Utilities and Roading Committee

Agenda

Tuesday 19 June 2018

3.00pm

Waimakariri District Council Chambers
215 High Street
Rangiora

Members:
Cr Sandra Stewart (Chairperson)
Cr Robbie Brine
Deputy Mayor Kevin Felstead
Cr John Meyer
Cr Paul Williams
Mayor David Ayers (ex officio)
The Chairman and Members  
WAIMAKARIRI DISTRICT COUNCIL

A Meeting of the UTILITIES AND ROADING COMMITTEE will be held in the COUNCIL CHAMBERS, 215 HIGH STREET, RANGIORA on TUESDAY 19 JUNE 2018 to commence at 3.00pm.

Adrienne Smith  
Committee Advisor

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

BUSINESS

1 APOLOGIES

2 CONFLICTS OF INTEREST

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

3 CONFIRMATION OF MINUTES

3.1 Minutes of a meeting of the Utilities and Roading Committee held on Tuesday 17 April 2018

RECOMMENDATION

THAT the Utilities and Roading Committee:

(a) Confirms, as a true and correct record, the minutes of a meeting of the Utilities and Roading Committee held on Tuesday 17 April 2018.

4 MATTERS ARISING

5 PRESENTATION
6 REPORT

6.1 Closure of Oxford Road Stock Water Race R3N-1 Closure Proposal – Janet Fraser (Utilities Planner) and Owen Davies (Drainage Asset Manager)

RECOMMENDATION

THAT the Utilities and Roading Committee:

(a) Receives report No. 180516053605.

(b) Approves the closure of water race R3N-1 on Oxford Road, east of Lehmans Road.

(c) Notes that, following water race R3N-1 closure, Council staff will discuss maintenance arrangements and possible filling in of sections of the race on Oxford Road with the affected properties.

(d) Notes that, following race R3N-1 closure, the Council will apply for an Archaeological Authority from Heritage New Zealand which would authorise earthworks to fill in sections of the race.

(e) Circulates this report to the Rangiora Ashley Community Board for their information.

6.2 20 February 2018 Storm Event – Update on Service Requests – Kalley Simpson (3 Waters Manager)

RECOMMENDATION

THAT the Utilities and Roading Committee:

(a) Receives report No. 180608063509.

(b) Notes that of the 38 drainage assessments identified from the 208 service requests, 6 have been completed, 7 are currently underway and 8 have been scoped but not commenced.

(c) Circulates this report to the Council for information.

6.3 Engineering Code of Practice – New Stormwater and Water Supply Drawings – Kalley Simpson (3 Waters Manager) and Gary Stevenson (Acting Development Manager)

RECOMMENDATION

THAT the Utilities and Roading Committee:

(a) Receives report No. 180606062155[v2].

(b) Adopts the following new ECOP drawings for onsite stormwater attenuation:

- Plan 600 Sheet 251 Issue B, Onsite Stormwater Tanks.
- Plan 600 Sheet 252 Issue A, Onsite Detention Swale / Pond.
(c) **Adopts** the following revised ECOP drawings for onsite stormwater soakage:
   - Plan 600 Sheet 330B Issue B, Rural Soak Pit.

(d) **Adopts** the following new ECOP drawings for onsite water supply tanks:
   - Plan 600 Sheet 403 Issue A, Private Water Tank (Restricted Scheme).

(e) **Notes** that the Engineering Code of Practice is currently due for a full review, but specific updates are being undertaken on a case by case basis.

6.4 **Water New Zealand – National Performance Review 2016/17 – Kalley Simpson (3 Waters Manager)**

**RECOMMENDATION**

THAT the Utilities and Roading Committee:

(a) **Receives** report No. 180607062770.

(b) **Notes** that the Waimakariri District Council performs relatively well in the key theme areas identified in the 2016/17 National Performance Review.

(c) **Notes** that the National Performance Review provides numerous performance metrics which can be used comparative purposes on specific matters with other councils.

6.5 **Update on Nitrate Levels in Public Drinking Water Supplies – Colin Roxburgh (Water Asset Manager)**

**RECOMMENDATION**

THAT the Utilities and Roading Committee:

(a) **Receives** report No. 180601061125.

(b) **Notes** that all the nitrate levels in public water supplies on all Council managed public drinking-water schemes within the district are below the maximum acceptable value in the Drinking-water Standards for New Zealand.

(c) **Notes** that the Poyntzs Road scheme has nitrate levels at approximately 80 – 90% of the maximum acceptable value, and that a new source is required for this scheme long term.

(d) **Notes** that staff are actively working with Environment Canterbury to understand any long terms risks to the district's supplies and how these can be managed and mitigated.
7 MATTER REFERRED FROM THE REGENERATION STEERING GROUP
MEETING OF 11 JUNE 2018

(including extract from the minutes from this meeting)

7.1 Jones Street Repair Options (Kaiapoi East Regeneration Area) – Michelle Flanagan (Landscape Planner – District Regeneration)

RECOMMENDATION

THAT the Utilities and Roading Committee:

(a) Receives report No. 180426045143.

(b) Approves staff progressing with the concept design of permanent repairs to Jones Street to a business standard on the west side consisting of kerb and channel and for the eastern side to be rebuilt with a swale to a standard similar to the new Kaiapoi East road link (between Feldwick Drive and Cass Street).

(c) Notes that there is currently a budget of $580,000 available for these permanent repairs.

(d) Notes that there is the potential for future rework on Jones Street to support the development of the mixed-use business area in Kaiapoi East.

(e) Notes that New Zealand Transport Agency funding for the preferred option (Option 4) would need to be confirmed.

(f) Notes that access will be maintained to the private residential property on Jones Street in any repair strategy.

8 REPORTS FOR INFORMATION ONLY

8.1 Approval to Change Intersection Controls
(report no. 180423043958 to the Kaiapoi-Tuahiwi Community Board meeting of 21 May 2018).

8.2 Approval to install cattle stops on Carleton Road
(report no. 180517054232 to the Oxford-Ohoka Community Board meeting of 7 June 2018).

9 PORTFOLIO UPDATES

9.1 Roading – Councillor John Meyer

9.2 Drainage and Stockwater – Councillor Sandra Stewart

9.3 Utilities (Water Supplies and Sewer) – Cr Paul Williams

9.4 Solid Waste– Cr Robbie Brine
10 QUESTIONS

11 URGENT GENERAL BUSINESS

**BRIEFING**

At the conclusion of the meeting, there will be a briefing for the committee, on the following matters:

- Seal Extensions (Joanne McBride)
- Nitrate Assessment implications to Water Supplies in the Waimakariri District (joint presentation by Kalley Simpson, 3 Waters Manager WDC and Zeb Etheridge, Senior Scientist ECan)
WAIMAKARIRI DISTRICT COUNCIL

MINUTES OF THE MEETING OF THE UTILITIES AND ROADING COMMITTEE HELD IN THE COUNCIL CHAMBERS, 215 HIGH STREET, RANGIORA ON TUESDAY 17 APRIL 2018 AT 2.30PM

PRESENT
Councillor S Stewart (Chairperson), Mayor D Ayers, Deputy Mayor K Felstead, Councillors R Brine, J Meyer and P Williams.

IN ATTENDANCE
Councillors K Barnett, D Gordon, W Doody. Messrs J Palmer, (Chief Executive), G Cleary (Manager Utilities and Roading), K Simpson (3Waters Manager), K Straw (Civil Project Team Leader), A Klos (Project Engineer) and S Nichols (Governance Manager).

The meeting was adjourned by the Chairperson at 2.31pm to enable the District Planning and Regulation Committee briefing to conclude and the Utilities and Roading Committee meeting reconvened at 2.40pm.

1 APOLOGIES
Nil.

2 CONFLICTS OF INTEREST
Nil.

3 CONFIRMATION OF MINUTES

3.1 Minutes of a meeting of the Utilities and Roading Committee held on Tuesday 20 March 2018

Moved: Councillor Meyer  Seconded: Councillor Williams

THAT the Utilities and Roading Committee:

(a) Confirms, as a true and correct record, the minutes of a meeting of the Utilities and Roading Committee held on Tuesday 20 March 2018.

CARRIED

4 MATTERS ARISING
Nil.

5 PRESENTATION

5.1 Secondary Stopbank Gap Filling on Cones Road and Millton Ave, Rangiora

Shaun McCracken (ECan) and David Bridges (Good Earth Matters) presented information in relation to this project. They spoke to a presentation outlining the location of the stopbanks and the timing of the works. It was proposed that Cones Road stopbank would be completed first, with traffic diverted to Millton Avenue, before the second stopbank would be completed on Millton Avenue with traffic diverted to Cones Road. The Ashley River Bridge would be open at all times. The timing of the works had taken into account the Rangiora A&P Show with no works on Millton Avenue in late October to avoid disruption.
Environment Canterbury staff would work with the Council communications team to ensure the public were aware of the diversions being in place and timing.

6 MATTERS REFERRED FROM THE WOODEND-SEFTON COMMUNITY BOARD MEETING OF 9 APRIL 2018

6.1 Gladstone Road Cycleway – K Straw (Civil Project Team Leader)

K Straw spoke to the report outlining approximately 750 metres of road was within the Woodend Bypass designation and he reflected on the Community Board comments. The Board opted for the second option based on the possibility of the footpath becoming redundant over 10 years. It was noted that the Kaiapoi path has a different surface of chip seal and different costs associated.

G Cleary commented on the Community Board not wanting to waste funds. He explained the reason staff recommended the hot mix option as it related to ongoing maintenance costs. Further options were explained, including potential to direct staff to find the best life cycle cost effective option.

J Palmer commented on the status of the path timeframe. It was advised that property owner negotiations would likely take the timing to September 2018. J Palmer advised that by September 2018 the Council would have a clearer indication from the Government on the future timing of the Woodend Bypass project. Potentially the whole of life cost options may change pending the government review of their Transport Policy Statement.

Councillor Blackie asked if construction parameters are the same except for the seal. K Straw advised of a potential risk for a slight increase if the top coat was not included in the tender, however tender documentation could be worded appropriately.

Councillor Stewart enquired if purchase property costs are included in budgets. Staff confirmed this was the case, including hedging.

Moved: Councillor Meyer  Seconded: Councillor Brine

THAT the Utilities and Roading Committee:

(a) Receives report No. 180306023458.

(b) Authorises staff to carry out an evaluation on the lowest whole of life option and to proceed with construction following an announcement of timing for the Woodend Bypass from the NZ Transport Agency.

(c) Note the Woodend Bypass is not likely to be constructed for 10 years.

CARRIED

Councillor Meyer commented on the goodwill of the Community Board with thoughts of the Bypass timing and the subsequent new government information affecting the project. He believed the Woodend-Sefton Community Board would be supportive of the motion.

Mayor Ayers commented on the Woodend Bypass stating it was planned to be a full motorway (ie like the Belfast Bypass). It is currently included in the draft Regional Transport Plan for 2026, however the government presently has thoughts that all motorway projects that have not yet commenced will stop and be reassessed. Mayor Ayers stated the key issue for the Woodend Bypass is
road safety. The Council submission to the Government Policy Statement on Transport will state this. The indicated date for government release of updated information is the end of August.

**6.2 Combining of Woodend and Pegasus Water Supplies – New Water Supply Main Concept Design – A Klos (Project Engineer) and C Roxburgh (Water Asset Manager)**

A Klos spoke briefly to the report, outlining the proposal for a new supply pipeline from Gladstone Road and partial joining of the Woodend and Pegasus water supplies. Staff also advised that all treatment would occur at the Pegasus plant. A Klos commented on the alignment of pipes, road flows and of various options considered. One long term option was to remove all the trees on the road reserve, which would cost an additional $61,000 than the option to lay pipe through Gladstone Park. Ideally it is preferred if pipes are laid through a roadway or road reserve. The Woodend-Sefton Community Board favoured the option to lay pipe through the trees.

Mayor Ayers asked if there was no road reserve option what would then be the preferred option. A Klos spoke of the road reserve and potential future road. In a supplementary question Mayor Ayers sought clarification of views of some Pegasus residents. G Cleary spoke of the preference to place utilities in road reserve where it is available. J Palmer spoke of the current connection points, avoiding state highway interference and interim solutions.

Moved: Councillor Meyer Seconded: Councillor Brine

**THAT** the Utilities and Roading Committee:

(a) **Receives** report No. 180322031093.

(b) **Notes** that this project to install a new raw water pipe is part of the wider project to join the Woodend and Pegasus water schemes.

(c) **Notes** that design work is scheduled to be undertaken this financial year, 2017/18, and construction is scheduled to be completed next financial year, 2018/19.

(d) **Endorses** that the section of pipe immediately north of Gladstone Road be installed in the road reserve land, rather than through Gladstone Park.

(e) **Approves** the removal of the trees along the preferred route, in road reserve land.

(f) **Notes** that the recommended route is supported by the Gladstone Park Advisory Group.

(g) **Recommends** to Council that an additional capital works budget of $231,000 is included in the 2018/19 financial year, split 30% to growth and 70% to level of service, to give a revised total budget of $811,000 for the Gladstone Road to Pegasus WTP raw water main.

**CARRIED**

Councillor Meyer reflected on long term matters including the unknown timing of the State Highway alternations and future roading, however remarked that this motion was a sensible and necessary option for the longer term.
8 PORTFOLIO UPDATES

8.1 Roading – Councillor John Meyer
Councillor Meyer spoke of the current discussions of the Road Safety Committee and means of slowing drivers down by using rubber judder bars, with potential trials to have a safer environment for construction workers when undertaking road works.

8.2 Drainage and Stockwater – Councillor Sandra Stewart
Councillor Stewart spoke of recent rural drainage meetings and their feedback. All the groups were keen to have the rates eased to enable one year of maintenance funding to be held in reserve. This matter would be deliberated at the end of May through the LTP process.

It was reported that Councillors Blackie, Felstead, and Stewart formed the Stormwater Drainage and Watercourse Protection Bylaw 2018 hearing panel that will make recommendations for the bylaw adoption to the May Council meeting.

Councillor Stewart commented on the Canterbury Water Management Strategy work with the first consultations with affected consent holders beginning this week and expected to take several weeks.

8.3 Utilities (Water Supplies and Sewer) – Councillor Paul Williams
Councillor Williams commented briefly on the Garrymere and Poyntzs Road scheme, with further information to come to elected members shortly, before further public discussion.

8.4 Solid Waste – Councillor Robbie Brine
Councillor Brine advised there would be a Joint Landfill Committee meeting later in the week, where it was expected to receive the interim report and draft SOI key items. Further discussions relating to recycling will also occur.

Councillor Brine spoke of the Waste Minimisation Fund and options of a hospitality campaign and another reduce waste by recycling campaign. On discussion with staff the Reduce, Recycle campaign was favoured.

9 MATTERS TO BE CONSIDERED WITH THE PUBLIC EXCLUDED

Section 48, Local Government Official Information and Meetings Act 1987

Moved: Councillor Stewart    Seconded: Mayor Ayers

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

The general subject of each matter to be considered while the public is excluded, the reason for passing this resolution in relation to each matter and the specific grounds under section 48(1) of the Local Government Official Information and Meetings Act 1987 for the passing of this resolution, are as follows:
Item No | Minutes/Report of: | General subject of each matter to be considered | Reason for passing this resolution in relation to each matter | Ground(s) under section 48(1) for the passing of this resolution
--- | --- | --- | --- | ---
9.1 | Minutes of the public excluded portion of a meeting of the Utilities and Roading Ctte 20 March 2018 | Confirmation of Minutes | Good reason to withhold exists under Section 7 | Section 48(1)(a)

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

<table>
<thead>
<tr>
<th>Item No</th>
<th>Reason for protection of interests</th>
<th>Ref NZS 9202:2003 Appendix A</th>
</tr>
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<tbody>
<tr>
<td>9.1</td>
<td>Protection of privacy of natural persons To carry out commercial activities without prejudice</td>
<td>A2(a) A2(b)ii</td>
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</tbody>
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CARRIED

10 QUESTIONS
There were no questions.

11 URGENT GENERAL BUSINESS
There was no urgent general business.

The public excluded portion of the meeting occurred from 3.33pm to 3.35pm.

There being no further business, the meeting closed at 3.35pm.

CONFIRMED

__________________
Chairperson

__________________
Date

At the conclusion of the meeting, there was a public excluded briefing for the Committee, on the following matters
- Stormwater Network Discharge Consent
- Oxford Rural No. 1 Water Update
- Siena Place Drainage
1. SUMMARY

1.1 This report recommends that the Utilities and Roading Committee approves the closure of the Council stock water race R3N-1 on the south side of Oxford Road, Rangiora. The segment of the race that is proposed to be closed is shown on the plan in Attachment iii.

1.2 There are a number of reasons for the proposed race closure. These are: a) that there is no ongoing demand for the stockwater from among properties supplied with the service; b) provision of stockwater is not appropriate in an urban setting; and c) Ngai Tuahuriri indicated a preference to avoid mixing water from separate waterways and sought to prevent rural source contaminants from entering the North Brook via the water race.

1.3 This report summarises the results of consultation on the race closure proposal. Properties paying the stock water race rate and properties bordering the upper reaches of the North Brook west of West Belt were all consulted on this proposed closure. Among both groups, views are roughly split over whether or not the race should close. Of nineteen responses received, eleven property owners (58%) supported the closure, and 8 property owners (42%) wanted the race to remain open.

Attachments:

iii. Plan of Race R3N-1 proposed for closure and plans of affected properties, south side of Oxford Road to West Belt (TRIM 161125121811).
iv. Consultation responses received by Council from affected properties (TRIM 170316026041). (Circulated separately to members)
v. Consultation meeting with Ngai Tuahuriri as recorded in notes of meeting 19 November 2015 (TRIM 151118153872).
 vii. Archaeological Assessment of proposed water race closure (TRIM 180516053860).
2. **RECOMMENDATION**

THAT the Utilities and Roading Committee:

(a) **Receives** report No.180516053605.

(b) **Approves** the closure of water race R3N-1 on Oxford Road, east of Lehmans Road.

(c) **Notes** that, following water race R3N-1 closure, Council staff will discuss maintenance arrangements and possible filling in of sections of the race on Oxford Road with the affected properties.

(d) **Notes** that, following race R3N-1 closure, the Council will apply for an Archaeological Authority from Heritage New Zealand which would authorise earthworks to fill in sections of the race.

(e) **Circulates** this report to the Rangiora Ashley Community Board for their information.

3. **BACKGROUND**

3.1. There have been a number of requests from several properties adjoining the stockwater race on the south side of Oxford Road to consider its closure. The reason for the requested closure is that the water is no longer required for the supply of stock water and it is no longer appropriate in a built up urban environment.

3.2. The Utilities and Roading Committee previously approved the closure of the stock water race on the north side of Oxford Road (R3Q) at its 15 December 2015 meeting (see TRIM 151125156380).

3.3. The race R3N-1 along the south side of Oxford Road between Lehmans Road and the head of the North Brook traverses 4 rural properties and 9 urban properties. Of these thirteen properties, 7 are currently paying the stock water race rate and so were consulted on the proposed race closure.

3.4. At the time of the consultation in February 2017, 8 properties were paying the stock water race rate, of which 1 (the property at 29 Oxford Road) has since been subdivided. The properties consulted on the race closure are shown on plans in Attachment iii (TRIM 161125121811).

3.5 The race water is piped through some of the Oxford Road properties. The race flows through a landscaped section of road reserve adjacent to the intersection of Oxford Road and Acacia Ave. None of these properties are using the water for stock water and are therefore not paying the water race rate.

3.6 The Council consulted the race closure request with thirty two properties in total. These include: a) the 8 properties adjoining the water race that were paying the stock water rate at the time the consultation was undertaken; and b) twenty two other properties, adjacent to the North Brook between Oxford Road and West Belt, and 2 on the landscaped intersection of Acacia Ave and Oxford Road.

3.7 The race R3N-1 provides intermittent flow to the North Brook. The North Brook is a spring fed stream originating at a point just south of Oxford Road near Aspen Street. The North Brook then flows through the centre of urban Rangiora and through farmland until it joins the Ruataniwha (Cam) River.

3.8 The race terminates where it enters the North Brook on Oxford Road. The race is managed to avoid any excess stock water entering the North Brook. The Council stock water system...
is presently consented to supply stock water only and is not designed or consented to augment the flow in the natural streams.

3.9 As the water race sometimes augments flows in the upper North Brook, the properties between Oxford Road and West Belt are considered to be affected by the race closure proposal. As the North Brook flows south and east through Rangiora it is increasingly augmented by spring flows. This means the proposed closure downstream of Oxford Road will have a minor effect on the flow.

4 ISSUES AND OPTIONS

4.1 Summary of Consultation Responses

4.2 The Council consulted the race closure proposal in February 2017 with two groups of properties. These are: 1) the 8 properties adjoining the water race that were still paying the stock water race rate at the time of the consultation (7 continue to pay the rate as at May 2018); and 2) twenty four other properties adjoining the North Brook between Oxford Road and West Belt. Thirty two separate property owners in total were consulted on the proposal. Comments from all property owners are summarised in Attachment i and ii.

4.3 The thirty two property owners were each asked whether or not they wanted the Oxford Road race R3N-1 to close. Of the nineteen responses received, there were eleven property owners (58%) that supported the closure, and 8 property owners (42%) that wanted the race to remain open.

4.4 Of the 8 properties paying the stock water race rate, 5 responded to this consultation. Of these, 3 wanted the race to close (60%) and 2 wanted it to remain open (40%).

4.5 The consultation therefore shows a small majority of all respondents, including some stock water race ratepayers and other affected properties support closing the race.

4.6 The feedback from consultation indicates a division of views among both the stock water race rate payers and other properties adjacent to the North Brook whether to close the race. Given this lack of consensus among the affected properties, the Utilities and Roading Committee is requested to consider all views and make a decision.

4.7 Properties Paying the Stock Water Race Rate.

4.8 Of the 8 properties along Oxford Road which were paying the stock water race rate at the time of the consultation, 4 are rural and 4 were large urban properties (the property at 29 Oxford Road has since subdivided).

4.9 Of the four rural properties that could feasibly use the water race to supply water to stock, two support the race closure and one supports keeping the race open.

4.10 One submitter has commented that over the last 40 years the water race has not been used for stock water supply purposes on any of these properties, other than for the Council owned property at 89 Oxford Road.

4.11 It is noted that the Council, both as property owner and “affected party” in terms of this consultation, did not provide a consultation response to the race closure proposal to avoid any “conflict of interest”. This property is leased for sheep grazing. If this race is closed then the Council will ensure the requirements of the leaseholder are met in terms of provision of a future supply of stock water. This could be achieved by supplying stock water to this property from the existing pipe under Lehmans Road.
4.12 The property at 75 Oxford Road valued the stock water race as an emergency water supply. This property could be connected to the Rangiora Urban water supply.

4.13 Properties Affected by Race Closure – Amenity

4.14 The twenty four properties potentially affected by closure of the race in terms of their amenity values were located adjacent to the upper North Brook between Oxford Road and West Belt. The head of the North Brook stream is occasionally augmented by the water race. Also consulted were two properties at the intersection of Acacia Ave and Oxford Road, where the race flows through a landscaped section of road reserve.

4.15 Of these twenty four properties, fourteen responded to the consultation, 8 supported the race closure and 6 wanted to keep the race open. The comments from these properties are summarised in Appendices 1 and 2.

4.16 The two urban properties on the corner of Acacia Ave and Oxford Road are located adjacent to a landscaped section of the open water race. This section of the race is in the road reserve. The property owners both raised concerns with the maintenance of the riparian plants adjacent to the water race. If the race is closed, the Council will work with these owners with advice and help on suitable planting and landscaping if/when the race is filled in.

4.17 One property owner near the top of the North Brook has requested that they be permitted to re-align the fence adjacent to the stream (at no cost to Council). This is to allow better care of the stream margins, utilisation of the land and to adjust the fence line so that it better follows the natural stream bank alignment. Regardless of whether or not the race is closed staff will investigate the options for re-aligning this fencing and provide advice to the owner.

4.18 Summary

4.19 There are a number of reasons for the proposed race closure recommendation. These are: a) that there is no ongoing demand for the provision of stockwater among properties supplied with the service; b) provision of stockwater is not appropriate in an urban setting; and c) Ngai Tuahuriri indicated a preference to avoid mixing water from separate waterways and sought to prevent rural source contaminants entering the head of the North Brook via the water race (see Section 5 for discussion).

4.20 Race Maintenance Options

4.21 If the water race closes maintenance options include filling of the redundant race. Staff will provide advice to owners wishing to fill in their section of the race.

4.22 If the race R3N-1 is closed, the channel of the upper North Brook would still remain as a natural spring fed waterway. One submitter suggests this could be redeveloped as a “swale” and landscaped in a way similar to the swale in the Oaks, however this would not be supported by Council staff as the North Brook is a natural stream. The stream bed crosses private property at some locations along this reach. The Council will continue to provide maintenance advice to each private property owner to ensure the stormwater drainage function of the stream bed is retained. Any modifications to the channel would need to be approved by the Drainage Asset Manager, to ensure the capacity and maintenance access is not compromised.

4.23 If the race is closed then the Council will work with property owners to determine if any parts of the race can be back-filled. Consideration must be given to the residual drainage function of the redundant race.
4.24 Flood Management Implications

4.25 Several submitters have raised the question of whether the closure of the water race would mitigate flood risk for urban Rangiora by removing the flood conveyance capacity of the water race. Closure of the race may have some positive flood mitigation effects, though these would likely be marginal. Flood mitigation is not the primary reason for closing the water race.

4.26 Diversion of Race, if Closed

4.27 The veterinary clinic at 181 Lehmans Road (west side of Lehmans Road) supports keeping the race open. If the Utilities and Roading Committee decides to close the race along Oxford Road east of Lehmans Road, the race could be diverted around the veterinary clinic. This would effectively terminate the stock water race at the clinic, so that it is not conveyed beneath Lehmans Road to flow any further east along Oxford Road.

4.28 The veterinary clinic owners have suggested that the race continues to run through their property. It would then be diverted along the road reserve on the western side of Lehmans Road. The race would terminate at Oxford Road.

4.29 Aquifer Recharge and River Flow Augmentation

4.30 The Council previously considered this race closure proposal at its meeting on 18 April 2017. During that meeting it discussed implications of ongoing race closures in terms of effects on the Environment Canterbury managed aquifer recharge programme. It also considered opportunities to use the water races to augment minimum flows in downstream waterways.

4.31 There is no known demand for any groundwater augmentation among property owners in Rangiora or east of Rangiora located down-gradient of race R3N-1. Groundwater levels are generally higher in the east of the District than in the area west of Rangiora which is serviced by the water race network. The use of race R3N-1 for managed aquifer recharge is therefore not considered to be required.

4.32 At the meeting on 18 April 2017, the Council also queried whether the water race water from R3N-1 could be used to augment base-flow in the Cam River east of Rangiora. This could be for the purposes of either: (1) protecting ecological values by increasing minimum flows; or (2) providing increased minimum flows to support larger irrigation abstractions which are sought by some property owners.

4.33 This query was referred to Environment Canterbury scientists in May 2017. Environment Canterbury undertook consultation on this option with landowners adjoining the Cam River and with Ngai Tuahuriri in mid-2017. The consultation also involved some landowners with an interest in using Cam River water for irrigation on their properties.

4.34 Following that consultation, no recommendation on use of the race water for augmenting the Cam River base-flow has been received from Environment Canterbury or from any other party. In any case, the capacity of the water race along Oxford Road is not sufficient to provide the flow volumes which would likely be sought by potential irrigators or which would be needed to significantly increase the Cam River minimum flows. It is now understood that no further investigations on this option are intended.

4.35 The Management Team have reviewed this report and support the recommendations.
5 COMMUNITY VIEWS

5.1 Groups and Organisations

5.2 The Council consulted the race closure request with a number of property owners including some affected ratepayers and other various community stakeholders and agencies.

5.3 The Council consulted with 8 properties adjoining the race who were still required to pay the stock water race rate at the time of consultation. It consulted a further twenty four properties which were considered to be affected by the proposed closure due to amenity values provided to their property from the race.

5.4 The Council also consulted the following re the race closure: a) Ngai Tuahuriri (see TRIM 151118153872); b) the Water Race Advisory Group (see TRIM 17033103164); c) Heritage New Zealand (the Council then obtained an Archaeological Assessment as requested by Heritage New Zealand (TRIM 180516053860); and d) Waimakariri Irrigation Limited, through a number of ongoing discussions.

5.5 It did not receive any objections to closing the race from any of these organisations.

5.6 Ngai Tuahuriri

5.7 Ngai Tuahuriri were made aware of the proposed race closure as part of its monthly meetings with the Council, including originally at a meeting on 19 November 2015 (TRIM 151118153872) and also at a meeting on 16 February 2017. During these meetings the benefits and potential issues associated with the proposed closure were discussed.

5.8 The concern about reducing the flows in the upper portion of the North Brook was weighed against the benefit of removing the rural contaminants. The result of ceasing the discharge may be improved health outcomes associated with mahinga kai collected downstream from removal of rural source contaminants. Conversely, lower flows will potentially increase water temperatures and impact the health of some mahinga kai species. There is also a concern with the “mixing” of waters from different catchments or waterway systems which would be addressed by removing stock water from the North Brook. On balance, the Runanga do not have any concerns with the proposed closure of the water race.

5.9 Other Stakeholders

5.10 The Council has also consulted Waimakariri Irrigation Limited (WIL) on the proposed closure of the water race. WIL has indicated it supports the proposal, as the race closure would be likely to provide operating efficiencies for the balance of the network.

5.11 The Council consulted the Water Race Advisory Group about the proposed race closure. The Committee members did not have any objections to the closure of this race.

5.12 The Council also commissioned an Archaeological Assessment of the section of race proposed for closure as requested during its consultation with Heritage New Zealand. The assessment does not identify any particular significant historic heritage values associated with the water race. However, it recommends that the Council obtain an Archaeological Authority from Heritage New Zealand prior to undertaking any earthworks required to close and fill in the race.

5.13 If a decision is made to close the race, then the Council will need to apply for an Archaeological Authority from Heritage New Zealand to fill in parts of the race. Such
Authority would take about 3 months to obtain. It would then need to comply with any requirements of that Authority when undertaking any race back-filling work.

5.14 **Wider Community**

5.15 Those property owners that supported the water race closure provided the following reasons:
- Irregular flows causing stagnant water and mosquito breeding
- Excessive weed growth and weed maintenance issues
- A practical response to ongoing urban development
- Closing the race to remove its flood conveyance capacity, protecting urban Rangiora from future flooding (see discussion in Section 4)
- It is understood that the race has not been used to supply stockwater to stock for a number of years.

5.16 Those properties that wanted the race to remain open provided these reasons:
- Supporting ecological base flows, retaining in-stream ecology and habitat
- Amenity and recreational values of the race
- Property values are greater for those with a flowing stream on the property
- Properties built around the stream as a feature, including time and expense
- Concern about adverse effects of closure including loss of biodiversity, increase in weeds, greater frequency of stagnant pools, mosquito breeding and odour
- Use of water race as backup water supply in event of disaster (e.g. draught)
- Easements on property are for a stream rather than a stormwater drain

5.17 Following a decision to close the race, the Council will then write to all affected residents advising of the decision, reasons and future maintenance arrangements.

6 **IMPLICATIONS AND RISKS**

6.1 **Financial Implications**

6.2 If the race R3N-1 is closed then the properties adjoining the race will no longer need to pay a stock water race rate. Any future drainage works associated with drainage of properties previously serviced by this stock water race would in future be funded through the Rangiora drainage account.

6.3 The annual water race network total operating and maintenance expenditure is currently around $379,000 per annum (as at 2017/18). The current stock water race rates paid by properties along the south side of Oxford Road is $728.28 per annum (at 2017/18 financial year).

6.4 A reduction in the stock water race rates income to Council following closure of R3N-1 of $728 per annum would have a minimal effect on this overall budget. The race on the south side of Oxford Road has maintenance requirements that currently exceed the income received from the ratepayers on this section.

6.5 If the race R3N-1 is closed then the properties currently paying the rate will no longer be rated for stockwater from 1 July 2018.

6.6 **Community Implications**

6.7 There are a number of implications for the community of closing the water race. These include:
To reflect an ongoing change in the area towards urbanisation, and consequent reduction in rural stockwater use;

To facilitate future residential development in this area;

Addressing concerns about increasingly irregular flows in the race which may be a consequence of seasonal weather variation, irrigation intake restrictions, upstream race maintenance issues and/or climate change;

Closure of the race has associated potential reduction of habitat for some aquatic species in the upper reaches of the North Brook;

Possible effect on flood management in north-west Rangiora, including whether the closure would reduce risk of rural overland flows being conveyed into urban Rangiora.

6.8 If the Utilities and Roading Committee approves closure of the water race, staff will write to each affected property and advise the future maintenance responsibilities. Following a decision to close the race, the Council will survey the drainage functions of the race and advise each affected property owner about whether or not they can each fill in their section of race. No part of the North Brook will be permitted to be filled in, however, as the stream serves an essential urban drainage function.

6.9 Risk Management

6.10 Closure of the race may reduce local flood risk in the immediate vicinity of the race. This could occur via removing this potential channel which could in a flood event, convey flood waters draining from rural land to the west into north-west Rangiora via the available water race channel.

6.11 Property owners adjacent to the North Brook will not be able to fill in the stream. It provides their properties and downstream properties with an essential stormwater drainage function and mitigates flood risk in central Rangiora.

6.12 Maintenance options for the stream bed will need to be investigated in consultation with these properties.

6.13 There is potential for further closure of water races associated with ongoing urbanisation west of Rangiora. All proposed closures will be reported to the Utilities and Roading Committee for consideration, following consultation with affected parties. The financial implications will be considered for each closure in terms of potential effects on existing ratepayers, the operation of the balance of the network and on the overall level of service provided.

6.14 Health and Safety

6.15 The proposal to close the water race will improve public health and safety on residential properties and in new subdivisions by removing areas of flowing or standing water.

7 CONTEXT

7.1 Policy

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

The proposal is consistent with the Stockwater Race Closure Policy. The Policy requires the decision making process in Part 6 of the Local Government Act 2002 to be followed when making a decision to close a water race.
In particular, section 4.2 of the policy requires an assessment of significance in terms of the Council’s Significance Policy. An assessment against the Significance Policy shows the following:

i. the level of service for the supply and delivery of stockwater will not be significantly affected if the race is closed as it is apparent that the race is no longer required for the supply of stock water to properties;

ii. the race considered for closure is not a strategic asset;

iii. the closure will not significantly affect the Council’s ability to supply stock water;

iv. the closure will not significantly affect costs to Council or ratepayers as the reduction in revenue will be offset by a reduction in maintenance and improved operating efficiencies.

For these reasons, the water race closure proposal is not considered significant and therefore consultation with residents using the Special Consultative Procedure is not required.

Consultation with affected parties in accordance with Section 82 of the Act has been undertaken for properties paying the water race rate adjacent to R3N-1, and for property owners adjoining the North Brook between Oxford Road and West Belt, and those on the landscaped section of the race on the corner of Oxford Road and Acacia Ave.

Feedback on the desired future of the water race among the affected property owners is divided. There are a small majority of respondents in favour of race closure. The Council will need to consider all views and feedback in support of either closing the race or leaving it open when making its decision on this issue.

7.2 Legislation

Water race closure procedures, including public consultation requirements, are outlined in the Local Government Act 2002. In terms of this water race closure proposal, Sections 77, 78 and 82 of the Act apply. The consultation undertaken as described in this report is considered to adequately meet these requirements.

7.3 Community Outcomes

This proposal contributes to the following outcomes:

- There is a safe environment for all
- There is sufficient clean water to meet the needs of communities and ecosystems
7.4 Delegations

The Utilities and Roading Committee would have usual delegated authority to make a decision on this race closure.

Janet Fraser
Utilities Planner

Owen Davies
Drainage Asset Manager
### Attachment i.

**Summary of Comments: Properties that Do Not Support Race Closure**

<table>
<thead>
<tr>
<th>Property Address</th>
<th>R3N-1 Stock Water Race</th>
<th>Ratepayers</th>
</tr>
</thead>
<tbody>
<tr>
<td>41 Oxford Road</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>75 Oxford Road</td>
<td>Value the back-up water supply in emergencies</td>
<td>Value the water race for its biodiversity</td>
</tr>
<tr>
<td></td>
<td>Retain baseflow for North Brook stream</td>
<td>A benefit of WIL irrigation scheme is to augment flows in lowland streams and springs</td>
</tr>
<tr>
<td></td>
<td>Better flow regulation to prevent the recent irregular flows</td>
<td>Performance of existing soak holes in Oxford Road area in relation to the water race function</td>
</tr>
<tr>
<td></td>
<td>Encourage developers to enhance rather than remove open waterways</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Property Address</th>
<th>Properties Adjacent to Upper North Brook</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Milesbrook Close</td>
<td>&quot;I would be very upset if this proposal goes ahead as I have spent a considerable amount of time, energy and finance on developing and maintaining this feature on my property&quot;.</td>
</tr>
<tr>
<td>7 Milesbrook Close</td>
<td>Retain in-stream ecology and habitat</td>
</tr>
<tr>
<td></td>
<td>Urbanisation is causing loss of biodiversity</td>
</tr>
<tr>
<td></td>
<td>Stream is significant feature for property</td>
</tr>
<tr>
<td></td>
<td>Increase in weed infestations if closed</td>
</tr>
<tr>
<td></td>
<td>Stagnant pools if closed</td>
</tr>
<tr>
<td></td>
<td>Retain property values if kept open</td>
</tr>
<tr>
<td></td>
<td>Issues with maintaining stormwater drain on private property</td>
</tr>
<tr>
<td></td>
<td>Function of existing easements for flowing stream rather than dry stormwater drain</td>
</tr>
<tr>
<td>13 Milesbrook Close</td>
<td>Stream is significant feature for property</td>
</tr>
<tr>
<td></td>
<td>&quot;Everyone comments on how lovely it is to have a little stream&quot;</td>
</tr>
<tr>
<td></td>
<td>Contribution to wellbeing of residents</td>
</tr>
<tr>
<td></td>
<td>Retain property values</td>
</tr>
<tr>
<td></td>
<td>Issues with maintaining stormwater drain on private property</td>
</tr>
<tr>
<td></td>
<td>Increase in weeds &amp; smell if closed</td>
</tr>
<tr>
<td>15 Milesbrook Close</td>
<td>&quot;One of the reasons we purchased this property was because it has a stream&quot;.</td>
</tr>
<tr>
<td></td>
<td>&quot;We feel the creek with only minimal water running through it would create an odour&quot;.</td>
</tr>
<tr>
<td>19 Milesbrook Close</td>
<td>&quot;There is little enough water flow most times&quot;.</td>
</tr>
<tr>
<td></td>
<td>&quot;Reduction (by closing water race) would have a negative impact on flora as well as fauna and birds, insects etc&quot;.</td>
</tr>
<tr>
<td>21 Milesbrook Close</td>
<td>Stream is significant feature for property</td>
</tr>
<tr>
<td></td>
<td>An asset if kept running and clean</td>
</tr>
<tr>
<td></td>
<td>Increase in weed infestations if closed</td>
</tr>
<tr>
<td></td>
<td>Would become woody and muddy if closed</td>
</tr>
<tr>
<td></td>
<td>Fill with rubbish if closed</td>
</tr>
<tr>
<td></td>
<td>Stagnant pools and mosquitos if closed</td>
</tr>
<tr>
<td></td>
<td>Retain property values</td>
</tr>
</tbody>
</table>
### Summary of Comments: Properties that Support Race Closure

<table>
<thead>
<tr>
<th>Property Address</th>
<th>R3N-1 Stock Water Race Ratepayers</th>
</tr>
</thead>
<tbody>
<tr>
<td>43 Oxford Road</td>
<td>-</td>
</tr>
</tbody>
</table>
| 63 Oxford Road   | "We have owned our property since 1973 and have never used the creek as we have water troughs in every paddock".  
"We also owned the property on corner of Lehmans Road and Oxford Road which we sold to the Waimak Council. This is the only property that uses the creek to supply water to sheep".  
"No other property on Oxford Road has ever used the creek".  
"We have been asked this question before and although it was voted to be closed it never happened". |
| 83 Oxford Road   | -                                                                                                |

<table>
<thead>
<tr>
<th>Property Address</th>
<th>Properties not paying the R3N-1 Water Race Rate; and Properties Adjacent to the Upper North Brook</th>
</tr>
</thead>
</table>
| 96 Acacia Ave    | "We appreciate that this will cause upset to the plantings, but we would welcome the removal of the unsightly reeds and would be happy to blend our plantings to result in a more landscaped area".  
"We are not adverse to the maintenance of a more botanically enhanced front aspect from our property". |
| 97 Acacia Ave    | Request for Council to landscape race after it is closed and backfilled  
Do not replant the native flax grasses along fence line – they are not maintained and are overgrown and untidy.  
"I need clear space along the fence line for maintenance and painting". |
| 27 B Oxford Road | Planting to attract the birds please.                                                            |
| 27D Oxford Road  | "This seems both a logical and practical move in response to urban housing development and expansion in the area".  
"The biggest positive regarding closure is significant flood mitigation. Only a few years ago, heavy rain in the area caused flooding to houses in Aspen St, with the water race being a large contributing factor".  
If the water flow ceases then pools of stagnant water, breeding of mosquitos and excessive weed growth would all need to be addressed through ongoing stream bed/drain maintenance.  
Permission to re-align the fence adjacent to the stream (at no cost to Council) so as to allow for “sensible utilisation and improved care of the area”. This would align the fence with the natural contour of the stream bank.  
If closed, develop into a landscaped swale similar to that in the Oaks.  
Develop and strengthen the stream bed to allow for safer cyclist and pedestrian access into Aspen Street Reserve from Oxford Road. |
| 14 Aspen Street  | -                                                                                                |
| 16 Aspen Street  | -                                                                                                |
| 5 Milesbrook Close | Doesn’t affect us either way.                                                                            |
| 11 Milesbrook Close | Rural water draining into urban causing flood risk.  
"I would love to have the water to flow down the stream all year but after last year’s flood I don’t trust Council to maintain the Council parts of the water way".  
If they don’t control flood gate we could all be in trouble. |
**NOTES OF A MEETING HELD IN THE**

**WAIMAKARIRI DISTRICT COUNCIL, COMMITTEE ROOMS, RANGIORA**

**ON THURSDAY 19 NOVEMBER 2015 AT 10.10AM**

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**Purpose**

- To ensure that issues of interest to both parties are raised and discussed in a timely manner.
- To provide a decision-making forum for issues to be progressed and reported on.
- To ensure the development of an effective partnership between the Rūnanga and the Council.
- To promote better long-term community outcomes.

**Present**

- Clare Williams, Joan Burgman (Te Ngāi Tūāhuriri Rūnanga)
- Philippa Lynch (Mahaanui Kurataiao Ltd)
- Jim Palmer, Simon Markham, Louise Courtney (Waimakariri District Council)

**In Attendance**

- Kalley Simpson (3 Waters Manager, WDC), Trevor Ellis (Development Planning Manager, WDC), Ken Stevenson (Roading Manager, WDC), Christine Toner (Consultation Manager).

**Chair**

- Simon Markham

**Apologies**

- Mayor David Ayers

---

<table>
<thead>
<tr>
<th>Item</th>
<th>Notes/Action Points</th>
<th>Resp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The meeting opened with a karakia from Joan Burgman.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Actions from the previous meeting on 24 September 2015 and confirmation of meeting minutes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1. Silverstream Reserve proposed eel protection area</td>
<td></td>
<td></td>
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<tr>
<td>- Organise meeting time for MKT and DoC.</td>
<td>Claire/Bryan &amp; Dan Dan</td>
<td></td>
</tr>
<tr>
<td>- Dan needs to follow up with Bryan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2. Mahaanui Kurataiao Ltd Projects Update - Tukutuku Panels</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Tui needs to email Simon. Clare said that they will be delivered, restored and returned. Claire stated that funding needs to be confirmed. Tui’s understanding was that she was only assessing the panels and that once funding had been confirmed then work would commence.</td>
<td>Tui</td>
<td></td>
</tr>
<tr>
<td>- Tui has been informed that panels need to be returned.</td>
<td>Tui</td>
<td></td>
</tr>
<tr>
<td>- Joan advised there is only one that needs some work on.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.3. Wastewater Bylaw Review</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Kalley advised that hearings were held in March and the panel is reconvening this afternoon for deliberations. This communications plan is still to progress.</td>
<td>Janet Fraser</td>
<td></td>
</tr>
<tr>
<td>1.4. Flood works update</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simon to follow up that process includes subdivisions noted through MKT and process is working correctly of keeping MKT informed.</td>
<td>Simon M</td>
<td></td>
</tr>
<tr>
<td>Simon would follow up, including the Harris development.</td>
<td>Simon M</td>
<td></td>
</tr>
<tr>
<td>1.5. Planning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simon to write formally to the Runanga and record copy of all documents and where to find information.</td>
<td>Simon M</td>
<td></td>
</tr>
</tbody>
</table>
1.6. Recreation and Ecological Linkage Reserve Management Plan
Resolved that Green Space staff will continue to work with MKT when preparing the draft Recreation and Ecological Linkages Reserve Management Plan, and M Flanagan will be in contact with Bryan for his assistance.

Michelle/Bryan

1.7. Taranaki Stream Willows
There was discussion regarding producing a concept management plan for improvement and revitalisation of the area. A walkover would be organized with WDC, Bryan, HNZ (Heritage New Zealand), Greg Byrnes (Te Kōhaka Trust) and Te Marino Lenihan (Kaiapoi Pa Trustee). Kalley would coordinate the walkover and Bryan would coordinate involvement with Te Marino.

Kalley & Tania

1.8. Renaming of Maori Drain
Kalley Simpson explained the process would be to get feedback from the CRDAG also and then the names would be put to the Woodend-Ashley Community Board.

Kalley S

1.9. Ravenswood - potential purchaser and Runanga engagement
Bryan would facilitate this by contacting the potential purchaser through Paul White and would initially set up some ground rules for Runanga engagement.

Bryan

1.10. Road naming – Smith Street subdivision – Kaiapoi
Bryan advised he would contact Te Marino for more detail and communicate back to the Council.

Bryan

1.11. Private and Council Plan Changes
Trevor and Tania to get in touch to discuss work and priorities regarding plan changes and how that work will affect MKT resourcing.

Trevor and Tania/Philippa


1.12. Oxford Road water race
Kalley to discuss with MKT who will seek approval from Runanga.

Kalley

2. Roading

2.1. Kaiapoi Pa Road Upgrade
The Kaiapoi Pa Road proposal was outlined noting the connection from Pegasus from Tiritiri Moana Drive. Clare commented that it was common sense project referencing safety in regards to travel to and from local schools. Staff noted that intention to retain the rural nature of road. Comments were made about dangerous drivers on that road and it was hoped that sealing the road may mitigate that.

Clare queried widening of the road. Ken replied that the proposed plan was to widen the road to approximately six meters. Contractors would have to dig to a depth of approximately 300mm but no trenching would be required as no services would be installed.

Clare stated that a Cultural Impact Assessment (CIA) and an archaeological assessment would be required noting that an urupa and houhou pa (where pounamu was worked), highly sensitive sites, were adjacent to the intersection of Tiritiri Moana Drive and Kaiapoi Pa Road.

Discussion about work to seal road. The seal will be worked added to the current road and only the extended part of the road would require excavation work.

K Stevenson & C Toner
Query regarding controls at Waikuku Beach Road. This was likely to be a Give Way control with Ken commenting that sealing would likely require painting on the road which would highlight road controls.

Clare commented that during times of flooding, especially at Waikuku Beach, the road becomes a way out of the area. She added that the stormwater pipe at intersection of Tiririti Moana Drive and Kaiapoi Pa Road, had caused the road to be inaccessible during high rainfall period a few years previous and had meant that residents had to use the stopbank along the Ashley River.

Ken commented that staff would like to discourage residents using Preeces Road as a thoroughfare to the Highway, Main North Road, and sought feedback from Runanga about that could be achieved. It was suggested that keep the road unsealed may help discourage the road being used as a thoroughfare.

Philippa queried the timeframe of the project. Ken replied that the plan was to have the road constructed by winter 2016, adding that public bus routes change late 2016 or when the road is completed.

Due to the significance of the area, it was suggested that a detailed plan and proposal with key points and timeframes be prepared for presentation at the Runanga’s December meeting, 6 December 2015.

3. Planning

3.1. District Plan Changes and Review

Trevor tabled a memo which is outlined. (Trim. 151117153280)

Updated Philippa on the Council’s rolling review process and that there were plans to change that to a more intensive review beginning early 2016. He noted that a light review of approximately 25% of the District Plan had been carried out to date but it would be intensified in 2016 and acknowledged the importance of engagement with Runanga in the process.

Simon outlined the advantages of accelerating the review process giving insight to broader implications of plan at a ‘bigger picture’ level, adding that the Iwi Management Plan needed to be weaved into the strategic plan.

Private Plan Changes

PPC26 - If no appeals, then will be included in plan 2016.

PPC28 – current issues related to flooding.

4. Drainage

4.1. Kaiapoi Pa Works

Tabled update, see attachment i.

Commented on difficulty in getting in touch with Pa trustees. Clare stated that Te Marino was the only one that is contactable.

- Clare will pass on Te Marino’s contact details to Kalley.
### 4.2. Ward Park

Physical works started with plans to be completed by Christmas 2015. Commented on regular updates to MKT.

- Arrange for updates to be forward to MKT on a regular basis.
- Approval for planting by MKT. Kalley to contact MKT to action.

Kalley

### 4.3. Flood Works

See attachment i.

### 4.4. Oxford Road water race

Report going to Utilities and Roading Committee to seek approval to close R3Q, north of Oxford Road, and R3N1, south of Oxford Road, (see page 4 attachment i) in December.

Kalley commented that R3Q is dry as residents do not use it but R3N1 is still flowing. The key issue is that the water race flows into the North Brook. The positive is that it provides base flow into the North Brook but the negative is that it brings agriculture run off into the brook. Staff have identified that an open water race is no longer appropriate in an urban environment.

It was confirmed that there was no need to go through MKT for closing these water races.

### 5. Wastewater

Kalley

#### 5.1. Rangiora WWTP Inlet Works

Noted that it does not extend to the silent file area and a number of consents are required.

#### 5.2. Wastewater Discharge Consents

Clarification was sought regarding discharge to air and discharge to land.

Kalley reference a consent in Oxford, where the discharge to air was in relation to odour not being offensive. Another consent in Oxford, in relation to discharge to land, where effluent was treated then pumped to Eyre River where it was used irrigate to farmland.

Clare questioned whether the consents should be brought to the attention of the Canterbury Water Zone Committee. Kalley stated that Council is treated the same as any other Resource Consent applicant. Clare queried whether Council had a nutrient budget for the discharge to land consent. Kalley responded that effluent discharge has less nutrient loading than agriculture discharge, adding that stricter conditions, specific to effluent discharge, were required of the Council’s consent adding that staff were happy to provide their resource consent conditions if requested.

Kalley noted that Council had 17 resource consents, with 205 compliance conditions. He outlined the five conditions of non-compliance and the action staff were undertaking in relation to the non-compliance. Philippa, in relation to the Eastern Districts Ocean Outfall, queried whether samples taken from the plant. Kalley stated that samples are taken out of the plant and at the outfall for comparison. Investigations are being carried out to determine why high levels being found at outfall.

Kalley commented that the Fernside WWTP was small and problematic but staff were investigating a cost effective solution.

Commented on new requirements under the Local Government Act regarding reporting on abatements etc.
6. Water

6.1. Old North Road Water Connection
Noted that all sorted.

7. General

7.1. Earthquake recovery work
Outlined Dudley Drain Regeneration with proposed work to carry out planting and reinstate natural environment.

7.2. Development activity
Ravenswood consent, ongoing discussion. Joan commented that Runanga are supportive of naturalisation of Taranaki Stream.

8. Maahanui Kurataiao Ltd

8.1. Projects Update
District Plan Review and Wastewater Consent updates for the next meeting.

9. General Business

9.1. Meetings for 2016
Supportive of dates proposed including date proposed for annual Hui.

9.2. Petition for bus service through Tuahiwi
Joan stated that a petition was being circulated for the public bus service to go through Tuahiwi and would like support from Council.

Simon commented on increased need for second tier service for more localised service within the district.

9.3. Morris Dancers to visit marae
An international Morris dance group would like to visit the marae in early 2016. Clarified that it should be referred to the marae office to progress.

9.4. Red Zone Future Use
Simon updated work with the FURZ steering group, stating that there would be a more detailed update for the December meeting.

Commented on positive response from Council and CERA staff regarding a cultural workshop carried out by the Education Committee at the marae.

9.5. Iwi Management Plan
Discussion about training in relation to the district plan and how the IMP can be incorporated. Council are supportive of a training session but need to investigate timing; it would not likely occur before Christmas 2015.
9.6. **MR873**

Simon stated that the plan change is operative. Sought clarification regarding next steps. Clare commented that residents were not sure what the change meant and requests have come to Council for information sessions regarding rules and regulations and how they impact residents.

Joan suggested that a document be created outlining how the change affects people. Simon also suggested an FAQ sheet specific for MR873.

The meeting ended at 11.40pm with karakia by Clare Williams.
PRESENT: Joe Boulton, Brian Judson, Greg Bennett (WDC), Jamie Hamilton (WIL), Owen Davies (WDC), Clr. Sandra Stewart, Margaret Spencer-Bower, Keith Vallance, Denise Clark (Minute Secretary)

1. APOLOGIES

An apology was received from Les Inch, Tim Stokes, Greg Bennett. Change in committee members this term sees the resignation of Joe Boulton and our new Councillor on board is Sandra Stewart.

MOVED: Keith Vallance / Joe Boulton
That the apologies be received. Carried

2. CONFIRMATION OF MINUTES

That the Waimakariri Water Race Advisory Group

- Confirms as a true and correct record the minutes of the meeting held of the Waimakariri Water Race Advisory Group on Thursday 21 July 2016 with the exception of the following amendment.

Amendment:
- A correction was made to the previous minutes as follows:
  - It was noted that the date was incorrect on the previous minutes and read 22 July 2017 instead of 21 July 2016.

MOVED: Brian Judson / Joe Boulton
Carried

3. VOTE FOR A NEW CHAIRPERSON

A nomination has been put forward for Tim Stokes however as he is absent from this meeting Owen will contact Tim and ask for his acceptance. Owen will confirm with members at next meeting.

4. MATTERS ARISING

- An anomaly of $21,000 in the financial statement was noted, Greg said utilities pay rates which is set on the valuation of assets in Road Corridors. Council collects the rates. Irrigation rates were exempt until last year which hasn’t been budgeted for the last financial year. A lump sum transfer was done in June. Irrigation NZ have gone to the Valuation General to protest this.
  - Greg will check with Finance to see if the rates will come back into this Water Race account rather than the General account as Greg was told previously.
  - Owen has not caught up with finance but noted that the new figure has risen to $28,995.

5. WAIMAKARIRI IRRIGATION LTD REPORT

- WIL Report was presented by Jamie Hamilton:
  - It has been a favourable season with rivers being full due to the amount of rainfall.
  - Last month we were on water restrictions however there has not been a lot of demand for water at the moment with the amount of rain we are now experiencing.
o Winter works programme – identified some areas to start this winter.
o WIL have developed environmental management as part of their business now. Looking at farm practices, soil types, better ways to manage applications.
o Paul Reece is the Environmental Manager at WIL.
o West Eyreton area work has been completed.
o Intake structure – ladder works completed. A winch was put in to help with opening the very heavy lid, however it was stolen. New cameras have been installed.
o There was a break in attempt at the yard last week but they were unsuccessful.
o Owen said it might be worth having a site visit to the intake if anyone was interested in looking at the structure. Let Owen know if you are interested.
o Due to new health and safety regulations, MWH engineers have been looking at the rock structures at the intake. Over time alternative track access may be required.
o Ongoing maintenance issues through Cust races.
o Margaret enquired about flooding on Two Chain Road. Jamie said the landowner doesn’t always maintain the race at this particular point and the drain is sloped uphill in this particular area so causes flooding. This issue has now been resolved.

6. FINANCIAL REPORT
A Financial Report to February 2017 was tabled:
o Margaret asked what are the external recoveries? Owen will find out for next meeting.
o To date the budget is looking good we have spent 70% of the budget so far this financial year.

7. GENERAL BUSINESS
o Proposal to close two races.
o 1. Race R3N-1 Oxford Road race closure at the top of the North Brook.
o Most people are in favour of closing this race.
o There is not a constant flow down here and it is not spring water.
o Margaret queried if some people want to keep it open, then do we need to keep it open? Owen said as there are more people who want to close it, then we would recommend closing the Race.
o WDC is asking this group to provide feedback to go to Council.
o Margaret would support closing the race as the race now runs through mainly residential properties.
o Is it wise to fill the drain in? Owen said we would write to everyone affected and tell them if they want to fill the drain in when closed, then they must talk to Council first.

o 2. Proposed Closure of Stock Water Race R1-A
o Margaret has a vested interest in this particular closure as the race runs through her property.
o All users of this Water Race have given consent to close the race.
o Margaret said she hasn’t had any water come through Ngai Tahu property for at least 6 months.
o Joe said we need to be very careful we don’t end up with a system that isn’t viable if we start closing races when people request it.
o Keith said if it’s not being used, it may as well be closed.
o Joe wants to wait for the other two absentee members to be present before a conclusion is reached. Owen has sought to contact absentee committee members as requested during the meeting. No further objection was raised from Tim Stokes.
o Silverstream has been identified as an area with pollutants in the catchment. WIL is working with Ecian at the moment to look at ways to flush this out. The closure of this race could mean the water could potentially be used to flush out the Silverstream.
o The ratepayers who will lose the use of the race will stop paying a stockwater rate. Owen said the closure of the race would not affect anyone else’s rates.
o Margaret said she would like to have the races remain in place even when/if closed to help in the event of a flood in the future.
Keith Vallance mentioned Lily Road has had some people drive through the water race and have caused a huge mess.

8. MEETING DATES

- Next Meeting Thursday 20th July at the Oxford Town Hall. The final meeting for this year is proposed for 2nd November.
- Please keep Thursday 18th May free for the Annual Drainage Groups get together in the Rangiora Council Chambers.

*There being no further Business, the meeting was declared closed at 9.00 pm*
Archaeological Assessment for
Part of Oxford Road Water Race, Rangiora

Michael Trotter
18 April 2017

Executive Summary

Although the exact date of construction for a section of water race alongside Oxford Road west of Rangiora is not known it is likely to have been between 1898 and 1900.

It is recommended that an Authority be obtained from Heritage New Zealand before any works affecting this race are undertaken.
Introduction

The Waimakariri District Council is considering closing a section of an old water race that runs along the southern side of Oxford Road between Lehmans Road and the North Brook on the western side of Rangiora, and has requested this archaeological assessment. The race, which is referred to as R3N-1 by the Waimakariri District Council (2012), is part of a network that was constructed to provide water for irrigation and livestock.

The general area can be seen in the above topographical map and in more detail on the larger scale aerial map below where the race is coloured dark blue.
**Statutory Requirements**

There are two main pieces of New Zealand legislation that control work affecting archaeological sites. These are the *Heritage New Zealand Pouhere Taonga Act 2014* and the *Resource Management Act 1991*.

The *Heritage New Zealand Pouhere Taonga Act* is administered by Heritage New Zealand and there is a consent (authority) process for any work affecting archaeological sites. For the purpose of the Act an archaeological site is defined as any place in New Zealand, including any building or structure (or part of a building or structure), that—

1. was associated with human activity that occurred before 1900 or is the site of the wreck of any vessel where the wreck occurred before 1900; and
2. provides or may provide, through investigation by archaeological methods, evidence relating to the history of New Zealand, or
3. has been declared an archaeological site under the Heritage New Zealand Pouhere Taonga Act by Heritage New Zealand.

Anyone who intends to carry out work that may modify or destroy an archaeological site must first obtain an Archaeological Authority from Heritage New Zealand. The process applies to sites on land of all tenure including public, private and designated land, and the Heritage New Zealand Pouhere Taonga Act defines penalties for unauthorised site damage or destruction.

The Archaeological Authority process applies to all archaeological sites that fit the Heritage New Zealand Pouhere Taonga Act definition, regardless of whether:

- the site is recorded in the Site Recording Scheme of the New Zealand Archaeological Association or has been included in the New Zealand Heritage List by Heritage New Zealand,
- the site only becomes known about as a result of ground disturbance, and/or
- the activity is permitted under a district or regional plan, or a resource or building consent has been granted.

Heritage New Zealand maintains the New Zealand Heritage List of Historic Places, Historic Areas, Wāhi Tūpuna, Wāhi Tapu and Wāhi Tapu Areas, and can include archaeological sites. The purpose of the List is to inform members of the public about such places and to assist with their protection under the Resource Management Act (below).

The *Resource Management Act* requires City, District and Regional Councils to manage the use, development, and protection of natural and physical resources in a way that provides for the well-being of today’s communities while safeguarding the options of future generations. The protection of historic heritage from inappropriate subdivision, use, or development is identified as a matter of national importance.

Historic heritage is defined as those natural and physical resources that contribute to an understanding and appreciation of New Zealand’s history and cultures, derived from archaeological, architectural, cultural, historic, scientific, or technological qualities.

- Historic heritage includes:
  - historic sites, structures, places, and areas,
  - archaeological sites,
  - sites of Maori significance, including wāhi tapu,
  - surroundings associated with natural and physical resources.

The above categories are not mutually exclusive and some archaeological sites may include above-ground structures or may also be places that are of significance to Maori communities. Where resource consent is required for any activity, the assessment of effects is required to address cultural and historic heritage matters.
Assessment Methods

This assessment is based on an inspection of the water race on 10 April 2017, information supplied by the Waimakariri District Council, a study of relevant newspaper items available through Papers Past (National Library 2017), consultation with Bernard Kingsbury of the Cust Museum, and checking historical information available from various publications.

Physical Environment

The water race under consideration was constructed on flat alluvial farm land between the Ashley and Waimakariri Rivers.

Since then much of the land has been subdivided into urban and semi-rural properties of varying sizes, and any livestock or pasture requirements can be met by other means.

The race currently discharges into the high reaches of the North Brook stream, augmenting its natural spring-fed flow.

The Water Race Alongside Oxford Road

The section of water race along the southern side Oxford Road on the western side of Rangiora is part of an extensive network of races throughout the greater part of lowland North Canterbury between the Ashley and Waimakariri Rivers. The above map shows a portion of this network west of Rangiora, with the section being considered for closure marked by a purple arrow pointing to each end – blue indicates that the race is maintained by the landowner. The map, taken from one covering a much larger area (Waimakariri District Council 2012) shows only those races still in operation in 2012, by which time a number had been closed (e.g. Trotter 2013, 2014).

The construction of this network of races, which has been developed to supply water for irrigation and stock drinking purposes, dates back to the early 1890s (Trotter 2007), and a useful account of their early history has been provided by Allison (1999).

The date that the section along Oxford Road was constructed is unclear – it has not been definitely identified in historic newspaper items referring to the races (National Library 2017) and does not show on a map dated 1898 (Williams 1898, reproduced on the following page). It seems likely, however, that it was formed shortly after the larger races were constructed at or about that time in order to complete the network in this area.
Legal titles of the properties through which the section of race along Oxford Road passes are Part RS 1275, Part RS 936, Part RS 909, Part RS 903, Lot 275 DP 426010, Lot 93 DP 426010, Lot 94 DP 437360, Lot 1 DP 19236, Lot 2 DP 19236, Lot 507 DP 437360, Lot 78 DP 437360, and Lot 1 DP 356107.

The condition of the race varies considerably from property to property, in some cases it is reasonably well maintained, but in others not recently maintained at all, in some urban properties it is piped underground, or in one case edged with galvanised sheet iron to form a very narrow channel at ground level. Some examples of the condition of the race are shown in the following photographs.
Water race opposite Brick Kiln Road, looking eastwards.

Water race at number 45 Oxford Road, looking westwards.
Water race at number 43 Oxford Road, looking eastwards.

The diagram below shows a typical cross section in a well-maintained part of the water race on an urban property. Further to the west on rural land near Lehmans Road the exact dimensions are obscured by vegetation but there is a distinct low mound of material taken from the trench lying on the southern side (opposite the road) – this can be seen lying to the left of the race, where it is covered with long grass, in the lower photograph on page 5.

Typical cross section in a well-maintained part of the water race.

There are no previously recorded archaeological sites in the vicinity of the water race, the nearest being a historic brick well in Rangiora some 1190 metres away from the North Brook end. For the purposes of applying for an Authority if the proposed closure goes ahead, this section of race has now been recorded as site M35/1846.
Archaeological Values

The following table summarises the archaeological values of the recorded section of the water race.

<table>
<thead>
<tr>
<th>Site</th>
<th>Value</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>M35/1846</td>
<td>Condition</td>
<td>Due to periodic maintenance involving the removal of vegetation and mud build-up, the original dimensions of the water race have inevitably been modified. In recent years it has been piped underground in places, both beneath driveways and across properties. The water flow varies and little used.</td>
</tr>
<tr>
<td></td>
<td>Rarity/ uniqueness</td>
<td>Common.</td>
</tr>
<tr>
<td></td>
<td>Contextual value</td>
<td>Low contextual value in itself but is part of an extensive network of water races in North Canterbury.</td>
</tr>
<tr>
<td></td>
<td>Information potential</td>
<td>Virtually nil due to disturbance and modifications.</td>
</tr>
<tr>
<td></td>
<td>Amenity value</td>
<td>Low.</td>
</tr>
<tr>
<td></td>
<td>Cultural associations</td>
<td>European era farming.</td>
</tr>
</tbody>
</table>

Iwi Values

Traditional Maori histories of the general Canterbury region have been collected and published by writers such as Mackay (1873), Stack (1893), Carrington (1934), Beattie (1945), and Taylor (1950). A summary has been included in the local history by Hawkins (1957: 1–8). All of these are European interpretations of the Maori written or verbal sources.

General notes on Maori values in the Canterbury region are given in Te Whakatau Kaupapa (Tau et al 1990) and in more detail in the Mahaanui Iwi Management Plan (Jolly 2013).

The local Tuahiwi Rūnanga (Ngāi Tuāhuriri) has been made aware of the proposed race closure and concerns about reducing the flows in the upper portion of the North Brook have been weighed against the benefit of removing rural contaminants. The stopping of the discharge could result in improved health outcomes associated with mahinga kai collected downstream by the removal of such contaminants. Conversely, lower flows would potentially increase water temperatures and impact on the health of some mahinga kai species. There is also a concern with the “mixing” of waters from different catchments or waterway systems which would be addressed by closing race R3N-1. On balance, the Rūnanga do not have any concerns with the proposed closure of the water race. (Fraser 2017.)

Effects of the Proposed Closure

The immediate effect of closing the water race will be that it is blocked off at the Lehmans Road end and water will cease to flow.

At this stage it is not intended to fill in the whole length of the race from Lehmans Road to the North Brook, and it is possible that parts of the race will be left open to act as a drain for surface water in the area. The preferences of individual landowners through which the race runs will be taken into consideration.
Recommendation

Although the exact date of the construction of the water race along the southern side of Oxford Road between Lehmans Road and the North Brook is not known, it is likely to have been before 1900.

In order to comply with the requirements of the Heritage New Zealand Act 2014 it is therefore recommended that an Authority should be obtained from Heritage New Zealand before any earthworks that might affect the race are undertaken.

Application Form A for this Authority and a guide to its completion can be downloaded from the Heritage New Zealand website at http://www.heritage.org.nz/protecting-heritage/archaeology/archaeological-authorities and when completed it should be submitted to Heritage New Zealand along with relevant documents, including a copy of this assessment, any detailed plans, and comment on the proposed works from the Tuahiwi rūnanga. It is important that the associated Form E is completed and accompanies the application, as considerable delay can result if this is not done at the outset.

Contractors involved in any work that could affect the structure of the race should be briefed as to what archaeological evidence might be found in the ground and their responsibilities under the Heritage New Zealand Act 2014.

It is also recommended that any excavations affecting the race should be monitored by an archaeologist approved by Heritage New Zealand. Any archaeological evidence present should be investigated in accordance with current archaeological practice.

The Tuahiwi rūnanga may wish to have a cultural monitor present while excavations are being made.

Allowance should be made for the costs of monitoring, recording, field investigation, laboratory analyses if appropriate, and reporting to Heritage New Zealand as required by the Authority.

Acknowledgements

Bernard Kingsbury of the Cust Museum provided invaluable assistance. Effective use was made of the very useful on-line resources provided by Environment Canterbury on its Canterbury Maps website.
References and Reports


BEATTIE, Herries, 1945. *Maori Place-names of Canterbury.* Published by the author. [A second edition with index was also published by Cadsonbury Publications, Christchurch, in 1995.]

CANTERBURY MAPS, 2017. https://mapviewer.canterburymaps.govt.nz/?webmap =9ac1f8370dfe4a44808bec8f8b1dccb24

CARRINGTON, Arthur Hugh, 1934. *Ngaitahu. The story of the invasion of the South Island of New Zealand.* MS-0470 in the Alexander Turnbull Library, Wellington. [There are also at least three different typescript versions of this, with altered pagination and textual differences.]


TROTTER, Michael, 2014. *Archaeological Assessment for the Browns Road Quarry and Irrigation Project.* Report for Christchurch Ready Mix Concrete Limited and the New Zealand Historic Places Trust. [Historic water race along Bowers Road near Browns Road.]


WILLIAMS, George Phipps, 1898. [Plan of] *South Fernside Races.* Waimakariri-Ashley Water-supply Board. [Held at the Museum of the Cust and Districts Historical Records Society.]

Appendix

The following is a copy of the Site Record Form for M35/1846 as required by Heritage New Zealand:
NZAA Site Record
Number: M35/1846

SITE TYPE: Water Race
SITE NAME: Oxford Road
RECORD DATE: 13 April 2017

SITE COORDINATES (NZTM): Easting: 1565203 Northing: 5205043

Source of location data: Hand held GPS unit
Field visit date: 10 April 2017
Visited by: Michael Trotter

Finding aids to the location of the site:
Along the southern side of Oxford Road between Lehmans Road and the North Cote Stream, Rangiora.

Site description:
The site is an 820 metre length of water race that was constructed some time shortly after 1898 as part of a network in North Canterbury for the purpose of supplying water for irrigation and livestock drinking. It is referred to by the Waimakariri District Council as race R3N-1.

The above diagram below shows a typical cross section in a well-maintained part of the water race on an urban property. Further to the west on rural land near Lehmans Road the exact dimensions are obscured by vegetation but there is a distinct low mound of material taken from the trench lying on the southern side of the race.

List of visible archaeological features:
The race is mostly visible alongside the road though it is piped underground beneath driveway entrances and across some urban properties.

Condition of site:
Much disturbed by routine clearing of vegetation and mud build-up and by other activities. In places it has been piped underground or otherwise modified.

Associated sites:

Record submitted by:
Michael Trotter, Tuahiwi, North Canterbury.
Location of the section of water race (coloured blue) between Lehmans Road and the North Brook along Oxford Road, Rangiora.

The water race at number 45 Oxford Road, looking westwards.
1. SUMMARY

1.1 The purpose of this report is to update the Utilities & Roading Committee on the status of the drainage service requests received during and following the 20 February 2018 storm event.

2. RECOMMENDATION

THAT the Utilities & Roading Committee:

(a) Receives report No. 180608063509.

(b) Notes that of the 38 drainage assessments identified from the 208 service requests, 6 have been completed, 7 are currently underway and 8 have been scoped but not commenced.

(c) Circulates this report to the Council for information.

3. BACKGROUND

1.2 A report on the 20 February 2018 storm event was presented to Council on the 3 April 2018 (refer TRIM: 180322031170[v03]). The purpose of this report was to inform the Council of the affect the 20 February 2018 storm event had on the 3 Waters infrastructure in the District and to seek approval of new budget to undertake works at Springbrook and Southbrook / South Belt in Rangiora.

1.3 The report noted the following in Section 3.7:

“There were a total of 208 drainage related service requests over the week of the 20 February 2018 storm event. All of these service requests have been acknowledged. However, there are still a number of these that need an engineering assessment in order to reply with advice or a proposal to resolve the particular issue.”

1.4 As part of the meeting Council requested that staff report back on the status of the drainage service requests and included the following recommendation:
(i) Notes further investigation into areas like Kingsbury Avenue and Golding Avenue and other flooding service request matters will be reported back on.

1.5 This report provides an update on the status of the 208 drainage services requests referred to in the previous report.

4. ISSUES AND OPTIONS

4.1. The 208 service requests have been classified into one of the following categories:

- **Maintenance Undertaken** (93) – This relates to either clearing a blockage or maintaining a drain. This main have been undertaken on the day (e.g., typically clearing of blocked sumps) or over the following weeks (e.g., programmed drain maintenance).

- **Maintenance Proposed** (5) – This relates to works where more substantial maintenance works is required (e.g., cleaning of Dudley Drain), which will require more planning.

- **Signs Erected** (4) – This relates to requests where the only works requested or undertaken was to erect flooding signs.

- **Advice Provided** (36) – This relates to either advice being provided on a private drainage issue or the status of our system (e.g., confirming that Council pumps are operating).

- **Drainage Assessment** (38) – This relates service requests where further investigation and assessment is required to determine if there is an underlying issue with the drainage system. These areas are discussed further below.

- **Roading Investigation** (8) – This relates service requests where water is running off the road onto private property or roading infrastructure may not be operating adequately (e.g., soak pits).

- **Upgrade Proposed** (24) – This relates to flooding in areas where upgrades are proposed to address the issue. These areas are discussed further below.

4.2. It is noted that there are currently 10 service requests that have not been closed off, but all service requests have been responded to or acknowledged.

**Drainage Assessments**

4.3. The following sites have been identified for further drainage assessments. This works is being undertaken by a combination of engineers from the PDU team and also engineers from Beca.

<table>
<thead>
<tr>
<th>Location</th>
<th>Assessment</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>James Drive, Woodend</td>
<td>CCTV inspection</td>
<td>Complete</td>
</tr>
<tr>
<td>Island Road / Cosgrove Road, Kaiapoi</td>
<td>CCTV inspection</td>
<td>To commence</td>
</tr>
<tr>
<td>Ohoka Road, Kaiapoi</td>
<td>CCTV inspection</td>
<td>Complete</td>
</tr>
<tr>
<td>Hilton Street, Kaiapoi</td>
<td>CCTV inspection</td>
<td>Complete</td>
</tr>
<tr>
<td>Bracebridge Street, Kaiapoi</td>
<td>CCTV inspection</td>
<td>To commence</td>
</tr>
<tr>
<td>Gray Crescent, Kaiapoi</td>
<td>Drainage system investigation</td>
<td>Underway</td>
</tr>
<tr>
<td>Murray Place, Kaiapoi</td>
<td>CCTV inspection</td>
<td>To commence</td>
</tr>
<tr>
<td>Location</td>
<td>Description</td>
<td>Status</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>--------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Cridland Street West, Kaiapoi</td>
<td>Drainage system investigation</td>
<td>Underway</td>
</tr>
<tr>
<td>Railway Road, Rangiora</td>
<td>CCTV inspection</td>
<td>To commence</td>
</tr>
<tr>
<td>Golding Avenue / Kingbury Avenue, Rangiora</td>
<td>CCTV inspection &amp; further assessment (refer below)</td>
<td>Underway</td>
</tr>
<tr>
<td>Seddon Street / Kinley Street, Rangiora</td>
<td>Investigation to look at solutions.</td>
<td>Underway</td>
</tr>
<tr>
<td>Oxford Road, Rangiora</td>
<td>Soak pit investigation</td>
<td>Complete</td>
</tr>
<tr>
<td>Carmana Gardens, Rangiora</td>
<td>CCTV inspection</td>
<td>Complete</td>
</tr>
<tr>
<td>Douglas Street, Rangiora</td>
<td>CCTV inspection</td>
<td>To commence</td>
</tr>
<tr>
<td>Belmont Avenue, Rangiora</td>
<td>Soak pit and secondary flow investigation.</td>
<td>To commence</td>
</tr>
<tr>
<td>Acacia Avenue, Rangiora</td>
<td>Drainage system investigation</td>
<td>Complete</td>
</tr>
<tr>
<td>Coates Street / Bush Street, Rangiora</td>
<td>CCTV inspection</td>
<td>To commence</td>
</tr>
<tr>
<td>White Street, Rangiora</td>
<td>Onsite drainage connectivity study</td>
<td>Underway</td>
</tr>
<tr>
<td>Pegasus (3 locations)</td>
<td>Swale infiltration check</td>
<td>To commence</td>
</tr>
<tr>
<td>Waikuku Beach</td>
<td>Area wide investigation</td>
<td>Underway</td>
</tr>
<tr>
<td>The Pines Beach</td>
<td>Area wide investigation</td>
<td>Underway</td>
</tr>
</tbody>
</table>

4.4. The work undertaken to date in the Golding Street / Kingsbury Avenue area has not identified any faults with the existing system. The CCTV inspection undertaken did not show and blockages or defects in the pipeline. Further work is planned to be undertaken to check; the pipework configuration at the discharge point into the North Drain on Ashley Street, the capacity of the system (note that the pipe under Ashley Street was previously identified as a potential constriction, refer TRIM 100803027322), and the blockage risk of structures on the North Drain. The North Drain downstream of Ashley Street will also be re-inspected to confirm that no maintenance is required. It is also noted that checks of sumps at the Golding Street / Kingsbury Avenue intersection will be undertaken before and during rainfall events to ensure there is no debris accumulating (e.g.: leaves) that could block the sumps.

**Upgrades Proposed**

4.5. The following existing or recently proposed upgrading projects are proposed to address some of the flooding identified:

- Feldwick Drain Catchment Improvements (2020/21) – Improve drainage in Beach Road / Williams Street area.
- Johns Road, Rangiora (2020/21 & 2022/23) – Improve drainage Church Street / Palmer Street area.
- King Street, Rangiora (2018/19) – Improve drainage outside police station.
- Springbrook development, Rangiora (2017/18) – Immediate works complete and further works currently being designed.
- South Belt / Southbrook Road intersection (2017/18) – Works to improve sump inlet capacity to commence shortly.
- Oxford Road, Rangiora (2018/19) – Water race closure.
- North Brook – Janelle to White, Rangiora (2018/19) – Upgrade of North Brook capacity.
• Roscrea Place / McHughs Road, Mandeville (2018/19) – Capacity upgrade.
• Siena Place / Silano Place, Mandeville (2018/19) – Drainage improvements.
• Main Street, Oxford (2018/19) – Installation of new pipework.
• Tui Street / Weka Street, Oxford (2017/18) – Installation of new soak pits.

4.6. The first stage of the proposed works at Springbrook (i.e.: the immediate works), has been completed. This has provided the 50 year level of protection to all houses in the development. The second stage which comprises of further works to achieve the 200 year level of protection is currently being designed. These works will not be undertaken until earlier in the next financial year.

4.7. The proposed works at the South Belt / Southbrook Road intersection have been designed, tendered and the contract awarded. These works are programmed to commence in mid June and be completed by the end of the financial year.

4.8. The works to install new soak pits at Tui Street / Weka Street in Oxford will be undertaken in June 2018 and be completed by the end of the financial year.

5. COMMUNITY VIEWS

5.1. Groups and Organisations

5.2. The Springbrook residents have been regularly kept up to date with progress on works to respond to flooding in this development.

5.3. Regular updates are also being sent out to landowners on Waikuku Beach Road, relating to this specific issue.

5.4. Drainage staff have met with residents to discuss the wider Waikuku Beach issues and also have met with the Pines Kairaki Beach Association to discuss issues at this location. It has been agreed to send out regular updates to the Pines Kairaki Beach Association on progress with works in this area.

5.5. It is also proposed to meet with the Oxford Ohoka Community Board and the Mandeville Residents Association to discuss the proposed drainage works in the Mandeville area.

5.6. Wider Community

5.7. The wider community was consulted as part of the Long Term Plan on whether we are doing enough to manage flooding. Most submitters either responded that we were doing enough or were neutral, however 22% of submitters thought we could be doing more.

6. IMPLICATIONS AND RISKS

6.1. Financial Implications

3.1 The maintenance work and engineering assessments has been undertaken from existing budgets.

3.2 The proposed upgrades have either already been budgeted or additional budget has been requested from Council.

3.3 It is noted that further upgrades recommended from the engineering assessment works may require further budget to be approved by Council.
6.2. Community Implications

6.3. The works undertaken in response to the 20 February 2018 event will improve the overall performance of the drainage system in the district for the wider community.

6.4. Risk Management

6.5. There remains a residual risk of flooding as the groundwater levels in the district remain high and the catchments are saturated.

6.6. Health and Safety

6.7. Safety in Design will be formally considered and documented as part of the detailed design stage.

7. CONTEXT

7.1. Policy

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

7.3. Legislation

7.4. Local Government Act 2002 relates to the provision of infrastructure services.

7.5. Community Outcomes

- There are wide ranging opportunities for people to contribute to the decision making that effects our District
- There is a safe environment for all
- There is a healthy and sustainable environment for all
- Core utility services are provided in a timely and sustainable manner

7.6. Delegations

7.7. The Utilities & Roading Committee is responsible for the drainage functions of the Council.
WAIMAKARIRI DISTRICT COUNCIL

REPORT FOR DECISION

FILE NO and TRIM NO: EXC-05-04 / 180606062155[v2]

REPORT TO: Utilities & Roading Committee

DATE OF MEETING: 19 June 2018

FROM: Kalley Simpson, 3 Waters Manager
       Gary Stevenson, Acting Development Manager

SUBJECT: Engineering Code of Practice – New Stormwater and Water Supply Drawings

1. SUMMARY

1.1 The purpose of this report is to request that the Utilities & Roading Committee adopt new and revised stormwater and water supply standard drawings developed for the Engineering Code of Practice (ECOP).

Attachments:

i. New / revised drawings:
   - Plan 600 Sheet 251 Issue B, Onsite Stormwater Tanks.
   - Plan 600 Sheet 252 Issue A, Onsite Detention Swale / Pond.
   - Plan 600 Sheet 330B Issue B, Rural Soak Pit.
   - Plan 600 Sheet 403 Issue A, Private Water Tank (Restricted Scheme).


2. RECOMMENDATION

THAT the Utilities & Roading Committee:

(a) Receives report No. 180606062155[v2].

(b) Adopts the following new ECOP drawings for onsite stormwater attenuation:
   - Plan 600 Sheet 251 Issue B, Onsite Stormwater Tanks.
   - Plan 600 Sheet 252 Issue A, Onsite Detention Swale / Pond.

(c) Adopts the following revised ECOP drawings for onsite stormwater soakage:
   - Plan 600 Sheet 330B Issue B, Rural Soak Pit.

(d) Adopts the following new ECOP drawings for onsite water supply tanks:
   - Plan 600 Sheet 403 Issue A, Private Water Tank (Restricted Scheme).
Notes that the Engineering Code of Practice is currently due for a full review, but specific updates are being undertaken on a case by case basis.

3. BACKGROUND

3.1 The 3 Waters team and Subdivision team has been working with the Building Unit regarding improving the clarity of requirements for both onsite stormwater disposal and water supply tanks.

3.2 As part of this work the Guide for the Onsite Disposal of Stormwater in the Waimakariri District has been reviewed. This guide, which was last updated in 2010, is used for internal reference by the Building Unit as an initial screening tool to determine the appropriateness of stormwater disposal methods proposed by Building Consent applicants.

3.3 There have been a number of areas where additional clarity is required in this guide, particularly with regard to the sizing of soak pits and requirements for stormwater onsite attenuation in areas of low soakage. This has necessitated the revision of existing and development of new drawings for inclusion in the Engineering Code of Practice (ECOP).

3.4 In addition, there has been a need to develop a standard drawing for onsite water supply tanks, to ensure that it is clear that an air gap is provided to provide backflow prevention and also to set out minimum requirements for onsite water supply tanks that are installed by property owners.

4. ISSUES AND OPTIONS

Stormwater Drawings

4.1. Two new stormwater drawings have been developed to set out minimum requirements for onsite attenuation of stormwater in areas of low soakage.

4.2. Either an onsite stormwater holding tank designed in accordance with standard drawing 251 or a detention swale/pond designed in accordance with standard drawing 252 is required to achieve stormwater neutrality as required by the ECOP.

4.3. The onsite stormwater tank drawing includes a dual purpose tank which can be used for both stormwater detention storage and also reuse storage for non-potable use (e.g., garden irrigation). Note there was an earlier version of this drawing (Issue A), which was circulated for use but never formally adopted. This earlier version did not include the dual purpose tank for stormwater reuse. This has been added to the latest version of the drawing based on feedback from applicants wanting to harvest rainwater for reuse.

4.4. Two existing drawings have been revised to clarify the requirements for soak pits. Standard drawing 330A (previously Soak Pit with Overflow) has been revised to set out the performance requirements for urban soak pits. This sets out that an overflow is required in all urban installations, which is a new requirement. It also includes different installations for when a sump is required.

4.5. Standard drawing 330B (previously titled Soak Pit without Overflow) has been revised to set out performance requirements for rural soak pits. An overflow is only required in rural areas where there is no flow path away from the building to the natural drainage point or roadside drain.

4.6. Both soak pit drawings set out standard requirements for sizing soak pits or alternatively allow the applicant to provide full design calculations in accordance with Building Code Verification Method E1/VM1 Section 9.
4.7. The new and revised drawings are intended to clarify and simplify the requirements for onsite stormwater disposal and will be part of the Guide to the Onsite Disposal of Stormwater in the Waimakariri District.

**Water Supply Drawing**

4.8. A new drawing has been developed to set out the requirements for onsite water supply tanks.

4.9. The drawing sets out the requirement for an air gap as required by the Backflow Prevention Policy and a sealed access lid and vermin proof overflow to ensure the risk of contamination is minimised. The drawing also shows how an emergency reserve for fire fighting purposes can be provided.

4.10. This drawing also provides the standard minimum requirements for onsite water supply tanks. If a developer or private property owner wants to install a tank to different standards, for example partially for fully submerged below ground level, then specific approval will be required by the Water Supply Asset Manager.

**ECOP Update**

4.11. The ECOP has not been fully updated since 2010 and is currently overdue for a full review.

4.12. A review is required to incorporate the following main changes in design requirements:

- Alignment with the new Christchurch City Council Infrastructure Design Standard (IDS) – note that the Waimakariri ECOP is heavily based on the CCC IDS.
- Changes to standard details and design requirements modified following the earthquakes – note these are currently being addressed on a case-by-case basis.
- Adoption of the standard drawings – note that a large number of drawings for manhole and pipework details that are currently labelled as “to be revised”.
- Incorporation of Water Sensitive Urban Design (WSUD) and other low impact design solutions into the ECOP.

4.13. It is intended that ECOP will be continually updated for specific as required, until a full review of the ECOP is undertaken.

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

5. **COMMUNITY VIEWS**

5.1. **Groups and Organisations**

5.2. The new and revised drawings have been reviewed internally by the 3 Waters team, Subdivisions team and the Building Unit.

5.3. **Wider Community**

5.4. No external consultation has been undertaken as part of this process.

5.5. The updated version of the ECOP will be made available on the WDC website and also registered ECOP users will be made aware of the change.

6. **IMPLICATIONS AND RISKS**

6.1. **Financial Implications**
6.2. There is no financial implications from adopting these standard drawings into the Engineering Code of Practice.

6.3. **Community Implications**

6.4. The drawings are intended to clarify and simplify the requirements for applicants applying for a building consent.

6.5. **Risk Management**

6.6. The adoption of the new and revised drawings into the ECOP will reduce the risk of incorrect or inappropriate systems being constructed by landowners.

6.7. **Health and Safety**

6.8. The drawings will help implement measures to reduce the likelihood of contamination of private water supply tanks and also minimise the damage to buildings from inappropriate stormwater disposal.

7. **CONTEXT**

7.1. **Policy**

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

7.3. **Legislation**


7.5. The Local Government Act 2002 sets out Council’s role in providing infrastructure services. The Building Act 1991 provides a national focus for building control to ensure that buildings are safe and sanitary. The Resource Management Act is the principal statute under which the use and subdivision of land is controlled.

7.6. It is noted that the discharge to ground from a single property is a permitted activity under the Land and Water Regional Plan.

7.7. **Community Outcomes**

7.8. The following community outcomes are relevant in this matter:

- Core utility services are provided in a timely and sustainable manner
  - Harm to the environment from sewage and stormwater discharges is minimised.
  - Council sewerage and water supply schemes, and drainage and waste collection services are provided to a high standard.
  - Renewable energy technologies and their efficient use is encouraged.

7.9. **Delegations**

7.10. The Utilities & Roading Committee have delegated power to adopt the changes to the Engineering Code of Practice as the standing committee responsible for 3 Waters and Roading assets.
NOTES:
1. TANK SIZE BASED ON PROVIDING A DETENTION STORAGE VOLUME OF 2m³ PER 100m² OF ROOF AREA. REUSE STORAGE VOLUME IS TYPICALLY HALF THE DETENTION STORAGE VOLUME.
2. TANK FOUNDATION AND FIXING TO GROUND TO BE IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.
3. DEBRIS DIVERTER/LEAF GUARD TO BE INSTALLED ON DOWNPIPES IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.
4. FIT UNISEAL IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.
5. HOLES DRILLED THROUGH TANK WALL TO BE IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.
NOTES:
1. DETENTION VOLUME SIZING - PROVIDE 2m³ OF STORAGE VOLUME PER 100m² OF ROOF AREA.
2. INVERT LEVEL OF SWALE TO BE ABOVE THE SEASONAL HIGH GROUNDWATER LEVEL.
3. SLOPES TO BE VEGETATED WITH GRASS (FOR SWALES) OR SUITABLE "LOWER BANK" VEGETATION AS SET OUT IN THE CHRISTCHURCH CITY COUNCIL STREAMSIDE PLANTING GUIDE.
4. DETENTION PONDS ARE GENERALLY SUITED TO FLAT LAND, WHILE DETENTION SWALES ARE GENERALLY SUITED TO LAND WITH A FALL (<1:100) IN STEEPER AREAS (>1:50) CHECK DAMS MAY NEED TO BE PROVIDED TO ACHIEVE THE REQUIRED DETENTION VOLUME.
5. DETENTION PONDS WITH SHALLOW DEAD STORAGE DEPTHS MAY NOT BE SUITABLE IN SOME LOCATIONS, DUE TO THE POTENTIAL FOR INSECTS AND MIDGE TO BREED. DETENTION PONDS WITH DEEP STORAGE DEPTHS WILL NEED TO CONSIDER THE REQUIREMENTS OF BUILDING CODE CLAUSE F9.
NOTES:

1. SOAK PIT SIZING - PROVIDE 1m² OF BASE AREA PER 100m² OF ROOF AREA AND 2m³ OF STORAGE VOLUME PER 100m² OF ROOF AREA (ALLOW 0.38 FACTOR FOR VOID SPACE) OR ALTERNATIVELY PROVIDE FULL DESIGN CALCULATIONS IN ACCORDANCE WITH VERIFICATION METHOD E1/VM1 SECTION 9.

2. CLEAN WASHED DRAINAGE METAL - TO BE EITHER TAILINGS 20mm-40mm, ROUNDS 40mm-65mm, BOULDERS 65mm-120mm, ROCKS 100mm-150mm OR SIMILAR.

3. A HOUSE DRAIN SUMP OR SMALL TRAFFICABLE SUMP IS ONLY REQUIRED WHERE RUNOFF FROM THE DRIVEWAY IS CONNECTED TO THE OUTLET PIPE (REFER INDICATIVE LAYOUT DIAGRAMS BELOW).
NOTES:

1. **SOAK PIT SIZING** - PROVIDE 1m² OF BASE AREA PER 100m² OF ROOF AREA AND 2m³ OF STORAGE VOLUME PER 100m² OF ROOF AREA (ALLOW 0.38 FACTOR FOR VOID SPACE) OR ALTERNATIVELY PROVIDE FULL DESIGN CALCULATIONS IN ACCORDANCE WITH VERIFICATION METHOD E1/VMI SECTION 9.

2. **CLEAN WASHED DRAINAGE METAL** - TO BE EITHER TAILINGS 20mm-40mm, ROUNDS 40mm-65mm, BOULDERS 65mm-120mm, ROCKS 100mm-150mm OR SIMILAR.
Guide for the Onsite Disposal of Stormwater in the Waimakariri District

Stormwater Disposal – Acceptable Means of Discharge

For runoff from roof and hardstanding areas:

- Where no resource consent conditions for stormwater disposal apply to the property.
- Related to residential buildings, sheds (<162m$^2$) and associated hardstanding.
- For commercial and industrial buildings and large areas of hardstanding (>200m$^2$) seek advice from the Drainage Asset Manager.

<table>
<thead>
<tr>
<th>Soil Infiltration</th>
<th>Urban (where Council reticulated system is available)</th>
<th>Rural (where no Council reticulated system is available)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area 5 (purple)</td>
<td>Highest Discharge to ground with overflow to kerb &amp; channel. Design to be in accordance with NZBC/E1 Surface Water and WDC ECOP standard drawing 600-330A.</td>
<td>Discharge to ground. Design to be in accordance with NZBC/E1 Surface Water and WDC ECOP standard drawing 600-330B.</td>
</tr>
<tr>
<td>Area 4 (blue)</td>
<td>High Discharge to ground. Design to be in accordance with NZBC/E1 Surface Water and WDC ECOP standard drawing 600-330A.</td>
<td>Discharge to ground if soakage test undertaken in accordance with NZBC/E1 Surface Water VM1 Section 9 confirms ground soakage is suitable. Alternatively assume low soil infiltration.</td>
</tr>
<tr>
<td>Area 3 (green)</td>
<td>Medium Discharge to kerb &amp; channel / roadside drain. Design to be in accordance with NZBC/E1 Surface Water and WDC ECOP.</td>
<td>Discharge to roadside drain or watercourse via either: - Holding tank. Designed in accordance with WDC ECOP standard drawing 600-251. - Detention swale/pond. Designed in accordance with WDC ECOP standard drawing 600-252. Stormwater neutrality must be achieved as required by WDC ECOP.</td>
</tr>
<tr>
<td>Area 2 (orange)</td>
<td>Low Discharge to kerb &amp; channel / roadside drain. Design to be in accordance with NZBC/E1 Surface Water and WDC ECOP.</td>
<td>- Holding tank. Designed in accordance with WDC ECOP standard drawing 600-251. - Detention swale/pond. Designed in accordance with WDC ECOP standard drawing 600-252. Stormwater neutrality must be achieved as required by WDC ECOP.</td>
</tr>
<tr>
<td>Area 1 (red)</td>
<td>Lowest Soil infiltration unknown. Assume lowest soil infiltration or alternatively discharge to ground if soakage test undertaken in accordance with NZBC/E1 Surface Water VM1 Section 9 confirms ground soakage is suitable.</td>
<td>Soil infiltration unknown. Assume lowest soil infiltration or alternatively discharge to ground if soakage test undertaken in accordance with NZBC/E1 Surface Water VM1 Section 9 confirms ground soakage is suitable.</td>
</tr>
<tr>
<td>Area 0 (grey)</td>
<td>Unknown</td>
<td></td>
</tr>
</tbody>
</table>
Other Information:

Consent Notices:
If a consent notice is issued relating to onsite stormwater control the water must be contained on the individual property and not allowed onto neighbouring properties.

Groundwater:
In areas of known high groundwater (refer Groundwater Map) an overflow from the soakage system, to the natural drainage point or roadside drain, shall be provided to direct water away from the building.

Outbuildings:
When an outbuilding (Importance Level 1) farm shed is built without spouting, if the property is located within Areas 5 or 4 (from soil infiltration map details), the stormwater may be discharged directly to the ground, provided the building is located a minimum of 10 metres from any boundary.

Watercourse or Drain:
If stormwater is to go to a Council maintained watercourse or drain then prior approval from the Waimakariri District Council Drainage Asset Manager is required. The maximum outlet pipe is 100 mm, unless otherwise approved, and the area surrounding the outlet of the pipe should be protected against erosion. Disposal of stormwater into watercourses should be via a sealed pipework system from the building to ensure contaminants are not permitted to enter.

Alternative Solutions:
The use of water sensitive urban design (WSUD) measures such as rain gardens and permeable pavers are encouraged by Council. If an alternative stormwater solution is to be used, then prior approval from the Waimakariri District Council Drainage Asset Manager is required prior to building consent being issued.

Commercial and Industrial Properties:
All hardstand areas are to discharge via either oil/grit separators and/or submerged outlet sumps, as approved by the Waimakariri District Council Drainage Asset Manager prior to the building consent being issued. The requirements of the Council’s Stormwater Drainage and Watercourse Protection Bylaw must also be met.

Hardstand Areas for Vehicles:
If large amounts of hardstand areas (>200m²) are indicated on the plans, these will need to be included within the stormwater disposal system utilising oil/grit separators and submerged outlet sumps. Stormwater and drainage plans are to be approved by the Waimakariri District Council Drainage Asset Manager. Note: Some urban subdivisions include mandatory requirements for the drainage of hardstanding areas (refer to relevant resource consent).

Water races:
Stormwater cannot discharge into an irrigation or stockwater race.
1. SUMMARY

1.1 The purpose of this report is to present the 2016/17 National Performance Review to the Utilities & Roading Committee and highlight Waimakariri District Council’s performance.

1.2 This is the third consecutive year that the Waimakariri District Council has participated in the annual survey.

Attachments:

2. RECOMMENDATION

THAT the Utilities & Roading Committee:

(a) Receives report No. 180607062770.

(b) Notes that the Waimakariri District Council performs relatively well in the key theme areas identified in the 2016/17 National Performance Review.

(c) Notes that the National Performance Review provides numerous performance metrics which can be used comparative purposes on specific matters with other councils.

3. BACKGROUND

1.3 The National Performance Review provides a benchmarking tool for local authorities and other organisations providing public drinking water, wastewater and stormwater services. Water New Zealand has undertaken this review since 2007 and the Waimakariri District Council has participated in the survey since 2014.

3.1 The objectives of the review is to benchmark councils against each other and to identify areas where there is room for improvement in service delivery. 44 of the 67 territorial authorities participated in the 2016/17 survey, covering approximately 90% of New Zealand’s population.
4. **ISSUES AND OPTIONS**

*Key Themes*

4.1. The key themes identified from the 2016/17 review at a national level were:

- Wet weather in 2016/17 had significant impacts for the performance of wastewater and stormwater systems.
- The diversity of approaches to inflow and infiltration and emergency management planning creates knowledge sharing opportunities.
- The absence of clear guidance is creating inconsistencies in the management of asset condition assessments and climate change management.
- Actual capital expenditure trails budgeted expenditure, with participants spending a median of 76% of their budgeted capital.
- The regulatory regime for 3 Waters services could be sharpened.
- There is an ongoing need to improve sector data.

**Wet Weather Performance**

4.2. Waimakariri District Council performed relatively well in terms of dry weather overflows and moderately well in terms of wet weather overflows (refer Figures 1 and 2 below).

4.3. The Council has a number of upgrading projects underway to reduce the frequency of wet weather overflows, including the Central Rangiora Sewer Upgrade and the Kaiapoi Sewer Modelling and Network Upgrade projects.

![Dry weather overflows per 1,000 properties](image-url)
3.2 The Council did not have any reported stormwater flooding events in the 2016/17 financial year as this was a relatively dry year with no significant storm events.

**Inflow and Infiltration**

4.4. The Waimakariri District Council uses a range of techniques to measure inflow and infiltration, including modelling, flow monitoring, CCTV inspections and has also undertaken hydraulic conductivity testing trials in Kaiapoi.

4.5. The peak wet to dry weather flow ratios for wastewater treatment plants (WWTP) are within the main cluster for national performance (refer Figure 3 below).

4.6. It is noted that the 2016/17 was a relatively dry year for the Waimakariri District. This is evident as the Fernside WWTP normally has consent compliance issues due to inflow and infiltration issues following moderate to large rainfall events, which did not occur in 2016/17.

4.7. Additionally, while Oxford WWTP performs relatively well there is still a need to address inflow and infiltration from a consent compliance perspective.

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**Figure 2 – Wet weather overflows per 1,000 properties**

- Oxford WWTP
- Fernside WWTP
- Loburn Lea WWTP
- EDSS WWTPs

**Figure 3 – Peak wet to dry weather flow ratios at wastewater treatment plants**

- Fernside WWTP
- Oxford WWTP
- Loburn Lea WWTP
- EDSS WWTPs
**Condition Assessment and Climate Change**

4.8. In terms of condition assessment approach and climate change allowance, we use national guidelines as much as possible and also collaborate with neighbouring councils to ensure a consistent approach is being used. We will monitor any work undertaken by Water NZ, University Quake Centre or central government to standardise guidance in this area.

**Capital Expenditure**

4.9. In terms of actual capital expenditure Waimakariri District Council performs slightly higher than the national average of 76% (refer Figure 4 below). However there is still room for improvement in this area, particularly in the delivery of the Drainage capital works programme.

![Figure 4 – Actual expenditure proportion to budgeted expenditure across 3 waters assets](image)

**Consent Compliance Performance**

4.10. While not specifically referenced in the National Performance Review document, the Council performs well in terms of wastewater consent compliance. All WWTP are consented, note that 20 out of 178 WWTP in New Zealand are currently operated under expired consents, and no abatement or infringement notices have been received.

4.11. The Council is also in the 58% of councils who reported some or all of stormwater discharges were consented. The work on the Network Discharge Consents for the five main urban areas in Waimakariri will increase the number of outfalls that are consented in our district.

**Asset Data**

4.12. The Council has also been proactive in improving its asset data, including the collection and recording of fault information against the asset. Full implementation of a mobile Asset Management Information System (AMIS) to streamline collection of data in the field to assessment of data in the office for decision making is about to commence to further improve this process. Additionally a 3 Waters data model that aligns with the New Zealand
Metadata Standards has been developed and is currently being implemented by the AIM team.

4.13. The National Performance Review provides numerous other performance metrics that can be reference in the reports or via an outline data portal, which enables relevant specific councils to be compared.

5. COMMUNITY VIEWS

5.1. Groups and Organisations

5.2. The National Performance Review has been discussed at the asset management collaboration meeting held between Waimakariri, Selwyn, Hurunui and Kaikoura district councils. Hurunui and Kaikoura district councils have not participated in the survey to date but it is intended to provide assistance to them as part of the 2017/18 review.

5.3. Wider Community

5.4. The National Performance Review gives the community assurance that WDC is performing well relative to other territorial authorities in New Zealand.

6. IMPLICATIONS AND RISKS

6.1. Financial Implications

3.3 The Waimakariri District Council pays a fee of approximately $4,000, excluding staff time to complete the survey, to participate in the review, but benefits from identifying areas where improvement is needed relative to other councils and also in terms of raising the performance of the sector as a whole.

3.4 This work is funded from the 3 Waters asset management budget.

6.2. Community Implications

6.3. The National Performance Review is publically available on the Water NZ website for the community to access.

6.4. Risk Management

6.5. The National Performance Review does not show WDC to be an outlier in any of the key theme areas identified.

6.6. Health and Safety

6.7. Health and safety is not specifically addressed in the National Performance Review.

7. CONTEXT

7.1. Policy

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

7.3. Legislation

7.4. Local Government Act 2002 relates to the provision of infrastructure services.
7.5. **Community Outcomes**

- There are wide ranging opportunities for people to contribute to the decision making that effects our District
- There is a safe environment for all
- There is a healthy and sustainable environment for all
- Core utility services are provided in a timely and sustainable manner

7.6. **Delegations**

7.7. The Utilities & Roading Committee is responsible for the 3 Waters functions of the Council.
5 April 2017

Kalley Simpson
3 Waters Manager
Waimakariri District Council
P O Box 1005
RANGIORA 7440

Dear Kalley

Thank you for participating in this year’s National Performance Review. Please find enclosed the two volumes of the 2016/17 report. Volume 1 provides an overview of key sector trends. Volume 2 contains comparative performance information.

The key purpose of the report is to provide you with information that helps inform your decision making. In the past, benchmarks have been used to discuss priorities with councillors, set level of service targets and inform planning. To this end, please share the document amongst your colleagues and contact us if you require additional hard copies. Electronic copies are available online: www.waternz.org.nz/NationalPerformanceReview

The diversity of New Zealand water supplies mean it is often not relevant to make comparisons across all entities included in the report. To this end, we have developed an online reporting tool that allows participants to select and download performance comparisons with similar entities. The tool is accessible by following links at the website listed above.

We acknowledge that data collation and reporting takes time and appreciate your effort. The value is significant. The review provides a vital ongoing mechanism to consolidate information on 3 waters service provision at a national level. We use the review to help prioritise projects that support the association’s stakeholders and industry. Data is also used to assist New Zealand to meet international reporting obligations for water and wastewater service provision.

We are seeking to continually improve the report and benchmarking process to improve its accuracy and the value it adds to participants. Your contributions to this process are welcomed. If you have any suggestions for improvement, or interest in joining our project advisory group, please let us know.

Yours sincerely

Lesley Smith
Technical Co-ordinator
MESSAGE FROM WATER NEW ZEALAND

New Zealand is at an interesting point in the delivery of 3 Waters services. The recent Havelock North Drinking Water Inquiry has exposed the shortcomings with some parts of the drinking water services provided by Councils. The Inquiry has recommended major changes to the way the sector operates. The Government has yet to respond to the report.

There is also a review being undertaken at present by the Department of Internal Affairs in various aspects of 3 Waters administration by Councils.

While it is expected that these two reviews may lead to changes in the way the sector operates going forward, the industry maintains an ongoing assessment of its performance – as reported in this annual performance review.

This Water New Zealand led review of the performance of Councils in the delivery of 3 waters services has the dual objectives of benchmarking Councils against each other, and identifying areas where there is room for improvement in service delivery. The Association frequently assists Councils to improve their levels of service by producing technical guidance material in areas where there are demonstrated shortcomings.

The survey reports Council performance against relevant international benchmarks, and against the Department of Internal Affairs Non-Financial Reporting Measures Rules.

The report does not always attempt to explain why Participants perform at different levels. It is primarily a report based on the evidence collected against the various benchmarks we assess. If Participants or the public wish us to provide further interpretation of the results they should contact Water New Zealand.

This report was compiled by Lesley Smith at Water New Zealand using data compiled by participants in the review. Auditing assistance was provided by Miles Wyatt of AECOM. Graphics in the report have been produced by Nina Vellaman of Bunkhouse design. Performance indicators contained in the review have been compiled with the our steering group, composed on the following participant representatives;

- Mike Schruer, Utilities Manager at Tasman District Council
- Steve Burton, General Manager City Waters at Tauranga City Council
- Jamie Cox, Engineering Manager at Wairoa District Council
- Ted Anderson, Group Manager Assets at South Waikato District Council
- Martyn Cole, Water & Wastewater Asset Manager at Kapiti Coast District Council
- Robert Blakemore, Chief Advisor Asset Management, Wellington Water

Our thanks to all involved for their contributions.

John Pfahlert
Chief Executive, Water New Zealand
EXECUTIVE SUMMARY

The National Performance Review (NPR) is an annual voluntary reporting initiative, benchmarking the provision of drinking water, wastewater and stormwater services.

Three water services (3 waters) in New Zealand are delivered by Territorial Authorities (TAs) and Council-Controlled Organisation (CCOs). Forty four of these, providing services in jurisdictions that cover approximately 90% of New Zealand’s population, are covered by this report. The large number of entities involved in service provision creates both challenges and opportunities: avoiding the inefficiencies of reinvention, and learning from a diversity of approaches. The NPR aims to identify where such challenges and opportunities exist as a starting point for improving service delivery.

The report underscores the significance of the 3 Waters sector, both in protecting the public health and environment, and as an economic entity in its own right. Collectively, the sector was responsible for ensuring that the 550,000,000 cubic meters of drinking water delivered in 2016/17 was safe to drink and subsequently, that the environment was safeguarded from the 458,000,000 cubic meters of wastewater returned back into sewers, as well as ensuring communities were protected from flooding. The provision of these services was delivered by assets worth over $33 billion, with an annual expense bill of nearly $2 billion.

The National Performance Review is undertaken by Water New Zealand on behalf of the sector, who contribute knowledge and resources to enable its delivery. The 44 participants in this year’s report have prioritised participation against a number of competing priorities, not least Long Term Plan development. The ongoing high levels of participation in the NPR is a demonstration of the sector’s commitment to providing stakeholders with transparent information on sector performance, continuously improving the services they provide, and collaborating as a whole.

The report provides performance metrics related to the central purpose of drinking water, wastewater, and stormwater services, i.e. to protect public health and the environment, as well as other core considerations in delivering this goal; i.e. system reliability, resilience, customer focus, economic sustainability and resource use efficiency.

The National Performance Review has been run since 2007/08. Over this time, a number of ongoing themes have emerged, while others relate only to this year’s report. Summarised here are key themes evident in 2016/17, as well as improvement opportunities and related initiatives underway in the sector.

Wet weather in 2016/17 had significant impacts for the performance of wastewater and stormwater systems.

2017 was the wettest autumn on record for parts of the North Island, and the preceding spring of 2016 was wetter than normal (NIWA). Unsurprisingly recorded sewage overflows and flooding events climbed accordingly. On average, sewage overflows related to wet-weather increased by 379% compared to the previous year. Flooding events recorded in 2016/17 increased by 62%, and the number of habitable floors affected by flooding rose by 155%.

The review contains information about design standards to protect against such events. Design capacity of sewers used to protect against wet weather overflows shows large variations (as high as a factor of 25 between different organisations), as does the modelled performance of the existing network. There are also gaps in knowledge, with only 19 of
the 42 wastewater operators reporting design standards for their sewage capacity.

Stormwater design standards show similar knowledge gaps, but do employ more consistent design standards. There are, however inconsistencies and methodological issues in how the rainfall and runoff analyses that underpin stormwater system design are applied.

Water New Zealand is leading an initiative that aims to resolve these analytical issues over time. However, these issues could be resolved faster if National Rainfall and Runoff Guidelines were developed and used to support more consistent and robust infrastructure investment decisions. Central government funding would be needed for this.

**The diversity of approaches to Inflow and infiltration and emergency management planning creates knowledge sharing opportunities.**

Inflow and infiltration are terms used to describe the ways that stormwater and groundwater enter the wastewater system. Active programs are in place for over half of respondents to prevent inflow and infiltration, which in turn lowers costs, and prevents wastewater from overflowing into the environment. A broad range of strategies is being employed by different organisations, including targeted renewals programmes, and a variety of monitoring and inspection regimes and third party collaborations with property owners, building inspectors, and contractors.

78% of participants have in place Emergency Management Plans. The nature and events planned for is, again, highly diverse. Events such as high water demand, pandemics and contaminated water, which may reasonably be expected to impact on all water supply operators, have only been addressed by a limited number of participants. A large majority of suppliers noted they were members of the Lifelines Forum, which may provide a vehicle for the sharing of plans.

The Water Services Managers Group, the Water Journal and annual Water Conference are all vehicles by which Water Services Managers regularly collaborate to share ideas. Addressing emergency management and inflow and infiltration through these forums provides an opportunity for participants to leap-frog their management through the learning experiences of others.

**The absence of clear guidance is creating inconsistencies in the management of asset condition assessments and climate change management.**

While condition assessment of pipelines and above ground assets is common place, such assessments are undertaken using a wide range of approaches, including using guidance supplied by NAMS, IPWEA and Water New Zealand, along with a range of Informal and in-house approaches.

Steps towards addressing this issue are being made. Water New Zealand has recently commissioned updates to the Pipe Inspection Manual. In addition, a decision support tool is being developed by the University of Canterbury Quake Centre to assist authorities in determining how to effectively apply the proliferation of existing, and not always consistent, advice.

Climate change considerations are included in planning documents for most organisations, but few have detailed projections for future climate conditions. Where these exist, there is a large variation in the time frames, metrics, and values being allowed for. For example Dunedin is anticipating a maximum sea level rise in the year 2090 of up to 1.6m, while in Ashburton, 50cm is being allowed for by 2100.
Most organisations sources of climate change information were generally not cited and where information sources were variable. It appears that while the Ministry for Environment have put out guidance related to climate change, there is an opportunity to raise awareness of that guidance as well as tailor the information so that it is fit for the purpose of informing 3 Waters related decision making. The Deep South Climate Challenge also presents opportunities to work with scientists on decision making guidance to address these gaps.

**Actual capital expenditure trails budgeted expenditure, with participants spending a median of 76% of their budgeted capital.**

This continues previous years’ trends, with only 69% of budgeted capital expenditure being spent in 2015/16, and 64% in 2014/15.

Internal resources for project delivery was the number one barrier preventing participants delivering their capital works programmes. Some participants commented this related to difficulties recruiting suitably qualified staff, devoting time to on-site contract management, and having staff time to focus on project management.

While the development of a workforce capability strategy has been initiated by Water New Zealand, it is only intending to address operational staff capability. Beyond that, addressing the capacity and capability constraints that affect the delivery of capital works will also be important. This would require cross-sectoral collaboration with the engineering, trades and construction sectors.

**The regulatory regime for 3 Waters services could be sharpened.**

There is a high degree of variability in the way stormwater systems and wastewater treatment plants are consented. A number of wastewater treatment plant consents have expired and the low number of non-compliances reported for both systems suggests that either consent conditions are lax, or enforcement of consents is not wide spread.

In a year of wet weather, with stories of beach closures and flooded homes dominating news reports, no stormwater consent non-compliances were reported to the National Performance Review. Wastewater treatment consent breaches were also low, with only seven infringement notices and one enforcement order issued across all 42 wastewater operators.

The low number of stormwater consents is partially explained by the patchy coverage of stormwater consents. Eight participants’ operating stormwater systems did not have any stormwater discharge consents. For 21 participants who did, the extent of their stormwater consents varied: some covered all discharges, while some only covered a small number of selected discharges.

Twenty of 178 wastewater treatment plants in the report were operating on expired effluent discharge consents. Most of which expired in the last three years, however one as far back as 1999.

Water New Zealand is pursuing a number of opportunities to achieve greater consistency in consenting and compliance practices, both to protect the environment and to reduce the effort and costs of administering consents. The National Policy Statement on Freshwater Management is likely to result in tougher standards for the sector through regional planning processes. It is important that issues with consenting and compliance practices are improved to enable the sector to meet these tougher standards in a timely and cost-effective way.
There is an ongoing need to improve sector data.

There has been a step change in the collection of customer focused data, best exemplified by the number of organisations supplying data for attending and resolving system faults. This has increased from 72.81% in 2014/15, to 92.86% in 2015/16, and 93.75% in 2016/17. However, large variations in data between organisations, and year on year, suggest that systems for collecting customer data are continuing to mature. For example, the average time taken to resolve non-urgent water supply issues varied by up to 25 hours compared with the previous year.

Another indication that data quality may need improvement is the lack of trends between apparently related variables. For example, there is no correlation between water supply interruption data, and either water supply pipeline age or water pipeline condition. It is unlikely that no such relationship exists between these two factors, suggesting improved data sources and further granularity in data sets are needed for meaningful analysis of pipeline performance.

National Meta Data Standards for 3 Waters assets have been drafted, and the University of Christchurch Quake Centre is attempting to refine these through a national pipe database pilot. The project aims to compile pipe data from six case study councils.
# National Performance Review

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1 ABOUT THE NATIONAL PERFORMANCE REVIEW

The National Performance Review (NPR) is an annual benchmarking exercise of drinking water, wastewater, and stormwater (collectively referred to as the 3 Waters) provision in New Zealand. The exercise provides comparative performance information to:

a) assist water managers identify improvement opportunities;
b) provide a transparent snapshot of sector performance; and
c) reduce the number of requests for information to councils.

New Zealand’s 3 Water services are provided by councils and council-controlled organisations. These organisations have voluntarily provided data and finances to produce the NPR since 2008.

The NPR is co-ordinated by Water New Zealand, an independent not-for-profit organisation representing water professionals and organisations. Development of the NPR is overseen by a project advisory group of representatives from participating entities. Water New Zealand Special Interest Groups, Water Services Managers Group, and the Water Utilities Association are used as vehicles for delivering industry-wide improvement initiatives, which are informed by the outputs of this report.


The Report covers the core elements of 3 Waters service provision, as shown in Figure 1. Exceptions are drinking and freshwater quality issues, which are addressed in the Annual Report on Drinking Water Quality (Ministry of Health, 2016) and the freshwater chapter of Environment Aotearoa 2015 (Ministry for the Environment, 2015) respectively.

New Zealand data may be compared with international benchmarks using the World Banks IBNET (International Benchmarking Network) database, accessed online at: https://database.ib-net.org/Default.aspx

Figure 1: Aspects of 3 Waters service provision addressed by the NPR
2 INTERPRETING INFORMATION IN THE REPORT

The Report covers data for the jurisdictions shown in Figure 2. Unless stated otherwise, services are delivered by territorial councils, and participants are referred to as the jurisdiction they service. Exceptions are:

- **Auckland**: Stormwater services are provided by Auckland Council, which is referred to as such in this report. Water and wastewater services are provided by Watercare (a council-owned CCO), which is referred to as “Auckland” in the report.
- **Wellington**: Water Management in Wellington is undertaken by Wellington Water on behalf of Upper Hutt City, Lower Hutt City, Porirua City, Wellington City, and Greater Wellington Regional Councils, whose performance is addressed separately in this report. The Greater Wellington Regional Council provides bulk water services to each of the other Councils, and is referred to as Wellington Region.
- **Kaipara District Council**: data for drinking water, wastewater and stormwater systems has been provided for Dargaville only.

Participants have been classified as small, medium, or large, based on the cumulative number of properties they service. A list of participant full names and classifications is shown in Appendix I.

Definitions for data collection points are available online. Cross-references to the definition guidelines are provided in reported figures and tables using indicator codes delineated with square brackets. For example, the reference [WSB4] can be used to cross-check the performance indicator for water-serviced properties within the definition guidelines.

Data quality is an utmost priority in the review compilation. Water New Zealand endeavours to ensure that data is as correct as possible by following the review process shown in Appendix II. AECOM conducts independent audits to support this process, and its report is available online.
3 SECTOR OVERVIEW

3.1 Assets under management
The report covers assets with a total value of over $33 billion. The value of assets by type is shown in Table 1.

Figure 4 shows the value of assets by participant region, illustrating that the majority of asset value is clustered in Auckland, Wellington, and Christchurch.

Table 1: Value of assets covered by the report

<table>
<thead>
<tr>
<th>Asset class</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water treatment facility value [WSF23a]</td>
<td>$2,013,043,728</td>
</tr>
<tr>
<td>Other water supply asset value [WSF23b]</td>
<td>$8,689,704,039</td>
</tr>
<tr>
<td>Drinking water asset value</td>
<td>$10,702,747,766</td>
</tr>
<tr>
<td>Wastewater facility value [WWF24a]</td>
<td>$2,867,838,717</td>
</tr>
<tr>
<td>Other wastewater asset value [WWF24b]</td>
<td>$10,937,881,357</td>
</tr>
<tr>
<td>Wastewater asset value</td>
<td>$13,805,720,074</td>
</tr>
<tr>
<td>Stormwater asset value [SWF20]</td>
<td>$9,485,752,480</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$33,994,220,320</td>
</tr>
</tbody>
</table>

3.2 Workforce
Participants have 2,139 full-time equivalent staff on their internal payrolls, and employ another 822 contractors, who are exclusively involved in the delivery of 3 waters services. A further 211 full time equivalent vacancies exist at participant workplaces, which is nearly 10% of the existing workforce.

3.3 Health and Safety
In 2016/17, participants reported 1,344 near misses, and had 250 days of lost-time injuries. This was a 22% increase in near-miss reporting, and a slight decline in the average number of lost-time injuries recorded in the previous year.

Figure 3: Average number of near-misses reported and days work of lost-time injuries reported per staff member (internal and contracted)
Figure 4: Total value of 3 Water assets by participant

1 Assets in Auckland have been grouped to show the combined value of Auckland Council’s stormwater assets with wastewater and drinking water assets managed by Watercare. Assets in Wellington City Council, Greater Wellington Regional Council, Porirua, Lower Hutt and Upper Hutt have been grouped to show assets managed by Wellington Water.
### 3.4 Staff Training

The majority of participants (78%) have formal training and development plans in place for the majority of their 3 Water staff.

![Proportion of participants who have training development plans in place for the majority of 3 Water staff](image CB18a)

Thirty three authorities provided information on their training budgets. For those who responded, the median training budget was $1,797. A box and whisker plot showing the spread of responses is shown in Figure 6. A histogram comparing the budgets at individual councils is provided in Volume 2 of the Report.

![Annual training budget per full time 3 Waters employee](image CB18b)

### 3.5 Participant Characteristics

Service area characteristics impact on participant performance. Some of these include connection density, tourist numbers, and service coverage. A full set of this data is published in Volume 2, and is important information to consider when comparing performance across councils. Other factors such as climate, topography and soil type can also have large performance impacts, however is not included in this report.

![Proportion of people in participant jurisdictions connected to water and wastewater networks](image CB18a)

![Number of properties connected per km of pipe](image CB18b)
wastewater treatment plants are operating on expired discharge consents

379% increase of wet weather overflows compared to the previous year

Over 1/3 of water operators issued boiled water notices

20 wastewater treatment plants are operating on expired discharge consents

Figures relate to National Performance Review participants supplying data, for the year 2016/17 financial year

The number of participants employing stormwater management options

Filtration
Biofiltration
Gross Pollutant Traps
Rain Gardens
Rainwater Detention/Retention Tank
Vegetative Filters
Water Quality Ponds

12, 18, 23

1
9
7
16
27
31

458,461,109 cubic meters

Treated

Public Health and Environmental Protection
4 PUBLIC HEALTH AND ENVIRONMENTAL PROTECTION

4.1 Drinking water quality
For comprehensive information on the drinking water quality of each public water supply refer to the Annual Report on Drinking Water Quality (Ministry of Health, 2017).

Boil water notices were issued by over one third of the 31 participants who responded to this question.

Figure 9: Issuing of boiled water notices in 2016-17

4.2 Wastewater treatment
4.2.1 Wastewater treatment plants
Wastewater treatment plants are operated to minimise the impacts of sewage on receiving environments. An interactive map with details of 262 treatment plants in New Zealand is available at: https://www.waternz.org.nz/WWTPInventory

Volumes of treated sewage being discharged shown in Figure 10, have been broadly classified as;

- **Primary**: Mechanical processes to remove gross, suspended and floating solids from raw wastewater.
- **Secondary**: Biological processes to remove additional organic matter that escapes primary treatment. It typically includes additional settling to remove suspended solids created by the biological process.
- **Tertiary**: Any process that is additional to those described above. Typically used to remove phosphorous or nitrogen. Disinfection is a tertiary treatment process.

Figure 10: Receiving environment for wastewater discharges by volume (million m$^3$)
4.2.2 Wastewater treatment plant consents

Wastewater treatment plants require consents for discharging treated effluent. Figure 11 shows that effluent discharge consents were expired for 20 of the 178 wastewater treatment plants that provided this information in 2016-17. The majority of participants noted that, where consents were expired, applications for new consents were lodged with the regional council. One plant with an expired consent noted that this was operating under an exemption.

Figure 12 shows data for 262 wastewater treatment plants (some of which provided data in previous years). Fifty seven percent of these hold consents for air (and related odour) emissions, and 24% for sludge (the solid component of sewage).

Participants recorded very few consent non-compliances. In 2016-17 only one abatement notice was received by Wairoa, and four participants received a total of seven infringement notices.
4.3 Stormwater discharges
4.3.1 Stormwater treatment

Figure 14: Number of participants employing stormwater treatment

Stormwater discharge consents

Participants were asked to provide information on their stormwater discharges and whether these were consented. Eight participants, operating stormwater systems, did not have stormwater discharge consents. Seven stormwater system operators did not supply information. For those with stormwater discharge consents, further detail on these is listed in Table 2.

Confusion around the definition of “stormwater discharge consent” was reported during the review, meaning not all results were consistently reported. The following definition clarifications were provided midway through the reporting process:

- **Stormwater discharges**: refer to outfalls from stormwater systems controlled by the organisation where stormwater is discharged into receiving water bodies or to land.
- **Number of stormwater discharges with resource consents**: the number of resource consents issued by the regional council to the organisation for stormwater discharges managed by the organisation.

Figure 15: Percentage of participants with stormwater discharge consents

Despite 20 participants having discharge consents, no consent non-compliances have been reported to the National Performance Review in the last two years. The last time consent non-compliance was recorded was in 2014-15.
Table 2: Stormwater discharges and discharge consents

<table>
<thead>
<tr>
<th>Participant</th>
<th>Stormwater discharge and consents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auckland Council</td>
<td>19,919 stormwater outlets with 2,400 discharge consents.</td>
</tr>
<tr>
<td>Christchurch</td>
<td>5,206 discharges all covered by discharge consents.</td>
</tr>
<tr>
<td>Dunedin</td>
<td>734 stormwater outlet points, and 10 consents.</td>
</tr>
<tr>
<td>Hamilton</td>
<td>All stormwater discharges are consented via three regional stormwater consents, however there is no record of the number of individual discharge points. The majority of discharges are consented via Hamilton City Council’s Citywide Comprehensive Stormwater Discharge Consent. Water and wastewater treatment plants have their own individual discharge consents.</td>
</tr>
<tr>
<td>Hauraki</td>
<td>Holds four separate discharge consents for their 20 discharges.</td>
</tr>
<tr>
<td>Invercargill</td>
<td>147 discharges to freshwater all covered by discharge consents.</td>
</tr>
<tr>
<td>Kapiti</td>
<td>1 discharge consent, covering 101 stormwater discharges.</td>
</tr>
<tr>
<td>Mackenzie</td>
<td>7 stormwater discharge consents, and 11 stormwater discharges.</td>
</tr>
<tr>
<td>Napier</td>
<td>5 stormwater discharge consents, and 14 stormwater discharges.</td>
</tr>
<tr>
<td>New Plymouth</td>
<td>Does not measure the number of stormwater discharges, however has two consents: one to Waiongana Stream, and one to the Waitaha Stream and its various unnamed tributaries.</td>
</tr>
<tr>
<td>Palmerston North</td>
<td>274 stormwater discharges, and 9 stormwater discharge consents.</td>
</tr>
<tr>
<td>Stratford</td>
<td>2 stormwater discharge consents, and 9 stormwater discharges.</td>
</tr>
<tr>
<td>Tasman</td>
<td>The council has 114 stormwater discharges related to 15 Urban Drainage Areas (UDA's) in Tasman District Council. None of the UDA's has a discharge consent, but application for these discharge consents is proposed within the next three years. The Council does hold 9 stormwater discharge consents, most of these are isolated discharge consents which were required in relation to stormwater upgrades or private subdivisions, and which were then made public assets to maintain.</td>
</tr>
<tr>
<td>Tauranga</td>
<td>2,590 stormwater discharge points, covered by 3 comprehensive resource consents.</td>
</tr>
<tr>
<td>Timaru</td>
<td>235 soakage pits and 177 outfalls, however only one consent related to a discharge from a private subdivision.</td>
</tr>
<tr>
<td>Waimakariri</td>
<td>Estimated 300 discharges to surface water bodies (does not include discharges to ground), based on known discharges in Rangiora and extrapolated to urban schemes. There are currently 62 separate stormwater discharge consents, however It is anticipated that some of these consents will get superseded by network discharge consents for the district five main urban areas.</td>
</tr>
<tr>
<td>Waipa</td>
<td>The number of individual stormwater discharges is known, but all are covered by five comprehensive stormwater consents. Two sites in Cambridge, and two in Te Awamutu are monitored for resource consent purposes.</td>
</tr>
<tr>
<td>Waioara</td>
<td>Waioara township has 74 discharges, all covered by discharge consents.</td>
</tr>
<tr>
<td>Wellington</td>
<td>243 stormwater discharges with resource consents in the primary stormwater network, all of which are discharges to the coast, and 2,200 stormwater outlets overall.</td>
</tr>
<tr>
<td>Whakatane</td>
<td>43 stormwater discharges all consented.</td>
</tr>
</tbody>
</table>
4.4 Wastewater overflows

Data is collected recording the instances where untreated sewage spills, surcharges, discharges, or otherwise overflows from the wastewater network into the external environment, against the following two categories:

- **Dry-weather overflows** which result from events such as blockages or extended power outages, and may occur at pump stations, manholes, etc.
- **Wet-weather overflows** which typically result from excessive stormwater infiltration, and may be permitted by network discharge consents. This includes overflows (both contained and uncontained) from pump stations, pipes, manholes, and designed overflow structures as a result of wet weather events.

Figure 16 shows the change in the number of wet and dry-weather overflows, averaged across participants where consecutive years data exists. Dry-weather overflows have declined, from a 2015/16 peak, however the number of wet-weather events has been gradually increasing. This may reflect that in the past some organisations have not disaggregated overflows related to wet and dry weather, instead recording all overflows as dry weather. However it is likely that wet-weather overflow increases also reflect that spring 2016 was wetter than normal, and that 2017 was the wettest autumn on record for parts of the North Island (NIWA).

Comparative performance information of wet and dry-weather overflows for all participants who provided data is shown in Volume 2.
The ability of the wastewater network to prevent overflows can be determined using hydraulic models. The modelled annual exceedance probability (AEP) of a sewer overflow provides a system performance indicator that is independent of rainfall in any given year. Figure 17 shows supplied information for the twelve participants who provided information on design standards using the AEP metric.

Christchurch noted that the worst site from their wet-weather flow model would see an overflow occurrence of 2.4 times per year, although the actual 15 years of record suggests a frequency of 1.8 times per year is more likely.

Auckland’s older central city combined sewer and stormwater networks were designed to have more frequent discharges in response to rain events. Watercare did not provide data for this metric however noted its network discharge consent requires that the discharge frequency of wet-weather overflows averages no more than two spills per year at engineered overflow points, equivalent to a 200% AEP. Where this containment standard cannot be reasonably achieved, the consent allows for the best practicable option. An additional requirement in the central interceptor catchment discharge consent requires an 80% reduction in predicted wet-weather overflow volumes by 2030.

The four councils under control of Wellington Water did not supply data, however noted that, based on the model and flow monitoring data, the system would contain three to six months overflows, equivalent to an AEP of between 200 and 400%. Wellington Water noted it intends to gather data to verify these figures over the next few years.
4.4.1 Sewage containment standards

Wastewater systems are designed to contain sewage. Participants were asked to provide design standards for the percentage probability that a wet-weather event will cause sewage to overflow from the wastewater system in any given year (referred to as the annual exceedance probability (AEP)).

The thirteen participants who provided design standards using this metric are shown in Figure 18. A further six participants stated that their sewer design standards used a multiple of annual dry weather flows, rather than annual exceedance probability. Design standards for these councils are shown in Figure 19. Eighteen participants did not supply any information on their sewer design standards.

The four participants under control of Wellington Water did not supply a design standard, however noted regional standards are in place.

Hamilton’s new sewers are designed using an allowance for infiltration of 2,250 litres per hectare per day and ingress of 16,500 litres per hectare per day.

Christchurch noted its design standard relates to an application for wet-weather overflow consent variation currently before Environment Canterbury.

Watercare noted that the design standard for Auckland shown here applies to local networks only. Different types of sewer systems, such as gravity and low pressure systems have different wet weather allowances.
Figures relate to National Performance Review participants supplying data, for the year 2016/17 financial year.
5.1 Customer complaints

Nearly all participants supplied data for complaints recorded in relation to their 3 water’s networks (with the exception of Ruapehu, which did not have complaints data for its wastewater network and Otorohanga, which did not have data for stormwater and wastewater networks). This is a marked improvement since 2013/14 when the Non-Financial Performance Measure Rules mandated complaint reporting for the first time, and data was missing for 8 percent of complaints metrics.

The frequency of complaints per 1,000 properties is shown as a range, rather than per participant, as it is a misleading measure when used for comparative purposes. This is because high complaint volumes often reflect mature complaint recording systems, rather than high levels of customer dissatisfaction. Figure 21 shows complaints recorded by categories required by the Non-Financial Performance Measure Rules (Department of Internal Affairs, 2013).
5.2 Attendance and resolution times for system faults

This section provides information on participants median time taken to attend and respond to call-outs in relation to urgent and non-urgent water supply faults, wastewater faults, and to attend flooding events. Further information showing average response and attendance times of individual participants’ networks is provided in Volume 2.

Flood event attendance data was only provided by half of the participants (21 of 42 operating stormwater systems), despite being a mandatory reporting requirement for the Non-Financial Performance Measure Rules (Department of Internal Affairs, 2013). Reasons for this may be that organisations had no flooding in their districts, or that the responsibility for responding to flooding events within the participant jurisdiction lies with civil defence or the fire service.
The number of participants supplying data for attending and resolving water and wastewater supply faults in Figure 24, shows a continually improving trend since the Non-Financial Performance Measure Rules (Department of Internal Affairs, 2013) introduced mandatory reporting.

Response and attendance times reported show large variations year on year. This may reflect that attendance and response time recording systems are continuing to mature. Alternatively, response times may be sensitive to large outliers that relate to one off events.
5.3 Charges

5.3.1 Residential charging approaches

A comparison of water, wastewater and stormwater charges per participant is shown in Volume 2. Further detail on residential water charging approaches, for all councils in New Zealand can be found in Water Tariffs in New Zealand (A Garnett, 2018).

Residential charges are typically levied using council rates bills, either through uniform annual general charges, general rates, or targeted rates. Charge types in use for participants that responded are shown in Figure 25. Other approaches listed for charging for water were:

- Watercare: use volumetric charges of $1.444/m³.
- Kapiti: recovers 50% of revenue from a fixed water charge and 50% from a volumetric charge.
- Tauranga: charges a volumetric fee and an annual fee that is divided by four and included in the quarterly water bill.

Other types of wastewater charges listed were

- Watercare: apply a fixed charge of $205 and a volumetric charge of $2.545/m³ of wastewater discharge (which is based on 78.5% of the water consumed for the majority of residences, apartments use 95%).
- Marlborough: combines a uniform charge for operation with a land value rate for capital costs.

Other types of stormwater charges listed were:

- Clutha: includes stormwater in water and wastewater charges.
- Ashburton: stormwater charges included in urban amenity rate.

Nearly half (19 of 39) of the participants who provided information on water charging approaches use some form of volumetric charging, however this is employed in a variety of forms, including:

- Volumetric charges for specific schemes
- Various volumetric charges for specific meter types
- Volumetric charges for users who have elected to have meters over rates
- Free water allowance’s
- Stepped tariffs
5.3.2 Affordability

One of the greatest concerns when setting an appropriate tariff for water services is the affordability for lower income households. The affordability of charges is based on participants’ supplied information of water and wastewater charges for a residential consumer using 200m³/year of water and Statistics New Zealand 2013 census data of the median household income by Territorial Authority.

Figure 26 shows that the three regions with the highest proportion of household income spent on water and wastewater are amongst the five regions with the lowest household incomes.

Figure 26: Proportion of water and wastewater charges of household income shown alongside household income
5.3.3 Non-residential water charges

65% (25 of the 39 who supplied information) of water suppliers had separate water supply charges for non-residential customers.

30 of those had a volumetric charge associated with non-residential water use, which ranged from $0.44/m$^3$ to $2.570/m$^3$. The average volumetric charge per cubic meter supplied is shown in Figure 27. Volumetric charges are not always linearly applied. The different forms of volumetric charging, described for residential charging regimes, such as free water allowances, and stepped tariffs, apply equally for non-residential water.

Figure 27: Dollars per cubic meter charges for non-residential water users

5.3.4 Non-residential wastewater charges

Twenty six authorities have a wastewater charging approach that in some way applies different charges for non-residential water users. Types of non-residential charges applied include; volumetric charges flow based charges, contaminant based charges, charges based on meter size, or charges based on the number of toilets.

Twelve use per cubic meter volumetric rates, ranging from 40 cents to $4.80 as shown in Figure 28. Christchurch applies two volumetric rates, one for peak, and one for off peak. Tauranga City Council, Marlborough and Waimakariri District Councils have non-residential charges that factor in users flow rates.

Figure 28: Dollars per cubic meter charges for non-residential wastewater
5.3.5 Trade waste management

Trade waste is managed using bylaws, individual trade waste consents or a combination of approaches by most participants. Approaches used are shown in Figure 29. Otorohanga, Kaipara and Whangarei didn’t provide information on their trade waste charging approach.

Figure 29: Trade waste management approach

Twenty two organisations use contaminant based charging for trade waste customers. Parameters charged for, and rates, where provided are listed in full in Volume 2. A summary of the number of participants applying charges for different parameters is shown in Figure 30.

Figure 30: Number of participants charging for various trade waste parameters
Figures relate to National Performance Review participants supplying data, for the year 2016/17 financial year.
6 ECONOMIC SUSTAINABILITY

6.1 Revenue

In 2016/17 participants collected over $1.8 billion to operate their 3 waters networks. The majority of revenue was collected as operational revenue, either through rates or direct charges for services.

Revenue collected for each of the three networks per property connected to the system is summarised in Figure 31. Further detail on the revenue received for individual participants is shown in Volume 2.

Table 3: 3 waters revenue

<table>
<thead>
<tr>
<th></th>
<th>Water</th>
<th>Wastewater</th>
<th>Stormwater</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating revenue</td>
<td>$601,121,868</td>
<td>$831,481,524</td>
<td>$211,206,715</td>
</tr>
<tr>
<td>Revenue from supply of</td>
<td>$33,453,857</td>
<td>$16,597,490</td>
<td></td>
</tr>
<tr>
<td>services to other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>authorities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Developer contribution</td>
<td>$29,934,829</td>
<td>$60,348,107</td>
<td>$54,357,055</td>
</tr>
<tr>
<td>revenue [WSF3, WWF3,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SWF2]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>$664,510,555</td>
<td>$908,427,122</td>
<td>$265,563,769</td>
</tr>
</tbody>
</table>

Figure 31: Revenue per property
6.2 Developer Contributions

In addition to cash contributions made by developers (quantified in section 6.1), developers also vested 3 Waters assets with a total value of $221 million across all participants.

Figure 32: Vested asset value in 2016/17

6.3 Expenditure

Expenditure across all participants in 2016/17 totalled nearly $2 billion. Of this, nearly 10% ($194 million) related to interest payments.

Figure 33: Total expenditure across all participants in 2016/17
6.3.1 Operational Expenditure

Participants spent $810 million in operational expenses across all three of their networks. A summary of operational expenditure per property is shown in Figure 34. A breakdown of operational expenditure per network for each participant is provided in Volume 2.

Operating expenses continue to increase year on year, as shown in Figure 35.

Figure 35 shows the median change in operational expenses from the previous year. In 2016/17 the median increase in operational costs from 2015/16 was 3.73%, 1.08% and 6.42% across water, wastewater and stormwater networks respectively.

Table 4: Operational expenses by type

<table>
<thead>
<tr>
<th></th>
<th>Water</th>
<th>Wastewater</th>
<th>Stormwater</th>
</tr>
</thead>
<tbody>
<tr>
<td>Council Overview Costs</td>
<td>$14,087,964</td>
<td>$5,946,335</td>
<td>$4,125,442</td>
</tr>
<tr>
<td>Management Costs</td>
<td>$106,688,737</td>
<td>$144,864,769</td>
<td>$30,685,309</td>
</tr>
<tr>
<td>Other External Opex</td>
<td>$157,023,231</td>
<td></td>
<td>$85,939,729</td>
</tr>
<tr>
<td>Reticulation External Opex</td>
<td></td>
<td>$85,949,490</td>
<td></td>
</tr>
<tr>
<td>WWTP External Opex</td>
<td></td>
<td>$86,086,369</td>
<td></td>
</tr>
<tr>
<td>Sludge Disposal Costs</td>
<td></td>
<td></td>
<td>$13,522,397</td>
</tr>
<tr>
<td>Chemicals and consumables</td>
<td>$16,098,852</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy Costs</td>
<td>$26,479,698</td>
<td>$32,998,836</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>$320,378,481</td>
<td>$369,368,195</td>
<td>$120,750,480</td>
</tr>
</tbody>
</table>

Figure 34: Operational expenditure per property

Figure 35: Median change in operational expenditure from previous year for water supply wastewater and stormwater systems
6.3.2 Capital Expenditure

Participants spent $978 million on capital works in 2016/17. A breakdown of capital expenditure by purpose is shown in Figure 37. Capital expenditure per property of individual participants is provided in Volume 2.

Figure 37: Capital expenditure by purpose

- To meet additional demand [WSF20a, WWF21a, SWF17a]
- To improve levels of service [WSF20b, WWF21b, SWF17b]
- To replace existing assets [WSF20c, WWF21c, SWF17c]
6.3.3 Capital works delivery constraints

Actual expenditure continues to trail budgeted expenditure, with participants spending a median of 76% of their budgeted capital in 2016/17. This is a slight improvement from previous years, as shown in Figure 39. A breakdown showing actual versus budgeted expenditure for individual participants is shown in Volume 2.

To identify reasons for this gap, participants were asked to rank the top three pressures affecting the delivery of their capital works programme.

Internal resources for project delivery were listed as the number one pressure. Consenting delays were listed as the second major pressure. A resource consent consistency project is being led by Water New Zealand to identify industry-wide opportunities that may speed up consenting processes.

Other delivery constraints listed included the pressure of insufficient preliminary planning and scoping, as noted by Gore. Ashburton noted that uncertainty around the legislative environment, especially in the drinking water space, was affecting the delivery of its capital works programme, first around agricultural scheme compliance, and now with potential changes post-Havelock North.

Rangitikei, Ruapehu and Western Bay of Plenty District Councils listed contractor availability. This may also be an issue for others captured under the external expertise response.

Whakatane found social, cultural, and third party issues major factors in delivery of CAPEX programmes. With a diverse community and strong opinions, some projects are extremely difficult to deliver. Marlborough has similar issues, listing public consultation and acceptance of affordability as principal pressures. Invercargill listed the ability to accurately identify asset lives, and Central Otago similarly cited the availability of data on asset condition as a pressure.
6.4 Depreciation

Annual depreciation recognises the decline in service potential of water, wastewater, and stormwater assets at rates that will write off the cost or valuation of the asset to its expected residual value over its expected useful economic life. The definition for depreciation reported in the National Performance Review is based on the latest replacement cost valuation. The annual depreciation applied across all participants’ assets is shown in Figure 40.

Local Government meets the Essential Services Benchmark in the Local Government (Financial Reporting and Prudence Regulations 2014) if its capital expenditure on network services is greater than depreciation on network services (i.e. greater than or equal to 100%). Given the fluctuating nature of capital expenditure, the extent to which participants meet the benchmark varies significantly year on year. This is illustrated in Figure 40 which shows capital expenditure versus depreciation in 2016/17 and 2015/16 for participants who provided data in both years. The benchmark may prove less misleading if averaged over a greater time period.

**Figure 40: Capital expenditure versus depreciation in 2016/17 and 2015/16**

![Figure 40](image-url)
6.5 Cost coverage

6.5.1 Operational cost coverage
Operational costs and interest as a proportion of revenue for each of the 3 Waters networks are shown in Figure 40. This metric aligns with the Balanced Budget Benchmark in the Local Government (Financial Reporting and Prudence) Regulations 2014 (New Zealand Government, 2014).

The benchmark is easily achieved by the majority of participants, however neither depreciation nor capital costs, required to maintain networks, are included in the benchmark. Cost coverage per participant per network is shown in Volume 2.

Figure 41: Revenue as a proportion of operational costs and interest

![Figure 41](image)

6.5.2 Debt servicing
The proportion of revenue (excluding developer contributions) spent on interest payments for each of the 3 Waters networks is summarised in Figure 42. Information per participant is provided in Volume 2.

Debt servicing benchmarks under the Local Government (Financial Reporting and Prudence) Regulations 2014 (New Zealand Government, 2014) are met if borrowing costs are less than 10% of a local authorities’ revenue per year, or 15% for a high-growth council. This is a whole of council requirement and not required to be met by water, wastewater or stormwater services individually. When considered on an individual basis Figure 42 shows that borrowing costs exceed these benchmarks for a large proportion of water, wastewater, and storm water networks.

Figure 42: Interest as a proportion of revenue

![Figure 42](image)
Average age of pipeline across network participants:

- **WATER**: 35 YEARS
- **STORMWATER**: 35 YEARS
- **WASTEWATER**: 39 YEARS

Peak wet to dry weather flow ratios vary from 1.06 to 14.8.

Unplanned water supply interruptions per 1000 properties: 4.79

Figures relate to National Performance Review participants supplying data, for the year 2016/17 financial year.
7 RELIABILITY

7.1 Water supply interruptions

The total number of planned, unplanned, and third party interruptions to the water supply reported by each participant is summarized in Figure 43.

Volume 2 shows a comparison of the frequency of unplanned interruptions per participant. In 2016/17 there was a median of 4.79 unplanned interruptions per 1,000 properties serviced.

Two participants reported notable increases in the number of planned interruptions to their water supply network in 2016/17: Waimakariri’s water supply interruptions jumped from one in 2015/16 to 19, and Rotorua’s from 35 in 2015/16 to 1,447 in 2016/17.

The group as a whole saw little change in the frequency of unplanned interruptions from the previous year, with a median decline of only 2%, while the median number of third party incidents declined across the group by 20%.
7.2 Condition Assessments

7.2.1 Pipeline condition assessment

The majority of participants have undertaken condition assessment for some, if not all, of their pipelines. Only a small fraction of participants had yet to undertake any condition grading (one, two and three for water, wastewater, and stormwater networks respectively). Volume 2 shows the percentage of participants’ networks that have been condition graded, as well as the proportion of assets assessed as being in a poor or very poor condition.

Figure 45: Number of participants undertaking pipeline condition assessments

<table>
<thead>
<tr>
<th>Pipeline condition assessment approaches</th>
<th>Number of participants using assessment approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAMS International Infrastructure Management Manual</td>
<td>Water: 12, Wastewater: 8, Stormwater: 9</td>
</tr>
<tr>
<td>New Zealand Infrastructure Asset Grading Guidelines</td>
<td>Water: 6, Wastewater: 7, Stormwater: 7</td>
</tr>
<tr>
<td>IPWEA Condition Assessment and Asset Performance Guidelines</td>
<td>Water: 2, Wastewater: 1, Stormwater: 1</td>
</tr>
<tr>
<td>IPWEA Practice Note 7: Water Supply and Sewerage</td>
<td>Water: 0, Wastewater: 1, Stormwater: 1</td>
</tr>
<tr>
<td>Inhouse</td>
<td>Water: 5, Wastewater: 4, Stormwater: 2</td>
</tr>
<tr>
<td>Informal</td>
<td>Water: 1, Wastewater: 2, Stormwater: 1</td>
</tr>
<tr>
<td>Other</td>
<td>Water: 1, Wastewater: 3, Stormwater: 4</td>
</tr>
</tbody>
</table>

Condition assessment approaches vary, limiting the ability to make comparisons of pipe condition around New Zealand. While most participants apply condition grades from one to five (one being very good, five being very poor) a variety of different assessment approaches, shown in Table 6, are in use.
7.2.2 Above-ground asset assessment

Over 80% of participants have in place processes for assessing the condition of their above-ground water and wastewater assets, however only a third assess all of their assets as part of each three-year asset management cycle.

A range of assessment approaches exist, however many participants have adopted in-house or informal approaches to above ground asset condition assessments.

Table 7: Above ground condition assessment approaches in use

<table>
<thead>
<tr>
<th>Above ground assessment approaches</th>
<th>Number of participants using assessment approach</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Water</td>
</tr>
<tr>
<td>NAMS International Infrastructure Management Manual</td>
<td>15</td>
</tr>
<tr>
<td>New Zealand Infrastructure Asset Grading Guidelines</td>
<td>5</td>
</tr>
<tr>
<td>IPWEA Condition Assessment and Asset Performance Guidelines</td>
<td>4</td>
</tr>
<tr>
<td>Visual Assessment Manual for Utility Assets</td>
<td>0</td>
</tr>
<tr>
<td>In-house</td>
<td>7</td>
</tr>
<tr>
<td>Informal</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
</tr>
</tbody>
</table>
7.3 Pipeline Age

The median average water, wastewater and stormwater pipeline age is 35, 39, and 35 years respectively. The spread of average pipeline ages is summarized in Figure 47 and average pipeline ages per participant are provided in Volume 2.

Figure 47: Average age of pipelines (years)
7.4 Impacts of pipeline age and condition on interruptions

Surprisingly, no trend is evident between the number of water supply interruptions, and either water supply pipeline age or water pipeline condition (shown in Figure 48). It is unlikely, however, that no relationship exists between these two factors, highlighting that improved data sources are needed for meaningful analysis of pipeline performance. It may be that trends are evident at a more granular level, or that high numbers of interruptions in relatively young pipes points to poor installation practices.

Figure 48: Unplanned interruption frequency plotted against water pipeline average age and proportion of assets in poor or very poor condition

\[ \text{Percentage of assets graded as being in poor or very poor condition} \]
\[ \text{Average Age of Water Pipelines [VISA]} \]

Christchurch and MacKenzie have been excluded from the analysis, as their unplanned interruption frequency was a significant outlier from the group. Zero values have also been excluded.
Inflow and infiltration is the process of liquids other than wastewater (predominantly stormwater and groundwater) entering the wastewater system. Participants were asked to provide information on any inflow and infiltration programmes in place, and related performance indicators. Over half (22 of 42) had in place active inflow and infiltration programs, which included:

- Modelling of reticulation, pump stations, and constructed overflows
- Inspection of private properties (including gully traps and downpipes)
- Pipeline renewals targeting areas of high infiltration
- Improvements to stormwater management
- Working with building inspectors to improve water-tightness of new plumbing
- Smoke testing to target leaky pipes
- CCTV inspections
- Flow monitoring programs

A table of participant responses is included in Volume 2.

A range of key performance indicators are used to characterise the various sources of inflow and infiltration. Indicators used in the Water New Zealand Inflow and Infiltration Control Manual (Carne & Le, 2015) are:

- Groundwater Infiltration (GWI) or base flow
- Rainfall Dependent Inflow and Infiltration (RDII); and
- Wet Weather Peak Flow factor, defined by stormwater inflow (SWI)

Both RDII and SWI vary depending on the intensity of the rainfall event they relate to. Given the difficulty in providing comparable benchmarks across such a broad range of measures, participants were asked to provide the ratio of peak wet to dry weather flows at each of their wastewater treatment plants. Ratios were supplied for 93 wastewater treatment plants and are summarised in Figure 49.

The peak wet to dry weather flow associated with each treatment plant is included in the New Zealand wastewater treatment plant inventory, available online at: [https://www.waternz.org.nz/WWTPinventory](https://www.waternz.org.nz/WWTPinventory).

---

3 each diamond represents a different wastewater treatment plants flow ratio
RESOURCES EFFICIENCY

GHG emissions: 356 grams of CO2 equivalent gases per cubic meter of water supplied

Total volume of water supplied: 550,000,000 cubic meters

70% Residential water use

30% Non-residentail water use

Water loss out of system: 91,000,000 cubic meters

Wastewater removed: 458,000,000 m³/year

Energy used in water and wastewater treatment and supply: 1,882,000 GJ

Figures relate to National Performance Review participants supplying data, for the year 2016/17 financial year.
8 RESOURCE EFFICIENCY

8.1 Water abstractions
In 2016/17, participants supplied 550 million cubic meters of water, equivalent to over 220,000 Olympic-size swimming pools. Per participant volumes are illustrated in Figure 50. Of the proportion that was not lost through leakage, roughly a third (137,304,938 m$^3$) was identified as being for non-residential use.

Volume 2 includes a breakdown of residential and non-residential use per participant, as well as changes in abstraction to individual participant systems.

8.2 Water demand management

8.2.1 Water restrictions
Nearly half (44%) of participants applied water restrictions in some or all of their district at some period in 2016/17.

Figure 51: Proportion of participants who had water restrictions in place in 2016/17
8.2.2 Residential water efficiency

The median average daily residential water use across participant networks was 260 litres per person, per day.

Figure 52: Average daily residential water use (litres/person/day)
8.2.3 Water metering and water restrictors

The number of participants with water meters on residential properties continues to climb. In 2016/17, over 12,000 residential water meters were added to participant systems. The total number of meters installed in all participant systems over the last three years is shown in Figure 53, and the percentage of participants’ residential connections with meters is shown in Figure 55.

In addition to water meters there are also 25,770 water restrictors installed across the systems of 20 participants. Volume 2 shows the total number of restrictors installed on each of these systems.

Non-residential water metering is significantly more widespread than residential metering. Only three of the 41 participants that provided data indicated that they had no non-residential metering in place, and 30 of the 41 have meters installed in at least half of the non-residential properties connected to their water supplies. The percentage of non-residential metering coverage per participant is shown in Volume 2.
Figure 55: Proportion of residential water supply connections with water meters.
8.3 Water loss

Participant systems lost an estimated 90 million cubic metres of water in 2016/17, roughly equivalent to the amount of water Tauranga residents would use over a period of nine years. To make comparisons of how efficient or inefficient individual participant losses are, the Infrastructure Leakage Index is used.

The Infrastructure Leakage Index (ILI) is a water loss performance indicator for inter-utility water-loss comparisons recommended by leading international best practice (European Benchmarking Commission, 2015) and New Zealand water loss guidance material (Dr Ronnie McKenzie, 2008). The European Benchmarking Commission (European Benchmarking Commission, 2015) classifications for water loss, as either “very high”, “high”, “moderate”, or “low” are shown in Figure 56. A series of suggested actions are associated with each of these categories.

ILI is the ratio of current annual real losses over unavoidable annual real losses. ILI allows for current system pressure in the UARL formula, however, because pressure is a strong determinant of leak flow rates and burst frequency, the current system pressure is not necessarily optimal, and excess operating pressure and pressure transients can lead to higher water losses, pressure is shown as an additional data point.

Changes in water loss over time can be compared using the systems current annual real losses. The current annual losses, per connection, per day, for each participant are shown in Volume 2.
8.4 Sludge production and disposal

8.4.1 Water treatment sludge

Twenty three participants supplied information on water treatment plant sludges, however only thirteen provided information on treatment plant sludge volumes, suggesting records of this data are not routinely kept as a matter of priority.

Participants were also asked for information on the route used to dispose of their water treatment sludge. Some participants used a combination of disposal routes. Of those who provided responses, landfill was used in ten instances, disposal to sewer was used in 15, and alternative disposal routes, typically via disposal to a water body, were used in a further nine instances. Exceptions were Rangitikei, which land-applied sludges, and New Plymouth, where these were ploughed into land which was regrassed for pasture.

8.4.2 Wastewater treatment sludge

Of 262 treatment plants included in the wastewater treatment plant inventory, the volumes of sludge produced was supplied for 48. Not all values supplied appear credible and so figures of total sludge volume have not been reproduced here.

Information on the disposal route for sludges was supplied for 88 treatment plants, a few of which used multiple disposal routes. Figure 57 shows routes employed. Disposal routes listed in the ‘other’ category were largely where biosolids were sent to other wastewater treatment plants. Selwyn District Council’s ESSS Pines treatment plant biosolids were used for land remediation, and Ashburton District Council’s Rakaia treatment plant’s biosolids were applied to pasture, however this was not harvested for reuse.

Details for sludge volumes at individual wastewater treatment plants are included in the wastewater treatment plant inventory, available online at: https://www.waternz.org.nz/WWTPInventory

Figure 57: Number of wastewater treatment plants utilising various sludge disposal routes
8.5 Energy use

Thirty participants provided reliable information on the energy use of their water and wastewater systems. Collectively the operation of water supply pumps and water treatment plants in these systems used 580,003 GJ of energy, and a further 1,302,007 GJ was used for wastewater pumps and wastewater treatment plants.

Of these, a median energy intensity of 1.3 MJ of energy was used per cubic metre of water supplied, and 2 MJ of energy was used per cubic metre of wastewater collected. A summary showing the range of energy intensities for each system is shown in Figure 58. A comparison of the energy use of individual participant systems is available in Volume 2.

Figure 58: GJ used per m³ of water supplied and wastewater collected
8.6 Greenhouse Gas Emissions

It is estimated that an average of 356 grams of carbon dioxide equivalent gases (CO2-e/m³) are emitted for every cubic meter of water supplied. This is based on calculations conducted by Water New Zealand in collaboration with BraveGen and the Bank of New Zealand.

8.6.1 Energy Related emissions

Equivalent emissions related to energy used for treating and conveying water and wastewater have been estimated based on the energy-use figures for pump stations and treatment plants, provided in Section 8.5.

The estimation does not account for the use of diesel (known to be used at some pump stations and backup generators), biogas, and gas generation (known to be used at some water and wastewater treatment plants).

Electricity related emissions per m³ of water supplied have a weighted average of 110gCO₂-e/m³ of water supplied, and have been determined using the following formula:

\[
E_{\text{ission Factor per Participant}} \left( \frac{\text{kgCO}_2-e}{\text{m}^3} \right) = \text{Coverage Factor} \left( \frac{\text{kWh}}{\text{GJ}} \right) \times E_{\text{ergy Emissions Factor}}(\text{kgCO}_2-e/\text{kWh}) \times \left( \frac{\text{Water system energy use (GJ/year)}}{\text{Water supplied (m}^3\text{year)}} + \frac{\text{Wastewater system energy use (GJ/year)}}{\text{Water supplied (m}^3\text{year)}} \right)
\]

Conversion Factor (kWh/GJ) = 277.778

Emissions Factor (kgCO₂-e/m³) (Ministry for the Environment, 2016) = 0.119

8.6.2 Wastewater fugitive emissions

Fugitive emissions from domestic wastewater have been based on estimates included in New Zealand’s Greenhouse Gas Inventory (Ministry for the Environment, 2015) for methane and nitrous oxide. Fugitive emissions of wastewater from all sources in New Zealand, including septic tanks were 238.68 ktCO₂-e. Fugitive emissions from domestic wastewater treatment plants (i.e. not including septic tanks) were 157.64 ktCO₂-e (Ministry for the
Environment, unpublished). Based on these figures, it is estimated that 246g CO2-e of fugitive wastewater emissions are produced per cubic meter of water supplied to participant systems by using the following formula:

$$\text{Average fugitive emissions (gCO}_2 - e) = \frac{\text{NZ fugitive domestic wastewater emissions} \times \text{Proportion of population in review}}{\text{m}^3 \text{ of water supplied by participants}}$$

$$\text{NZ fugitive domestic wastewater emissions (tCO}_2 - e) = 157,640$$

$$\text{Proportion of population in review} = 86.08\%$$

$$\text{Water supplied by participants (m}^3) = 550,067,714$$

### 8.6.3 Average emissions per cubic meter of water supplied

Based on weighted energy emissions factors summed with average fugitive emissions, it has been estimated that an average of 356 grams of carbon dioxide equivalent gases (CO2-e/m3) are emitted for every cubic meter of water supplied using the following formula:

$$\text{Water supply emission factor (gCO}_2 - e \text{ m}^3) = \sum_{p=1}^{p} \frac{\text{Emission factor}_p (kgCO}_2 - e \text{ m}^3) \times \text{Water supplied by participant}_p (m}^3 \text{ year)} + \text{Average fugitive emissions (gCO}_2 - e \text{ m}^3)}{\text{Water supplied by all participants (m}^3 \text{ year})}$$

\(p = \text{participant with water and wastewater data supplied}\)
RESILIENCE

Turn of the century sea level rise guestimates range from 50 cm to 1.6 m.

- 62% increase in flooding events
- 155% increase in residences inundated by flooding
- 35% of water treatment plants have backup generation
- 1.36 days of water is stored in reservoirs on average

Figures relate to National Performance Review participants supplying data, for the year 2016/17 financial year.
9 RESILIENCE

9.1 Climate Change

Most participants have high-level climate change considerations included in planning documents. Few have detailed projections for future climate conditions. A number of participants noted that infrastructure plans also include climate change considerations.

Climate change considerations within planning documents range from high level acknowledgement of climate change as a strategic issue and/or key risk, to detailed planning assumptions. In Dunedin, “forecast changes to climate have been included in activity management planning assumptions and are built into capital project scoping and design.”

Some authorities that had considered climate change noted that further work needed to be done. For Christchurch City “climate change is acknowledged but there is not yet a specific policy on areas which will be defended and areas that will be retreated from.” Western Bay of Plenty noted that “customer usage is observed based on climate conditions, however at this stage we are more reactive, data collecting with minor long-term planning.”

Others had in progress work to address climate change issues. For example Whakatane is “working towards defining parameters for climate change”, and will be “undertaking modelling projects over next few years when budget allows”. Watercare has a “proposed work program to develop climate change mitigation and adaptation approaches to enhance the reliability and resilience of Watercare’s existing and future assets and operations which was presented to the Watercare Board in September 2017”.

In some instances climate change considerations flowed through from long term plans and asset management processes, and were embedded in design considerations. For example, at Timaru District Council, projected rainfall in 2090 is considered in asset design. Other councils had embedded climate change into design documents. For example, Tasman was working on incorporating climate change into a land development manual which sets minimum design standards. Palmerston North City Council indicated that climate change is addressed in engineering standards. Whangarei District Council imbeds climate change in design through its Environmental Engineering Standards (EES).
### Stormwater System Design
- Tauranga City Council considers climate change in designing for flood hazards and coastal inundation.
- Kaipara District Council allow for Climate Change in their stormwater design and standards.
- Christchurch has Climate Change incorporated in Land Drainage designs.
- Selwyn and Auckland Council have addressed Climate Change in a Stormwater Code of Practice.
- Western Bay have climate change parameters used for stormwater network design.

### Modelling Considerations
- Ashburton “Modelling accounts for future development and climate change demands.” Dunedin City Council has forecast changes to climate-related variables (e.g., rainfall intensity) included in hydraulic modelling scenarios which are used as the basis for design calculations.
- Wellington Water’s councils has the likely effects of climate change integrated into the water supply strategic planning tool (Sustainable Yield Model (SYM)). Previous assessments have included the effect of climate change on the capacity and timing of future source upgrades, and the expected impact of sea level rise on abstraction from the Waiwhetu aquifer. The SYM has recently been updated by NIWA consistent with the outcomes of the latest IPCC fifth assessment.

### Project Specific Design Considerations
- Kapiti Coast District Council included Climate Change in the design of their river recharge with ground water scheme, which includes saline intrusion monitoring.
- Waipa has a number of projects which will assist in climate change adaptation; construction of a new reservoir to increase water storage, installation of universal water metering (to reduce customer demand), Drought Management Plans updated three-yearly, and planned capacity upgrades for water and wastewater plants to cover increased demands.
- Kaipara District Council has revised Finished Floor Levels because of sea level rise.
- South Taranaki District Council had moved the location of upgraded Kapuni Water Treatment Plant away from river for flood/lahar protection and instituted an Inflow and Infiltration reduction program to account for increased rainfall. Growth and demand forecasts also account for predicted climatic changes.
9.1.1 Climate Change Projections

Participants were asked to provide information about the projected changes they were anticipating for sea-level rise, rainfall return period, and average annual rainfall. In each instance, a wide variety of responses was received, indicating, in general, that participants lack reliable information sources.

Data sources for most future projections were generally not cited. The sources that were listed were very variable. Tasman District Council based its predictions on a 2015 report produced by NIWA for the Council. Councils in the Wellington Region used 2008 Ministry for the Environment figures. Dunedin City Council used Ministry for the Environment figures from 2016.

Some councils had commissioned their own studies to inform their climate-change considerations. For example, Waipa had a climate-change report produced by CH2M Beca Ltd in 2013 to report on the impact of climate change on 3 Waters services. Central Otago was using the report “The Past, Present and Future Climate of Central Otago” written by Bodeker Scientific.

This is leading to inconsistent assumptions being used for climate change planning around New Zealand. An example of this is shown in Figure 60, which shows sea-level rise allowances for those who listed this by year. A table showing a full list of responses provided is included in Volume 2 of the report.
9.2 Emergency Management Plans

The majority of participants (78%) have in place Emergency Management Plans. The nature and extent vary significantly. A selection of participant responses is shown here. A full list of responses is included in Volume 2.

Kapiti Coast District Council has completed the following emergency and risk planning studies:

- Treatment Plants Earthquake Risk Reduction Study
- Reservoirs structural assessment and auto shut valve installation 2004-2010
- Business Continuity Plans for water treatment and operations, updated on a bi-annual basis.
- Council Civil Defence Emergency Plan that details planning and response procedures.
- Business continuity plan
- Lifelines response plan
- Asset criticality framework

Dunedin City Council is currently building Business Continuity Plans for the 3 Waters using the Water Research Foundation, EPA and American Water Works Associations, Business Continuity Plan for Water Utilities Guidance Document. The plans will cover the first 30 days of any event that disrupts business as usual (BAU) process.

It is also developing a suite of Emergency Response Plans, to give an overview of processes for the first three to four days following an event, additional to water safety plans. So far included are processes to guide for:

- Disruption to BAU operations
- Contaminated water
- Drinking water tankers
- Flushing the water system in residential properties and smaller buildings
- Flushing the water system in a large building
- Lifting a boil water notice
- Earthquake
- Landslide
**Tasman District Council** are currently formulating a Water Emergency Plan that outlines a call tree (communication model), Bacteria Transgression Procedures, Chlorine Dosing Procedures, Issuing a Boil Water Notice Procedures, Contingency Plans, and identifying critical control points. Staff are also updating Water Safety Plans for each water supply scheme which has an identified specific contingency for each scheme. Other documents outline procedures in the event of a wastewater overflow.

**South Taranaki District Council** has a Business Continuity Plan that includes water supply and wastewater. Significant hazards covered include earthquakes, volcanic hazards (ashfall and lahars), damaging winds, floods and pandemic.

**Wellington group of councils** scenarios considered are:
- Tsunami
- Earthquake
- Severe storm
- Prolonged power outage
- Loss of communication or control system capability
- Contamination of water supply
- Loss/lack of raw water

**Christchurch City Council** has developed plans for water supply contamination events, loss of supply in zones (emergency valves), drainage flooding, and wastewater overflow response, and clean up.

**Tauranga City Council** has in place an Incident Response Plan, Business Continuity Plan, and Drought Management Protocol (for high water demand).

**Marlborough District Council’s Assets and Services Department** has developed Emergency Response Plans. Earthquake and flood are predominant risks, while other risks are more frequent but with lesser consequences. It is also learning more about tsunami. Plans are exercised using real and fictional scenarios.

**Auckland Council** has the following plan types in addition to a civil defence programme:
- Business Continuity Plans (BCP)
- Incident Response Plans (IRP)
- Contractors’ contingency plans

**South Taranaki District Council** has a Business Continuity Plan that includes water supply and wastewater. Significant hazards covered include earthquakes, volcanic hazards (ashfall and lahars), damaging winds, floods and pandemic.
9.3 Firefighting water supplies

The New Zealand Fire Service Firefighting Water Supplies Code of Practice (Standards New Zealand, 2008) provides direction on what constitutes a sufficient supply of water for firefighting in urban fire districts.

Participants were asked to provide information on the percentage of fire hydrants they inspected in the previous five years and the number of key hydrants that do not meet testing requirements of the code. Results for the twenty participants that provided information are shown in Figure 61. Kapiti Coast noted that while they do not test hydrants themselves the local file brigade to. This may be the case with other participants, potentially explaining the low number of responses to this question.
9.4 Backup-generation

Information on the number of back-up generators on water and wastewater treatment plants and pump stations is shown in Volume 2. The total number across all participants is shown in the table below.

Figure 62: Number of treatment plants with backup generation

![Graph showing number of treatment plants with backup generation.]

Figure 63: Number of pump stations with backup generation

![Graph showing number of pump stations with backup generation.]

9.5 Water storage

Participants have a median of 1.36 days of water stored in their systems, and a median average reservoir level of 86%. The average number of days of water storage, and reservoir levels per participant, are shown in Volume 2.

Figure 64: Average days storage in reservoirs and average reservoir level

![Graph showing average days storage in reservoirs and average reservoir level.]

<table>
<thead>
<tr>
<th>Water treatment plants</th>
<th>Wastewater treatment plants</th>
</tr>
</thead>
<tbody>
<tr>
<td>With backup generation</td>
<td>Without backup generation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wastewater pumps</th>
<th>Water pumps</th>
</tr>
</thead>
<tbody>
<tr>
<td>With backup generation</td>
<td>Without backup generation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wastewater pumps</th>
<th>Water pumps</th>
</tr>
</thead>
<tbody>
<tr>
<td>205</td>
<td>112</td>
</tr>
<tr>
<td>148</td>
<td>43</td>
</tr>
<tr>
<td>2416</td>
<td>738.5</td>
</tr>
<tr>
<td>272</td>
<td>159.5</td>
</tr>
</tbody>
</table>
9.6 Flooding

9.6.1 Flooding events

The number of flooding events recorded in 2016/17 increased by 62% from 2015/16, and the number of habitable floors affected by flooding rose by 155%. Gross numbers are summarised in Figure 65 and per participant results are available in Volume 2.

Figure 65: Number of flooding events and habitable floors impacted

<table>
<thead>
<tr>
<th></th>
<th>2016/17</th>
<th>2015/16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flooding events</td>
<td>105</td>
<td>65</td>
</tr>
<tr>
<td>Habitable floors</td>
<td>222</td>
<td>87</td>
</tr>
</tbody>
</table>

9.6.2 Flood design standards

The number of participants targeting various levels of service for the design of primary and secondary stormwater networks is summarised in Figure 66 and Figure 67.

The primary network typically consists of a network of pipes, culverts, and soak holes designed to minimise nuisance flooding by collecting and discharging stormwater from moderate rainfall events into streams and other watercourses. The secondary network refers to the stormwater flow path when the primary system is overloaded, and typically includes drains and other overland flow paths through private property and along roadways, designed to convey excess stormwater with a minimum of damage.

The figures show the annual exceedance probability (AEP) for both primary and secondary networks, i.e. the chance or probability of a flooding event occurring annually. If different levels of service exist across a participant’s jurisdiction, participants have been asked to provide the value used across the largest proportion of the catchment.

Figure 66: Number of participants employing various design standards for the primary network

<table>
<thead>
<tr>
<th>AEP (%)</th>
<th>4%</th>
<th>5%</th>
<th>10%</th>
<th>15%</th>
<th>20%</th>
<th>No response</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>3</td>
<td>15</td>
<td>1</td>
<td>14</td>
<td>9</td>
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</tbody>
</table>

Figure 67: Number of participants employing various design standards for the secondary network

<table>
<thead>
<tr>
<th>AEP (%)</th>
<th>1%</th>
<th>1.50%</th>
<th>2%</th>
<th>5%</th>
<th>10%</th>
<th>No response</th>
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<tbody>
<tr>
<td></td>
<td>19</td>
<td>1</td>
<td>11</td>
<td>1</td>
<td>1</td>
<td>9</td>
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## APPENDIX 1: Participant Abbreviations

<table>
<thead>
<tr>
<th>Participant name</th>
<th>Report abbreviation</th>
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<tbody>
<tr>
<td>Ashburton District Council</td>
<td>Ashburton</td>
</tr>
<tr>
<td>Auckland Council</td>
<td>Auckland Council</td>
</tr>
<tr>
<td>Central Otago District Council</td>
<td>Central Otago</td>
</tr>
<tr>
<td>Christchurch City Council</td>
<td>Christchurch</td>
</tr>
<tr>
<td>Clutha District Council</td>
<td>Clutha</td>
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<td>Dunedin City Council</td>
<td>Dunedin</td>
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<td>Gore</td>
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<td>Hamilton City Council</td>
<td>Hamilton</td>
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<td>Hauraki District Council</td>
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<tr>
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<td>Marlborough</td>
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<tr>
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<td>Masterton</td>
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<tr>
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<td>Napier</td>
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<tr>
<td>New Plymouth District Council</td>
<td>New Plymouth</td>
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<td>Otorohanga</td>
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<tr>
<td>Palmerston North City Council</td>
<td>Palmerston North</td>
</tr>
<tr>
<td>Queenstown Lakes District Council</td>
<td>Queenstown Lakes</td>
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<td>Rotorua District Council</td>
<td>Rotorua</td>
</tr>
<tr>
<td>Ruapehu District Council</td>
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<tr>
<td>Selwyn District Council</td>
<td>Selwyn</td>
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<tr>
<td>South Taranaki District Council</td>
<td>South Taranaki</td>
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</table>

<table>
<thead>
<tr>
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<th>Report abbreviation</th>
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<td>Stratford</td>
</tr>
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</tr>
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<td>Tauranga City Council</td>
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<td>Thames - Coromandel District Council</td>
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<td>Timaru</td>
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<td>Waimakariri District Council</td>
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<td>Waipa District Council</td>
<td>Waipa</td>
</tr>
<tr>
<td>Wairoa District Council</td>
<td>Wairoa</td>
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<tr>
<td>Watercare Services Ltd</td>
<td>Auckland</td>
</tr>
<tr>
<td>Wellington City Council</td>
<td>Wellington Central</td>
</tr>
<tr>
<td>Lower Hutt City Council</td>
<td>Lower Hutt</td>
</tr>
<tr>
<td>Porirua City Council</td>
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<tr>
<td>Wellington Regional Council</td>
<td>Wellington Region</td>
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<tr>
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<td>Upper Hutt</td>
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<tr>
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<td>Western Bay of Plenty</td>
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<tr>
<td>Whakatane District Council</td>
<td>Whakatane</td>
</tr>
<tr>
<td>Whangarei District Council</td>
<td>Whangarei</td>
</tr>
</tbody>
</table>
APPENDIX 2: Quality assurance processes

Data in the report is manually entered by participants. Participants rate the confidence level of data they provided using a 5 to 1 descending scale, with 5 being very high confidence, and 1 being very low. The definition of each data confidence level is provided in Table 8. Where data confidence is low, highly variable, or showing a noteworthy trend, data confidence has been included in the report.

Data quality checks have followed the process shown here.
Table 8: Data quality definitions used in the NPR

<table>
<thead>
<tr>
<th>RATING</th>
<th>DESCRIPTION</th>
<th>PROCESSES</th>
<th>ASSET DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Highly reliable/ Audited</td>
<td>Strictly formal process for collecting and analysing data. Process is documented and always followed by all staff. Process is recognised by industry as best method of assessment.</td>
<td>Very high level of data confidence. Data is believed to be 95-100% complete and + or - 5% accurate. Regular data audits verify high level of accuracy in data received.</td>
</tr>
<tr>
<td>4</td>
<td>Reliable/ Verified</td>
<td>Strong process to collect data. May not be fully documented but usually undertaken by most staff.</td>
<td>Good level of data confidence. Data is believed to be 80-95% complete and + or - 10% to 15% accurate. Some minor data extrapolation or assumptions has been applied. Occasional data audits verify reasonable level of confidence.</td>
</tr>
<tr>
<td>3</td>
<td>Less Reliable</td>
<td>Process to collect data established. May not be fully documented but usually undertaken by most staff.</td>
<td>Average level of data confidence. Data is believed to be 50-80% complete and + or - 15 to 20% accurate. Some data extrapolation has been applied based on supported assumptions. Occasional data audits verify reasonable level of confidence.</td>
</tr>
<tr>
<td>2</td>
<td>Uncertain</td>
<td>Semi-formal process usually followed. Poor documentation. Process to collect data followed about half the time.</td>
<td>Not sure of data confidence, or data confidence is good for some data, but most of dataset is based on extrapolation of incomplete data set with unsupported assumptions.</td>
</tr>
<tr>
<td>1</td>
<td>Very uncertain</td>
<td>Ad hoc procedures to collect data. Minimal or no process documentation. Process followed occasionally.</td>
<td>Very low data confidence. Data based on very large unsupported assumptions, cursory inspection and analysis. Data may have been developed by extrapolation from small, unverified data sets.</td>
</tr>
<tr>
<td>0</td>
<td>No data</td>
<td>No process exists to collect data.</td>
<td>No data available.</td>
</tr>
</tbody>
</table>


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1 INTRODUCTION

This section of the report shows comparative data. For sector wide trends and contextual information on data refer to Volume 1 of the report. Figures in Volume 1 and Volume 2 have both been categorised into the groupings shown in Figure 1.

Not all participants provided data for all measures. Only participants who provided data have been included in figures. Where participants names are listed on histograms but no data appears, this is because a 0 value has been provided.

All values are GST exclusive unless otherwise noted.

When making comparisons of participants it is important to consider the impact of service area characteristics impact on performance. Some characteristics that impact on performance are covered in this report: connection density, tourist numbers, and service coverage. Other factors such as climate, topography and soil type can also have large performance impacts, however are not included in this report.
2 SECTOR OVERVIEW

2.1 Staffing

Figure 2: Number of internal staff, permanent contractors and vacancies per 1000 properties on the stormwater and wastewater system

1 The number of full time employees not on the organisations payroll but exclusively involved in the delivery of 3 waters services for the organisation. Does not include consultancies contracted to perform one of tasks.
2.1.1 Training

Figure 3: The average training budget allocated for each member of three water staff.

---

Figures for the Wellington Group of Council, do not include mandatory Health and Safety training which is received by all staff. Whakatane figures are only for the assets team. The figure provided by Waimakariri includes travel costs.
**Table 1: Training development plans used for the majority of three water staff**

<table>
<thead>
<tr>
<th>Participant</th>
<th>Training Plans in Place Yes/No</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timaru</td>
<td>Yes</td>
<td>Along with D&amp;W Training records</td>
</tr>
<tr>
<td>Tasman</td>
<td>Yes</td>
<td>Addressed as part of performance management conversations</td>
</tr>
<tr>
<td>Tauranga</td>
<td>Yes</td>
<td>Blue Print (Staff Performance and development process)</td>
</tr>
<tr>
<td>Stratford</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Selwyn</td>
<td>Yes</td>
<td>These are across Council</td>
</tr>
<tr>
<td>Queenstown Lakes</td>
<td>Yes</td>
<td>Annual training plans developed for all 3</td>
</tr>
<tr>
<td>Otorohanga</td>
<td>Yes</td>
<td>Working progress</td>
</tr>
<tr>
<td>New Plymouth</td>
<td>Yes</td>
<td>Plans are in place for all staff, stored in HR</td>
</tr>
<tr>
<td>Napier</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Masterton</td>
<td>Yes</td>
<td>Training and development is assessed during performance reviews or as required.</td>
</tr>
<tr>
<td>Mackenzie</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Kapiti Coast</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Kaipara</td>
<td>Yes</td>
<td>As part of the 6 monthly and Annual Performance Development Plan</td>
</tr>
<tr>
<td>Invercargill</td>
<td>Yes</td>
<td>Corporate Performance and Development</td>
</tr>
<tr>
<td>Hamilton</td>
<td>Yes</td>
<td>Combination of Training matrices developed for the relevant depts. In order to identify and book legislative, industry and other relevant training. Training needs also identified via HR driven Performance Development Program</td>
</tr>
<tr>
<td>Gore</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Clutha</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Christchurch</td>
<td>Yes</td>
<td>Performance Review and Development</td>
</tr>
<tr>
<td>Ashburton</td>
<td>Yes</td>
<td>Included in performance and development</td>
</tr>
<tr>
<td>Upper Hutt, Greater Wellington, Porirua, Lower Hutt, Wellington</td>
<td>Yes</td>
<td>Performance development Plans developed annually and updated quarterly.</td>
</tr>
<tr>
<td>Waipa</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Waimakariri</td>
<td>Yes</td>
<td>Training development plans are part of the Performance Review process.</td>
</tr>
<tr>
<td>Watercare</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Western Bay of Plenty</td>
<td>Yes</td>
<td>Training and development plans reviewed</td>
</tr>
<tr>
<td>Thames - Coromandel</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Taupo</td>
<td>Yes</td>
<td>Training plans are in place for operations staff, national standards etc...</td>
</tr>
<tr>
<td>South Taranaki</td>
<td>Yes</td>
<td>6 monthly Performance Development</td>
</tr>
<tr>
<td>Rotorua</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Palmerston North</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Marlborough</td>
<td>Good training plans for plant operators and</td>
<td></td>
</tr>
<tr>
<td>Whakatane</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Wairoa</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Whangarei</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Central Otago</td>
<td>No</td>
<td>no formalised training plans developed, but</td>
</tr>
<tr>
<td>Auckland Council</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Hauraki</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Dunedin</td>
<td>Yes</td>
<td>Training development plans usually come out of the PDR process with staff as well as key</td>
</tr>
<tr>
<td>Ruapehu</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Waikato</td>
<td>Yes</td>
<td>Staff have ongoing continuous training made</td>
</tr>
<tr>
<td>Rangitikei</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

**Waipa**

Training development plans are part of the Performance Review process.

**Watercare**

- Addressed as part of performance management conversations
- Training and development plans are part of the Performance Review process.
- Training plans are in place for operations staff, national standards etc...
- 6 monthly Performance Development
- 6 monthly Performance Development Plan
- 6 monthly Performance Development Program
- Training development plans usually come out of the PDR process with staff as well as key
- Staff have ongoing continuous training made
- Staff have ongoing continuous training made
2.2 Health and Safety

Figure 4: Near miss reports per staff member (internal and contracted) [CB12/(CB10+CB11)]
Figure 5: Lost time injuries per staff member (internal and contracted) \([\text{CB13}/(\text{CB10}+\text{CB11})]\)
2.3 Participant Characteristics

Figure 6: Water supply service coverage
Figure 7: Wastewater service coverage
Figure 8: Tourist numbers
Figure 9: Water supply connection density (properties/km)
Figure 10: Wastewater connection density (properties/km)
3 PUBLIC HEALTH AND ENVIRONMENTAL PROTECTION

3.1 Wastewater overflows

Figure 11: Dry weather overflows per 1000 properties
Figure 12: Wet weather overflows per 1000 properties

Wairoa has 140.3 wet weather overflows per 1000 properties however they have been removed from the figure as they are a large outlier.
4 CUSTOMER FOCUS

4.1 Attendance and resolution times for system faults

Figure 13: Median time taken to attend and respond to urgent fault’s or unplanned interruption’s to the water supply system.

The diagram shows the median resolution time and median attendance time for urgent water supply call-outs across different regions. The regions are categorized into Large, Medium, and Small, each with their own distribution of median resolution and attendance times. The bars for each region indicate the frequency distribution of these times, with the height representing the number of occurrences.
Figure 14: Median time taken to attend and respond to non-urgent fault’s or unplanned interruption’s to the water supply system

Median resolution time (hours)   Median attendance time (hours)
Figure 15: Median time taken for the local authority to attend and respond to sewerage overflows or other faults in the local authority's sewerage system

Median resolution time (hours)   Median attendance time (hours)
Figure 16: Median time taken by organisations to attend call outs in relation to a flooding event
4.2 Charges

Figure 17: Residential water charges (GST inclusive) for a connection using 200m³ year

Whakatane have 3 separate schemes, two of which are charged volumetrically. Figures used in this benchmarking graph are the average charges related to the two volumetric schemes. The third scheme is charged a fixed rate of $224.21/year.

Taupo has different charging regimes for each of their 21 water schemes. The benchmarking figures shown in this graph are the average of schemes charges fixed rates. A further 8 schemes are charged using a rate applied based on land value.

Ruapehu charges separate rates for each of their water schemes. Values shown here exclude 3 schemes which have no fixed charges, where rates vary from $775 to $1,762.50.
Figure 18: Residential wastewater charges (GST inclusive) for a connection using 200m$^3$ of water$^5$

The value for Dunedin shows the combined drainage rate which includes wastewater and stormwater charges.

---

$^5$ The value for Dunedin shows the combined drainage rate which includes wastewater and stormwater charges
Stormwater charges are commonly included as a component of General Rates or Uniform Annual General Rates. Some, but not all, participants have determined stormwater charges based on average property values in the district, multiplied by the proportion of the general charge that relates to stormwater.

\footnote{Stormwater charges are commonly included as a component of General Rates or Uniform Annual General Rates. Some, but not all, participants have determined stormwater charges based on average property values in the district, multiplied by the proportion of the general charge that relates to stormwater.}
Volumetric charges are not always linearly applied. Different forms of charging include (but are not limited to) free water allowances and stepped tariffs.

---

7 Volumetric charges are not always linearly applied. Different forms of charging include (but are not limited to) free water allowances and stepped tariffs.
### Table 2: Trade waste contaminant charges (GST inclusive)

<table>
<thead>
<tr>
<th></th>
<th>Solids</th>
<th></th>
<th>Oxygen Demand</th>
<th>Nutrients</th>
<th>Heavy metals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SS ($/kg)</td>
<td>TSS ($/kg)</td>
<td>COD ($/kg)</td>
<td>CBOD ($/kg)</td>
<td>BOD ($/kg)</td>
</tr>
<tr>
<td>Whangarei</td>
<td>0.58</td>
<td>0.52</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Taranaki</td>
<td>2.51 [Eltham]</td>
<td>1.10 [Hawera]</td>
<td>0.42 [Other]</td>
<td>0.5 [Eltham]</td>
<td>0.46 [Hawera]</td>
</tr>
<tr>
<td>Rotorua</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marlborough</td>
<td>Charge (price not provided)</td>
<td>Charge (price not provided)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dunedin</td>
<td>0.19</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Plymouth</td>
<td>0.88</td>
<td></td>
<td>2.54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Invercargill</td>
<td>0.359</td>
<td></td>
<td>0.395</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gore</td>
<td>0.42c/m3</td>
<td></td>
<td>0.33c/m3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Christchurch</td>
<td>0.36</td>
<td></td>
<td>0.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ashburton</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper Hutt</td>
<td>0.91</td>
<td>0.36</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waimakariri</td>
<td>Charge (price not provided)</td>
<td>Charge (price not provided)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hutt</td>
<td>0.91</td>
<td>0.36</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wellington</td>
<td>0.31 [Up to 1,575kg/day]</td>
<td>0.57 [Above 1,575kg/day]</td>
<td>0.32 [Up to 3,150kg/day]</td>
<td>0.71 [Above 3,150kg/day]</td>
<td></td>
</tr>
<tr>
<td>Tauranga</td>
<td>1.73</td>
<td></td>
<td>0.66</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Palmerston North</td>
<td>0.7</td>
<td></td>
<td>0.4345</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

Hauraki, Hamilton, Waipa, Selwyn also noted that they use contaminant based charges, however information was not provided on what these charges are.
5 ECONOMIC SUSTAINABILITY

5.1 Revenue

Figure 21: Revenue collected per property serviced

---

Per property revenue figures are skewed in areas with high non-residential water usage e.g. South Taranaki has 7 major connections which contribute to 16% of total consumption.
5.2 Expenditure

Figure 22: Operational expenditure per property serviced
Figure 23: Capital expenditure per property serviced
5.3 Financial Benchmarks

Figure 24: Actual expenditure as a proportion of budgeted expenditure across water, wastewater and stormwater networks
Figure 25: Interest as a proportion of revenue (excluding developer contributions)  

Rotorua was a significant outlier and so has been excluded from the figure.
Figure 26: Ratio of revenue to operating costs for water, wastewater and stormwater

[Bar chart showing the ratio of revenue to operating costs for different regions and services.]
6 RELIABILITY

6.1 Water Supply Interruptions

Figure 27: Number of unplanned interruptions to the water supply per 1000 properties connected
Figure 28: Average water pipeline age (years)
Figure 29: Average wastewater pipeline age (years)
Figure 30: Average stormwater pipeline age (years)
Figure 31: Proportion of pipelines that have not yet been assessed for a condition grading

RELIABILITY
Figure 32: Percentage of water pipelines that have been assessed in a poor or very poor condition
Figure 33: Percentage of wastewater pipelines that have been assessed in a poor or very poor condition
Figure 34: Proportion of wastewater pipelines that have been assessed in a poor or very poor condition
## Figure 35: Inflow and Infiltration programs and KPI’s

<table>
<thead>
<tr>
<th>Participant</th>
<th>Performance Indicator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timaru</td>
<td>Under development</td>
<td>Modelling of reticulation and pump stations. Inspection of private properties is ongoing.</td>
</tr>
<tr>
<td>Tasman</td>
<td>Contractor is constantly on look out for I/I and repairs completed as issues found. Annual budgets for investigations and CCTV to accurately locate sources or I/I, catchment by catchment. Owners of problem private reticulation instructed to make repairs at own cost. In year two of long term program. Working with building inspectors to improve water tightness of new private plumbing - this is proving highly successful. Over time improvements to stormwater system and secondary flow paths will also aid with I/I outcomes.</td>
<td></td>
</tr>
<tr>
<td>MacKenzie</td>
<td>Smoke testing to target I/I</td>
<td></td>
</tr>
<tr>
<td>Kapiti</td>
<td>Under development</td>
<td>Recalibrated model for Paraparaumu/Waikanae identified areas for further investigation.</td>
</tr>
<tr>
<td>Invercargill</td>
<td>Monitoring of Constructed Overflows Flow monitoring and Hydraulic Model to identify RDII areas Mains and Laterals Renewal Programme</td>
<td></td>
</tr>
<tr>
<td>Hamilton</td>
<td>0-22% range across 27 catchments Investigated and analysed the severity of I/I to include featured in the renewal strategy to be implemented during the 18-28 LTP (funding approval dependant)</td>
<td></td>
</tr>
<tr>
<td>Christchurch</td>
<td>Estimate 15% (based on a small number of catchments)</td>
<td></td>
</tr>
<tr>
<td>Ashburton</td>
<td>Gully trap/downpipe inspection programme. CCTV surveys.</td>
<td></td>
</tr>
<tr>
<td>Palmerston North.</td>
<td>Updating and re-calibrating of wastewater model in progress. Renewal of wastewater pipes has been prioritised in catchments with high I&amp;I indicators. A targeted I&amp;I city wide programme is to be initiated from 2018-19 (subject to 10 year plan adoption)</td>
<td></td>
</tr>
<tr>
<td>Waipa</td>
<td>CCTV investigation. Pipe renewals</td>
<td></td>
</tr>
<tr>
<td>Wairoa</td>
<td>CCTV program for 30% of network complete. Pipe relining commenced.</td>
<td></td>
</tr>
<tr>
<td>Watercare</td>
<td>I&amp;I program commenced in Mellons Bay with 1560 properties investigated and 44 defects identified. 50% of defects have been remedied by property owners.</td>
<td></td>
</tr>
<tr>
<td>Western Bay</td>
<td>Online monitoring underway of WW through network Review of I&amp;I based on flow monitoring and wastewater model undertaken.</td>
<td></td>
</tr>
<tr>
<td>Ruapehu</td>
<td>CCTV, smoke testing, pump station checks</td>
<td></td>
</tr>
<tr>
<td>Dunedin</td>
<td>All renewals for the foreseeable future are targeted at areas of high I&amp;I</td>
<td></td>
</tr>
<tr>
<td>Tauranga</td>
<td>For an AR10 (1hr duration) – April 2013:- WWTP1 – SWI 6.5, GWI1 4.71%, GWI2 231.5 L/p/d, RDII 0.62% WWTP2 – SWI 2.61, GWI1 17.2%, GWI2 221.5 L/p/d, RDII 0.66%</td>
<td></td>
</tr>
<tr>
<td>South Taranaki</td>
<td>KPI metrics measured for each treatment plant include GWI1, GWI2, RDII and PWWF Internal metric of max instantaneous RDII used to represent inflow up to 4 hours after rainfall Weighted average combined 2016-2017 annual RDII 7.3% Max instantaneous RDII 53%, GWI1 45% GWI2 359l/p/d, PWWF 7.2.</td>
<td></td>
</tr>
<tr>
<td>Wellington City, Porirua, Hutt, Upper Hutt</td>
<td>Under development: anticipate a 10% threshold</td>
<td></td>
</tr>
</tbody>
</table>
Figure 36: Volume of water supplied to participant systems in 2016-17 (m3)

- Non-residential Water Consumption [WSB7]
- Residential water consumption [WSB5-WSB7]
Figure 37: Volume of water supplied (m³/year) to large size participant systems
Figure 38: Volume of water supplied (m3/year) to medium size participant systems in the north island.
Figure 39: Volume of water supplied (m3/year) to medium size participant systems in the south island
Figure 40: Volume of water supplied (m³/year) to small size participant systems
Figure 41: Percentage of non-residential connections with water meters.
Figure 42: Total number of water restrictors installed on participant systems

![Bar chart showing the total number of water restrictors installed on participant systems, categorized by city or region.](chart.png)
Figure 43: Current annual real water losses for large participant systems (litres/service connection/day)
Figure 44: Current annual real water losses for medium size participant systems in the north island (litres/service connection/day)
Figure 45: Current annual real water losses for medium size participant systems in the south island (litres/service connection/day)
Figure 46: Current annual real water losses for small size participant systems (litres/service connection/day)
Figure 47: Energy intensity of the water supply systems (GJ/m³)
Figure 48: Energy intensity of wastewater systems (GJ/m³)
## 8 RESILIENCE

### 8.1 Climate Change

Table 3: Sea level rise projections for councils with coast lines

<table>
<thead>
<tr>
<th>Participant</th>
<th>Projection</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tasman</td>
<td>Plan for a sea level rise of 0.5m for the period 2090-2099, but consider the consequences of SLR of at least 0.8m</td>
<td>The official advice is plan for a sea level rise of 0.5m for the period 2090-2099, but consider the consequences of SLR of at least 0.8m in this same period. Beyond 2100, allow 10mm/year additional. The latest MFE advice (in draft) is that to plan for a sea level rise will be of up to 0.8 by 2090 and 1.0 m for the period to 2115 100 years. For sensitive infrastructure plan for 1.9 m by 2150. It will be assumed that this is a realistic estimate of sea level rise unless/until MFE revises its official advice. Predominantly related to Stormwater</td>
</tr>
<tr>
<td>Tauranga</td>
<td>0.3m to 1.25m</td>
<td>0.3m SLR (climate change to 2055) used for current planning, moving to 1.25m (climate change to 2130) for future urban growth structure planning</td>
</tr>
<tr>
<td>Selwyn</td>
<td>0.08-0.23m by 2046</td>
<td>Climate Change Report</td>
</tr>
<tr>
<td>Otorohanga</td>
<td>1.7mm</td>
<td>Per year over the 20th Century</td>
</tr>
<tr>
<td>New Plymouth</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Masterton</td>
<td>0.8m by 2090</td>
<td>GWRC climate change strategy. Tracking 0.8m sea level rise by 2090's.</td>
</tr>
<tr>
<td>Kapiti Coast</td>
<td>0.06 - 0.18 by 2030 - 0.8-1.0 by 2090</td>
<td></td>
</tr>
<tr>
<td>Kaipara</td>
<td>0.5m</td>
<td>Under tidal areas</td>
</tr>
<tr>
<td>Invercargill</td>
<td>800mm by 2100</td>
<td></td>
</tr>
<tr>
<td>Christchurch</td>
<td>1m by 2100</td>
<td>For all new stormwater works</td>
</tr>
<tr>
<td>Ashburton</td>
<td>0.5m</td>
<td>To 2100. Following Table 1 of Preparing for coastal change A guide for local government in New Zealand (MFE 2009)</td>
</tr>
<tr>
<td>Lower Hutt, Porirua, Wellington Region, Wellington City</td>
<td>1m</td>
<td>Service Plan growth and demand</td>
</tr>
<tr>
<td>Waimakariri</td>
<td>0.5m-1.0m</td>
<td>Most new infrastructure works has an allowance for sea level rise where applicable, either over a 50 or 100 year horizon.</td>
</tr>
<tr>
<td>Western Bay of Plenty</td>
<td>Only in District Planning</td>
<td>Initial modelling underway to assess effects of climate change on long term asset viability.</td>
</tr>
<tr>
<td>South Taranaki</td>
<td>0.15 within 30 years</td>
<td></td>
</tr>
<tr>
<td>Marlborough</td>
<td></td>
<td>The mathematical models used for designing infrastructure include a factor for uncertain future changes including more frequent &amp; intense storms, more rainfall, longer periods without rain. The exact assumptions used will depend on the life expectancy of the infrastructure being designed, cost and criticality and uncertainty on other factors such as growth, resilience, etc</td>
</tr>
<tr>
<td>Whakatane</td>
<td>WDC - Undertaking modelling projects over next few years when budget allows</td>
<td></td>
</tr>
<tr>
<td>Auckland Council</td>
<td>0.8m</td>
<td></td>
</tr>
<tr>
<td>Hauraki</td>
<td>Recognised and noted for future LTP</td>
<td></td>
</tr>
<tr>
<td>Dunedin</td>
<td>0.3 m to 2040, 1.6m to 2090 (upper end of range)</td>
<td></td>
</tr>
<tr>
<td>Rangitikei</td>
<td>Not used.</td>
<td>Sea level rise would affect Koitiata and Scotts Ferry, but this is not specifically included in design as a height/runup.</td>
</tr>
<tr>
<td>Participant</td>
<td>Projection</td>
<td>Comment</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Timaru</td>
<td>0.16</td>
<td>This is based on TDC Design Rainfall for 2 degree rise by 2090.</td>
</tr>
<tr>
<td>Tasman</td>
<td>Varies</td>
<td>Predominantly related to Stormwater.</td>
</tr>
<tr>
<td></td>
<td>depending</td>
<td>on the duration of the event.</td>
</tr>
<tr>
<td></td>
<td>from 3.5%</td>
<td>to 8.0%.</td>
</tr>
<tr>
<td>Tauranga</td>
<td>12% to 25%</td>
<td>12% increase in rainfall intensity for current planning (climate change to 2055), moving to 25% increase in rainfall intensity for future urban growth structure planning (climate change to 2130)</td>
</tr>
<tr>
<td>Queenstown Lakes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Otorohanga</td>
<td>2</td>
<td>According to a risk assessment undertaken by the Environment Waikato 2009</td>
</tr>
<tr>
<td>Palmerston North</td>
<td></td>
<td>2 degrees C applied to HIRDS outputs</td>
</tr>
<tr>
<td>New Plymouth</td>
<td>HIRD Data + 2.1 degree temp rise by 2090</td>
<td></td>
</tr>
<tr>
<td>Napier</td>
<td>1 in 50 years</td>
<td>Future climate change affects will be incorporated in the design standards</td>
</tr>
<tr>
<td>Masterton</td>
<td>0</td>
<td>GWRC climate change strategy 2015 &amp; NIWA 2016 GWRC report is unable to give predictions on increase or decrease in Masterton’s AEP. Masterton 2040 &amp; 2090 rainfall average is predicted to be similar to current levels but it is acknowledged that the likelihood of more frequent rain events will occur in Masterton District.</td>
</tr>
<tr>
<td>Mackenzie</td>
<td>6 - 28% increase</td>
<td></td>
</tr>
<tr>
<td>Kapiti Coast</td>
<td>-1% to +10% by 2030 &amp; 0% to +26% by 2090</td>
<td>Winter rainfall change. AEP change not calculated.</td>
</tr>
<tr>
<td>Hamiton</td>
<td>0</td>
<td>Has not changed. Already based on 2.1 Degree C Climate Change Design Level of Service as follows, AEP %, ARI years: Primary Systems Residential Area- 50, 2 Industrial Area- 20, 5 Commercial Area, Business, CBD- 10, 10 Community and Major Facilities- 10, 10 Parks, Reserves and Open Spaces- 50, 2 Rural and Future Urban- 50, 2 Transport Corridor- 50, 2 Secondary Systems Local Roads, Collector Roads, Off road systems- 1, 100 Residential - falling away from public road- 2, 50</td>
</tr>
<tr>
<td>Gore</td>
<td></td>
<td>This is generally considered on a case by case basis, the Council does not have a specific policy for this</td>
</tr>
<tr>
<td>Christchurch</td>
<td>No</td>
<td>No allowance for change in return period of events as this is irrelevant for stormwater, however allowance for a 16 % increase in storm intensity by 2100</td>
</tr>
<tr>
<td>Ashburton</td>
<td>43</td>
<td>Depends on the duration and intensity of the event. Response is for a 10% AEP event</td>
</tr>
<tr>
<td>Upper Hutt, Lower Hutt, Porirua, Wellington Region, Wellington City</td>
<td>0 to 50</td>
<td>Climate change and impacts assessment, MfE 2008. Return periods of heavy rainfall events in a range from no change to halving by 2040</td>
</tr>
<tr>
<td>Waipa</td>
<td></td>
<td>No % available in report. Waipa: Increased frequency of extreme rainfall events. Possibility of higher river levels. Waikato Region: Increased risk of inland flooding in the west and in river catchments in the Coromandel.</td>
</tr>
<tr>
<td>Waimakariri</td>
<td>0.16</td>
<td>All new infrastructure has an allowance of 16% for increase in rainfall intensities.</td>
</tr>
<tr>
<td>Western Bay of Plenty</td>
<td>YES - For stormwater</td>
<td>Only addressed through stormwater</td>
</tr>
</tbody>
</table>
### Table 5: Average annual rainfall projections

<table>
<thead>
<tr>
<th>Participant</th>
<th>Projection</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auckland Council</td>
<td>-3%</td>
<td>Predominantly related to Stormwater. The RCP4.5 and RCP8.5 projections indicate slightly more rainfall in most seasons except spring for much of the area of coastal plains adjacent to Tasman Bay (i.e. Motueka, Waimea plains) to 2040. By 2090 for RCP8.5, more rainfall is projected for the plains in summer, autumn, and especially winter. By 2090 under RCP8.5, the western part of Tasman District is projected to receive less rainfall (by less than 5%) in summer and autumn, but significantly more rainfall in winter (up to 40% in some parts).</td>
</tr>
<tr>
<td>Tasman</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tauranga</td>
<td>No long term change</td>
<td>Infrastructure design uses a model based on a 100 year rainfall history in Tauranga performed by Opus.</td>
</tr>
<tr>
<td>Selwyn</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Queenstown Lakes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Otorohanga</td>
<td>1250mm</td>
<td>According to a risk assessment undertaken by the Environment Waikato 2009</td>
</tr>
<tr>
<td>New Plymouth</td>
<td>HiRD Data + 2.1 degree temp rise by 2090</td>
<td></td>
</tr>
<tr>
<td>Masterton</td>
<td>0</td>
<td>GWRD climate change strategy 2015 - Rainfall in Masterton District is predicted to stay at 2015 levels by 2040 &amp; 2090. Though seasonal rainfall change is predicted IE Less rain Spring &amp; Winter, more rain in Summer &amp; Autumn. Increased drought periods and increased ‘Hot’ days are predicted for 2040 &amp; 2090.</td>
</tr>
<tr>
<td>Kapiti Coast</td>
<td>-2% to +7% by 2030 &amp; -7% to +14% by 2090</td>
<td></td>
</tr>
<tr>
<td>Kaipara</td>
<td>0.08</td>
<td>8% increase very 1°C</td>
</tr>
<tr>
<td>Invercargill</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Hamilton</td>
<td>14% Avg increase</td>
<td>Based on 2.1 deg C Climate Change</td>
</tr>
<tr>
<td>Christchurch</td>
<td>Yes</td>
<td>This has only been allowed for in water supply planning of future demand (decrease of 5% by 2100 - Source NIWA</td>
</tr>
<tr>
<td>Ashburton</td>
<td>16</td>
<td>To 2045. Figure cited in stormwater model build report.</td>
</tr>
<tr>
<td>Upper Hutt, Lower Hutt, Porirua, Wellington Region, Wellington City</td>
<td>0 to 13.4</td>
<td>Climate change and impacts assessment, MFE 2008. Flow volumes increase in a range from no change to 13.4% by 2038</td>
</tr>
<tr>
<td>Waipa</td>
<td>4% decrease (-23% to +16%)</td>
<td>Waipa: Average annual rainfall may not change significantly in the Waipa District. Waikato Region: Little change for Ruakura and Taupo. For example, spring rainfall in Ruakura could decrease by 4%; but depending on the model - lower to upper limit: -23% to +16%.</td>
</tr>
<tr>
<td>Waimakariri</td>
<td>0</td>
<td>The District is expecting longer dry periods but similar AAR. Not all projects allow for the secondary impacts of drier conditions.</td>
</tr>
<tr>
<td>Western Bay of Plenty</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>
## 8.2 Emergency Management Plans

<table>
<thead>
<tr>
<th>Council</th>
<th>Emergency Management Plan in place</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timaru</td>
<td>Yes</td>
<td>Draft Crisis and Emergency Response Management Guidelines has been prepared for natural and other events that could disrupt 3 waters operations (Document#930290)</td>
</tr>
<tr>
<td>Tasman</td>
<td>Yes</td>
<td>WATER: Staff are currently formulating a Water Emergency Plan that outlines a call tree (communication model), Bacteria Transgression Procedures, Chlorine Dosing Procedures, Issuing a boil Water Notice Procedures, Contingency Plans and identifying Critical Control Points. Furthermore, staff are updating Water Safety Plans for each water supply scheme which has a identified specific contingency for each scheme. We have also engaged a consultant to help with this process. STORMWATER: Currently we do not have any specific emergency plans related to the Stormwater Utility, aside from the Contractors plans or documentation. It is has been an area identified as requiring improvement.</td>
</tr>
<tr>
<td>Stratford</td>
<td>Yes</td>
<td>Water and Wastes Incident Response Plan available and is in the process of being reviewed.</td>
</tr>
<tr>
<td>Selwyn</td>
<td>Yes</td>
<td>Lifelines report</td>
</tr>
<tr>
<td>Queenstown Lakes</td>
<td>Yes</td>
<td>Contractor 'ERP's in place for CBD Flooding, Large WW overflow in vicinity of lake, Drinking water contamination event, Chlorine Gas leak etc</td>
</tr>
<tr>
<td>Otorohanga</td>
<td>Yes</td>
<td>Services have engaged electrical contractors to ready 3 waters plant and pump stations to receive generator power</td>
</tr>
<tr>
<td>New Plymouth</td>
<td>Yes</td>
<td>Incidents graded by severity and response take as part of response plans specific to the grade and any additional considerations that may arise from situation</td>
</tr>
<tr>
<td>Napier City Council</td>
<td>Yes</td>
<td>WELA lifelines document</td>
</tr>
<tr>
<td>Masterton</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Mackenzie</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Kaipara</td>
<td>Yes</td>
<td>Emergency response plans</td>
</tr>
<tr>
<td>Invercargill</td>
<td>Yes</td>
<td>Reliance placed on work done with Emergency Management Team and internal emergency response knowledge of Asset Managers and Engineering Services Group - development within improvement plan of current AMP's</td>
</tr>
<tr>
<td>Hamilton</td>
<td>Yes</td>
<td>Individual Business Continuity Plans have been developed for all three waters activities. Events covered are earthquake (seismic), flood, fire</td>
</tr>
<tr>
<td>Gore</td>
<td>No</td>
<td>Business Continuity plans are currently being developed</td>
</tr>
<tr>
<td>Clutha</td>
<td>Yes</td>
<td>Part of lifelines group</td>
</tr>
<tr>
<td>Christchurch</td>
<td>Yes</td>
<td>Specific plans have been developed for water supply contamination events, and loss of supply in zones (emergency valves) . Land drainage flooding events plan. Wastewater overflow response and clean up plan</td>
</tr>
<tr>
<td>Ashburton</td>
<td>Yes</td>
<td>High level plan developed. Some contingency plans exist for drinking water but detailed response plans are a work in progress.</td>
</tr>
<tr>
<td>Upper Hutt, Lower Hutt,</td>
<td>Yes</td>
<td>Scenarios considered: Tsunami, Earthquake, Severe Storm, Prolonged Power Outage, Loss of Communication or Control System Capability, Contamination of Water</td>
</tr>
<tr>
<td>Council</td>
<td>Emergency Management Plan in place</td>
<td>Details</td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>-----------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Porirua, Wellington Region, Wellington City</td>
<td>Yes</td>
<td>Supply, Loss/Lack of Raw Water, Terrorism/bomb threat/sabotage, Solar Storm, Snow, Serious Harm Assets considered: Water Supply, Wastewater, Stormwater, Interdependency with other lifeline utilities Phases: Reduction, Readiness, Response, Recovery</td>
</tr>
<tr>
<td>Waipa</td>
<td>Yes</td>
<td>Emergency Plans exist and emergency response scenarios are run through/roleplayed with staff quarterly to test the plans and ensure staff and networks are prepared in case of an emergency. Any opportunities for improvement or high risks are identified and plans updated accordingly.</td>
</tr>
<tr>
<td>Waimakariri</td>
<td>Yes</td>
<td>We have basic Business Continuity Plans and Emergency Response Plans</td>
</tr>
<tr>
<td>Watercare Services Ltd</td>
<td>Yes</td>
<td>Watercare maintains and regularly tests a range of Emergency / Incident Response and Business Continuity Plans including those to address loss of critical supporting systems and infrastructure.</td>
</tr>
<tr>
<td>Western Bay of Plenty</td>
<td>Yes</td>
<td>Emergency Management Plan is available - Currently being reviewed and updated</td>
</tr>
<tr>
<td>Taupo</td>
<td>Yes</td>
<td>We have developed business continuity plans for key areas.</td>
</tr>
<tr>
<td>South Taranaki</td>
<td>Yes</td>
<td>Business Continuity Plan for all activities including Water Supply, Wastewater - Significant Hazards covered include Earthquakes, Volcanic Hazards (Ashfall and Lahars), Damaging Winds, Floods and Pandemic. Engineering Group manager is Taranaki CDEM Group Controller and Asset Engineer and Manager are Lifelines Utility Coordination group members.</td>
</tr>
<tr>
<td>Rotorua</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Palmerston North</td>
<td>Yes</td>
<td>Manawatu-Wanganui Civil Defence Emergency Management Group Plan 2016-2021</td>
</tr>
<tr>
<td>Marlborough</td>
<td>Yes</td>
<td>Emergency response plans have been developed by the Assets &amp; Services Dept. Earthquake and flood are the predominant risks but other risks are more frequent but with lower consequences. We are learning more about tsunami but have less infrastructure within inundation zones. We take opportunities to exercise our plans both from real and fictional scenarios. WE are active participants in Marlborough Engineering Lifelines</td>
</tr>
<tr>
<td>Whakatane</td>
<td>No</td>
<td>Corporate plans existing for tsunami, earthquake, flood, town evacuation only. Certain components for critical Water, Wastewater and Stormwater infrastructure have emergency operating protocols</td>
</tr>
<tr>
<td>Wairoa</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Whangarei</td>
<td>Yes</td>
<td>Active involvement in Engineering Lifelines Northland Group. Internal business continuity plans and response plans as part of ISO documentation.</td>
</tr>
<tr>
<td>Central Otago</td>
<td>Yes</td>
<td>Earthquake and Flooding, at organisation level but not specific to 3 waters</td>
</tr>
<tr>
<td>Auckland Council</td>
<td>Yes</td>
<td>Plan Types: Business Continuity Plans (BCP), Incident Response Plans (IRP), Contractors’ contingency plans and also Civil defence programme</td>
</tr>
<tr>
<td>Hauraki</td>
<td>no</td>
<td></td>
</tr>
<tr>
<td>Dunedin City Council</td>
<td>Yes</td>
<td>The Dunedin City Council are currently building Business Continuity Plans for the 3 Waters using the Water Research Foundation, EPA and American Water Works Associations, Business Continuity Plan for Water Utilities: Guidance Document. The BCP documentation is designed to cover the first 30 days of any event that disrupts BAU. There has also been some processes developed around the BCP including; BCP development framework process, BCP activation process and Review of BCP The OCC are also developing a suite of Emergency Response Plans, so far included in this are processes to guide for: Disruption to BAU operations, Contaminated water, Drinking water tankers, Flushing residential properties and smaller buildings – water, Flushing the water system in a large building, Lifting a boil water notice, Earthquake, Landslide, Cyber security, Drought, Flooding These ERP’s are designed to give an overview of processes for the first 3-4 days following an event. There has been no development on recovery phase plans as of yet. Other documentation that has a impact on the business resilience to events includes the Infrastructure Strategy and the 3 Waters Strategic Statement, both of which take in to consideration planning for business resilience through to 2060. Water Safety Plans have also bee developed.</td>
</tr>
<tr>
<td>Rangitikei</td>
<td>Yes</td>
<td>All realistic scenarios are planned for, with the exception of solar flares. This includes various volcanic hazards, seismic, liquefaction, floods, etc.</td>
</tr>
</tbody>
</table>
Figure 49: Number of water treatment plants with and without backup generation

- Water treatment plants with backup generators
- Water treatment plants without backup generator
Figure 50: Number of water pump stations with and without backup generation

Water pumps with backup generators
Water pumps without backup generator
Figure 51: Number of wastewater treatment plants with and without backup generation

- Wastewater treatment plants with backup generators
- Wastewater treatment plants without backup generator
Figure 52: Number of wastewater pumps with and without backup generation

- Wastewater pumps with backup generators
- Wastewater pumps without backup generator
Figure 53: Days of treated water stored in reservoirs on average

[Diagram showing the days of treated water stored in reservoirs for different regions, with a comparison line at 1.36 days.]
Figure 54: Average level of water storage reservoirs

[Bar chart showing reservoir levels across different regions, with labels for various regions and reservoir sizes: Large, Medium, Small.]
Figure 55: Number of flooding events recorded and the number of habitable floors impacted per participant.

Flooding events

- Auckland
- Tauranga
- Christchurch
- Palmerston North
- Lower Hutt
- Wellington
- Hamilton
- Napier
- Napier North
- Napier South
- Rotorua
- Taupo
- Tauranga
- Whakatane
- Whakatane North
- Auckland East
- Auckland West
- Auckland Central

Habitable floors flooded

- Auckland
- Tauranga
- Christchurch
- Palmerston North
- Lower Hutt
- Wellington
- Hamilton
- Napier
- Napier North
- Napier South
- Rotorua
- Taupo
- Tauranga
- Whakatane
- Whakatane North
- Auckland East
- Auckland West
- Auckland Central

Legend:
- Green: Flooding events
- Purple: Habitable floors flooded
Figure 56: Annual Exceedance Probability of events designed to be contained by Primary and Secondary Stormwater networks.
WAIMAKARIRI DISTRICT COUNCIL

REPORT FOR INFORMATION

FILE NO and TRIM NO: WAT-03 / 180601061125

REPORT TO: Utilities and Roading Committee

DATE OF MEETING: 19 June 2018

FROM: Colin Roxburgh, Water Asset Manager

SUBJECT: Update on Nitrate Levels in Public Drinking Water Supplies

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

Department Manager

Chief Executive

1. SUMMARY

1.1 This report is to present the Utilities and Roading Committee with information on nitrate levels measured in public water supply sources within the district.

1.2 All levels measured on Council’s public drinking water supply schemes are less than the maximum acceptable value (MAV) in the Drinking-water Standards for New Zealand, and all but one of the primary sources are below 50% of the MAV.

1.3 The Poyntzs Road scheme has nitrate levels at approximately 80 – 90% of the MAV. A new source is required for this scheme to address this issue, as well as the protozoal compliance of the scheme with the Drinking-water Standards for New Zealand. There is budget in place as part of the 2018-28 Long Term Plan to have this project completed by the end of the 2019/20 financial year.

1.4 Staff are working closely with the Environment Canterbury to understand and manage the risk of nitrate levels potentially increasing in the future.

Attachments:

i. Nitrates in Drinking-water Frequently Asked Questions document (180531060916).

2. RECOMMENDATION

THAT the Utilities and Roading Committee:

(a) Receives report No. 180601061125.

(b) Notes that all the nitrate levels in public water supplies on all Council managed public drinking-water schemes within the district are below the maximum acceptable value in the Drinking-water Standards for New Zealand.

(c) Notes that the Poyntzs Road scheme has nitrate levels at approximately 80 – 90% of the maximum acceptable value, and that a new source is required for this scheme long term.
Notes that staff are actively working with Environment Canterbury to understand any long terms risks to the district’s supplies and how these can be managed and mitigated.

3. BACKGROUND

3.1 There is a growing interest in nitrate levels within groundwater in particular in the Canterbury region. This is partly in response to the release of some data by Environment Canterbury (ECan) and subsequent media stories.

3.2 Council has fifteen¹ public drinking-water supply schemes, and as part of demonstrating compliance of these schemes monitors nitrate levels.

3.3 Under the Drinking-water Standards for New Zealand (2008), chemical tests are required to be carried out every five years as a minimum. This testing includes measuring nitrate levels.

3.4 If a value is measured at more than 50% of the maximum acceptable value (MAV) then it is assigned as a Priority 2 determinant, and additional monitoring is required. In the case of nitrate, in the event that it is detected at more than 50% of the MAV, monthly nitrate samples are required.

3.5 Based on the above, for most of Council’s schemes nitrate is measured every five years where nitrate is below 50% of the MAV. The Poyntzs Road scheme is measured monthly as nitrate has been detected at more than 50% of the MAV.

3.6 The MAV for Nitrate Nitrogen is 11.3 g/m³. This gives the value of 50% of the MAV of 5.65 g/m³.

4. ISSUES AND OPTIONS

4.1. Table 1 and Figure 1 summarise the nitrate values for all Council managed public drinking-water schemes within the district. Where a scheme has multiple similar sources (such as the Smith Street well field for Rangiora), these values have been averaged together. Where a scheme has two different sources such as a shallow source and a deep source, these have been reported separately.

¹ Previous reports have referred to 16 public water supply schemes. There are now 15 schemes as Fernside has recently been joined to Mandeville. There will soon be 14 once the joining of Oxford Rural No.2 to Oxford Urban has been completed.
Table 1: Nitrate-N Values

<table>
<thead>
<tr>
<th>Source</th>
<th>Approximate Depth (m bgl)</th>
<th>Nitrate-N (g/m³)</th>
<th>Percentage of MAV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rangiora Deep (Smith Street)</td>
<td>154</td>
<td>0.65</td>
<td>6%</td>
</tr>
<tr>
<td>Rangiora Shallow (Ayers Street backup)</td>
<td>11</td>
<td>0.615</td>
<td>5%</td>
</tr>
<tr>
<td>Kaiapoi Deep</td>
<td>109</td>
<td>0.96</td>
<td>8%</td>
</tr>
<tr>
<td>Pegasus Deep</td>
<td>187</td>
<td>0.01</td>
<td>0%</td>
</tr>
<tr>
<td>Woodend Deep</td>
<td>208</td>
<td>0.01</td>
<td>0%</td>
</tr>
<tr>
<td>Cust Deep</td>
<td>77</td>
<td>0.21</td>
<td>2%</td>
</tr>
<tr>
<td>Ohoka Deep</td>
<td>84</td>
<td>0.35</td>
<td>3%</td>
</tr>
<tr>
<td>Ohoka Shallow (backup)</td>
<td>19</td>
<td>7.75</td>
<td>69%</td>
</tr>
<tr>
<td>Waikuku Beach Shallow</td>
<td>22</td>
<td>0.38</td>
<td>3%</td>
</tr>
<tr>
<td>West Eyreton Deep</td>
<td>98</td>
<td>1.87</td>
<td>17%</td>
</tr>
<tr>
<td>Mandeville Deep (Two Chain Road)</td>
<td>92</td>
<td>2.70</td>
<td>24%</td>
</tr>
<tr>
<td>Mandeville Shallow (Tram Road backup)</td>
<td>23</td>
<td>3.85</td>
<td>34%</td>
</tr>
<tr>
<td>Mandeville Shallow (Fernside backup)</td>
<td>18</td>
<td>1.54</td>
<td>14%</td>
</tr>
<tr>
<td>Oxford Urban Deep</td>
<td>123</td>
<td>1.21</td>
<td>11%</td>
</tr>
<tr>
<td>Oxford Rural No.1 (surface water)</td>
<td>1</td>
<td>0.14</td>
<td>1%</td>
</tr>
<tr>
<td>Oxford Rural No.1 (deep)</td>
<td>132</td>
<td>3.20</td>
<td>28%</td>
</tr>
<tr>
<td>Oxford Rural No.2 (surface water)</td>
<td>1</td>
<td>0.06</td>
<td>1%</td>
</tr>
<tr>
<td>Garrymere Shallow</td>
<td>30</td>
<td>0.59</td>
<td>5%</td>
</tr>
<tr>
<td>Poyntzs Road (Shallow)</td>
<td>29</td>
<td>9.52</td>
<td>84%</td>
</tr>
</tbody>
</table>

Figure 1: Summary of Nitrate Values on All Schemes

4.2. The Poyntzs Road primary source and the Ohoka backup source, which are both shallow wells, have nitrate levels above 50% of the MAV. Accordingly they have been sampled monthly while in operation. The trending of nitrate values for these sources is depicted on Figure 1.
4.3. It is noted that sampling of the Ohoka source ceased when this stopped being used as the primary source (when the new well was commissioned in 2016). Consideration has been given to the event that this well be required to be used as a back-up at short notice however, and it is deemed prudent to start sampling for nitrate again every 3 months so that staff can be confident that it is still within safe levels after being offline for a number of years.

4.4. It is apparent from Figure 2 that the nitrate at Poyntzs Road has been trending upwards from July 2017 to January 2018, although this has since plateaued for the last two samples at approximately 9.5g/m³ (84% of the MAV). Staff will continue to monitor these levels closely. It is common for nitrate levels to increase following wet periods, of following periods of extensive irrigation.

4.5. It is also noted that meaningful trending of the sources where nitrate is less than 50% of the MAV has not been possible, with samples only required to be taken every 5 years, and with many of the sources only in the order of 5 – 10 years old. Given the growing interest and concern in the risks around nitrate in drinking-water it is proposed that sampling of nitrate be increased to annual samples for all sources, rather than every 5 years. This will allow a better understanding of any changes going forward.

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

5. COMMUNITY VIEWS

5.1. Groups and Organisations

5.2. Staff are working closely with Environment Canterbury and other territorial authorities via the Canterbury Drinking-water Reference Group to understand and manage the risk of nitrate levels potentially increasing in the future.
5.3. **Wider Community**

5.4. Staff are to consult with the Poyntzs Road community in the coming financial year regarding the need to upgrade their source. This was primarily identified as being in order to address the fact that the scheme does not comply with the protozoal requirements of the Drinking-water Standards for New Zealand, but is also needed to address the risk of the source exceeding the MAV for nitrate in the future.

6. **IMPLICATIONS AND RISKS**

6.1. **Financial Implications**

6.2. This is a status report for information, and as such does not have any financial implications.

6.3. **Community Implications**

6.4. The chemical parameters of the district’s water supply sources which include nitrate readings are made available to the community on the Council’s website.

6.5. **Risk Management**

6.6. The Drinking-water Standards for New Zealand require that nitrate levels be less than the MAV of 11.3 g/m³. At present the only scheme at risk of exceeding this is the Poyntzs Road scheme. An upgrade project is proposed to address this risk by abandoning this source and connecting the scheme with the West Eyreton scheme.

6.7. There is however a residual risk that the nitrate levels for the scheme may exceed the MAV in the interim period before the project, which would require residents to be advised not to feed infants with formula or water from the scheme supply.

6.8. As noted earlier, staff are working closely with ECa to understand the longer term risk of nitrate levels on other schemes changing over time.

6.9. **Health and Safety**

6.10. High levels of nitrate can pose a risk to babies less than six months who are formula fed and the unborn foetus of pregnant women. Adults with specific rare metabolic disorders (deficiency of glucose-6-phosphate dehydrogenase or methaemoglobin reductase) may also be at risk.

6.11. **Policy**

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

6.13. **Legislation**

6.14. The Health (Drinking-water) Amendment Act is relevant in this matter.

6.15. **Community Outcomes**

6.16. The following community outcomes are relevant in this matter:

- Core utility services are provided in a timely and sustainable manner
- Our community’s needs for health and social services are met.
- There is a safe environment for all.
6.17. **Delegations**

6.18. No delegations are required to receive this report.
Nitrate in Drinking Water: Frequently Asked Questions

What is nitrate?

Nitrate (NO$_3$) is a compound that is formed when nitrogen combines with oxygen. The main adult intake of nitrate is from food rather than water; but sometimes high amounts of nitrate get into drinking water.

Where does nitrate come from?

Typical sources of nitrate include; fertilisers, animal wastes, particularly in areas of intensified farming, unreticulated sewage disposal systems, industrial waste and food processing waste. Nitrate is highly soluble in water, making it readily transported through the soil to groundwater.

Who is at risk?

High levels of nitrate can pose a risk to babies less than six months who are formula fed and the unborn foetus of pregnant women. Adults with specific rare metabolic disorders (deficiency of glucose-6-phosphate dehydrogenase or methaemoglobin reductase) may also be at risk.

What are the health effects?

Nitrate is converted into nitrite by bacteria in the gut. This nitrite combines with foetal haemoglobin in the foetus or infant less than 6 months old preventing oxygen from binding and being distributed around the body. Symptoms include blueness around the mouth, hands and feet, hence the name ‘blue baby’ syndrome and in severe cases can affect breathing and be life-threatening.

By 6 months of age infants have only mature haemoglobin which does not bind to nitrite. This allows oxygen to freely bind to haemoglobin and ‘blue baby’ syndrome does not occur. Fully breastfed infants are not affected as nitrates do not enter the breastmilk. Very few cases of ‘blue baby’ syndrome have been reported in New Zealand, though nitrates in groundwater have been rising in the last twenty years.

How do I know if my water has high nitrate levels?

Council water supplies in Canterbury currently have safe nitrate levels.

Many rural drinking water bores in Canterbury are at risk of elevated nitrate levels, with some private bores exceeding the recommended safe level of nitrates. Environment Canterbury (ECan) has produced maps identifying where nitrate levels in drinking water may be a concern. These are available via the Community and Public Health website.

The maps identify green, yellow and red areas.

- Green areas are where nitrate concentrations in groundwater are always below the MAV and the water is therefore safe to drink.
- Red areas are where nitrate concentrations in groundwater are above the MAV most or all of the time and therefore alternative water sources should be used for drinking.
Yellow areas are areas where it is not known if a sample collected from a well will have nitrate concentrations exceeding the MAV and testing is recommended.

The drinking water consumed by pregnant women, or formula fed babies under 6 months that comes from a private bore in a medium to high risk area should be tested for nitrates.

Testing is the only way to detect nitrate as it is tasteless, odourless and colourless. There are several laboratories that are able to test for nitrate. Some of these labs are listed on the Community and Public Health website.

What is a safe nitrate level in drinking water?

Drinking Water Standards for New Zealand set a Maximum Acceptable Level (MAV) of 50mg/L for nitrate, which is equivalent to 11.3mg/l nitrate-nitrogen. Some laboratories report nitrate levels whereas other report nitrate-nitrogen, ensure that you are aware which they are reporting if you are getting your water tested.

What do I do if my water has high nitrate levels?

If tests show that nitrate levels are above or close to the MAV pregnant women and formula-fed infants less than 6 months should use an alternative water source for drinking or making up formula.

If tests reveal that nitrate levels are above half the MAV the water is safe to drink but water should be tested monthly to ensure that it does not increase over the MAV.

Can I filter or treat my water to get rid of the nitrate?

Nitrate is difficult to remove from water. Common household cartridge or carbon filters, boiling water and chemical treatments (e.g. chlorine) will not remove nitrate.

There are three methods that do remove nitrate from drinking water: distillation, reverse osmosis and anion exchange. These processes are expensive and potentially unreliable.

Will the amount of nitrate in my well be constant or will it change?

Nitrate levels do vary over the year. Often we find results are highest in spring (following rain and snow melt). Also in areas where there is extensive irrigation high nitrate levels have been found in late summer.

If I make my well deeper will I get find water with lower/safe nitrate levels?

Sometimes, but not always, accessing a deeper aquifer will find water with less nitrate contamination. This might mean going several tens of meters deeper. We would recommend checking nitrate monitoring information available for other close by wells and getting some expert advice before undertaking this expensive step.
1. SUMMARY

1.1. The purpose of this report is to seek a recommendation from the Regeneration Steering Group to the Utilities and Roading Committee on the proposed repair strategy for Jones Street in the Kaiapoi East Regeneration Area.

1.2. Jones Street is the last roading project in the Earthquake Infrastructure Repair Programme, and there is a budget of $580,000 available for permanent repairs.

1.3. Jones Street bisects, and provides access to, the Kaiapoi East mixed-use business area. It also connects the new Kaiapoi East road link currently under construction (between Feldwick Drive and Cass Street) to the Town Centre via Charles Street.

1.4. The future use of Jones Street is linked to the development of the adjacent mixed-use business area. How, and when, the mixed-use business area develops has not been confirmed, and is currently the subject of the Kaiapoi Town Centre Plan refresh.

1.5. There are a number of options for the rebuild of Jones Street. Four options look to defer a permanent rebuild until there is certainty over the development of the mixed-use business area. These options are unlikely to meet community expectations for a repaired network. Two options would permanently rebuild the road in the short-term with a risk that future rework is required to support the mixed-use business area.

1.6. The preferred staff option (Option 4) is to rebuild Jones Street with a level of service comparable to the new Kaiapoi East road link. Proceeding with this option accepts the risk that there is potential future rework to support the development of the adjacent mixed-use business area.

Attachments:

i. Summary of Jones Street rebuild options.
2. **RECOMMENDATION**

THAT the Regeneration Steering Group recommends that the Utilities and Roading Committee:

(a) Receives report No. 180426045143.

(b) Approves staff progressing with the concept design of permanent repairs to Jones Street to standard similar to the new Kaiapoi East road link (between Feldwick Drive and Cass Street.) (Option 4).

(c) Notes that there is currently a budget of $580,000 available for these permanent repairs.

(d) Notes that there is the potential for future rework on Jones Street to support the development of the of the mixed-use business area in Kaiapoi East.

(e) Notes that New Zealand Transport Agency funding for the preferred option (Option 4) would need to be confirmed.

(f) Notes that access will be maintained to the private residential property on Jones Street in any repair strategy.

3. **BACKGROUND**

3.1. Jones Street (between Cass Street and Charles Street in the Kaiapoi East Regeneration Area, refer Figure 1 below) was included in the Earthquake Infrastructure Recovery Programme, and is the last roading project in the Recovery Programme that requires completion.

*Figure 1: Location of Jones Street*
3.2. The Waimakariri Residential Red Zone Recovery Plan (Recovery Plan) shows Jones Street as remaining open. Also shown in the Recovery Plan is a new road link in Kaiapoi East between Fieldwick Drive and Cass Street. This is currently under construction and due for completion in June 2018. This route provides a new direct link from the remaining Kaiapoi East neighbourhoods to the Town Centre, via Jones Street and Charles Street.

3.3. With the imminent completion of the new road link, a repair strategy for Jones Street needs to be considered, particularly as the community will be looking for a completed road network. However, given that the future use of Jones Street is linked to the development of the Kaiapoi East mixed-use business area there is the risk that a permanent repair strategy does not support the development of the mixed-use business area.

4. ISSUES AND OPTIONS

4.1. Under the Recovery Plan, Jones Street bisects (and provides access to) the Kaiapoi East mixed-use business area and provides access to the Town Centre, via Charles Street. Jones Street also provides access to one private residential property at 14 Jones Street.

4.2. Jones Street is a key link through to the Town Centre, particularly with the new Kaiapoi East road link, and the proposed shared path adjacent to this. This link currently terminates at Cass Street. It would be beneficial to extend this key link (including the shared path) via Jones Street to Charles Street.

4.3. The future use of Jones Street is linked to the development of the adjacent mixed-use business area. There are a number of options for the rebuild of Jones Street. Options One to Three and Option Six all delay the permanent rebuild of Jones Street until there is greater certainty around the development of the mixed-use business area. Options Four and Five see the permanent rebuild of Jones Street in the short-term with a risk that future rework is required to support the mixed-use business areas.

- **Option One**: Do nothing. Maintain the road in its current condition until there is certainty around the development of the adjacent mixed-use business area.

- **Option Two**: Interim repairs. Repair the road surface only, until there is certainty around the development of the adjacent mixed-use business area. The kerb, channel and footpath would remain in its current (damaged) state.

- **Option Three**: Temporarily closing Jones Street and directing traffic along Cass Street to Williams Street until there is certainty around the development of the adjacent mixed-use business area.

- **Option Four**: Rebuild to a similar standard as the new road link between Fieldwick Drive and Cass Street, which would include a shared path on the eastern side.

- **Option Five**: Rebuild to a business standard. This is essentially rebuilding Jones Street taking into account the change of the adjacent land use from residential to mixed-use business.

- **Option Six**: Rebuild Jones Street in accordance with a master plan for the Kaiapoi East mixed-use business area.

Note: Access to the residential property at 14 Jones Street would need to be maintained for all options.

A summary assessment of the options is included in Attachment 1. The following paragraphs discuss the options further.
Option 1 – Do nothing (Not recommended)

4.4. Maintaining Jones Street in its current condition (with reactive maintenance and patch repairs as necessary) is a cost effective option in the short term, and avoids the risk that permanent repairs do not support the development of the adjacent mixed-use business area (resulting in potential rework). However, given that the new road link (from Feldwick Drive to Cass Street) directs vehicles onto Jones Street, an unrepaired street will not meet community expectations of a repaired network.

Option 2 – Interim repairs (Not recommended)

4.5. Carrying out interim repairs is again cost effective in the short term and avoids the risk of significant rework. However, while the road surface may be repaired, the rest of the corridor will remain in its current (damaged) state. As with Option One (Do Nothing), this will not meet community expectations of a repaired network. From a community perspective the road pavement, footpaths and drainage do not meet expectations for an urban road, and in rainfall events the shoulders of Jones Street experience surface flooding.

Option 3 – Temporary closure (Not recommended)

4.6. Closing Jones Road until the future of the mixed-use business area is confirmed would be cost effective in the short term, and avoids the risk of significant rework. This treatment has been applied to many of the existing roads in the Regeneration Area where suitable alternative routes are available. However, it will not meet the community expectation of a repaired network, nor is an undeveloped corridor likely to be acceptable to the community, particularly given the potential extended timeframe for development of the mixed-use business area. Significant costs could be incurred for Option Three if the corridor was remediated to improve amenity. The kerb and channel could be removed, the road surface and footpath removed, and interim drainage provided. Access to the private residential property at 14 Jones Street would need to be retained.

Option 4 – Rebuild to match new Kaispol East Access Road (Recommended)

4.7. Rebuilding Jones Street with a comparable level of service as the new road link between Feldwick Drive and Cass Street essentially restores the road to its pre-earthquake condition but with an improved path. This option does not take into account the development of the mixed-use business area (either in the interim or permanently) with an on-road parking width being less suited to high turnover and traffic lanes less compatible with larger vehicle turning movements. Option Four would likely meet community expectations for a repaired network. Implementing this option could require a potential future upgrade to a business standard.

4.8. Subsequent development of the mixed business area would require the retrofitting of vehicle crossings, which is common in new residential subdivisions, or more significant changes to the kerbs to provide access into the lots. Installation of sewer or water services to the developments may also require trenching across the paths and/or carriageway.

Figure 2: Indicative cross section showing Option 4 (looking north from Charles Street)
Option 5 – Rebuild to District Plan business standard [Not recommended]

4.9. Rebuilding Jones Street to a business standard restores the road corridor, taking into account the land uses in the Recovery Plan. This option could see Jones Street rebuilt at 11.6m (kerb to kerb) which provides for two 3.3m traffic lanes and two 2.5m parking lanes with space between the kerb face and the property boundary for a shared path. This is the District Plan standard for an Urban Collector with residential or business land use. Jones Street is currently designated in the District Plan as a Local Road but it will fulfil the former function of Cass Street as an Urban Collector.

4.10. The current cross section of Jones Street is approximately 10.0m (kerb to kerb) with two traffic lanes. There is footpath on both sides of the road with approximately 5.0m between the kerb and the boundary.

4.11. Option Five would likely meet community expectation for a repaired network. As with Option Four, subsequent development of the mixed business area would require the retrofitting of vehicle crossings, or more significant changes to the kerbs to provide access into the lots. Installation of sewer or water services to the developments may also require trenching across the paths and/or carriageway.

Option 6 – Rebuild as Part of Development Master Plan [Not recommended]

4.12. Option Six is essentially the follow up to Options One, Two or Three; that is delaying permanent repair works on Jones Street until there is certainty over the development of the mixed-use business area. Delaying permanent repairs until the medium to long-term will not meet community expectations for a repaired network.

4.13. While consideration of the mixed-use business area in Kaiapoi East is currently underway through the refresh of the Kaiapoi Town Centre Plan, the timeframe for potential development of this area is unknown. Through the refresh, a master plan for the mixed-use business area is being developed. The Town Centre Plan is due for public consultation in 2018 with adoption by Council post consultation. At this stage land tenure arrangements, land remediation requirements, zoning provisions, defined mixed-use business activities, infrastructure servicing, and access and parking arrangements are unknown. Therefore, there is the potential that Options One and Two could end up being a medium term (2-10 years) or longer-term (10 years +) solution. This uncertainty could cause problems as at some point it will not be economic to keep repairing the damaged infrastructure. Similarly, Option 3 (the temporary closure of Jones Street) could become a medium or longer-term solution given the development timeframe.

Preferred Option

4.14. In considering the options for the permanent repair of Jones Street, staff preference is for Option Four; rebuilding Jones Street with a similar level of service as the new Kaiapoi East road link. This would include a narrowed carriageway, swales for drainage (rather than kerb and channel) and a shared path along one side of the street. This is the preferred option for the following reasons:
   - It currently has the lowest permanent rebuild cost (Options One to Three are not considered permanent rebuild options, rather interim repair strategies). The potential costs of Option 6 are unknown at this stage.
   - It would resolve the condition and drainage issues associated with the current road.
   - It would likely meet community expectations for a repaired network.
   - It would link Kaiapoi East with the Town Centre.
   - It would complete the road aspect of the Earthquake Infrastructure Recovery Programme.
   - It would give effect to the Recovery Plan, which shows the new road link in Kaiapoi East connecting with Jones Street.
4.15. In considering the options for Jones Street, expenditure on interim repairs/remediation under Options One, Two and Three will result in a reduced budget provision for the eventual implementation of a permanent repair solution, unless additional budget is approved in future.

5. COMMUNITY VIEWS

5.1. Groups and Organisations

5.1.1. All the repair options will affect the private property owner at 14 Jones Street. Any repair option will need to maintain access to this private property. Staff will engage with this property owner about access arrangements regardless of which repair option is progressed.

5.1.2. The key users of the Kaiapoi East sport and recreation reserve could be affected by the repair options for Jones Street. Options One, Two and Three may not be desirable for reserve users as it limits access options, however given that Cass Street will be open, alternative access to and from the reserve will be possible. Overall, Options Four or Five (rebuild of Jones Street) would better support access to and from the reserve.

5.2. Wider Community

5.2.1. The wider community were consulted on the roading options for Kaiapoi East during the development of the Recovery Plan. The new Kaiapoi East road link and the retention of Jones Street was shown in both the Preliminary Draft and Draft Recovery Plan and confirmed in the approval of the Recovery Plan in 2016.

5.2.2. The wider community has not been consulted on repair options for Jones Street. Given the length of time that they have experienced challenging road conditions, it is anticipated they would expect a repaired road network, particularly with the completion of the new road link. Options One, Two, Three and Six would not likely meet wider community expectations of a repaired road network.

6. IMPLICATIONS AND RISKS

6.1. Financial Implications

6.1.1. Jones Street is included in the Earthquake Infrastructure Recovery Programme. There is currently $560,000 allocated in the 18/19 financial year. This budget was prepared prior to the development of the Recovery Plan and did not anticipate the mixed-use business activity. This budget was based on Jones Street being rebuilt to a different level of service than it previously had, i.e. a reduced width, and swales instead of kerb and channel for drainage. This level of service is comparable to that of the new road link (between Feldwick Drive and Cass Street).

6.1.2. This budget may not cover the rebuild of Jones Street in accordance with a future master plan for the mixed-use business area. In addition, interim or remedial repairs (as suggested in Options One, Two and Three) will be drawn from this budget, reducing the budget provision for any permanent repair solution.

6.1.3. New Zealand Transport Agency (NZTA) funding (subsidy) is available under the Emergency Works Category in the 2018/19 financial year. This is on the basis that the road would be rebuilt to a similar level of service as pre-earthquake. NZTA have previously given a little flexibility on earthquake projects where a better outcome could be achieved for a modest additional cost over like-for-like replacement. This would need to be discussed with NZTA once Council decides its preferred outcome.
6.1.4. If the project were constructed after the 2018/19 financial year it is unlikely that the Emergency Works Category would still apply, given the length of time the road will have been left in a damaged state. If that were the case then an application would need to be made under an alternative NZTA funding category. Funding has already been set for the next 3 years and it may not be possible to make a new application for this period. This would need to be discussed with NZTA once Council decides its preferred outcome.

6.1.5. The estimated costs of the six repair options for Jones Street are summarised in Table 1 below. Options One and Two will incur annual costs until a permanent repair is implemented. Option Three could also incur initial remediation costs.

Table 1: Estimated costs for the repair options for Jones Street.

<table>
<thead>
<tr>
<th>REPAIR OPTION</th>
<th>WORKS INCLUDED*</th>
<th>ESTIMATED COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Do nothing (Not recommended)</td>
<td>Reactive maintenance and patch repairs as necessary</td>
<td>No works have been undertaken in recent years.</td>
</tr>
<tr>
<td>2. Interim repairs (Not recommended)</td>
<td>Repair of the road surface only.</td>
<td>$31,000</td>
</tr>
<tr>
<td>3. Temporary closure of Jones Street (Not recommended)</td>
<td>Installation of barriers and appropriate signage a) Everything is left in place behind the barriers b) Removal of roadway assets and reinstatement of grass.</td>
<td>$8,500</td>
</tr>
<tr>
<td>4. Rebuild to the same standard as the new link between Feldwick Drive and Cass Street. (Recommended)</td>
<td>Rebuild Jones Road at a reduced width with swales instead of kerb and channel for drainage. The shared path could be extended along one side of the street.</td>
<td>$445,000</td>
</tr>
<tr>
<td>5. Rebuild to a business standard (Not recommended)</td>
<td>Rebuild Jones Road at 11.6m (kerb to kerb) which provides for two 3.3m traffic lanes and two 2.5m parking lanes with space between the kerb and channel and the property boundary for the shared path down one side of the street.</td>
<td>$480,000</td>
</tr>
<tr>
<td>6. Rebuild Jones Street in accordance with a master plan (Not recommended)</td>
<td>Unknown – likely to be development driven</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

* All options will need to maintain access to the private residential property at 14 Jones Street.

* The estimated costs above do not include:
  - Land remediation or raising the level of Jones Street.
  - Additional drainage works.
  - Water or wastewater servicing for the mixed-use business area.

6.2. Community Implications

6.2.1. The Kaiapoi East community has experienced difficult road conditions for some time and are keen to see the network permanently repaired. Given that the new road link between Feldwick Drive and Cass Street is currently under construction, the do nothing, interim repair, temporary closure or a rebuild as part of a master plan options (Options one to three and six) for Jones Street will not meet community expectations for a repaired network. Council is likely to experience
negative feedback from the community should any of these options be implemented.

6.3. Risk Management

6.3.1. Jones Street bisects the Kaiapoi East mixed-use business area and is a key access corridor. Future planning for the mixed-use business area is underway through a refresh of the Kaiapoi Town Centre Plan. This refresh will result in a master plan for the mixed-use business area being developed. At this stage, there is minimal certainty on the development of the mixed-use business area. There is the risk that any permanent repairs to Jones Street do not support the future development of the mixed-use business area, potentially resulting in rework. The scale and scope of this rework is unknown and could vary from minor (i.e. the installation of a vehicle crossing) to major (i.e. to accommodate a change in land levels).

6.3.2. The do nothing, interim repair and temporary closure options for Jones Street (Options One, Two and Three) mitigate this risk by delaying permanent repairs until there is more certainty over the future of the mixed-use business area. Rebuilding Jones Street to a standard similar as the new road link (Option Four) or a business standard (Option Five) carries a risk that the repairs do not support the future development of the mixed-use business area. Rebuilding Jones Street to a business standard does reduce this risk. Delaying permanent repairs to Jones Street (Option Six) until such time as there is certainty over the future development of the mixed-use business area, avoids the risk of potential future rework, however this option will not meet community expectation for a repaired network given the potential extended timeframe.

6.3.3. While the preferred staff option is to rebuild Jones Street to similar level of service as the new Kaiapoi East road link, this raises issues for future water and wastewater servicing. The current water and wastewater services in Jones Street are damaged and already abandoned. It is proposed to service the remaining private property on a permanent basis via a pressure wastewater system. Ideally, any underground water and wastewater services would be installed when the road is rebuilt to avoid future construction on the rebuilt road. With the high level of uncertainty around the future development of the mixed-use business area, it is difficult to know what the water and wastewater servicing requirements will be. At present, there is no specific budget provision in either the Earthquake Infrastructure Regeneration Programme or Regeneration Programme for new water and wastewater services in Jones Street (or Sewell Street) to service future mixed-use business activities.

6.3.4. As part of the development of a concept design for permanent repairs to Jones Street, staff will investigate options for water and wastewater servicing to determine if these could be accommodated during repairs.

6.4. Health and Safety

6.4.1. The preferred option to repair Jones Street mitigates the health and safety issues associated with the use of an earthquake damaged road and footpath.

7. CONTEXT

7.1. Policy

7.1.1. This matter is not a matter of significance in terms of the Council’s Significance Policy.
7.2. Legislation

7.2.1. The Greater Christchurch Regeneration Act 2016. The Recovery Plan has been prepared in accordance with this Act and the divestment of the land in the Regeneration Areas from the Crown to the Council is conditional upon the agreed land uses being implemented. The roading repairs are a key component of the implementation of the Recovery Plan.

7.3. Community Outcomes

7.3.1. Transport is accessible, convenient, reliable and sustainable

7.4. Delegations

7.4.1. In accordance with the delegations policy and the Regeneration Steering Group Terms of Reference, the proposed next steps would be for staff to commence concept designs and workshop these with the Regeneration Steering Group, followed by a formal report on the preliminary designs, which would be referred to Utilities and Roading Committee for approval.

7.4.2. If, during preparation of the preliminary design and updated costs estimate, there were an apparent budget shortfall, a request for additional budget would need to be endorsed by the Regeneration Steering Group and referred to Council for final decision and approval.
### Attachment 1: Summary of Jones Street rebuild options.

<table>
<thead>
<tr>
<th>REBUILD OPTIONS</th>
<th>POTENTIAL WORKS</th>
<th>ESTIMATED COST</th>
<th>SUPPORTS RECOVERY PLAN OUTCOMES</th>
<th>COMMUNITY EXPECTATIONS</th>
<th>FUTURE REWORK</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Option 1</strong></td>
<td>Do nothing:</td>
<td>Reactive maintenance and patch repairs to road surface only.</td>
<td>No works have been undertaken in recent years.</td>
<td>Yes. Later rebuild to support mixed-use business activities.</td>
<td>Does not meet community expectations for a repaired road network.</td>
</tr>
<tr>
<td></td>
<td>Maintain the road in its current condition until there is certainty around the development of the adjacent mixed-use business area. (Not recommended)</td>
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<tr>
<td><strong>Option 2</strong></td>
<td>Interim repairs:</td>
<td>Hot mix reshaping, strip and resurfacing, and replacement of the sumps at the Charles Street intersection</td>
<td>$31,000</td>
<td>Yes. Later rebuild to support mixed-use business activities.</td>
<td>Does not meet community expectations for a repaired road network.</td>
</tr>
<tr>
<td></td>
<td>Repair the road surface only, until there is certainty around the development of the adjacent mixed-use business area. The kerb, channel and footpath would remain in its current state. (Not recommended)</td>
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<td></td>
<td></td>
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<tr>
<td><strong>Option 3</strong></td>
<td>Temporary closure:</td>
<td>a) Installation of appropriate barrier and signage (no asset behind barriers removed).</td>
<td>$6,500</td>
<td>Yes. Later rebuild to support mixed-use business activities.</td>
<td>Does not meet community expectations for a repaired road network.</td>
</tr>
<tr>
<td></td>
<td>Temporarily closing Jones Road and directing traffic along Cass Street to Williams Street. (Not recommended)</td>
<td>b) Installation of appropriate barrier and signage (asset removed and area regrassed).</td>
<td>$260,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option 4</td>
<td>Rebuild to pre-earthquake standard: Rebuild to the same standard as the new road link between Feldwick Drive and Cass Street. <em>(Recommended)</em></td>
<td>Narrowed carriageway, swales for drainage (no kerb and channel), shared path down one side of the street.</td>
<td>$446,000</td>
<td>Partially. May not support mixed-use business activities.</td>
<td>Likely to meet community expectations for a repaired network.</td>
</tr>
<tr>
<td>----------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>----------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Option 5</td>
<td>Rebuild to a business standard: This is essentially rebuilding Jones Street taking into account the change of the adjacent land use from residential to mixed-use business. <em>(Not recommended)</em></td>
<td>Rebuild carriageway with two traffic lanes, two parking lanes and footpaths. Kerb and channel for drainage. Shared path down one side of the street.</td>
<td>$485,000</td>
<td>Yes. Likely to support mixed-use business activities, although some rework may be required.</td>
<td>Likely to meet community expectations for a repaired network.</td>
</tr>
<tr>
<td>Option 6</td>
<td>Rebuild to master plan: Rebuild Jones Street in accordance with the master plan for the Kalapoi East mixed-use business area. <em>(Not recommended)</em></td>
<td>Unknown — likely to be development driven</td>
<td>Unknown</td>
<td>Yes. Rebuild to support mixed-use business activities.</td>
<td>Likely to meet community expectations for a repaired network.</td>
</tr>
</tbody>
</table>

* All options will need to maintain access to the private residential property at 14 Jones Street.

* The estimated costs above do not include:
  * Land remediation or raising the level of Jones Street.
  * Additional drainage works.
  * Water or wastewater servicing for the mixed-use business area.
7.1 **Jones Street Repair Options (Kaiapoi East Regeneration Area)** – Michelle Flanagan, Landscape Planner – District Regeneration

M Flanagan advised that the purpose of the report is to seek a recommendation from the Steering Group on the proposed repair strategy for Jones Street in Kaiapoi East. Jones Street is the last remaining roading project in the Infrastructure Repair Programme. The future of Jones Street is linked to adjacent mixed-use business areas. It is a key link to the town centre and provides access to the mixed-use business area. Given that the future development of the mixed-use business areas are not yet confirmed there is a potential that the rebuild works now in Jones Street will not support the mixed-use business activities and may need future re-work. There is also the potential that any future land or flood remediation work will require reworking in permanent repairs.

Six options for the rebuild of Jones Street were considered. Four of the options delayed the rebuild works and two options looked to rebuild Jones Street in the short-term. Staff preference is for Option four which is rebuilding Jones Street to a similar standard as the new Feldwick link. Option four would resolve the current condition and drainage issues associated with Jones Street and would likely meet community expectations for a repair network and link Kaiapoi East to the town centre.

There is currently $580K available for permanent repairs to Jones Street in the Earthquake Infrastructure Repair budget and this includes funding from NZTA under the emergency works category. Any interim repair works such as those in options one, two and three would also come from this budget. There are a number of key risks associated with the rebuild strategy for Jones Street. Options one, two and three are unlikely to meet community expectations for an urban road network and in addition now that the new Feldwick link is almost complete, an unrepaired Jones Street will not meet community expectations. Permanent repair options four and five do not fully take into account further development of the mixed-use business areas to varying degrees. Both options may require rework as a result of future land and flood remediation work which may require the level of the road to be raised. Option four would be the cheaper permanent repair option but would potentially need rework to support the mixed-use business activities in the future. Option five being the option to rebuild to a business standard to support the land uses in the recovery plan but may require future rework as a result of the master plan.

D Ayers asked if staff have considered the natural pedestrian walkway and is it possible that the footpath could be on the wrong side.

M Flanagan replied that it is possible. When we are looking through this we are also looking at the Reserve Master Plan that brings another connection through the park which would come down through the centre of the sport and recreation reserve, and down through the dog park area and come out at Charles Street as well.

M Pinkham noted he struggles to support recommendation four, given that the relatively small area of the mixed-use business between Jones Street and the existing business areas. To rebuild to a business standard would be quite feasible and this could actively encourage development between Jones Street and the existing business area.

Moved: A Blackie Seconded: D Ayers

**THAT** the Regeneration Steering Group recommends that the Utilities and Roading Committee:

(a) **Receives** report No. 180426045143.

(b) **Approves** staff progressing with the concept design of permanent repairs to Jones Street to standard similar to the new Kaiapoi East road link (between Feldwick Drive and Cass Street.) (Option 4).

(c) **Notes** that there is currently a budget of $580,000 available for these permanent repairs.

(d) **Notes** that there is the potential for future rework on Jones Street to support the development of the of the mixed-use business area in Kaiapoi East.
(e) **Notes** that New Zealand Transport Agency funding for the preferred option (Option 4) would need to be confirmed.

(f) **Notes** that access will be maintained to the private residential property on Jones Street in any repair strategy.

**Amendment (recommendation B)**

Moved: J Meyer  
Seconded: M Pinkham

(b) Approves staff progressing with the concept design of permanent repairs to Jones Street to a business standard on the west side consisting of kerb and channel and for the eastern side to be rebuilt with a swale to a standard similar to the new Kaiapoi East road link (between Feldwick Drive and Cass Street).

CARRIED

The amendment then became the substantive motion

**THAT** the Regeneration Steering Group recommends that the Utilities and Roading Committee:

(a) **Receives** report No. 180426045143.

(b) **Approves** staff progressing with the concept design of permanent repairs to Jones Street to a business standard on the west side consisting of kerb and channel and for the eastern side to be rebuilt with a swale to a standard similar to the new Kaiapoi East road link (between Feldwick Drive and Cass Street).

(c) **Notes** that there is currently a budget of $580,000 available for these permanent repairs.

(d) **Notes** that there is the potential for future rework on Jones Street to support the development of the mixed-use business area in Kaiapoi East.

(e) **Notes** that New Zealand Transport Agency funding for the preferred option (Option 4) would need to be confirmed.

(f) **Notes** that access will be maintained to the private residential property on Jones Street in any repair strategy.

CARRIED
1. **SUMMARY**

The purpose of this report is to:

1.1 Seek approval from the Board for the proposed Give Way controls at the roundabout at the Smith Street / Williams Street intersection.

1.2 Seek retrospective approval from the Board for the Give Way control at the intersection of Mill Road, and the Passchendaele Cycleway.

1.3 The need for the Give Way on Mill Road was identified by a safety audit.

**Attachments:**

i. Mill Road Cycleway Plan (TRIM 180426043958)

2. **RECOMMENDATION**

**THAT** the Kaiapoi – Tuahiwi Community Board:

(a) **Receives** report No. 180423043958

(b) **Authorises** the following intersection controls pursuant to Section 2 of the Land Transport Rule: Traffic Control Devices 2004 with effect from the date of installation of the appropriate signage:

<table>
<thead>
<tr>
<th>Road to be Controlled</th>
<th>Type of Controls to be Imposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Williams Street, on both approaches to the Smith Street / Beach Road intersection</td>
<td>Give Way</td>
</tr>
<tr>
<td>Smith Street, on the approach to the Williams Street intersection</td>
<td>Give Way</td>
</tr>
<tr>
<td>Beach Road, on the approach to the Williams Street intersection</td>
<td>Give Way</td>
</tr>
</tbody>
</table>
(c) **Authorises** the removal of the following intersection controls pursuant to Section 2 of the Land Transport Rule: Traffic Control Devices 2004 with effect from the date of the removal of the appropriate signage:

<table>
<thead>
<tr>
<th>Road with control to be removed</th>
<th>Uncontrolled Road</th>
<th>Type of Control to be removed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smith Street</td>
<td>Williams Street</td>
<td>Stop</td>
</tr>
<tr>
<td>Beach Road</td>
<td>Williams Street</td>
<td>Stop</td>
</tr>
</tbody>
</table>

(d) **Authorises** the installation of the following intersection controls pursuant to Section 2 of the Land Transport Rule: Traffic Control Devices 2004 with effect from 22 May 2018.

<table>
<thead>
<tr>
<th>Road to be controlled</th>
<th>Uncontrolled Road</th>
<th>Type of Control to be Imposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mill Road</td>
<td>Passchendaele Cycleway (Shared Space)</td>
<td>Give Way</td>
</tr>
</tbody>
</table>

(e) **Notes** that the requirement for the Give Way control on Mill Road was identified by a safety audit that was carried out after the scheme plan for the Passchendaele Cycleway was approved by Council.

(f) **Circulates** this report to the Utilities and Roading Committee.

3. **ISSUES AND OPTIONS**

3.1. The intersection upgrade at Williams Street/Smith Street / Beach Road currently under construction has been approved by Management Team. The roundabout is to improve road and pedestrian safety by slowing vehicles entering the intersection. It also allows easy right turning movements from Smith Street and Beach Road into Williams Street.

3.2. The Give Way controls at the intersection require formal approval. The Board has delegated authority to approve intersection controls.

3.3. The Passchendaele Cycleway provides an off-road link for pedestrians and cyclists between Kaiapoi and Rangiora. As part of this project a Give Way was installed at Mill Road.

3.4. This Give Way was not included in the scheme plan that was approved by Council. The need for the Give Way was identified by a safety audit following the Council approval of the Scheme Plan. Therefore retrospective approval is required to ensure the Give Way is enforceable.

3.5. There are no alternative options to those recommended as Give Way controls are mandatory at roundabouts. The Mill Rd Give Way is already in place and is the most appropriate control for this situation.

4. **COMMUNITY VIEWS**

4.1. No specific consultation has been undertaken on the proposed intersection controls at Williams Street because the Land Transport Rule: Traffic Control Devices 2004 specifically requires roundabouts to be controlled by Give Way signage.

4.2. No specific consultation has been undertaken on the proposed intersection controls at Mill Road because there are no affected residents or businesses located on this stretch of
road. With the formation of the cycleway, the primary travel route is now along the Cycleway.

5. **IMPLICATIONS AND RISKS**

5.1. **Financial Implications**

The Smith Street / Williams Street intersection Upgrade is being funded from the Roading Outline Development Plan Contribution budget, and is subsidised by NZTA. The budget allocation to this project is $612,000 and the estimated total cost based on the tendered rates for the work is $501,000.

The construction of the Passchendaele Cycleway is being funded from the Urban Cycleway Programme, and is subsidised by NZTA.

The total cost of the traffic controls is included in the project budgets.

5.2. **Community Implications**

Inclusion of intersection controls in Williams Street will add delay times to north and south bound traffic. This delay is off-set by improved traffic delay times for both Smith Street and Beach Road traffic, as well as improved intersection safety. Details regarding the roundabout design were given to the Board in a memo. (TRIM 171201130916)

Give Way intersection controls will provide clarification to the traffic that uses Mill Road. This portion of Mill Road has an AADT of just 21 vehicles per day. This estimate excludes cycles, and was carried out prior to the construction of the cycleway.

5.3. **Risk Management**

Risk Management aspects of this work have been adequately covered in the respective contracts.

5.4. **Health and Safety**

Health and Safety aspects of this work have been adequately covered in the respective contracts.

6. **CONTEXT**

6.1. **Policy**

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

6.2. **Legislation**

Changes to the intersection controls are pursuant to Section 2 of the Land Transport Rule: Traffic Control Devices 2004.

6.3. **Community Outcomes**

  c. There is a safe environment for all.

  j. Transport is accessible, convenient, reliable, affordable and sustainable.
6.4. **Delegations**

The Kaiapoi Tuahiwi Community Board has delegated authority to approve traffic control restrictions on streets (Delegation S-DM 1041).

Kieran Straw     Ken Stevenson
Civil Projects Team Leader   Roading Manager
Attachment i): Mill Road / Passchendaele Cycleway Plan
1. **SUMMARY**

1.1. This report is to obtain the Boards approval to install two cattle stops and associated fences and gates in Carleton Road to enable the adjoining dairy farmer to move his cows across Carleton Road in a more efficient and safe manner.

1.2. Neville Thompson of Stoneleigh Park Ltd owns land on both sides of Carleton Road and as part of his operation moves his cows across Carleton Road on a daily basis. His current method of doing this is to open the gates on each side of the road and put electric tapes across the road before letting the cows cross Carleton Road with minimal supervision.

1.3. As Carleton Road is a low volume road, this method has worked satisfactorily. However this method does cause an inconvenience and there is a risk cows may escape through the electric tapes, so Mr Thompson has requested approval to install cattle stops each side of the crossing. Cattle stops will prevent cows from escaping along Carleton Road and at the same time vehicles will be able to use the road normally. Appropriate signage will be installed to warn motorists of the cows on the road when they are crossing the road.

1.4. The previous Oxford Eyre Advisory Board approved the installation of cattle stops in Reed Road in 2012, in Sheats Road in 2014, Glentui Bennets Road in 2015 and Moderates Road in 2016, for the same purpose as the proposed cattle stops in Carleton Road. All of these cases are working well and so it is recommended the cattle stops are approved for Carleton Road.

1.5. The alternative is an underpass and this cannot be justified on Carleton Road, as it is a low volume road.

1.6. All costs for the construction and the ongoing maintenance of the cattle stops and associated fences and gates will be met by the property owner and this will be covered by a standard Council Licence to Occupy Agreement. This agreement enables the Council to require the cattle stops to be removed if for some reason circumstances change in the future.

**Attachments:**

i. Draft Licence to Occupy Agreement (Doc. 180517054320)
ii. Cattle stops location map (Doc. 180517054315)

2. RECOMMENDATION

THAT the Oxford Ohoka Community Board:

(a) **Receives** report No. 180517054232.

(b) **Approves** the construction of two cattle stops and associated fences and gates on Carleton Road at the location shown on the attached plan (Doc. 180517054315) for the purpose of enabling the safe and efficient movement of cows across Carleton Road while at the same time keeping the road accessible and safe for road users.

(c) **Approves** the attached Draft Licence to Occupy Agreement (Doc. 180517054320)

(d) **Notes** that all costs associated with the construction and the maintenance of the cattle stops, fences and gates will be met by the property owner.

(e) **Notes** that the property owner will be required to remove the cattle stops, fences and gates if and when they cease dairy farming operations or if they change their method of operation that does not require the regular movement of cows across Carleton Road.

(f) **Circulates** this report to the Utilities & Roading Committee.

3. BACKGROUND AND ISSUES AND OPTIONS

3.1. Neville Thompson of Stoneleigh Park Ltd owns land on both sides of Carleton Road and he moves his cows across Carleton Road on a daily basis. The current method of putting electric tapes across the road and allowing the cows to cross on their own with minimal supervision has worked reasonably well in the past because Carleton Road carries low traffic volumes. However there are risks with this method. Cows could escape and cause traffic safety issues.

3.2. There are a number of options that are available to improve the current situation. They are:

- **Option 1** – Farmer to install cattle stops on Carleton Road on each side of the crossing point with associated fences and gates as requested and as recommended.
- **Option 2** – Require the farmer to continuously supervise and control the cows across Carleton Road at all times.
- **Option 3** – Require the farmer to construct a cattle underpass.
- **Option 4** – Do nothing.

3.3. Option assessment.

Option 1 – Farmer to install cattle stops on Carleton Road on each side of the crossing point with associated fences and gates as requested and as recommended.

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enables cows to cross Carleton Road with minimal supervision and at the same time allowing unrestricted movement of vehicles, except when cows are crossing. (Signs will be in place to warn drivers when cows are crossing.)</td>
<td>Provides an inconvenience to horse riders and walkers along Carleton Road in that they will have to open and close gates. (Gates would be left open when cows are not crossing)</td>
</tr>
<tr>
<td>Cheaper and are more appropriate at this location than an underpass.</td>
<td>Could become a Council liability if the property owner does not properly maintain the cattle stops, fences and gates.</td>
</tr>
</tbody>
</table>
Drivers may not see cows crossing the road. This is unlikely as visibility is good and signs will be in place to warn drivers of the cows.

Option 2 – Require the farmer to continuously supervise and control the cows across Carleton Road at all times.

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fully supervised so very low risk of cows escaping or vehicles and other road users being inconvenienced.</td>
<td>Inefficient from a farm management perspective and so there is a high risk it may not be followed at all times.</td>
</tr>
<tr>
<td>No cost to the Council and no separate agreement apart from the Stock Crossing Permit</td>
<td>Higher enforcement requirement on Council staff.</td>
</tr>
</tbody>
</table>

This is a lesser option than what the farmer is offering.

Option 3 – Require the farmer to construct a cattle underpass.

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Separates cow movement from road users so no impact on road users.</td>
<td>Unnecessarily expensive and because of low traffic volumes there would be no NZTA or Council contribution.</td>
</tr>
<tr>
<td></td>
<td>Council could not compel the farmer to install an underpass.</td>
</tr>
</tbody>
</table>

Option 4 – Do nothing.

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current method works satisfactorily most of the time.</td>
<td>Does not improve the current situation.</td>
</tr>
<tr>
<td></td>
<td>Current risk of cows escaping would remain.</td>
</tr>
<tr>
<td></td>
<td>Current occasional inconvenience to motorists would remain.</td>
</tr>
<tr>
<td></td>
<td>Would not take advantage of the current offer being made by the farmer.</td>
</tr>
</tbody>
</table>

3.4. The Management Team has reviewed this report and supports the recommendations.

4. **COMMUNITY VIEWS**

4.1. **Groups and Organisations**

4.2. The property owner has consulted with neighbours verbally.

4.3. **Wider Community**

4.4. Wider community consultation is not considered necessary in this case.
5. **IMPLICATIONS AND RISKS**

5.1. **Financial Implications**

5.2. All costs to construct and maintain the cattle stops, fences and gates and signage will be met by the property owner.

5.3. There is a risk the property owner will not properly maintain the cattle stops, fences and gates and the will become a Council liability. This is unlikely as Mr Thompson is an established property owner in the area and it is in his interest to keep the infrastructure in good condition. Also regular monitoring will identify any issues at an early stage and will allow action to be taken.

5.4. There is a risk that drivers of vehicles may not see the cows and will hit them. It is noted that this risk exists now with the current method and the proposed method improves on the current situation by providing appropriate signage. Also the cattle stops and fences will provide a definite road narrowing and visual clues to the motorist of a change in road environment and a reason to take care. In addition visibility is very good and the crossing will only be operational in day light hours.

5.5. It is also noted that the farmer has responsibilities under the Health and Safety in the Workplace Act in regard to his operations so he will need to have procedures in place in his farm operations health and safety management plan for managing this crossing.

5.6. It is noted that having cattle stops on this roads will be similar to other roads where cattle stops are in place where there are no fences alongside the road and stock can roam on the road. This happens on Lees Valley Road for example.

**Community Implications**

5.7. This proposal is on a low volume local road that will only impact on the local community. This impact will be minor and is an improvement to what is in place now.

5.8. **Risk Management**

5.9. Normal construction risks will apply when construction is undertaken.

5.10. **Health and Safety**

5.11. The property owner and his contractor will be required to submit a Site Specific Health & Safety Plan for approval, prior to work commencing on site. This will include a temporary traffic management plan.

6. **CONTEXT**

6.1. **Policy**

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

6.2. **Legislation**

The Land Transport Management Act is the relevant legislation in this matter.

6.3. **Community Outcomes**

This report considers the following outcomes:

**There is a safe environment for all**

- Harm to people from natural and man-made hazards is minimised.
- Our district has the capacity and resilience to quickly recover from natural disasters and adapt to the effects of climate change.
• Crime, injury and harm from road crashes, gambling, and alcohol abuse are 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.

6.4. **Delegations**

The Board has the authority to approve this type of work within the Road Reserve.
WAIMAKARIRI DISTRICT COUNCIL

LICENCE TO OCCUPY ROAD

THIS IS AN AGREEMENT made on the ............ day of .......................... 2018

BETWEEN                                  THE WAIMAKARIRI DISTRICT COUNCIL
                                             ("the Council")

AND                                      STONELEIGH PARK LIMITED
                                             ("the Licensee")

IN CONSIDERATION of the conditions and covenants contained in, or implied by, this
document and in return for the licensee’s observation and performance of these conditions
and covenants.

THE COUNCIL HEREBY GRANTS to the licensee -

(a) the right to construct two cattle stops and associated fences and gates, within the road
reserve on that area shown in the attached map, being legal road – Carleton Road,
adjacent to 2138 Carleton Road, in the position and according to the specification
shown on the attached map for the purpose of allowing for the efficient regular
movement of cows across the road.

(b) the right to occupy the land until this right is terminated under any of the provisions of
this agreement.

THE LICENSEE HEREBY COVENANTS with the Council as follows:

1. That the design and construction of the cattle stops, fences and gates shall be carried
out to the satisfaction of the Manager – Utilities and Roading or his/her representative.

2. That the Licensee will properly indemnify the Council from and against all costs,
actions, demands, suits, damages and proceedings of any kind for and in respect of
any loss or damage that may directly or indirectly be caused to or be suffered by any
person or property by reason of the gross negligence of any act carried out by the
licensee.

3. That the Licensee will during the continuance of this licence keep the cattle stops,
fences and gates in good order and condition as may be reasonably required.

AND IT IS HEREBY AGREED BY AND BETWEEN THE PARTIES AS FOLLOWS:

4. That no vested right shall be created and this licence is transferable only with the
Council’s written consent and upon payment of the fee applicable at that time.

5. (a) The term of this licence shall be for the operating life of the cattle stops, fences
and gates or any replacement.

(b) In the event the Council may require any portion of the equipment to be
removed and/or realigned then it shall give the licensee reasonable notice of its
intentions and the requirements that are associated with the proposed removal
and/or realignment.
(c) All costs relating to the proposed removal and/or realignment are to be the responsibility of the Licensee.

6. That termination of the licence on grounds of gross negligence of any act by the licensee or on the licensee's behalf may be by way of the Council giving notice to the licensee who shall immediately remove the equipment and leave the roadway in good order and condition to the satisfaction of the Manager – Utilities and Roading

7. That the costs of any work required by the Council to remedy any failure by the licensee to comply with these provisions may be recovered by the Council as a debt.

8. That the licensee shall not be entitled to any compensation on the withdrawal or termination of this licence.

9. That nothing in this licence shall be construed to derogate from the rights of the Crown, the Council, or any local authority to enter upon the land for the purpose of installing, maintaining, repairing or removing any new or existing service over, under or on the land or for any other lawful purpose, providing that the installation of any services by the Crown, the Council or any other local authority shall not interfere with the cattle stops, fences and gates.

10. That when any notice is to be given it shall be sufficient in cases where the notice is to be given by the Council that the notice be signed by some person acting under the Council's express or implied authority and sent by post addressed to the licensee at the licensee's legal address.

11. The Licensee shall maintain and advise the Council of any changes to the existing layout of the cattle stops, fences and gates and provide the Council with the appropriate plans.

12. Special Conditions

(a) The Licensee pays one off administration fee of $200 +GST.

(b) A Traffic Management Plan must be used by the Contractor undertaking the work and submitted to Council for approval prior to work commencing.

(c) Gates must be erected either side of the cattle stops for pedestrian and horse rider access. Approved mounting blocks to be installed on both sides for use by horse riders.

(d) The Road Reserve must be left to high standard after the completion of work. If any gorse or noxious weeds appear due to the work undertaken, it will be the responsibility of the Licensee to eradicate.

(e) The Licensee shall install and maintain permanent traffic warning signs as directed by the Manager, Utilities and Roading on each approach to the cattle stops warning drivers of the possible presence of cows on the road.

(f) The Licensee shall keep the Council advised of any and all changes to the cattle stops, fences and gates.

(g) The licensee shall be responsible for all repairs and maintenance of the cattle stops, fences and gates and any damage to the road or road reserve caused by the failure of the equipment or by any work on it.
(h) The licensee shall remove the cattle stops, fences and gates from the road reserve and reinstate the road and road reserve to its original condition if dairy farming operations cease resulting in the regular movement of cows across Carleton Road no longer occurring.

(i) This licence is transferable and the cost of transfer is that published in the Council’s Schedule of Fees and Charges applicable at time of transfer.

SIGNED by the
WAIMAKARIRI DISTRICT COUNCIL
acting under the delegated authority
of the Council
by affixing its common seal
in the presence of:

_________________________________
Authorised Person

_________________________________
Authorised Person

Signed by the Licensee

NAME

_________________________________
Licensee

Witness for Licensee signature:

(Name) _____________________________________

(Address) _____________________________________

_________________________________