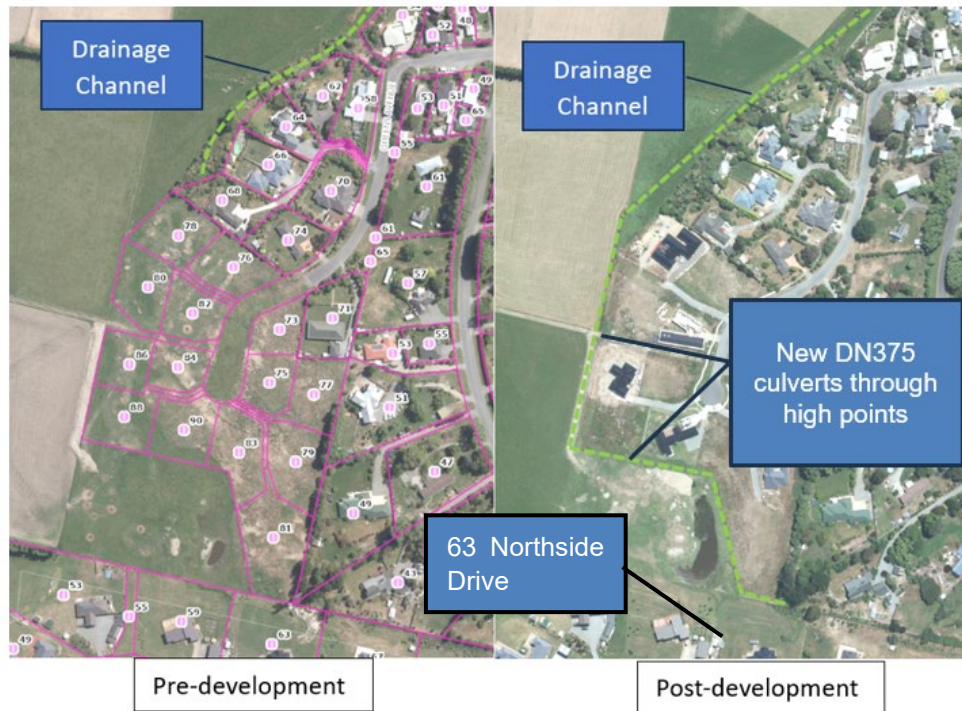


Figure 12 – Leggitts Park Development

- 4.1. Works have been programmed for the 2023/24 financial year to install back-flow prevention on the DN375 culvert shown in Figure 13 below. This will hydraulically isolate the pond from backflow, preventing excess flood water from reaching it and causing it to overflow through 63 Northside Drive.



Figure 13 - Culvert back-flow prevention install

Kings Avenue Culvert Upgrade

- 4.2. A flood investigation report was completed in March 2023 for the July 2022 rainfall event for Allin Drive in Waikuku.
- 4.3. The report determined that the Kings Avenue culvert was undersized and should be upgraded to meet the Council's 10-year (ARI) level of service requirement.

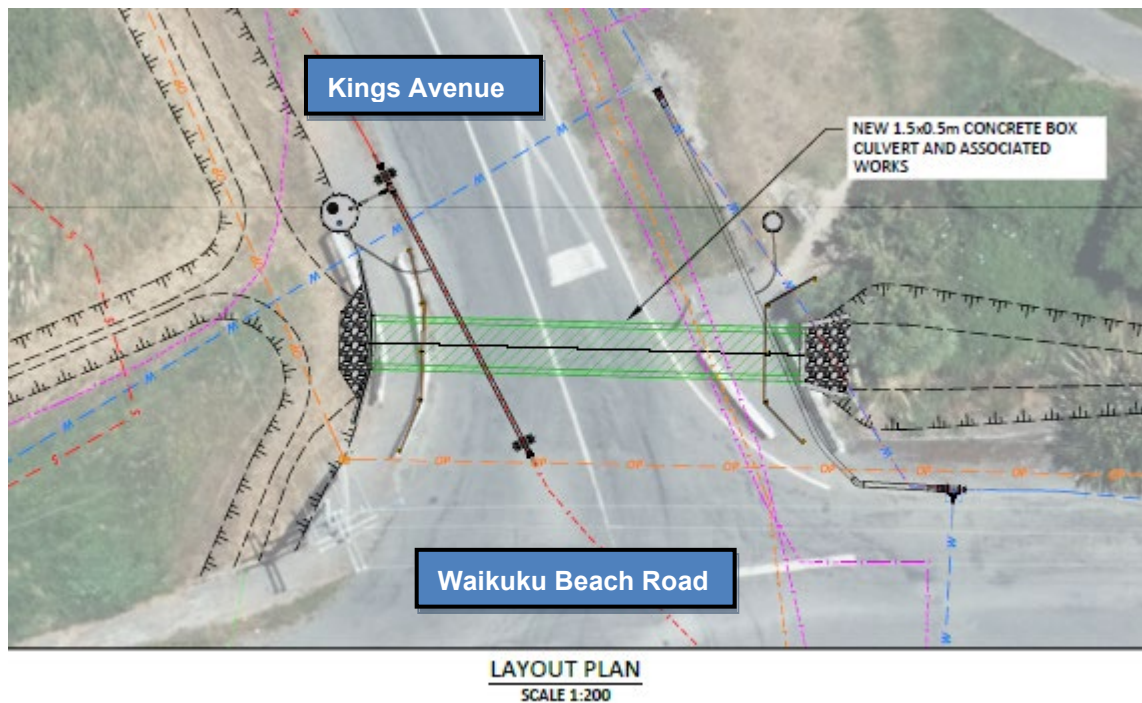


Figure 14 - Kings Avenue Culvert Upgrade

- 4.4. The proposed works include upgrading the existing twin 375mm culverts with a 1500mm by 500mm box culvert to provide additional capacity and meet the Council's level of service requirements (see Figure 14).
- 4.5. The works are anticipated to go out for tender in June 2024, with construction commencing in the 2024/25 financial year.

Waikuku Beach Modelling Assessment

- 4.6. Modelling works of the Taranaki Stream has commenced as part of the detailed assessment to determine the cause of higher than expected flooding in Waikuku Beach.
- 4.7. This work will assess factors such as the operation of the flood gate, upstream development, flood storage within the Tutaepatu Lagoon area and the catchment hydrology, including any recharge from the Ashley River.
- 4.8. A meeting with Environment Canterbury has been held as part of scoping the modelling work required. This modelling work will take some months to complete, and it is not expected to know the outcome until August 2024.
- 4.9. The results of the modelling assessment will be provided to the Woodend-Sefton Community Board for information.

Implications for Community Wellbeing

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

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

5. COMMUNITY VIEWS

5.1. Mana whenua

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

5.2. Groups and Organisations

Directly affected property owners will be consulted with on the proposed upgrades.

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 will be kept informed via the Council's website. A dedicated webpage has been set up for the recent flood events across the wider district, refer:

<https://www.waimakariri.govt.nz/council/major-projects/council-projects/flood-recovery>

6. OTHER IMPLICATIONS AND RISK MANAGEMENT

6.1. Financial Implications

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

All investigation, maintenance and capital works are being undertaken from existing operational and capital budgets.

The Coastal Urban maintenance budgets as allocated in the 2024/34 Long Term Plan for Woodend, Waikuku Beach and Pines Kairaki are outlined in Table 1.

Table 1 - Coastal Urban Maintenance Budgets in 2024/34 Long Term Plan

| 24/25 | 25/26 | 26/27 | 27/28 | 28/29 | 29/30 | 30/31 | 31/32 | 32/33 | 33/34 |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| \$70,600 | \$72,200 | \$74,470 | \$76,260 | \$77,970 | \$79,690 | \$81,410 | \$83,180 | \$84,930 | \$86,600 |

The Coastal Urban capital works budget allocated in the 2024/34 Long Term Plan is outlined in Table 2.

Table 2 - Coast Urban Capital Works Budget in 2024/34 Long Term Plan

| Project | Budget | Construction |
|----------------------------------|-------------|--------------|
| Box Drain Improvements | \$1,200,000 | 25/26 |
| McIntosh Drain Capacity Upgrade | \$691,000 | 25/26 |
| Pines Kairaki Upgrade | \$272,000 | 25/26 |
| East Woodend Detention Pond | \$346,000 | 28/29 |
| School Road Drainage Upgrade | \$541,000 | 24/25 |
| Rotton Row Drainage Improvements | \$1,100,000 | 28/29 |

6.2. Sustainability and Climate Change Impacts

Waikuku Beach in general is significantly exposed to hazards, including flooding and coastal inundation. These issues are likely to be exacerbated in the future due to climate change.

The works described in this report aim to address drainage and flooding issues with practical solutions. While these measures will not eliminate future flooding or the ongoing risks associated with climate change, they will provide improvements to the current level of service.

6.3. **Risk Management**

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

6.3 **Health and Safety**

The health and safety risks associated with undertaking this investigation work and with the development of proposed solutions will be managed by following standard Council processes.

Any contractors undertaking condition assessment or physical works contracts will be required to be SiteWise registered and meet minimum score requirements appropriate for the risk of the work being undertaken.

7. **CONTEXT**

7.1. **Consistency with Policy**

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

7.2. **Authorising Legislation**

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

7.3. **Consistency with Community Outcomes**

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

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

7.4. **Authorising Delegations**

The Woodend-Sefton Community Board has delegation to receive this report as it relates to issues affecting the ward area.