Regional Direction and Delivery Committee

NOTICE IS GIVEN

that the next meeting of the **Regional Direction and Delivery Committee** will be held in **Mauao Rooms, Bay of Plenty Regional Council Building, 87 First Avenue, Tauranga** on:

Tuesday, 11 December 2018 commencing at 9.30 am.

Fiona McTavish
Chief Executive
30 November 2018

BAY OF PLENTY REGIONAL COUNCIL TOI MOANA

Regional Direction and Delivery Committee
Terms of Reference

The Regional Direction and Delivery Committee has a core function of policy formulation and implementation and monitoring of Regional Council strategy and policy.

Delegated Function

To set the strategic direction for the Region by formulating policy that clearly identifies Council's role and direction on issues. This will be achieved through the development and approval of Council strategy and policy.

To set the operational direction for approved Regional Council policy and strategy and monitor how it is implemented. This will be achieved through the development of specific operational decisions which translate policy and strategy into action.

Membership

Chairman and all councillors.

Quorum

In accordance with Council standing order 10.2, the quorum at a meeting of the committee is not fewer than seven members of the committee.

Term of the Committee

For the period of the 2016-2019 Triennium unless discharged earlier by the Regional Council.

Meeting frequency

Six-weekly.

Specific Responsibilities and Delegated Authority

The Regional Direction and Delivery Committee is delegated the power of authority to:

- Approve and review statutory and non-statutory policy, plans and strategies for:
  - the management of resources in the region;
  - identifying and promoting community aspirations;
  - defining and delivering on Council's roles;
- Approve and review operational policy and plans;
- Develop and review bylaws;
- Receive reporting on consenting, compliance and enforcement;
- Receive reporting from state of the environment monitoring;

- Receive any annual reporting of organisational programmes;
- Enter into contracts on matters within its Terms of Reference to a maximum value of $700,000 (excluding GST) for any one contract, subject to and within the allocation of funds set aside for that purpose in the Long Term Plan or Annual Plan or as otherwise specifically approved by Council;
- Approve submissions on matters relating to the Regional Direction and Delivery Committee's areas of responsibility that are not delegated to staff;
- Establish subcommittees and hearing committees and delegate to them any authorities that have been delegated by Council to the Regional Direction and Delivery Committee, including those under section 34 of the Resource Management Act 1991, and to appoint members (not limited to members of the Regional Direction and Delivery Committee);
- Delegate to hearings commissioners under section 34A of the Resource Management Act 1991 to exercise the powers, functions duties in relation to any authorities that have been delegated by Council to the Regional Direction and Delivery Committee;
- Establish working groups to provide advice to the Regional Direction and Delivery Committee on its areas of responsibility.

Note:

- The Regional Direction and Delivery Committee reports directly to the Regional Council.
- The Regional Direction and Delivery Committee is not delegated the power of authority to:
  - Approve the Regional Policy Statement and bylaws;
  - Review and adopt the Long Term Plan and Annual Plan;
  - Develop and review funding, financial, audit and risk policy and frameworks;
  - Approve Council submissions on Maori related matters except where submissions may have a wide impact on Council's activities;
  - Develop, approve or review non statutory policy for the Rotorua Te Arawa Lakes.

Public Forum

1. A period of up to 15 minutes may be set aside near the beginning of the meeting to enable members of the public to make statements about any matter on the agenda of that meeting which is open to the public, but excluding any matter on which comment could prejudice any specified statutory process the council is required to follow.

2. The time allowed for each speaker will normally be up to 5 minutes but will be up to the discretion of the chair. A maximum of 3 public participants will be allowed per meeting.

3. No statements by public participants to the Council shall be allowed unless a written, electronic or oral application has been received by the Chief Executive (Governance Team) by 12.00 noon of the working day prior to the meeting and the Chair's approval has subsequently been obtained. The application shall include the following:

   - name of participant;
   - organisation represented (if any);
   - meeting at which they wish to participate; and matter on the agenda to be addressed.

4. Members of the meeting may put questions to any public participants, relevant to the matter being raised through the chair. Any questions must be asked and answered within the time period given to a public participant. The chair shall determine the number of questions.

Membership

Chairperson:	P Thompson
Deputy Chairperson:	A von Dadelszen
Councillors:	Chairman D Leeder, N Bruning, W Clark, J Cronin, S Crosby, D Love, T Marr, M McDonald, J Nees, A Tahana, L Thurston, K Winters
Committee Advisor:	J Durham

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

Agenda

Resolution to exclude the public

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:

General Subject of Matter to be Considered	Reason for passing this resolution in relation to this matter	Grounds under Section 48(1) LGOIMA 1987 for passing this resolution
9.1 Public Excluded Regional Direction and Delivery Committee Minutes - 30 October 2018	Good reason for withholding exists under Section 48(1)(a)	Refer to the relevant section of the open meeting minutes
9.2 Lake Rotorua Integrated Framework Update	Good reason for withholding exists under Section 48(1)(a)	To carry out commercial activities

Previous Minutes

Minutes of the Regional Direction and Delivery Committee Meeting held in Mauao Rooms, Bay of Plenty Regional Council Building, 87 First Avenue, Tauranga on Tuesday, 30 October 2018 commencing at 9.33 a.m.

Present:

Chairman: P Thompson

Deputy Chairman: A von Dadelszen

Councillors: Chairman D Leeder, S Crosby, M McDonald, L Thurston, D Love, N Bruning, J Nees, W Clark, S Crosby, K Winters

In Attendance: N Poutasi (General Manager, Strategy & Science); C Ingle (General Manager, Integrated Catchments); S Omundsen (General Manager, Regulatory Services); R Donald (Science Manager); R Fraser (Consents Manager); D Phizacklea (Regional Integrated Planning Manager); S Lamb (Natural Resources Policy Manager); G Corbett (Biosecurity Manager); P de Monchy (Kaituna Catchments Manager); D Smith (Consents Team Leader); R Burton (Freshwater Team Leader); J Low (Water Policy Team Leader); P Doorman (Programme Leader, Geothermal); N Steed (Programme Leader, Statutory Policy); M Akurangi (Senior Planner); H Fraser (Programme Coordinator, Integrated Catchments); L Baty (Planning Coordinator); J Durham (Committee Advisor)

External: J Moir and G Cook (Carbon Reduction Group)

Apologies: J Cronin (Leave of Absence), T Marr, and A Tahana for absence Chairman D Leeder, S Crosby and M McDonald for lateness

1 Apologies

Resolved

That the Regional Direction and Delivery Committee:

1 Accepts the apologies of; Chairman Leeder, Cr Crosby and Cr McDonald for lateness, and Cr Cronin, Cr Marr and Cr Tahana for absence tendered at the meeting.

Thompson/Thurston
CARRIED

2 Public Forum

2.1 Joy Moir and Gillian Cook, Carbon Reduction Group

9.34am - Cr Crosby joined the meeting.

Ms Moir and Ms Cook outlined the background, objectives, and activities of the Tauranga Carbon Reduction Group and its efforts to reduce carbon emissions and climate change within the Bay of Plenty.

Key points included:

- Requested consideration be given to the establishment of mitigation targets to reduce emissions within the region.
- Suggested public engagement include more extensive community involvement and education to ensure the community was on board to reduce emissions and counteract climate change, and that Council collaborate with businesses and organisations throughout the region.
- Southland Regional Council set a goal to become a carbon neutral region and Central Government had provided $190,000 in support.
- Support for community lead climate change initiatives.
- In response to a question raised, it was suggested the message to the public reiterate the collective impact of each person and the combined efforts of each small country making positive changes.

3 Acceptance of Late Items

Nil.

4 General Business

Resolved

That the Regional Direction and Delivery Committee discuss the following Items under General Business:

1 Proposed Special Housing Areas.

Thompson/Nees
CARRIED

5 Declaration of Conflicts of Interest

Nil.

6 Previous Minutes

6.1 Regional Direction and Delivery Committee Minutes - 18 September 2018

Resolved

That the Regional Direction and Delivery Committee:

1 Confirms the Regional Direction and Delivery Committee Minutes - 18 September 2018 as a true and correct record.

Von Dadelszen/Thurston
CARRIED

6.2 Public Excluded Regional Direction and Delivery Committee Minutes - 18 September 2018

Resolved

That the Regional Direction and Delivery Committee:

1 Confirms the Public Excluded Regional Direction and Delivery Committee Minutes - 18 September 2018 as a true and correct record.

Thompson/Love
CARRIED

7 Operating Environment

7.1 New Zealand Resource Management Conference

9.52am – Cr McDonald joined the meeting.

Chris Ingle (General Manager, Integrated Catchments) provided highlights of the recent New Zealand Association of Resource Management Conference, "Getting it Done; Catchments, Partnerships and Implementation", which received positive feedback on the presentations, workshops and fieldtrips provided.

7.2 Tauranga Moana Biosecurity Capital Launch and Symposium

Refer Objective ID A3027854 for PowerPoint presentation.

Greg Corbett (Biosecurity Manager) summarised the successful Tauranga Moana Biosecurity Capital Launch and Symposium. It was well received, supported and had provided an opportunity to hear iwi perspectives and values.

Staff follow up:

- Provide a report on Myrtle Rust to the next meeting.
- Consider a similarly formatted event focussed on climate change.

8 Reports

8.1 Making the Proposed Regional Coastal Environment Plan Operative

Refer Objective ID A3028291 for PowerPoint presentation.

David Phizacklea (Regional Integrated Planning Manager) and Michal Akurangi (Senior Planner) outlined the next steps and potential enforcement requirements to make the Regional Coastal Environment Plan (RCEP) operative (less the parts under appeal).

Key points included:

- The RCEP would go to the Minister of Conservation for consideration and then be made operative within four to six months.
- Acknowledged the efforts of staff, Commissioners and Councillors to get the RCEP to the implementation stage.

Staff follow up:

- Share this achievement more widely through a media/communications plan.

Resolved

That the Regional Direction and Delivery Committee:

1 Receives the report, Making the Proposed Regional Coastal Environment Plan Operative.

2 Adopts the Proposed Bay of Plenty Regional Coastal Environment Plan for reference to the Minister of Conservation for approval.

3 Delegates to the Chief Executive the authority when approval has been given by the Minister of Conservation to set the date to make the Bay of Plenty Regional Coastal Environment Plan operative.

4 Acknowledges the significant contribution of staff, Commissioners, and Subcommittee Members in making the Plan Operative.

Thompson/Nees
CARRIED

8.2 Bounties for Wallaby Control

Refer Objective ID zA233872 for PowerPoint presentation.

Greg Corbett (Biosecurity Manager) gave a history of wallabies in the region and work undertaken to prevent spread.

Key points included:

- Based on the current rate of spread it was forecasted over the next 50 years, wallabies would spread across a third of New Zealand and cost $84m.
- Staff proposed a three stage approach; detect and control wallaby disbursement, prevent further dispersal through a buffer zone around a

containment area, and suppressing the core population. The approach was forecasted to cost $21.3m over 10 years.
- There was a potential funding overlap with Predator Free 2050.

Staff follow up:

- Identify sites where suppression would be most effective.
- Rather than bounties, staff to investigate regulated approach to contract hunting in specific areas on a trial basis.

Resolved

That the Regional Direction and Delivery Committee:

1 Receives the report, Bounties for Wallaby Control.

2 Requests that a further report be referred to RDD on the approach to wallaby management including a regulated approach to contract hunting in specific areas with a view to achieving sustained control.

3 Endorses Council partnering with communities planning 'pest hunt' fund-raising events to raise awareness of the wallaby problem.

Clark/Thurston
CARRIED

11am - the meeting adjourned.

11.15am - the meeting reconvened.

8.3 Proposed Change 5 (Kaituna River) to the Regional Policy Statement Project Timing and Steps

Nassah Steed (Programme Leader, Statutory Policy) advised Plan Change 5 would align with the Regional Natural Resource Plan Change, in order to comply with the Tapuika Claims Settlement Act 2014. The effect of changes to National Planning Standards and the Resource Management Act 1991 would likely remain unknown until April 2019.

Staff follow up:

- Provide a summary of RPS changes, plan changes and the way forward to the next meeting.

Resolved

That the Regional Direction and Delivery Committee:

1 Receives the report, Proposed Change 5 (Kaituna River) to the Regional Policy Statement Project Timing and Steps.

2 Approves the general timeframes and process for developing Proposed Change 5 (Kaituna River) to the Regional Policy Statement up to the point of public notification for submissions, set out in section 5 of this report.

3 Notes the Draft Proposed Change 5 (Kaituna River) policy framework will be reported to the Regional Direction and Delivery Committee for consideration prior to commencing external stakeholder consultation.

4 Notes the Te Maru o Kaituna River Authority will be closely consulted and their support sought at key project stages.

Nees/Leeder
CARRIED

8.4 Freshwater Futures Update

Refer Objective ID zA233883 for PowerPoint presentation.

9 Public Excluded Section

Resolved

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:

General Subject of Matter to be Considered	Reason for passing this resolution in relation to this matter	Grounds under Section 48(1) LGOIMA 1987 for passing this resolution
8.4 Freshwater Futures Update – Verbal Update on Lake Rotorua Nutrient Management Plan Change 10	**Good reason for withholding exists under Section 48(1)(a)**	**To maintain legal professional privilege**

Thurston/von Dadelszen
CARRIED

9.1 Freshwater Futures Update Continued

David Phizacklea (Regional Integrated Planning Manager), Rob Donald (Science Manager), Rebecca Burton (Freshwater Team Leader), and James Low (Water Policy Team Leader) outlined freshwater workstreams underway including; implementation of the National Policy Statement for Freshwater Management, plan changes, identification of at-risk catchments, Land Air Water Aotearoa (LAWA) data and tools, and monitoring.

Staff follow up:

- Session with Councillors to be arranged to demonstrate the LAWA site.
- Provide an update on the Three Waters Review developments to the next meeting.
- A paper on the Regional Growth Study Opportunities and Barriers be presented to the Committee in December.

Resolved

That the Regional Direction and Delivery Committee:

1 Receives the report, Freshwater Futures Update.

Thompson/Nees
CARRIED

9.2 Government Blueprint - Essential Freshwater

Refer Objective ID zA233883 for PowerPoint presentation.

David Phizacklea (Regional Integrated Planning Manager) and Rebecca Burton (Freshwater Team Leader) discussed Central Government's progress on freshwater and the potential impact on Council. Councillors noted the potential implication of changes as a result of Essential Freshwater and requested Annual Plan funds be considered for implementation.

Resolved

That the Regional Direction and Delivery Committee:

1 Receives the report, Government Blueprint - Essential Freshwater.

Thompson/Love
CARRIED

12.17pm - Cr Crosby left the meeting.

9.3 Update on Work under the Geothermal Programme

Refer Objective ID zA233883 for PowerPoint presentation.

12.20pm – Cr Thompson vacated the Chair and left the room and Cr von Dadelszen assumed the Chair

Stephen Lamb (Natural Resources Policy Manager) and Penny Doorman (Programme Leader, Geothermal) summarised work and engagement underway in Rotorua, Tauranga, and Kawerau in relation to the geothermal programme.

12.27pm –Cr Thompson entered the room and resumed the Chair

Key points included:

- Data availability varied between areas.
- Engagement with Maori in Rotorua had brought challenges but resulted in building trust and a better management plan.
- Concern was raised regarding differences in modelling between geothermal activities and freshwater activities.

Staff follow up:

- Provide a report on the differences in modelling to a future Committee meeting.

Resolved

That the Regional Direction and Delivery Committee:

1 Receives the report, Update on Work under the Geothermal Programme;

Thompson/von Dadelszen
CARRIED

9.4 Regional Policy Statement Implementation Strategy - Geothermal Resources Workstream

Nassah Steed (Programme Leader, Statutory Policy) and Michal Akurangi (Senior Planner) outlined the implementation strategy for the Geothermal Resources Workstream.

Resolved

That the Regional Direction and Delivery Committee:

1 Receives the report, Regional Policy Statement Implementation Strategy - Geothermal Resources Workstream.

Thompson/Bruning
CARRIED

9.5 Integrated Catchment Management Update

Refer Objective ID A3028748 for Video presentation.

Chris Ingle (General Manager, Integrated Catchments), Sarah Omundsen (General Manager, Regulatory Services), and Pim de Monchy (Kaituna Catchments Manager) provided a detailed overview of integrated catchment workstreams, including the Kaituna rediversion project.

12.50pm - Cr Crosby joined the meeting.

Resolved

That the Regional Direction and Delivery Committee:

1 Receives the report, Integrated Catchment Management Update.

Thompson/von Dadelszen
CARRIED

9.6 Consents Update 1 July – 8 October 2018

Sarah Omundsen (General Manager, Regulatory Services), Reuben Fraser (Consents Manager), and Dan Smith (Consents Team Leader) answered questions in relation to the consents backlog and work underway.

Key points included:

- The majority of the backlog was caused by applicants not providing further details to progress their applications, causing them to be placed on hold until it

was provided. Applicants were being contacted and asked if they wanted to proceed with their applications, most had not.
- Where consents were delayed due to awaiting cultural impact assessments, limited notification was being used to progress them.

Staff follow up:

- Future reports to include three year trend analysis data.

Resolved

That the Regional Direction and Delivery Committee:

1 Receives the report, Consents Update 1 July – 8 October 2018.

Thompson/Bruning
CARRIED

9.7 Update on Climate Change Activities

Stephen Lamb (Natural Resources Policy Manager) responded to questions regarding climate change activities.

Key points included:

- Community outreach and engagement needed to be considered.
- Noted that setting emission targets would be assisted by Central Government adopting national targets.
- A climate change symposium along the lines of the biosecurity one was suggested.
- Staff regularly looked to other national and international work underway addressing climate change.

Staff follow up:

- Provide information regarding funding received by Venture Southland (joint councils agency) for their carbon neutral goal.

Resolved

That the Regional Direction and Delivery Committee:

1 Receives the report, Update on Climate Change Activities.

Thompson/Nees
CARRIED

10 Consideration of General Business

11 Public Excluded Section

Resolved

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:

General Subject of Matter to be Considered	Reason for passing this resolution in relation to this matter	Grounds under Section 48(1) LGOIMA 1987 for passing this resolution
General Business Item 1: Consideration of Regional Policy Statement Change	Good reason for withholding exists under Section 48(1)(a)	To prevent the disclosure or use of official information for improper gain or improper advantage

Crosby/Thompson
CARRIED

The meeting closed at 1.12pm

TO BE CONFIRMED 11 DECEMBER 2018: _____
Chairperson

Reports

Report To: Regional Direction and Delivery Committee

Meeting Date: 11 December 2018

Report From: David Phizacklea, Regional Integrated Planning Manager

Final Regional Targets for Swimmable Rivers and Lakes

Executive Summary

Bay of Plenty's Regional Targets for Swimmable Rivers and Lakes are required by the National Policy Statement for Freshwater Management to be finalised and made available to the public by 31 December 2018.

Approval is sought in this report to the final regional targets of 95.7% for specified rivers and 85% for specified lakes to be swimmable by 2030.

Setting regional targets is part of Council's National Policy Statement for Freshwater Management implementation work programme.

The regional targets to improve the quality of fresh water for primary contact in specified rivers and lakes are the Bay of Plenty region's contribution to achieving the national target of 80% swimmable rivers and lakes by 2030 and 90% swimmable by 2040. The draft Bay of Plenty Regional Targets were approved by Council on 29 March 2018.

The Ministry for the Environment will identify any shortfalls in the national targets and consider how these could be met after final regional targets have been set.

Recommendations

That the Regional Direction and Delivery Committee:

1 Receives the report, Final Regional Targets for Swimmable Rivers and Lakes.

2 Approves the final Regional Targets of 95.7% for specified rivers and 85% for specified lakes to be swimmable by 2030 as required by the National Policy Statement for Freshwater Management.

3 Directs staff to make the final Regional Targets publicly available by 31 December 2018, provide the final targets to the Ministry for the Environment in the required format, and work with the Ministry for the Environment should any further work be required.

1 Purpose

The purpose of this report is to finalise the Bay of Plenty Regional Targets for Swimmable Rivers and Lakes and make the targets available to the public by 31 December 2018 to satisfy Policy A6 (b) of the National Policy Statement for Freshwater Management 2014 (NPS-FM).

Regional targets are the Bay of Plenty's contribution to the national targets set by the NPS-FM.

The report recommends that the draft Bay of Plenty Regional Targets are adopted as the final regional targets and that these are made publicly available by 31 December 2018. This recommendation is based on the Bay of Plenty region having already met and exceeded the national 2030 targets for swimmable rivers and lakes and the national 2040 target for rivers.

2 Background

Bay of Plenty Regional Council set the draft Bay of Plenty Regional Targets of 95.7% for specified rivers and 85% for specified lakes to be swimmable by 2030 on 29 March 2018. Specified rivers are those classified as fourth order or above, and specified lakes are those with a perimeter of 1.5 kilometres or more.

The Bay of Plenty 'draft regional swimmability targets' were made available to the public on council's website and reference made to the MfE's 'Regional information for setting draft targets for swimmable lakes and rivers' report by the 31 March 2018, satisfying Policy A6 a) of the NPS-FM.

The Minister for the Environment, Hon David Parker, sought advice from regional councils on monitoring of *E.coli* and seasonal and high flow differences in water quality in relation to swimmability. Council's response was:

- seasonality should be considered in determining long-term grading of primary contact, with the data supporting this being collected during the summer months when contact recreation is actually taking place.
- at present, there is a disconnect between the NPS-FM contact recreation targets (which are based on year-round freshwater State of the Environment monitoring networks), and the need to manage public health warnings which are based on surveillance monitoring programmes during the summer months.

The Ministry for the Environment (MfE) has agreed that a review of the science underpinning the freshwater microbiological guidelines used to manage contact recreation is required and work is underway to progress this.

3 Process for Finalising Regional Targets

At the time of setting draft regional targets in March 2018, it was unclear what the process was for finalising regional targets by 31 December 2018. Minister Parker outlined the process in his letter to Council of 27 August 2018:

- Each council will need to make its final regional targets publicly available by 31 December 2018

- Final regional targets should reflect the intent of the NPS-FM which is to improve water quality so that it is safe to swim in more often
- A template for reporting each regions targets has been provided which needs to be completed and returned to MfE.

Based on the draft regional targets across New Zealand, we are collectively achieving national swimmability levels of 78.1%, which is slightly under the 2030 national target of 80% and well short of the national target of 90% by 2040. The Minister's letter confirms there is no need for a combined report finalising all regional targets from each of the councils and councils are not expected to trade between themselves to collectively meet the national targets.

Any work required to identify shortfalls in the national targets, and how these shortfalls could be met will be carried out by MfE, after final regional targets have been set. The Minister has indicated there will be an opportunity for technical staff to work with MfE should further work be required.

4 Bay of Plenty Regional Targets

The Bay of Plenty regional targets for 2030 are based on MfE's modelling of work already planned and underway to improve the quality of fresh water for primary contact and are our regions contribution to collectively achieving the national target of 80% swimmable rivers and lakes by 2030 and 90% by 2040 as set out in Appendix 6 of the NPS-FM. Setting regional targets are only a small part of the bigger picture needed to implement the contact recreation requirements of the NPS-FM.

The MfE modelling determined, the Bay of Plenty region currently has 94.5% swimmable rivers and 85% swimmable lakes, which is above the national target of 80% by 2030. After modelling the planned and underway projected improvements for swimmable rivers only, the regional targets are expected to increase by 1.2% to 95.7% by 2030. The model used only considers rivers so projected improvements to lakes have not been modelled which is why the regional target for lakes remains unchanged at 85%. Key assumptions informing the scientific and economic modelling are set out in the MfE report. A list of specified rivers and lakes by WMA and map showing results of MfE's projected water quality for swimming by 2030 is attached in Appendix 1.

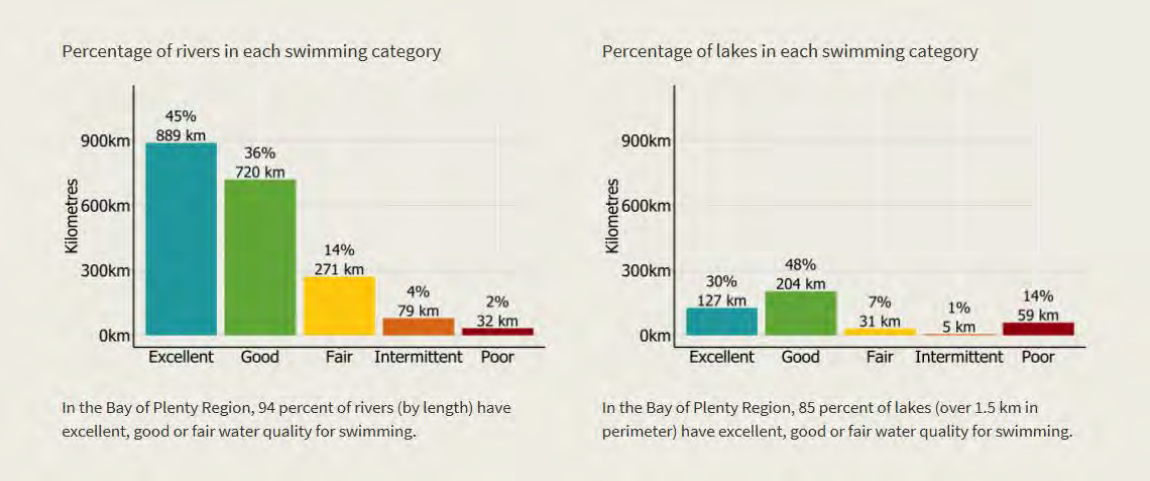
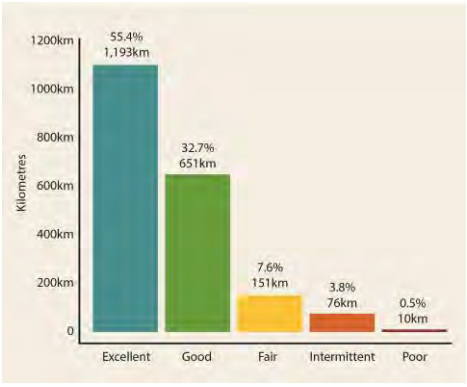


Figure 1: Water quality for swimming in the Bay of Plenty region – current state (2017) as modelled by MfE

Modelling shows council's Sustainable Land Use Incentives (SLUI) scheme is expected to make steady improvements towards making sure rivers and lakes are suitable for primary contact more often. In addition, the Rotorua Te Arawa Lakes restoration programme is in place and the Rotorua catchment team actively driving lake water quality improvements, none of which has modelled as part of MfE's swimmability target modelling.



Regional target for specified rivers

In the Bay of Plenty Region, 95.7 percent of specified rivers (by length) are projected to have excellent, good or fair water quality by 2030

Figure 2: Projected improvement in water quality for swimming in specified rivers the Bay of Plenty region by 2030 as modelled by MfE

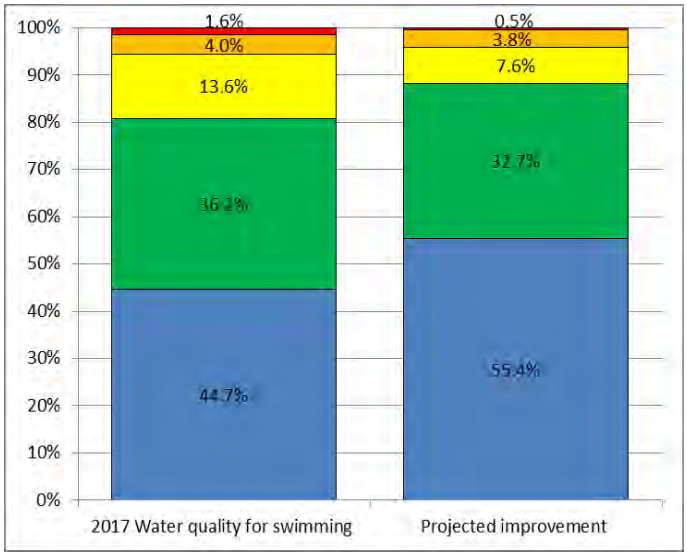


Figure 3: Projected improvement in water quality for swimming for Bay of Plenty's rivers by 2030 as modelled by MfE

5 Communication and Consultation

Regional council's projected improvements are all budgeted for and align with the LTP 2018-2028. The LTP process included community consultation and showed there to be strong support from the BOP community to maintain and improve water quality within the Bay. No further formal consultation programme is planned for release of the final Bay of Plenty regional targets.

The final Bay of Plenty regional targets will be made available to MfE in the format based on the Ministers template and the public by 31 December 2018 satisfying Policy A6 (b) of the NPS-FM. The regional targets will be made available to the public via an article in the December edition of Freshwater Flash and also placed on council's website.

Consultation will be undertaken in accordance with Schedule 1 of the Resource Management Act for any proposed changes to the Regional Natural Resources Plan to address primary contact (or swimmability) of rivers and lakes.

6 Next steps – regional plan change

Regional targets for swimmable rivers and lakes will form a small part of the information to be considered when changing the Regional Natural Resource Plan to implement the contact recreation requirements of the NPS-FM. The regional targets have been based on MfE's limited and straightforward criteria at a scale appropriate for obtaining a national snapshot of how work planned and already underway in each region is expected to contribute to meeting national targets in specified rivers and lakes. It is clear from kōrero with iwi, co-goverance groups and community groups that the swimmability of all freshwater bodies (not only specified rivers and lakes) are highly valued alongside other important values such as ecosystem health, mahinga kai and use of water for cultural ceremonies.

Policy A5 of the NPS-FM requires the regional plan to be changed to the extent needed to ensure the plan:

(i) Identifies specified rivers and lakes, and primary contact sites; and

(ii) States what improvements will be made, and over what timeframes, so they are suitable for primary contact more often; or

(iii) States how they will be maintained if regional targets established under Policy A6(b) have been achieved.

Primary contact (or swimmability) will be addressed as one of the region wide components for inclusion in the Rangitāiki and Kaituna-Pongakawa-Waitahanui Water Management Area plan change 12. It will include provisions for specified rivers and lakes and primary contact sites already identified as freshwater contact recreation waterbodies in the Regional Natural Resources Plan. Any additional primary contact sites will be considered as part of each of the water management area plan changes.

7 Financial implications

The MfE report includes economic modelling and identified that nationally the improvement from committed works will come at a cost of $217M per annum. The report identifies $4.17M (or 2% of the total national cost) will be spent per annum to fund projected improvements in the rural area of the Bay of Plenty region. The estimated costs include those not only on BOPRC but also local landowners, industry and territorial authorities funding.

Council's Long-term Plan 2018-2028 identifies $1.7M per annum to fund our programmed improvement activities within the Integrated Catchment Management budget for our Sustainable Land Use Incentives (SLUI) scheme. The SLUI scheme currently assumes that Council will 50:50 fund fencing and riparian improvements, which aligns with the MFE report. These figures do not include costs associated with funding the Rotorua Te Arawa Lakes restoration programme which has not been factored into MfE's report, partly due to the fact that projected improvements to lakes were not modelled. Key assumptions informing the scientific and economic modelling are set out in the MfE report.

Although the regional targets assume that we continue with this level of investment over the next 10 years, Council has the option to alter the levels of service around this

funding as part of the Long Term Plan process. Based on the regional targets, there is no impact to the LTP 2018-2028 budgets.

8 Implications for Māori

Council continues to engage with iwi and hapū to understand and consider their values and interests in water as part of implementing the NPS-FM, in particular as part of the Water Management Area (WMA) work in the Rangitāiki and Kaituna-Pongakawa-Waitahanui (PC12) planning processes.

It is clear not only from kōrero about WMA processes, but also from work co-governance groups have undertaken, that iwi and hapū value the swimmability of rivers and streams highly alongside other important values such as ecosystem health, mahinga kai and use of water for cultural ceremonies.

It is recognised that Māori involvement in the planning and delivery of improved water management is integral to their role as kaitiaki and necessary to achieve requirements of the NPS-FM. Information received through engagement will be used in the consideration of limit setting which appropriately account for Māori interests and values.

9 Council's Accountability Framework

9.1 Community Outcomes

Council's Freshwater Futures work including setting of regional targets for swimmability directly contributes to the following community outcomes in Council's Long Term Plan 2018-2028:

- Freshwater for Life – Improving freshwater water quality to improve the ecological health of estuaries and freshwater bodies.
- A Healthy Environment – Improving the state of degraded estuaries.
- Safe and Resilient Communities – Seeking to achieve water quality standards in the estuaries that enable safe food harvesting and contact recreation.

9.2 Long Term Plan Alignment

Finalising regional targets is a National Policy Statement for Freshwater Management legislative requirement. This work is planned under various activities within the Long Term Plan 2018-2028, including Regional Planning and Engagement, Integrated Catchment Management and Technical Services – included Science, Geospatial, and Data Services.

9.3 Current Budget Implications

There are no budget implications for the current financial year.

9.4 Future Budget Implications

There are no known budget implications for future years.

Jo Watts
Senior Planner (Water Policy)

for Regional Integrated Planning Manager

30 November 2018

APPENDIX 1

Ministry for the Environment Projected Water Quality Improvements for Swimming in Specified Rivers and Lakes in the Bay of Plenty Region by 2030

Water quality for swimming 2030

- Excellent
- Good
- Fair
- Intermittent
- Poor

* Specified rivers are those classified as fourth order and above. Specified lakes are those with a perimeter of 1.5km or more

MfE projected water quality for swimming - 2030
Specified* Rivers and lakes in Bay of Plenty Region

BAY OF PLENTY REGIONAL COUNCIL
TOI MOANA

Projection and Grid Information
HORIZONTAL DATUM: New Zealand Geodetic Datum 2000
For practical purposes, NZGD2000 equates to WGS84
VERTICAL DATUM: Moturiki
PROJECTION: New Zealand Transverse Mercator 2000

Scale 1:775,000

0 10 20 30
10 Kilometres

GSP-571615
Sheet 1 of 1
Printed 21/11/2018

List of Specified* Rivers and Lake names identified within the MFE maps for the Bay Of Plenty region by Water Management Area (WMA)

*Specified rivers are those classified as fourth order or above. Specified lakes are those with a perimeter of 1.5 kilometres or more.

RIVERS

East Coast Water Management Area

Name of River	Length (Km)
Haparapara River	27.8
Hawai River	11.5
Kahoka Stream	7.7
Kereu River	24.7
Mangahinatore Stream	2.1
Mangakirikiri Stream	9.8
Mangamate Stream	2.2
Mangatutara Stream	18.9
Motu River	51.3
Ngaupokotangata Stream	8.2
Petipeti Stream	2.4
Pohueroro Stream	0.7
Raukokore River	45.9
Takaputahi River	29.6
Takataka Stream	1.8
Te Kahika Stream	9.7
Te Whaiti Stream	3.7
Torere River	15.9
Waiaua River	13.4
Waiopoahu Stream	5.4
Waiti Stream	3.5
Whangaparaoa River	8.7
Whitikau Stream	3.7

Ohiwa Harbour and Waiotahi WMA

Name of River	Length (Km)
Nukuhou River	17.6
Waiotahi River	34.4

Kaituna-Pongakawa-Waitahanui WMA

Name of River	Length (Km)
Kaikokopu Canal	5.3
Kaituna River	49.2
Mangorewa River	31.4
Oeuteheuheu Stream	4.0
Onaia Stream	8.1
Pokopoko Stream	6.2
Pongakawa Canal	0.3
Pongakawa Stream	18.9
Pungarehu Stream	1.9
Raparapahoe Stream	12.4
Waiari Stream	23.3
Waitahanui Stream	11.3
Wharere Canal	4.0

Rangitaiki WMA

Name of River	Length (Km)
Dry Creek	8.5
Flaxy Creek	9.4
Haumea Stream	4.5
Hikurangi Stream	1.2
Horomanga River	24.4
Manawahiwi Stream	1.9
Mangaharakeke Stream	15.9
Mangakaretu Stream	2.5
Mangamate Stream	4.2
Mangatiti Stream	10.8
Mangawiri Stream	9.7
Okahu Stream	8.7

Rangitaiki WMA continued

Name of River	Length (Km)
Otamatea River	27.1
Otangimoana Stream	12.6
Pekepeke Stream	11.5
Pokairoa Stream	6.3
Pukumatai Stream	2.7
Rangitaiki River	181.3
Ruarepuae Stream	3.2
Te Tehi Stream	3.6
Upper Mangamate Stream	1.0
Upper Okahu Stream	7.8
Waiatiu Stream	5.8
Waihua Stream	10.2
Waikaukau Stream	1.9
Waikowhewhe Stream	7.1
Waione Stream	2.6
Wairohia Stream	0.2
Waitaruna Stream	4.8
Wheao River	34.1
Whirinaki River	70.3

Rotorua Lakes WMA

Name of River	Length (Km)
Haumi Stream	4.4
Ngongotaha Stream	19.9
Ohau Channel	2.0
Puarenga Stream	11.0
Tarawera River	0.1
Taupo Stream	6.6

Rotorua Lakes WMA continued

Name of River	Length (Km)
Tupapakurua Stream	4.0
Tureporepo Stream	1.1
Umurua Stream	5.5
Utuhina Stream	10.9
Waihuahuakakahi Stream	2.0
Waikaruru Stream	1.4
Wairoa Stream	9.4
Waiteti Stream	11.5

Tarawera WMA

Name of River	Length (Km)
Awakaponga Canal	2.9
Buddles Creek	1.4
Herepuru Stream	10.7
Mangakotukutuku Stream	1.5
Mangaone Stream	3.2
Mangawhio Stream	13.7
Rangitaiki River	0.1
Ruruanga Stream	9.8
Tarawera River	58.0
Waiaute Stream	9.0
Waikanapiti Stream	2.3
Waiwhakapa Stream	15.0

List of Specified* Rivers and Lake names identified within the MFE maps for the Bay Of Plenty region by Water Management Area (WMA)

*Specified rivers are those classified as fourth order or above. Specified lakes are those with a perimeter of 1.5 kilometres or more.

Tauranga Harbour WMA	
Name of River	**Length (Km)**
Aongatete River	7.2
Heretatua Stream	2.6
Kaukaumoutiti Stream	6.2
Mangakarengorengo River	5.3
Mangapapa River	6.9
Ngamuwahine River	5.6
Ngutuuru Stream	0.7
Omanawa River	18.3
Opuiaki River	19.0
Ruahihi Canal	0.6
Te Rereatukahia Stream	1.5
Tuapiro Creek	9.7
Uretara Stream	5.0
Waimapu Stream	17.1
Wairoa River	25.6
Waitao Stream	2.8
Waitekohe Stream	2.9

Waioeka and Otara WMA	
Name of River	**Length (Km)**
Kukumoa Creek	1.2
Manganuku Stream	7.4
Mangaoira Stream	3.1
Opato Stream	13.8
Oponae Stream	3.2
Otara River	23.5
Pakihi Stream	28.5
Taipouri Stream	2.0

Waioeka and Otara WMA continued	
Name of River	**Length (Km)**
Tataweka Stream	3.9
Tauranga Stream	3.4
Te Pato Stream	7.0
Te Waiti Stream	9.6
Tutaetoko Stream	18.8
Waiata Stream	6.7
Waioeka River	66.9

Whakatane and Tauranga WMA	
Name of River	**Length (Km)**
Kaharoa Stream	4.2
Kaitawa Stream	1.3
Kanihi Stream	8.6
Kohuru Stream	1.4
Kotorenui Stream	3.1
Mahakirua Stream	10.9
Manaohou Stream	6.7
Mangakakaho Stream	8.3
Mangapae Stream	4.2
Mangatoatoa Stream	2.1
Mimiha Stream	0.8
Ohane Stream	6.3
Ohau Stream	2.1
Ohaua River	3.4
Ohora Stream	8.1
Oireakahanui Stream	0.2
Okarika Stream	5.2
Otane Stream	6.2

Whakatane and Tauranga WMA cont	
Name of River	**Length (Km)**
Otapukawa Stream	4.4
Owhakatoro Stream	14.4
Tamurenui Stream	0.7
Tauranga River	32.4
Tawawharara Stream	1.0
Tawhana Stream	2.8
Te Kakea Stream	1.1
Waiarua Stream	6.1
Waihui Stream	4.2
Waiiti Stream	18.2
Waikare River	27.8
Waimana River	39.9
Waimeha Stream	5.0
Waioho Stream	17.7
Whakatane River	95.0

LAKES

R = Rangitaiki WMA
RL= Rotorua Lakes WMA
TH = Tauranga Harbour WMA
T = Tarawera River WMA

Name of Lake		Perimeter (K
Flaxy Lake	R	2.2
Lake Aniwhenua	R	24.2
Lake Matahina	R	18.4
Lake Mclaren	TH	4.7
Lake Okareka	RL	10.5
Lake Okaro	RL	2.2
Lake Okataina	RL	29.1
Lake Otumahi	R	1.6
Lake Pouarua	R	4.4
Lake Pupuwharau	R	2.2
Lake Rerewhakaaitu	RL	22.3
Lake Rotoehu	RL	39.6
Lake Rotoiti	RL	59.9
Lake Rotokakahi (Green Lake)	RL	14.3
Lake Rotokawau	RL	2.8
Lake Rotoma	RL	24.9
Lake Rotomahana	RL	27.1
Lake Rotoroa	T	3.2
Lake Rotorua	RL	45.9
Lake Tamurenui	T	2.0
Lake Tarawera	RL	46.7
Lake Tikitapu (Blue Lake)	RL	5.1
Matahi Lagoon	RL	1.7
Onewhero Lagoon	RL	1.7
Whakarewarewa Lagoon	RL	2.1

Report To: Regional Direction and Delivery Committee

Meeting Date: 11 December 2018

Report From: David Phizacklea, Regional Integrated Planning Manager

National Policy Statement for Freshwater Management Implementation Programme

Executive Summary

The Committee is asked to formally adopt an updated programme of staged implementation of the National Policy Statement for Freshwater Management by extending the timeline to complete implementation by 31 December 2030.

Amendments to National Policy Statement for Freshwater Management in September 2017 provide an opportunity for Council to review its implementation programme. During the 2018-2028 Long-term Plan deliberations members asked staff to consider the need to extend its implementation timetable to 2030.

In light of Plan Change 9 appeals, emerging Plan Change 12 complexities and a changing national policy landscape it is recommended to rescind the 30 November 2017 implementation timetable and adopt an amended schedule for implementing the National Policy Statement for Freshwater Management as set out in this report.

Recommendations

That the Regional Direction and Delivery Committee:

1 **Receives the report, National Policy Statement for Freshwater Management Implementation Programme.**

2 **Rescinds its 30 November 2017 implementation timetable**.

3 **Adopt and publicly notify an amended schedule for implementing the National Policy Statement for Freshwater Management as set out in this report, signalling completion by 31 December 2030.**

1 Purpose

To formally adopt the updated programme of staged implementation of the National Policy Statement for Freshwater Management 2014 (NPS-FM).

The possibility of extending the NPS-FM implementation programme has been previously signalled including in November 2017, when Council adopted its current NPS-FM timetable.

2 Background

Policy E1(c & d) of the National Policy Statement for Freshwater Management 2014 requires Council to formally adopt a *programme of time-limited stages* to implement the NPS-FM. Council first did this at its 14 December 2015 meeting where it approved a schedule signalling completion by 31 December 2025. Since then, Council has received a number of papers and made a number of key decisions in relation to NPS-FM implementation - attached as Appendix 1.

Among these papers on 16 March 2017 staff presented to RDD with alternative options for Council's approach to implementing the NPS-FM. There we highlighted implementation challenges caused by central government policy uncertainty, including pausing implementation while further policy guidance was sought[1]. This was not a preferred option because, notwithstanding policy uncertainty, considerable technical work needs completing.

On 30 November 2017, Council revised its initial indicative timetable as follows:

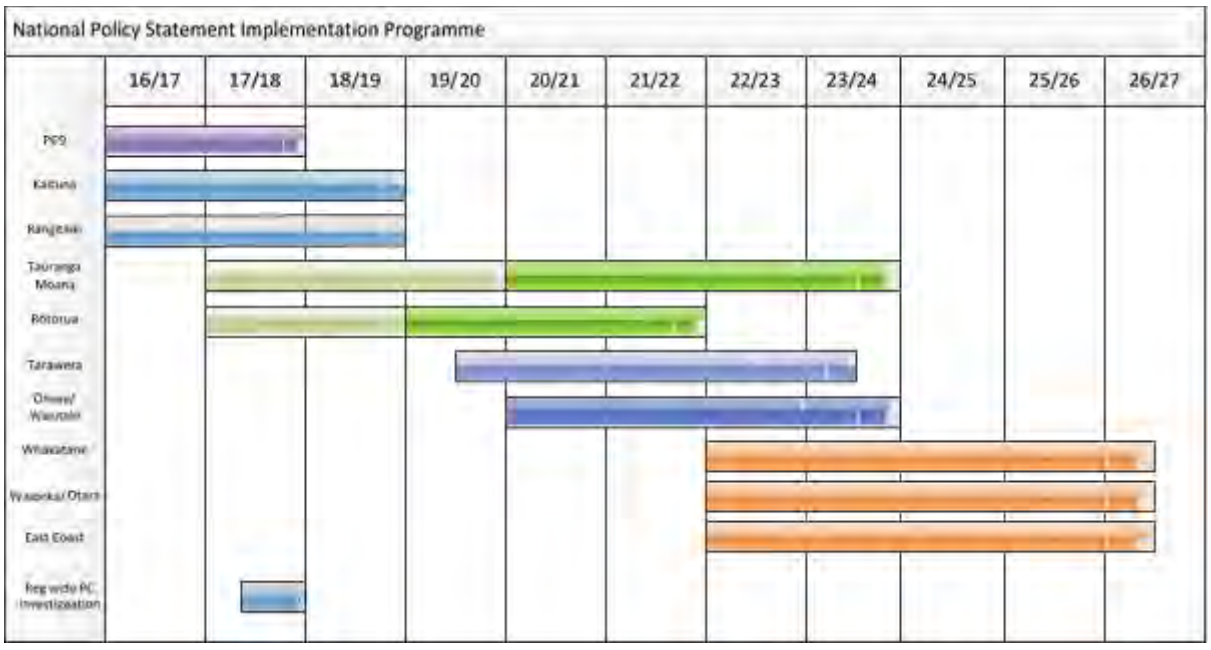


Figure 1: Bay of Plenty NPS-FM Operational Implementation Programme timeline.

At this time, it was noted the September 2017 amendments to the NPS-FM included the ability to review and revise implementation timelines and formally adopt revised timelines by 31 December 2018 - providing an opportunity to extend NPS-FM implementation from completion in 2025 to 2030. Those provisions read:

Any programme adopted under Policy E1 (c) of the National Policy Statement for Freshwater Management 2011 or under E1(c) of the National Policy Statement for Freshwater Management 2014 by a regional council is to be reviewed, revised if

[1] Appendix 1: Future National Policy Statement for Freshwater Management 2014 Implementation Options. Regional Direction & Delivery Committee meeting 16 March 2017.

necessary, and formally adopted by the regional council by 31 December 2018, and publicly notified.

During 2018 LTP workshops Councillors directed staff to undertake a review of whether NPS-FM implementation timeframes should be extended to 2030. Although some steps have been taken towards this with the extension of the stocktake phase for the Rotorua WMA and a delay in timeline for the Rangitāiki and Kaituna-Pongakawa-Waitahanui Water Management Areas (WMAs) no official notice has been given to MfE that Council intends to extend its timeframes .

This report recommends changes to the NPS-FM implementation timetable. The new indicative timetable is shown below in Figure 2. Note the dark blue blocks are included for context because they affect the timetable.

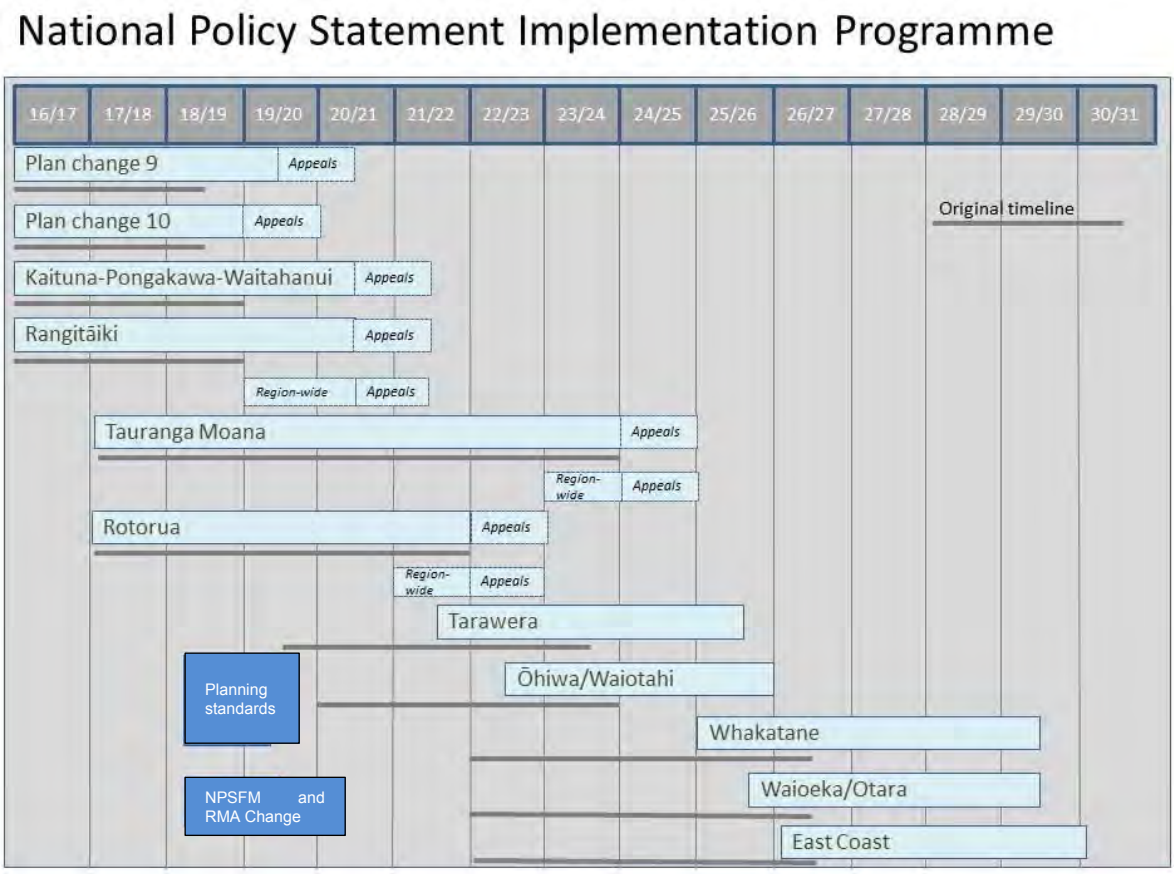


Figure 2: Updated NPS-FW implementation timetable

The following sections provide a brief update on NPS-FM implementation progress and reasons for the proposed timetable changes.

3 Implementation progress

The BOPRC website[2] details the 'official' NPS-FM implementation program relative to a December 2016 start. It details three 12 month implementation steps for the Kaituna, Pongakawa, Waitahanui, Rangitāiki (KPW) WMAs.

[2] https://www.boprc.govt.nz/our-region-and-environment/water/freshwater-futures/implementing-the-national-policy-statement-for-freshwater-management/

The following table provides an analysis of progress relative to that timetable and includes relevant details on other key NPS-FM implementation projects.

Implementation Progress	Relative to notified schedule	Scheduling implication
Plan Change 9		
Groundwater accounts	Groundwater accounts have been automated considerably ahead of schedule and as a direct result of PC9.	Dramatically streamlines future processes and discussions around groundwater. Direct benefit to consents and industry.
Groundwater and surface water data	Detailed analysis and recalculation of estimated take volumes.	Significantly improved confidence in account figures. Direct benefit to consents and industry.
Surface water accounts	Project now well developed and brief are in negotiation.	Provides new analytical capabilities that substantially reduce manual calculations. Time and cost savings for future WMAs. Will benefit consents and industry.
Metering	New systems and standards now in place with continually improving records.	With time, will provide a more robust dataset for policy analysis.
Decision notified on 9 October 2018	Towards end of planned schedule.	Possibly means decisions will overlap government decisions on water allocation.
Reporting to Environment Court January 18 2019	Very rapid – progressing faster than anticipated.	Immediate impact on staff resources for PC12. But, pushes us to achieve early settlement.
First report to Env Court April 2019	Very rapid – progressing faster than anticipated.	As above.
Rotorua Lakes (PC10)		
Environment Court Appeals	Nationally significant.	Direct (anticipated) resourcing implications.
Kaituna, Pongakawa, Waitahanui, Rangitāiki (PC12)		
Phase 2: 12 Months • Confirm values • Define FMUs • Map Values	Complete, but slightly delayed.	Slight schedule delay.

• Review attributes vs state • Outstanding FWB (work postponed)		
Phase 3: 12 Months • Assess needs • Scenario impact analysis • Evaluation of scenarios • Policy development state • Consult	Modelling complexities have caused modelling to be significantly delayed. Needs and scenario work is almost complete. KPW issues may take longer to resolve than anticipated.	Potentially 6 month delay due to issue complexity requiring greater consultation than anticipated. PC9 may further impact on ability to deliver water quantity solutions.
Rotorua and Tauranga WMAs (PC15 & 16)		
Preliminary data gathering and project setup.	Good progress has been made. Good stakeholder support in both WMAs.	Nil

Further details are provided in the Freshwater Futures Update agenda report to this Committee meeting.

4 Proposed Timetable Change

This section details the proposed NPS-FM implementation timetable changes and other management responses to anticipated policy change, and the material presented in section 3.

4.1 Regional Wide Water Quantity (Plan Change 9)

Region-wide Water Quantity Plan Change 9 (PC9) sets interim freshwater and groundwater allocation limits. Its progress is outlined in section 3.

A significant number of submissions were received from tangata whenua on Plan Change 9. They included broader issues staff consider better sit in a Water Management Area plan change process, or need to be resolved with the Crown.

Staff are currently assessing the implications of appeals to PC9. The potential for PC9 appeals to significantly draw on resources that would otherwise be committed to PC12 and other water policy work will be known only after initial discussions with the appellants. A separate paper details the appeals, but it is important to note that most parts of the plan change are impacted, particularly in relation to concerns that tangata whenua have raised, including how water is allocated.

In that regard, it is important to note that Government's newly formed Kahui Wai Māori is intended to engage with Māori on freshwater and may be involved in final 'sign off' on new ways of reflecting Māori rights and interests in freshwater policy and regulation. This is integral to some of the PC9 appeals and may affect PC12 and other freshwater plan changes.

Extending NPS-FM implementation to 2030 provides a buffer that may be required if PC9 appeal matters substantively affect how PC12 is developed. Staff will prioritise confirming appellant intentions in this regard and remain hopeful that PC9 may not impact on other plan changes.

4.1 Kaituna, Pongakawa, Waitahanui (KPW) and Rangitāiki Water Management Area (PC 12)

PC12 development is well summarised in the Freshwater Futures update.

Given complexities in modelling, data cleansing and data gap-filling (which were required to get the model working) PC12 progress has been delayed as noted in section 3. In addition, more time has been spent ensuring material is supported by stakeholders. A key lesson learnt is that beginning community engagement as early as we did should not be repeated for future WMAs.

The investigative phase of the PC12 work is now largely complete meaning the 2019 (calendar) year focus shifts to problem solving. A draft plan change is now provisionally scheduled for the end of 2019.

Key next steps in the Kaituna, Pongakawa and Waitahanui Water Management Area relate to developing a response appropriate to the size of the problem. A “Coastal Receiving Environment” report (included elsewhere in this agenda) highlights that a large scale reduction of catchment contaminant loads is needed. Developing an appropriate pathway to achieving this will take time.

Relative to the Rangitāiki Water Management Area, the Kaituna Pongakawa and Waitahanui may be delayed. Nevertheless, as noted, we still anticipate notifying one plan change for these two Water Management Areas towards the end of the 2019 calendar year.

These sorts of challenges are commonplace and were anticipated. We hold regular cross-team discussions to ensure everyone understands current issues. Additional modelling to help understand the feasibility of different mitigation options is underway and preliminary scheduling of a revised program for this work has commenced. Staff anticipate having greater clarity about the overall project schedule after March next year when the Coastal Receiving Environment material will be more actively communicated.

Extending the implementation timetable to 2030 as proposed provides scope, if required, for significant changes to the KPW program which we are in the very early stages of considering.

4.2 Rotorua Lakes (Plan Change 15) and Tauranga Moana (Plan Change 16)

In June 2017, Council agreed to commence work on the Rotorua Lakes and Tauranga Moana WMAs. Both are now in their early planning and information gathering phases.

As noted in figure 2 and section 3 these plan changes are accommodated in the current schedule. However, the additional time proposed by extending the implementation schedule to 2030 accommodates potential slippage should water quantity work be put on hold pending PC9 appeals (other WMAs would be advanced if this were the case).

4.3 Tarawera

The Tarawera River Catchment Plan became operative in 2004. A review of plan effectiveness occurred in 2015 which noted a number of amendments were required, including alignment with the National Policy Statement for Freshwater Management.

The proposed schedule in Figure 2 indicates delays to the Tarawera water management area to reduce the number of parallel plan changes. Further discussion will be needed with mill owners to align with any work they have underway in anticipation of the earlier review date.

Because PC9 appeals and national policy direction may cause more advanced Water Management Area processes to be delayed pending further central government direction we could need to juggle other priorities. If this is required, then part of the Tarawera program may be advanced; but equally it may be delayed.

Staff propose ensuring no water management area proceeds to plan change until central government policy is clear.

5 Changing National Policy

The national policy landscape around the management of freshwater resources has a number of changes anticipated in 2019/20. Bay of Plenty Regional Council is well placed to respond with stop and stare moments.

A key part of our response strategy is to ensure technical work progresses and community discussions happen, but formal plan changes are not developed until the risk of rework is low. In particular, we wish to avoid developing policy or confirming direction in matters such as water allocation where greater direction is signalled and we risk doing unnecessary rework. But, equally, it is important to use the available time effectively which means, for all WMAs, effectively sizing the problem and developing potential solution packages. It should also be noted that the work program includes provision for region-wide plan changes to be promoted in parallel with WMA plan changes as a key means of implementing new policy requirements.

It should also be noted also that BOPRC staff are active on central government Special Interest Groups, are involved in the At Risk Catchments work and have a secondment in the Ministry for the Environment, so we are abreast of this changing situation.

5.1 Planning Standards

As part of the 2017 Resource Management Act 1991 (RMA) amendments the government proposed new national planning standards to improve plan consistency. All plans will soon need to follow the same structure and format with common definitions, glossary of te reo Māori terms, standardised mapping and electronic delivery in an ePlan format. The Regional Natural Resources Plan, combining six regional plans into one, and the streamlined approach to regional plan content aligns well with the draft national planning standards, but is unlikely to be 100% compliant.

Final standards are due in April 2019. Councils will have one year to implement basic functionality for existing plans and policy statements and five years to notify more significant amendments directed by the national planning standards.

Given their imminent release, it is also important to delay draft plan notification until standards are available. These will provide greater clarity and standardisation which may eliminate appeals related to 'style' matters. Depending on the content of the standards and other policy released around this time, we may consider a new option of no longer doing a draft plan release.

5.2 Resource Management Act (RMA) Reforms

Minister Parker recently announced on 9 November 2018 a two stage Resource Management Act review process. Significantly, he stated an intention to give regional councils the ability to review groups of consents in line with updated standards. The intention of these changes is to speed the cleaning up of rivers, which otherwise could be delayed waiting for existing consents to come up for renewal.

The Minister has indicated that stage two of his water reforms will be more comprehensive and build on current Government work priorities across urban development, climate change, and freshwater. This is expected to start in 2019. The Minister/MFE regularly seeks input from Councils which, as noted earlier, includes support for the ministry's Catchments at Risk work and secondment.

Staff do not anticipate RMA reforms affecting the NPS-FM implementation timeframe.

5.3 National Policy Statement for Freshwater Management Reforms

Under 2017 changes to the National Policy Statement for Freshwater Management (first released in 2014) BOPRC addressed additional requirements including:

- new national targets for swimmable lakes and rivers
- greater direction for Te Mana o te Wai in freshwater management
- more direction for monitoring macroinvertebrates, managing nitrogen and phosphorus, and considering economic well-being
- a requirement to improve water quality in terms of human health

These have had direct impacts on the NPS-FM implementation work program.

The government has signalled an intention to stop further environmental degradation and loss and reverse past damage by introducing new amendments to the NPS-FM and NES. We understand that these may address water allocation and work towards a system for fairer allocation of nutrients.

Once more information is available around March/April 2019 Council will be able to determine the implications on the implementation work programme and will report back to the Committee.

6 Analysis of options

Policy E1(f) of the NPS-FM gives Council the opportunity to extend its NPS-FM implementation programme, or not. These two options are assessed below:

Option	Benefits	Costs
Option 1 Maintain the original implementation programme to be completed by 31 December 2025	Industry and other stakeholders have certainty as to when NPS-FM compliant limits will come into force. An earlier delivery will probably cost less.	Confidence of meeting the target date is uncertain/low, therefore we are potentially misleading the public. In an attempt to meet this timeline BOPRC could be forced to rush work at the expense of quality. The risk of appeals is potentially greater because the schedule has less time for consultation and getting community buy in. Lacks flexibility to move to accommodate future changes (which as yet are not known).
Option 2 Extend the timeframe for implementation to be completed by 31 December 2030	Provides flexibility. Means BOPRC can still work at pace, but gives us room to extend consultation or repeat steps if legislation changes requiring rework. Enables better engagement with tangata whenua and time for them to undertake important technical work. Does not stop BOPRC from finishing early. Is more realistic, based on experience with Plan Changes 9, 10, 12, and seeing upcoming change. Is the most likely option to deliver quality results.	Could be perceived negatively as being unwarranted and costly. Possibly affects third parties who have made arrangements based on the earlier timeframe.

7 Recommended Update to NPS-FM Implementation Programme

On the basis of the above discussion an updated timeline (Figure 2) is proposed. Changes will:

- Accommodate national policy and legislative changes, including national planning standards with stop and stare moments and ability to accommodate changes as part of regional components of future plan changes
- Better accommodate extended timeframes associated with PC9 appeals.
- Reduce/minimise parallel processes (i.e. delay Whakatane, Waioeka, East Coast WMA processes) taking on board lessons learnt from PC12.
- Accommodate complexity that is now more understood.

The information contained in this report will also form the basis of the annual NPS-FM implementation report against the original notified timeline.

Staff recommend that Council adopt and publicly notified the proposed implementation programme shown in Figure 2.

8 Implications for Māori

Māori involvement in planning and delivery of improved water management is integral to their role as kaitiaki and necessary to achieve requirements of the National Policy Statement for Freshwater Management. However, as noted in this report, some Māori have expressed reservations about Plan Change 9 and there are government initiatives underway intended to provide clarity on matters of particular significance to Maori.

It is important to respect the significance of water to Maori and for council processes to accommodate their special place in freshwater management. This proposed amendment extending the implementation programme to 2030 will help provide opportunities for Council to work more effectively with tangata whenua in a changing policy landscape.

9 Council's Accountability Framework

9.1 Community Outcomes

Council's Freshwater Futures work directly contributes to the 'Freshwater for Life' community outcome in Long Term Plan 2018-2028.

9.2 Long Term Plan Alignment

This work is planned under various activities within the Long Term Plan 2018-2028, including the Integrated Catchment Management, Regional Planning and Engagement, Regional Development, Technical Services and Corporate Services groups of activities.

9.3 Current Budget Implications

Council's Freshwater Futures work programme is being undertaken within the current budget for the activities in Year 1 of the Long Term Plan 2018-2028.

9.4 Future Budget Implications

Future work is provided for in Council's Long Term Plan 2018-2028.

Any additional work for Bay of Plenty Regional Council resulting from national direction will need to be considered as to future budget implications.

James Low
Water Policy Team Leader

for Regional Integrated Planning Manager

30 November 2018

APPENDIX 1

Appendix 1 Key Council NPS Actions

Key Council NPS-FM Decisions and Direction Date	Meeting	Decision / Direction
Oct 2012	Strategy, Policy & Planning	Adopted BOPRC phased implementation for the National Policy Statement for Freshwater Management, noting that given the complexities and uncertainties around this model, Council will take an adaptive management approach focusing on priority areas and risk.
Aug 2013	Strategy, Policy & Planning	Adopted Water Management Areas.
Feb 2014	Regional Direction & Delivery (RDD)	Agreed to commence catchment based delivery of the NPS-FM for Freshwater Management in the Rangitāiki and Kaituna-Pongakawa-Waitahanui Water Management Areas. Total additional approved budget of $990,000 for the two WMAs.
Dec 2014	Regional Direction & Delivery (RDD)	Agreed that Involve (Schedule 1 process) is the preferred approach for working with communities in the limit setting process. Approved staff commencing a procedure to establish community groups in the Rangitāiki and Kaituna/Maketū/Pongakawa Water Management Areas. Sought advice from Komiti Māori together with that of Council Chairman and Chief Executive on how best to progress water limits within a co-governance decision-making context.
Jul 2015	Regional Direction & Delivery (RDD)	Agreed that the Draft plan change for Water Quantity and Allocation be released for feedback from the community. Agreed that a regional councillor member for each freshwater community group is appropriate. Confirmed that the Selection Panels are responsible for making decisions on Freshwater community group membership including the Chair of the Regional Direction and Delivery Committee.
Dec 2015	Regional Direction & Delivery (RDD)	Adopted the revised Bay of Plenty Regional Council Implementation Programme for the National Policy Statement for Freshwater Management 2014. Approved public notification of the revised Bay of Plenty Regional Council Implementation Programme for the National Policy Statement for Freshwater Management 2014.
Mar 2016	Regional Direction & Delivery (RDD)	Approved the draft principles for values setting for further discussion during community group, iwi/hapū and other engagement, as outlined in the March 2016 report. Approved the draft principles for Freshwater Management Unit development for further discussion during community group, iwi/hapū and other engagement, as outlined in the March 2016 report, with minor amendment to include “and

		aggregated where possible".
23 Jun 2016	Regional Direction & Delivery (RDD)	'Freshwater Futures: Value setting and Freshwater Management Unit update' report received. Noted progress made on value setting and identification of Freshwater Management Units and upcoming engagement on these.
8 Jun 2016	Regional Direction & Delivery (RDD)	Preparation of the Proposed Region-wide Water Quantity Plan Change report received. Approved changes to the Proposed Region-wide Water Quantity Plan Change resulting from the 5 May workshop and review as described (and attached) in the report. Directed staff to prepare a revised Allocation Status Report including the methodology for determining ground water recharge. Directed staff to revise provisions for metering and reporting of water takes in the Proposed Region-wide Water Quantity Plan Change being prepared for adoption at the 9 August 2016 RDD meeting so that: a) all surface water takes requiring resource consent are metered and required to report daily unless a lesser frequency of reporting is consistent with Policies 73, 76, 80 and 80A. b) metering and monthly reporting is required for all water takes, including those permitted or allowed by the RMA as stock drinking water if the total daily volume used on a property exceeds permitted activity volume. Directed staff to continue development of the Section 32 Evaluation Report and the Allocation Status Report for adoption at 9 August 2016 RDD meeting. Noted that staff will present the Proposed Region-wide Water Quantity Plan Change for adoption at the 9 August RDD meeting.
9 Aug 2016	Regional Direction & Delivery (RDD)	Adoption of Region-wide Water Quantity Proposed Plan Change 9 to the Operative Bay of Plenty Regional Water and Land Plan report received. Confirmed that it is satisfied that the requirements of the Resource Management Act 1991, relating to the preparation of Region-wide Water Quantity - Proposed Plan Change 9 to the Operative Bay of Plenty Regional Water and Land Plan up to its public notification stage have been met. Confirmed that it is satisfied that the requirements of Section 32 of the Resource Management Act 1991 have been met and recommends adoption of the Section 32 Report to the Operative Bay of Plenty Regional Water and Land Plan. (Section 32 report is attached as a supporting document and includes the Implementation Requirement report).

		Approved the Region-wide Water Quantity - Proposed Plan Change 9 to the Operative Bay of Plenty Regional Water and Land Plan for public notification on 18 October 2016 pursuant to the requirements of Schedule 1 of the Resource Management Act 1991. Approved the release of the Implications for Maori Report and Feedback Summary Report. Noted that the Assessment of Water Availability and Estimates of Current Allocation Levels report will be released when Proposed Plan Change 9 is adopted. Delegated to the General Manager, Strategy and Science the authority to approve any minor changes, including grammar, formatting, consistency checks and other minor changes to Proposed Plan Change 9, the Section Regional Direction and Delivery Committee Tuesday, 9 August 2016 32 Report, supporting documents and guidance documents prior to notification. Noted that the period for submission is to be extended and that the Hearing Committee will be appointed following receipt of submissions. Freshwater Futures report received noting progress made on value setting against FMUs, identification of attributes and determining modelling strategy and direction.
2016	Regional Direction & Delivery (RDD)	Draft Freshwater Values and Management Units report received. Approved in principle the draft regional freshwater value set for use in the next steps of NPS-FM implementation. Approved in principle the draft freshwater management units for Rangitāiki and Kaituna-Pongakawa-Waitahanui Water Management Areas for use during the next steps of the NPS- FM implementation.
23 Feb 2017	Regional Direction & Delivery (RDD)	National Policy Statement for Freshwater Management Implementation - Progress Report for 2016 report received. Noted that Council is progressing NPS-FM implementation for the previous calendar year as scheduled.
16 March 2017	Regional Direction & Delivery Freshwater Workshop	Direction sought regarding: - engagement approach to implementing NPS-FM. - noting in the Rangtitaiki and Kaituna-Pongakawa-Waitahanui WMA in order to address some issues an 'improve' approach will be needed. - Which WMAs to start next - Rotorua and Tauranga? - timeline extension 12 month delay anticipated for PC12 due to project complexities and modelling. - Consideration of the need or otherwise of a regional water quality plan change.
29 March 2017	Regional Direction and Delivery Committee	Council approved PC12 objective setting, the continuation of the 'involve approach' to engagement for PC12 and future WMAs. Council also noted that issues in the Rangitaiki and Kaituna-Pongakawa-Waitahanui WMAs means that objectives and management options will need to halt water quality decline and in some cases improve water quality. The 12 month timeline extension for PC12

		was also approved.
18 May 2017	Regional Direction and Delivery Committee	Approval in principle of the pairing of values and attributes as the basis for objective setting under NPS-FM. Received an update on PC9 regarding key themes of submissions.
22 June 2017	Regional Direction and Delivery Committee	Received an update on PC12 attributes. NPS-FM Implementation updated timeline was approved, with the start of Tauranga and Rotorua WMAs with information collection and key stakeholder discussions and investigation of a region-wide water quality plan change to be brought back to the committee in Feb 2018.
29 August 2017	Regional Direction and Delivery Committee Freshwater Workshop	Direction sought on NPS-FM changes and implications, engagement approach and catchment modelling and scenarios for the Kaituna-Pongakawa-Waitahanui and Rangitaiki WMAs. Council reaffirmed the 'involve' process for engagement and discussed Matauranga Maori monitoring, swimmability targets and Te Mana o te Wai.
14 Sept 2017	Regional Direction and Delivery Committee	Received the technical report Physical, chemical, biological and ecological water quality attributes for rivers and lakes in the BOP.
26 Oct 2017	Regional Direction and Delivery Committee	Received an update on PC9 further submissions and rescheduling of the hearing. Council also received and update on PC12, and reported the outcomes of the Water Workshop in August including support for maintaining the 'involve' approach.
30 Nov 2017	Regional Direction and Delivery Committee	NPS-FM Implementation progress report approved including amended timeline. Annual progress reported Updates for PC9 and 12 provided.
20 Feb 2018	Regional Direction and Delivery Committee	Received an update on PC9 that prehearing meetings were being held and staff were preparing the S42a reports. Further update on PC12 (Kaituna-Pongakawa-Waitahanui and Rangitaiki) PC15 (Rotorua WMA) and PC16 was provided.

Report To: Regional Direction and Delivery Committee

Meeting Date: 11 December 2018

Report From: David Phizacklea, Regional Integrated Planning Manager

Reducing Contaminant Loads to Waihi and Maketu Estuaries: Estimated Limits and next steps

Executive Summary

Estimated catchment contaminant load limits have been developed to support objectives for Waihī and Maketū Estuaries set in the Regional Coastal Environment Plan. This is required to implement the National Policy Statement for Freshwater Management in the Kaituna-Pongakawa-Waitahanui Water Management Area. The declining state of the estuaries and the estimated limits clearly show that some action must be taken in the short term for the estuaries, even while additional monitoring and modelling is completed to increase confidence in the limits.

The estimated catchment contaminant load limits are 30-66% less than the current state, meaning that significant action would be required to achieve the objectives.

A potential way forward is to develop a framework to achieve the required load limits over time, in discussion with tangata whenua, the community, and stakeholders, and in consideration of many factors including:

a. timeframes and shorter term targets towards achieving limits;
b. review periods for reviewing limits, targets and methods;
c. benefits and risks for estuary values;
d. ability to make improvements (e.g. confidence about methods and their effectiveness);
e. the costs and benefits (social, economic and environmental); and
f. affordability.

Approval is sought to enable staff to discuss the the estimated contaminant load limits and potential pathways with tangata whenua, the community, and stakeholders during planned engagement for Plan Change 12 in the new year.

1 Recommendations

That the Regional Direction and Delivery Committee:

1 Receives the report, Reducing Contaminant Loads to Waihi and Maketu Estuaries: Estimated Limits.

2 Gives approval for staff to discuss the estimated contaminant load limits and potential pathways to achieving them over time with the community during planned engagement for Plan Change 12. This will include discussion about:

a. timeframes and shorter term targets towards achieving limits;

b. review periods for limits, targets and methods;

c. benefits and risks for estuary values;

d. ability to make improvements (e.g. confidence about methods and their effectiveness);

e. the costs and benefits (social, economic and environmental); and

f. affordability.

1 Purpose

Approval is sought to discuss the estimated contaminant load limits and potential pathways to achieving them over time with the community during planned engagement for Plan Change 12.

2 Introduction

The National Policy Statement for Freshwater Management (NPS-FM) requires Council to set freshwater objectives and water quality limits to support community values of freshwater bodies. In doing so, Council is required to consider the connections and interactions between freshwater, land use and development and coastal waters, from the ki uta ki tai (from the mountains to the sea). Successive amendments to the NPS-FM have strengthened this requirement. Council is also required to manage land and water to support coastal receiving environment objectives set out in Regional Coastal Environment Plan (RCEP). We are in the process of doing this for Kaituna-Pongakawa-Waitahanui Water Management Area (Plan Change 12 project), as these are the first two, out of nine, Water Management Areas in which we working to implement the NPS-FM.

Estimated catchment contaminant load limits have now been developed to support objectives for Waihī and Maketū Estuaries (Appendix 1). This has taken some time as the estimates were based on several contributing technical assessments, and also in part on surface water catchment modelling results. These are summarised below, along with key messages and policy considerations. Similar work for other sensitive coastal receiving environments in the other Water Management Areas (Tauranga Harbour, Tarawera, Whakatāne, Ōhiwa Harbour, Waiokea, and East Coast) has not yet started.

3 Background

Waihī and Maketū estuaries are substantially more sensitive to contaminants than the freshwater bodies that discharge in to them. As such, estuary objectives will be the main driver of contaminant load limits for freshwater bodies draining to them.

Waihī and Maketū estuaries are highly valued for ecological, mahinga kai, cultural and recreational values. Protection and restoration of these values is embedded strongly in narrative objectives and policies in the RCEP. Community group and iwi

engagement to date shows strong alignment with these values and a desire to address address them through the PC12 process.

Ecological health and mahinga kai values are significantly degraded in Maketū and Waihī estuaries and continue to degrade. Loss of sea grass and increased macroalgal growth are key indicators of state. Swimming water quality is good at the Maketū estuary monitoring site, but poor for Waihī estuary due to faecal contaminants.

Nutrient (nitrogen and phosphorus), sediment, and faecal contaminants from the catchment, and modified freshwater flows are the main stressors. Other contaminant sources (e.g. nutrients recycled from estuary sediments) contribute a very small proportion of the load.

For Maketū Estuary the decline of the estuary's benthic ecological health is in part addressed by the soon to be implemented project to increase the Kaituna River flow back into the estuary. This will increase the export potential and flushing of the estuary and shift it back towards its original natural state. However the issue of nutrients and eutrophication will persist and need to be addressed in terms of catchment management.

4 Contaminant Load Limits

The estimated contaminant load limits for the catchments to support estuary objectives set by the RCEP are 30-66% less than the current state (Table 1). The estimates for Maketū estuary a based on estimated flows and contaminant loads after the Kaituna Re-diversion is complete.

Table 1: Combined load of contaminants from freshwater bodies discharging to estuaries including estimated current load (from SOURCE modelling) and estimated load required to meet estuary objectives, expressed as a limit (Park, 2018b and Scholes, 2018).

	Total Nitrogen (tonnes/year)		**Total Phosphorus (tonnes/year)**	
	Current	**Limit (% reduction)**	**Current**	**Limit (% reduction)**
Combined load of freshwater bodies discharging to **Maketū Estuary**	477.4	178.7 (63%)	22.2	13.8 (38%)
Combined load of freshwater bodies discharging to **Waihī Estuary**	618.2	211.9 (66%)	57.2	40.0 (30%)

	Total Suspended Solids (tonnes/year)		***E. coli* (units/day)**	
	Current	**Interim target**	**Current**	**Limit (% reduction)**
Combined load of freshwater bodies discharging to **Maketū Estuary**	4,647.2	2014 level (to be estimated)	2.84×10^{12} (estimated, after Kaituna re-diversion)[3]	1.1×10^{12} (60%)

Combined load of freshwater bodies discharging to **Waihī Estuary**	8,075.8	2014 level (to be estimated)	1.74×10^{12}	9×10^{11} (50%)

These first estimates for nitrogen, phosphorus, total suspended solids and *E.coli* are based on current data and modelling, and there are some substantial data and modelling gaps. This affects our level of confidence in the specific numbers. Further monitoring and modelling is scheduled within the next 5-10 years which will be used to improve our estimates.

At this stage, there is insufficient information available to estimate the sediment load limits required. The interim value stated in Table 1 is based solely on an objective in the RCEP "*Sediment accumulation in harbours and estuaries resulting from land use and accelerated erosion is minimised and reduced over time compared to 2014 levels*". It is likely "2014 levels" will be insufficient to achieve the objectives.

While the accuracy of the estimated load limits is not as high as it will be in 10 years, it is clear that substantial reduction from current loads is needed and the estuaries are degrading.

Catchment sources and mitigation options are being explored, beginning with an assessment of how much can be achieved by basic improvements in farm/growing practice under current and anticipated future land use. Initial calculations suggest that, while basic improvements in management practice across the catchment would lead to some reduction in contaminant losses, this alone will not be sufficient to achieve the load limits in Table 1.

5 Next Steps

Given the above points, it is clear that some action must be taken in the short term to reduce contaminant loads, while additional monitoring and modelling is completed. A potential way forward is to establish a pathway towards achieving the above limits over time, in discussion with tangata whenua, the community, and key stakeholders, and in consideration of many factors including:

a. timeframes and shorter term targets towards achieving limits;
b. review periods for limits, targets and methods;
c. benefits and risks for estuary values;
d. ability to make improvements (e.g. confidence about methods and their effectiveness);
e. the costs and benefits (social, economic and environmental); and
f. affordability.

Planned engagement includes discussion with Te Maru o Kaituna River Authority, iwi, community groups and the wider public. Staff expect to report back to Council after this analysis with policy options in mid-2019.

6 Implications for Māori

Waihī and Maketū estuaries are recognised in the RCEP as Areas of Significant Cultural Value, for mahinga kai, spiritual, heritage and access/tauranga waka reasons.

This has been confirmed by engagement with iwi to date. *Kaituna, He Taonga Tuku Iho* (the Kaituna River Document) seeks contaminant limits for Kaituna River to ensure the water is safe for swimming where people swim, suitable for sustainable kai awa and kai moana, and suitable for cultural ceremonies. The estimated load limits will contribute to these outcomes.

The potential implications for land owners in the estuaries catchments, including Māori land owners, are significant. These are yet to be explored and assessed. Staff intend to discuss this with iwi and hapū as required by the NPS-FM.

7 Council's Accountability Framework

7.1 Community Outcomes

This project/proposal directly contributes to the following Community Outcome/s in the council's Long Term Plan 2018- 2028:

- Freshwater for Life – Improving freshwater water quality to improve the ecological health of estuaries and freshwater bodies.
- A Healthy Environment – Improving the state of degraded estuaries.
- Safe and Resilient Communities – Seeking to achieve water quality standards in the estuaries that enable safe food harvesting and contact recreation.

7.2 Long Term Plan Alignment

Current Budget Implications

Work towards setting freshwater objectives, limits and methods via Plan Change 12 is being carried out under the Freshwater Futures progamme activity in the Long Term Plan 2018-2028 and is required by national policy.

Additional monitoring and modelling of Waihī and Maketū Estuaries is planned to occur under the Science Activity in the Long Term Plan 2018-2028.

Future Budget Implications

There are likely to be budget implications associated with achieving the estimated load limits listed above. These are yet to be explored and assessed.

Nicola Green
Senior Planner (Water Policy)

for Regional Integrated Planning Manager

30 November 2018

APPENDIX 1

Estimated Contaminant Load Limits for Waihi and Maketu Estuaries

MEMORANDUM

BAY OF PLENTY REGIONAL COUNCIL TOI MOANA

To: James Low/ Nicola Green
Team Leader/Senior Planner (Water Policy)

From: Paul Scholes **Date:** 15 November 2018
Team Leader Science

File Ref: A3041213

Subject: **Estimating bacterial load reductions to Maketū and Waihī estuaries**

1 Introduction

As required by the National Policy Statement for Freshwater Management (NPS-FM), Bay of Plenty Regional Council must implement freshwater objectives, limits and methods for achieving agreed sustainable management of freshwater quality and quantity in the region. BOPRC has divided the task up into Water Management Areas (WMAs) comprising defined individual surface water catchments and has commenced the NPS-FM implementation process on the Rangitāiki and Kaituna-Pongakawa-Waitahanui WMAs. The NPS-FM requires Councils to have regard to the connections between freshwater bodies and coastal water, and seeks to improve integrated management of freshwater and land in whole catchments, including interactions with the coastal environment. Amendments made in 2017 strengthened this direction.

For Waihī and Maketū Estuaries, earlier reports documented sensitivity to catchment inflows and the extent to which ecological health has been impacted (Hamill 2014, Park 2016). This was later updated in 2018 and sensitivity to catchment inflows was assessed using the ETI Tool 1. Both Maketū and Waihī Estuaries are in poor ecological condition with the highest stressor for both estuaries being eutrophication. Assessment of susceptibility to eutrophication placed Maketū Estuary at high risk and Waihī Estuary at very high risk of degradation as a result of the current nutrient loads (Hamill 2018).

The Regional Coastal Environment Plan (RCEP) identifies the significant cultural values of the Waihī and Maketū estuaries, particularly for mahinga kai gathering and spiritual reasons. In addition, it sets policy direction that discharges in to estuaries should meet water quality classification standards (after reasonable mixing) as follows, which assumes the standard is met in ambient conditions / prior to any new discharge:

- Estuaries are safe for primary contact recreation/bathing: The concentration of enterococci must not exceed 280 cfu/100ml. See Microbiological Water Quality Guidelines for methodology.

- Kaimoana are safe to eat: The median faecal coliform content of water samples taken over a shellfish-gathering season shall not exceed a Most Probable Number (MPN) of 14/100 mL, and not more than 10% of samples should exceed an MPN of 43/100 mL (using a five-tube decimal dilution test).

Reduction of pathogens entering the estuaries from freshwater inputs may be required if the recreational values of Maketū and Waihī estuaries are to be enhanced.

Indicator bacteria used for swimming and shellfish water quality are good indicators as they provide a useful management tool to assess the risk to human health, and as an indicator of faecal contamination. There are at least two concerns for ensuring sufficiently low bacterial concentrations:

- Protection of people swimming in water or coming into contact with water from other recreational activities (e.g. boating), because there is a risk of consuming water during these activities; and

- Protection of people collecting and consuming shellfish because there is a risk of ingesting pathogens if critical bacteria levels are present in shellfish.

This memorandum examines the microbiological state of Waihī and Maketū estuaries with respect to current water quality guidelines. Current and past state data along with recent modelling is used to estimate the reduction of faecal indicator bacteria (FIBs) required within the estuaries to meet the values in the RCEP. Estimates of the reduction required from freshwater bodies discharging into the estuaries to meet the water quality classifications mentioned above are also presented.

No detailed examination of where FIBs are coming from in the landscape (sources) is undertaken, although some catchment results are presented where information was available. Further work on catchment sources will be required to help prioritise and target mitigation and planning measures.

2 Current State of Microbiological Water Quality

Recreational values associated with swimming and shellfish collection are primarily restricted to the bottom end of the estuaries, nearer the estuary outlet, where water is deeper and more influenced by mixing with oceanic waters. This is also where the more abundant shellfish beds are located (Gaborit-Haverkort 2012). Hence this area of the estuaries is the focus of targeting any bacterial loading limit to the estuary with the aim of lessening the risk of infection to swimmers and consumers of shellfish.

Generally swimming water quality is good at monitored sites in the lower estuaries, but swimming water quality is at times compromised, with 95th percentile results being over the Microbiological Water Quality Marine and Freshwater guidelines orange alert level.

Swimming water quality at the current monitoring location in Maketū estuary is consistently good and the aim would be to maintain this quality (Figure 2.1). Waihi estuary water has less tidal dilution than Maketū (Appendix, Table 6.2), which may be one reason for the poorer bacterial quality (Figure 2.1). Last seasons' results for the monitoring location in Waihī estuary showed that indicator bacteria were above the orange alert level for 5% of the season.

Shellfish water quality is also guided by the Microbiological Water Quality Marine and Freshwater Guidelines (2003). Water samples from monitored sites are analysed for Faecal Coliforms (FC), which are suitable microbiological indicators for sanitary safety in regard to shellfish consumption. Faecal coliforms have a stronger correlation with health risks associated with eating shellfish than enterococci (MfE/MoH, 2003), making them a useful indicator. The FC values specified in the microbiological guidelines indicate the likely presence of pathogenic bacteria, protozoa and viruses. The guidelines for safe shellfish consumption are as follows:

- The median FC content should not exceed a Most Probable Number (MPN) of 14/100 ml, and
- No more than 10% of samples should exceed a MPN of 43/100 ml.

Note that compliance with these guidelines does not ensure that shellfish in the waters will be safe for consumption as they do not account for bio-toxins.

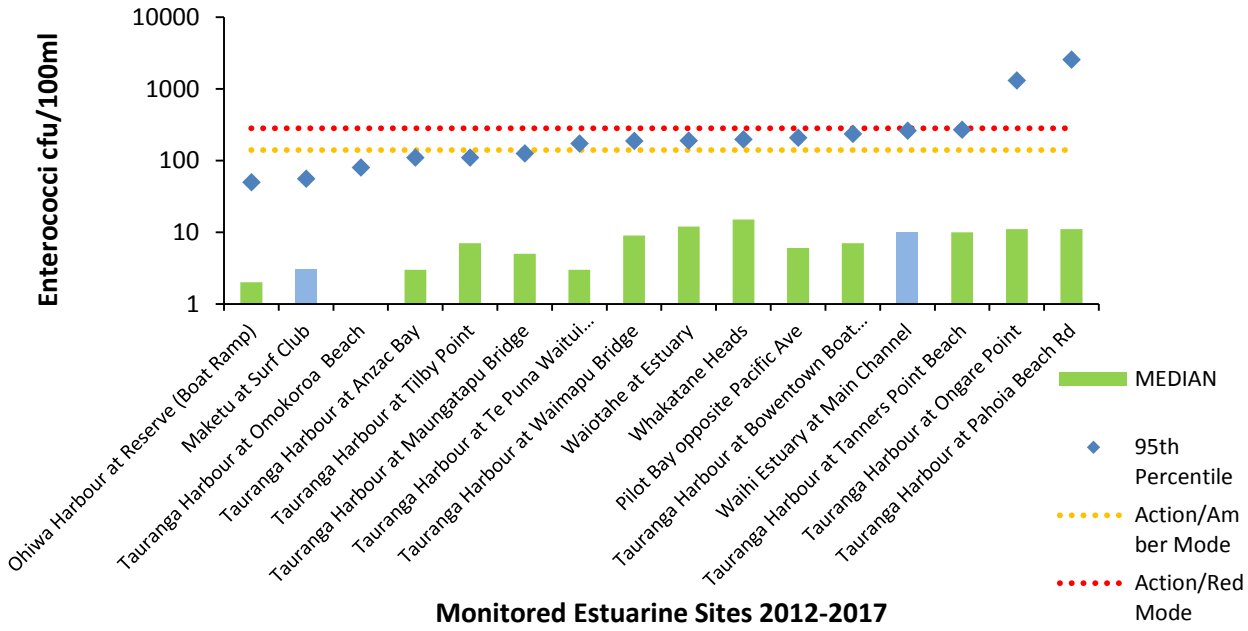
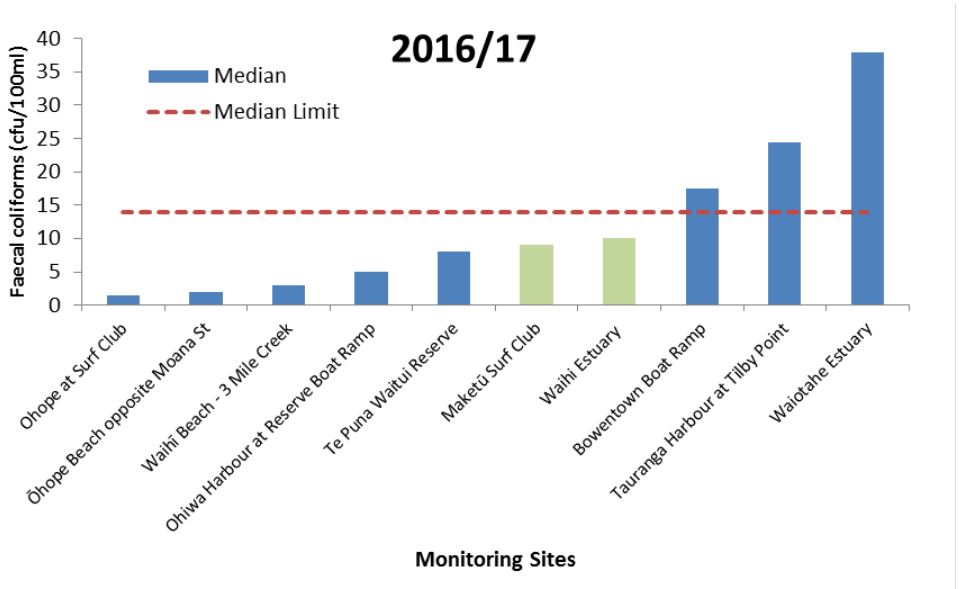


Figure 2.1: 95th percentile and median results for enterococci concentrations at Bay of Plenty estuarine marine sites over 2012 to 2017. Maketū & Waihī estuaries are highlighted in blue.

Figure 2.2 and 2.3 show the results of faecal coliform monitoring in Waihi and Maketū estuaries over the 2016/17 and 2017/18 seasons. Maketū Estuary met the median threshold (14 FC/100ml), but Waihī Estuary has not for the last season (2017/18). Both sites have not met the threshold of 43 faecal coliforms/100ml for 90% of the time for the last two seasons. Hence, there is a health advisory not to take shellfish from Waihī Estuary, but no advisory for Maketū Estuary as both thresholds have not been triggered.



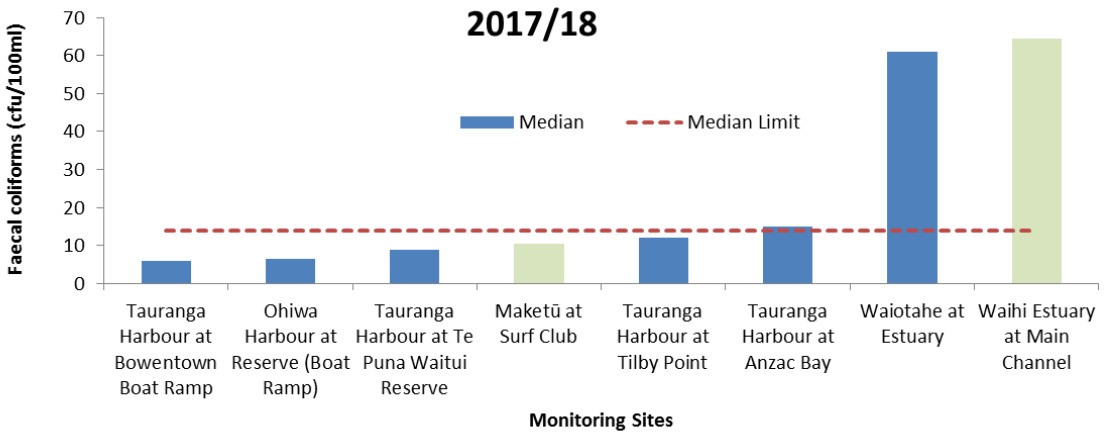


Figure 2.2: Median faecal coliform concentrations at shellfish gathering locations for the 2016/2017 & 2017/2018 seasons and guideline median limit for safe shellfish consumption.

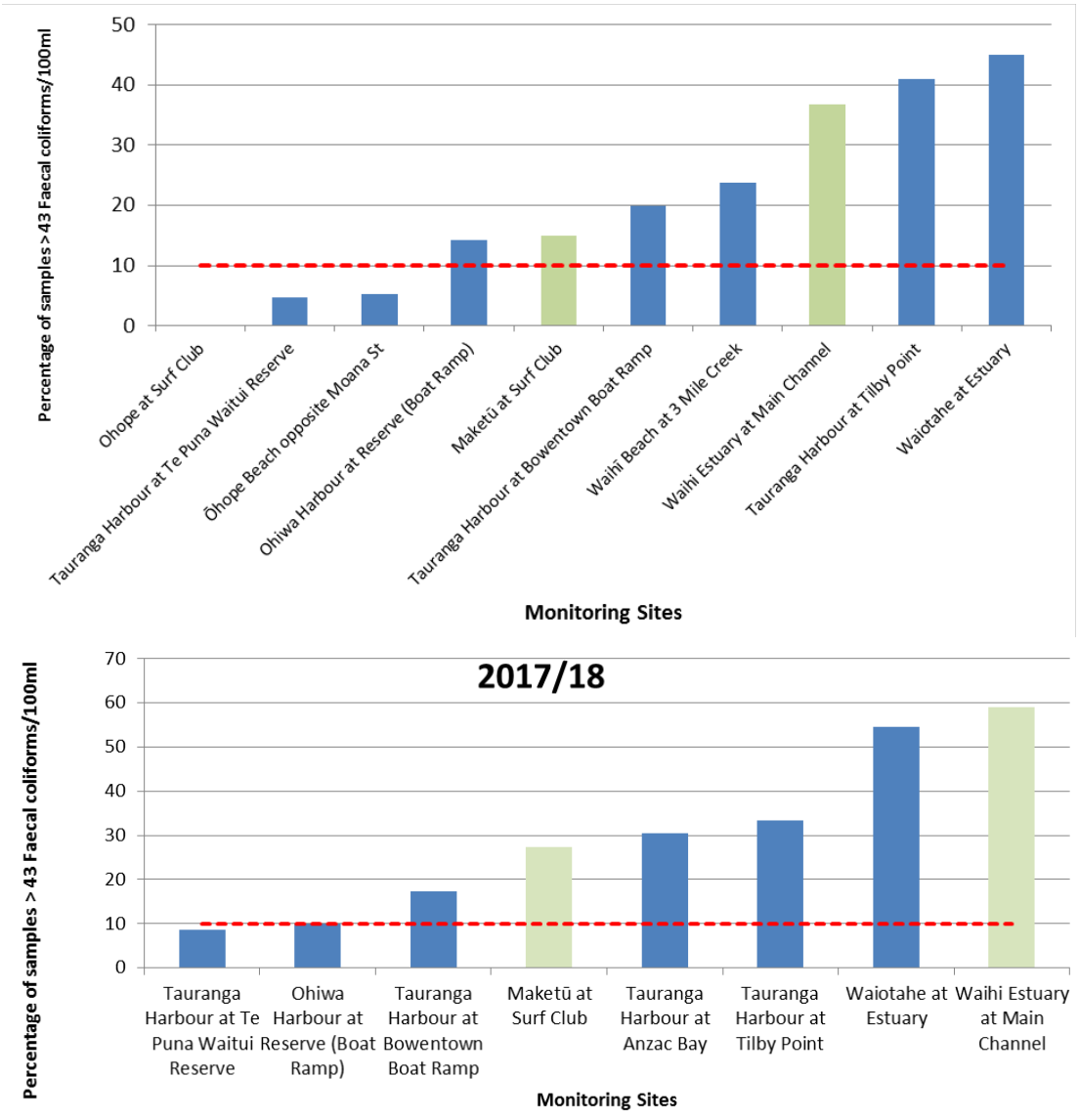


Figure 2.3: Percentage of samples at shellfish gathering locations in the 2016/2017 & 2017/2018 seasons exceeding the faecal coliform limit of 43 cfu/100 ml stipulated by the Microbiological Water Quality Guidelines (MfE/MoH 2003) for marine sites.

3 Faecal Indicator Bacteria Reduction Targets for Shellfish Consumption

3.1 Waihī Estuary

Reduction of the faecal bacteria loading contributing to shellfish contamination would be required to meet the estuary water quality standards in the RCEP. Based on the data distribution the aim would be to decrease the amount of time the water exceeds 43 faecal coliforms/100ml. Reducing the influx of faecal indicator bacteria (FIBs) from freshwater inflows will also improve swimming water quality.

The longer term faecal coliform data set indicates that the 43 n/100ml threshold is exceeded 36% of the time (Figure 3.1) compared to just over 40% of the time for the last seven years (based on the best available data).

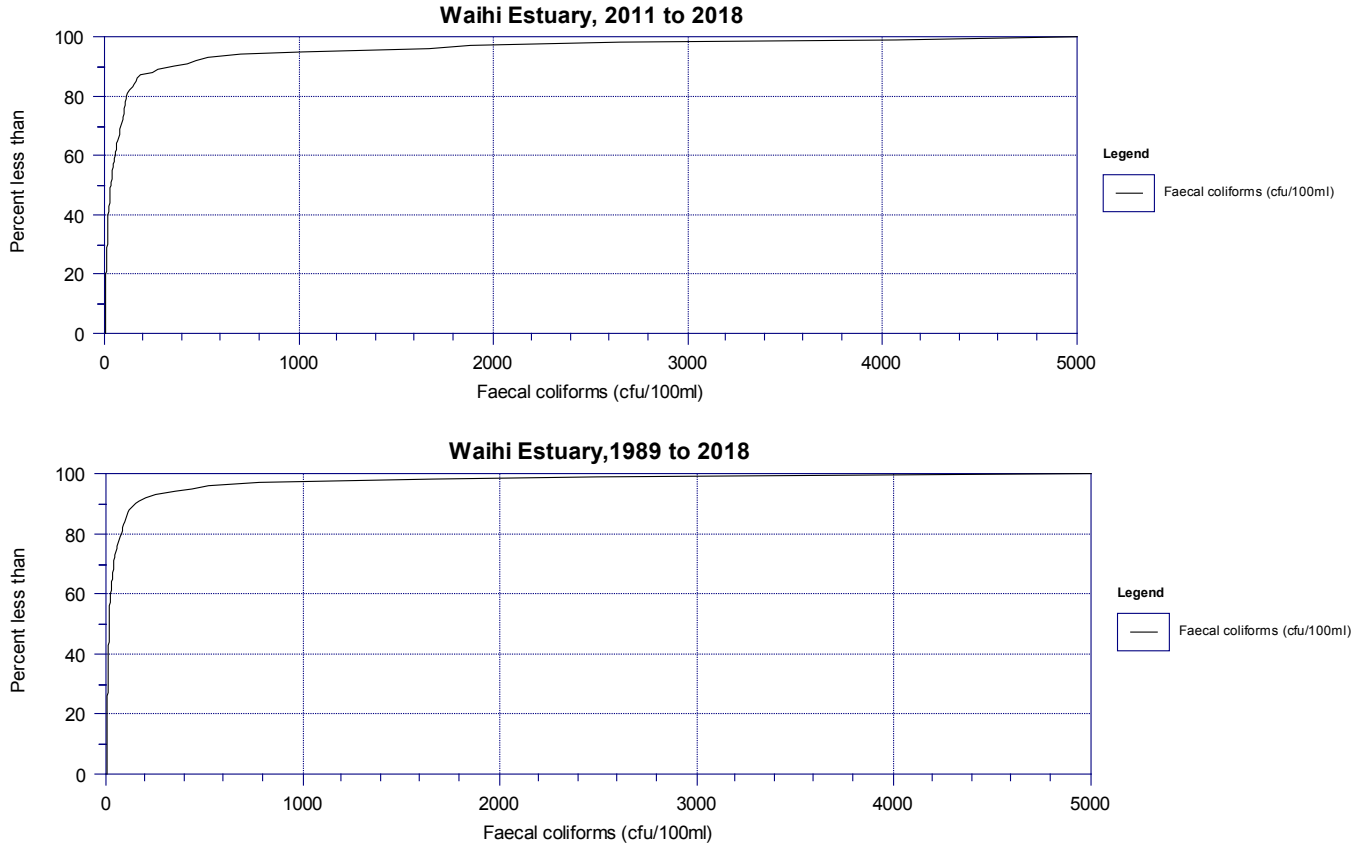


Figure 3.1: Frequency distribution for faecal coliforms in Waihi estuary water - 2011 to 2018.

To determine the level of reduction in faecal coliform bacteria required to reach the water quality objective of "*no more than 10% of samples should exceed a MPN of 43/100 ml"*, the change in concentration required to reach this target was modelled against the last seven years of faecal coliforms results from the estuary. The model assumes a direct proportional reduction is required.

This analysis shows that a reduction in faecal coliform concentration of greater than 80 percent would be required (Figure 3.2). Note that enterococci and faecal coliform have a reasonably linear relationship, as do *E.coli* and faecal coliforms (see Figure A1, Appendix1). The relationship between these faecal indicators shows that reduction in one will achieve similar results in others.

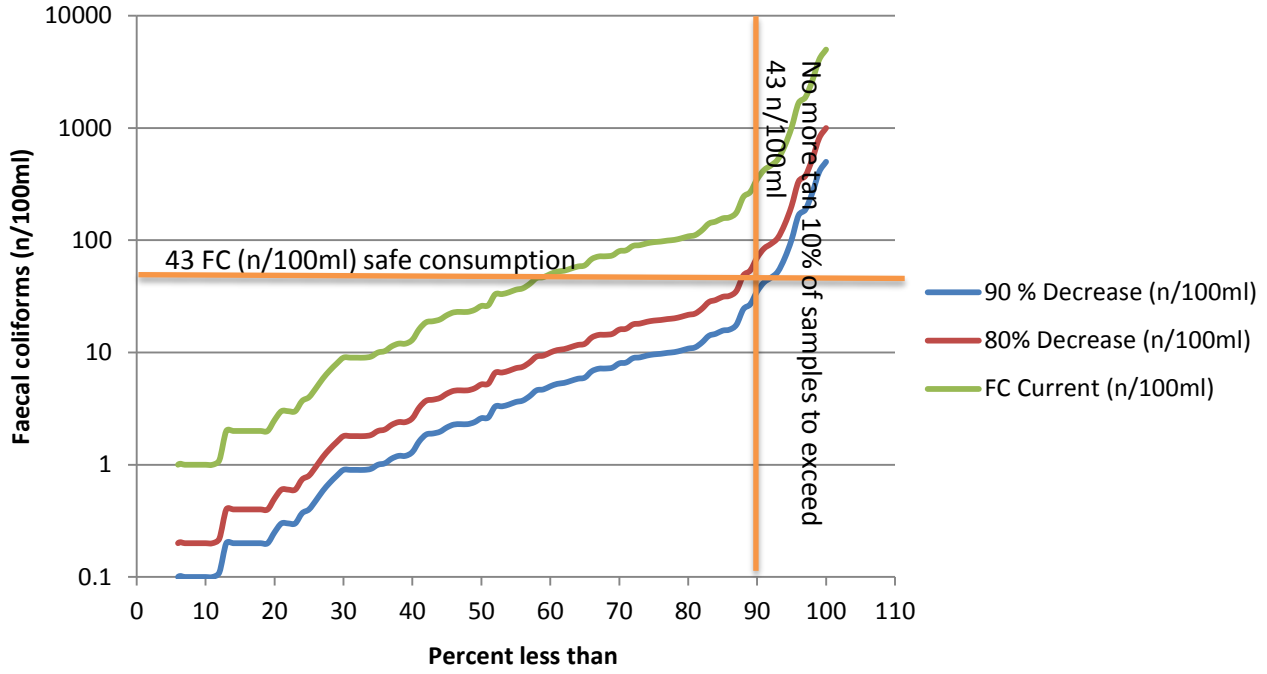


Figure 3.2: Projected change in faecal coliform concentrations from current (2011-18) to reach the objective of "no more than 10% of samples exceeding 43/100 ml".

3.1.1 Faecal contamination in freshwater entering the estuary

The main inflows to the Waihī Estuary are the Pukehina, Pongakawa, Wharere (including tributaries, the Wharere and Puanene streams), and Kaikokopu canals (Figure 3.3).

The direct relationship between freshwater flow (as measured at Pongakawa SH2) and FIBs in the estuary is weak, and may reflect the lack of comparable data (taken on the same day under similar conditions). Also tidal re-suspension and other decay mechanisms complicate the relationship. Seasonality of freshwater inputs is not strong, peaking in winter.

There is limited FIB and other water quality data for the four major inflows into the estuary and this is restricted mostly to the period 2014 to 2016. Flow data is lacking from this data set, and gaps have been supplement by SOURCE hydrological modelling data (Loft et al., 2018).

A linear relationship was assumed between loads and concentrations to convert load (from freshwater inflows) into concentration (in the estuary). Hence, the assumption will be that a mitigation action that reduces loads from freshwater inflows by a certain percentage, will achieve the same relative bacterial reductions in the estuary. The linear relationship has been tested in the freshwater inflows (Figure 3.4) with recent *E. coli* concentration data to the estuary and flow data (based on SOURCE modelled flow).

Estuary dilution factors averaged over a tidal cycle (see Table 3.1) have been used to calculate indicator bacteria concentrations. No factoring of decay or deposition is accounted for. The relationship between inflow load and estuary concentration can be used to estimate a load that is equivalent to the shellfish water target of 43 n/100ml concentration (assuming a 1:1 *E. coli*: Faecal coliform relationship). Using this relationship (Figure 3.4) we can estimate the inflow *E. coli* load to the estuary needed to achieve the shellfish water threshold of 43 n/100ml faecal coliform concentration. The estimated load to meet this target is $9x10^{11}$ coliform units (cfu) per day.

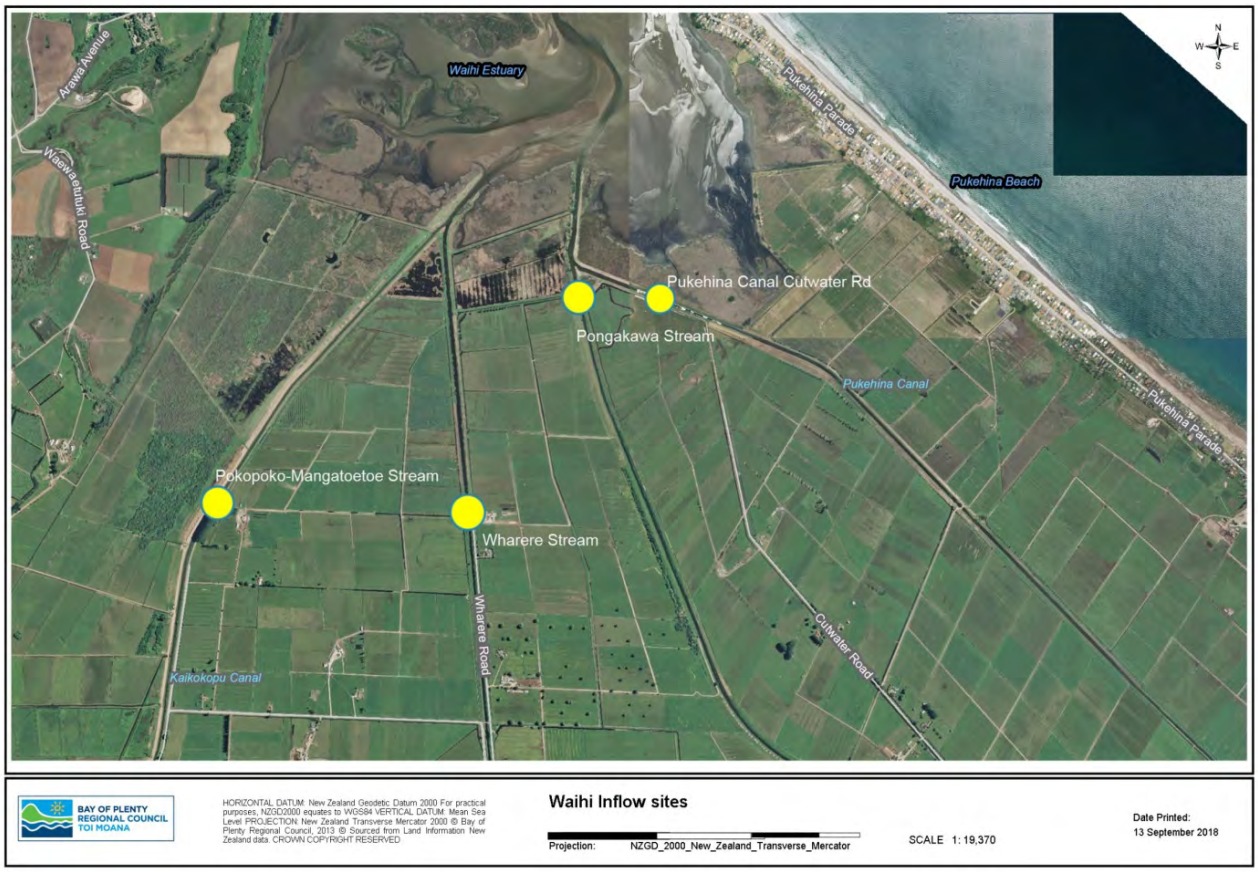


Figure 3.3: Waihī Estuary stream inflow sampling locations.

Table 3.1: Tidal volume changes and estimated dilution of freshwater inflows into Waihī Estuary.

Hour	Hourly tidal volumes (m^3)	Dilution factor	Average Hourly dilution
0	246,000	0.0000	
1	393,000	0.0966	0.0483
2	786,000	0.0483	0.0725
3	1,179,000	0.0322	0.0403
4	1,572,000	0.0242	0.0282
5	1,965,000	0.0193	0.0217
6	2,358,000	0.0161	0.0177
	Average dilution over a tidal cycle		**0.0381**

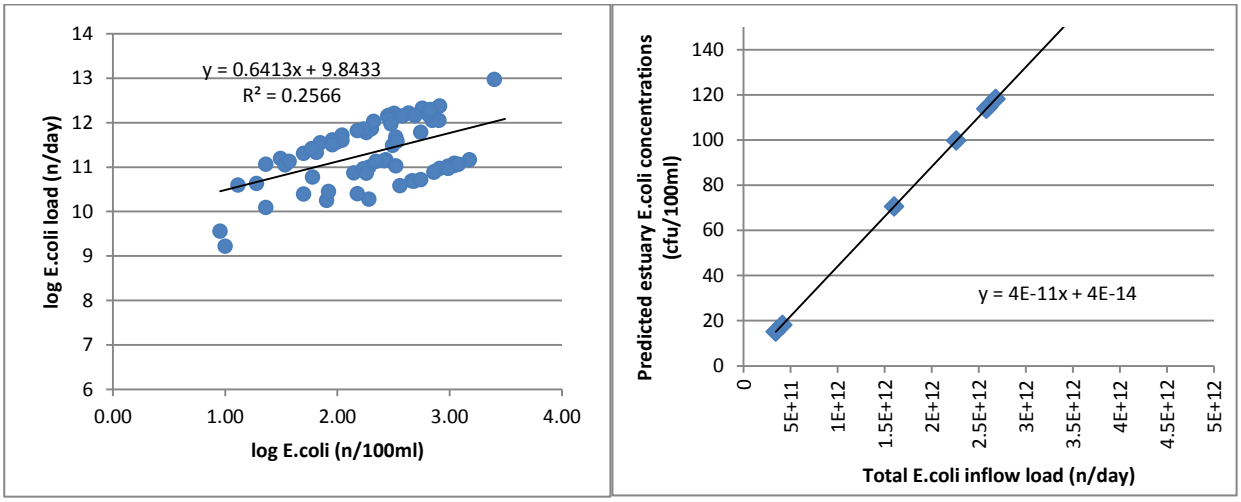


Figure 3.4 Left - *E.coli* concentrations versus *E. coli* load from four inflows to Waihī estuary 2014 to 2016 (left); Right - the relationship between predicted average *E.coli* concentrations based on estuarine dilution vs daily *E. coli* inflow loads.

Plotting modelled inflow *E.coli* loads and the observed estuary *E.coli* concentrations shows the reductions that might be required to achieve faecal coliform concentrations in the estuary to consistently meet the Microbiological Water Quality Guidelines (MfE 20003) for safe shellfish consumption (Figure 3.5). A frequency distribution of the modelled *E.coli* load to the estuary shows that the $9x10^{11}$ coliform units (cfu) per day is exceeded around 46 % of the distribution (Figure 3.6). While the reduction in faecal indicator concentrations in the estuary needed to reach the guideline criteria is upwards of 80%, the actual inflow faecal contamination load (as measured by *E.coli*) would need to be reduced by less than 50%. The portion of loads that would achieve the most reduction typically occurs under higher flow conditions - that is during rainfall generated run-off.

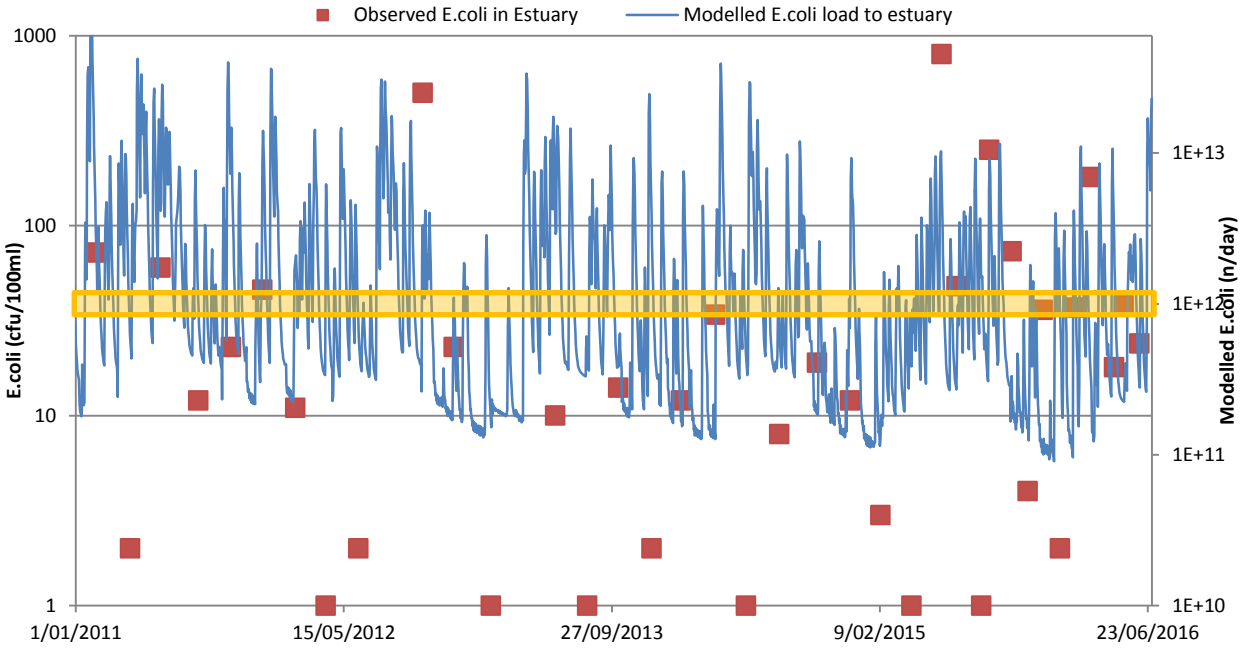


Figure 3.5 Modelled inflow *E.coli* loads into Waihī estuary (ESource model run April 2018) and estuary *E.coli* concentrations, 2011 to 2016. Above the orange area are loads that would trigger the shellfish water microbiological guideline concentration of 43 faecal coliforms (*E.coli*)/100ml.

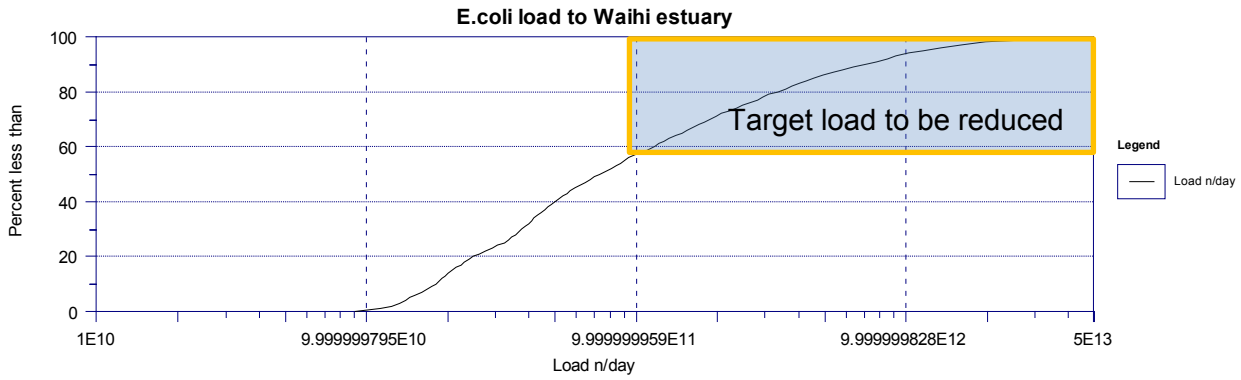


Figure 3.6: Frequency distribution of modelled *E. coli* load from inflow sources to Waihī Estuary, 2011 to 2016.

The percentage reduction required for faecal loads from freshwater inflows may be even lower, as the *E. coli* results from the SOURCE model tends to predict lower concentrations (*E. coli* <10) poorly. Improvement in the SOURCE model to better distribute the first order of magnitude range would change the distribution of concentration data, which would reduce the percentage reduction required. Alternatively comparison of measured data with the modelled could be undertaken only at concentrations above the first order data.

Also not taken into consideration in this estimate of inflow loading and estuary bacterial concentrations is the decay of the bacteria on entry to the estuary. Decay is dependent on a range of factors (salinity, temperature, light, predation, dilution, seasonality), with k-values for *E. coli* and also the k-values for enterococci being regarded as in the same order of magnitude (Hiijnen et al, 2007). On balance, changes to decay rates on entry to the estuary will be offset by dilution changes and we might assume that loading reduction due to decay will not greatly impact the scale of inflow loading required to reduce faecal coliform levels to below the shellfish waters guideline.

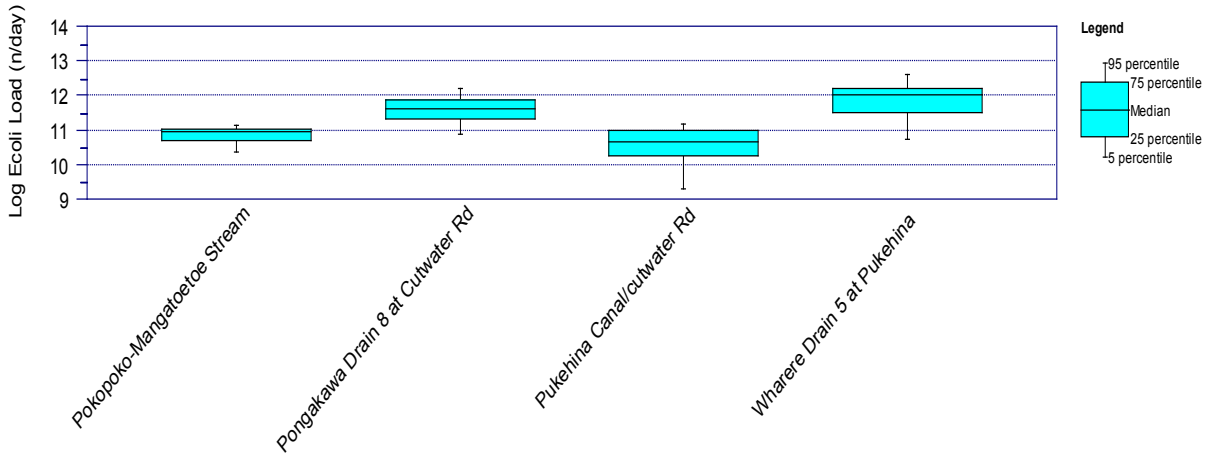


Figure 3.7: *E. coli* load from Waihī Estuary inflows based on modelled flow data and measured *E.coli* concentrations 2014 to 2016. Note log scale.

Modelling results and estimated loading figures will be useful in targeting where and what remediation measures might be employed to bring about a reduction in faecal contaminant loading. Figure 3.8 shows the 95 percentile *E. coli* concentrations over the modelled sub-catchment (along with the observed 95 percentile) and reveals where the higher event load concentrations are coming from. Estimated *E. coli* loads from the four stream inputs also show where the majority of

loading comes from (Figure 3.7), and this information can be used to inform strategies for reducing faecal contamination.

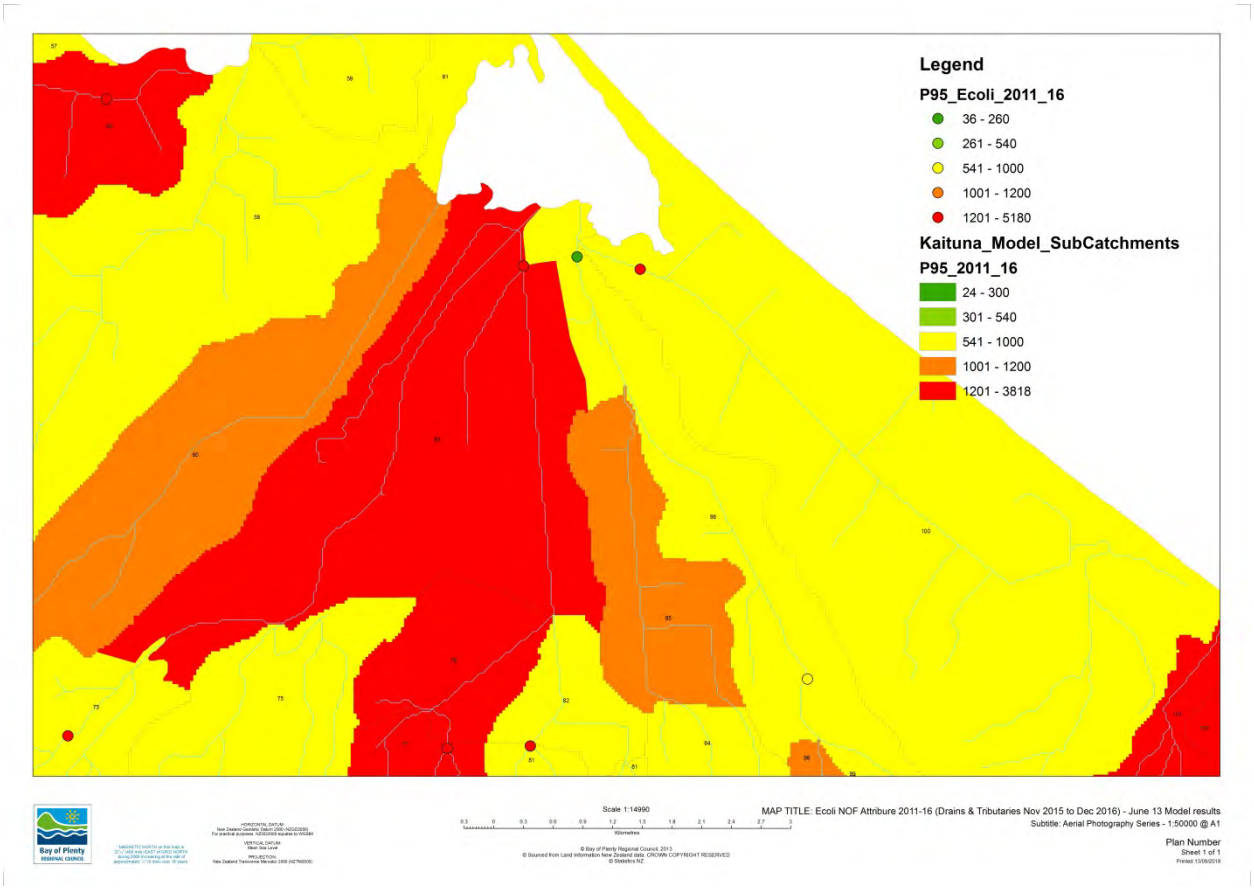


Figure 3.8: Shaded circles indicate *E. coli* data (95th percentile) for drains (2015/16 data) and SOE water quality sites (2011-16 data), shaded sub-catchments show SOURCE model predictions.

3.2 Maketū Estuary

Monitoring of water quality in Maketū Estuary has shown that the shellfish guideline of 43 faecal coliforms/100 ml has been exceeded for around 26% of results (Figure 3.9). This longer sequence of data also shows that faecal coliform results have remained under the median guideline value of 14 faecal coliform per 100ml (Table 3.2). As both conditions need to be exceeded to trigger exceedance of the guidelines (see Section 1), no health warning has yet been issued for the estuary. As one of the shellfish water threshold is being exceeded in one case, and near to be exceeded in the other, further exploration of the risk to shellfish gatherers is warranted.

Table 3.2: Faecal coliform concentration statistics from the Maketū Estuary Boat Ramp site and Surf Club sites, 2015 to 2018.

Variable	Sample size	Minimum	Maximum	Mean	Median	95 percentile	Standard deviation (denom. = n-1)
Faecal coliforms (n/100ml)	106	0	1500	85	13	280	242

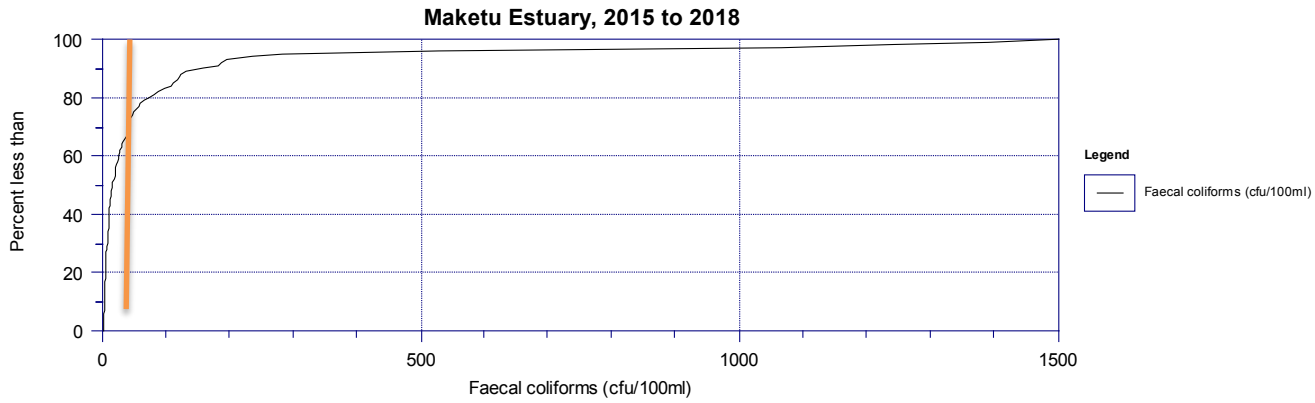


Figure 3.9: Frequency distribution of faecal coliform results from Maketū Estuary, 2015 to 2018 (43 FC/100ml concentration is shown in orange)

The Kaituna River re-diversion project is currently underway to increase the volume of water (particularly freshwater) flowing from the Kaituna River into Maketū Estuary so as to maximise the ecological and cultural health. The project will increase the total volume of water entering the estuary via Ford's Cut during a mean tidal cycle from about 153,700 m^3 to 574,500 m^3. There will be an overall increase in freshwater entering the estuary (133,700 m^3 to 436,600 m^3), but a decrease in the fraction of freshwater to saltwater (see Appendix Table 6.2). When converted to an average 24-hour equivalent flow, the volume of water entering the Maketū Estuary via Ford's Cut will increase from 3.43 m^3/s to 12.82 m^3/s and the volume of freshwater from the Kaituna River will increase from 2.98 m^3/s to 9.74 m^3/s (during a mean tide cycle and a mean river flow) (Hamill 2018). The faecal contamination load coming from the river will increase due to the larger freshwater input.

Modelling of set inflow FIB concentrations to Maketū Estuary from the Kaituna River by DHI showed similar results to this study with respect to the shellfish water guidelines - the median 14 FC/100ml being exceeded around 46% of the time. However, with increased flow to the estuary from the Kaituna diversion the median criteria of 14 FC/100ml is predicted to be exceeded 92% of the time (Jensen et al. 2010).

Similarly, the DHI model predicted that under the current conditions the 43 FC/100ml threshold for shellfish water would be exceeded 27% of the time. This corresponds well with the 26% of the time estimated here for the 2015 to 2018 data. DHI predicted this threshold would be exceeded 65% of the time with the increase in freshwater from the re-diversion of the Kaituna River.

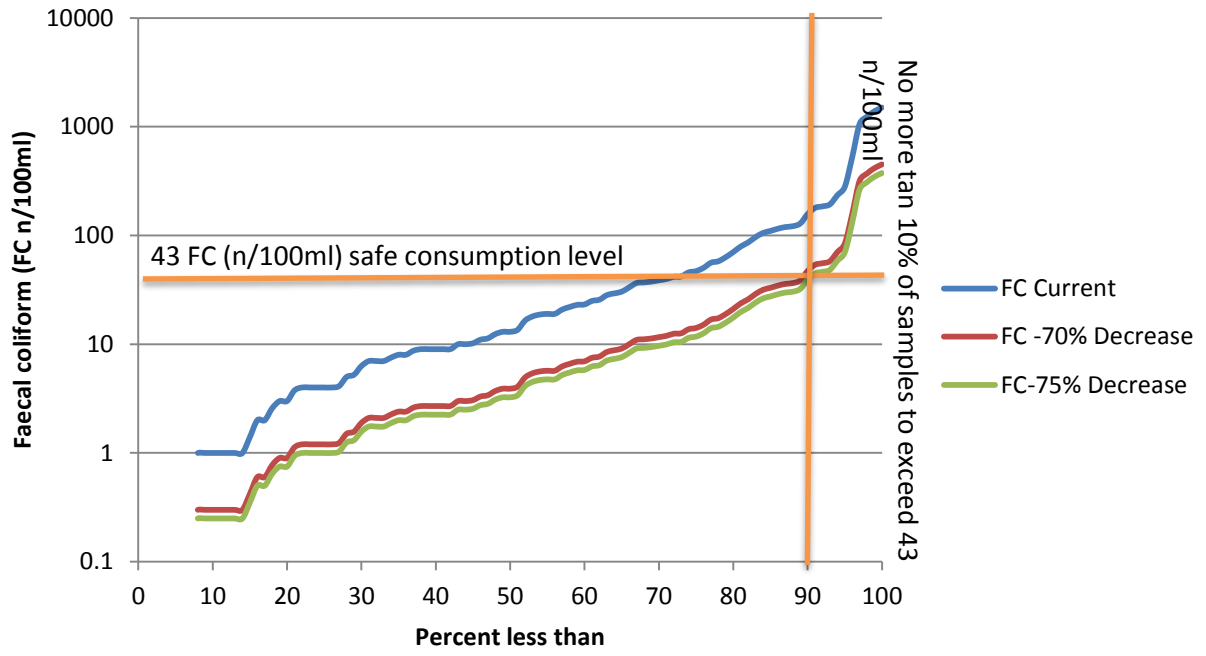


Figure 3.10: Projected changes in faecal coliform concentrations in Maketū Estuary needed to achieve "no more than 10% of samples exceeding 43/100 ml" compared to the current distribution (2015-18 data).

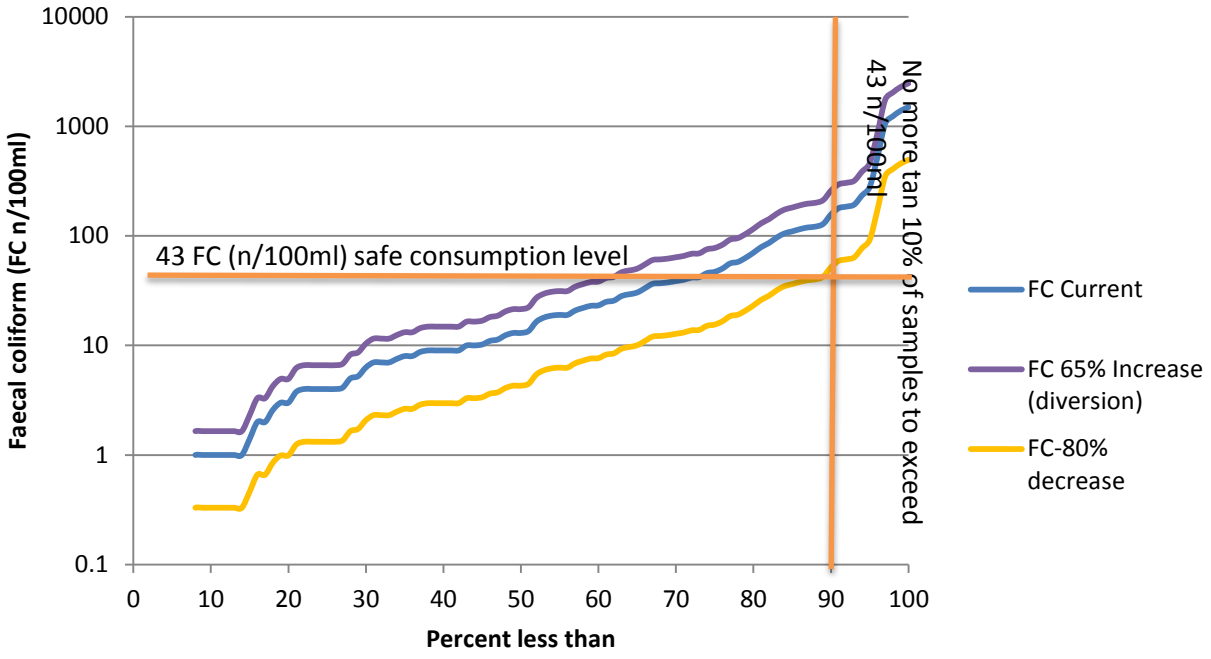


Figure 3.11: Projected changes in faecal coliform concentrations in Maketū Estuary needed to achieve "no more than 10% of samples exceeding 43/100 ml" following re-diversion. Note FC current is as for Figure 3.10 (2015-2018 data)

The level of reduction in faecal coliform bacteria required to reach the water quality objective of *no more than 10% of samples should exceed a MPN of 43/100 ml*, was modelled using the current level of faecal coliforms in the estuary. Movement of the faecal coliform distribution (2015-2018) indicates a greater than 70 percent reduction in faecal coliform concentration is required to achieve the shellfish water threshold (Figure 3.10). An approximate 80 percent reduction in concentration is required with the increased freshwater flow from the Kaituna River (Figure 3.11).

3.2.1 Faecal contamination in freshwater entering Maketu Estuary

Microbial contamination of Maketū Estuary occurs from multiple sources. The main load of faecal indicator bacteria to the estuary comes via the Kaituna River, Waitipuia Stream, and drains (Table 3.3). Hamill (2014) estimated that birds contribute 33% of the current median faecal coliform load entering via Ford's Cut, although the relative contribution from birds reduces to about 10% after the Kaituna River Re-diversion and Maketū Estuary Enhancement Project diverts more water to the estuary.

The concentration of *E.coli* bacteria are within bathing guidelines at Te Matai but increase downstream to exceed the guidelines at Te Tumu (i.e. a 95 percentile of 400 and 1890 cfu/100mL respectively). The higher bacteria concentrations at Te Tumu compared to Te Matai points to localised inputs from the Waiari, Ohineangaanga and Raparapahoe Streams, and drainage canals (Table 3.3). Hamill (2018) found no significant correlation between *E. coli* concentrations and flow in the Kaituna, although there are notable observations of increased *E. coli* concentrations with rainfall.

Table 3.3: Faecal Indicator Bacteria in the lower Kaituna River and drains to Maketū Estuary and lower Kaituna. Average of monthly median concentrations in the Kaituna River for the period 2010-2018, and drain data for the periods 2011-2013 and 2016-2017 (source Hamill 2018).

Site	E.coli (cfu/100ml)	Enterococci (cfu/100ml)	E.coli load (n/day)	E.coli load with diversion (n/day)
Kaituna at Te Matai	105	120		
Kaituna at Te Tumu	291	203	7.49×10^{11}	2.45×10^{12}
Waitipuia Stream	1424	1573	3.14×10^{11}	3.14×10^{11}
Singletons Pump Drain	1087	2110	6.67×10^{10}	6.67×10^{10}
Kaituna Road Drain	836	999	6.65×10^{9}	6.65×10^{9}
Ford Rd Drain u/s Pump station	1953	1914		
Diagonal Drain at Control Gates	907	876		
Totals			1.14×10^{12}	2.84×10^{12}

This analysis has not attempted to model the catchment contribution relative to estuarine FIB concentrations, as dilution is complicated by the diversion structure and the imminent change in freshwater input through the diversion structure. There will be times in the tidal cycle when a pulse of mostly seawater will come through Ford's cut, in addition to what is entering through the estuary mouth, changing the mix of fresh to oceanic water.

Overall, the increase in the freshwater from the Kaituna River drives a general increase in the concentration of indicator bacteria in the estuary derived from external sources (Hamill 2014). Given this prognosis, the initial aim for faecal contaminant reduction could be to strive for the bacterial load under current conditions. To achieve this, the catchment load to the estuary would need to be reduced by around 60 percent (this is difference between the predicted bacteria load after an increase of freshwater from the Kaituna compared to the current load).

The estimated catchment bacterial load reductions required may be lower if load results have been biased by a wetter period (i.e. increased flushing of bacteria to the estuary). Increased flushing from an increase in freshwater through the estuary could also reduce the re-suspension of bacteria from the sediments. However as stated for Waihī Estuary, mitigation actions in the catchment to reduce bacterial loading are likely to occur stepwise over time and the impacts of these can be measured and assessed against the relevant guidelines.

4 Summary Discussion

4.1 Catchment faecal load reductions and estuarine targets

In recent years bacterial water quality has failed (Waihī Estuary) or nearly failed (Maketū Estuary) to meet guidelines for shellfish consumption. While median faecal coliform concentrations have been less than 14 MPN/100mL, the 90 percentile of 43 FC/100ml guideline has been exceeded (in 36% and 26% of samples from Waihī and Maketū estuaries respectively). The amount of time the guideline has been exceeded varies over summer seasons, so estimates have been made on what reductions in the estuary are required based on available data. Estimates of the bacterial loading reductions required from the catchment and a corresponding load target are provided in Table 4.1.

Table 4.1: Estimated estuary faecal coliform reductions and catchment load targets to meet the shellfish water guideline value (90% of samples<43 FC/100ml).

	Waihi		Maketū		
			pre	Post	
	% Reduction	Target Load (n/day)	% Reduction	% Reduction	Target Load (n/day)
Estuary faecal coliform concentration reduction required	~80%		~70%		~80%
Catchment faecal coliform reduction required and corresponding load target	~50%	$9x10^{11}$		~60%	$1.1x10^{12}$

The bacterial load reductions required from the catchments of both estuaries are not dissimilar, with potentially a larger reduction required for the Maketū catchment once the freshwater diversion increase has occurred. Although the Kaituna River input does have a significant impact on water quality in the estuary, the original re-diversion in 1996 resulted in improved microbial water quality rather than a decline. Flushing effects may limit predicted increases in bacterial concentrations in the Maketū Estuary.

4.2 Limitations and assumptions

Faecal indicator bacteria concentration data from inflow sampling sites was used to estimate mean annual loads. These data are subject to error in sampling and analysis. Given the variability of FIB concentrations over time, determination of average catchment concentrations and yields is known to be difficult (Muirhead, 2015, Wilcock, 2006). The measured loads were determined using concurrent flow data where flow data were available. However, there was only limited data for the Pokopoko-Mangatoetoe Stream (Kaikokopu canal) compared to the other three inflows which introduces some bias to the overall predicted load of *E.coli* to the estuary.

One assumption is that the reduction in faecal contaminant loading from the catchment (as measured by FIBs) will result in an equivalent reduction in the estuary. However, this may not necessarily be the case as deposition, resuspension and other faecal contamination sources (e.g. avian) may add to the loading in the estuary. If a reduction of loading from the catchment resulted

in an exponential decrease in the estuary (rather than a linear decrease as has been assumed in this report) then greater gains may be made by some mitigation measures. It is likely that reductions from mitigation actions in the catchment will be undertaken in a stepwise fashion and the benefits of this will be able to be assessed by further monitoring and modelling.

Modelling has also been undertaken based on a past (known) set of conditions. These conditions may change (e.g. there may be more intensive rainfall events due to the effects of climate change) and therefore the reduction targets may also need to change.

No decay component for FIB was used in the analysis as data used from the SOURCE model has a decay component, and once bacteria are in the estuary some decay is implicit in the dilution estimates.

The re-diversion project will reduce the load of microbes from sediment re-suspension (by increased flushing), but it will also increase the external load of microbial contamination from the Kaituna River. It is uncertain as to whether internal loading or external loading is more important in driving microbial contamination of shellfish in Maketū Estuary, so it is unclear whether the re-diversion will improve or worsen the microbial contamination of shellfish in the estuary (Hamill 2018). There are also other sources such as wildfowl, septic tanks and direct stormwater runoff that were not included in the load estimates, but these can have a significant impact in localised parts of the estuary. For example avian sources have been estimated by Hamill (2014) to be a significant addition to Maketū Estuary (around 30% of the current load).

There is a moderate to high level of confidence in the concentration reductions required to meet shellfish water thresholds consistently in the estuaries. Longer term and recent data have very similar distributions giving some confidence that the data repesents the faecal coliform concentrations in the estuaries (e.g. Figure 3.1). Faecal coliform data for both estuaries have a similar variance and standard error (see Appendix, Figure A3). As the standard error around the mean for faecal coliform concentration is relatively small this gives some confidence in the precision of the reduction estimates.

Less certainty exists around the faecal contaminant loads to the estuaries for the reasons explained above. The level of confidence around the catchment load targets required to achieve shellfish water guidelines in the estuaries is at the scale of 0.5-1 log(10) order of magnitude. Hence, there is a moderate level of uncertainty around these daily load targets. The relative percentage reduction of load required may be 10 to 20% lower (or higher) than estimated.

Given the level of uncertainty in faecal contaminant loads from the catchments, there will be a requirement to track progress towards environmental objectives and to measure the effectiveness of policies and interventions. Monitoring and modelling recommendations have been made by Jensen et al (2012) for the Maketū Estuary, and similar recommendations and modelling would be useful for Waihī Estuary also. Monitoring and modelling that can assess and quantify the change in state over time and space will need consideration, possibly including more intensive monitoring of the estuarine receiving environment to support dynamic estuarine models.

SOURCE modelling will also be useful in evaluating the potential impact of catchment interventions designed to realise estuary objectives.

5 References

Gaborit-Haverkort, T. (2012): Intertidal shellfish survey within Maketū Estuary Bay of Plenty, New Zealand. Report prepared for the Maketū Taiapure Committee.

Hamill K.D. (2014). Microbiological health risk of bathing and shellfish gathering in the Maketū estuary. Memo report to Pim de Monchy and Stephen Park, Bay of Plenty Regional Council. 16 July 2014.

Hamill, K.D. (2018): Catchment water quality and loads to Maketū Estuary and Waihi Estuary. Client Report for Bay of plenty Regional Coucil, River Lake Ltd., wk-1095.

Hiijnen, W, A.T. Lutenberg & H. Ruiter (2007): Decay Rate Index for E. coli and enterococci in fresh and salt bathing waters. WQTC Conference Paper.

Jensen, J.K., B. Tuckey & A. Gasc. (2010): Lower Kaituna River – Maketū Estuary Water Quality Modelling. DHI Client Report.

Loft, J., H. Zhao & J. Williams (2018): Bay of Plenty Regional Council Kaituna & Rangitāiki Catchment Models. Williams Water Advisory Ltd. WWA0033.

Ministry for the Environment and Ministry of Health (2003): Microbiological Water Quality Guidelines for Marine and Freshwater Recreational Areas. Ministry for the Environment Publication number: ME 474.

Muirhead, R. (2015) A Farm-Scale Risk-Index for Reducing Fecal Contamination of Surface Waters. *J. Environ. Qual.*, 44(1): 248-255. 10.2134/jeq2014.07.0311

Park, S. (2018): Internal memorandum: Setting an interim guideline for nutrient load to Maketū and Waihi Estuaries.

Tuckey, B. (2014): Kaituna River Rediversion and Ongatoto/Maketū Estuary Enhancement Project, Numerical Modelling. DHI Report 2014-06-27.

Wilcock, B. (2006) Assessing the Relative Importance of Faecal Pollution Sources in Rural Catchments Report prepared for Environment Waikato, NIWA client report: AHM2006-104.

6 Appendix 1

6.1 Faecal indicator bacteria relationships – Waihī Estuary

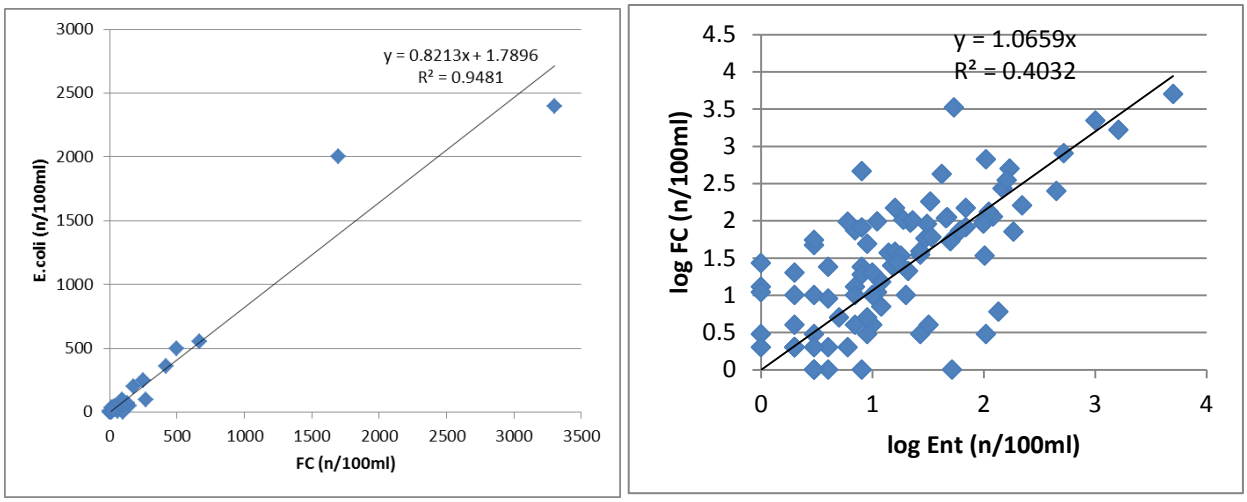


Figure A1: FIB relationships for Waihī Estuary data, 2012 to 2018.

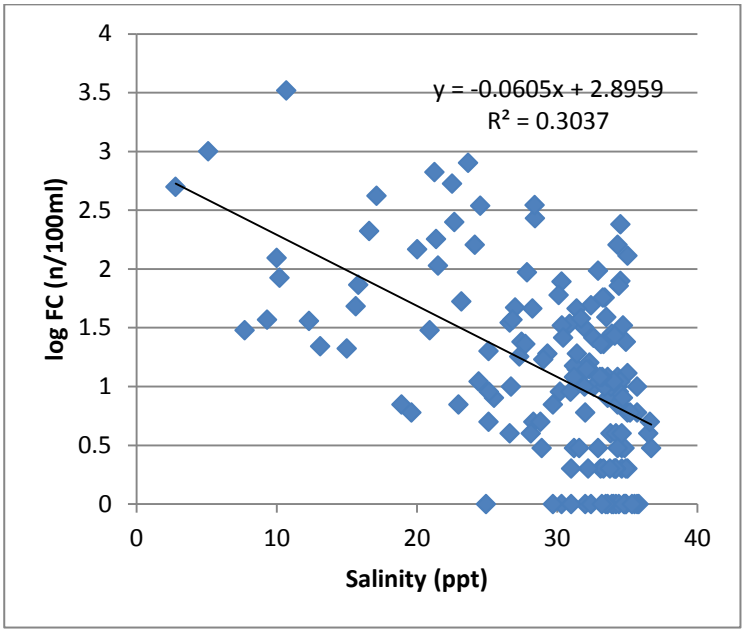


Figure A2: Salinity vs log faecal coliform concentrations, Waihī Estuary.

6.2 Estuary characteristic volumes and areas

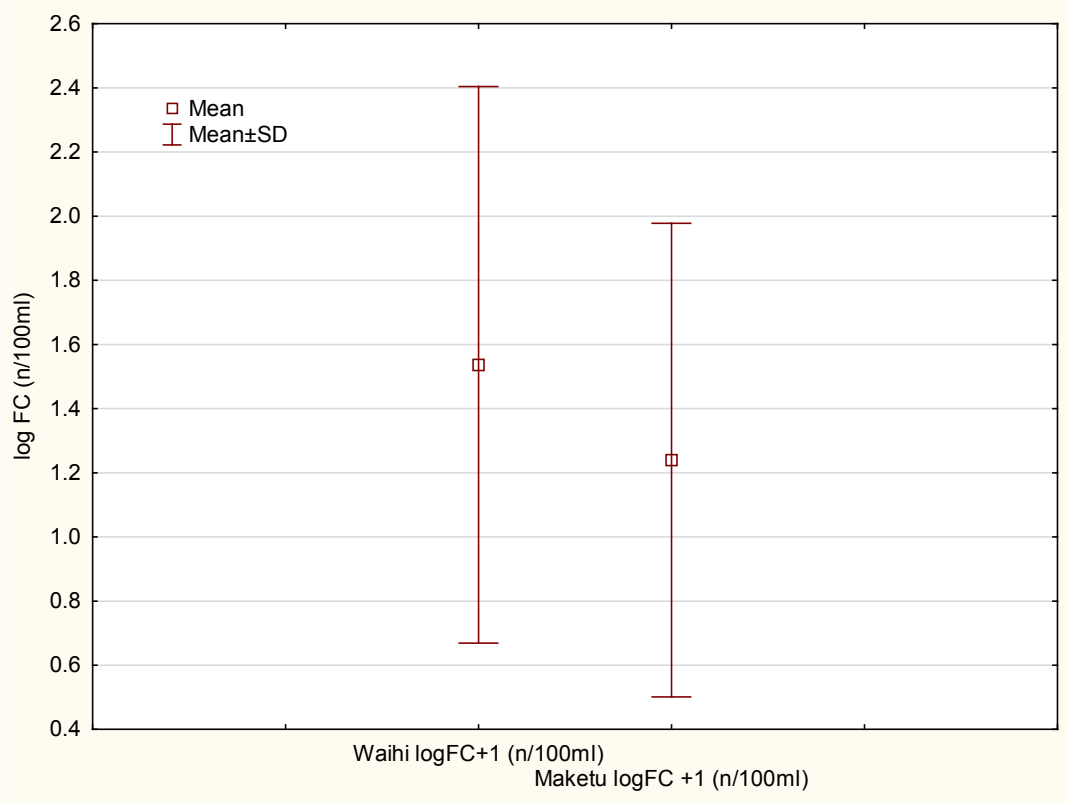
Table 6.2: Estuary characteristics.

	Maketū (pre-diversion)	Maketū (post-diversion)	Waihī
Total estuary area (ha)	255.9		338.8
Channels (ha)	54.3		41
Sand/mudflats (ha)	192		221
Saltmarsh (ha)	9.6		76.8
Subtidal Estuary volume (m^3)	217,200		246,000
Tidal prism P (m^3)	959,300		2,358,000
Estuary volume V (m^3)	1,176,500		2,604,000
Freshwater Inflow/day (m^3)	291,168	872,640	911,520
Freshwater inflow (m^3/s)	3.37	10.1	10.6
Ratio of Freshwater/saltwater (at mean river flow)	0.87	0.76	
Flushing potential	0.75		0.35
Dilution potential	0.000000024		1.09E-08
Approximate mean tide area (ha)	245		290

6.3 Faecal indicator bacteria Statistics –Estuarine

Table 6.2: Faecal indicator statistics for Waihī Estuary 1989 to 2018.

Variable	Sample size	Minimum	Maximum	Mean	Median	Standard deviation (denom. = n-1)
E coli (cfu/100ml)	164	0	2400	78.7	4.5	314
Enterococci (cfu/100ml)	224	0	5000	81.8	7	424
Faecal coliforms (cfu/100ml)	224	0	5000	112.4	10	461



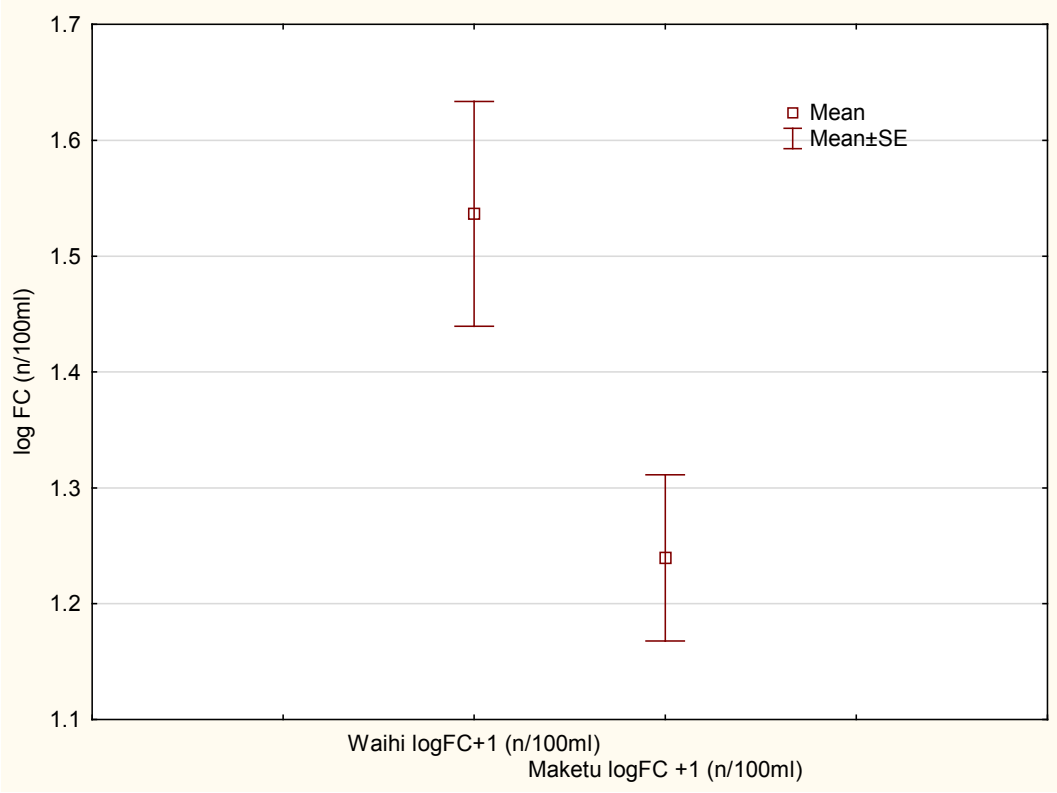


Figure A3: Mean and standard deviation (SD=1) (top), and mean and standard error (bottom) of faecal coliform results from Waihi and Maketū estuaries, 2015 to 2018 data.

MEMORANDUM

BAY OF PLENTY REGIONAL COUNCIL TOI MOANA

To: Shane Iremonger
Team Leader - Coastal Land & Air

From: Stephen Park **Date:** 16 November 2018
Senior Environmental Scientist - Marine Ecology

File Ref: A2984492

Subject: **Setting interim guidelines for nutrient loads to Maketū and Waihi Estuaries**

1 Introduction

As required by the National Policy Statement for Freshwater Management (NPS-FM), Bay of Plenty Regional Council must implement freshwater objectives, limits and methods for achieving agreed (with community input) sustainable freshwater quality and quantity in the region. To achieve these goals BOPRC has divided the task up into Water Management Areas (WMAs) comprising defined individual surface water catchments and has commenced this process on the Rangitāiki and Kaituna-Pongakawa-Waitahanui WMA's. The NPS-FM requires Councils to have regard to the connections between freshwater bodies and coastal water, and seeks to improve integrated management of fresh water and land in whole catchments, including interactions with the coastal environment. Amendments made in 2017 strengthened this direction.

With respect to the coastal receiving environment, the first stage of working towards implementation of appropriate freshwater quality objectives and limits was to assess the sensitivity of estuaries in these WMAs to nutrients loads from catchment inflows. This involved field surveys of the estuaries characteristics and current state (Park 2018a & b). Assessment of survey data also utilised the New Zealand Estuarine Trophic Index (ETI) framework (Robertson et al. 2016) to provide a consistent national assessment approach. Kaituna River Estuary, Rangitāiki (Thornton) Estuary and Waitahanui Stream mouth were found to have limited (if any for Waitahanui Stream) estuarine ecology and the estuarine or near ocean sections of these coastal receiving environments are of low sensitivity to current catchment nutrient loads.

For Waihī and Maketū Estuaries, earlier reports had documented sensitivity to catchment inflows and the extent to which ecological health had been impacted (Hamill 2014, Park 2016). This was later updated in 2018 and sensitivity to catchment inflows was assessed using the ETI Tool 1. Both Maketū and Waihī Estuaries are in poor ecological condition with the highest stressor for both estuaries being eutrophication. Assessment of susceptibility to eutrophication placed Maketū Estuary at high risk and Waihī Estuary at very high risk of degradation as a result of the current nutrient loads (Park 2018b, Hamill 2018).

Based on the current assessments and results for Maketū and Waihī estuaries there is a clear need to implement appropriate catchment nutrient load limits to protect the estuaries from ecological degradation or loss of mauri. Waihī Estuary currently has no model or hydrological and water quality data suitable for setting robust regulatory guidelines. Hence interim guidelines for nutrient limitation will be set. This will later be assessed more robustly using additional data and modelling which has been funded as part of Bay of Plenty Regional Council's Long Term Plan. For Maketū Estuary the same approach is taken as extensive consented changes are currently being implemented. Those changes include an increase in re-diversion of the Kaituna River back into

Maketū Estuary (currently 153,700 m^3/tidal cycle, changing to 574,500 m^3) and restoration of around 40 Ha of wetland back to the estuary. These changes are expected to result in improvement in the export of sediment and nutrient from the estuary and a period of monitoring is required to assess the effects of the changes.

For sediment loads, there is currently no modelling or data suitable for determining limits to protect the ecological integrity of the estuaries. From assessments of the estuary, it is clear that sedimentation has historically contributed to ecological degradation and loss of mauri. The Bay of Plenty Proposed Regional Coastal Environment Plan has an objective "*Objective 6 Sediment accumulation in harbours and estuaries resulting from land use and accelerated erosion is minimised and reduced over time compared to 2014 levels*." This objective is linked to the issue of sedimentation in estuaries and the associated impacts on biological diversity, functioning and kaimoana values. However it is not currently possible to determine if "2014" loads are at levels that would prevent further ecological degradation, or whether much lower loads are needed. Monitoring has been put in place to determine what the current levels of sedimentation are and whether the ecosystem is still degrading. This will enable assessments to be made over time to establish trends and whether improvement is required.

In the interim, guidelines values for sediment load limits for the estuary would need to default to being set at the 2014 levels. These have not been measured in any robust fashion, but can obviously be estimated from the catchment modelling. This provides a maximum value for the rivers and streams, but the reality is that it is not monitored. The in-estuary monitoring of sediment accumulation rate can address this requirement and the modelling that will be undertaken in the 2019 – 2021 period will include components to address any reduction required in sediment loads to maintain ecological and kaimoana values.

2 Background – nutrients and eutrophication

Eutrophication is a global issue in shallow coastal ecological systems. It is generally defined as the excessive input of nutrients from surrounding catchments (point source and diffuse) which then causes excessive algal growth and subsequent changes in the functioning of biological, chemical and physical processes of shallow coastal ecosystems. In New Zealand's shallow and sheltered estuarine systems, particularly those with high flushing rates and short water residence time, it is more likely for blooms of macroalgae to occur. These blooms lead to the accumulation of high algal biomass which then causes increased organic enrichment, deoxygenation, increases in toxic sulphide levels and increases in mud content of the sediments. All of these changes are detrimental to benthic biological assemblages which may be lost and replaced by less diverse opportunistic pollution tolerant species.

In New Zealand and in temperate regions globally, it is generally accepted that of the two main nutrients that limit algal growth (nitrogen and phosphorus), that nitrogen is the main limiting nutrient (Rees 2009, Robertson & Stevens 2012, Lapointe et al. 1992), particularly in summer when bacterial denitrification rates are high (Christensen et al. 2003, Zeldis 2008). However research on sea lettuce (Ulva spp.) in Tauranga Harbour, New Zealand shows that nitrogen is not always clearly limiting (Park 2011) and that in some instances it may be appropriate to manage both phosphorus and nitrogen in estuaries (Rees 2009).

A range of factors affect the sensitivity of a shallow coastal ecosystem to excessive nutrient loading. These include the physical nature of the system, including the depth, water residence time and the dilution potential of inflowing fresh water. These features form the basis of the US "ASSETS" approach (Bricker 1999) to assessing sensitivity of nutrient loads from catchments. In New Zealand the majority of coastal estuaries are small and very shallow with high flushing rates and as a consequence do not fit well in the ASSETS approach, particularly with use of phytoplankton abundance. An adapted version of the ASSETS approach has been developed for New Zealand's shallow intertidal and riverine dominated estuaries (Robertson et al. 2016).

3 Nutrient loads to Maketū and Waihī Estuaries

Nutrient loading into Maketū and Waihī Estuaries has been assessed by the use of models (NIWA - Clues data in Coastal Explorer, Williamson – eWater Source 2018) and a simple calculation approach (Hamill 2018). These results for each method are presented in Table 1 below which provides the estimated annual loading for total nitrogen and total phosphorus into the estuaries along with the areal loading in terms of the daily load per square metre of the estuary area on a mean high tide.

Rates of sediment and nutrient load into rivers and streams are generally linked closely with rainfall. In particular sediment and phosphorus concentrations tend to be much higher during heavy rainfall and significantly increased flow levels. As a consequence, unless these loads are measured over the full range of rain and flow conditions for extensive periods of time, the true loads will not be known. As stated by Hamill (2018) the simple calculation method relied on data collected predominantly during base flow conditions, with limited rain event data which limited ability to determine relationships with flow levels. This means that results below for the calculation method will present figures that will under estimate the true total nutrient loads into Maketū and Waihī Estuaries. The modelling approaches take into account the interactions established between influences such as land cover/use, soil types and slope, which are then run under scenarios of typical rainfall patterns seen over a number of years.

Table 1: Estimates of the annual load of Total Nitrogen and Total Phosphorus entering Maketū and Waihī Estuaries and the daily areal loading in the estuaries.

Estuary	Data source	Tons/year-TN	Tons/year-TP	mg/day/m^2-TN	mg/day/m^2-TP
Maketū*	Hamill	267.0	20.1	298.6	22.5
	Source	477.4	22.2	533.8	24.8
	Clues	354.8	26.6	396.8	29.8
Waihī*	Hamill	517.0	50.1	488.4	47.3
	Source	618.2	57.2	584.0	54.1
	Clues	514.9	38.0	486.4	35.9

*Area of estuaries used for areal load is estimated mean high tide area - Maketū = 245 Ha, Waihī = 290 Ha.

In Table 1 above, the loading estimates for total nitrogen and phosphorus into Maketū Estuary is lowest for the simple calculation method which is what would be expected. The Clues model estimate is lower than the Source model for total nitrogen but higher for the total phosphorus load. However, the NIWA Clues model data is generated from a national coverage model that has not had the benefit of extensive local data refinement and updating, or additional water quality survey data collected for further calibration. For that reason it is likely that the Source model which has had extensive development work done, will likely represent the most accurate nutrient load estimates.

The estimates for nutrient load into Waihī Estuary presented in Table 1 are all in a narrower range for estimates of total nitrogen load with the Clues estimate being the lowest. For total phosphorus load the Clues estimates are lower than the calculation method. This may be due to springs in the headwaters of the Waihī Estuary catchment that have high nutrient concentrations (Hamill 2018) that have not been taken into account by the Clues model.

Overall the three estimates of nutrient loads are reasonably close if the methods and biases of those methods are taken into account. The most reliable estimate will be that of the Source model which has the benefit of extensive calibration and additional work to improve datasets while the simple calculation method sets an absolute minimum for the nutrient loads coming out of the catchments.

3.1 Other nutrient inputs

Other potential pathways for nutrient loading into Maketū and Waihī Estuaries include groundwater inflows, nutrient recycling and atmospheric deposition. Atmospheric deposition is highly variable depending on anthropogenic sources, the physical dynamics and characteristics of the water body. For example it has been estimated that atmospheric nitrogen deposition on the surface waters of the Gulf Stream region (Western North Atlantic) increases surface nitrate concentrations by around 2% on average over a year (St-Laurent et al. 2017). For Maketū and Waihī Estuaries the atmospheric contributions are will be much lower as a percentage of the total loads, hence they are not considered further in assessments of nutrient loading and limits.

Groundwater inflows to Maketū and Waihī Estuaries have been estimated with the use of models, although no significant inputs have been noted from extensive field surveys over many years. Model results (JACOBS, 2018) indicate that groundwater inflows to both estuaries are likely to be negligible. A key reason for this is that both estuaries are very shallow (both average 1.6m – NIWA Coastal Explorer) and surrounded by extensive flat low lying land consisting of alluvial and marine sediment deposits with uniform uncontained flow paths which are drained either by tidal flap gates or pump drainage. These drains effectively intercept the shallow groundwater that would in the absence of the drains, flow towards the estuary flats. Hence groundwater nutrient inflows are considered to be negligible and not included in further assessments.

Extensive survey work in both Maketū and Waihī Estuaries has been undertaken to determine the state of sediment nutrient concentrations and macroalgal cover (Park 2018b). Results show that these are high (poor condition) for both estuaries, which means that nitrogen recycling from the sediment is likely to be a significant contributor to the overall load available for macroalgal growth. This contribution has been estimated by modelling rates, determined from a range of studies on similar estuaries in New Zealand, based on key variables such as the extent and state of the sediments and the tidal exposure (Needham 2018). One key issue identified in estimating the efflux of nitrogen from the sediments is that current studies do not adequately cover the high end of the range with respect to mud, organic enrichment and nitrogen in the sediments. For that reason Needham (2018) suggests that the 90 percentiles of the estimate bounds may best represent the level of nitrogen being released from the sediments. For Waihī and Maketū Estuaries the annual 50 and 90 percentile load of nitrogen being released from sediments is; Waihī – 3.9 & 15.2 t, Maketū 4.1 & 17.8 t.

Based on these additional nitrogen inputs to Waihī and Maketū estuaries the total areal loading of nitrogen is provided in Table 2 below for the 50 and 90 percentile values. The nitrogen load estimates are added to the catchment loads estimated from the Source model.

Table 2: Estimates of the total annual load of Total Nitrogen from catchment and internal nutrient recycling in Maketū and Waihī Estuaries and the daily areal loading in the estuaries.

Estuary	Percentile	N efflux – T/year	Catchment TN - T/year	Total TN load/year	N efflux as % total TN load	Areal load TN - mg/day/m^2
Maketū	50	4.1	477.4	481.5	0.9	538.4
	90	17.8	477.4	495.2	3.6	553.7
Waihī	50	3.9	618.2	622.1	0.6	587.7
	90	15.2	618.2	633.4	2.4	598.4

As shown in Table 2, the estimates of nitrogen efflux from sediments have a wide range ~~and~~ but at the 50 percentile level ~~it~~ only represents around 1% of the total nitrogen input to Maketū Estuary. However it needs to be considered that if the inflows from the catchment were at lower levels then it would be a significant portion of the total nitrogen available for algae growth. In addition the nitrogen released from sediments is in a bioavailable form (DIN) whereas total nitrogen includes a portion which isn't and this means that a greater proportion of the sediment load may be utilised by algae. In anoxic sediments the nitrogen being released may also be non-oxidised ammonium

nitrogen which can be preferentially and more effectively taken up by algae (Dortch et al. 1991, Robertson & Savage 2018). Given these points and that the nitrogen efflux levels may be more accurately represented by the 90 percentile values, and then the proportion effectively contributed from sediments to the total nitrogen load may be high, even with the current high catchment loads.

4 Nutrient and sediment inputs under natural and future scenarios

The Source model has been used to predict the estimated nutrient loads in Waihī and Maketū Estuaries under scenarios based on the natural state of the catchment (pre-human impact) and two possible future development cases based on extensive consultation with industry sectors. The specifications of the two development scenarios are set out in detail in a memo (BOPRC, 2017). In brief the two cases are:

"Scenario C" – urban growth, horticulture expansion, unmitigated sea level rise, new forestry & mānuka in upper catchment.

"Scenario D" – urban growth, dairy expansion, mitigated sea level rise, new forestry & mānuka in upper catchment.

Modelling results in Table 3 for catchment loads and areal loading in the estuary highlight the large increase in loads of nitrogen, phosphorus and total suspended solids that have occurred compared to the natural state of the catchments flowing into each of the Maketū and Waihī Estuaries. Waihī Estuary in particular now has an areal nitrogen loading that is nearly six times its original state.

Under the future scenarios for both estuaries the Source model predicts that nitrogen loads could significantly decrease, while phosphorus does so to a lesser extent. The model also predicts a decrease in suspended solids loads to Maketū Estuary, but an increase for Waihī Estuary.

Table 3: Catchment load of annual total nitrogen, phosphorus and total suspended solids (tons per year) and the areal loading rate in the Maketū and Waihī Estuaries based on the Source model estimates for natural state, current state and two future scenarios.

Estuary	Scenario	T/y - TN	T/y - TP	T/y - SS	mg/day/m^2-TN	mg/day/m^2-TP	g/day/m^2-TSS
Maketu	Natural*	155.5	12.2	1,262.4	174	14	1.4
	current	477.4	22.2	4,647.2	534	25	9.0
	"C"	310.4	17.1	5,478.9	374	19	6.1
	"D"	427.1	20.5	5,485.6	478	23	6.1
Waihi	natural	106.5	36.8	3,356.9	101	35	3.2
	current	618.2	57.2	80,75.8	584	54	7.6
	"C"	240.5	40.9	11,131.9	227	39	10.5
	"D"	386.0	47.8	10,728.9	365	45	10.1

*Note that this is taking 23.7% of the Kaituna flow through Maketū Estuary which is not the original natural physical flow state but uses the natural catchment state contributions to allow comparison to current and future modelled scenarios.

5 Guidelines for nutrient limits

Due to eutrophication of estuaries being a widespread issue globally as a result of catchment development, there is an extensive body of research available to draw upon for managing the issue of nutrient enrichment and excessive algal growth. Research results and guidelines can be presented in terms of either nutrient loadings or overlying water concentrations. There is however general agreement that nutrient loadings better reflect associated changes of increases in macroalgal growth (Robertson et al. 2016, Rees 2009), as it is possible for algae to rapidly take up

available nutrients in the water column and as a result appear comparable to areas receiving low nutrient loadings.

The New Zealand Estuarine Trophic Index (ETI) framework (Robertson et al. 2016) is essentially a management tool focused on eutrophication which has been adapted for nutrient loadings to New Zealand estuaries which can be underestimated using the ASSETTS approach (Garmendia et al. 2012). Borja et al. (2006) have also modified the ASSETTS approach to grade eutrophication levels for smaller volume Basque estuaries by taking into account the estuary area and physical susceptibility (export potential). As these two grading frameworks are similar, they are shown in the matrix below for determining the susceptibility of shallow intertidal dominated estuaries to total nitrogen loading.

	Reference	N load susceptibility (mg/m^2/day)			
		Very high	High	Moderate	Low
Physical susceptibility	Robertson et al. 2016	>250	50-250	10-50	<10
	Borja et al. 2006	>300	200-300	100-200	<100
High		Very high	High	High	Moderate
Moderate		Very high	High	Moderate	Low
Low		High	Moderate	Moderate	Low

Both Maketū and Waihī Estuary have a moderate physical susceptibility under the ETI framework which is only a broad guideline as a number of physical characteristics including shape, shelter or substrate type and condition can vary susceptibility at localised scales. In terms of the ETI framework, both Maketū and Waihī Estuary with nitrogen loadings above 250 mg/m^2/day currently sit in the "very high" susceptibility band.

Another study looking at eutrophication and the issue of macroalgal growth and the loss of seagrass from shallow temperate estuaries as a result of nitrogen loading was that of Valiela et al. (1992, 1997). In this study seven estuaries from Waquoit Bay, Massachusetts, were assessed to determine the relationship between the abundance of macroalgae and seagrass cover and the loading of total nitrogen. At levels as low as 20 mg/m^2/day of total nitrogen, significant losses of seagrass occurred and around 100 mg/m^2/day of total nitrogen, seagrass became absent and macroalgal biomass was high. A similar result was found by Fox et al. (2008) in a comparison of three shallow sub-estuaries of Waquoit Bay with different total nitrogen loads over a six year period. The findings showed a shift to high macroalgal blooms at total nitrogen loads of around 100 mg/m^2/day.

Seagrasses are generally adapted to low nutrient environments and gain a significant portion of their nutrient requirements through the root systems. When nutrient levels become enriched seagrasses are both outcompeted by other algae and may also suffer impacts from a number of other mechanisms which include toxicity (nitrate, ammonia and sulphide) and light reduction. As a result, seagrass can start declining in abundance earlier than the occurrence of extensive macroalgal blooms. Below are a range of studies and loading estimates that relate to impacts on seagrasses in shallow estuaries of temperate regions (as reviewed by Schallenberg & Schallenberg 2012).

Reference	Region	Level of decline	Loading threshold TN – mg/m^2/day
Sanderson & Coade (2010)	Australian lagoons	some loss	10
Hauxwell et al. (2003)	Waquoit Bay, USA	some loss	17
Boynton et al. (1996)	Chincoteague Bay, USA	some loss	14
Scanes (2012)	Australian lagoons	some loss	25
Viaroli et al. (2008)	Mediterranean lagoons	high loss	27*
Latimer & Rego (2010)	New England	some/high	18/37
Burkholder et al. (2007)	Global - temperate	some/high loss	27/80
Fox et al. (2008)	Waquoit Bay, USA	high loss	100

*DIN value which may equate to around 20-40 for TN load.

The loading values above include of range of estuarine systems with varying residence time, export potential (flushing/dilution) and species of seagrass, so the values present a range that shallower coastal systems are likely to fall within. As expected, the range of values reflects nitrogen loading susceptibility of the ETI Tool 1 (Robertson et al. 2016) which takes into account impacts on seagrass.

Salinity also adds another level of complexity to the success of seagrass survival that needs to be taken into account. Seagrass (*Zostera spp*.) is known to flower more frequently, increase seed production and have higher germination rates in lower salinity (Philips et al. 1983, Conacher et al. 1994, Tanner & Parham 2010, Ramage & Schiel 1998). *Z. muelleri,* the New Zealand species also has wide salinity tolerance and has been shown to produce the highest shoot density at 12 psu after ten weeks (Collier et al. 2014) compared to higher or lower salinities. In addition estuarine seagrass has been shown to have lower vitality at higher salinities in the presence of high nutrient loads (Katwijk et al., 1999). Hence at lower salinities seagrass survival will be higher than indicated by many of the overseas studies and as an example when Maketū Estuary was in its natural state (full river flow), seagrass appeared to be thriving (Park 2014) at relatively high areal TN loading rates (721mg/m^2/day) bearing in mind that the extensive surrounding wetlands may have reduced the load to some extent.

5.1 Interim nutrient limits for Maketū and Waihī Estuaries

Reviews of temperate shallow intertidal dominated estuaries (Burkholder et al. 2007, Schallenberg & Schallenberg 2012, Robertson et al. 2016) clearly show that moderate eutrophication and impacts on ecological communities and in particular seagrass extent, start to occur at around levels of 15 - 50 mg/m^2/d – TN. At around 50 to 100 mg/m^2/d – TN, high eutrophication will generally start to occur so that in most estuaries of this type, seagrass will become absent.

Both Maketū and Waihī Estuaries clearly reflect the impacts of nitrogen loading. Maketū Estuary with a catchment loading of 534 mg/m^2/d and Waihī Estuary at 584 mg/m^2/d –TN are both around 2 - 10 times the load that would generally be expected to result in high eutrophication taking into account physical susceptibility. Source modelling estimates that the relative comparable natural state catchment contribution to Maketū Estuary is a TN load (mg/m^2/d) of 174 while Waihī had 101. For Maketū Estuary the original natural state TN load is 721(mg/m^2/d) but the estuary had much higher freshwater inflow (41.8 m^3/s = flushing potential 3, compared to 10.1 m^3/s & 0.75) placing it into the less sensitive river dominated estuary category compared to its current shallow intertidal dominated state.

As a consequence the natural state for Maketū Estuary no longer provides a relevant reference point as the current physical susceptibility makes it more sensitive to nitrogen loading. For Waihī Estuary the estimated natural state TN load of 101 mg/m^2/day provides a reference level at which the estuary was formerly in a healthy minimal eutrophication state. Given that Maketū Estuary is now very similar in terms of physical susceptibility to Waihī Estuary (flushing potential will be 0.75 compared to Waihī Estuary at 0.35 once the new Kaituna River diversion flows commence in 2020), then a TN load of 100 mg/m^2/day may also be an appropriate reference point for minimal eutrophication state.

Another relevant point that needs to be considered for an appropriate interim guideline for nutrient levels is that it will not be possible to achieve a natural state for Maketū and Waihī Estuaries due to significant changes that have taken place over time. These changes include channelised freshwater inflows by-passing wetland filtration, sedimentation/nutrient accumulation, loss of fringing wetlands and extensive catchment development. Given the physical characteristics of Waihi and Maketū Estuaries, particularly the relatively high flushing rates, the changes that have taken place and the guidance of the overseas research and frameworks, then both estuaries may remain in no more than a moderately eutrophic state if TN is kept to a maximum areal load of 200 mg/m^2/day. If the higher estimation for nutrient recycling were used and included as part of the total load then the catchment load would have to be reduced by around 10%.

Applying a target TN load to Maketū and Waihī Estuaries of 200 mg/m^2/day equates to an annual TN load of 178.7 and 211.9 tons respectively. For Maketū Estuary this is near an equivalent natural state estimate of TN load and only half the Source model estimate of "Scenario C", hence may have to be moderated if later more rigorous modelling doesn't show a higher acceptable target. For Waihī Estuary the Source modelling shows that under "Scenario C" the catchment TN annual load would be only around 13% higher than the 200 mg/m^2/day target for areal loading of TN in Waihī Estuary which shows that it may be an achievable target.

As raised in the section on nutrients and eutrophication, both nitrogen and phosphorus should be considered for management as either can become a limiting nutrient to growth if concentrations fall below critical levels, as there is an ideal ratio of both required for growth depending on structural requirements (Atkinson and Smith 1983) and climatic zone (Lapointe *et al.* 1992). These studies and other such as Sfriso *et al.* (1995) show an N:P ratio of 30:1 to be a relevant standard for assessing nutrient limitation. At this ideal ratio of 30:1 for N:P, an interim maximum areal TN load target of 200 mg/m^2/day would mean that the phosphorus limit would be 14.7 mg/m^2/day. This equates to an annual load of TP for Maketū Estuary of 13.768 tons and 18.228 tons for Waihī Estuary.

For Maketū Estuary, the interim target TP load is above but close to the Source model estimate of equivalent natural state catchment load (12.2 tons/yr) and 19% lower than the estimated catchment load under "Scenario C". This is similar to results for the TN target reduction and suggests that although it appears to be an appropriate target when assessed against relevant research information, it may be difficult to achieve.

In Waihī Estuary the modelled natural state for Waihī Estuary has a naturally high TP load of 36.8 tons per year which results in a very low N:P ratio around 6.4:1. This means it is nitrogen limited and sensitive to any nitrogen increase. It also places a focus on managing nitrogen rather than phosphorus until that ideal N:P ratio of 30:1 is reached. The natural state of Waihī Estuary also shows that trying to achieve a balanced N:P ratio management approach is not possible in any case due to the ideal annual TP load for the estuary being half the natural state. Under "Scenario C" which is close to the interim target required for TN loading to the estuary, the N:P ratio would be around 13:1 which indicates continued nitrogen limitation. This implies that a TP load close to that of "Scenario C" and ideally slightly less (ie around 39-40 tons per year) should be acceptable and in line with the TN loading target.

6 Summary

Appropriate areal nutrient loads are considered here to keep Maketū and Waihī Estuary in a moderately healthy ecological state that supports biodiversity, ecological functioning, mahinga kai, taunga ika and other cultural values. This is based on research reviews and applicable frameworks for assessing eutrophication. Using this information, the following interim guidelines are recommended;

- For TN an areal load of 200 mg/m^2/day; and
- For TP an areal load of 14.74 mg/m^2/day.

For Maketū Estuary these values are close to the natural state and this infers they may be too ambitious. Modelling of Waihī Estuary nutrient loads shows that the TN load target may be achievable as it is close to the "Scenario C" model loads. However the high natural TP loads to Waihī Estuary mean the ideal TP load is clearly not achievable and that a load to the estuary around and preferably slightly lower than "Scenario C" result would be appropriate. The ETI framework (Robertson et al. 2016) stresses that for regulatory purposes, a modelling approach is recommended. A modelling approach would increase the accuracy and robustness of any

estimates and give better resolution within the estuaries of where, and to what extent, eutrophication issues could be expected to occur.

References

Atkinson, M.J. & Smith, S.V. (1983): C:N:P ratios of benthic marine plants. Limnol. Oceanogr. 28(3): 568-574.

Bay of Plenty Regional Council (2017): FINAL future land use specifications for catchment modelling. Internal memo – 10 p, Objective ID:A2855842.

Bricker, S.B., Clement, C.G., Pirhalla, D.E. & Orlando, S.P. (1999): National Estuarine Eutrophication Assessment: Effects of Nutrient Enrichment in the Nation's Estuaries.

Borja, A., Galparsoro, I., Solaun, O., Muxika, I., Tello, E.M., Uriarte, A., & Valencia, V. (2006):Thr European Water Framework Directive and the SPSIR, a methodological approach to assess the risk of failing to achieve good ecological status. Estuarine, Coastal and Shelf Science, 66(1-2): 84-96.

Boynton, W., Murray, L., Hagy, J. & Stokes, C. (1996): A comparative analysis of eutrophication patterns in a temperate coastal lagoon. Estuaries, 19: 408-421.

Burkholder, J.M., Tomasko, D.A. & Touchette, B.W. (2007): Seagrasses and eutrophication. J. Experimental Marine Biology & Ecology 350: 46-72.

Collier, C.J., Vilcorta-Rath, C., van Dijk, K., Takahashi, M. & Waycott, M. 2014: Seagrass proliferation Precedes mortality during hypo-salinity events: A stress-induced morphometric response. PloS ONE 9(4): e94014 doi:10 1371/journal pone 0094014.

Conacher, C.A., Poiner, I.R., Butler, J., Pun, S. & Tree, D.J. 1994: Germination, storage and viability testing of seeds of *Zostera capricorni Aschers*, from a tropical bay in Australia. Aquatic Botany. 49(1): 47-58.

Christensen, P.B., Glud, R.N., Dalsgaard, T. & Gillespie, P. (2003). Impacts of longline mussel farming on oxygen and nitrogen dynamics and biological communities of coastal sediments. Aquaculture 218, 567-588.

Dortch, Q., Thompson, P.A. & Harrison, P.J. (1991): Short-term interaction between nitrate and ammonium uptake in Thalassiosira pseudonanna: effect of preconditioning nitrogen source and growth rate. Marine Biology 110: 183-193.

Fox, S.E., Stieve, E., Valiela, I., Hauxwell, J. & McClelland, J. (2008): Macrophyte abundance in Waiquoit Bay:Effects of land-derived nitrogen loads on seasonal and multi-year biomass patterns. Estuaries and Coasts. 31: 532-541.

Garmendia, M., Bricker, S., Revilla, M., Borja, A., Franco, J., Bald, J. & Valencia, V. (2012): Eutrophication assessment in Basque Estuaries: Comparing a North American and a European method. Estuaries and Coasts 35: 991-1006.

Hamill, K.D. (2014): Kaituna River Re-diversion Project: Ongatoro/Maketū Estuary condition and potential ecological effects. Prepared for Bay of Plenty Regional Council.

Hamill, K.D. (2018): Catchment water quality and loads to Maketū Estuary and Waihī Estuary. Prepared for Bay of Plenty Regional Council by River Lake Limited. 36p.

Hauxwell, J., Cebrian, J. & Valiela, I. (2003): Eelgrass Zostera marina loss in temperate estuaries: relationship to land-derived nitrogen loads and effect of light limitation imposed by algae. Mar. Ecol. Prog. Ser. 247: 59-73.

JACOBS (2018): MT3D Nitrate Flux Modelling: Kaituna-Maketū-Pongakawa Groundwater Model Additional Scenarios. Memorandum prepared for Bay of Plenty Regional Council by Ruolin Wu & Gillian Holmes. 11p.

Van Katwijk M.M., Schmitz, G.H.W., Gasseling, A.P., van Avesaath, P.H. (1999): Effects of salinity and nutrient load and their interaction on Zostera marina. Marine Ecology Progress Series. 1999;190:155–165. doi: 10.3354/meps190155.

Lapointe, B.E., Littler, M.M. & Littler, D.S. (1992): Nutrient availability to marine macroalgae in siliciclastic versus carbonate-rich coastal waters. Estuaries 15(1): 75-82.

Latimer, J.S. & Rego, S.A. (2010): Empirical relationship between eelgrass extent and predicted watershed-derived nitrogen loading for shallow New England estuaries. Estuarine Coastal and Shelf Science 90: 231-240.

Needham, H.R. (2018): Estimating the efflux of NH4+ from intertidal sediment in Waihī and Maketū Estuaries. Report prepared for Bay of Plenty Regional Council. 9 p.

OSPAR, (2008): Second integrated report on the eutrophication status of the OSPAR maritime area. Eutrophication Series, OSPAR Commission, 107p.

Park, S.G. (2011): Sea Lettuce and Nutrient Monitoring in Tauranga Harbour 1991-2010. *Environment BOP Environmental Publication 2011/06*: 54 p.

Park, S.G. (2014): Extent of wetland vegetation in Maketū Estuary – 1939 to 2011. Bay of Plenty Regional Council *Environmental Publication 2014/05*: 54 p.

Park, S.G. (2016): Ecological health of Waihi Estuary. BOPRC internal memo, Objective ID-A2272466.

Park, S.G. (2018a): Preliminary investigation of ecological sensitivity of Waitahanui, Kaituna and Rangitāiki (Thornton) estuaries. BOPRC internal memo, Objective ID-A2908752.

Park, S.G. (2018b): State (health) of benthic ecology in Waihi and Maketu Estuaries. BOPRC internal memo, Objective ID-A2892930.

Philips R.C., Grant, W.S. & McRoy, C.P. (1983): Reproductive strategies of eelgrass (Zostera marina L.). Aquatic Botany. 16:1-20.

Ramage, D.L. & Schiel, D.R. (1998): Reproduction in the seagrass *(Zostera novzelandica)* on intertidal platforms in southern New Zealand. Marine Biology. 130: 479-489.

Rees, T.A.V. (2009): Effects of nutrients on marine algae: Eutrophication globally and in New Zealand. Report published by Leigh Marine Laboratory, University of Auckland. 42p.

Robertson , B.P. & Savage, C. (2018): Mud-entrained macroalgae utilise porewater and overlying water column nutrients to grow in a eutrophic intertidal estuary. Biogeochemistry 139: 53-68.

Robertson, B.M. & Stevens, L. (2012): Guidance Document: Nutrient Load Criteria to Limit Eutrophication in Three Typical New Zealand Estuary Types – ICOLL's, Tidal Lagoon, and Tidal River Estuaries. Report prepared by Wriggle Coastal Management for Environment Southland. 9p.

Robertson, B.M, Stevens, L., Robertson, B., Zeldis, J., Green. M., Madarasz-Smith. A., Plew. D., Storey. R., Hume. T. & Oliver. M. (2016): NZ Estuary Trophic Index Screening Tool 1. Determining eutrophication susceptibility using physical and nutrient load data. Prepared for the Envirolink Tools Project: Estuarine Trophic Index, MBIE/NIWA Contract No. C01X1420. 47 p.

Sanderson, B. & Coade, G. (2010): Scaling the potential for eutrophication and ecosystem state in lagoons. Environmental Modelling & Sofyware. 25: 724-736.

Scanes, P. (2012): Nutrient loads to protect environmental values in Waituna Lagoon. Report prepared for Environment Southland NZ. 11 pp.

Schallenberg, M. & Schallenberg, L.A. (2012): Eutrophication of coastal lagoons: a literature review. Report prepared for Environment Southland. Invercargill, New Zealand.

Schallneberg, M., Hamilton, D.P., Hicks, A.S., Robertson, H.A., Scarsbrook, M., Robertson, B., Wilson, K., Whaanga, D., Jones, H.F.E & Hamill, K. (2017): Multiple lines of evidence determine robust nutrient load limits required to safeguard a threatened lake/lagoon system. New Zealand Journal Marine & Freshwater Research 18 p.

Sfriso, A., Marcomini, A. & Pavoni, B. (1987): Relationships between macroalgal biomass and nutrient concentrations in a hypertrophic area of the Venice Lagoon. Marine Environ. Res. Pp: 297-312.

St-Laurent, P., Friedrichs, M.M., Najjar, R.G., Martins, D.K., Herrmann, M., Miller, S.K. & Wilkin, J. (2017): Impacts of Atmospheric Nitrogen Deposition on Surface Waters of the Western North Atlantic Mitigated by Multiple Feedbacks. Published 10 October 2017, https://doi.org/10.1002/2017JC013072

Tanner, C.E. & Parham, T. (2010): Growing *Zostera marina* (eelgrass) from seeds in land-based culture systems for use in restoration projects. Restoration Ecology Vol 18 (4): 527-537.

Valiela, I. & others (1992): Couplings of water sheds and coastal waters: Sources and consequences of nutrient enrichment in Waquoit Bay, Massachusetts. Estuaries, 15: 443-457.

Valiela, I., McClelland, J., Hauxwell, J., Behr, P.J., Hersh, D. & Foreman, K. (1997): Macroalgal blooms in shallow estuaries: Controls and ecophysiological and ecosystem consequences. Limnology & Oceanography, Vol 42 (5): 1105-1118.

Viaroli, P., Bartoli, M., Giordani, G., Naldi, M., Orfanidis, S. & Zalddivar, J. (2008): Community shifts, alternative stable states, biogeochemical control and feedbacks in eutrophic coastal lagoons: a brief overview. Aquatic Conservation; Marine and freshwater Ecosystems. 18: 105-117.

Zeldis, J. (2008): Exploring the Carrying Capacity of the Firth of Thames for Finfish Farming: a Nutrient Mass-balance Approach. Prepared by National Institute of Water and Atmospheric Research Limited for Environment Waikato. Environment Waikato Technical Report 2008/16. 28 pages.

MEMORANDUM

BAY OF PLENTY REGIONAL COUNCIL TOI MOANA

To: Shane Iremonger
Team Leader - Coastal Land & Air

From: Stephen Park **Date:** 16 November 2018
Senior Environmental Scientist - Marine Ecology

File Ref: A2984492

Subject: **Setting interim guidelines for nutrient loads to Maketū and Waihi Estuaries**

1 Introduction

As required by the National Policy Statement for Freshwater Management (NPS-FM), Bay of Plenty Regional Council must implement freshwater objectives, limits and methods for achieving agreed (with community input) sustainable freshwater quality and quantity in the region. To achieve these goals BOPRC has divided the task up into Water Management Areas (WMAs) comprising defined individual surface water catchments and has commenced this process on the Rangitāiki and Kaituna-Pongakawa-Waitahanui WMA's. The NPS-FM requires Councils to have regard to the connections between freshwater bodies and coastal water, and seeks to improve integrated management of fresh water and land in whole catchments, including interactions with the coastal environment. Amendments made in 2017 strengthened this direction.

With respect to the coastal receiving environment, the first stage of working towards implementation of appropriate freshwater quality objectives and limits was to assess the sensitivity of estuaries in these WMAs to nutrients loads from catchment inflows. This involved field surveys of the estuaries characteristics and current state (Park 2018a & b). Assessment of survey data also utilised the New Zealand Estuarine Trophic Index (ETI) framework (Robertson et al. 2016) to provide a consistent national assessment approach. Kaituna River Estuary, Rangitāiki (Thornton) Estuary and Waitahanui Stream mouth were found to have limited (if any for Waitahanui Stream) estuarine ecology and the estuarine or near ocean sections of these coastal receiving environments are of low sensitivity to current catchment nutrient loads.

For Waihī and Maketū Estuaries, earlier reports had documented sensitivity to catchment inflows and the extent to which ecological health had been impacted (Hamill 2014, Park 2016). This was later updated in 2018 and sensitivity to catchment inflows was assessed using the ETI Tool 1. Both Maketū and Waihī Estuaries are in poor ecological condition with the highest stressor for both estuaries being eutrophication. Assessment of susceptibility to eutrophication placed Maketū Estuary at high risk and Waihī Estuary at very high risk of degradation as a result of the current nutrient loads (Park 2018b, Hamill 2018).

Based on the current assessments and results for Maketū and Waihī estuaries there is a clear need to implement appropriate catchment nutrient load limits to protect the estuaries from ecological degradation or loss of mauri. Waihī Estuary currently has no model or hydrological and water quality data suitable for setting robust regulatory guidelines. Hence interim guidelines for nutrient limitation will be set. This will later be assessed more robustly using additional data and modelling which has been funded as part of Bay of Plenty Regional Council's Long Term Plan. For Maketū Estuary the same approach is taken as extensive consented changes are currently being implemented. Those changes include an increase in re-diversion of the Kaituna River back into

Maketū Estuary (currently 153,700 m^3/tidal cycle, changing to 574,500 m^3) and restoration of around 40 Ha of wetland back to the estuary. These changes are expected to result in improvement in the export of sediment and nutrient from the estuary and a period of monitoring is required to assess the effects of the changes.

For sediment loads, there is currently no modelling or data suitable for determining limits to protect the ecological integrity of the estuaries. From assessments of the estuary, it is clear that sedimentation has historically contributed to ecological degradation and loss of mauri. The Bay of Plenty Proposed Regional Coastal Environment Plan has an objective "*Objective 6 Sediment accumulation in harbours and estuaries resulting from land use and accelerated erosion is minimised and reduced over time compared to 2014 levels*." This objective is linked to the issue of sedimentation in estuaries and the associated impacts on biological diversity, functioning and kaimoana values. However it is not currently possible to determine if "2014" loads are at levels that would prevent further ecological degradation, or whether much lower loads are needed. Monitoring has been put in place to determine what the current levels of sedimentation are and whether the ecosystem is still degrading. This will enable assessments to be made over time to establish trends and whether improvement is required.

In the interim, guidelines values for sediment load limits for the estuary would need to default to being set at the 2014 levels. These have not been measured in any robust fashion, but can obviously be estimated from the catchment modelling. This provides a maximum value for the rivers and streams, but the reality is that it is not monitored. The in-estuary monitoring of sediment accumulation rate can address this requirement and the modelling that will be undertaken in the 2019 – 2021 period will include components to address any reduction required in sediment loads to maintain ecological and kaimoana values.

2 Background – nutrients and eutrophication

Eutrophication is a global issue in shallow coastal ecological systems. It is generally defined as the excessive input of nutrients from surrounding catchments (point source and diffuse) which then causes excessive algal growth and subsequent changes in the functioning of biological, chemical and physical processes of shallow coastal ecosystems. In New Zealand's shallow and sheltered estuarine systems, particularly those with high flushing rates and short water residence time, it is more likely for blooms of macroalgae to occur. These blooms lead to the accumulation of high algal biomass which then causes increased organic enrichment, deoxygenation, increases in toxic sulphide levels and increases in mud content of the sediments. All of these changes are detrimental to benthic biological assemblages which may be lost and replaced by less diverse opportunistic pollution tolerant species.

In New Zealand and in temperate regions globally, it is generally accepted that of the two main nutrients that limit algal growth (nitrogen and phosphorus), that nitrogen is the main limiting nutrient (Rees 2009, Robertson & Stevens 2012, Lapointe et al. 1992), particularly in summer when bacterial denitrification rates are high (Christensen et al. 2003, Zeldis 2008). However research on sea lettuce (Ulva spp.) in Tauranga Harbour, New Zealand shows that nitrogen is not always clearly limiting (Park 2011) and that in some instances it may be appropriate to manage both phosphorus and nitrogen in estuaries (Rees 2009).

A range of factors affect the sensitivity of a shallow coastal ecosystem to excessive nutrient loading. These include the physical nature of the system, including the depth, water residence time and the dilution potential of inflowing fresh water. These features form the basis of the US "ASSETS" approach (Bricker 1999) to assessing sensitivity of nutrient loads from catchments. In New Zealand the majority of coastal estuaries are small and very shallow with high flushing rates and as a consequence do not fit well in the ASSETS approach, particularly with use of phytoplankton abundance. An adapted version of the ASSETS approach has been developed for New Zealand's shallow intertidal and riverine dominated estuaries (Robertson et al. 2016).

3 Nutrient loads to Maketū and Waihī Estuaries

Nutrient loading into Maketū and Waihī Estuaries has been assessed by the use of models (NIWA - Clues data in Coastal Explorer, Williamson – eWater Source 2018) and a simple calculation approach (Hamill 2018). These results for each method are presented in Table 1 below which provides the estimated annual loading for total nitrogen and total phosphorus into the estuaries along with the areal loading in terms of the daily load per square metre of the estuary area on a mean high tide.

Rates of sediment and nutrient load into rivers and streams are generally linked closely with rainfall. In particular sediment and phosphorus concentrations tend to be much higher during heavy rainfall and significantly increased flow levels. As a consequence, unless these loads are measured over the full range of rain and flow conditions for extensive periods of time, the true loads will not be known. As stated by Hamill (2018) the simple calculation method relied on data collected predominantly during base flow conditions, with limited rain event data which limited ability to determine relationships with flow levels. This means that results below for the calculation method will present figures that will under estimate the true total nutrient loads into Maketū and Waihī Estuaries. The modelling approaches take into account the interactions established between influences such as land cover/use, soil types and slope, which are then run under scenarios of typical rainfall patterns seen over a number of years.

Table 1: Estimates of the annual load of Total Nitrogen and Total Phosphorus entering Maketū and Waihī Estuaries and the daily areal loading in the estuaries.

Estuary	Data source	Tons/year-TN	Tons/year-TP	mg/day/m^2-TN	mg/day/m^2-TP
Maketū*	Hamill	267.0	20.1	298.6	22.5
	Source	477.4	22.2	533.8	24.8
	Clues	354.8	26.6	396.8	29.8
Waihī*	Hamill	517.0	50.1	488.4	47.3
	Source	618.2	57.2	584.0	54.1
	Clues	514.9	38.0	486.4	35.9

*Area of estuaries used for areal load is estimated mean high tide area - Maketū = 245 Ha, Waihī = 290 Ha.

In Table 1 above, the loading estimates for total nitrogen and phosphorus into Maketū Estuary is lowest for the simple calculation method which is what would be expected. The Clues model estimate is lower than the Source model for total nitrogen but higher for the total phosphorus load. However, the NIWA Clues model data is generated from a national coverage model that has not had the benefit of extensive local data refinement and updating, or additional water quality survey data collected for further calibration. For that reason it is likely that the Source model which has had extensive development work done, will likely represent the most accurate nutrient load estimates.

The estimates for nutrient load into Waihī Estuary presented in Table 1 are all in a narrower range for estimates of total nitrogen load with the Clues estimate being the lowest. For total phosphorus load the Clues estimates are lower than the calculation method. This may be due to springs in the headwaters of the Waihī Estuary catchment that have high nutrient concentrations (Hamill 2018) that have not been taken into account by the Clues model.

Overall the three estimates of nutrient loads are reasonably close if the methods and biases of those methods are taken into account. The most reliable estimate will be that of the Source model which has the benefit of extensive calibration and additional work to improve datasets while the simple calculation method sets an absolute minimum for the nutrient loads coming out of the catchments.

3.1 Other nutrient inputs

Other potential pathways for nutrient loading into Maketū and Waihī Estuaries include groundwater inflows, nutrient recycling and atmospheric deposition. Atmospheric deposition is highly variable depending on anthropogenic sources, the physical dynamics and characteristics of the water body. For example it has been estimated that atmospheric nitrogen deposition on the surface waters of the Gulf Stream region (Western North Atlantic) increases surface nitrate concentrations by around 2% on average over a year (St-Laurent et al. 2017). For Maketū and Waihī Estuaries the atmospheric contributions are will be much lower as a percentage of the total loads, hence they are not considered further in assessments of nutrient loading and limits.

Groundwater inflows to Maketū and Waihī Estuaries have been estimated with the use of models, although no significant inputs have been noted from extensive field surveys over many years. Model results (JACOBS, 2018) indicate that groundwater inflows to both estuaries are likely to be negligible. A key reason for this is that both estuaries are very shallow (both average 1.6m – NIWA Coastal Explorer) and surrounded by extensive flat low lying land consisting of alluvial and marine sediment deposits with uniform uncontained flow paths which are drained either by tidal flap gates or pump drainage. These drains effectively intercept the shallow groundwater that would in the absence of the drains, flow towards the estuary flats. Hence groundwater nutrient inflows are considered to be negligible and not included in further assessments.

Extensive survey work in both Maketū and Waihī Estuaries has been undertaken to determine the state of sediment nutrient concentrations and macroalgal cover (Park 2018b). Results show that these are high (poor condition) for both estuaries, which means that nitrogen recycling from the sediment is likely to be a significant contributor to the overall load available for macroalgal growth. This contribution has been estimated by modelling rates, determined from a range of studies on similar estuaries in New Zealand, based on key variables such as the extent and state of the sediments and the tidal exposure (Needham 2018). One key issue identified in estimating the efflux of nitrogen from the sediments is that current studies do not adequately cover the high end of the range with respect to mud, organic enrichment and nitrogen in the sediments. For that reason Needham (2018) suggests that the 90 percentiles of the estimate bounds may best represent the level of nitrogen being released from the sediments. For Waihī and Maketū Estuaries the annual 50 and 90 percentile load of nitrogen being released from sediments is; Waihī – 3.9 & 15.2 t, Maketū 4.1 & 17.8 t.

Based on these additional nitrogen inputs to Waihī and Maketū estuaries the total areal loading of nitrogen is provided in Table 2 below for the 50 and 90 percentile values. The nitrogen load estimates are added to the catchment loads estimated from the Source model.

Table 2: Estimates of the total annual load of Total Nitrogen from catchment and internal nutrient recycling in Maketū and Waihī Estuaries and the daily areal loading in the estuaries.

Estuary	Percentile	N efflux – T/year	Catchment TN - T/year	Total TN load/year	N efflux as % total TN load	Areal load TN - mg/day/m^2
Maketū	50	4.1	477.4	481.5	0.9	538.4
	90	17.8	477.4	495.2	3.6	553.7
Waihī	50	3.9	618.2	622.1	0.6	587.7
	90	15.2	618.2	633.4	2.4	598.4

As shown in Table 2, the estimates of nitrogen efflux from sediments have a wide range ~~and~~ but at the 50 percentile level ~~it~~ only represents around 1% of the total nitrogen input to Maketū Estuary. However it needs to be considered that if the inflows from the catchment were at lower levels then it would be a significant portion of the total nitrogen available for algae growth. In addition the nitrogen released from sediments is in a bioavailable form (DIN) whereas total nitrogen includes a portion which isn't and this means that a greater proportion of the sediment load may be utilised by algae. In anoxic sediments the nitrogen being released may also be non-oxidised ammonium

nitrogen which can be preferentially and more effectively taken up by algae (Dortch et al. 1991, Robertson & Savage 2018). Given these points and that the nitrogen efflux levels may be more accurately represented by the 90 percentile values, and then the proportion effectively contributed from sediments to the total nitrogen load may be high, even with the current high catchment loads.

4 Nutrient and sediment inputs under natural and future scenarios

The Source model has been used to predict the estimated nutrient loads in Waihī and Maketū Estuaries under scenarios based on the natural state of the catchment (pre-human impact) and two possible future development cases based on extensive consultation with industry sectors. The specifications of the two development scenarios are set out in detail in a memo (BOPRC, 2017). In brief the two cases are:

"Scenario C" – urban growth, horticulture expansion, unmitigated sea level rise, new forestry & mānuka in upper catchment.

"Scenario D" – urban growth, dairy expansion, mitigated sea level rise, new forestry & mānuka in upper catchment.

Modelling results in Table 3 for catchment loads and areal loading in the estuary highlight the large increase in loads of nitrogen, phosphorus and total suspended solids that have occurred compared to the natural state of the catchments flowing into each of the Maketū and Waihī Estuaries. Waihī Estuary in particular now has an areal nitrogen loading that is nearly six times its original state.

Under the future scenarios for both estuaries the Source model predicts that nitrogen loads could significantly decrease, while phosphorus does so to a lesser extent. The model also predicts a decrease in suspended solids loads to Maketū Estuary, but an increase for Waihī Estuary.

Table 3: Catchment load of annual total nitrogen, phosphorus and total suspended solids (tons per year) and the areal loading rate in the Maketū and Waihī Estuaries based on the Source model estimates for natural state, current state and two future scenarios.

Estuary	Scenario	T/y - TN	T/y - TP	T/y - SS	mg/day/m^2-TN	mg/day/m^2-TP	g/day/m^2-TSS
Maketu	Natural*	155.5	12.2	1,262.4	174	14	1.4
	current	477.4	22.2	4,647.2	534	25	9.0
	"C"	310.4	17.1	5,478.9	374	19	6.1
	"D"	427.1	20.5	5,485.6	478	23	6.1
Waihi	natural	106.5	36.8	3,356.9	101	35	3.2
	current	618.2	57.2	80,75.8	584	54	7.6
	"C"	240.5	40.9	11,131.9	227	39	10.5
	"D"	386.0	47.8	10,728.9	365	45	10.1

*Note that this is taking 23.7% of the Kaituna flow through Maketū Estuary which is not the original natural physical flow state but uses the natural catchment state contributions to allow comparison to current and future modelled scenarios.

5 Guidelines for nutrient limits

Due to eutrophication of estuaries being a widespread issue globally as a result of catchment development, there is an extensive body of research available to draw upon for managing the issue of nutrient enrichment and excessive algal growth. Research results and guidelines can be presented in terms of either nutrient loadings or overlying water concentrations. There is however general agreement that nutrient loadings better reflect associated changes of increases in macroalgal growth (Robertson et al. 2016, Rees 2009), as it is possible for algae to rapidly take up

available nutrients in the water column and as a result appear comparable to areas receiving low nutrient loadings.

The New Zealand Estuarine Trophic Index (ETI) framework (Robertson et al. 2016) is essentially a management tool focused on eutrophication which has been adapted for nutrient loadings to New Zealand estuaries which can be underestimated using the ASSETTS approach (Garmendia et al. 2012). Borja et al. (2006) have also modified the ASSETTS approach to grade eutrophication levels for smaller volume Basque estuaries by taking into account the estuary area and physical susceptibility (export potential). As these two grading frameworks are similar, they are shown in the matrix below for determining the susceptibility of shallow intertidal dominated estuaries to total nitrogen loading.

	Reference	N load susceptibility (mg/m^2/day)			
		Very high	High	Moderate	Low
Physical susceptibility	Robertson et al. 2016	>250	50-250	10-50	<10
	Borja et al. 2006	>300	200-300	100-200	<100
High		Very high	High	High	Moderate
Moderate		Very high	High	Moderate	Low
Low		High	Moderate	Moderate	Low

Both Maketū and Waihī Estuary have a moderate physical susceptibility under the ETI framework which is only a broad guideline as a number of physical characteristics including shape, shelter or substrate type and condition can vary susceptibility at localised scales. In terms of the ETI framework, both Maketū and Waihī Estuary with nitrogen loadings above 250 mg/m^2/day currently sit in the “very high” susceptibility band.

Another study looking at eutrophication and the issue of macroalgal growth and the loss of seagrass from shallow temperate estuaries as a result of nitrogen loading was that of Valiela et al. (1992, 1997). In this study seven estuaries from Waquoit Bay, Massachusetts, were assessed to determine the relationship between the abundance of macroalgae and seagrass cover and the loading of total nitrogen. At levels as low as 20 mg/m^2/day of total nitrogen, significant losses of seagrass occurred and around 100 mg/m^2/day of total nitrogen, seagrass became absent and macroalgal biomass was high. A similar result was found by Fox et al. (2008) in a comparison of three shallow sub-estuaries of Waquoit Bay with different total nitrogen loads over a six year period. The findings showed a shift to high macroalgal blooms at total nitrogen loads of around 100 mg/m^2/day.

Seagrasses are generally adapted to low nutrient environments and gain a significant portion of their nutrient requirements through the root systems. When nutrient levels become enriched seagrasses are both outcompeted by other algae and may also suffer impacts from a number of other mechanisms which include toxicity (nitrate, ammonia and sulphide) and light reduction. As a result, seagrass can start declining in abundance earlier than the occurrence of extensive macroalgal blooms. Below are a range of studies and loading estimates that relate to impacts on seagrasses in shallow estuaries of temperate regions (as reviewed by Schallenberg & Schallenberg 2012).

Reference	Region	Level of decline	Loading threshold TN – mg/m^2/day
Sanderson & Coade (2010)	Australian lagoons	some loss	10
Hauxwell et al. (2003)	Waquoit Bay, USA	some loss	17
Boynton et al. (1996)	Chincoteague Bay, USA	some loss	14
Scanes (2012)	Australian lagoons	some loss	25
Viaroli et al. (2008)	Mediterranean lagoons	high loss	27*
Latimer & Rego (2010)	New England	some/high	18/37
Burkholder et al. (2007)	Global - temperate	some/high loss	27/80
Fox et al. (2008)	Waquoit Bay, USA	high loss	100

*DIN value which may equate to around 20-40 for TN load.

The loading values above include of range of estuarine systems with varying residence time, export potential (flushing/dilution) and species of seagrass, so the values present a range that shallower coastal systems are likely to fall within. As expected, the range of values reflects nitrogen loading susceptibility of the ETI Tool 1 (Robertson et al. 2016) which takes into account impacts on seagrass.

Salinity also adds another level of complexity to the success of seagrass survival that needs to be taken into account. Seagrass (*Zostera spp*.) is known to flower more frequently, increase seed production and have higher germination rates in lower salinity (Philips et al. 1983, Conacher et al. 1994, Tanner & Parham 2010, Ramage & Schiel 1998). *Z. muelleri,* the New Zealand species also has wide salinity tolerance and has been shown to produce the highest shoot density at 12 psu after ten weeks (Collier et al. 2014) compared to higher or lower salinities. In addition estuarine seagrass has been shown to have lower vitality at higher salinities in the presence of high nutrient loads (Katwijk et al., 1999). Hence at lower salinities seagrass survival will be higher than indicated by many of the overseas studies and as an example when Maketū Estuary was in its natural state (full river flow), seagrass appeared to be thriving (Park 2014) at relatively high areal TN loading rates (721mg/m^2/day) bearing in mind that the extensive surrounding wetlands may have reduced the load to some extent.

5.1 Interim nutrient limits for Maketū and Waihī Estuaries

Reviews of temperate shallow intertidal dominated estuaries (Burkholder et al. 2007, Schallenberg & Schallenberg 2012, Robertson et al. 2016) clearly show that moderate eutrophication and impacts on ecological communities and in particular seagrass extent, start to occur at around levels of 15 - 50 mg/m^2/d – TN. At around 50 to 100 mg/m^2/d – TN, high eutrophication will generally start to occur so that in most estuaries of this type, seagrass will become absent.

Both Maketū and Waihī Estuaries clearly reflect the impacts of nitrogen loading. Maketū Estuary with a catchment loading of 534 mg/m^2/d and Waihī Estuary at 584 mg/m^2/d –TN are both around 2 - 10 times the load that would generally be expected to result in high eutrophication taking into account physical susceptibility. Source modelling estimates that the relative comparable natural state catchment contribution to Maketū Estuary is a TN load (mg/m^2/d) of 174 while Waihī had 101. For Maketū Estuary the original natural state TN load is 721(mg/m^2/d) but the estuary had much higher freshwater inflow (41.8 m^3/s = flushing potential 3, compared to 10.1 m^3/s & 0.75) placing it into the less sensitive river dominated estuary category compared to its current shallow intertidal dominated state.

As a consequence the natural state for Maketū Estuary no longer provides a relevant reference point as the current physical susceptibility makes it more sensitive to nitrogen loading. For Waihī Estuary the estimated natural state TN load of 101 mg/m^2/day provides a reference level at which the estuary was formerly in a healthy minimal eutrophication state. Given that Maketū Estuary is now very similar in terms of physical susceptibility to Waihī Estuary (flushing potential will be 0.75 compared to Waihī Estuary at 0.35 once the new Kaituna River diversion flows commence in 2020), then a TN load of 100 mg/m^2/day may also be an appropriate reference point for minimal eutrophication state.

Another relevant point that needs to be considered for an appropriate interim guideline for nutrient levels is that it will not be possible to achieve a natural state for Maketū and Waihī Estuaries due to significant changes that have taken place over time. These changes include channelised freshwater inflows by-passing wetland filtration, sedimentation/nutrient accumulation, loss of fringing wetlands and extensive catchment development. Given the physical characteristics of Waihi and Maketū Estuaries, particularly the relatively high flushing rates, the changes that have taken place and the guidance of the overseas research and frameworks, then both estuaries may remain in no more than a moderately eutrophic state if TN is kept to a maximum areal load of 200 mg/m^2/day. If the higher estimation for nutrient recycling were used and included as part of the total load then the catchment load would have to be reduced by around 10%.

Applying a target TN load to Maketū and Waihī Estuaries of 200 mg/m^2/day equates to an annual TN load of 178.7 and 211.9 tons respectively. For Maketū Estuary this is near an equivalent natural state estimate of TN load and only half the Source model estimate of "Scenario C", hence may have to be moderated if later more rigorous modelling doesn't show a higher acceptable target. For Waihī Estuary the Source modelling shows that under "Scenario C" the catchment TN annual load would be only around 13% higher than the 200 mg/m^2/day target for areal loading of TN in Waihī Estuary which shows that it may be an achievable target.

As raised in the section on nutrients and eutrophication, both nitrogen and phosphorus should be considered for management as either can become a limiting nutrient to growth if concentrations fall below critical levels, as there is an ideal ratio of both required for growth depending on structural requirements (Atkinson and Smith 1983) and climatic zone (Lapointe *et al.* 1992). These studies and other such as Sfriso *et al.* (1995) show an N:P ratio of 30:1 to be a relevant standard for assessing nutrient limitation. At this ideal ratio of 30:1 for N:P, an interim maximum areal TN load target of 200 mg/m^2/day would mean that the phosphorus limit would be 14.7 mg/m^2/day. This equates to an annual load of TP for Maketū Estuary of 13.768 tons and 18.228 tons for Waihī Estuary.

For Maketū Estuary, the interim target TP load is above but close to the Source model estimate of equivalent natural state catchment load (12.2 tons/yr) and 19% lower than the estimated catchment load under "Scenario C". This is similar to results for the TN target reduction and suggests that although it appears to be an appropriate target when assessed against relevant research information, it may be difficult to achieve.

In Waihī Estuary the modelled natural state for Waihī Estuary has a naturally high TP load of 36.8 tons per year which results in a very low N:P ratio around 6.4:1. This means it is nitrogen limited and sensitive to any nitrogen increase. It also places a focus on managing nitrogen rather than phosphorus until that ideal N:P ratio of 30:1 is reached. The natural state of Waihī Estuary also shows that trying to achieve a balanced N:P ratio management approach is not possible in any case due to the ideal annual TP load for the estuary being half the natural state. Under "Scenario C" which is close to the interim target required for TN loading to the estuary, the N:P ratio would be around 13:1 which indicates continued nitrogen limitation. This implies that a TP load close to that of "Scenario C" and ideally slightly less (ie around 39-40 tons per year) should be acceptable and in line with the TN loading target.

6 Summary

Appropriate areal nutrient loads are considered here to keep Maketū and Waihī Estuary in a moderately healthy ecological state that supports biodiversity, ecological functioning, mahinga kai, taunga ika and other cultural values. This is based on research reviews and applicable frameworks for assessing eutrophication. Using this information, the following interim guidelines are recommended;

- For TN an areal load of 200 mg/m^2/day; and
- For TP an areal load of 14.74 mg/m^2/day.

For Maketū Estuary these values are close to the natural state and this infers they may be too ambitious. Modelling of Waihī Estuary nutrient loads shows that the TN load target may be achievable as it is close to the "Scenario C" model loads. However the high natural TP loads to Waihī Estuary mean the ideal TP load is clearly not achievable and that a load to the estuary around and preferably slightly lower than "Scenario C" result would be appropriate. The ETI framework (Robertson et al. 2016) stresses that for regulatory purposes, a modelling approach is recommended. A modelling approach would increase the accuracy and robustness of any

estimates and give better resolution within the estuaries of where, and to what extent, eutrophication issues could be expected to occur.

References

Atkinson, M.J. & Smith, S.V. (1983): C:N:P ratios of benthic marine plants. Limnol. Oceanogr. 28(3): 568-574.

Bay of Plenty Regional Council (2017): FINAL future land use specifications for catchment modelling. Internal memo – 10 p, Objective ID:A2855842.

Bricker, S.B., Clement, C.G., Pirhalla, D.E. & Orlando, S.P. (1999): National Estuarine Eutrophication Assessment: Effects of Nutrient Enrichment in the Nation's Estuaries.

Borja, A., Galparsoro, I., Solaun, O., Muxika, I., Tello, E.M., Uriarte, A., & Valencia, V. (2006):Thr European Water Framework Directive and the SPSIR, a methodological approach to assess the risk of failing to achieve good ecological status. Estuarine, Coastal and Shelf Science, 66(1-2): 84-96.

Boynton, W., Murray, L., Hagy, J. & Stokes, C. (1996): A comparative analysis of eutrophication patterns in a temperate coastal lagoon. Estuaries, 19: 408-421.

Burkholder, J.M., Tomasko, D.A. & Touchette, B.W. (2007): Seagrasses and eutrophication. J. Experimental Marine Biology & Ecology 350: 46-72.

Collier, C.J., Vilcorta-Rath, C., van Dijk, K., Takahashi, M. & Waycott, M. 2014: Seagrass proliferation Precedes mortality during hypo-salinity events: A stress-induced morphometric response. PloS ONE 9(4): e94014 doi:10 1371/journal pone 0094014.

Conacher, C.A., Poiner, I.R., Butler, J., Pun, S. & Tree, D.J. 1994: Germination, storage and viability testing of seeds of *Zostera capricorni Aschers*, from a tropical bay in Australia. Aquatic Botany. 49(1): 47-58.

Christensen, P.B., Glud, R.N., Dalsgaard, T. & Gillespie, P. (2003). Impacts of longline mussel farming on oxygen and nitrogen dynamics and biological communities of coastal sediments. Aquaculture 218, 567-588.

Dortch, Q., Thompson, P.A. & Harrison, P.J. (1991): Short-term interaction between nitrate and ammonium uptake in Thalassiosira pseudonanna: effect of preconditioning nitrogen source and growth rate. Marine Biology 110: 183-193.

Fox, S.E., Stieve, E., Valiela, I., Hauxwell, J. & McClelland, J. (2008): Macrophyte abundance in Waiquoit Bay:Effects of land-derived nitrogen loads on seasonal and multi-year biomass patterns. Estuaries and Coasts. 31: 532-541.

Garmendia, M., Bricker, S., Revilla, M., Borja, A., Franco, J., Bald, J. & Valencia, V. (2012): Eutrophication assessment in Basque Estuaries: Comparing a North American and a European method. Estuaries and Coasts 35: 991-1006.

Hamill, K.D. (2014): Kaituna River Re-diversion Project: Ongatoro/Maketū Estuary condition and potential ecological effects. Prepared for Bay of Plenty Regional Council.

Hamill, K.D. (2018): Catchment water quality and loads to Maketū Estuary and Waihī Estuary. Prepared for Bay of Plenty Regional Council by River Lake Limited. 36p.

Hauxwell, J., Cebrian, J. & Valiela, I. (2003): Eelgrass Zostera marina loss in temperate estuaries: relationship to land-derived nitrogen loads and effect of light limitation imposed by algae. Mar. Ecol. Prog. Ser. 247: 59-73.

JACOBS (2018): MT3D Nitrate Flux Modelling: Kaituna-Maketū-Pongakawa Groundwater Model Additional Scenarios. Memorandum prepared for Bay of Plenty Regional Council by Ruolin Wu & Gillian Holmes. 11p.

Van Katwijk M.M., Schmitz, G.H.W., Gasseling, A.P., van Avesaath, P.H. (1999): Effects of salinity and nutrient load and their interaction on Zostera marina. Marine Ecology Progress Series. 1999;190:155–165. doi: 10.3354/meps190155.

Lapointe, B.E., Littler, M.M. & Littler, D.S. (1992): Nutrient availability to marine macroalgae in siliciclastic versus carbonate-rich coastal waters. Estuaries 15(1): 75-82.

Latimer, J.S. & Rego, S.A. (2010): Empirical relationship between eelgrass extent and predicted watershed-derived nitrogen loading for shallow New England estuaries. Estuarine Coastal and Shelf Science 90: 231-240.

Needham, H.R. (2018): Estimating the efflux of NH4+ from intertidal sediment in Waihī and Maketū Estuaries. Report prepared for Bay of Plenty Regional Council. 9 p.

OSPAR, (2008): Second integrated report on the eutrophication status of the OSPAR maritime area. Eutrophication Series, OSPAR Commission, 107p.

Park, S.G. (2011): Sea Lettuce and Nutrient Monitoring in Tauranga Harbour 1991-2010. *Environment BOP Environmental Publication 2011/06*: 54 p.

Park, S.G. (2014): Extent of wetland vegetation in Maketū Estuary – 1939 to 2011. Bay of Plenty Regional Council *Environmental Publication 2014/05*: 54 p.

Park, S.G. (2016): Ecological health of Waihi Estuary. BOPRC internal memo, Objective ID-A2272466.

Park, S.G. (2018a): Preliminary investigation of ecological sensitivity of Waitahanui, Kaituna and Rangitāiki (Thornton) estuaries. BOPRC internal memo, Objective ID-A2908752.

Park, S.G. (2018b): State (health) of benthic ecology in Waihi and Maketu Estuaries. BOPRC internal memo, Objective ID-A2892930.

Philips R.C., Grant, W.S. & McRoy, C.P. (1983): Reproductive strategies of eelgrass (Zostera marina L.). Aquatic Botany. 16:1-20.

Ramage, D.L. & Schiel, D.R. (1998): Reproduction in the seagrass *(Zostera novzelandica)* on intertidal platforms in southern New Zealand. Marine Biology. 130: 479-489.

Rees, T.A.V. (2009): Effects of nutrients on marine algae: Eutrophication globally and in New Zealand. Report published by Leigh Marine Laboratory, University of Auckland. 42p.

Robertson , B.P. & Savage, C. (2018): Mud-entrained macroalgae utilise porewater and overlying water column nutrients to grow in a eutrophic intertidal estuary. Biogeochemistry 139: 53-68.

Robertson, B.M. & Stevens, L. (2012): Guidance Document: Nutrient Load Criteria to Limit Eutrophication in Three Typical New Zealand Estuary Types – ICOLL's, Tidal Lagoon, and Tidal River Estuaries. Report prepared by Wriggle Coastal Management for Environment Southland. 9p.

Robertson, B.M, Stevens, L., Robertson, B., Zeldis, J., Green. M., Madarasz-Smith. A., Plew. D., Storey. R., Hume. T. & Oliver. M. (2016): NZ Estuary Trophic Index Screening Tool 1. Determining eutrophication susceptibility using physical and nutrient load data. Prepared for the Envirolink Tools Project: Estuarine Trophic Index, MBIE/NIWA Contract No. C01X1420. 47 p.

Sanderson, B. & Coade, G. (2010): Scaling the potential for eutrophication and ecosystem state in lagoons. Environmental Modelling & Sofyware. 25: 724-736.

Scanes, P. (2012): Nutrient loads to protect environmental values in Waituna Lagoon. Report prepared for Environment Southland NZ. 11 pp.

Schallenberg, M. & Schallenberg, L.A. (2012): Eutrophication of coastal lagoons: a literature review. Report prepared for Environment Southland. Invercargill, New Zealand.

Schallneberg, M., Hamilton, D.P., Hicks, A.S., Robertson, H.A., Scarsbrook, M., Robertson, B., Wilson, K., Whaanga, D., Jones, H.F.E & Hamill, K. (2017): Multiple lines of evidence determine robust nutrient load limits required to safeguard a threatened lake/lagoon system. New Zealand Journal Marine & Freshwater Research 18 p.

Sfriso, A., Marcomini, A. & Pavoni, B. (1987): Relationships between macroalgal biomass and nutrient concentrations in a hypertrophic area of the Venice Lagoon. Marine Environ. Res. Pp: 297-312.

St-Laurent, P., Friedrichs, M.M., Najjar, R.G., Martins, D.K., Herrmann, M., Miller, S.K. & Wilkin, J. (2017): Impacts of Atmospheric Nitrogen Deposition on Surface Waters of the Western North Atlantic Mitigated by Multiple Feedbacks. Published 10 October 2017, https://doi.org/10.1002/2017JC013072

Tanner, C.E. & Parham, T. (2010): Growing *Zostera marina* (eelgrass) from seeds in land-based culture systems for use in restoration projects. Restoration Ecology Vol 18 (4): 527-537.

Valiela, I. & others (1992): Couplings of water sheds and coastal waters: Sources and consequences of nutrient enrichment in Waquoit Bay, Massachusetts. Estuaries, 15: 443-457.

Valiela, I., McClelland, J., Hauxwell, J., Behr, P.J., Hersh, D. & Foreman, K. (1997): Macroalgal blooms in shallow estuaries: Controls and ecophysiological and ecosystem consequences. Limnology & Oceanography, Vol 42 (5): 1105-1118.

Viaroli, P., Bartoli, M., Giordani, G., Naldi, M., Orfanidis, S. & Zalddivar, J. (2008): Community shifts, alternative stable states, biogeochemical control and feedbacks in eutrophic coastal lagoons: a brief overview. Aquatic Conservation; Marine and freshwater Ecosystems. 18: 105-117.

Zeldis, J. (2008): Exploring the Carrying Capacity of the Firth of Thames for Finfish Farming: a Nutrient Mass-balance Approach. Prepared by National Institute of Water and Atmospheric Research Limited for Environment Waikato. Environment Waikato Technical Report 2008/16. 28 pages.

Report To: Regional Direction and Delivery Committee

Meeting Date: 11 December 2018

Report From: Namouta Poutasi, General Manager, Strategy & Science

Lowland Drainage Scheme Water Quality and Ecology - Implications and Actions

Executive Summary

As part of our work to implement the National Policy Statement for Freshwater Management (Plan Change 12 process (PC12)), a new report will be published shortly that details findings of recent water quality, ecology and fish presence monitoring in several drains and canals within the Rangitāiki and Kaituna-Pongakawa-Waitahanui Water Management Areas (WMAs).

The results confirm some water quality, ecology and drain discharge issues that will need to be addressed by Bay of Plenty Regional Council (Council). There are potentially substantial implications for Council's Rivers and Drainage function and lowland land management. This will be of public interest, as these issues have been raised during engagement to date with Te Maru o Kaituna, iwi, and the Freshwater Futures Community Groups.

The PC12 process is Council's primary avenue to address cumulative effects of land use on receiving environment water quality and values in an integrated way. The process will need to consider managing contaminant generation and pathways into drains, as well as management of drainage discharges, which could be at a farm scale (e.g. good practice requirements) and at drainage scheme scale (e.g. amendments to discharge rules).

Council is also taking action now to:

- address hot spots by working with local farmers, providing advice and incentives;
- progressively address fish passage at prioritised sites in Council's drainage network;
- support innovative drain management trials on a farm.

Further monitoring of pumped drainage discharges is also being considered.

Approval is sought to discuss the matters detailed in this report during planned engagement for the PC12 process.

Recommendations

That the Regional Direction and Delivery Committee:

1 Receives the report, Lowland Drainage Scheme Water Quality and Ecology - Implications and Actions.

2 Approves the way ahead expressed in this report, that is:

a. land management offices will work with landowners to address hot spots;

b. to address drain and canal water quality issues and integrated management solutions primarily through the Plan Change 12 process; and

c. to support immediate actions that are in progress, such as, enabling fish passage at some sites, supporting drain management trials, and progressing drain discharge monitoring.

3 Approves discussion of the matters covered in this report during planned engagement for the Plan Change 12 process (Rangitāiki and Kaituna-Pongakawa Waitahanui Water Management Areas).

1 Introduction

The Science Manager will publish a new report shortly that details findings of recent water quality, ecology and fish presence monitoring in several drains and canals within the Rangitāiki and Kaituna-Pongakawa-Waitahanui Water Management Areas (WMAs). The work was carried out to address a data gap, to inform the process of setting freshwater objectives, limits and methods for these two WMAs as required by the National Policy Statement for Freshwater Management 2014 (amended 2017)(NPSFM), i.e, the Plan Change 12 process (PC12).

The results confirm some water quality, ecology and drain discharge issues that will need to be addressed by Bay of Plenty Regional Council (Council). There are potentially substantial implications for Council's Rivers and Drainage function and lowland land management. This will be of public interest as these issues have been raised during engagement to date with Te Maru o Kaituna, iwi, and the Freshwater Futures Community Groups.

This report summarises findings, highlights implications for Council, and presents a proposed way ahead. Approval is sought to discuss the findings, implications and way ahead with the public during planned engagement.

2 Background

Council has obligations to provide drainage under the Soil Conservations and Rivers Control Act 1941 and some local and national drainage acts. Drainage enables agricultural land use on the lowland Kaituna and Rangitāiki plains. Council manages the 'backbone' of some of the Region's drainage schemes (i.e. 'collector' drains and canals), while farmers manage 'feeder' drains on their properties. The Waihī Drainage Society manages the drainage network in the Waihī Estuary catchment.

Council also has obligations under the Resource Management Act 1991 including controlling discharges to land and water, and control of land use to maintain and enhance water quality and ecosystem health. Implementing the NPSFM is also a requirement.

The Region's drainage network includes *artificial watercourses* (i.e., drains) and *modified natural watercourses* (i.e. land drainage canals). This distinction is important as they are treated differently by the RMA, NPSFM and Regional Natural Resources Plan (RNRP). Discharges of water *in* to artificial watercourses, estuaries or natural watercourses are currently managed under a permitted activity rule in the Regional Natural Resources Plan. This rule requires, among other things, a no more than minor effect on aquatic life[1].

The water quality attributes, national bottom lines, and macroinvertebrate indicator in the NPSFM apply to *modified natural water courses*. Measurable objectives and indicators will be set for these during the PC12 process. PC12 also involves consideration of all contaminant sources and pressures on water bodies in the catchment the range of available methods to achieve objectives, including land use controls, discharge controls and/or works.

3 Summary of Water Quality and Ecology Results

Results expressed in the Lowland Drainage Scheme Water Quality and Ecology Report are summarised below:

- The selection of sampling sites included drains and canals defined in the Regional Natural Resources Plan (RNRP) as "artificial water courses" or "modified natural water courses".
- The sites monitored were found to have poor quality habitat reflecting the artificial/heavily modified nature of the channels, lack of bank vegetation and riparian shade.
- Water quality was poor, with high nutrient levels (ammonia in particular), high turbidity and extreme levels of dissolved oxygen (both high and low). These conditions may have implications for receiving environments into which the drains and canals discharge, including rivers, streams and estuaries.
- The ecology at sampling sites is largely consistent with the habitat and water quality conditions. Low macroinvertebrate (MCI) scores indicate poor ecological conditions and this is thought to be primarily due to the high ammonia levels.
- In some instances, water quality in *modified natural watercourses* do not meet national bottom lines (e.g., maximum ammonia concentrations) or action levels (e.g. for Macroinvertebrates).
- Despite these conditions, 18 species of fish were identified across all sites, with inanga (whitebait) and shortfinned eels present at all sites. A number of the fish species found are classified nationally as "at risk – declining" (inanga, longfin eel, redfin bully, torrent fish and giant kokopu), while lamprey are classified as "threatened - nationally vulnerable". All of these species require access to and from the sea to complete their life-cycles.

[1] Rule DW R3, page 12 RNRP

- Relatively large quantities of shortfinned eels were found at some sites, although most were of intermediate size range (250 to 450 mm in length) suggesting obstruction of fish passage for elvers (young eels).
- Monitoring at Landenberger drain discharge indicates that the operative permitted activity standards may not be met at some drain discharge locations.

4 Key Issues

The results bring the following issues to attention:

1. While *artificial water courses/drains* exist to drain water to enable agriculture, they drain contaminants sourced from land as well, and this has impacts on receiving environments that drain discharge in to (natural watercourses, estuaries and wetlands). They also inadvertently provide habitat for some indigenous species.
2. *Modified natural watercourses* were modified to drain land and manage flooding, and this has had impacts on habitat, ecological health, and indigenous species.
3. The quality of drainage scheme discharges and water quality in *modified natural watercourses* is primarily caused by land use and on-farm drain management. Council's Rivers and Drainage team collects water from farms via farm drains and discharges it in specific places (there are similarities with a Territorial Authority's stormwater discharge). While Rivers and Drainage can progress actions within their network (noting that in most instances Council does not own the land), actions to improve water quality and ecology will also need to include on farm contaminant and drain management actions.

5 The Way Ahead

Council will need to work towards:

1. improving habitat and water quality in modified natural watercourses of the network to comply with NPSFM bottom lines and thresholds, and improving fish passage;
2. addressing key source areas/hotspots; and
3. improving management of discharges from artificial watercourses into receiving environments to support objectives for these water bodies (e.g., estuaries and rivers).

The PC12 process is Council's primary avenue to address cumulative effects of land use on receiving environment water quality and values in an integrated way. This is a community issue as much as a technical issue, and is best resolved through this process. The process will need to consider managing contaminant generation and pathways in to drains, as well as management of drainage discharges, which could be at a farm scale (e.g. good practice requirements) and at drainage scheme scale (e.g. amendments to discharge rules).

While the PC12 process progresses, Council can and/or is taking immediate action as outlined in Table 1. Future implications and actions will be developed once the PC12 solution building phase is well advanced (late 2019, early 2020).

Table 1: Actions Council is undertaking now to address drain water quality, and water quality and ecology of lowland natural watercourses, and future implications

Focus	Actions now	Future implications	Who
Addressing Hot spots - high priority	Hot spots have been identified in Kaituna WMA through detailed survey work, and land management officers are focussing on working with land owners to promote change in 5 priority sub-catchments. This will include obvious 'low hanging fruit' such as moving, or managing runoff from races close to drains and stock crossings.	Identify hotspots in Rangitāiki and Whakatāne catchments and explore next steps.	Kaituna Catchment Management
Managing Cumulative Effects	Working with tangata whenua and the community through the PC12 process to consider cumulative sources and effects on water quality and identify solutions, including management of land use and drainage discharges. This will initially include the Freshwater Futures Groups and also River Scheme Advisory Groups including Waihi Drainage Society/WBOP, and the wider public.	Implementation of PC12 may include education, land use controls, requirements for on-farm drain management practices, and/or consent requirements for drainage schemes.	Water Policy/ Community Engagement/ Comms/ Reg. Services / Science / Kaituna Catchment Management / Rivers and Drainage / Māori Policy
Enabling Fish Passage	A GIS tool has been developed by the science team to help map likely areas for future intervention to enable fish passage. Replacement of the Awaiti flood gates, incorporating fish-friendly flood gates, has been completed and other sites are being investigated in Rangitāiki catchment this financial year.	Asset Management Plans may need to detail. LTP funding may need to provide for progressively implementing priority fish passage at sites identified	Science and Rivers and Drainage
Drain Management Techniques	A trial has been proposed on Te Arawa farm, to investigate best management techniques for drain management and impacts on aquatic ecology and habitat. This proposal is awaiting landowner approval.	Depending on results of the trial and PC12, Catchment Management/Rivers and Drainage may need additional resources for land, riparian and drain management activities.	Kaituna Catchment Management / Science / Rivers and Drainage
Operative Permitted Activity Rule	Further monitoring of identified drainage discharges is being considered to help to quantify the impact of current pumped drainage discharges, to confirm Permitted Activity conditions are being met, and if not what the options are.	Possible need to apply for resource consents.	Science / Regulatory Services/ Rivers and Drainage.

A risk for Council is that a number of point-source drain discharges operated by Council may not meet current permitted activity conditions, and therefore would constitute a discretionary activity and require a resource consent. In these instances, the resource consent process would be required to assess how the effects of the discharges will be avoided, remedied or mitigated. Council will review these cases and consider the most appropriate way forward to manage this risk from a regulatory point of view.

Given that long term, effective and enduring solutions will need to include land and drain management actions on privately owned land within the catchment, as well as discharge management, integrated solutions will be explored through the PC12 process. Action is also being taken to address hot spots now.

7 Implications for Māori

The issues noted in this report are of key interest to Te Maru o Kaituna, Rangitāiki River Forum and tangata whenua. By way of example, Tapuika has regularly raised concern about the quality of pumped drainage discharges, Rangitāiki River Forum has a strong focus on improving passage for tuna and other kai, and Ngāti Whakaue's new iwi management plan specifically identifies lowland freshwater quality and ecology issues.

Staff intend to discuss these issues and solutions with co-governance fora and iwi and hapū as part of the PC12 process.

8 Council's Accountability Framework

8.1 Community Outcomes

This project/proposal directly contributes to the following Community Outcomes in the council's Long Term Plan 2018-2028:

- "A healthy environment" and "freshwater for life" – working towards improving water quality and ecology of rivers and estuaries; and
- "Safe and resilient communities" and "a vibrant region" – continuing to deliver land drainage obligations that enable agricultural land use in the lowlands.

8.2 Long Term Plan Alignment

Current Budget Implications

The PC12 process is planned under the Regional Planning and Engagement activities in the Long Term Plan 2018-2028, and is required by national policy. Other actions in Table 1 are delivered under the Catchment Programme for Kaituna, and Rivers and Drainage (Flood Protection and Control) group of activities.

Monitoring of drainage network discharge water quality is not currently planned or budgeted in the Annual Plan 2018/19 or Year 1 of the Long Term Plan 2018-2028. Further monitoring of Landenberger Drain discharge can be delivered under 2019/2020 budget.

Future Budget Implications

Rivers and Drainage are not currently funded to manage for water quality and ecological values, or for potential solutions. Future LTP funding may be needed to provide for fish passage interventions (other than routine asset replacement which that incorporates fish passage), riparian management and other interventions for drains managed by Council (and resolving access/tenure issues). Depending on how cumulative effects of land use and drain discharges are managed under PC12, then consent could be required for schemes to discharge to waterways. Implications will be reported in more detail by March 2020 once PC12 and other actions in Table 1 have progressed.

Nicola Green
Senior Planner (Water Policy)

for General Manager, Strategy & Science

30 November 2018

Reports Continued

Report To: Regional Direction and Delivery Committee

Meeting Date: 11 December 2018

Report From: Stephen Lamb, Natural Resources Policy Manager

Update on the Proposed Regional Pest Management Plan

Executive Summary

This report sets out the consultation undertaken for the Proposed Regional Pest Management Plan.

One of the steps to make a Regional Pest Management Plan, as set out in the Biosecurity Act, requires Council to be satisfied with the consultation undertaken. Staff consider the consultation and engagement for the proposed Regional Pest Management Plan fulfils this legislative requirement.

Recommendations

That the Regional Direction and Delivery Committee:

1 Receives the report, Update on the Proposed Regional Pest Management Plan.

2 Is satisfied that consultation undertaken for the Proposed Regional Pest Management Plan meets the requirements of section 72 of the Biosecurity Act.

1 Purpose

The purpose of this report is to provide an update on consultation undertaken for the Proposed Regional Pest Management Plan (RPMP).

Under the Biosecurity Act, a series of chronological steps must be taken to make a Regional Pest Management Plan and those decisions must be documented. This paper fulfils section 72 of the Biosecurity Act whereby Council must be satisfied with consultation undertaken.

2 Background

Notification of the Proposed RPMP on 25 September 2018 signified the initiation of the review of our existing RPMP. Due to changes in legislation, pest spread, our understanding of pests and our ability to manage pests, the Proposed RPMP differs

substantively to the existing Plan. In particular, there are fewer pests included and different pest programmes are proposed.

A supporting document *Regional Pest Management Plan for the Bay of Plenty Region: Meeting the Biosecurity Act requirements* (also made available during consultation) contains the detail on how legislative requirements have been met in particular the requirements within sections 70 and 71 which are the first two steps required to make a RPMP. This supporting document also provides the rationale for which pests are included in the Proposed RPMP and how their pest programmes have been chosen. Essentially the management goal for each pest must be achievable, there must be enough funding to support that programme and the benefits to manage the pest must outweigh the costs[1].

The existing RPMP continues to have effect until the Proposed RPMP is finalised and replaces the existing Plan.

3 Ways we consulted with our regional community

Consultation on this Proposal has been happening since the development of the Regional Pest Management Plan: Discussion Document. The Discussion Document was used as the basis for consultation in March - April 2017 and was developed to canvas community feedback on how pests are managed in this region. Feedback was used to inform development of the Proposed RPMP.

Since the focused consultation on the Discussion Document closed, staff continued to meet with interested parties who wanted further conversations including Kiwifruit Vine Health (KVH), Regional Aquaculture Organisation, Department of Conservation, Te Uru Taumatua, Te Arawa Lakes Trust, Fish and Game, Federated Farmers and Lakes Water Quality Society.

The Proposed RPMP is the first opportunity for persons to see the full detail of proposed provisions. Some landowners and occupiers may be substantially affected by provisions in the Proposed RPMP i.e. they may be required to remove or manage pests. For this reason it was agreed full consultation was required and a comprehensive consultation and engagement plan was developed (see Appendix One). Council approved this consultation and engagement plan at its meeting on 6 September 2018.

3.1 Notification and the subsequent submission period

Public notification followed Council's established processes for Resource Management Act plans and plan changes. This included public notices in newspapers, copies made available at Council's front desks, public libraries across the region, emails and hard copy letters to those on our contact databases.

Our consultation and engagement approach encouraged persons to use the online version of the proposal. A summary was provided on the website with links to help readers navigate their way through the proposal. There was a total of 877 views - 616 views were unique (meaning they only came to the website once) and 261 people visited the page more than once. People spent an average of 4.27-5min on the page, which is above average length of time spent on page visits. Hard copies were provided to anyone who requested one and approximately 30 copies were sent out.

[1] These are Biosecurity Act requirements.

Facebook posts and advertisements were also used to help spread the word that the Proposed RPMP was out for consultation. The reach was 30,014 people which is one of our best for a plan change. From this 381 (approximately 1%) clicked through and went on to our website. The submission period for the Proposed RPMP coincided with a highly vocal anti-1080 'movement'. Staff chose not to respond to misinformation, threats and other ill-informed opinions and comments being made to Council's Facebook ads and posts.

A follow up email was sent to all those on our contact databases after notification offering to meet with staff and discuss the Proposed RPMP. Several stakeholders took up this invitation. In addition, there were a number of interactions between staff and members from the regional community both in person and over the phone.

During the consultation phase, there were two pest management initiatives organised by local groups: the Tauranga Moana Biosecurity Capital Symposium (16 October), and the Lakes Water Quality Society community workshop (27 September). Council staff were very much present and involved at these gatherings and encouraged submissions on the Proposed Regional Pest Management Plan.

The Envirohub newsletter that brings together news for community and environmental groups included an article on the Proposed RPMP and encouraged readers to get in touch with Council and submit. The circulation for this is around 1500.

4 Submissions received

52 submissions were received. Table 1 shows the breakdown of who submitted.

Table 1

Who the submissions were from	Number of submissions
Central Government representatives or those with legislative pest management responsibilities	5
Industry Groups and representatives	7
Environmental and community groups	8
Interested persons	27*
Other Councils	5
Tangata Whenua	0**

* Note 17 of these were in support of Lakes Water Quality submission

**See discussion in section 4.3

Section 72 of the Biosecurity Act sets out consultation requirements to make an RPMP (see Appendix Two). In summary, Council must be satisfied Ministers, local authorities

and persons who may be affected by the Plan along with tangata whenua have been consulted.

4.1 Ministers

All Ministers whose responsibilities may be affected by the Proposed RPMP were notified that the Proposed RPMP was out for submissions. They also received a follow up email from staff offering to meet and discuss any issues they may have.

The Ministry for Primary Industries was the only Ministry to submit. However submissions were received from government agencies and entities including Department of Conservation, Land Information New Zealand and New Zealand Transport Agency.

4.2 Local Authorities

Western Bay of Plenty District Council (WBOPDC) was the only local authority within our region to submit. WBOPDC questioned our consultation approach and found it limited. Staff followed this up with WBOPDC and it seems notification and offers to meet were not received by the person writing the submission.

Submissions (generally in support) were received from our neighbours Gisborne District Council and Waikato Regional Council. Submissions were also received from Northland Regional Council and Auckland City Council who we are working in partnership with to manage marine pests through pathway management.

4.3 Tangata Whenua

Letters were sent to all iwi authorities on our contact database at both the Discussion Document and notification phases. These letters asked recipients to extend this invitation to anyone (including hapū and corporate entities) who might be interested in giving feedback on Council's Proposed RPMP.

Two submissions were received from iwi on the Discussion Draft. After that, staff used additional forums to further engage with Māori in the lead up to notification of the Proposed RPMP.

- Paper to Komiti Maori inviting feedback on ways to consult (2 August 2018)
- E-panui (June 2018)
- Follow up meetings with Māori who have asked for ongoing conversations (Te Uru Taumatua, Te Arawa, Ngāti Ranginui, Te Arawa Lakes Trust and one individual who contacted us)

A follow up letter was sent out during the submission period offering to meet with iwi.

Examples of ongoing conversations and collaborative partnerships with iwi include our interactions with Te Uru Taumatua, Te Arawa Lakes Trust and Te Rūnanga o Ngāi Te Rangi Iwi Trust.

Unfortunately no submissions from Maori were received.

Staff consider the likely reason iwi have not submitted is due to limited capacity (for example resourcing) and timeframes that don't align with iwi/hapū meeting cycles. Meaningful engagement with iwi is a wider issue that staff continue to explore.

Since submissions have closed staff have met with CNI Iwi Holdings Ltd and provided an opportunity for representative iwi to provide a late submission. Staff also have upcoming meetings with Ngāi Te Rangi and Ngāti Ranginui and will extend the offer of a late submission to them also. Staff are working through the process of contacting submitters to discuss their submission points for reporting back the results to this Committee. During this process there is the opportunity to again offer iwi the chance to engage with the process.

4.4 Other

Staff consider the submissions received reflect a good cross section of the regional community likely to be affected by provisions in the Proposed RPMP including care groups, industry groups and interested persons.

5 What we heard

Staff are currently collating and considering submission points raised. Overall, there is a perception that Council is stepping back from its duty and managing or requiring management of fewer pests. Other key themes emerging out of submissions received include:

- Additional pests to be included in the RPMP including pathogens, plant, animal and marine pests. There was concern that pests listed in the Appendix are not subject to RPMP provisions.
- General support for marine pest rules
- Requests to include Good Neighbour and site-led rules
- Mixed support for split programmes across the region
- Requests for programme changes (in most cases submitters want pests to have a higher level of intervention or regulation)
- Woolly nightshade, ginger, pampas, wild kiwifruit and wallabies were pests of high interest
- Questions about Councils' role managing some pests that are subject to other regulations
- Additional rule to ensure boats entering lakes are clean

Councillors can review all submissions on STELLAR.

6 Staff Comment on Consultation

Good practice consultation and engagement throughout the submission period included follow up emails and letters, posts and ads on social media, staff presence at biosecurity related events and availability of staff to talk or meet with interested

persons. Staff will continue to make themselves available to anyone (whether they have submitted or not) that would like to discuss pest management issues.

Staff consider relevant Minister's, local authorities, tangata whenua and other persons have been informed and encouraged to be involved. The consultation undertaken is consistent with the scale and nature of this proposal. On this basis, staff recommend that Council should be satisfied with consultation undertaken on the Proposed RPMP.

If Council is not satisfied, it is not within this Committee's delegation to decide how further consultation should be undertaken. This decision will need to be made by full Council (section 72(5), Biosecurity Act). The Committee would however make a recommendation to Council on the basis of this report.

7 Implications for Māori

Working with Māori is an important part of any policy development process.

While no submissions were received from Māori, staff have gained insights into implications for Māori through ongoing interactions with iwi, concerns raised through Komiti Māori and reviewing iwi/hapū management plans. The end of the submission period does not signal the end of collaboration. Staff are committed to building on and furthering relationships with Māori.

The Strategic Direction within the Proposed RPMP supports Māori pest management objectives. Staff envisage a high level of interest from Māori as Council undertakes its biosecurity operational planning.

8 Next Steps

At its meeting on 6th September 2018, Council agreed next steps following the submission period:

- All submitters are contacted by staff and each submission point discussed either in person or over the phone. This also provides an opportunity to provide context and explain the Proposed RPMP
- Staff provide proposed responses to submissions and recommended amendments to the Proposed RPMP in a report to Regional Direction and Delivery Committee
- RDD considers officer report and makes recommendations to Regional Council
- Regional Council considers recommendations and adopts the RPMP
- Staff respond back to submitters on submission points.

Staff are now contacting submitters to arrange to discuss their submission points. Through this time, there is an opportunity to contact iwi again and encourage their further involvement.

Key messaging through our upcoming discussions with submitters will need to reiterate and explain Biosecurity Act requirements and limitations. For example, even if Council saw merit in trying to manage Taiwanese Cherry, it can't be included in the RPMP if there is no funding to manage it, the cost to manage it outweighs the benefit, or the programme objectives can't realistically be met.

Staff will report back to this Committee with recommendations early next year.

9 Council's Accountability Framework

9.1 Community Outcomes

This project/proposal directly contributes to the *healthy environment* community outcome in Council's Long Term Plan 2018-2028

9.2 Long Term Plan Alignment

This work is planned under the Regional Pest Management (Biosecurity) Activity in the Long Term Plan 2018-2028.

A measure to deliver effective pest management is Council maintaining a current Regional Pest Management Plan. Notification of the Proposed RPMP is part of that process. Through the Long Term Plan development process (including workshops) guidance was provided to staff on a number of generic and specific pest issues. The Long Term Plan funding and service delivery decisions are reflected in the Proposed RPMP.

Current Budget Implications

This work is being undertaken within the current budget for the Regional Pest Management activity in the Long Term Plan 2018-2028.

Future Budget Implications

Implementation of the Regional Pest Management Plan is provided for in Council's Long Term Plan 2018-2028.

Lisa Power
Senior Planner (Water Policy)

for Natural Resources Policy Manager

29 November 2018

APPENDIX 1

PRPMP Consultation and Engagement Plan

Appendix One

Consultation and Engagement Plan for the Proposed Regional Pest Management Plan

Aims of engagement (Why?)	• Everyone is informed about the purpose of an RPMP • Everyone knows they have the opportunity to submit • Everyone understands what may be required from them once the RPMP comes into effect • Everyone understands their role in pest management and how their role contributes to regional pest management • To identify community perspectives of pest management • To fulfil legislative and Treaty obligations
Stakeholders (Who)	**Engagement tools (How?)**
Crown agencies – DOC, NZTA, LINZ (those who manage land in our region)	• Letter to relevant Crown Agencies • MOUs with Crown Agencies (NZTA and DOC)
Local authorities / adjoining regional councils	• Invitation from Council to meet and discuss • Use established contacts to disseminate to Council colleagues
MPI / other ministers / National pest management working groups E.g. Central North Island Wilding Conifer Group, Top of the North	• Invitation from Council to meet and discuss • Continue to participate in collaborative working groups
Māori	• Ongoing conversations with Māori • Use Trust administrators to spread the word • Invitation to those on our Māori Contacts database to meet and discuss using preferred forum eg hui, drop-in, • Komiti Māori / E-panui
Key industries – Aquaculture NZ, Kiwifruit Vine Health, Horticulture NZ, Port of Tauranga, Federated Farmers, Dairy NZ, Beef and Lamb, Forestry industry	• Ongoing conversations with key industries • Invitation from Council to meet and discuss before and after formal notification
Rural support / Fish and Game/ Environmental Groups	• Use established groups to spread the word • Email those on our Contacts database • Staff available to discuss
The regional community including: • **Owner and occupiers** • **Recreationalists** • **Previous submitters**	• Public Notices / Media Release / Website / Social Media • Email those on our Contacts database • Summary document available • Copies of RPMP in libraries • Staff available to discuss

APPENDIX 2

Section 72 Biosecurity Act

Third step: satisfaction with consultation or requirement of more consultation

(1) If the council is satisfied of the matters in section 71, the council may take the third step in the making of a plan, which is for the council to consider whether the council is satisfied—

(a) that, if Ministers' responsibilities may be affected by the plan, the Ministers have been consulted; and

(b) that, if local authorities' responsibilities may be affected by the plan, the authorities have been consulted; and

(c) that the tangata whenua of the area who may be affected by the plan were consulted through iwi authorities and tribal runanga; and

(d) that, if consultation with other persons is appropriate, sufficient consultation has occurred.

(2) In considering whether the council is satisfied as required by subsection (1)(d), the council must have regard to the following:

(a) the scale of the impacts on persons who are likely to be affected by the plan; and

(b) whether the persons likely to be affected by the plan or their representatives have already been consulted and, if so, the nature of the consultation; and

(c) the level of support for, or opposition to, the proposal from persons who are likely to be affected by it.

(3) If the council is satisfied as required by subsection (1), the council must apply section 73.

(4) If the council is not satisfied as required by subsection (1), the council may require consultation to be undertaken on the proposal.

(5) If the council requires consultation to be undertaken, the council must determine the way or ways in which the consultation must be undertaken, including, but not limited to, ways such as—

(a) consultation with persons likely to be affected by the plan or with their representatives:

(b) the appointment by the council of 1 or more persons to carry out an independent inquiry into the proposal on terms of reference set by the council:

(c) public notification of the proposal and the receipt of submissions.

(6) After the consultation required by the council has been undertaken, the council must apply subsection (1) again.

Receives Only – No Decisions

Report To: Regional Direction and Delivery Committee

Meeting Date: 11 December 2018

Report From: Sarah Omundsen, General Manager, Regulatory Services

Mount Maunganui Industrial Area Regulatory Compliance Update

Executive Summary

This update outlines actions underway to manage contaminant discharges in the Mount Maunganui Industrial Area. There are a large number of sites in the Mount Maunganui Industrial Area that emit contaminants as part of their processes. The report covers the period from 1 July to mid-November 2018.

Regional Council continues to work with Port, business and industry managers to ensure compliance with consent conditions and permitted activities in regional plans. A number of new air quality monitoring stations have also been commissioned in the area to gain better data on the state of air quality and the levels of contaminants present.

Recommendations

That the Regional Direction and Delivery Committee:

1 Receives the report, Mount Maunganui Industrial Area Regulatory Compliance update.

1 Background and purpose of this report

The Regional Direction and Delivery Committee (RDD) have requested regular updates on actions undertaken by business operators in the Mount Maunganui Industrial Area to mitigate the effects of dust and other contaminant discharges.

This report covers the period from 1 July to mid-November 2018 and covers relevant work underway, including compliance monitoring, Science and modelling, and policy and planning.

2 Implications for Tangata Whenua

Ngāi Te Rangi iwi and affiliated hapū, particularly those with connections to Whareroa Marae are major stakeholders in the Mount Maunganui Industrial Area and activities undertaken there. Residents around Taiaho Place, people attending events in the area, and children at the marae Kohanga Reo have been affected by contaminant

discharges to air in the past. The Council have operated an air quality monitoring station at Whareroa Marae for almost 3 years, have set up regular meetings with iwi representatives and engage with marae residents if they have issues or concerns. Air quality at the marae is sampled for a wide range of contaminant parameters that may affect human health and wellbeing.

3 Update on actions and issues, July to November 2018

A number of initiatives to improve air and stormwater quality in the Mount Maunganui Industrial Area have been undertaken during the period reported on. These include:

3.1 Installation of six additional air quality monitoring stations.

Site installation and commissioning at the six new air quality monitoring locations is progressing well and almost complete. This brings the total to nine monitored sites in the Mount Maunganui Industrial Area industrial area. All monitoring stations are now installed with some locations awaiting final commissioning works.

All data types (Particulate matter 10 microns or less (PM10), Particulate matter 2.5 microns or less (PM2.5), Total Suspended Particulate (TSP), Sulphur dioxide (SO_2), Hydrogen sulphide (H_2S), Hydrogen fluoride (HF), and Meteorological) have progressively come on-line since early August.

The first continuous monitoring to investigate methyl bromide levels began in mid-November. Additional sites with the ability to investigate methyl bromide are expected to be activated by mid-December.

Delays in getting all sites operational have mainly been due to the difficulty of establishing electrical connections and meeting the expectations of landowners allowing us to site the equipment on their properties.

Live data is available in the Regional Council telemetry system and alarm levels and alerting is being set up for various parameters.

Figure 1: Locations of air quality monitoring sites in the Mount Maunganui Industrial Area.

3.2 Aerodrome Road dust issues

The building located at 101 Aerodrome Road is divided into several different units, leased to a variety of businesses. The separate units are used to store bulk stock foods prior to them being on sold to farmers. The products are varied and include palm kernel, maize, tapioca, dried distilled grains and cotton seed.

Since 2010 Regional Council compliance has received 69 service requests relating to nuisance dust at this site, 50 of these service requests have been received since July 2017. Despite an extensive response from our officers which included two air monitoring exercises by an independent third party we have been unable to confirm that an objectionable or offensive discharge has occurred on any occasion.

In February this year Toi Te Ora became aware of a case of allergic bronchitis secondary to exposure to an adverse substance which Toi Te Ora assumed to be palm kernel dust. This exposure was suspected to have occurred in the vicinity to 101 Aerodrome Road.

As a result, BOPRC have re-engaged an independent third party to repeat the air monitoring exercise although this time to expand the monitoring to incorporate levels of airborne Total Suspended Particulates (TSP) and PM10 (dust particles 10 microns and less).

Three PM10 and TSP monitors are now live, and we are supplying live data access to complainants and businesses in the direct vicinity of 101 Aerodrome Road via the cloud.

Regular meetings are held with all stakeholders including Tauranga City Council, Work Safe and Toi Te Ora.

3.3 Methyl bromide and the Genera consent

In July, Genera sought a change of consent conditions to the recapture schedule allowed for under their consent 62719. Current recapture requirements were to change by 31st October 2018. Genera sought changes to the consent conditions so recapture requirements would not become effective until April 2019 and April 2020 respectively.

The request to defer the date to achieve 60% recapture on log and timber stacks was declined. The request to defer the 100% recapture was also declined however the Council advised they would consider another request for deferral from 31 January 2019.

Genera's reporting for the months of June, July, August, September and October confirmed they achieved 100% recapture for container fumigations in accordance with the consent recapture schedule. Recapture reporting for log stacks confirmed recapture rates for July, August and September complied with the recapture schedule.

Image 1: Genera workers apply recapture technology to log stacks

A total of 10 abatement notices have been issued to Genera in response to a number of separate incidents, many that have occurred over the last 12 months. Genera appealed four abatement notices and have sought a stay on these until the appeals are resolved.

Image 2: Log stacks being fumigated at the Port of Tauranga.

Genera continue to invest in significant research and development of new recapture technology to enable them to meet their recapture targets for both container and log stack fumigations. The number of ships fumigated with methyl bromide at the Port of Tauranga continues to decrease with more ships being fumigated with phosphine in transit where the market allows. Work is also underway to explore alternative fumigants such as ethanedinitrile which may be a potential substitute for methyl bromide in the future.

Minister Parker has recently written to industry to express his concern about the use of methyl bromide, and has asked to meet to discuss options available to them given the 2020 recapture deadline is looming. The letter is attached at Appendix 1 for information.

3.4 Service request response

The Regulatory Compliance team operates a 24 hour, 7 days a week pollution response hotline for service requests from the public. During the period of reporting:

- 1132 complaints received from across the region between 1 July and 12 November 2018
- 238 of these relate directly to the Mount Maunganui Industrial Area and Port of Tauranga
- 90% of Mount Maunganui Industrial Area complaints were related to air quality
- 154 of these were odour complaints, mostly related to a single Mount location and the activity of pet food manufacturing.

4 Planning and policy

4.1 Plan Change 13 – Regional Air Plan

Hearings for the Plan Change were held on 15-17 and 25-26 October 2018. Key submissions that may impact the Mount Maunganui Industrial Area were:

- Industrial and trade premises excluded from general permitted activity rule AQ R1. This would mean these premises must apply for resource consent.
- Submitters concerned this does not allow for discharges that have no adverse effect, and that many activities which are not causing issues beyond the boundary, will need to apply for consent.
- Several submissions centred around the effects of palm kernel and stock food dust on lifestyle and health.

The Hearing process closed on 8 November 2018. The Decisions Report and version 7.0 of Plan Change 13 will be presented to the RDD Committee early in 2019.

4.2 Ministry of Transport and the MARPOL convention

The International Convention for the Prevention of Pollution from Ships (MARPOL) is the main international convention covering prevention of pollution of the marine environment by ships from operational or accidental causes. The Ministry of Transport has started public consultation on whether New Zealand should accede to Annex VI: Prevention of Air Pollution from Ships.

Currently New Zealand is has not acceded to Annex VI. The Resource Management (Marine Pollution) Regulations 1998 prevent rules relating to a discharge from the normal operations of a ship from being included in any regional coastal plan (which includes our air plan). Therefore the Regional Council is unable to regulate or enforce against discharges from ships, even when they may be contributing to breaches of the ambient air quality standards of the National Environmental Standards for Air Quality 2004.

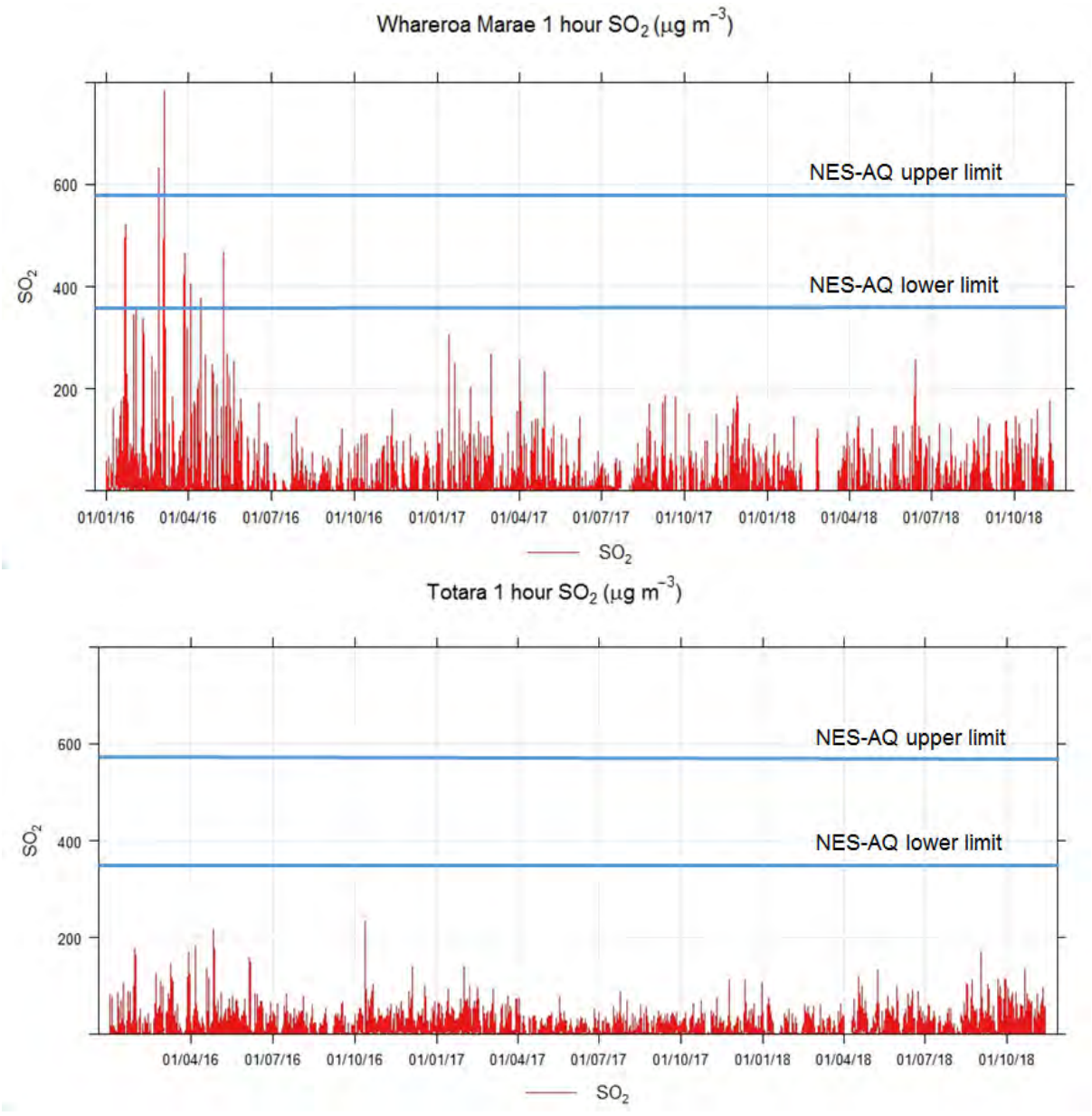
Staff are preparing a submission to the Ministry of Transport in support of New Zealand's accession to Annex VI. This submission is due on 11 February 2019.

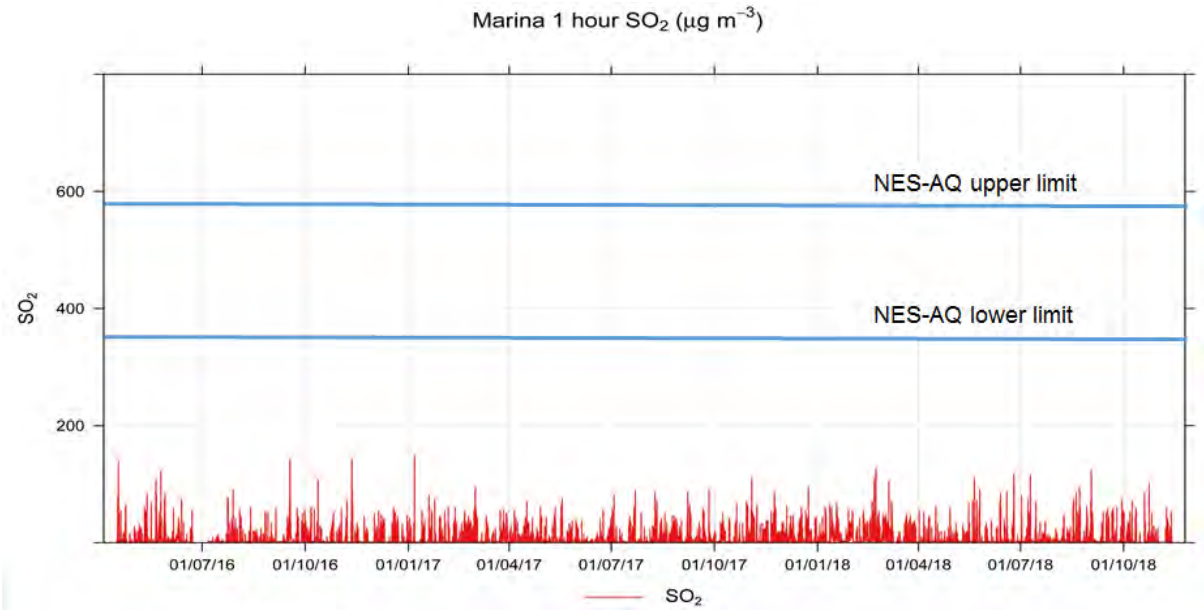
5 Science information

5.1 Air quality monitoring at key sampling locations

Sulphur Dioxide (SO_2)

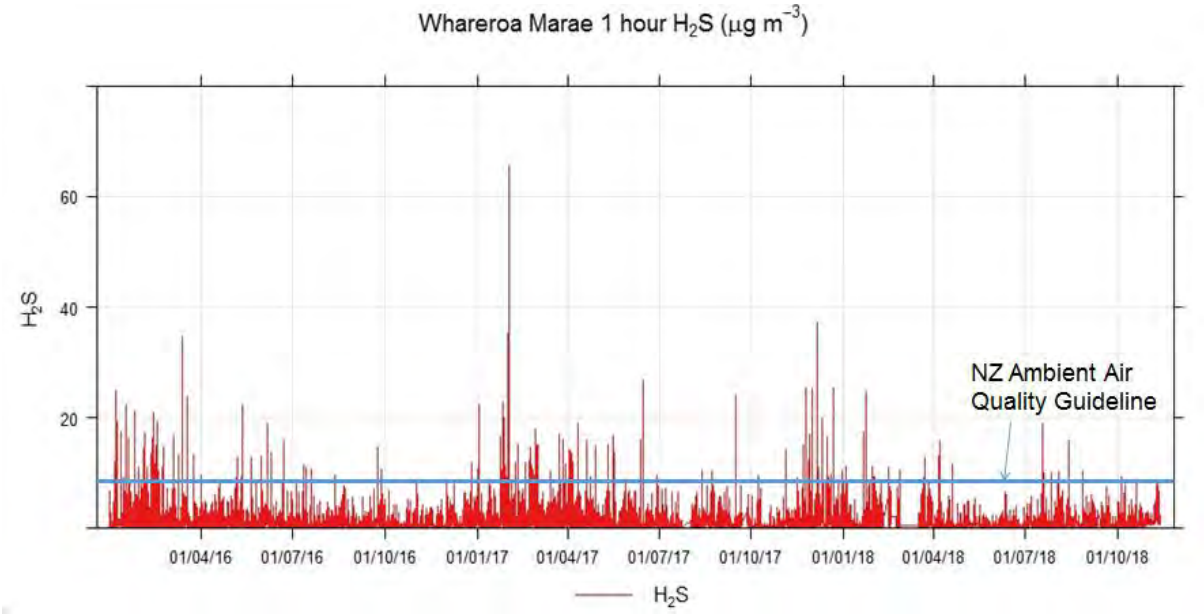
Levels of SO_2 measured at the Whareroa Marae, the Harbour Bridge Marina and Totara Street continue to be below 200μg/m^3 as a 1 hour average. This has been the pattern for the last 6 months. The New Zealand National Environmental Air Quality Standard has 2 values for this contaminant, 350μg/m^3 can be exceeded 9 times per year, and 570 μg/m^3 should not be exceeded at any time.





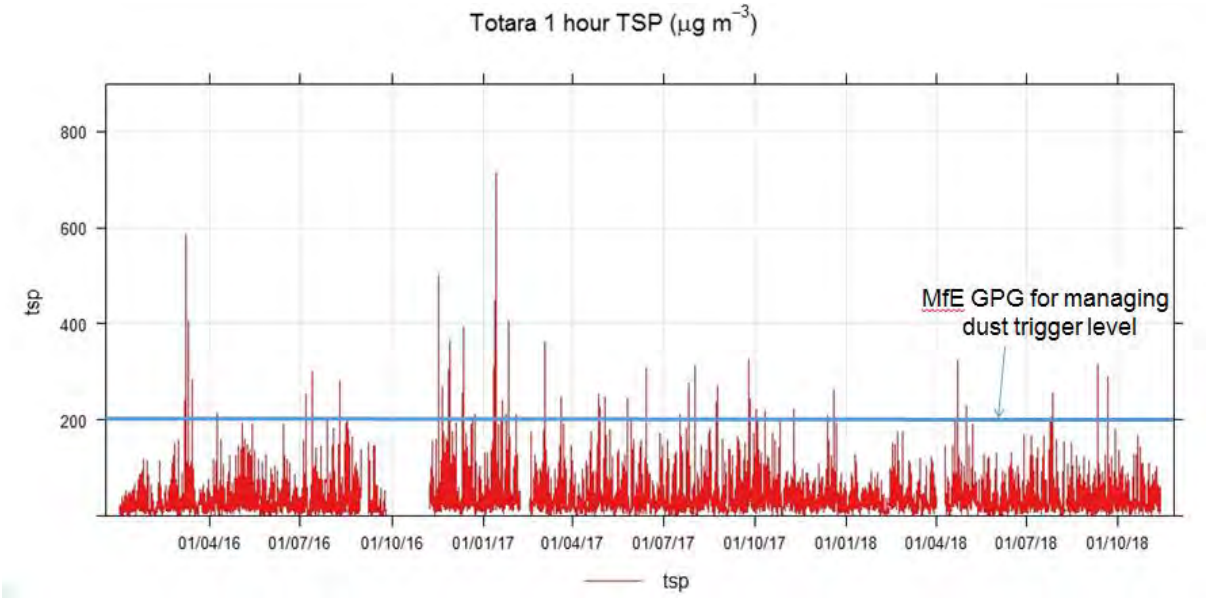
Hydrogen Sulphide (H_2S)

The New Zealand Ambient Air Quality Guideline for hydrogen sulphide is 7µg/m^3 which is based on odour nuisance in non-geothermal areas. Values have exceeded this guideline at Whareroa Marae, and approach it on a number of occasions. Natural sources often provide elevated levels as decomposition of organic matter occurs within the estuarine environment.



Total Suspended Particulate (TSP)

Total suspended particulate is measured at the Totara Street monitoring site. The MfE Good Practice Guide for Dust Management recommends values are kept below 200µg/m^3 (1 hour) for sensitive receiving environments. Data collected at the Totara Street site from the beginning of 2016 to November 2018 is shown below.



Particulate Matter less than 10 microns (PM_{10})

On 11/8/2018 Regional Council added the ability to monitor PM_{10} to the existing monitoring station at the Whareroa Marae. On the 9/11/2018 this monitor recorded an exceedance of the National Environmental Standard PM_{10} limit of 50 $\mu g/m^3$ - 57 $\mu g/m^3$. This is the first such exceedance at this monitoring station (and is regarded by the Standard as a permitted exceedance (One exceedance allowed per annum)).

Currently our science and compliance teams are investigating the source(s) of the discharge within the area and analysing the material collected by the monitor. They are also talking to surrounding industry and looking at the data from any other monitoring stations which may help us to conclude where this discharge originated.

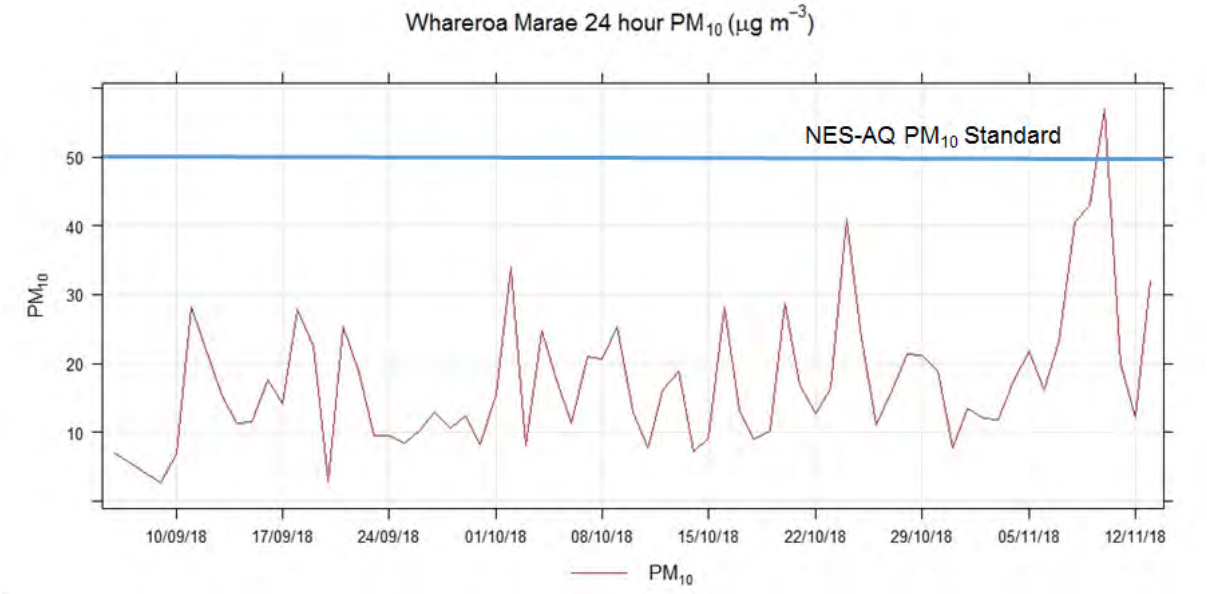
If there is another PM_{10} exceedance anywhere in the region we will be in breach of the National Environmental Standard and will be required to publically notify the exceedance and also notify the Ministry for the Environment. As per the *2011 NES Air Quality Users Guide*, should another exceedance be detected the Regional Council will need to enhance measures in the area of interest to achieve compliance with the National Standards which will include formulating a management plan to limit future discharges. Concerning PM_{10}, we are required to gather a meaningful data set over a 12 month period prior to establishing that a polluted airshed exists.

If after gathering meaningful PM_{10} data for a 12 month period a polluted airshed were declared, any significant new industrial emissions will be required to be offset, or counterbalanced by the removal of other emissions from elsewhere in the airshed. Current emitters are not affected, however any expansion of a business's emissions, or the introduction of new emissions will need to have a zero effect on air quality. In this way if the Mount Maunganui Industrial Area were to be declared a polluted airshed there will be the effect of restricting the development of new industrial emissions within the area.

Staff are currently preparing to respond, should another exceedance be recorded.

Particulate matter less than 2.5 microns ($PM_{2.5}$)

The small fraction particles known as $PM_{2.5}$ are suspected carcinogens often associated with combustion activity. These are currently being monitored at one site in Totara Street, and have been monitored for a number of years in the Rotorua airshed. They are not currently controlled by the National Environmental Standards for Air Quality. There has however been an ongoing discussion within the Ministry for the Environment that future reviews of the NES could include a $PM_{2.5}$ standard. By monitoring the levels of these emissions in the Mount Maunganui Industrial Area, the Bay of Plenty Regional Council is able to be involved in informed discussions with the Ministry when it comes to the NES review.



5.2 Modelling information

Air Quality Dispersion Modelling – Sulphur Dioxide (SO_2)

A suite of air quality dispersion modelling reports has been produced for Regional Council. These reports look at SO_2, with a particular focus on emissions from Ballance Agri Nutrients Ltd, Lawters Ltd and Waste Management Ltd, which are three operations that are located in the southern area of the Mount Maunganui industrial area.

These companies all hold air discharge consents for SO_2 emissions. These reports have been circulated to these three industries for comment and to aid in conversations around the conditions of their air discharge consents. Council staff will also use these reports to guide management of this contaminant within the wider Mount Maunganui Industrial Area.

Emission inventory

Environet Ltd has been engaged by Regional Council to undertake a 2017/18 detailed air emission inventory (this is different from the recently produced Bay of Plenty Community Carbon Footprint report which focussed on greenhouse gases) for the area defined by the Tauranga City boundary.

Contaminants include particulate matter, carbon monoxide, sulphur dioxide and oxides of nitrogen (the NES- Air Quality contaminants). Sources of interest are domestic heating, transportation and industry and most sections of the inventory are completed or nearly completed (domestic heating, motor vehicles, rail, industry, small scale activities and outdoor burning). Draft results should be available towards the end of 2018 and will be used to inform Council staff for managing and improving air quality in this part of the region.

6 Port of Tauranga update

Port of Tauranga Stormwater Consent Application update

Submissions on the application had been received from Tauranga City Council, Ngai Te Rangi and Ngati Ranginui. The Port have recently met with iwi groups and additional monitoring data is to be provided. The hearing is scheduled for the 14 and 15 February 2019.

Log Berth housekeeping

The Port has introduced new housekeeping requirements for the berths handling logs. These include measures such sweeper trucks to assist with debris accumulations, which will reduce the amount of material that may be discharged to stormwater in a rain event.

Environmental Levy

The Port is introducing an environmental levy which covers the costs associated with the clean-up from logging operations on the wharf. It is hoped that the introduction of a levy will encourage good practice and possibly encourage a move to a reduction in bark on activity.

Misting Units

Misting units have been set up on two of the larger hoppers. Bulk cargo importers have expressed concern around the use of the misters as the wetting of their products can cause issues. The Port is working through these issues with the importers to demonstrate the volume of water emitted is minimal. In addition to this, the Port is working on a project which looks at stopping smaller hoppers being used by stevedores for certain dusty cargos to minimise the risk of dust generation. The Port is continuing to work with the bulk cargo discharge stevedores to educate and audit/regulate non-conformances with the Port's Bulk Cargo Handling Procedures.

Dust Monitoring

Continual monitoring of dusty activities is being undertaken by the Port. The Port has requested they receive notifications of elevated TSP and PM10 at air quality monitoring stations located in close proximity to the Port to assist with the identification of potential sources.

7 Tauranga City Council update

Tauranga City Council is continuing to follow up on findings from their five yearly comprehensive stormwater consent monitoring report. Actions include:

- Investigative sampling has been prioritised for the Mount Industrial Catchment, with council enabling access to more of the catchments outlets for monitoring purposes.
- Initial design work on improving the effectiveness of the Portside Drive and Tukorako stormwater ponds will start soon.
- How potential stormwater treatment can be incorporated into the upgrades to Totara St as part of the new cycle way is being reviewed, focusing on the area between Triton Ave and Hull Road.
- Staff from both councils are working together to refer industrial sites for discharge consents or review applications for new consents for potential impacts on network discharges to the harbour.

8 Conclusion

Regional Council continues to work closely with all stakeholders in the Mount Maunganui Industrial Area including business and industry operators, iwi and hapū, residents and the Port of Tauranga to manage both emerging issues and the existing permitted and consented activities.

Additionally, the enhanced air quality monitoring will allow Council to build a clearer picture of air discharges, issues, and any hotspot locations around the Mount Maunganui Industrial Area.

9 Council's Accountability Framework

9.1 Community Outcomes

This project/proposal directly contributes to the Environmental Protection and Resilience and Community Outcomes in the council's Long Term Plan 2018-2028.

9.2 Long Term Plan Alignment

Current Budget Implications

This work is being undertaken within the current budget for the Regulatory Compliance Activity in the Long Term Plan 2018-2028

Future Budget Implications

Future work on regulatory compliance and air quality monitoring at the Port of Tauranga and the Mount Manganui industrial area is provided for in Council's Long Term Plan 2018-2028.

Reece Irving
Senior Regulatory Project Officer

for General Manager, Regulatory Services

30 November 2018

APPENDIX 1

Letter from Hon David Parker, Minister for the Environment - Methyl Bromide Phase-out or Recapture by 2020

Hon David Parker BCom, LLB

Attorney-General
Minister for Economic Development
Minister for the Environment
Minister for Trade and Export Growth

Associate Minister of Finance

22 NOV 2018

Don Hammond
Chair
Stakeholders in Methyl Bromide Reduction (STIMBR)

don@hrml.co.nz

Dear Don Hammond

Methyl bromide phase-out or recapture by 2020

Since New Zealand became a signatory to the 1987 Montreal Protocol, methyl bromide has been officially identified as an ozone depleting gas. Under the Protocol, New Zealand has obligations to use non-ozone-depleting technologies wherever possible. Where methyl bromide is used, the obligation is to minimise emissions through containment and recapture technologies to the extent possible.

Successive governments have sought to limit losses of methyl bromide to atmosphere to meet New Zealand's obligation under the Montreal Protocol. There are also human health concerns around its use.

Methyl bromide is used to treat imported and exported products such as logs to ensure they are free from pests and diseases. Use in New Zealand has increased from 245 tonnes in 2006 to 592 tonnes in 2016. Over 90 percent of this is used to fumigate logs.

In October 2010 methyl bromide was reassessed under the Hazardous Substances and New Organisms Act 1996, by the Environmental Risk Management Authority (now the Environmental Protection Authority). A result of this reassessment was a new control requiring all methyl bromide fumigations to use recapture technology within 10 years, i.e. by 28 October 2020 – less than two years away.

The recapture obligation effectively requires 99.9 percent of methyl bromide used to be recaptured. However, nowhere near this level of recapture is currently being achieved, and nor is it likely to be by 2020.

I am very concerned about this situation. So are my Ministerial colleagues, Forestry Minister Hon Shane Jones, Agriculture Minister Hon Damien O'Connor, and Associate Environment Minister Hon Eugenie Sage.

+64 4 817 8710 Private Bag 18041, Parliament Buildings, Wellington 6160, New Zealand d.parker@ministers.govt.nz beehive.govt.nz

While we recognise the collaborative efforts made through Stakeholders in Methyl Bromide Reduction (STIMBR), it appears that to date most companies have not been willing to invest sufficiently in effective recapture technology or infrastructure.

We want to remind you that the 2020 recapture deadline is getting ever closer. Any operator non-compliant after the deadline will be unable to operate after this date.

We would like to meet with you and other stakeholders in Wellington to discuss the options available to the industry, including investing in debarking facilities and the potential use of alternative fumigants – or if any methyl bromide continues to be used by 2020, the construction of covered recapture facilities at every log export port.

My Office will be in touch about a date for the meeting, which would take place early in the New Year. Any other options that you want to raise should be provided in writing in advance of the meeting.

I attach a list of stakeholders to whom I am addressing this letter. If you think the meeting would benefit from anyone else being present, please let me know.

Yours sincerely

Hon David Parker
Minister for the Environment
Minister for Trade and Export Growth

Attachment: list of addressees

Copied to:

Hon Damien O'Connor, Minister of Agriculture

Hon Shane Jones, Minister of Forestry

Hon Eugenie Sage, Associate Minister for the Environment

Chief Executives of regional councils

Chief Executives of port companies

List of addressees

Don Hammond
Chair, Stakeholders in Methyl Bromide Reduction
don@hrml.co.nz

Ian Gear
Executive Officer/Research Director, Stakeholders in Methyl Bromide Reduction
ian@ingearglobal.com

Peter Weir
President, New Zealand Forest Owners Association
peter.weir@ernslaw.co.nz

David Rhodes
Chief Executive, New Zealand Forest Owners Association
david.rhodes@nzfoa.org.nz

Jon Tanner
– Chair, Forest Products Export Committee
– Chief Executive, Wood Processors & Manufacturers Association of New Zealand
Jon@wpma.org.nz

Neil Cullen
President, New Zealand Farm Forestry Association
cullen@farmside.co.nz

Warren Parker
Chair, Forestry Ministerial Advisory Group
warren.parker@outlook.com

Receives Only – No Decisions

Report To: Regional Direction and Delivery Committee

Meeting Date: 11 December 2018

Report From: David Phizacklea, Regional Integrated Planning Manager

Freshwater Futures Update

Executive Summary

This report provides an update on policy work being undertaken to implement the National Policy Statement for Freshwater Management and relevant national policy direction.

Key updates since the last Committee meeting include:

- A Cabinet paper has been released for the three waters project, it provides an update on actions over the next 18 months
- The Environment Court appeal period for proposed Plan Change 9 closed on 21 November 2018 with 14 appeals received
- Key technical work is being delivered for Plan Change 12 (Rangitāiki and Kaituna-Pongakawa-Waitahanui Water Management Areas) with policy options and discussion documents being prepared over the next few months;
- Te Maru o Kaituna River Authority are progressing development of a Kaituna River Action Plan which is expected to be completed by July 2019, it will comprise priority projects to contribute to meeting the objectives of the river document;
- Central government intends to release a draft Essential Freshwater Package for consultation in April 2019; this will include proposed amendments to the National Policy Statement for Freshwater Management and a proposed National Environmental Standard, including actions for identified pilot At Risk Catchments.

Recommendations

That the Regional Direction and Delivery Committee:

1 Receives the report, Freshwater Futures Update.

1 Purpose

This report provides an update on work underway to improve management of freshwater resources in the Bay of Plenty region. It also provides an update on freshwater policy matters at a national level.

2 National Updates

At a national level there are key activities underway that may impact Council's freshwater work programme for the Bay of Plenty.

2.1 Three Waters Review: Update

Government has released a Cabinet paper on 22 November 2018 on the 'Future state of the three waters systems: regulation and service delivery.' The paper reaffirms that there are system wide challenges facing the three waters and that a system wide response is required.

The paper proposes a staged approach over the next 18 months to identify and resolve the issues related to the three waters system and introduce legislation in 2020. An overview of each stage is provided below:

June 2019

The Minister of Local Government, Health and Environment will report back to Cabinet with detailed policy proposal covering:

- Drinking water: system wide reform of regulation and a new risk management regime
- Wastewater: targeted change to environmental regulation and lifting performance within the existing framework of the RMA
- Wastewater and stormwater: measures to achieve greater transparency to the operations of these systems and promote better practice.
- Regulatory institutional arrangements: the regulatory bodies that would give effect to the above reforms and provide oversight and stewardship arrangements.

The scope of the June policy paper is included as Appendix 1.

The paper confirms that no decisions on service delivery are able to be made until after the June 2019 decisions on regulation have been confirmed. The paper identifies three options for service delivery that may provide the best fit, and will be further investigated and released for engagement.

These are:

- *Proceed with regulatory reform only, with voluntary sector- led reforms for service delivery:* This approach reflects the majority view from elected local government officials and Local Government New Zealand that any reform should be a local government decision
- *Establish a three waters fund to support voluntary service delivery improvements:* This approach involves the creation of a national, long-term fund, as a mechanism for supporting improvements to current service delivery arrangements and/or incentivising voluntary changes (the approach described above). Revenue sources for such a fund are yet to be determined.
- *Create aggregated systems of dedicated, public owned drinking water and wastewater providers.* This approach would involve the creation of statutory, aggregated, self-funding water utilities

Late 2019

The Minister of Commerce and Consumer Affairs, and Minister of Local Government will report back to cabinet with policy proposals for the economic regulation of the three water services.

Ministers of Local Government, Health, Environment and Commercial and Consumer Affairs will report to cabinet on proposals to improve oversight and stewardship across the three waters system.

Outcomes

A number of outcomes have been identified with this guiding the process over the next 18 months. These include:

- Existing three water assets will remain in public ownership
- There is a need for a sustainable three water systems that operates in the long-term interests of consumers, communities, tangata whenua and NZ
- Drinking water needs to be safe, reliable and acceptable
- Environmental performance needs to realise the aspirations of communities
- A need for effective, efficient, accountable, resilient and transparent three waters services
- Regulatory stewardship and systems need to be fit for purpose.

Engagement

The paper provides an overview of engagement and feedback received to date. In particular it recognises that there is support for a significant reform of the drinking water regulation with this being the priority. This aligns with the recent position of LGNZ which recommends as a first principle that drinking water should be fixed first.

Feedback received on service provision have been mixed with views split on the need for change, the need for aggregation and that government should focus on regulation and leave the service delivery to be addressed by local authorities.

The paper confirms that engagement with stakeholders will continue and will be considered as part of policy development.

Implications on Council work

As part of the Regional Components process the package related to drinking water has already been pushed out to be notified after PC12 alongside either PC15 or earlier plan change. This approach aligns with the timeframe proposed by the cabinet paper. This avoids any implications for current planning processes.

No further implications will be known until decisions are made in June 2019.

2.2 Central Government's direction on Fresh water

The Government's blueprint for fresh water, *Essential Freshwater: Healthy Water, Fairly Allocated,* was released Monday 8 October 2018 outlining the key actions government will be taking in the freshwater space over the next two years. An overview of this was provided at the previous RDD meeting held in October.

A draft Freshwater Package is intended to be released for consultation in April 2019, this will include proposed amendments to the NPS-FM and a proposed National Environmental Standard for Freshwater Management (NES-FM). This will include

proposed actions for At Risk Catchments identified by the Ministry for the Environment (MfE).

2.3 At Risk Catchments

Council staff attended the Ministry for the Environment 'At Risk Catchments' workshop in Wellington the 14 and 15 November 2018. The workshop was attended by regional and unitary councils, some iwi groups, non-governmental organisations and central government.

The intent of the workshop was to identify a priority list of 'pilot' catchments to focus Government efforts to halt declining water quality. The workshop attendees were unable to confirm a list of 20 catchments as requested due to lack of information available on the extent of issues within each catchment and whether any additional investment from MfE would add additional value.

In total 28 catchments across New Zealand were identified on the proviso that these would be sent back to each Regional Council and stakeholder involved in the process to confirm if they should be included, or not. This process would then identify the 20 At Risk Catchments for MfE.

2.4 Urban Water Management Principles Recommended to Government

The independent Urban Water Working Group convened by MfE recommended a set of principles for urban water management to the Government in September (refer Appendix 2).

On 1 November 2018, Hon Nanaia Mahuta delivered a press release acknowledging and welcoming the principles. While these principles are not government policy, the Minister has encouraged industry and councils to consider them when planning and developing urban spaces.

The principles are not government policy but may inform future policy. The working group is now contributing advice on practices to support the principles, national policy options, and national outreach options. There are no implications for Council at this stage.

3 Plans and Plan Changes

Council is actively working on several freshwater plan changes to the operative Regional Natural Resources Plan. Updates are provided below.

3.1 Staged Implementation of the National Policy Statement for Freshwater Management

A separate report to this Committee presents progress against the publicly notified staged implementation of the NPS-FM in this region, and seeks to formalise previously agreed amendments to that timeline, as required by the NPS-FM.

3.2 Region-wide Water Quantity - Proposed Plan Change 9

Council's decisions on Proposed Plan Change 9 were notified on 9 October 2018 and the appeal period closed on 21 November 2018. Fourteen appeals were received and parties have until 11 December 2018 to file any section 274 notices to join those appeals. A separate report advising on the appeals is provided to the Committee.

Preparations for implementation are well underway, subject to working within the scope of the appeals now received. Priority areas include finalising Council metering requirement documentation, completion of the web based registration for permitted activity water takes and processes for Controlled Activities. The special Controlled Activity rules for existing unauthorised dairy shed water takes and previously permitted water takes are only available for 12 months. Staff are working closely with the dairy industry, including running on farm water use sessions to find effective and innovative solutions.

3.3 Kaituna/Pongakawa/Waitahanui and Rangitāiki Water Management Areas - Plan Change 12

The purpose of this work is to deliver freshwater objectives based on freshwater values and to set appropriate water quality and quantity limits and methods to support those objectives by way of a change to the Regional Natural Resources Plan (RNRP).

Two key technical reports have recently been delivered. One estimates maximum contaminant load limits required to support values and objectives for Waihī and Maketū estuaries. The other reports the results of water quality, ecology and fish passage monitoring in the lowland drainage network of the Rangitāiki and Kaituna Plains. These have significant implications for Plan Change 12 and future management of land and fresh water, particularly in the catchments of Waihī and Maketū estuaries. For this reason, they are each addressed by separate agenda reports to this Committee meeting.

Some key technical work is still in progress, and is needed to inform our understanding of issues and options. Staff aim to see this completed by the end of December 2018, although this is subject to delivery by external consultants. This work includes:

- finalising review of the SOURCE surface water catchment modelling report, including industry organisation and expert peer review;
- assessment and reporting on nutrient status of hydro-electric power dam Lake Matahina;
- receiving and assessing groundwater modelling reports for Kaituna-Pongakawa-Waitahanui Water Management Area (WMA).
- developing and modelling mitigation scenarios for surface water quality;
- finalising the methodology for identifying and assessing minimum flow and allocation limit options for surface water.

Engagement with iwi and hapū is ongoing.

Staff are also now starting to develop policy options papers and discussion documents to discuss with Regional Council elected members, co-governance forums, iwi, community groups and stakeholders in 2019. This requires consideration of all technical, policy and engagement information. The first is likely to be for groundwater management in the Rangitāiki WMA, and others will follow as the technical information is finalised. For the Kaituna-Pongakawa-Waitahanui WMA, investigation into appropriate water quality targets and methods is likely to be more complex than for Rangitāiki.

The timeline for Plan Change 12 is shown below in Figure 1.

Figure 1: Current timeline for Plan Change 12 planning process.

4 Co-Governance Forum Updates

In addition to the statutory changes noted above there is also co-governance work underway with Te Maru o Kaituna River Authority (TMoK) and the Rangitāiki River Forum. Both forums have continued to receive regular updates on the Freshwater Futures programme undertaken by Council. Council will continue to seek their advice/feedback as to whether/how our work aligns with the objectives of their river documents.

4.1 Te Maru o Kaituna River Authority update

At its last meeting, the Regional Direction & Delivery Committee endorsed progressing Proposed Change 5 to the Bay of Plenty Regional Policy Statement in tandem with the freshwater plan change to the Bay of Plenty Regional Natural Resources Plan for the Kaituna-Pongakawa-Waitahanui and Rangitāiki Water Management Areas (Plan Change 12). This will ensure alignment of these two Resource Management Act processes. TMoK was presented with an overview of the Change 5 timing and process and noted it will be involved as a key partner in the Proposed Change 5 process.

TMoK is progressing development of a Kaituna River Action Plan which is expected to be completed by July 2019. It will comprise priority projects to contribute to meeting the objectives of the river document. TMoK is holding a water workshop at its next meeting on 14 December 2018 to update and involve members at a governance level of the technical work being undertaken in the freshwater and coastal water space for the Kaituna catchment and Maketū Estuary to date.

4.2 Rangitāiki River Forum update

The Forum received a presentation from Tina Porou on Te Mana o Te Wai in the Forum workshop on 14 September 2018. The next Rangitāiki River Forum meeting is scheduled for 7 December 2018.

5 Additional projects supporting the management of our Freshwater resources

There are a number of additional projects underway across Council to improve the management of freshwater in the region. This includes investment in modelling and

accounting, additional science monitoring, and increasing our communication to the public. An update is provided below on our progress.

5.1 Regional Growth Study – Freshwater-related Opportunities and Barriers to Sustainable Economic Growth

The purpose of this project is to assess the potential for irrigation expansion across most of the region. It is based on Plan Change 9 default allocation limits, the latest assessments of freshwater availability, the amount of available irrigable land and projections of land use change and increase in water demand. The study is therefore subject to the same limitations and uncertainties as those applicable to this underlying information. Although the focus is freshwater quantity, the project also identified other barriers and opportunities to land or freshwater-based economic growth. Although not directly related to current planning processes, it is expected that the output of this project will provide relevant information for those processes.

This project stems from the Regional Growth Study's freshwater work stream. The Growth Study identified fresh water as a key enabler of economic growth in the region. The Council received funding from the Ministry for Primary Industries Irrigation Acceleration Fund, and subsequently contracted Aqualinc Research, to complete this work.

Six tangata whenua and stakeholder workshops were carried out to receive feedback on Aqualinc's initial analysis and to discuss other opportunities and barriers to economic growth, covering the following areas:

- Waioeka/Otara WMA - Ōpōtiki, 6 June 2018
- Wairoa catchment - Tauranga, 7 June 2018
- Tarawera WMA - Kawerau, 12 September 2018
- Whakatāne/Tauranga and Ōhiwa/Waiōtahe WMAs - Whakatāne, 13 September 2018
- Rangitāiki WMA - Whakatāne, 23 October 2018 – with the Rangitāiki Freshwater Futures Community Group
- Kaituna-Pongakawa-Waitahanui WMA - Pongakawa, 25 October 2018 – with the Kaituna/Maketū and Pongakawa/Waitahanui Freshwater Futures Community Groups.

The key findings of the study are that the projected growth in irrigation (both horticulture and dairy) can generally be provided for in all the areas assessed with available fresh water (either surface or groundwater), if all consented irrigation and frost protection is based on reasonable use. There currently are a large number of water take consents, particularly older resource consents, which enable users to take more water than what is reasonable for the intended use. It would appear that constraints other than freshwater availability (e.g. wiling and skilled labour, infrastructure, access to capital, constraints on the use of Māori-owned land, lack of knowledge and information, etc.) are generally more significant.

Aqualinc also made estimations about the economic and employment impact of this irrigation expansion and, in the absence of water quality limits for most of the region,

they also estimated changes in nitrogen and phosphorus losses as a result of the projected land use change, as possible indicators of environmental impact.

Council staff are currently reviewing an initial draft of this work and, once completed, will brief the Committee and present the results in more detail in the new year.

5.2 Communications

Communications business as usual continues, including promotion and resource development to support Council's Hands on Water Expo, Kaituna River re-diversion and Plan Change 9 implementation work.

The next edition of the Freshwater Flash e-newsletter is due out in early December. Proactive and reactive media work in the coming months is expected to focus on Plan Change 9 implementation and appeals, along with swimming water monitoring/LAWA and any associated health warnings and catchment management work.

6 Advice

We continue to seek advice on Council's Freshwater Futures programme, through the Regional Water Advisory Panel and Territorial Local Authority Freshwater Collaboration Group. A summary of those recent meetings is captured below.

6.1 Regional Water Advisory Panel (RWAP)

The next Regional Water Advisory Panel meeting will be held in February 2019 when members will be asked to feed back on the key technical reports that will have been presented to the Rangitāiki and Kaituna-Pongakawa-Waitahanui community group members. The minutes of the last meeting held in August 2018 are attached (Appendix 3).

6.2 Territorial Local Authority Freshwater Collaboration Group

The last Territorial Authority Freshwater Collaboration Group meeting was held on 17 October 2018 (draft minutes attached in Appendix 4).

Topics discussed include the national Essential Freshwater programme and 3 Waters review, storm water and wastewater network discharge consent progress and compliance, Plan Change 9 and 12 updates. This continues to be a useful forum for sharing information and seeking opportunities for alignment.

7 Implications for Māori

It is recognised that Māori involvement in planning and delivery of improved water management is integral to their role as kaitiaki and necessary to achieve requirements of the National Policy Statement for Freshwater Management.

For the Rangitāiki and Kaituna-Pongakawa-Waitahanui WMAs, opportunities for Māori involvement in engagement on freshwater discussions will continue to be provided.

The Rangitāiki and Kaituna Rivers and their tributaries are culturally significant to iwi. Change 3 to the Regional Policy Statement recognises and provides for the Te Ara Whānui o Rangitāiki – Pathways the Rangitāiki River Document. Proposed Change 5 (Kaituna River) to the RPS will be progressed to recognise and provide for the vision, objectives and desired outcomes of Kaituna, he taonga tuku iho – the Kaituna River

Document. Plan Change 12 to the Regional Natural Resources Plan will recognise and provide for both river documents. These regional changes will further enable the aspirations of the Rangitāiki River Forum and Te Maru o Kaituna River Authority to be realised over time.

For the Tauranga Moana WMA, Ngāi Te Rangi and Ngāti Ranginui are proposing to develop a Wai Māori Strategy to inform their participation in the Plan Change 16 limit-setting process.

8 Council's Accountability Framework

8.1 Community Outcomes

Council's Freshwater Futures work directly contributes to the 'Freshwater for Life' community outcome in Long Term Plan 2018-2028.

8.2 Long Term Plan Alignment

This work is planned under various activities within the Long Term Plan 2018-2028, including the Integrated Catchment Management, Regional Planning and Engagement, Regional Development, Technical Services and Corporate Services groups of activities.

8.3 Current Budget Implications

Council's Freshwater Futures work is being undertaken within the current budget for the activities in Year 1 of the Long Term Plan 2018-2028.

8.4 Future Budget Implications

Future work is provided for in Council's Long Term Plan 2018-2028.

Any additional work for Bay of Plenty Regional Council resulting from national direction will need to be considered as to future budget implications.

Rebecca Burton
Freshwater Team Leader

for Regional Integrated Planning Manager

30 November 2018

APPENDIX 1

Proposed Scope of June 2019 Three Waters Cabinet Paper

Proposed scope of June 2019 Cabinet paper(s)

Components of a more effective approach to ensuring drinking water safety
Work in this area will include the components of a new drinking water regulatory system, including: 62.1 the purpose and intended outcomes for drinking water regulation;

- the scope of drinking water regulation;
- the roles, functions, duties and responsibilities of organisations and persons for ensuring drinking water safety, including the establishment of a dedicated drinking water regulator;
- how the regulator will work to achieve compliance with regulatory objectives and duties, including: 62.4.1 how drinking water standards and other regulatory requirements will be set, maintained, and promoted;
- how risks to drinking water safety will be assessed and managed;
- how drinking water suppliers will be encouraged and supported to meet regulatory requirements; and
- compliance, monitoring and enforcement arrangements;
- how information about the performance of drinking water suppliers and their compliance with regulatory duties will be reported, to provide improved transparency and assurance to the public of the safety of drinking water;
- how the regulator will interface with statutory public health protection functions, including those undertaken by the Director-General of Health, Director of Public Health, Ministry of Health, medical officers of health, and health protection officers (including public health surveillance, investigation and response).
- Managing risks to drinking water sources

Work in this area will comprise a new risk management regime for drinking water sources that is effectively integrated with the other components of the drinking water regulatory system, including the drinking water standards. Key components will include:

- the purpose and intended outcome of the new regime;
- how risks to drinking water sources will be assessed and managed;
- roles, functions and responsibilities of organisations and persons in identifying and managing risks to drinking water sources;
- the interface with regional planning and regulation of land use under the Resource Management Act 1991.
- Environmental regulation of wastewater and stormwater

Work in this area will comprise targeted reform of environmental regulation of wastewater, aimed at lifting environmental performance within the existing framework of the Resource Management Act 1991. It will also include measures to give greater transparency around the operation of wastewater and stormwater systems, and to promote better practice. These proposals could comprise the following elements:

- national-level environmental performance requirements for wastewater networks. Such requirements could include minimum standards for discharges from wastewater treatment plants, and targets for wastewater overflows;
- good practice guidelines to promote the uptake of water-sensitive urban design in stormwater networks, and for the recovery and re-use of biosolids produced by wastewater treatment plants;
- transparent public information about the environmental performance of wastewater and stormwater networks, and their compliance with regulatory requirements;
- improved compliance, monitoring and enforcement arrangements for wastewater and stormwater services, including for consent holders that rely on section 124 of the Resource Management Act 1991 (which enables resource consent holders to continue operating on expired consents). A focus of this workstream will be to explore links with the Compliance Oversight Unit for the Resource Management Act 1991.

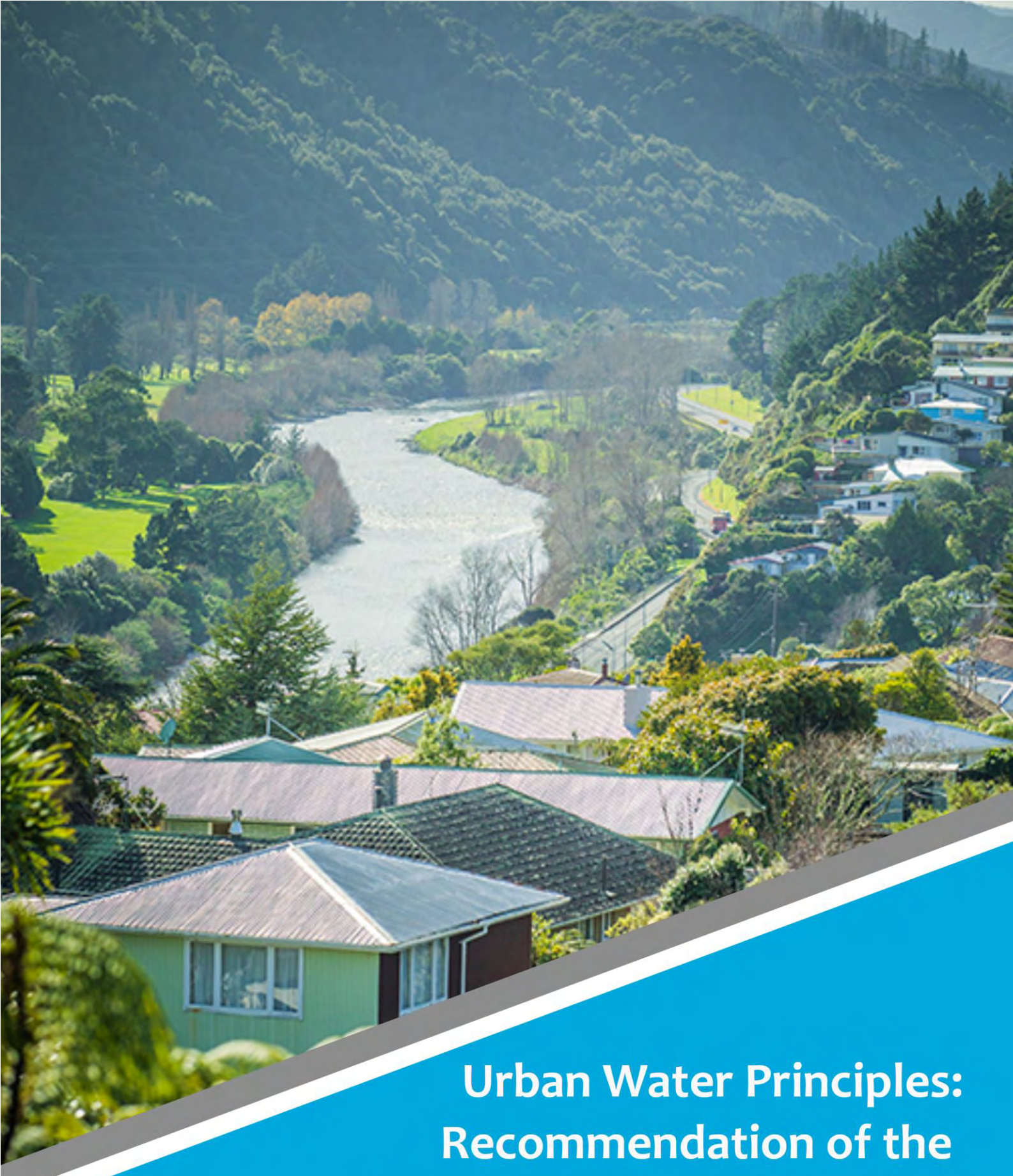
65. Officials' advice will include sequencing and prioritisation of proposed functions, and their relationship to broader regulatory arrangements.

Institutional arrangements, oversight and stewardship for drinking water and environmental regulation
Work in this area will consider the institutional arrangements, and oversight and stewardship needed to support and enable the drinking water and environmental regulatory reforms arising from the work described above. This will include:

- options for the establishment of regulatory functions and the associated institutional arrangements, including the potential for co-location of environmental and drinking water regulatory functions;
- advice on the resources needed to provide for the proposed regulatory and other interventions, and how these could be funded;
- advice on oversight and stewardship arrangements for drinking water and environmental regulation.

APPENDIX 2

Urban Water Principles Recommended to Government by the Urban Water Working Group



Urban Water Principles: Recommendation of the Urban Water Working Group

Phase I Report

Disclaimer

This report documents the initial work of the Urban Water Working Group – an independent collaborative body comprising urban water practitioners and technical experts convened by the Ministry for the Environment. This report illustrates the process, initial findings and recommendation of the Group. It does not reflect the official position of the Ministry for the Environment and is not a Government policy.

Acknowledgements

The Ministry for the Environment acknowledges the input of all the members of the Urban Water Working Group who have volunteered their time, expertise and mātauranga to this project to date. It is estimated that participants collectively provided over one-thousand hours of work toward Phase I of the collaborative process.

Contributors to this process included Sam Archer, Mark Bishop, Troy Brockbank, Clint Cantrell, Crystal Chan, Charlotte Cudby, Kara Dentice, Paul Dickson, Stu Farrant, Ulrich Glasner, Nicki Green, David Greig, Michael Hannah, Jan Heijs, Claudia Hellberg, Katja Huls, Justine Jones, Rebecca Kiddle, Allan Leahy, Alastair Lovell, Jo Martin, Carl McGuinness, Stewart McKenzie, Sam Miles, Neil Miller, Jonathan Moores, Onur Oktem, Alistair Patrick, Craig Pauling, Andrea Phillips, Tom Porter, James Reddish, Marjorie van Roon, Philip Shackleton, Helen Shaw, Peter Silcock, Robyn Simcock, Kalley Simpson, Tim Strang, Gina Sweetman, Lucy Tukua, Paula Vincent, Yvonne Weeber, Jade Wikaira, Nicci Wood, and Clare Wooding.

Officials from the Ministry for the Environment also provided administrative support and facilitation as the secretariat for the Group.

This document may be cited as: *Urban Water Principles: Recommendation of the Urban Water Working Group.* 2018. Wellington: Ministry for the Environment.

Published in October 2018 by the
Urban Water Working Group

This document is available on the Ministry for the Environment website: www.mfe.govt.nz.

Contents

Introduction

In 2017, the Ministry for the Environment (the Ministry) convened the Urban Water Working Group (the Group), a collaborative body comprising practitioners and technical experts working in the field of urban water management. The Group developed 10 'urban water principles', to protect and restore Te Mana o Te Wai[1] in urban contexts. The urban water principles are high-level principles and values, intended to inform urban water policy and planning decisions, infrastructure design choices, and other activities related to urban water outcomes. Overall these principles are intended to help inform a national vision, promote alignment in government and industry, and prompt action to support the achievement of local and national objectives for urban water.

This report includes:

- a summary of the work of the Group in developing the urban water principles (Phase I)
- the urban water principles agreed by the Group in September 2018
- the proposed forward agenda for the group in 2019.

The Ministry acknowledges the time and commitment of the Group in the development of the urban water principles.

[1] Te Mana o Te Wai, described in the National Policy Statement for Freshwater Management, refers to 'the integrated and holistic well-being of the water.'

Urban Water Working Group – Phase I

Background

In late 2017, the Ministry convened the Group to assess existing problems related to urban water and to inform the development of 'Good Management Principles and Practices' for improving urban water management.

The Group comprised approximately 45 practitioners working in local government, the Three Waters sector, and the wider urban development and design sectors. These individuals were nominated by their peers (or self-nominated) for their relevant experience and knowledge, including mātauranga and te ao Māori. Working group members volunteered their time, and served in their personal thought-leadership capacities, rather than representing any of their affiliated organisations.

The Group worked through four plenary sessions and additional sub-group meetings over 2017-2018 to analyse and define existing problems related to urban water and propose solutions. The Group ultimately produced a set of urban water principles, which encapsulate *their* proposed vision for improving urban water management approaches in New Zealand.

Why develop national principles?

Urban water problems

At present the design, management and use of urban areas in New Zealand is having adverse effects on water ecosystems and resources, and people's relationships with them. Some of these effects are significant and long-term, including impacts on human health (physical and cultural), liveability, climate resilience, the economy, and the health of downstream environments.

These issues are largely related to urban land use and infrastructure planning and design. The infrastructure of cities and towns is central to the urban water system. It influences how Māori and communities take and use water, discharge into it, modify or channel it, change land use over time and exercise kaitiakitanga and stewardship.

The major pressures on urban freshwater and coastal water bodies include sediments, nutrients, pathogens, metals, oils, heat and gross pollutants (such as litter). Urbanised catchments are also characterised by flashy flows (impervious surfaces such as roofs and pavement create extreme high flows during rain events, with periods of very low flows in-between). Other issues include modified or channelised stream beds, barriers to fish passage, and low biodiversity dominated by tolerant weed or pest species. These additional

pressures, commonly referred to as symptoms of 'urban stream syndrome', need to be addressed to provide for ecosystem health and other community values related to liveability.

Altered stream channels and piping can in some cases have counter-productive effects on urban resilience when piped networks and flow channels reach design capacity and overflow. This can cause damage to property, and in some extreme cases, pose a threat to human life.

For urban Māori and the community at large, these issues decrease their social and cultural well-being. For kaitiaki and others who see themselves as custodians and environmentalists, these impacts can be spiritually devastating. The loss of urban water bodies to piping/drainage can also reduce the sense of place that people have with an area. Impacts on urban water bodies often go hand in hand with reducing or degrading areas people use (eg, for recreation, mahinga kai). This can have negative impacts on the well-being of urban residents and visitors.

An opportunity to inspire and align action

Each of these problems partially stem from the poor alignment of a complex web of decision-makers toward positive environmental outcomes. Many have a role to play in protecting urban waterbodies, including policy makers, regional and urban planners, three waters and transport infrastructure service providers, resource and building consent officers, property developers and their consultants – architects, engineers and contractors, and urban businesses and residents.

After working with the Ministry to clarify and substantiate the problems described above, the Group developed a vision and related principles to drive better outcomes at various levels. The development of this vision is timely as it may serve as a useful starting point to illustrate ways to maintain or improve ecosystem health while also meeting the significant demand for urban growth in New Zealand.

> The purpose of the urban water principles is to guide decision-making that promotes sustainable behaviours and the creation of water sensitive urban spaces by drawing on mātauranga, the lessons of the past, international best practice, the needs of our present communities, and a vision of a sustainable, resilient future.

Having such a comprehensive set of high-level principles can also help to frame the specific practices that can be undertaken at different scales and by people in different roles, and could guide many Government policy processes to achieve positive outcomes for urban water.

Approach and criteria for developing principles

The development of the urban water principles was an iterative process, during which the concepts were brainstormed, adjusted and refined using 'sprint' methods[2]. The Group initially canvassed existing examples of principles and practices from other parts of the world and built on these concepts to create a vision relevant to Aotearoa New Zealand.

The Group also explored the challenges in providing for community values through integrated planning and urban design, identified priority pressures on urban waterbodies, explored the efficacy of existing policy and economic incentives at a high level, and identified some monitoring and capability gaps which currently hinder practitioners in applying best practice. This background work helped the Group conceptualise the content of these principles and has been provided separately to the Ministry to inform ongoing policy work.

The Group set out the following criteria for developing the principles referred to throughout the drafting process. They should:

1. be simple, concise statements that use the language of the community (both Māori and non-Māori)
2. clearly direct action at a high level that will lead toward the objectives and outcomes sought for receiving environments (rather than being simply statements of issues or objectives)
3. set the scene for more specific good management practices
4. be general enough to apply to everyone
5. be able to be demonstrably monitored/measured
6. be realistic and able to be adaptively/progressively applied by communities
7. support building an informed community that is able to participate and contribute in decision-making.

After considerable discussion and testing against these criteria, the following version of the principles was agreed by the Group on 13 September 2018.

[2] 'Sprint' methods require participants to prototype, test and refine their ideas in a collaborative environment over short, defined periods of time.

Group agreement on a set of national principles

Excerpt: Minutes of Urban Water Working Group Workshop (13 September 2018)

Present
Mark Bishop, Troy Brockbank, Kara Dentice, Stu Farrant, Ulrich Glasner, Nicola Green, David Grieg, Claudia Hellburg, Justine Jones, Jo Martin, Stewart McKenzie, Jonathan Moores, Onur Oktem, Andrea Phillips, Tom Porter, James Reddish, Phillip Shackleton, Helen Shaw, Kalley Simpson, Paula Vincent, Nicci Wood, Tui Arona*, Lucy Bolton*, Sarah Boone*, Dianna Caird*, Stephen Fragaszy*, Andrew McCauley*.

Apologies
Jan Heijs, Paul Dickson, Allan Leahy, Carl McGuinness, Neil Miller, Robyn Simcock, Gina Sweetman, Lucy Tukua, Marjorie van Roon, Kimba Stainton-Herbert*. No response from 18 other invitees.

*Officials from the Ministry were facilitators and active observers but did not participate in group decision-making.

Decisions
The Group recommends the attached set of Urban Water Principles be promoted by the Government. Of 19 votes cast, 18 (95%) agreed that the Group should recommend this set of principles to be promoted by the Government. This was considered a sufficient margin and a motion was passed to make this recommendation to the Government. The one group member who voted against this motion did so on the basis that they thought the principles should be made more aspirational.

The Group also agrees to continue work related to developing specific practices and policy options in the future. Existing sub-groups will each convene at least one more time in 2018 to establish a plan for future work and develop a new terms of reference for the next phase of the project.

Urban Water Principles – Ngā Wai Manga

Our greatest obligation is to that which gives us life – Te Mana me Te Mauri o Te Wai

In Aotearoa's cities and towns people have important relationships with water. Water provides for the basic needs of our community and supports the natural and built environments that many New Zealanders call home. However, as our urban areas grow and change we also need to be mindful of our impact on this taonga. There are legacy problems related to how urban infrastructure networks and built environments have been developed to date and we need to meet these challenges. **We need a transformational change in the way that we interact with urban water.**

By following this set of principles, we hold in the highest regard the life-giving properties of water – **Te Mana o Te Wai** of urban water ecosystems. Te Mana o Te Wai is a concept within the National Policy Statement for Freshwater Management, which is described as 'the integrated and holistic well-being of the water.' Upholding Te Mana o Te Wai **acknowledges, protects and enhances the mauri of the water**. This requires that we must also provide for Te Hauora o Te Taiao (the health of the environment), Te Hauora o Te Wai (the health of the water body) and Te Hauora o Te Tangata (the health of the people).

In an urban context, it is important that communities establish a common understanding of what it means to achieve Te Mana o Te Wai in their specific area and that all other **planning and resource-use decisions uphold this strategic vision**. The following principles can help guide this decision-making at all levels and promote the creation of water sensitive urban spaces by drawing on mātauranga, the lessons of the past and international best practice, the needs of our present communities and a vision of a sustainable, resilient future.

PAPATŪĀNUKU – *"Our relationship with the land –papatūānuku – will pre-determine our relationship with water".*

1. **Protect and enhance ecosystem health of all receiving environments.** Use integrated planning to ensure that decisions made upstream protect downstream receiving environments, such as streams, lakes, wetlands and terrestrial ecosystems, groundwater, estuaries, and the ocean.
2. **Co-design with nature an integrated and regenerative approach to urban development.** Use nature-based or green infrastructure engineering solutions where possible to mimic or work with processes found in the natural environment. Retain, restore and enhance existing elements of the natural drainage system, and integrate these elements into the urban landscape.
3. **Address pressures on waterbodies close to source.** Urban water ecosystems are under increased pressure from a wide range of pollutants, modified flow characteristics and altered channel form. These pressures can be either acute (such as a spill or pollution incident) or chronic, created by the cumulative effects of these pressures over time. Mitigating these pressures at or close to their source prevents degradation downstream.

NGĀ WAI TUKU KIRI – *"Our waters are a gift of life provided to us by our tupuna".*

4. **Recognise and respect mana motuhake – the whakapapa and relationship that mana whenua have with water ecosystems in their rohe**. Mana motuhake means the authority (mana) gained through self-determination and control over one's own destiny. Mana whenua communities have this authority in their customary 'rohe' or territory and have special cultural relationships with ecosystems in these areas. It is important to proactively engage mana whenua in designing urban environments within their rohe so that they can have a meaningful role in shaping the outcome.

TĀNGATA – *"Our environments are places of human occupation".*

5. **Identify and consider the community values for urban water and reflect them in decision-making.** Communities often have strong aspirations and values for their urban spaces, including values for environmental sustainability, sense of place, and general amenity and liveability. Urban planning and design processes should create opportunities for communities to express their values and for decision-makers to reflect these goals in their decisions.
6. **Optimise environmental, social and cultural benefits when investing in buildings and infrastructure.** When considering options for investment, prioritise options that provide multiple benefits. Investment decisions should take lifecycle costs of buildings and infrastructure into account and generate an enduring well-being gain.

TE HĀPORI ME TE WAI – *"The community's love and care for water is enduring".*

7. **Uphold and foster kaitiakitanga and custodianship of urban water ecosystems.** Everyone has a responsibility to care for the health of our urban water bodies. Because of this, it is important that all community members can connect with these water bodies and are encouraged and empowered to take direct action to maintain and restore ecosystem health.
8. **Collect and share information to promote common understanding of urban water issues, solutions and values.** Meaningful and transparent data and information is necessary to improve both the design and use of our urban environments. Improving access to quality information can support integrated catchment planning and water sensitive design, while information for urban residents and businesses on current and emerging issues and solutions can foster positive behaviour change and the acceptance of new policy and technology.

TIAKINA MŌ APŌPŌ – *"In building future resilience, our connectedness with the environment is our strength".*

9. **Increase resilience to natural hazards and climate change.** To improve the resilience of urban communities, we need to design water sensitive systems and landscapes which reflect the environmental characteristics of the area and are resilient to natural disasters and change.
10. **Conserve and reuse water resources.** Drinking water, wastewater and stormwater are each valuable resources and we should reduce their consumption and/or production and maximise their reuse. This includes increasing water-use efficiency by reducing potable water demand and maximising the use of greywater and stormwater.

Phase II – Looking forward

Identifying good practice and informing policy

For the next phase of work, the Group has agreed to continue to support the Ministry in two ways.

1. By further identifying and illustrating specific good practices for a range of audiences, which may form the basis of future guidance or regulatory approaches. These practices will complement and provide greater detail on how people can practically give effect to the vision set out in the urban water principles. This work will also seek to leverage existing guidance and resources for practitioners from around the country and around the world. The Group has already done considerable work to identify these practices during Phase I.
2. By providing input to the Ministry in policy development. This may include considering aspects related to the Essential Freshwater Work Programme or the Government's Three Waters Review, and helping frame the Ministry's future urban water work.

The Group will set out formal terms of reference for this phase in late 2018.

Getting involved

The Urban Water Working Group is a collaborative forum that has a flexible membership system. If you have relevant expertise and would like to volunteer your time to help the Ministry for the Environment you can apply to be part of the Group by sending an expression of interest to info@mfe.govt.nz.

APPENDIX 3

Draft Minutes Regional Water Advisory Panel Meeting - 23 August 2018

Regional Water Advisory Panel Meeting
9 May 2018 at Hotel Armitage, Tauranga

Attendees:	**Members:** Andrew Curtis (Irrigation NZ), Chris Keenan (HortNZ), Corina Jordan (Beef and Lamb), Justine Young (DairyNZ), Linda Conning (Environmental Consultant), Nicola Foran (Trustpower), Rick Powdrell (Federated Farmers), Ross Bawden (Te Puke Fruitgrowers Assn), Tanira Kinig (alternate – afternoon only) **Observers:** Caleb Higham (DairyNZ), David Phizacklea (BOPRC), Martin Meier (Federated Farmers), Paul Le Meier (Federated Farmers) **Presenters**: Anabella Vidal (BOPRC), Andrew Millar (BOPRC), Glenys Kroon (BOPRC), Ian Morton (Chair - BOPRC), Jon Williams (WWA), Nic Conland, (Nicki Green (BOPRC), Rochelle Carter (BOPRC), Santiago Bermeo (BOPRC)
Apologies:	Anthony Olsen, Eben Herbert, Karamea Insley, Kit Richards, Michel Dedual, Philip Millichamp, Roku Mihinui
Meeting date:	23 August 2018
Scribe:	Sue Simpson
Venue:	Hotel Armitage, 9 Willow Street, Tauranga

Action Summary

What	Who
General Update	
Nicola Foran to advise if Trustpower agenda item should be tabled at future meeting, or addressed through an off site visit	Nicola (Trustpower)
Terms of Reference to be reviewed at a later meeting. Sue to follow up with Namouta regarding Nicki Douglas joining the panel.	Ian/Sue
Add 'communications' as a standard agenda item	Sue
Offline discussion with Linda regarding an alternative view presentation she would like the panel to see on irrigation/water storage.	Ian
National and hot topics	
Climate change – report back to the panel in early 2019 following completion of BOPRC's action plan. Add to subsequent agenda.	Sue
Send the panel the MfE criteria list and any other available information on the at-risk catchments.	David
Add agenda item for future meeting - industry related environmental strategy presentations.	Sue
BOPRC Consents team to present on Cultural Impact Assessments. Sue to add to future agenda.	Sue
Freshwater futures	
Update on work /research underway about drain water quality/wetland treatment is to stay as an outstanding item.	Sue/Nicki
Contact Linda regarding her question on inclusion of financial contributions in the region-wide	Nicki

What	Who
provisions.	
Third PerrinAg and Landcare Research report to be circulated to the panel.	Santiago
Check with WWA to find out what sediment generation assumptions were made for the current state in the Kaituna catchment.	Rochelle
Report back to the panel on what is driving the increased sedimentation below Te Matai.	WWA
WWA Report to be available on the portal.	Sue/WWA
Proposed plan change 9 – region-wide water quantity	
Email to the panel relating to the Tarawera Plan.	Glenys
AOB	
Email to panel for suggestions on future agenda items.	Sue/Ian

Minutes from today's meeting

	Agenda Item	Discussion Points
1	**Welcome**	Ian welcomed panel members and attendees to the meeting. Introductions were made round the table.
2	**Actions from last meeting**	**Trustpower field trip**: discussion highlighted that a site visit is probably not required; Nicola can pull together a package of information based on requests for lower flow management at Rangitāiki in terms of managing residual flows, future systems, efficiency of turbines, understanding constraints in place for people who want water. Nicola to advise.
		Climate change: Ian reported that the BOPRC LTP includes additional resources. Action plan being prepared for completion in December covering : 1)getting our house in order 2) internal decision making taking into account climate change, 3) the work we do and adaptations of the services we provide, 4) reaching out to help the community. Ian asked panel members where they would like help. Chris made three points: 1) interconnection between flood protection controls, hazard management and limit setting process and the quantity issues, 2) the strategic view around quality and quantity issues with flood protection infrastructure and elevated cost of protecting land, and 3) systems proposed for build and infrastructure. Rick was keen to ensure that affected landowners would receive reasonable notice and communications on any impacts and what they would mean. Ian advised we would have more information to report back in early 2019. Chris commented that communities need to think about the link between land use and climate change in terms of water bodies' resilience and what that means for water quality and land at risk. In terms of work with the communities groups, Nicki explained that BOPRC had promised to explore good management practice before exploring restrictive options. Nicki told the group that future scenarios modelling would include climate change.
		Industry/BOPRC sessions: the MfE work on at-risk catchments has overtaken this. Over the next two months, regional councils are feeding back to MfE and then funding will be targeted to improve those catchments. There is no real direction from the ministry as to the criteria and the freshwater improvement fund won't address the at-risk catchments. David will get back to the panel with any information he can share, including the list Nicki highlighted at the meeting. **The panel suggested that BOPRC need to inquire from the ministry what they plan to do with this catchment of risk information.**
		Irrigation/water storage: Linda would like to present her alternative view to the panel. Offline

	Agenda Item	Discussion Points
		conversation with Linda to organise the detail.
		Communications: the panel agreed that work in this area is important and the topic is to be added to the agenda for each meeting.
		Update on drain water quality/wetland treatment work: leave as an outstanding item.
		Terms of Reference: review due every two years. Agenda item at a later date. Linda raised her concern that no tangata whenua representatives were attending. The panel previously discussed Nicki Douglas joining. Sue to follow up with Namouta.
3	**PC12 surface water catchment modelling**	Ian thanked the panel for their input into this project to date.
		Nicki presented. The focus for this presentation was for the panel to give feedback on, and potentially question/challenge, the surface water catchment modelling.
	Timeline	The current timeline: discussion document launch 30 March 2019, draft plan change publication 30 June 2019, proposed plan change notification November 2019 is ambitious. The policy team are currently pulling together modelling outputs, working towards how limits are set and what mitigation packages to model.
	Region-wide provisions	Nicki explained they would be progressed through the WMA plan changes. It was also noted the Regional Natural Resources Plan is due for its 10 year review. Rolling review changes would be made alongside WMA plan changes. Nicki will get back to Linda regarding her question on the introduction of financial contributions.
	Engagement	Justine asked for a quick summary on work to date with the community groups. Nicki explained that as Councillors wanted to see all results before they went to wider audiences, staff had not met with the community groups for several months. Informal catch ups had been held in the meantime however. Whilst the meeting delays and the amount of material to cover in a rushed amount of time frustrated the groups, they are very keen to be involved. Rangitāiki participation is good; less so in KPW. The community groups and the Rangitāiki River Forum are asking how much their voices count.
	Issues	Nicki ran through the issues for the KPW and Rangitāiki WMAs. Questions and points raised: • What is meant by land use intensification, are staff monitoring water quality or land use change? Suggested Council start a more considered programme around monitoring land use across the catchments. *Staff noted: Council's land use maps history is not good, but we do have statistics on stocking rates.* • Are staff sure stocking rates are increasing in the Kaituna? *Staff noted the wording could have more accurately noted intensification in the lowlands.* • Where is Council getting its data from and how up to date is it? • Still some scientific work to be done as to why these outcomes are happening. • How staff communicate this information is vital if communities are to share problems rather than lay blame. • *Staff noted: in terms of groundwater, staff are working through the results produced by Jacobs*.
	SOURCE Catchment Model Development	WWA presented. Key points raised: • Concern that sub catchments and some of the areas with the biggest issues have no data. *Staff noted: permanent flow gauging stations are generally put in places where there are known issues. Some areas have spot measurements, but are not continuously recorded*. *Monitoring in the wider region will be reassessed following work carried out on the first two WMAs.* • Queries were raised about overland flow pathways, identifying critical source areas in the catchments and how the model looks at cost and benefits, and their critical source areas and modelling of mitigation activities at a farm scale level. *WWA noted the model is not set to work at a farm scale level, however the model looks at an*

	Agenda Item	Discussion Points
		aggregate level (build of multiple sub-catchments). The modelling is really making an estimate about what change you can get from certain actions, naming all assumptions, so you can say "Overall, looking across 100 farms, we see these things will work". It does not address costs and benefits – this will be the subject of further assessments. • *For information, staff noted: the model can test iteratively and it can test the assumptions.*
		WWA noted some key aspects of the model: • *the model simulates the impact of dams, however the drainage and flood protection networks were out of scope.* • *The model takes E.coli loss into account through an inverse relationship, and the calibration looks approx. ok.* • *There were calibration curves for each contaminant for each catchment modelled. Overall, although it was variable,* ***WWA were confident the calibration is good and they were happy with the hydrology.***
	Modelling scenarios	Santiago presented the four contaminant modelling scenarios: A) naturalised; B) current; C) and D) land use change. Questions and points raised: • *Staff noted: the community groups and the major landowners didn't feel there was going to be a lot of land use change in the upper Rangitaiki area*. • *Staff noted*: *No Provincial Growth Fund (PGF) projects have been included specifically in the scenarios.*
	Modelling results: e-coli	Rochelle presented the results for the surface water catchment modelling for e-coli, total suspended solids, total nitrogen and total phosphorous. • *Staff noted: no practices or intensities were changed for developments C and D; urban expansion was taken into account for both developments, there was more horticulture in development C and more dairy in development D.* • *Staff noted: the development scenarios could be shown on a spectrum if required* • *Staff noted: the dairy cow numbers between developments C and D weren't a parameter that was changed, although it could be looked at under mitigation scenarios.* • One scenario that could happen was an increase in dairy intensification. • If the current scenarios are not realistic, what does a realistic scenario look like? It was suggested that looking at alternative scenarios would be helpful for the community groups. • If the high country went back into sheep, the whole picture would change. • These scenarios are essential to developing policy frameworks to enable flexibility. • Carbon will change farmers' priorities. *Staff noted: advice was taken from an earlier meeting with the panel and the PerrinAg and Landcare work included greenhouse gas emissions.* • *Staff noted: it is recognised there are several scenarios that could be included; these today are a starting point and staff will be working other ideas and mitigation scenarios with the community groups.*
	Modelling results: total suspended solids	• What are the assumptions behind sediment generation? *Staff noted: there was an increase in forestry for those sections, which also took into account some felling cycles. Rochelle will check with WWA for more information.* • How have forestry path cycles been factored in? *Staff noted: some harvesting, different growth cycles and also talked to the industry. The forestry harvest period was averaged out per year over a 30 year cycle. A generic approach has been taken with the model.* • *Staff noted: the sediment is cumulative as it moves down the catchment. The next level of analysis would take into account the additional flows into the river.* • Point made that it seems a bit anomalous that the slope isn't driving the sediment. *WWA noted: the model uses an 8m slope and several components drive sediment. WWA will look at what is driving the increase below Te Matai and report back to the panel.* ***Panel members noted that BOPRC need to have a clear story around what is happening now – this will be key for the community.*** • There was interest in looking at sediment running off/on farm for mitigation practices. • *Staff noted: an urban factor for Pukehina hasn't been included , but could be considered for the flow into the Waihī estuary.*
	Modelling results: total nitrogen	• **Consider how the message is given to the community, eg nitrogen is managed here, but sediment has increased.** *Staff noted: they are expecting the Coastal Receiving Environment work*

	Agenda Item	Discussion Points
		within the next couple of months. • Useful when looking at natural and current states to think about where common aspirations might be. • Suggestion made that only two scenarios be used for thinking about mitigations. *Staff noted: this is the point to which they were moving.* • It is important to run these models with higher rainfalls and different weather patterns. *Staff noted: NIWA are generating a time series and the scenarios will be run through that to see what changes will look like.* • Serious conversation needed about monitoring nitrogen work; how it is set up, future proofing and where the money is spent. *Staff noted: monitoring of nitrogen work is being reviewed across the region and resourcing included in LTP to initiate some of this work.*
	Modelling results: total phosphorous	• In order to make informed decisions, community groups need more detail regarding contaminant loads. • Communities will ask if an economic layer has been looked at. *Staff noted: this layer was not yet built into the work, however the third PerrinAg and Landcare report included some abatement costs, per hectare.* • *Staff noted: OVERSEER was used for the purpose of estimating effectiveness, but wasn't used in ESOURCE.* Request made for emission profiles to be checked as sheep and beef discharges look different. *Staff noted: WWA report will be available soon and it will cover that. The report will be available through the portal.*
	Modelling results: general	• Draw out the reasons for any significant changes to the modelling results • Land use should be monitored in a consistent method. *Staff noted: an accounting and monitoring system is being set up to support that.*
2	**Proposed plan change 9 – region-wide water quantity**	Glenys presented. Deliberations were completed on 22 August 2018. The timeframe was extended to give the panel more time to address all the points made. Recommendations will be made to the RDD Committee on 18 September 2018, at which time the recommendations report will be circulated. Council will formally notify on 9 October 2018. Any appeals can be lodged 30 working days after notification, to 21 November 2018. The process has highlighted Council's need to improve its accounting system. BOPRC currently working on an automated system for groundwater which will "go live" in a couple of months. This will hugely improve Council's ability to monitor groundwater in particular. Groundwater accounting will be in real time and the information available on a GIS basis. Surface water is not as advanced. Glenys thanked Justine for prompting the discussion on implementation. Council is looking to work with the industry groups in the interests of efficiency and information sharing. Sharon Pimlott is overseeing implementation of the project. Key points: • Communication of the requirements, eg how, who is the audience, development of factsheets, how we will contact people. • Regulation of permitted takes. • Metering, especially for dairy farmers. • Efficient reporting. • Consents – dairy applications: under the Tarawera Plan where proposed plan change 9 isn't applied. Request made for Glenys to circulate an email on Tarawera to the panel. • New controlled activity rule for those under 5ha, big job to ensure they all register in the timeframe as Council doesn't know who they are. • Amethod approach is needed to deal with exceedances against permitted activity limits. • Ensure background information Council has is available as supporting data. • Talk to industry groups about how they would like to be involved with the registration forms and guidance documents. **The panel recognised it is a great opportunity for co-operation and discussion between different sectors. Whilst Council can be involved, the solutions are not all with them.** Staff felt that using the different organisations logos on communications highlighted to communities that industry and council were working together collaboratively.

	Agenda Item	Discussion Points
		Concern that the message gets out to people who are affected by unauthorised takes in catchments and rivers that are over allocated. *Staff noted: the Water Availability and Allocation Status Report shows allocation status.* The question was raised as to whether contact had been made with people whose consents were up for renewal. *Staff noted: there is a process to follow.* *Staff noted: A joint working group with BOPRC / Industry is required to map out implementation plans.*
4	**Rotorua water management area – proposed plan change 15**	Anabella presented. As part of the NPSFM implementation, Council currently establishing a baseline for this water management area (WMA). As part of the stocktake, all available information is being pulled together to see where the gaps might be. Lake Rotorua is included in this WMA because proposed plan change 10 is only looking at nitrogen within the lake, not the wider NPSFM process. A cultural stocktake has been done by Elva Conroy to get an understanding of iwi and tangata whenua aspirations around fresh water. Part of the engagement strategy is to work with other staff already engaged with iwi, as well as thinking about wider community engagement. The panel asked if plan change 15 would enter into a level of engagement similar to plan change 12 and staff explained they will take advice from councillors on this. Staff confirmed that no decision had been made by Council as to its future engagement approach. "Involve" is working quite well at the moment.
5	**Tauranga harbour water management area - proposed plan change 16**	Santiago presented. This plan change is taking a similar approach to building a baseline as presented on PC15. Challenging conversations have been held with iwi and hapū that overlap the Kaituna area as some of the topics are outside scope. The Hauraki Settlement and wider iwi rights and interests cover these subjects. The Coastal Receiving Environment work is expected to be a big driver of quality similar to the Kaituna. As notification is not until 2024, community groups won't be formed for the next three to four years. *Staff noted: No decision has been made yet as to how we use the modelling already in place for the next WMAs.*
6	**National and hot topics**	Ian reported: discussions with Minister Parker highlighted four priority areas: changes to the RMA and potentially getting a pool of qualified hearing commissioners to help the process, listening to regional councils to stop moving goalposts, a national modelling approach rather than council by council and Councils need to do more about compliance monitoring enforcement. The Minister is looking at a regulatory approach to sediment and focussing on catchments at risk. He is lukewarm on swimmability. Later this year, calls will be made around regulation on the 3 waters. The PGF will invest in the Eastern Bay of Plenty as an area of high deprivation and social issues. Catalytic projects include Ōpōtiki Wharf, Eastern Bay horticulture, Kawerau industrial development and Whakatāne wharf. In terms of legislative related topics: - No changes expected this year for the NPSFM and nothing about stock exclusion - An NES being introduced in the first quarter of 2019 would encompass sediment - NPS for Biodiversity early draft available - Our Land and Water under the National Science Challenges Linda raised concern in relation to compliance monitoring: the number of dairy farms had gone down and the amount of non-compliance had gone up. She also noted shellfish in Waiotahi and Ōhiwa Harbour could not be gathered now because of pollution from the catchment that had been scientifically traced back to cows. She feels rules in the plan (discharge of the drain into the waterway is a permitted activity) are completely at odds with water quality standards and would like any ideas on how this can be addressed.

	Agenda Item	Discussion Points
		Ian noted that there is still a lot more work to be done in terms drainage. Corina reported much is happening within the sheep and beef industry and she would be happy to present on it: including new organisational and environmental strategies, YouTube origin brand story (Taste Pure Nature), The Northern Report, developing a national industry led, but independently audited, farm assurance programme and farming environmental plans that empower farmers. Corina agreed with Rick's point that to get farmers on board, the plans should be prepared by the farmers themselves, not by an independent. Staff to look at Tanira's suggestion of across-the-industry environmental strategy presentations. Following Paul's mention of feedlotting in Ashburton, Rick noted that people are becoming more conscious of winter grazing systems. Rick highlighted the request that Cultural Impact Assessments (CIAs) and renewal of water consents is an item for the next meeting's agenda. He feels the process is longwinded with exorbitant fees and believes Councillors should be telling the government that the process is not working. Andrew felt clarity around who should be consulted and a template around on what would be helpful. Of concern is the pricing, consistency, the lack of capacity and people who don't respond. For Tanira, the PGF is really important as farmers are looking at fresh milk, dairy sheep and root crops. Ian suggested Tanira contact Rebecca Lyons. Tanira also sees the National Science Challenges as an opportunity for groups and regional councils to line up with the Our Land and Water challenge. Ian noted that Ken Taylor (Lead – our land and Water) attends quarterly Resource Management Group meetings. In terms of the advisory groups that ministers are setting up, the implications for regional councils is the difference between whether it's iwi (not necessarily landowners) consultation or Māori (Landowners/ratepayers) authority consultation. Nicola's main focus has been on the NPS submission on National Standards. Good farming practice and working out what the high level stuff means has been Andrew's focus.
	AOB	Ian confirmed Council has asked to see the minutes of these meetings as they want to see all views. The minutes go to the RDD Committee and are also summarised for the leadership team. Ian will send out an email asking for suggestions for future agenda items. Given the collective knowledge of the panel, Justine would like discussions around the future of farm management plans.

Close: 3.30pm

APPENDIX 4

Draft Minutes Territorial Authorities Freshwater Collaboration Group Meeting - 17 October 2018

Minutes of the Territorial Local Authorities Freshwater Collaboration Group meeting held Tauranga City Council, on 17th October 2018 commencing at 10am

Chair: Namouta Poutasi (BOPRC)

Present: Steve Burton (TCC), Joel Peters (TCC), Nicholas Woodley (WDC), Michael Van Tilburg (WDC), Eric Cawte (RLC), Braden Leonard (Toi Te Ora), Tomasz Krawczyk (WDC), Garry Allis (WBOPDC), Wally Potts (TCC), Hanno van der Merwer (KDC)

Staff: Nicki Green, Reuben Fraser, Alex Miller, Paul Scholes, James Low and Lisa Baty (Scribe)

Apologies: Kelvin Hill, Claudia Hellberg, Denis Lewis, Jon Fields, Aileen Lawrie, Ari Erickson, David Bewley, Gerard McCormack, Jason Ward, Jim Finlay, Jim Miller, Miriam Taris, Nick Carroll, Paul van den Berg, Russell George, Grant King, Cameron Huxley, Tom McDowall, Marty Grenfell.

1 Welcome

Brief introductions were made around the table.

2 Minutes from Previous Meeting and Actions Update

The previous minutes were accepted. Nothing further to add to today's agenda.

An update on the open actions were captured below:-

Action Ref	Date Raised	Action Description	Owner	Forecast Completion date
Previous Open Actions				
WMP1047	10/04/2018	Each TLA to decide if they too would like to progress a similar comms opportunity as RLCs campaign on educating self-suppliers on their responsibilities under the health act (those not under a council supply). **Eric will send this around once is has been finalised and approved by RLC. Date changed to the end of November.**	Eric Cawte	30/11/2018
WMP1069	24/07/2018	Adell to send the source protection zones / layers and boundaries information when available. **This will be sent by the end of November 2018.**	Adell Gilchrist	30/11/2018
Actions noted at the meeting				
WMP1081	17/10/2018	If you are interested in TCC's Catchment Management Plans, please see Steve Burton.	All TAs	21/12/2018
WMP1083	17/10/2018	Send the RDD paper and links to the Freshwater Update report.	Lisa Baty	14/11/2018
WMP1084	17/10/2018	Send the science summaries and final SOURCE report for the current WMAs.	Nicki Green	14/11/2018
WMP1085	17/10/2018	BOPRC to set up doodle poll for next meeting.	Lisa Baty	16/11/2018

3 Stormwater and Wastewater Management

Alex noted the key points;

- The Comprehensive Stormwater report that went to BOPRC council in September has been sent via email to all members. This included actions which sit with each of the TAs.
- The same committee want a comprehensive report on Wastewater to understand the networks, issues and developing infrastructure. This report, once drafted will be sent out for TA input before it goes up to council, the annual report which includes TA compliance will be included.

Reuben

- Government's decisions for 3 Waters is due out over the next six months, which will have implications for us all.
- GHD Boffa Miskell Wastewater report. Feedback that BOPRC sent in;
    - TAs have inherited the infrastructure, coming up for re-consenting and funds needing to be outlaid to bring them up to modern standards, this will mean huge costs to communities.

Questions:

- Steve confirmed, TCC had input into the report, he mentioned Waste Water Overflows but they haven't see this covered in the report. It is expected that Ministry will report back in November.
- Steve also noted, TCC have Catchment Management Plans in place, he is happy to share with the other TAs.
- Tomasz and Nicholas noted that Whakatāne also had input into the report.

Action: If you are interested in TCC's Catchment Management Plans, please see Steve.

Wally TCC

- TCC now has five years of monitoring (since 2012) as required by consents. From this, a report has been prepared on the asset guidelines, identifying several catchments of concerns.
- The Programme Leader is looking at;
    - Stormwater programme on flood management;
    - Improvements to quality management;
    - Recruiting new staff to monitor, working in the industrial and commercial space;
    - Tracking of contaminants and developing mitigations and prioritisation; and
    - Perform a stocktake of information.

Paul Scholes

- BOPRC is gap filling, pulling the information together to come up with a comprehensive report and how we can improve our monitoring. We can share this with TAs once complete.

Namouta noted comments from Minister Mahuta: that regional councils are not strong enough in this space with TAs on compliance, and there is room for improvement. LGNZ has been working on providing more accurate data for the politicians to use.

4 National and Regional Update

Essential Freshwater.

- Release of the Government's blueprints for freshwater *Essential Freshwater Healthy Water, Fairly Allocated* and *Shared Interests in Freshwater* on 8 October 2018 which outline the key actions government will be taking in the freshwater management space over the next two years.
- The three key objectives identified that inform this direction include:
    1) stopping further degradation and loss
    2) reversing past damage
    3) addressing water allocation.

- Essential Freshwater has 6 work streams
    - Catchments at Risk - MfE are now looking at holding a workshop in November to discuss how they narrow the focus catchments.
    - Changes to the National Policy Statement for Freshwater Management.
    - NES for freshwater management - development of rules for at risk catchments, farm management plans, intensive grazing, feedlots, and wetlands.
    - RMA Bill – address complexity and improve certainty of public participation.
    - Water allocation – issues and options paper to be released and discussed.
    - Connection between central government with other activities – 3 waters, climate change etc.

Action: Send the RDD paper and links to the Freshwater Update report.

5 Policy Update and Presentation

Nicki gave an overview of implementing the NPSFM.

James Low presented an update on **Plan Change 9** – Region-wide Water Quantity Plan Change. Council adopted Hearing Panel decisions and these have just been notified.

- Replaces current Regional Natural Resources Plan provisions with more firm and certain provisions on how we allocate;
- Long process, 5 years in the making;
- The decisions notified: confirmed limits / set WMA requirements / retained generally decline policy for new takes in over- allocated water bodies / confirmed metering requirements.
- Decisions notified on the 9 October, appeals close on 21 November;
- City and District councils – hearings panel affirmed controlled activity for renewal of municipal supply takes;
- Enhanced policies recognising Tangata Whenua values and interests.

Implementation of this - for the most part there aren't any surprises that you are not already doing.

- Consents process and compliance activities,
- Administration and systems are now going to be automated.

Questions

- Reuben confirmed BOPRC have held conversations with the TAs already;
- Steve TCC: metering is becoming strongly required, there will be a requirement so we measure accurately – will BOPRC be investing into the river / stream flow monitoring? As currently this is light on BOPRCs behalf.
    - James confirmed, at the end of this process there is a requirement for all of us to improve our processes;
    - CHES: BOPRC is looking to use the NIWA model to accurately assess allocation effects. It also estimates flows based on gauging points. This is stage one – we hope to roll out over the next year;
    - EFSAP: NIWA model can also help in the space of ecological flow setting – uses virtual climate staging from NIWA to give us a much better basis.

Plan Change 10

Nicki noted that PC10 have Environment Court dates set for 4 and 11 March 2019.

PC12 – Progress, next steps and engagements (refer to presentation slides)

- Timeline
    - Working towards a draft Plan Change for release mid-2019, although she noted this is still ambitious;
    - Watching what comes out of the National space which could directly affect our work.

- Work in Progress
    - Rangitāiki – Lake Matahina Dam TLI indicates ecological health issues. Some further reporting is coming on what we understand about nutrients in the lake;
    - Contaminant loads needed for Estuaries;
    - Groundwater – no further modelling results for Rangitāiki - this is a few years out, so working with the data we have now. For Kaituna/Pongakawa - we are now testing scenarios using MODFLOW;
    - Surface Water Quantity – Using detailed instream flow assessments and EFSAP tool to estimate minimum flows needed for key fish species;
    - Report Data – Will report to our council, community groups and to the TAs.
- Next Steps
    - How much we need to reduce sediment, N, P and E.Coli;
    - Modelling what might happen if we manage contaminants better through various mitigation packages;
    - Costs and benefits, to whom and by when;
    - Propose and discuss solutions;
    - Wider Community engagement;
    - Develop rules and other actions.

We anticipate parts of rolling review of the Regional Plan will be delivered alongside Plan Changes 12, 15 (Rotorua Lakes WMA) and 16 (Tauranga Harbour WMA). Stock exclusion rules may be in the first tranche.

Kaituna & Rangitāiki Catchment Models (Williamson Water Advisory) Action: Send the final 400 page report.

Action: Send the science summaries for the current WMAs.

Close – Summary

- Technical inputs for this project are considerable but starting to come together now. Mitigation bundles are being developed.

Questions:

- Steve TCC, the development options, will this feed into any further conversations and how will this progress?
    - Nicki confirmed where there was a change to *Forestry* the change is showing higher sediment results. At the same time N and P have come down. We need to work through these options as both scenarios include changes to wetlands in the lower catchment.

6 3 Waters Update

- The announcement from Ministers Mahuta is expected in November.
- Delayed as a regulatory body next year, the Minister could possibly make a comment at the Water Conference.
- Minister Mahuta is open to the industry view and addresses and tailors her speech differently. Very open to any arrangement as long as the regulator sets the rules correctly and applies appropriately.
- Depends on what the regulators are covering, such as National Standards as this takes the entire region into account.
- If there was a move to aggregate into any entity, Storm Water / Waste Water – the decisions are made for the growth of the city.

- They are reviewing the Auckland process for Storm Water because they can see there are other benefits they can tap into, future improvements.

7 Round Table Discussion

TCC

- Large Waste Water main *Southern pipeline*, is now fully connected through the city – 100m project. Testing now completed and went well. This will offer the city to load and offload the plants as the conditions prevail and handle the growth in the future.
    - Running now, transferring 8,000 cubes a day which meets conditions. Trying at peat / min flows, cut in and out.
    - Handed over for operational commission – will run for a few months with further testing and scenarios.
- Waiari Scheme in Te Puke is underway. Establishment of the site has been underway for a few weeks, with a temporary bridge over the Waiari for earthworks project to manage sediment etc. in this area. Contractors will be there for 2-3 years.
    - Pipelines for this project are out to tender. Finalising the membrane contract at the moment, then this sets the parameters for the water filter. This will be commissioned by June 2021 and is on track for delivery.
- Summer demands are already kicking in with a dry September, already exceeded previous year. Had a meeting with BOPRC and WBOP to discuss water for Dust Suppression, looking at water restrictions entering summer months. BOPRC are taking this on board when consent applications come in.
- PC9 water management plans, specifying what the water is being used for, we need to be mindful of this and convey this to our users.
- TCC have purchased a 40ft container with membrane, everything is in place which will be pumped up at Joyce Road to take the pressure off and this can then be reallocated to other areas in the region. Capable of doing 6,000 cubes per day.
- This is a good idea for backups. Approx. $600/700k to purchase. Then shipping costs on top of.
- Monday kicked off the ‘wet wipes’ campaign. Water NZ are working on a joint NZ and Aus. standard to define what “flushable” is. The packaging needs to change, but this will take time. We need to engage with our community and doing so via a social media campaign.

Action: TCC to send it out details for wet wipe campaign.

WBOP

- Waste Water System at Aongatete Point, 3/3/3 approach, making it more affordable.
- Te Puna Pumps exercise of monitoring and measuring water, smart meters have been installed and have done a house hold survey to get a better understanding of what the community’s needs are for wastewater. Meeting discharge conditions with TCC.
- Ground water, new tool has an impact for WAI3 east of TGA, which is over allocated in terms of consenting. Needs to be a flexible approach to consenting in this area.

RLC

- Comprehensive Stormwater consents, water supply update within the WSP.
- Building a new treatment plant at Mamaku (UV and Filtration).
- Discussion around what role RLC needs to be playing in the Supply Committees (camp ground at the hot pools, Mountain bike park etc.). Understanding the responsibilities for “lessees” private property owners for water supply and sanitary services. Making sure council are covered of their responsibilities.
- Waste Water – submitted an application for Resource consent for upgrade of Treatment plant – $50m upgrade, this will go direct to enviro court. Treated processed water will go back into the lake which will get objections.
- Well underway of the Rotoiti / Rotoma treatment plant – based at Rotoiti. NBR.

- Adopting a back flow policy - gone through first committee, approve by council.
- Towards conclusion of the project / contractor to build the WW treatment plant and operate this and the network for next 25 years. Two preferred contractors, few weeks away from notifying the preferred with further negotiations.
    - Design, build, construct and monitor for the next 25 years for Wastewater only.
    - Growth assets as well, but subject to variations and without rights.

Questions:

- Rates model is being used. With pricing control – will be rated.
- Will be interesting model with specialists.

KDC

- Chlorine into drinking water – small teething problems, slow release into the water.

Toi Te Ora

- Drinking water assessors have been preparing the drinking water compliance reports, checking the health acts and standards. For those that were non-complaint, they will be passed to an enforcement officer to proceed.
- All the larger council suppliers are acceptable.

WDC

- New CE starting, Steph O'Sullivan.
- Water Safety Plans, 9 in place, 6 are expired – working through this with assessors, happy with progress.
- Smaller suppliers that don't comply, plans to address these. High risk with plans frozen for next 3 years until LTP.
- Modelling for Stormwater and future development.
- Climate Change - impacts WDC.
- HINZ Report as above – impacts all councils.
- Plains water supply covering Edgecumbe / Te Teko are supplied with good drinking water. Commissioned in July and working well.
- Recently upgraded Ōhope oxidation ponds, installed floating wetland to help with final clarification before it hits the UV treatment process.
- Meeting with BOPRC in Matatā announcing reverting back to the bankment zone for the Osset systems. New project with staged process, since then Te Teko has been added and possibly Awakeri areas will be included.
- Applying for new resource consents for the 5 x oxidation ponds within the area.
- Infiltration gallery along the WDC River as an emergency plan. Other sources as temporary solutions need to be explored that meets the quality. Preliminary readings at the river bank. In November they will sink the test bore to see what the infiltration reads are.

Meeting ended: 12.50pm
Next meeting: February 2019

Action: BOPRC (Lisa) to set up doodle poll for next meeting.

Receives Only – No Decisions

Report To: Regional Direction and Delivery Committee

Meeting Date: 11 December 2018

Report From: Sarah Omundsen, General Manager, Regulatory Services

Regulatory Compliance: 2017/2018 Annual Report

Executive Summary

Bay of Plenty Regional Council uses a variety of regulatory and non-regulatory tools to manage the environmental impacts of activities throughout the region, including rules and resource consents implemented under the Resource Management Act 1991. Compliance with the requirements of these rules and resource consents provides an important measure of how we, as a regulatory authority, engage with the community to manage environmental impacts.

The report provides an overview of findings from compliance monitoring, complaints, investigations and enforcement activities completed by the Regulatory Compliance team from 1 July 2017 to 30 June 2018. Compliance results are presented both per individual activity and geographically by Water Management Area. Comparisons with the results presented in the 2016/2017 compliance report are also presented where appropriate.

Implications for tangata whenua are discussed within the introduction of the report, which reflects that Council is actively seeking to collaborate and improve the way we do business in this space.

Recommendations

That the Regional Direction and Delivery Committee:

1 Receives the report, Regulatory Compliance: 2017/2018 Annual Report.

1 Introduction

Regional Council works to support the sustainable development of the region through managing the effects of people's use of natural and physical resources. We also have a broader responsibility for the economic, social and cultural well-being of the Bay of Plenty community.

Regional Council uses a variety of regulatory and non-regulatory tools to manage the environmental impacts of activities throughout the region, including rules and resource consents made under the Resource Management Act 1991 (RMA). Compliance with

the requirements of these rules and resource consents provides an important measure of how we, as a regulatory authority, engage with the community to manage environmental impacts.

This is the fourth year that Regional Council has presented a comprehensive regulatory compliance report which provides an overview of all its functions undertaken from 1 July 2017 to 30 June 2018.

The report is provided in full as a supporting document.

A snapshot of compliance, service requests (previously known as complaints), investigations and enforcement activities is also provided, as well as more detailed discussion of some of the more prominent and significant activities, challenges and case studies throughout the region.

2 Compliance inspections

Throughout the 2017/2018 period, the Regulatory Compliance team completed 2,634 compliance inspections on 1,514 individual resource consents. This is 41% more than the number of inspections recorded in the 2016/2017 report. The number of inspections changes from year to year as different activities can have different inspection frequencies ranging from 3 monthly to 10 yearly. The increase in inspection in 2017/2018 is also a result of increased resource being dedication to regulatory compliance, and increasing efficiencies in how we work.

Seventy five percent of all inspections were assessed as complying with their resource consent, 15% were considered to be low risk, 8% moderate risk, and the remaining 2% as significantly non-compliant. The compliance ratings are almost identical to the 2016/2017 results.

Similar to the previous reporting period, the largest numbers of compliance inspections were carried out in the Tauranga Harbour Water Management Area (44%). The Tauranga Harbour Water Management Area also recorded the greatest increase in inspection numbers, with 417 more inspections being completed than the previous reporting period.

In addition to compliance inspections, BOPRC received, logged and reviewed a total of 1,842 performance monitoring returns on 815 individual consents. The results of these reviews were also generally positive, with 89.3% of returns being assessed as complying with consent conditions.

3 Service requests (complaints)

Throughout the 2017/2018 reporting period, we received 2,834 service requests, which is the most service requests we have ever received for any twelve month period, and marks a 4% increase on the record set in the 2016/2017 reporting period. The average number of service requests received daily equated to eight, which was up from an average of seven the previous year. The majority of service requests remain linked to air quality (57%), particularly smoke (22%) and odour (20%).

Service requests are received throughout the year, with only six days during the 12 month period where none were received. The busiest month for 2017/2018 was January with 287 service requests being logged through our 24/7 Pollution Hotline. The busiest single day over this reporting period was 19 October 2017, with 28 service requests being received.

Service requests were spread throughout the region, with the Tauranga City district receiving the vast majority of complaints (44%).

A total of 26 urgent service requests were received and all of these were responded to within 12 hours from the time of the initial complaint. Of the 2,808 non-urgent service requests received, 2,755 (98%) were responded to within three working days of receiving the initial complaint.

4 Enforcement action

Throughout the 2017/2018 year, 90 abatement notices were issued, which was 16 more than the previous year. The majority of abatements related to discharges to land (25%), which was closely followed by failing to supply water use records (19%), and industrial discharges to air (10%) and land (10%). Fifty eight abatement notices were in relation to breaches of resource consent conditions, which was up from 31 the previous year.

There were 27 infringement notices issued throughout the year. Of the 27, 17 were consent related with 10 being linked to complaint response. Eleven infringement notices were the result of breaching an abatement notice. The majority of infringements (30%) related to dairy discharges, which was closely followed by discharges to water (22%) and air (15%), and earthworks (15%).

The investigations team have 45 investigations of serious RMA breaches that are either active or have been completed over the 2017/2018 period. Fifteen of the 45 investigations related to discharges of dairy effluent.

There were 20 formal cases where enforcement action other than prosecution was taken and there are three on-going investigations from this period. Three investigations are awaiting external legal advice and there are currently nine prosecutions before the Courts in various stages of the legal process.

Ten prosecution matters were sentenced during the 2017/2018 reporting period which resulted in fines totalling $414,976 as opposed to six prosecution matters in the 2016/2017 period which resulted in fines totalling $176,925

5 Implications for tangata whenua

Regional Council has clear statutory obligations to Māori under the Local Government Act 2002 (LGA), and the Resource Management Act 1991 (RMA). In particular, Part 2, Sections 6 and 7 of the RMA recognises and provides for participation in decision-making, having regard to kaitiakitanga, consultation and fostering development.

The core function of compliance is to ensure consent conditions, plans, policies, rules and the RMA are followed. The role of tangata whenua and kaitiaki is to protect the natural and physical environment, waahi tapu and other sites of cultural significance to ensure community and cultural sustainability is achieved. Therefore, the role of compliance directly aligns with tangata whenua and kaitiaki values; partnering with tangata whenua is of mutual benefit to ensure the best environmental outcome is achieved.

Regional Council is actively seeking to collaborate and improve the way we do business in the regulatory compliance space, as well as facilitate ongoing strengthening of relationships between the Regulatory Compliance team and tangata whenua.

Key highlights within the 2017/2018 period include:

- Early notification aims to ensure all effects (i.e. cultural, environmental, socio-economic, spiritual) from incidents, particularly discharges to water, are dealt with early and provides tangata whenua and kaitiaki an opportunity to inform their own decision-making. Their observations and involvement can then further inform relevant cultural assessments which feed into consent applications.
- Regular meetings and workshops with various tangata whenua across the region (e.g. quarterly meeting with Ngāi Te Rangi regarding Mount Maunganui Industrial area compliance) aim to strengthen communication and relationships, build trust and increase accountability.

Continuing with and adding to the above highlights from the 2017/2018 period will ultimately enable us to have an improved understanding and appreciation of matauranga maori. Greater understanding will drive consistency across the team and improve relationships and collaboration with tangata whenua across the region.

The Bay of Plenty is a growing part of New Zealand, with largescale development occurring throughout the region. Managing environmental outcomes can become more difficult under high growth situations and thus kaitiaki play a significant role in this space. It is the compliance teams focus to progress collaboration initiatives across the region.

He waka eke noa - We're all in this together.

6 Council's Accountability Framework

6.1 Community Outcomes

This project/proposal directly contributes to the Healthy Environment Community Outcome in the council's Long Term Plan 2018-2028.

6.2 Long Term Plan Alignment

This work is planned under the Regulatory Compliance Activity in the Long Term Plan 2018-2028.

Current Budget Implications

This work is being undertaken within the current budget for the Regulatory Compliance Activity in the Annual Plan 2018/2019.

Future Budget Implications

Future work is provided for in Council's Long Term Plan 2018-2028.

Christopher Brewer
Team Leader - Urban, Industry & Response

for General Manager, Regulatory Services

29 November 2018

SUPPORTING DOCUMENT - 2017/18 Annual Regulatory Compliance Report

Information Only Reports

Receives Only – No Decisions

Report To: Regional Direction and Delivery Committee

Meeting Date: 11 December 2018

Report From: Chris Ingle, General Manager, Integrated Catchments

Integrated Catchment Management Update

Executive Summary

This report provides an update on the operational activities of the Integrated Catchment Management teams across the region.

While the Regional Direction and Delivery Committee receives annual plans and progress reports from specific catchment programmes (e.g. Rotorua Te Arawa Lakes, Rangitaiki River and Tauranga Moana Programmes) these tend to focus on high level projects in place with various programme partners.

The intent of this regular update is to provide the Committee with operational updates on the specific biosecurity, biodiversity, engineering, rivers and drainage and land management work of Integrated Catchments staff teams.

Recommendations

That the Regional Direction and Delivery Committee:

1 Receives the report, Integrated Catchment Management Update.

1 Purpose

This report provides an update to the Committee on the operational activities of the Integrated Catchments teams across the region.

2 Regional Overview

2.1 Biosecurity

Sagittaria

A new incursion of aquatic pest plant Sagittaria platyphylla was discovered in Ohauiti in early October. The infestation runs through a private pond system that is shared by 12 landowners. The plants have been controlled and will be monitored monthly for the next several years by Biosecurity staff and contractors.

Myrtle rust

Myrtle rust originates from South America and is a fungal infection that affects plants of the Myrtle family, including some of our iconic natives such as pohutukawa, rata and mānuka and common garden plants like ramarama and lilly pilly. We do not have a good understanding of the long term impact on New Zealand's myrtles and overseas impacts have varied widely from country to country and species to species. However, severe infestations can kill plants with seedlings and regenerating plants being particularly vulnerable.

Since the initial discovery of myrtle rust on mainland New Zealand in the late autumn of 2017, it has spread across most of the North Island and the upper parts of the South Island in a manner that has been consistent with modelling. Taranaki, Auckland and Bay of Plenty continue to be the most seriously affected regions, with more moderate infections in Northland, Waikato, Manawatu and Wellington. Low level infections have also been found in Taupō, Tasman, Nelson, Marlborough, Coromandel and the East Cape area. There are now 784 known infected sites across New Zealand. Most of these infections have been found on ramarama (a native which is widely used in residential gardens) and pohukukawa.

The rust is easily spread by microscopic spores which can be carried long distances by wind, birds, insects, people or machinery. All attempts to contain and control infections to date have failed. MPI and DOC are now focussing on long-term monitoring and researching new management approaches. MPI (along with Council) are also supporting community-led initiatives such as the Manaaki Mauāo project led by Ngāi Te Rangi. MPI are planning to release a draft Long Term Management Strategy for public comment by the end of the year.

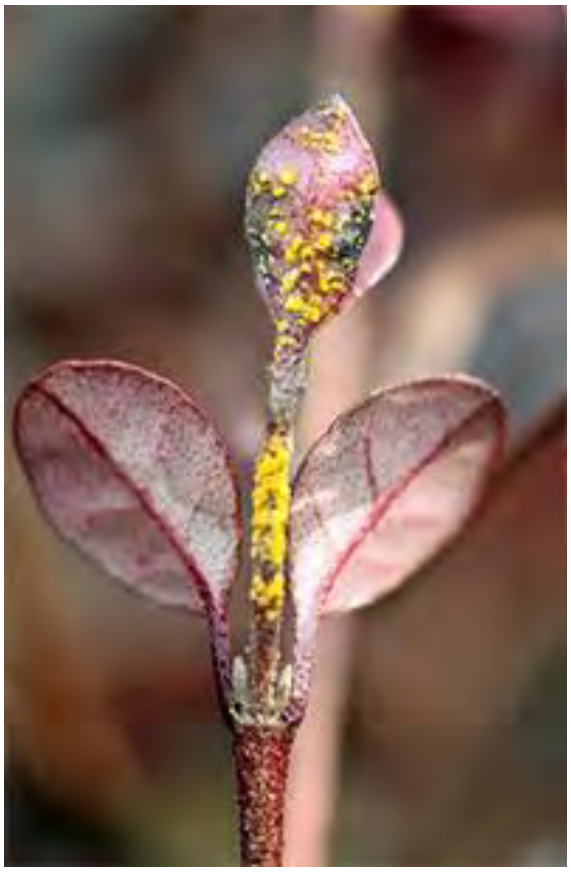


Figure 1: Myrtle rust

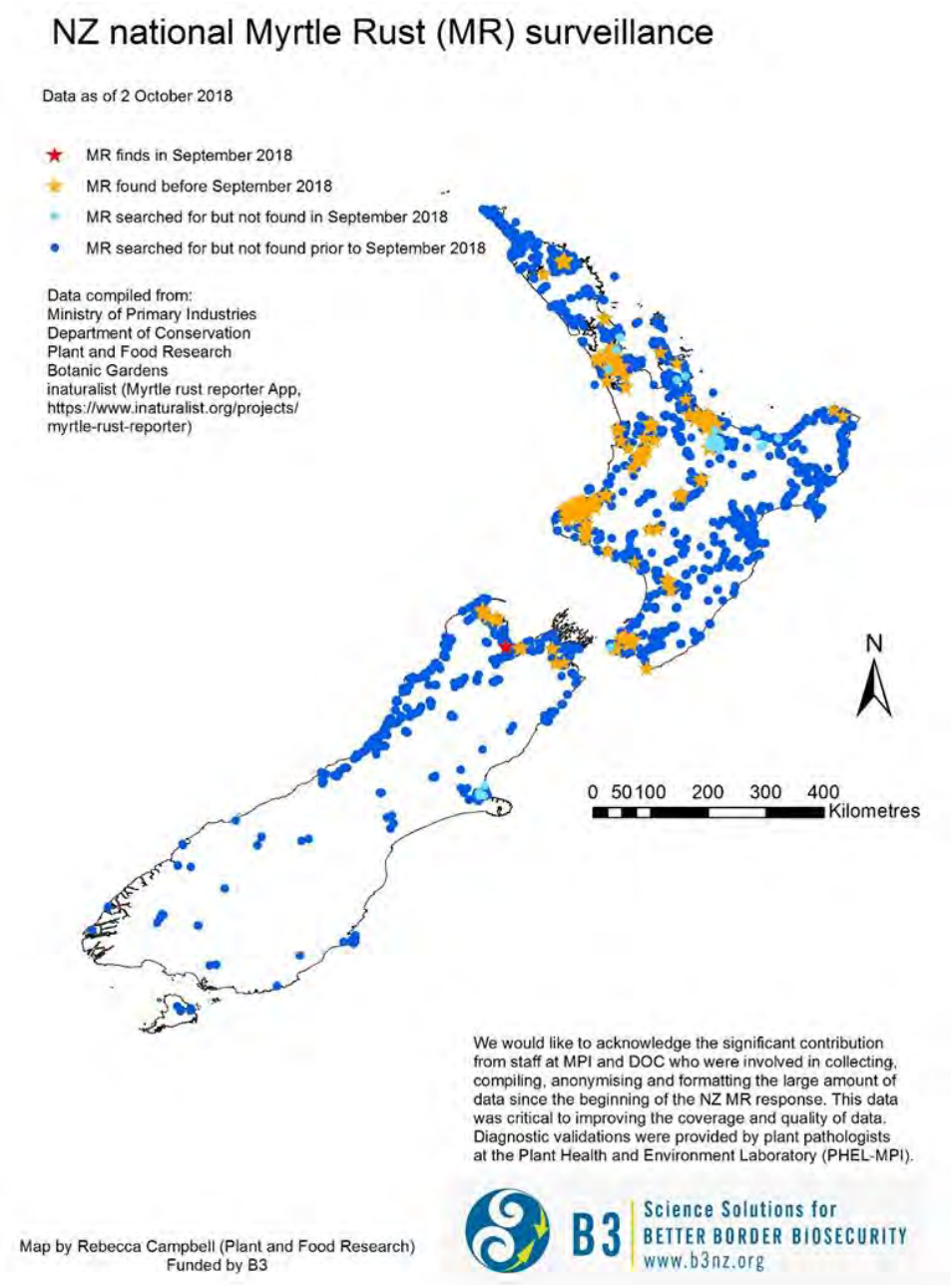


Figure 2: Current Myrtle rust monitoring map. Credit: R Campbell, Plant and Food Reserach, funded by B3

Pest plant surveillance

20 pre-selected high risk sites in Rotorua were inspected for potential new to region pest plants (NRPP). Sites included old nurseries, public gardens, reserves and gully systems. 43 potential NRPP species were found during the inspections. 25 are considered high risk, 16 are moderate risk and two species are low risk. All of the species found were planted in the region before naturalising, mainly via legal or illegal green waste dumping. Surveillance is now underway in Te Puke and Tauranga high risk sites.

Coast tea tree

Aerial spraying of coast tea tree on Matakana Island will be completed this month. This site is the only known site of the pest plant in Bay of Plenty. Coast tea tree has dominated certain parts of the island's eastern dune system, out competing native dune species and accelerating erosion of the dunes. Drone footage will be taken annually to show progress of the control effort and to record rehabilitation efforts of the dunes.

Figure 3: Coast tea tree Matakana Island

Marine biosecurity

Staff organised a well-attended Marine biosecurity workshop as part of the Tauranga Moana Biosecurity Capital. A vessel was lifted out of the sea and inspected for marine pests and highlighted parts of the vessel which can be missed during cleaning and antifouling.

Figure 4: Marine biosecurity workshop 20 October 2018

2.2 Rivers and Drainage

April 2017 Flood Repair Project

As expected, unfavourable ground conditions and wet weather slowed total programme progress for the flood repair project over the winter months. The conditions have allowed a focus on softer engineering works and planning as we head into the summer construction season. Rock supply in the Rangitāiki and Whakatāne areas is of concern and this has influenced the summer work programme planning with a shift in focus to the Kaituna and Waioeka-Otara River Schemes. Continued engagement with key stakeholders for scheduled work and funding has also been a priority.

Highlights for the project during the last month include;

- Preparation of Claim 3 to the Ministry of Civil Defence and Emergency Management for infrastructure repair work.
- Submission of a draft Material Damage Insurance claim to support further progress prepayment.

Tree removal

Tree removal along the Kaituna River right bank has been completed and several flood repair sites are about to commence. Rock supply in the lower Kaituna area has also been challenging as our works are competing for resources with the busy Tauranga construction environment.

Drainage networks

The drainage network desilting and aquatic weed spray programmes are progressing well around the region.

Ngongotahā Flood Response

Response to the 29 April 2018 storm event continues. Various vegetation removal and management sites have been completed. Rock supply and grading issues have been resolved and rock repairs are under way with a busy programme of repair works scheduled over the summer construction season.

Close coordination with staff at Rotorua Lakes Council is taking place with planning and undertaking works close by their assets and adjoining reserve land.

Halt to new commercial gravel extraction allocations on the Whakatāne, Tauranga, Waioeka and Otara Rivers

A decision has been made to halt any new allocations for commercial gravel extraction on the Whakatāne, Tauranga, Waioeka and Otara Rivers until the relevant technical analysis becomes available. This excludes any extraction of gravel for river management purposes e.g. overflow channels. The required technical analysis is programmed for completion in the first quarter of 2019. Commercial extractors are to be advised of this decision soon.

Fish passage

Three fish friendly floodgates have been installed at the Awaiti Canal Floodgate Structure to promote fish passage through this canal system. The gates were fitted as part of a planned replacement of the wooden floodgates and fitted at different levels to suit varying tidal ranges.

Figure 5: Fish friendly floodgate, Awaiti Canal

Upper Rangitāiki River

Maintenance works and flood damage repairs are progressing concurrently at many sites to make efficient use of machinery and resources although some delays are being experienced due to quarry rock supply.

As part of the flood repair works trench willow erosion repairs have been completed at several sites including on Ngati Manawa property and Cobb's farm at Galatea.

A very large erosion site again at the Ngati Manawa property at Kopuriki Road has been completed. This work involved installing 2,000 tonnes of graded rock armouring, works also incorporated a large bench for safe access, along with some land retirement and a planting stabilisation programme.

Gravel extraction works have started on the lower Horomanga River and Jones 'dry wash' on Ruarepuae Stream to minimise the risk of these waterways overflowing.

A new erosion repair methodology has been used on Mangamate Stream using geotextile gabions. This method offers significant cost benefits as well as utilising on-site materials as an alternative to rock. Follow up vegetation planting through and behind the bags will be carried out during the winter planting season and this will provide further reinforcing of the structure as well as shading and aquatic habitat benefits.

Figure 6: Erosion repair using geotextile gabions, Mangamate Stream

Tarawera River mouth whitebait habitat enhancement area

A network of river edge ponds and channels were constructed in 2016 as a collaborative project between BOPRC and local Iwi to enhance off-channel habitat for whitebait and eels. A night time inspection of the channels was carried out recently revealing good numbers of eels and adult whitebait species.

2.3 Coast Care

Coast Care has completed another successful planting season. Volunteers donated 12,000 hours of their time to plant a total of 70,000 plants over 120ha of dunes region-wide. Dune education was a highlight this year with 3,000 students attending beach classes. This is an increase of 1,000 students on the previous year.

Coast Care was also a finalist in the Keep NZ Beautiful Awards. The team attended the Gala dinner held in Auckland 26 October with other finalists. Unfortunately Coast Care didn't win.

Figure 7: Left to right contractors Mei Leong and Wayne O'Keefe, Land Management Officer Paul Greenshields (Coast Care Coordinator),and contractors Chris and Jayne Ward

3 Catchment Manager's Overview

3.1 Tauranga Moana

Sargent Drive

Formal access to BOPRC owned land at Sargent Drive near Apata is in the process of being secured. The property is 20ha and sits on the margins of the Wainui River estuary. It is low-lying and it is likely that it will be restored into harbour margin wetland, a habitat type that has been severely reduced in the Tauranga area.

Project Parore

The Project Parore team presented their vision for a community led catchment project to improve water quality and restore biodiversity to the Te Mania community on October 30. Eighty locals attended to hear about the project and almost all are keen to stay engaged with the project as it progresses.

The aim of the project is to have every property in the catchment develop a property plan based on Good Management Practices to improve water quality and biodiversity in Te Mania. Key industry partners representing the various agricultural sectors have indicated support for the project and staff are currently formalising this relationship. A series of workshops will be held with the Te Mania residents to discuss what Good

Management Practices look like and how we can implement them through a process of farm/property planning.

Summer students

Three summer students will be working with the Land Management team this year. Two will be working on a project to try and isolate the source of bacterial contamination in the upper Wairoa River catchment where swimmability is variable. They will also be surveying barriers to fish passage in the western part of the harbour catchments in partnership with Uretara Estuary Managers. The third student will be working with a University of Waikato student to research sea lettuce survey techniques.

Environmental programmes

In rural Welcome Bay, Steve and Sandra Kafka have had an Environmental Programme with the Regional Council since 2014 which has seen progressive protection and enhancement of streams and wetlands on their property. They grow all their own native plants and get the community involved in their 20 ha project. This year they had extra help from the sailing teams from Tauranga Boys' and Tauranga Girls' Colleges. Each Saturday over winter a group of kids and their parents from the sailing teams planted as a fundraiser for their teams. 7,000 plants were planted this winter.

Ryan Turner has recently purchased a 100ha block of land on Waitao Road, near the top of the catchment. He approached the catchment Land Management Officer with plans to fence all of the streams on his land and provide a 20m buffer around the wetland areas. This links into work previously done by Heritage Hills Farms at the very top of the catchment and beginning of the Arateka Stream. The Arateka Stream eventually flows into the Waitao Stream, where the Waitao Landcare Group works. Having willing landowners like this achieves greater environmental outcomes by linking up waterway protection between properties within catchments.

3.2 Lower Kaituna

Kopuaroa sub-catchment meeting

The Kopuaroa Stream is a small tributary sub-catchment of the Kaituna River between Te Puke and Pāpāmoa. Water quality monitoring shows that it has some of the highest contaminant levels in the catchment, which feeds into Maketū Estuary. Staff met with 18 landowners from within the Kopuaroa sub-catchment on 9 November to discuss the water monitoring results and consider ways in which the landowners might work together to improve water quality. The landowners were very interested in the results, particularly the data from within their own properties. Landowners seem really keen to find ways to make things better.

From here, landowners and staff will monitor water quality every quarter at eight sites in the sub-catchment, and there is a possibility that a Kopuaroa Stream Care Group may form in the community following the next meeting, in the new year. Staff will now engage with individual landowners in the sub-catchment to help identify critical source areas for contaminants and consider how these might be better managed. It is likely that a number of Environmental Programmes will be negotiated.

Kaituna River re-diversion and Te Awa o Ngatoroirangi / Maketū Enhancement Project

As of 31 October, the Kaituna River Re-diversion Project was 29% complete after 19% of the contract period. It is well ahead of schedule, and within budget (although there are some variations pending). 75% of imported material has now arrived on the site.

A community information evening was held on 7 November. Around 50 interested members of the public were present for a guided walking tour of the construction site followed by a presentation and further question time.

Ford Road and access to Te Tumu Cut will be reopened to the public on 20 December as required by the consent. This will be unrestricted until 7 February, when the road will be closed from 7:00am until 7:00pm each day, but open in the evenings.

Figure 8: Ford Island Loop

3.3 Rotorua Lakes

A detailed report on progress with the Integrated Framework for Lake Rotorua is provided as a separate report in this Agenda.

Incentives scheme

The Lake Rotorua Incentives Committee has commenced their Strategic Review as required by the Terms of Reference. The review outcomes will be presented to Council in March 2019.

A further Incentives deal has been approved for 1.2 tonnes by the Incentives Committee 8 November bringing the total amount of nitrogen secured to 20.4 tonnes.

Gorse Conversion Project

A deal for 98 hectares of gorse conversion is pending, which would take gorse conversion in the catchment to around 186 hectares.

Tarawera catchment

A blessing was held late October at Mount Tarawera to commence the 2018/19 wilding pine control project which the Regional Council supports. Along with ecological benefits the project creates year round employment for locals when combined with the Acacia control project as the base of Tarawera during winter.

The Tarawera Sewerage Steering Committee (which includes Regional Council representatives) have adopted a preferred option for sewerage reticulation at Lake Tarawera. This includes grinder pumps and reticulation down Tarawera Road back to the Lake Rotorua wastewater treatment plant. Detailed planning and design will now commence, led by the Rotorua Lakes Council. This preferred option requires no resource consents from the Regional Council.

Community

The Waiowhiro care group has had a successful season of rubbish collection, weed control and planting along a 300m stretch of the Waiowhiro Stream. Planning works for stage 2 is now in full swing, which will commence over the coming year.

Figure 9: Weed control and planting undertaken by the Waiowhiro Stream Care Group

The Paradise Valley Catchment Group is gaining traction with three environmental programmes and one land use change programme. The group is also planning on undertaking water quality monitoring in the Ngongotahā Stream in the coming year.

Joe Fleet, a member of the Rotorua community, has helped the Volcanic Zone Scouts join forces on a long term project to plant a native forest alongside State Highway 5, 5km south of Rotorua. Over time, they will continue to work on the site that has been running for over 20 years, to plant the native forest where there is currently blackberry and acacia. Goals this year are to prepare the site, and then plant 1,000 trees and shrubs in the autumn.

Regional Council staff spent two hours collecting rubbish along a section of the Mangakakahi Stream as part of WorkWell Activities undertaken during Mental Health Week. A ute load of rubbish was collected, sorted and recycled where possible. More staff rubbish clean-up events are planned.

Low Nitrogen Land Use Fund 2018

Full applications have closed for round two of the Low Nitrogen Land Use Fund with 10 applications received for $1.9 million. The applications include proposals to establish glass bottling for fresh milk, a hemp trial, sheep milking, eco-tourist cabins and further development of a feijoa orchard. A recommendations paper will be going to Rotorua Te Arawa Lakes Strategy Group 14 December. This paper will be confidential due to the commercial nature of the discussion.

Komiti Maori

To follow up with the concerns raised about the Utuhina Stream and Ruapeka (Ōhinemutu) at Komiti Māori in October, the Rotorua Catchments team organised a hui with local representatives and Rotorua Lakes Council to discuss those issues and actions moving forward. An action list has been compiled and a follow up hui will be held in early 2019.

3.4 Eastern Catchments

Environmental programmes – Rangitāiki catchment

Eighteen environmental programmes within the Rangitāiki catchment will deliver 18.5 km of new streamside fencing this financial year, including 6.5 km at Lochinver Station. One new priority 1 biodiversity site owner has signed up to an environmental programme which is being implemented this financial year.

Maramara a Tawa (near Waiohau) restoration is progressing nicely. Native plants which were once covered by willows are becoming visible, and the wetland is distinctly different with the native understory coming away. The coming years focus will be on weed control.

Figure 10: Left to right, photo taken 20 December 2016, photo taken 5 November 2018 - Maramara a Tawa restoration

Rangitāiki wetlands project

Landowner discussions for this MfE funded project are continuing, although two of the original proposed sites/landowners have withdrawn from the project. The remaining discussions underway are positive and are allowing the project planning to be refined. Baseline bird monitoring is well underway, with contractors and local iwi representatives from Ngāti Manawa undertaking site surveys. The surveys have identified bittern which is an exciting find, due to the scarcity of this native wetland bird species nationally.

Waiōtahe Catchment Project

The Waiōtahe catchment project continues to be a key focus for Land Management staff, to address water quality concerns including the bacterial contamination of pipi in the Waiōtahe estuary. Bacterial contamination of the river and the pipi bed is a complex issue. Of all the contaminants of freshwater resulting from farming, bacteria are the least understood and the most difficult to mitigate. It is expected that multiple solutions will need to be looked at to address this issue.

4 Implications for Māori

Integrated Catchment management staff work closely with Maori at both a governance level as well as an operational level across the region. At the governance level, all four catchments have at least 1 co-governance arrangement in place and these have oversight of many of the work programmes our teams are delivering.

Operationally, staff work directly with iwi, hapū, marae and trusts on a number of restoration projects to improve the health of the land and water. Operational opportunities are identified through relationships that staff have with kaitiaki and resource managers. They are also identified through Hapū Management Plans, as staff use these documents to understand the priorities and areas of significance for hapū, throughout the catchments.

5 Council's Accountability Framework

5.1 Community Outcomes

This work directly contributes to all four of the Long Term Plan's community outcomes: safe and resilient communities, a healthy environment, a vibrant region and freshwater for life.

5.2 Long Term Plan Alignment

This work is planned under the Integrated Catchment Management, Flood Protection and Control, Resource Regulation and Monitoring, and Technical Services Group of Activities in the Long Term Plan 2018-2028.

Current Budget Implications

This work is being undertaken within the current budgets for the Integrated Catchments, Flood Protection and Control and Resource Regulation and Monitoring activities in Year 1 of the Long Term Plan 2018-2028.

Future Budget Implications

There are no future budget implications.

Heidi Fraser
Programme Coordinator Integrated Catchments

for General Manager, Integrated Catchments

30 November 2018

Report To: Regional Direction and Delivery Committee

Meeting Date: 11 December 2018

Report From: David Phizacklea, Regional Integrated Planning Manager

Housing Capacity Targets and Urban Growth Update

Executive Summary

The National Policy Statement for Urban Development Capacity (NPS-UDC) contains requirements for local authorities to set housing capacity targets in their regional policy statements and district plans. This matter was discussed at a Regional Direction and Delivery Committee Workshop on 20 March 2018.

A new policy is to be inserted into the Operative Regional Policy Statement to include these housing targets. This is a discreet change that does not require a Schedule 1 process under the Resource Management Act 1991, and will be formalised through a public notice. The new policy introduces the estimated number of new houses to be enabled over the next 30 years. How and where this housing capacity is realised will be addressed through the Future Development Strategy.

Consultation has closed on the Draft Future Development Strategy for the western Bay of Plenty sub-region. Substantial feedback has been received and a summary of the key themes will be presented to the meeting.

The Regional Policy Statement work programme for 2019-20 has budgeted a wider review of the urban growth provisions that apply across the western Bay of Plenty sub-region. This is so that sufficient development capacity can be enabled by the territorial local authorities to meet the requirements of the National Policy Statement for Urban Development Capacity and Future Development Strategy. The proposed future RPS change will also take into account emerging central government policy direction through the Urban Growth Agenda. Flexibility in consideration of new proposals for housing developments outside the urban limits will also be a key consideration.

Recommendations

That the Regional Direction and Delivery Committee:

1 Receives the report, Housing Capacity Targets and Urban Growth Update.

2 Notes that the Bay of Plenty Regional Policy Statement will be changed prior to 31 December 2018 to insert a new Policy UG 25B with targets for housing development capacity for the western bay sub-region, as contained in Appendix 1 to this report.

1 Purpose of Report

This report advises on implementation of the National Policy Statement for Urban Development Capacity (NPS-UDC) for the western Bay of Plenty sub-region. It covers:

- the insertion of housing capacity targets into the Regional Policy Statement (RPS),
- an update on the progress of the Future Development Strategy (FDS), and
- the forthcoming review of urban limits and other urban growth provisions in the RPS.

This report seeks that the Committee note the insertion of targets into the RPS as the change is a statutory requirement and must be completed by 31 December 2018.

Given the extent of change in the area of urban growth planning across the SmartGrowth partnership and the demands on Bay of Plenty Regional Council, updates are provided on the FDS project and issues to be covered in the future RPS work programme.

2 Background

Regional Direction and Delivery Committee workshops on urban growth issues were held in March and June 2018, covering the NPS-UDC requirements. In addition, there was a comprehensive paper to the 8 May 2018 Committee meeting that set out how implementation of the RPS Urban and Rural Growth Management policies and methods is tracking and whether the relevant objectives are being achieved.

The SmartGrowth partner councils are required to work together to implement the National Policy Statement for Urban Development Capacity. An update on the three specific short-term deliverables is as follows:

NPS-UDC requirement	Update
Prepare a Housing and Business Development Capacity Assessment (HBDCA)	Now finalised and endorsed by SmartGrowth Leadership Group at its meeting 7 September 2018.
Insert housing capacity targets into the Regional Policy Statement (and district plans)	A new policy UG 25B is to be inserted into the RPS and is attached as Appendix 1.
Produce an Future Development Strategy	Consultation is now complete on the Proposed FDS.

3 Housing Capacity Targets to be inserted into RPS

The NPS-UDC recognises the national significance of urban environments and the need to provide sufficient feasible development capacity. Local authorities that have part or all of a high-growth urban area in their district or region ('high-growth local

authorities') are required to set minimum targets in their relevant regional policy statement or district plan by 31 December 2018. Local authorities that share jurisdiction over an urban area are strongly encouraged to collaborate and cooperate to agree upon the specification of minimum targets.

Policy PC 5 of the NPS-UDC states:

"Regional councils shall set minimum targets for sufficient, feasible development capacity for housing … and incorporate these minimum targets into the relevant regional policy statement."

Note that the minimum targets do not address how or where development capacity in a region or district will be provided, or identify what plan changes are required to implement the targets.

Policy PC6 of the NPS-UDC provides that a regional council should set minimum targets under policy PC5 for the medium and long term. The short term is within the next three years; the medium term is between three and 10 years; and the long term as between 10 and 30 years. It is recommended the minimum medium-term target includes the short-term projected demand and the 20 per cent additional margin; i.e. a minimum target covering the first 10 years. The long-term minimum target covers the 20-year period from year 10 to year 30, and includes the 15 per cent additional margin.

A new policy – Policy UG 25B to insert minimum housing capacity targets into the Regional Policy Statement is provided in Appendix 1. The targets were developed from extensive work on the HBDCA and are included in the Proposed FDS on page 25. Our approach has been endorsed by Ministry for the Environment officials and does not require a public consultation process under Schedule 1 of the RMA. Submissions on the FDS have not questioned the projected numbers of dwellings required as these are based on population and demographic projections of demand.

The targets assigned to Tauranga City and Western Bay of Plenty District Councils will be inserted into their district plans via the same approach without using a Schedule 1 RMA process. All three councils are planning to do a public notice in the same newspaper/s on or before 21 December 2018.

4 Future Development Strategy Update

Consultation on the Proposed FDS concluded on 5 November, and a substantial amount of feedback was received through a variety of channels. A brief report went to the SmartGrowth Leadership Group on 21 November that summarised the consultation process.

While the numbers of people are not high, they represent useful responses to key elements of the two documents we consulted on.

- 101 people attended one of the five Community Conversations held in Te Puke, Katikati, Barkes Corner, Pāpāmoa and the CBD.
- 45 SmartGrowth forum members attended the briefing session
- 7 people attended the stakeholder briefing
- 185 people completed the online survey
- 237 total submissions received including survey responses

- 1100 visits to the SmartGrowth website during October 2018.

All the feedback, which amounts to over 850 pages, has been made available to members in the Stellar Library. The key submission themes and how to respond to the matters raised from feedback will be discussed at the SmartGrowth Leadership Group meeting on 12 December 2018.

5 Regional Policy Statement Work Programme

The RDD Committee made the following decision at its 15 May 2018 Meeting:

"Notes refining and streamlining of the RPS Urban and Rural Growth Management provisions is required, including consideration of natural hazards, transport, freshwater, and climate change matters, and should occur ahead of the formal review of the second generation RPS in 2024."

A change to the urban and rural growth management section of the RPS is planned for 2019/20, being Year 2 of the LTP 2018-2028. This change will:

- give effect to the NPS-UDC
- implement policy changes arising from the FDS (once finalised by SmartGrowth) and Tauranga Urban Strategy
- seek to amend the urban limits at Katikati, Waihī Beach, Te Puke, Pāpāmoa and Welcome Bay (sought by WBOPDC and TCC)
- strengthen the existing transport infrastructure provisions
- consider greater flexibility in circumstances where it may be appropriate to develop outside the urban limits for residential or business purposes.

Work on the scope of that change is intended to commence once there is certainty from the SmartGrowth partnership on the FDS settlement pattern.

Consultation and engagement carried out on the FDS and TUS will be a key input to the section 32 evaluation required to support the RPS change.

This future RPS change will take into account the emerging Central Government policy direction, for example any initiatives under the Urban Growth Agenda. Use of the RMA Streamlined Planning Process may be an option for this RPS change. The outcomes of the separate Urban Form and Transport Initiative (UFTI) will also feed into the future change to the RPS. The terms of reference of the UFTI are to be discussed at the Regional Council meeting on 13 December 2018.

5.1 Urban Limits

The scope of this future RPS change will include a review of the urban limits that apply across the western bay sub-region. The RPS urban limits line has generally achieved its purpose of providing certainty to where urban development will occur and the sequencing of infrastructure servicing within subsequent growth areas.

The rigid approach of restricting urban development within the urban limits has been questioned in recent months however. This is especially the case in the current context of rapid population growth, the policies of the NPS-UDC which require responsive planning approaches, and risks highlighted in the Proposed FDS. Public and

stakeholder feedback has highlighted the growth pressures and the risks of delays to delivering the medium term greenfield growth areas.

In this regard, the SmartGrowth Leadership Group resolved at their 21 November 2018 meeting that:

1. *"SmartGrowth partner staff actively progress opportunities to meet short term land supply by taking into account the following guidelines:(refer A to L in substantive report), which shall be appropriately weighted on a case by case basis, and*
2. *in parallel, work will continue on medium term supply through the Future Development Strategy, Tauranga Urban Strategy, residential intensification projects and Greenfield Urban Growth Areas, and*
3. *together with the Tu Pakari Advisor SmartGrowth, partner staff will continue to progress opportunities to engage with Maori organisations to support their land development aspirations."*

The 12 guidelines A to L referred to above are assessment criteria to be applied by council staff on a case-by-case basis when a proposal for new urban development outside the urban limits is considered. This approach is likely to be temporary until a proposed change to the RPS has evaluated the merits of the urban limits line in a comprehensive manner pursuant to a statutory RMA process.

6 Implications for Māori

Substantial feedback on the Proposed FDS was received from Māori, including from the combined tangata whenua forum and iwi authorities such as Nga Potiki Resource Management Unit and Pirirakau Incorporated Society.

Other potential interests arise for Māori in the western Bay because:

- there are pronounced needs in terms of affordability and access to an adequate standard of housing.
- some large areas of rural land is in multiple Maori ownership. It is consistent with the principles of the Treaty of Waitangi and Part 2 of the RMA to recognise and provide for the establishment of papakainga and associated supporting facilities on Maori land
- there are complicating factors that impact the viability of urbanising multiple-owned Māori land, including access to capital and finance.

Given the above, there may be a need for specific RPS and plan provisions to enable the development of multiple-owned Māori land. As a first step the FDS will need to raise some potential solutions to these issues.

The SmartGrowth partners agreed on 21 November 2018 to consider any proposals for new urban development outside the urban limits on a case-by-case basis subject to certain guidelines. In regard to the potential for new rural land being opened up for development, note that the Tauranga City Plan identifies Significant Māori Areas and the Western Bay of Plenty District Plan identifies cultural heritage features and boundary overlays. Both plans recognise and provide for the protection of these areas where proposed development may affect them. Otherwise cultural impacts or considerations still need to be assessed on a site by site basis. The operative Bay of Plenty Regional Policy Statement contains Iwi Resource Management provisions

which need to be taken into account by the territorial authority decision makers when considering SHA applications.

7 Council's Accountability Framework

7.1 Community Outcomes

Urban growth management directly contributes to the Vibrant Region Community Outcome in the council's Long Term Plan 2018-2028. Council is delivering on its statutory requirements to take a lead role in integrated growth management.

7.2 Long Term Plan Alignment

This work is planned under the Regional Planning Activity in the Long Term Plan 2018-2028. Inserting targets in the RPS is a statutory requirement of the NPS-UDC.

Current Budget Implications

This work is being undertaken within the current budget for the Regional Planning Activity in Year 1 of the Long Term Plan 2018-2028.

Future Budget Implications

Future work on an RPS change is provided for in Council's Long Term Plan 2018-2028.

Adam Fort
Senior Planner

for Regional Integrated Planning Manager

30 November 2018

APPENDIX 1

New Policy UG 25B for Insertion into Regional Policy Statement - Targets for Housing Development Capacity - Western Bay of Plenty Subregion

Policy UG 25B: Targets for housing development capacity – western Bay of Plenty sub-region

Provide housing development capacity within the western Bay of Plenty sub-region for the period 2018–2048 as set out in the table below:

Geographical Area	Number of dwellings – development capacity to be enabled		
	Medium Term 2018 – 2028*	Long Term 2028 – 2048*	30 Year Total 2018 – 2048
Tauranga City	16,500	25,500	42,000
Western Bay of Plenty District	5,000	5,000	10,000
Total for Sub-Region	**21,500**	**30,500**	**52,000**

**The medium term target includes an additional margin of 20% capacity and 15% for the long term target.*

Explanation

The National Policy Statement for Urban Development Capacity (NPS-UDC) requires minimum targets for sufficient, feasible development capacity for housing in the western Bay of Plenty sub-region. The minimum targets represent development capacity for housing required to be enabled, rather than the amount of housing built in each term. The targets will be reviewed every three years following the completion of scheduled capacity assessments.

The targets are for the medium and long term and reflect the projected number of dwellings required based on projected demand. They include an additional margin for development capacity of at least 20% in the medium term and 15% in the long term, as required by the NPS-UDC.

These targets represent the development capacity that Tauranga City Council and Western Bay of Plenty District Council shall enable through their district plans, structure plans, growth and infrastructure strategies.

The NPS-UDC requires that medium term development capacity must be feasible, zoned and either serviced with development infrastructure, or the funding for the development infrastructure required to service that development capacity must be identified in the relevant long-term plan required under the Local Government Act 2002.

Long term development capacity must be feasible, identified in relevant plans and strategies, and the development infrastructure required to service it must be identified in the relevant Infrastructure Strategy required under the Local Government Act 2002.

Table reference: ***Objective 25****, Methods 1, 14 and 16*

Receives Only – No Decisions

Report To: Regional Direction and Delivery Committee

Meeting Date: 11 December 2018

Report From: Kataraina O'Brien, Strategic Engagement Manager

Update - Community Funding Requests 2015-2018

Executive Summary

The purpose of this report is to update the Regional Direction and Delivery Committee on community funding requests showing highlights and statistics from the Environmental Enhancement Fund and the Community Iniatitves Fund over the last three years. The report also provides an update on the current trend of community funding requests and how each fund is positioned to respond to these requests.

The Environmental Enhancement Fund ($300,000 p.a.) is a seed fund which provides community groups, kura, hapū, iwi and other entities the opportunity to undertake environmental enhancement projects on public land or land with public access. The fund continues to be a great mechanism for the community to actively participate in projects and initiatives that add value to our physical environment, but also to social and cultural environments through relationships, networking and support for the volunteers and kaitiaki across the region.

The Community Initiatives Fund ($200,000 p.a.) is a contestable external fund, through the Long Term Plan every three years for non-infrastructure related funding requests, available to all organisations. The report provides brief highlights from each organisation on funding they received from the Community Initiatives Fund 2015-2018 and how they contributed towards our community outcomes.

Through the Long Term Plan 2018-2028, $300,000 per annum funding was approved for the Environmental Enhancement Fund and $200,000 per annum towards the Community Initiatives Fund.

Recommendations

That the Regional Direction and Delivery Committee:

1 Receives the report, Update - Community Funding Requests.

1 Environmental Enhancement Fund

1.1 Background

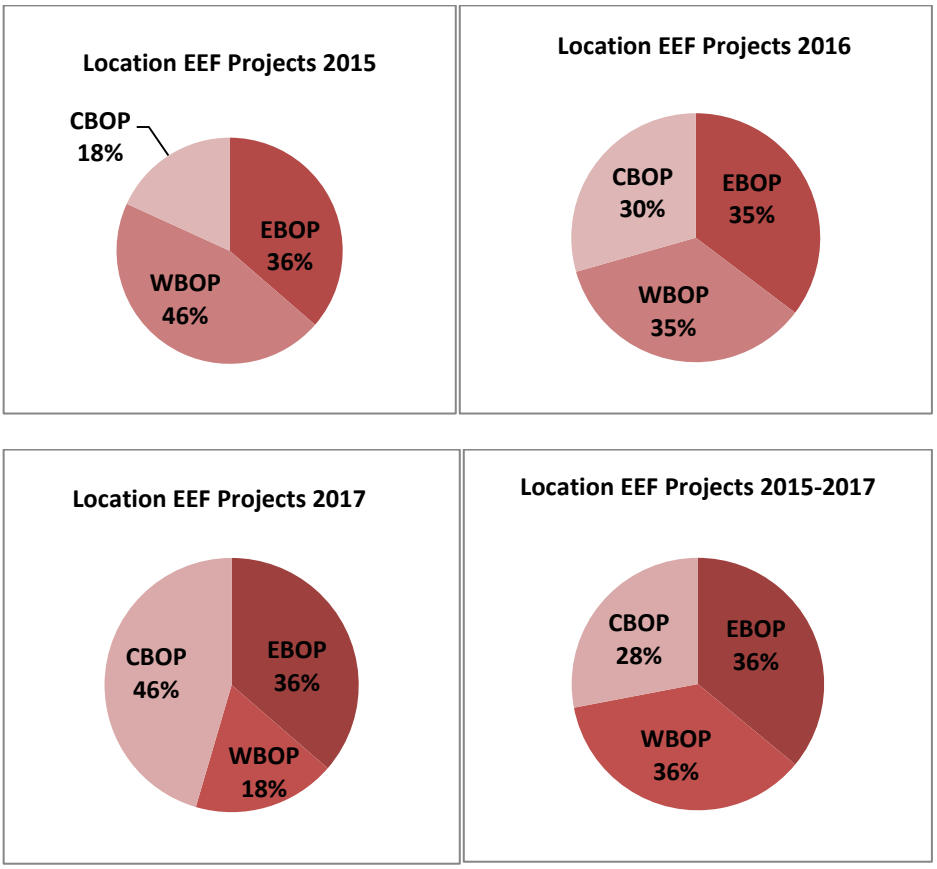
The Environmental Enhancement Fund (EEF) was established in 2000 as a proactive approach for the Bay of Plenty Regional Council (BOPRC) to work with communities on projects that enhance the

environment. The purpose of EEF is to contribute to our community outcomes and assist Bay of Plenty organisations and community groups with financial support which promote, enhance or protect the natural and physical environment.

EEF has continued to bring value and benefit to our environment through the efforts of staff and volunteer community groups. To date over $8.7million has been distributed to over 580 environmental projects within the region. Enabling volunteers supports the way we work as an organisation, in particular "We look to partnerships for best outcomes".

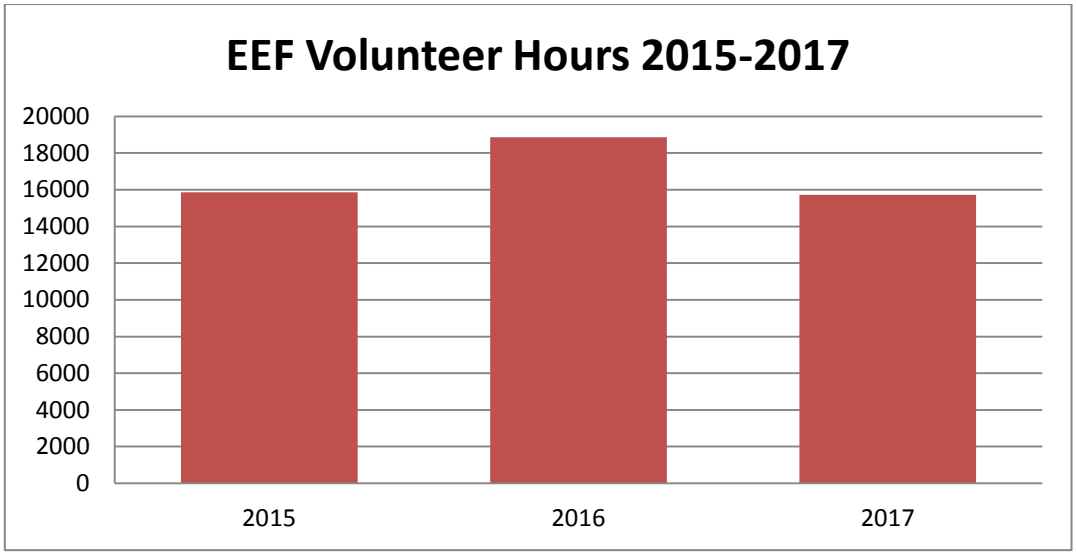
1.2 2015-2017 Funding Review

Over the last three funding years, just over $900,000 has been provided to 50 community projects across the region. Refer to the infographics below which detail the location of projects across the region, the number of native plants planted and the number of volunteer hours the EEF has achieved followed by a review of these statistics.

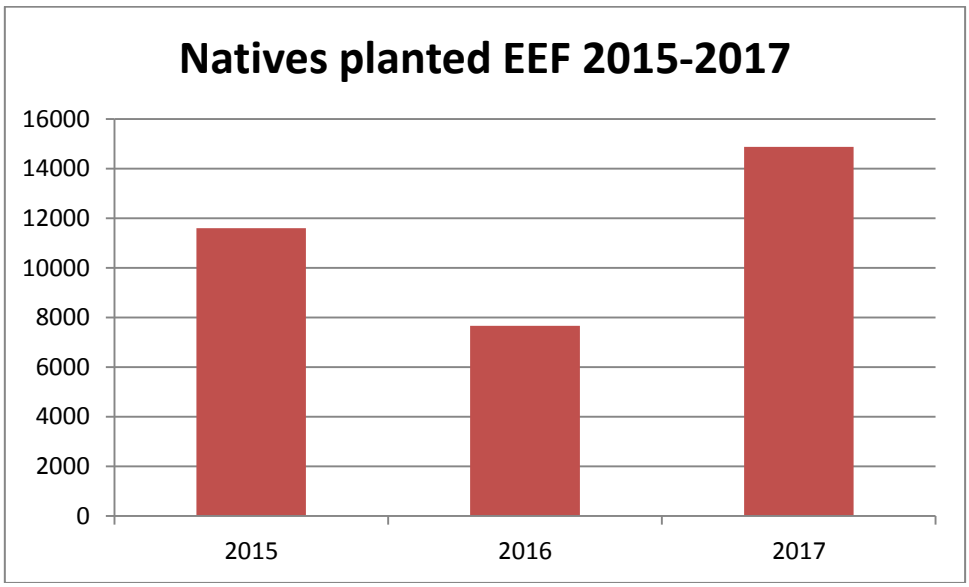


There has been an even spread of projects across the three regions of Bay of Plenty with Western and Eastern undertaking 36% of projects closely followed by Central (Rotorua District) with 28%. Central saw a large increase in 2017 largely due to the work of new land management officers in the area and a number of local awa projects which started with one marae.

Through word of mouth around the rohe, a number of other marae applied for funding. This is what we love to see with the EEF, one project being successful and creating a precedent for other groups within the rohe to try and do the same.



Volunteer hours have been consistently between 15,000 and 20,000 over the last three years with the highest number of volunteer hours in 2016 at 18,862. Total volunteer hours over the last 3 years are 50444, at minimum wage rates of $16.50 this equates to $832,326 of volunteer time and effort towards our EEF projects.



More than 22,000 additional natives have been planted over the last three years through Environmental Enhancement Fund grants supporting both the “Healthy environment” and ‘Freshwater for life” community outcomes. The number of natives planted peaked in 2017 at 14,874 mainly due to 10,000 plants being funded to Te Roopu Manaaki for their Kani Rangi Park project.

The scale of native planting in projects has scaled back in recent years to smaller projects doing smaller areas of planting. This has been a coordinated effort of EEF staff and Land Management staff to ensure that projects are successful long term.

By starting small in their first year of funding, the next year when the project group is applying for funding, staff are able to better gauge whether the group has easily maintained their project site and could go on to a bigger project.

This is substantiated by the results of the EEF assessment undertaken by the community engagement summer student in 2017. Of the 49 projects completed or close to completion during this time 41 were assessed showing that the average project has been mostly successful long term, receiving a rating of 2.5 out of 3. This demonstrates that most projects are achieving and sustaining their long term goals.

2 Community Initiatives Fund

2.1 Background

The Community Initiatives Fund ($200,000 p.a.) is a contestable external fund through the Long Term Plan every three years for non-infrastructure related funding requests available to all organisations. This fund was introduced during the 2012-2022 Long Term Plan so Council could make informed budget decisions on funding requests rather than receiving adhoc requests at Council meetings throughout each year. Council still has the discretion to fund further projects or organisations outside the Long Term Plan process as they did last year in funding Mōtū Trails $10,000.

2.2 2015-2018 Community Initiatives Fund Recipients

Through the 2015-2018 Community Initiatives Fund, seven organisations were funded a total of $200,000 per annum. Four of these organisations were successful in receiving further funding in the 2018-2021 Community Initiatives Fund while the other three did not re-apply. Please find below a brief comment on each organisations success and key highlights from their funding over the last three years.

2.3 Bay of Plenty Cats

Bay of Plenty Cats were funded a total of $50,000 for two years. Key highlights for BOP Cats were managing 77 colonies and being able to close 50 of those colonies generally in the Rotorua area. Over 500 cats were de-sexed avoiding thousands of unwanted offspring. Bay of Plenty Cats did not re-apply to the Community Initiatives Fund in 2018.

2.4 Envirohub (Formerly Tauranga Environment Centre)

Envirohub received a $100,000 per annum for all three years. Envirohub facilitates the Regional Environment Network and through their funding provided a number of training initiatives based on the needs of the community. Their funding culminated in an Annual Regional Hui in 2018 which was well attended by community group members across the Bay of Plenty.

2.5 Water4 Schools

Water4Schools received $15,000 for one year and installed six water tanks at kohanga, primary and secondary schools with at least one in each region of the Bay of Plenty.

2.6 Surf Life Saving Bay of Plenty

Surf Lifesaving received $12,000 per annum for three years towards their core services which helped enable them to complete rescues along a number of our BOP beaches. Surf Lifesaving are wishing to change their funding to a targeted rate from 2021 onwards.

2.7 Sustainable Business Network

Sustainable Business Network received $12,000 per annum for three years towards their core services and transport. Glen, on behalf of the network, is a passionate advocate for community for broad sustainability issues.

2.8 BOP Tertiary Intentions Strategy

A one off payment of $10,000 was provided to the BOP Tertiary Intentions Strategy to help with the completion of the strategy.

2.9 2018-28 Community Initiatives Fund Recipients

Please find a table below showing Community Initiatives Fund 2018-2021 recipients and the number of years they're receiving funding for.

Organisation	Year 1	Year 2	Year 3
Surf Lifesaving NZ (Eastern Region)	$30,000	$30,000	$30,000
Sustainable Business Network	$32,000	$12,000	$12,000
Te Rūnanga o Ngāi Te Rangi Iwi Trust	$19,000	$19,000	$19,000
Envirohub (Tauranga Environment Centre)	$70,000	$70,000	$70,000
Discovery Through Nature Ltd	$15,000	$20,000	$20,000
Bay Conservation Alliance	$20,000	$20,000	$20,000
EERST (Water 4 Schools project)	$12,380	-	-
Rotorua X Charitable Trust	$2,333	$2,333	$2,333

2.10 Community Funding Request Trends

The Community Initiatives Fund received a large increase in applications this year. In 2015 12 applications were received totalling $681,000, compared to 16 organisations requesting over $2.8million in 2018.

Over the last few years, requests to support environmental education programmes and research/water monitoring have increased. The Environmental Enhancement Fund does not provide funding for either of these types of requests from the community, meaning organisations must wait and apply through the Community Initiatives Fund on a three year cycle.

Three out of the eight approved requests for the 2018-2021 Community Initiatives Fund were environmental education related, with two other education requests being unsuccessful. A number of community members also ring requesting funding to do water monitoring testing on their local awa so they can ascertain the health of their local awa.

This report does not wish to make recommendations to change the criteria to allow these types of funding requests but seeks feedback from Council as to whether they think either of the education or monitoring requests should be made available through the Environmental Enhancement Fund.

3 Marketing of Funds

The Community Initiatives Fund was promoted through the Long Term Plan process. Any organisations that previously sought council funding that did not meet the criteria of the relevant fund were encouraged to apply to the Community Initiatives Fund. During the Long Term Plan, the fund was marketed alongside the Long Term Plan on our website, at community engagement events and also through a number of other networks. Previous applicants were directly contacted and invited to apply.

EEF is run on a first-in first-served basis. Since the fund began in 2000, the fund has been fully allocated every year. A small number of projects in recent years have been carried over until the beginning of the next financial year due to funding being fully allocated that year. We have chosen to maximise existing council channels and free externals channels rather than used paid advertising for EEF. In future, if a district appeared to be underrepresented staff would seek to rebalance that through targeted promotion.

EEF is generally marketed through word of mouth from organisations and marae and has been successful in doing this for a number of years. Land Management Officers in particular are vocal advocates for EEF in their work in the community and encourage applications where applicable. It is also marketed through events the community engagement team attend on behalf of Council. Some events EEF has been marketed at over the last six months include; Envirohub Care Group Conference, Te Ra Rehia, Te Puke Environment Forum, Te Maru o Kaituna Document launch Komiti Māori and EEF Project Events i.e. plantings, openings.

Each July a press release highlights successfully completed EEF projects and announces the fund is open again which media organisations can choose to publish. Other marketing of the fund generally happens through the success of a number of projects which receive media attention and pay thanks to the funding they have received from Bay of Plenty Regional Council through the EEF. Acknowledgement of EEF Funding is a requirement within EEF contracts for any media and signage.

4 Implications for Māori

Māori play a large role in community funding requests with 32% of EEF projects over the last three years being kaupapa Māori related. Funding for Māori organisations to undertake environmental kaupapa Māori based projects helps to build or strengthen relationships and trust with Regional Council**.**

Of the four kaupapa Māori applicants to the Community Initiatives Fund 2018-2021, Ngai te Rangi were the only successful applicant. A reasons for this included similar work already being planned or underway in the area, issues pertaining to District Council rather than Regional Council and one application not scoring against the criteria as highly as other applicants.

A budget of $26,667 has been set aside in Year 2 and Year 3 of the Community Initiatives Fund to trial a pilot programme to support outcomes of the wananga with iwi and hapu for better engagement with Council.

5 Summary

This report aims to show the significant benefit and impact that community funding has within our communities across the entire region and how funding directly contributes to each of our four community outcomes. The number of volunteer hours that are undertaken as part of EEF projects are a key outcome for Council.

They not only save Council money but also help to strengthen or build relationships with our local community group members who are sacrificing their time daily, weekly or monthly. Receiving funding from Council allows them to focus on the things they love to do as a volunteer; which is being out in our environment planting or checking traps.

The Community Initiatives Fund 2015-2018 covered a broad range of target areas across all six organisations. The fund allowed Council to supply environmentally focused organisations with funding to contribute to our outcomes at a lower cost than Council could. The Community Initiatives Fund 2018-2021 received an unprecedented amount of applications and funding requested creating questions on whether the increased trend of environmental education programmes or local water monitoring testing should be made available through the Environmental Enhancement Fund.

6 Council's Accountability Framework

6.1 Community Outcomes

Environmental Enhancement and Community Initiatives Fund directly contributes to all the Community Outcome/s in the council's Long Term Plan 2018-2028.

6.2 Long Term Plan Alignment

Both funds are funded $500,000 per annum in the Long Term Plan 2018-2028.

Current Budget Implications

This work is being undertaken within the current budget for the Annual Plan 2018-2019 or Year 1 of the Long Term Plan 2018-2028.

Edward Sykes
Community Engagement EEF Coordinator

for Strategic Engagement Manager

30 November 2018