



Problem Statement

What is the problem?

Council regularly monitors the effects of wastewater discharge on the Manawatū River. In 2011, monitoring results raised concerns that the general health of the river and its life-supporting capacity were being negatively impacted by wastewater discharge. Higher levels of nitrogen and phosphorus from the wastewater were increasing periphyton (green algae) growth, reducing the oxygen available to support the river ecosystem.

Palmerston North City Council had lodged a consent in 2006 to reduce levels of phosphorus and suppress periphyton growth during summer when river flows are low. However, despite suppression, the phosphorus levels remained sufficient to sustain periphyton growth. Investigations identified that river sediments were adsorbing phosphorus from the wastewater throughout the year and releasing it during summer. Further investigations identified that nitrogen in the wastewater was also contributing to the periphyton growth in the river during low summer flows.

Periphyton growth has been increasing in rivers around New Zealand over the past 15 years. The National Policy Statement for Freshwater Management 2020 (NPS-FM) requires councils to improve degraded water bodies and ecosystems by monitoring and managing nitrogen and periphyton levels.

After a review of the existing discharge consent, Council agreed to bring forward the date of a new application for wastewater discharge from 2028 to 2022. This initiated a broader look at the city's wastewater system and the health and future of the Manawatū River. Using a Best Practicable Option (BPO) approach, Council is

investigating, assessing and consulting on a shortlist of five options for discharge of treated wastewater to river, land and ocean. Council will identify the BPO for the new wastewater treatment and discharge solution by June 2021.

Currently approximately 17% of wastewater from New Zealand's treatment plants is discharged into rivers, 75% into the ocean, and 8% to land. Many treatment plants can discharge to a combination of land and rivers, providing options to manage the amount of wastewater going into rivers especially during low flow periods.

When the BPO for the wastewater system has been identified, Council will prepare new resource consents and lodge them with Horizons by June 2022. The new consents will need to accommodate increased population, business growth and resulting wastewater flows and contaminant loads. Council will be seeking consents for 35 years, the maximum duration for a consent under the RMA, and the consents will need to provide resilience and flexibility for innovation and technological developments over this period.

Who could be affected by the new wastewater system?



What evidence do we have?

Council's monitoring programme measures the quality and quantity of treated wastewater and a wide range of health indicators for the Manawātū River. Monitoring provides us with historical data on river and wastewater volumes enabling us to identify seasonal fluctuations and trends. This information is used to make predictions about our future wastewater flows and assess shortlist options for effectiveness, cost and potential impacts.

Environmental Monitoring

To monitor the effects of the current treated wastewater discharge to the Manawātū River we measure:

- Chemical, biological, microbiological and particulate contaminant levels in the treated wastewater and in the receiving river environment.
- Periphyton growth.
- Cyanobacteria.
- Effects on macroinvertebrates.
- Adverse effects on aquatic life, using the QMCI (Quantitative Macroinvertebrate Community Index).

Treated wastewater monitoring

To ensure treated wastewater meets the conditions of the current consent, we monitor wastewater flows and volumes and test for a range of water quality indicators including levels of nitrogen and phosphorus.

1,250
samples are
taken every year

20
different sampling
points along the river
are used

More than
6,400
tests are completed
to measure
compliance with our
resource consent
conditions.

Additional
lab tests also
help us ensure
compliance
with our
resource
consent
conditions.

Further investigations

In 2013, a study was undertaken to understand the processes driving periphyton growth in the Manawātū River and the implications for wastewater treatment. The study report describes a complex river ecosystem where the balance of nutrients (nitrogen and phosphorus), periphyton (algae) and macroinvertebrates is affected not only by wastewater discharge but also the upstream water quality. Seasonal fluctuations like dry weather river flows add complexity.

Next steps - Consent requirements and process

Consent requirements

In New Zealand, resource consents are required for activities that could have adverse effects on the environment. For wastewater systems, consents are required for the discharge of odour, discharge of treated wastewater to a receiving environment (land, ocean or river) and for the construction of supporting infrastructure.

To gain resource consents for the wastewater BPO we need to:

- describe all the activities comprising the wastewater system that needs to be consented.
- demonstrate how these comply with relevant statutory policies and regulations.
 - identify and quantify any potential adverse effects on the receiving environments.
 - demonstrate how we will prevent or mitigate each adverse effect.
 - consider what exceptional circumstances could lead to breaches, the frequency, magnitude and duration of any breaches and how we would manage these.

Who are we engaging with?

Stakeholder feedback is a key part of determining the best practicable option for the wastewater system. It helps us to understand the effects of the various options on the community. The RMA requires Council to include information in the consent application about how we worked with stakeholder groups such as trade waste dischargers, environmental interest groups, agribusiness, ratepayers and the wider community to develop wastewater options and how we continued to work with these groups to narrow the options down.

Mana Whenua are project partners and have been involved with determining the best practicable option for the wastewater system since project inception. Iwi have been working with Council throughout the process.

Looking to the future

The current resource consent authorises the discharge of up to 42,000 cubic metres per day (dry weather flow) of treated wastewater from the Palmerston North Wastewater Treatment Plant to the Manawatū River. The average volume of wastewater discharged (dry weather flow) during 2020 was 25,695m³ a day, of which 4948m³ a day came from trade waste.

The new consents will need to accommodate increased population, business growth and resulting increase in wastewater flows and contaminant loads.

The table below provides a snapshot of our projected future requirements to be accommodated by the new consent.

Current and future wastewater needs:

Now	Future (50 year planning horizon – 2073)
In dry weather, 250 litres of wastewater per person in the city arrives each second to the treatment plant	In dry weather, we estimate 350 litres per second to arrive at the treatment plant
25,300 connections/collection points	34,106 to 49,000 connections*
26 pump stations	27 – 30 pump stations depending on option chosen
358km wastewater pipe network	365 – 396km pipe network depending on option chosen
Population	
88,300 (June 2019)	120,000
Wastewater contaminant loads	
Nitrogen load is 1200 kg per day	Nitrogen load estimated to be 1632 kg per day
Phosphorus load is 196kg per day	Phosphorus load estimated to be 302kg per day

**This estimate is based on the current rate of 3.5 people per connection, urban intensification will increase this number. The figures provided represent an upper and a lower boundary for the number of connections in the future.*

Outcomes focus



PNCC has identified 11 key outcomes for the BPO process and the preferred option:

- 1. Protect public health and minimise public health risks**
River, ocean and land health can affect people who live, work or play in these environments. The BPO seeks to eliminate risks to public health wherever possible and minimise the impact of any remaining potential risks.
- 2. Minimise environmental effects on air, land and water.**
We're identifying possible environmental effects through the BPO process and planning to minimise them in the construction and operation phases.
- 3. Contribute to improving the health and mauri of the Manawatū River**
The preferred option will improve the health of the Manawatū River. Working with Mana Whenua we will ensure the mauri of the river is upheld during the BPO process and as a project outcome.
- 4. Active engagement of key stakeholders and the community**
Households, businesses and communities create, use and pay for wastewater and are engaged at all stages of the BPO process.
- 5. Be affordable and cost effective**
The BPO process considers capital and operating and maintenance costs as well as potential income streams so our preferred option represents the best value.
- 6. Be innovative and evidence based**
Research and technical investigations are used to gather evidence and understand our environment and requirements.
- 7. Be sustainable, enduring and resilient**
An enduring solution that provides sustainable wastewater management and offers resilience against future events and changes.
- 8. Take an integrated approach to wastewater management**
The preferred option will consider and manage cumulative effects on the Manawatū River catchment.
- 9. Minimise carbon and maximise resource recovery**
Our BPO process will consider the whole of life carbon emissions for each option and resource recovery opportunities to minimise waste.
- 10. Facilitate long term growth and economic development**
The preferred option will accommodate projected economic growth and development.
- 11. Enhance people's use and enjoyment of the Manawatū River**
The Manawatū River will continue to be a place for the community to enjoy leisure and recreation activities.

The five short list options are:



Option 1

River (Totara)



Option 4

Land (45-55%) + River (45-55%)



Option 2

River (Totara + Opiki)



Option 6

Ocean



Option 3

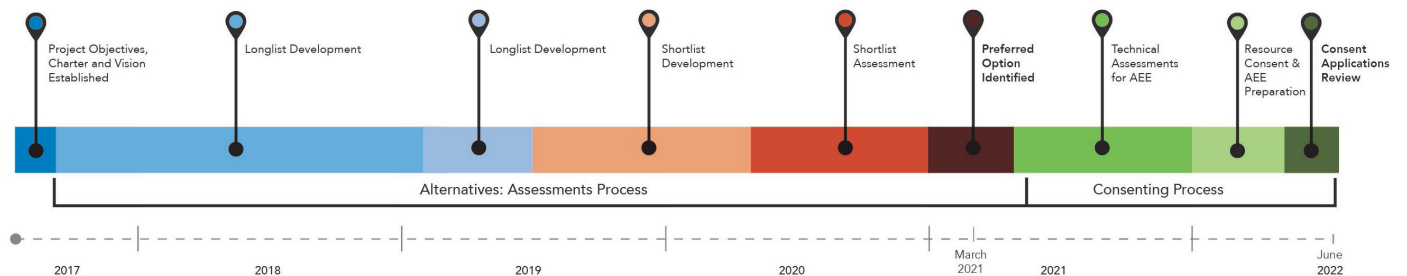
Land (97%) + River (3%)

About this project

The Nature Calls project takes a fresh look at how we manage wastewater in Palmerston North and what we need to achieve before 2022 to future-proof our wastewater management and infrastructure. The process involves engagement with iwi, the community and stakeholders as well as technical investigations, including this one. The timeline below shows expected project progress through to June 2022 when the consent applications for the preferred option will be lodged.



Project timeline



For more information, contact us.

For more information about wastewater, the Nature Calls project and the shortlist options:

Visit www.pncc.govt.nz/naturecalls

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NATURE CALLS

HE TIROHANGA HOU KI TE WAI PARA