

Report to Wastewater Management Committee (WMC) by Wastewater Options Review Group (WORG)

OVERVIEW

This report summarises the results of WORG's considerations to develop sustainable practical and cost-effective wastewater management options for Gisborne.

The objectives are to identify and refine options for the management of Gisborne's wastewater to no more than three wastewater management options, taking into account the human health, economic, social, cultural and environmental outcomes relating to wastewater management envisaged as a result of current consents.

WORG considered options in accordance with the principles and matters in the Terms of Reference. While there are potentially a number of options, WORG discounted those that did not meet the criteria. For example, the "Do Nothing" Option, was not supported by WORG as it did not meet "outcomes...envisaged as a result of current consents".

This report represents the consensus view of WORG on the preferred wastewater management options for Gisborne. While there are 6 options presented in this report, more options and variations within those options were considered.

WORG understands that this is a recommendation to WMC, who will in turn make its recommendation to Council.

Council, as consent holder, will need to decide whether it wishes to consider other options.

The recommendation of WORG is that the preferred wastewater management option for Gisborne is **OPTION 3**:

Existing BTF, plus Clarification and solids handling, additional redundancy measures, UV treatment, conveyance (pipes and pumps), polishing wetland (12 hectare; 10 hectares wetland plus 2 hectares roads, etc.), discharge to ocean outfall through construction and establishment periods (short term), with continued investigation into AUD options and ultimately no more discharge of treated domestic waste to sea (longer term).

Note: *This option does not propose a second BTF.*

And that the new consent, or consent variation, would be for 10 years only, allowing demonstration of Council's commitment to the AUD process.

BACKGROUND

The 2014 consent variation for the WWTP included a number of conditions, (Refer Attachment A) in particular:

Clause 4

The permit holder shall:

(b) Undertake further feasibility work to confirm the most appropriate long-term management option for Gisborne's wastewater, including the feasibility and level of community acceptance of an alternative wastewater management system, which may involve a range of alternative, use and disposal (AUD) options, to wastewater disinfection,

provided that any alternative wastewater management system to wastewater disinfection must meet or exceed the standards for wastewater discharge set out in clauses 40 – 62 of this consent; and

(c) By 31 December 2016, confirm the feasibility of an alternative wastewater management system and commit to undertaking further consultation, detailed design, and consenting processes in order to implement this system; and

(d) By 31 December 2018, lodge the necessary applications and/or notices required under the RMA to implement the preferred alternative wastewater management system with the intention for construction by 31 December 2019 and in any event no later than 12 months after the commencement of all necessary authorisations.

It also included conditions relating to the goal of ceasing the discharge of human waste to the marine environment by 2020 and for the consent holder to apply best endeavours to this and adoption of AUD options (Clause 8).

The Wastewater Management Committee (WMC) was established by Council as a condition of the consent (Clause 12). WMC is required to monitor progress and report to Council on the performance and the meeting of the consent conditions.

The Wastewater Technical Advisory Group (WTAG) was set up as a consent condition (Clause 4A) to *“initiate the BTF monitoring and investigation study and provide advice and peer review for wastewater alternative use and disposal (AUD) programme”* and report to WMC on progress on these studies and towards meeting consent conditions.

Council was required under Clauses 5, 6, & 7 to *“initiate a research/study programme...to investigate AUD”* and WTAG was set up to assist meeting those conditions.

The WTAG was required to report at least annually. The third annual report by WTAG was required 3 years after commissioning the single BTF, with regard to the items in Clause 4A (iv).

In particular, Clause 4A (iv) (f) directed WTAG to *“Recommend what additional treatment steps (if any) are required to achieve biotransformation and other requirements that may be necessary to improve the quality of the discharge to avoid adverse effects”*.

The following Clause 4A (iv) (g) noted that *“In the event of the WTAG being unable to make a recommendation to the permit holder as per (f) above, or the permit holder refusing to implement any recommendations as per (f) above, then clause 37 and clause 43 shall take effect”*.

The final WTAG report was delivered in November 2016. However, whilst alternate management systems were shown to be technically feasible, this report did not reach a point where WTAG could recommend a specific preferred alternative wastewater management system to WMC. As a consequence, council could not confirm by 31 Dec 2016 which wastewater management option(s) to take into the consultation phase (to be followed by detailed design and consenting) (Refer Clause 4c above).

On 1 December 2016, Council established the Waste Options Review Group (WORG) to develop sustainable practical and cost-effective wastewater management options, that are compliant with the consents and meet the economic, environmental, social and cultural needs of stakeholders and council’s communities.

The WORG consists of iwi and council representatives. Its membership is that of WMC plus an independent chair.

The objectives are to identify and refine options for the management of Gisborne's wastewater to no more than three wastewater management options, taking into account the human health, economic, social, cultural and environmental outcomes relating to wastewater management envisaged as a result of current consents.

The Terms of Reference (Attachment B) sets out guiding principles and matters to be taken into account by WORG in its consideration of the wastewater management options.

DISCUSSION

WORG has had seven meetings in 2017 – 15 February, 28 March, 03 April, 19 April, 12 May, 01 June, and 20 June.

Staff have provided information on potential options and a range of matters and provided responses to questions and information requested by WORG. This has been supported by expert advice from external subject matter experts.

In considering available options, WORG considered alternative ways so that human health was protected and not only focussed on the feasibility, but also the intention of the consents to pursue AUD and to ultimately remove the discharge of human waste from the bay.

While none of the options considered can deliver on all those aims, at this time, (given funding constraints/affordability, time to construct and the lack of AUD available at present), some options are better at enabling those aims in the future.

The WORG was of the opinion that not enough has been done in terms of identifying alternate use and disposal options. The point was also made that an integrated AUD strategy has not been developed. WORG are keen that all AUD options are explored, including a managed aquifer recharge of the Te Hapara aquifer. There is also an understanding that AUD could in part be seasonal, and would develop / be taken up over time as perceptions on re-use of treated wastewater and solids change.

To support these aims, WORG has looked at the options based on a "building blocks" approach. This would allow for components of the wastewater management system to be developed and added in future as technology develops and AUD opportunities become available. It would also allow staging of the system to assist in constructability, operational requirements and funding.

However, by following this approach, WORG also expects that the consent holder will actively work on AUD options and develop a strategy concurrent with constructing the preferred wastewater treatment and management option.

Building Blocks

Before describing the options, a short explanation of the "building blocks" and their functions would be useful. This should be read in conjunction with the Infogram shown in Attachment C (courtesy Cr Dowsing, with amendments from Council). It is noted the cost figures are preliminary.

Note: Screens are provided before the treatment process. These screens remove grit and solids which are presently taken to landfill. This component is common to all options.

Biological Trickling Filter (BTF)



The BTF is a large tank filled with plastic media. The wastewater trickles over the media and through a natural biological process it is broken down and treated. The BTF reduces many contaminants such as Biological Oxygen Demand (BOD). This creates an ecology in the BTF which grows on the wastewater as a food source. A biofilm is created - similar to slime on rocks in streams. The BTF is efficient in converting the waste, but it does not remove some contaminants such as pathogens and viruses. However, this process produces solids in the form of biomass/plant matter which needs to be flushed through the system periodically. These suspended solids make it difficult to disinfect (to destroy the pathogens) and so a clarifier is needed to remove the solids.

Clarifier



While the wastewater passing through the BTF has a high level of treatment, pathogens, viruses and emerging contaminants are not removed. Disinfection is the process to remove the remaining pathogens and viruses (those things harmful to human health). During the BTF process, however, biomass is produced and increases the suspended solids in the effluent. Periodically flushing (every 24hrs) adds further to the suspended solids content. A clarification step will remove the suspended solids to enable effective disinfection.

Disinfection



Disinfection removes pathogens from the wastewater. There are a number of systems to do this, e.g. chlorine, ozone and ultraviolet light (UV). UV is the most effective and does not leave potential chemical residues. For effective disinfection, UV requires that the wastewater has a low level of suspended solids – hence the need for pre-clarification.

Wetlands



Wetlands are natural systems that treat wastewater contaminants by means of physical, biological and biochemical processes. Key treatment processes are performed by biological communities within biofilm that is attached to plants, plant roots, and within the soils in the wetland base. Wetlands include both aerobic and anaerobic chemical processes, enabling the removal of a wide range of contaminants (including nutrients, bacteria, heavy metals, as well as a wide range of emerging contaminants). They also offer indirect benefits, such as water storage, ecosystem goods and services, and social benefits.

Denitrifying Sand Filters



These filters will promote denitrification in an anoxic environment. In order to achieve low levels of total nitrogen in the discharge a carbon source such as ethanol is required. They also do a good job in filtering out any suspended solids and microbial contaminants.

Denitrifying Woodchip Filters



These filters remove nitrate by using woodchips as a slow release of organic carbon to promote denitrification in an anoxic environment. They also do a good job in filtering out any suspended solids and microbial contaminants, and have been shown to reduce emerging contaminants.

The Options

WORG has considered a range of options and variations within those options. The assessment has been carried out based on the principles and the matters to be taken into account, as set out in the Terms of Reference.

While there are a range of permutations, WORG deliberated and settled on specific options and then assessed these.

The final list of options is shown in Attachment C and each option is discussed below. The following discussion is a summary of the key elements of the options and WORG's conclusions. The section below, "Assessment of Options", provides more detail of WORG's considerations. Readers can source the analyses and supporting information in the reports to WORG. These are referenced at the end of this report (Attachment D).

OPTION 1: Current Treatment System (Banks St) plus Clarification and disinfection

Description

Comprises the existing system with clarification and UV disinfection added, and no additional BTF

Comments

There was much debate on whether the existing consent (and variations) requires a second BTF. This aspect was discussed from 2 perspectives:

1) Outputs and discharge quality from the existing system (one BTF):

The present system is not meeting consent conditions of discharge quality to the marine environment, in terms of suspended solids and enterococci; and

2) the loading rate of the BTF:

The consent conditions set a loading rate (i.e. an input) for the BTF that has not been achieved. The loading rate implies the need for a second BTF.

It was accepted that the provision of clarification and disinfection would enable the discharge to meet all the default discharge quality requirements as stipulated in the consent without the need for an additional BTF.

However, the loading rate of the BTF has not been achieved. Furthermore, this option assumes a continued discharge to the marine receiving environment. The proposal to include a second BTF or not, needs to consider resilience, operational matters and potential AUD.

Option 1 would require a consent variation. If it was considered to be a “final solution”, it does not meet the intentions of AUD nor the progressive removal of the discharge of human waste to the Bay.

WORNG does not support this option.

OPTION 2: Current Treatment System (Banks St) plus an additional BTF, clarification and UV disinfection

Description

Comprises the existing system with an additional BTF, and with clarification and UV disinfection added. This is referred to as the Default option, fully compliant with the default conditions in the consent.

Comments

This option is essentially the addition of a second BTF to Option 1. This will enable compliance with the loading rate requirement of the current consent. However, as noted above, it will not significantly alter receiving environment outcomes.

WORNG considers that the default option still requires further consideration of AUD (clause 8) as it has not been assessed sufficiently. Methods of treatment have been assessed, but best endeavours for AUD may not have been met. A legal opinion has been requested by WORNG.

There was discussion that a second BTF could provide more resilience in the system. However, this is not the case. A second BTF would be operating in parallel with the existing BTF (to meet the loading consent condition). It could not be turned “off and on” to cover for mechanical failures or to deal with inflows of toxic wastewater. There may be dilution benefits, but it would not really cope with adverse events.

Overall this option does not meet the intentions of AUD nor the removing the discharge of human waste to the Bay.

WORG does not support this option.

OPTION 3: Current Treatment System (Banks St) plus Clarification, UV, and 12ha polishing wetland

Description

Comprises the existing BTF, plus Clarification and solids handling, additional redundancy measures, UV treatment, conveyance (pipes and pumps), polishing wetland (12 hectares; 10 hectares wetland plus 2 hectares roads, etc.), discharge to ocean outfall through construction and establishment periods (short term), with continued investigation into AUD options and ultimately no more discharge of treated domestic waste to sea (longer term).

Note: This option does not propose a second BTF.

Comments

The purpose of Wetlands are noted above under “Building Blocks” and the benefits are discussed more fully in the section “Assessment of Options”, below.

WORG considers this the starting point option. This option provides building blocks to enable future opportunities for alternative use and disposal (AUD) – another condition of the consent. WORG believes a commitment by council to establish a process that works specifically on finding AUD options, including a collaborative development of the strategy and its practical implementation

WORG believes that as the outputs from the present BTF are generally meeting the consent conditions, then it is better to invest part of the cost (e.g. second BTF) into researching and implementing AUD options.

This would need to form part of any new consent or consent variation, plus GDC would need to resource the further AUD work.

WORG is of the opinion that the new consent, or consent variation, should be for 10 years only. The above (consent timeframes, AUD investigations, and resourcing) would be a demonstration / confirmation of Council’s commitment to the AUD process.

This would mean the following in terms of timelines and expenditure:

- By 2020: Redundancy Measures + Clarification & Solids Handling + UV (approx. \$22M)
- Between 2020 and 2028: Conveyance + Polishing Wetland (approx. \$ 12M)

WORG supports this option.

OPTION 4: Current Treatment System (Banks St) plus additional BTF, clarification, UV disinfection, 12ha polishing wetland

Description

Comprises the existing BTF, plus an additional BTF, Clarification and solids handling, additional redundancy measures, UV treatment, conveyance (pipes and pumps), polishing wetland (12 hectare), discharge to ocean outfall through construction and establishment periods (short term), with continued investigation into AUD options and ultimately no more discharge of treated domestic waste to sea (longer term).

Comments

This option is an advance on Option 3 . Depending on AUD, Council may wish to add building blocks/ components in the future that match AUD needs. E.g. If nitrates are an issue for AUD then can add Filter – if not an issue then the system won't need to add it. However, WORG suggests that the additional costs are better spent on finding and implementing AUD options. Extra components can be added on later to match AUD opportunities.

OPTION 5: Current Treatment System (Banks St) plus additional BTF, clarification, UV disinfection, sand filter, 12ha polishing wetland

Description

Comprises the existing BTF, plus an additional BTF, Clarification and solids handling, additional redundancy measures, UV treatment, a denitrifying sand filter, conveyance (pipes and pumps), polishing wetland (12 hectare), discharge to ocean outfall through construction and establishment periods (short term), with continued investigation into AUD options and ultimately no more discharge of treated domestic waste to sea (longer term).

Comments

This option is an advance on Option 4. However, WORG suggests that the additional costs are better spent on finding and implementing AUD options. Extra components can be added on later to match AUD opportunities.

OPTION 6: Current Treatment System (Banks St) plus additional BTF, clarification, UV disinfection, woodchip filter, and 18ha treatment wetland

Description

Comprises the existing BTF, plus an additional BTF, Clarification and solids handling, additional redundancy measures, UV treatment, conveyance (pipes and pumps), a denitrifying woodchip filter (2 hectare), treatment wetland (18 hectare), discharge to ocean outfall through construction and establishment periods (short term), with continued investigation into AUD options and ultimately no more discharge of treated domestic waste to sea (longer term).

Comments

This option is an advance on Option 5. However, WORG suggests that the additional costs are better spent on finding and implementing AUD options. Extra components can be added on later to match AUD opportunities.

Assessment of Options

All options include the existing BTF, with the addition of a clarifier and disinfection.

As noted in discussion on OPTION 1 above, there is debate about the need for a second BTF. The WORG is of the opinion that the \$12M for a second BTF would be better spent on finding and implementing AUD options. The system does not need a second BTF for water quality reasons, and could integrate other redundancy measures (e.g. spare rotator arm, backup wetting system, etc.) to cater for potential outages at the treatment plant.

The inclusion of a wetland would also add resilience to the overall wastewater management system, as any potentially hazardous spillages / upfront treatment failures could be 'mopped up' and contained in the wetland. Such an incident would likely damage the front part of the wetland only, and wetlands bounce back well.

A second BTF in parallel to the existing BTF would not mitigate the concern of upstream spillages etc. damaging the BTF e.g. a bleach spill into the wastewater network would then affect two BTFs rather than one, which would potentially just cost more to fix. There is the possibility of having upstream monitoring to warn of any spills, but it would be extremely costly (and impractical) to monitor (telemetered; real time) for the full range of potential toxic chemicals that could enter the waste stream and monitoring would unlikely provide sufficient warning to divert spills.

The point was also made that if there was such a monitoring system, then it would better to have just have one BTF and divert such a spill to wetland.

So, a second BTF is something that would only be considered quite far into the future, if a higher level of nutrient treatment was needed for a specific AUD option.

The argument could also be made that the system does not need the wetland for AUD as it could simply be a matter of taking a pipe from Banks Street to industry, irrigation areas, etc.

However, inclusion of a wetland has some distinct advantages:

- The wetland offers storage of peak flows, which allows for flow buffering, enabling complete re-use / disposal of treated wastewater (one would only be able to take off about 30% of the treated wastewater without storage)
- The treated wastewater would have been through a polishing stage which would have reduced heavy metals and emerging contaminants, rendering the treated wastewater more useable
- The polishing wetland would further reduce pathogen (incl. virus) risks
- The wetland would be located closer to potential agricultural water users, aquifers, and the sand dunes – this would reduce conveyance requirements
- The cost of conveyance to the wetland would be incurred anyway if AUD options on land to the west of the city were taken up
- Over time (long term) the wetland could be augmented with further treatment components (e.g. aeration for nitrification and Woodchip Denitrification Filters for denitrification) that may enable passive discharge into groundwater (another form of alternate disposal)
- The wetland would also go some way to address a number of cultural requirements (e.g. enhance/improve the mauri of the water, 'through a land component', etc.)
- The wetland would moderate variability in water quality
- Importantly, a polishing wetland also shows Council's commitment to AUD.

However, there is a cost of maintaining and replacement of wetlands over time.

Conclusion

WORG considers that **Option 3** is the preferred wastewater management option for Gisborne:

Existing BTF, plus Clarification and solids handling, additional redundancy measures, UV treatment, conveyance (pipes and pumps), polishing wetland (12 hectares; 10 hectares wetland plus 2 hectares roads, etc.), discharge to ocean outfall through construction and establishment periods (short term), with continued investigation into AUD options and ultimately no more discharge of treated domestic waste to sea (longer term).

Note: *This option does not propose a second BTF.*

This will require a pipeline to and from a remote wetland site in the short term, with a continued discharge to sea whilst Alternative Use and Disposal (AUD) options are further investigated. This is with the aim of ultimately stopping all domestic discharges to sea (in which case return pipe becomes a redundancy / resilience feature).

WORG also considers that the new consent, or consent variation, should be for 10 years only, allowing demonstration of Council's commitment to the AUD process by investigating and being ready to start implementation of AUD options within 10 years.

WORG notes that the Terms of Reference sets objectives of identifying and refining no more than three wastewater management options for Gisborne. WORG has concluded that **Option 3** is its preferred option (together with a 10 year term) and does not recommend any of the other 5 options, at this stage, presented in this report. It is anticipated that in the future, when AUD options are implemented then extra "building blocks" may be required. This may lead to variations based on Options 4 through 6 being required to match the needs of alternative uses.

WORG also acknowledges that Council has other wider roles and responsibilities and may wish to consider other options to take through its public consultation processes.

Peter Higgs

Chair

WORG

5 July 2017

Key dates

- WMC meeting 6 July – Changed to 11 July 2017.
- Future Tairāwhiti meeting 20 July – Workshop. Noting paper.
- Full Council meeting 17 August – Decision (Project team presenting)

Attachment A)

IN THE MATTER of the Resource Management Act 1991

AND an application pursuant to section 127 of the Act by Gisborne District Council: Engineering and Works Department to the Gisborne District Council for changes to the discharge consent for the Gisborne Wastewater Treatment Plant that provides for the discharge of treated wastewater to the coastal marine area from an offshore outfall (consent reference CD-1208-02 ex CP-1208-01).

DECISION BY INDEPENDENT HEARINGS COMMISSIONERS

ON BEHALF OF GISBORNE DISTRICT COUNCIL

1.0 SUMMARY OF THE PROPOSAL AND THIS DECISION

The Gisborne District Council, Engineering and Works Department has made an application for a series of amendments to the clauses of the existing discharge consent for the Gisborne Wastewater Treatment Plant (as determined by the variation decision in 2009).

The primary amendment seeks to defer the installation of disinfectant treatment and to allow additional time to consider alternative forms of treatment and disposal. The deferral proposal has been endorsed by the Wastewater Management Committee which was constituted to ensure partnership between the Council, tangata whenua, and the wider community in deciding the best long term option for wastewater disposal. The application also proposes a number of amendments to the monitoring and testing regime.

This decision report leads to a decision to grant consent to the application to change the conditions of the existing consent as sought, subject to conditions.

The application is an outcome of a very positive process which has forged new partnerships between the Council, tangata whenua, stakeholders and the wider community and through this application there is a genuine commitment by all parties to properly evaluate alternative disposal and treatment options as part of moving towards a vastly improved wastewater discharge.

The effects of the discharge are found to be acceptable and granting consent to the application will be consistent with the relevant planning instruments and with the sustainable management purpose of the Act.

The specific amendments sought by the applicant are largely accepted, however the consent now granted includes some minor revisions to the review condition and also some revisions to the monitoring regime including revisions to the camera operation in Clause 61 where we accept recommendations from the Council officers.

2.0 APPOINTMENT

Messrs Nigel Mark-Brown, Antoine Coffin and Alan Watson have been appointed as Independent Hearings Commissioners (“**Commissioners**”) by the Gisborne District Council (“**the Council**”) in terms of section 34A of the Resource Management Act 1991 (“**RMA**” or “**the Act**”) to consider the application details and the section 42A RMA report by the Council’s officers and to make a decision on the application.

The appointment of independent Commissioners was deemed appropriate by the Council given the Council is both the applicant and the consent authority responsible for deciding the application. In this decision report it is referred to as “**the Council**” in its role as the consent authority and otherwise where appropriate as “**the applicant**”.

The information available to us comprised the application and its attachments and the section 42A RMA report prepared by Mr Todd Whittaker, an independent planning consultant. The Commissioners are each familiar with the site and locality area for the proposal from earlier visits and/or work in Gisborne.

The application is for a change of consent conditions in terms of section 127 of the RMA. However we note there is reference in the application and other documents to it being a “**consent variation application**”. In this decision report we refer to “**the application**” or “**the proposal**”. We also use both the terms “**Clauses**” and “**Conditions**” when referring to the conditions on the discharge consent.

3.0 BACKGROUND TO THE APPLICATION

The discharge of wastewater into Poverty Bay has been contentious for a long period of time. The Council and community’s position on the need to consider upgrading and alternative forms of wastewater treatment and disposal has evolved over time. The position of tangata whenua has been resolutely opposed to the discharge of human waste into Poverty Bay. The existing outfall was commissioned in 1964, and other than the installation of milliscreens in 1991 few other treatment steps occurred until the commissioning of the Biological Trickling Filter¹ (“**BTF**”) in 2010.

Resource consent applications (approved in 1993 and 1999) for ongoing use of the outfall, were highly contested by groups and individuals within the community and included strong opposition from tangata whenua.

In 2002 the Council launched its Wastewater Strategy. This Strategy outlined proposed upgrades to the existing system comprising primary sedimentation and the introduction of a high-rate activated sludge plant (clarifiers) together with ultra-violet disinfection which were to be introduced by 2016.

In 2003, the Environment Court gave its decision (A162/2003) on appeals to the discharge consent and sent a strong signal to the Council that it must address and resolve the violation of Māori taonga which was continuing with the wastewater outfall. Following that Environment Court decision, the discharge consent was limited in duration with an expiry date imposed of 31 December 2005.

¹ A Biological Trickling Filter is a means of secondary treatment utilising physical media to provide a large surface area over which the effluent undergoes oxidation.

The Wastewater Strategy and discharge application which was then lodged in September 2005, included the addition of Boulder Beds, which are designed to provide a form of land based treatment. The application was again met with strong opposition from submitters regarding the addition of the Boulder Beds as being a functionless and token gesture to alleviate cultural concerns in particular.

The stalemate situation at this time led to an adjournment of the hearing and it provided the impetus for the Council and the stakeholders to find an inclusive process for considering alternative treatment options. The adjournment was proposed to be for 6 months up until 2 October 2006. This adjournment process involved forming the Wastewater Adjournment Review Group (“**WARG**”). The WARG was charged with the task of investigating the BTF as a means of resolving the issues with human waste being discharged into Poverty Bay via the outfall. The adjournment was extended at the request of all WARG participants to allow further progress to be made and the resulting suite of consent applications provided for the wastewater treatment plant development at Aerodrome Road with treatment upgrades to be developed in stage for the BTFs and clarifiers.

The consents for Aerodrome Road were varied in 2009 to allow a change in location for the treatment plant from Aerodrome Road to the current site at Banks Street. At this time designations were arranged for the new site location. The 2009 variations also provided for a single BTF to be constructed and timeframes were stipulated for the commissioning of the BTF by December 2010 and for wastewater disinfection by December 2014. Clause 4A of the decision also set the terms of reference for the establishment of a Wastewater Technical Advisory Group (“**WTAG**”). The purpose of the WTAG was to oversee the monitoring of the BTF plant and to provide advice and peer review for the Wastewater Alternative Use and Disposal (“**AUD**”) Programme. The WTAG comprised membership of tangata whenua, the community, environmental groups, government bodies (Medical Officer of Health and Department of Conservation) and Council staff.

The 2009 variations also required the establishment of the Wastewater Management Committee (“**WMC**”) as a standing committee of Council. The WMC was mandated to comprise four tangata whenua representatives and four councillors, with other members able to be co-opted in an advisory or consultative capacity.

From the 2009 decision and the issues arising from the previous consents, it is clear that the involvement of the community, and specifically tangata whenua, in the review and determination of wastewater options for Gisborne has been a paramount consideration for achieving a long term solution to the disposal of wastewater.

4.0 THE SITE AND LOCALITY

The treatment plant is located in Banks Street. The location of the discharge is within the Coastal Marine Area with the outfall extending from a position close to the Midway Beach Surf Club approximately 1.8km out into Poverty Bay.

5.0 ACTIVITY STATUS

The current application to Coastal Permit conditions relates to the proposed changes to the treatment of the wastewater upstream of the discharge. It is not for any new consents. The application is therefore to change the consent conditions pursuant to section 127(3) of the RMA.

Section 127 provides for this process as follows:

S127 Change or cancellation of consent condition on application by consent holder

- (1) *The holder of a resource consent may apply to a consent authority for a change or cancellation of a condition of the consent, subject to the following:*
 - (a) *the holder of a subdivision consent must apply under this section for a change or cancellation of the consent before the deposit of the survey plan (and must apply under section 221 for a variation or cancellation of a consent notice after the deposit of the survey plan); and*
 - (b) *no holder of any consent may apply for a change or cancellation of a condition on the duration of the consent.*
- (2) *Repealed]*
- (3) *Sections 88 to 121 apply, with all necessary modifications, as if—*
 - (a) *the application were an application for a resource consent for a discretionary activity; and*
 - (b) *the references to a resource consent and to the activity were references only to the change or cancellation of a condition and the effects of the change or cancellation respectively.*
- (4) *For the purposes of determining who is adversely affected by the change or cancellation, the local authority must consider, in particular, every person who—*
 - (a) *made a submission on the original application; and*
 - (b) *may be affected by the change or cancellation.*

The application for the change to consent conditions has discretionary activity status in accordance with sub section 127(3)(a) of the RMA.

6.0 NOTIFICATION, SUBMISSIONS AND NEED FOR A HEARING

The application included a request for it to be publicly notified and that occurred on 24 and 28 January 2015. The Council also issued a press release so that the wider community was aware of the application. In addition to the public notice, individual notice was sent to a number of parties including the submitters to the 2009 variation.

Two submissions were received with both submitters supporting the application.

The Medical Officer of Health (Dr Bruce Duncan) submitted in full support of the application. He initially requested to be heard by the hearing panel but subsequently withdrew that request. Dr Duncan is a member of the WTAG.

Mr Peter Williamson also submitted in full support of the application. Mr Williamson submitted as an individual although we note he is also a member of the WTAG. His submission requested to be heard by the hearing panel, but only if there was to be a hearing due to other submissions.

As there were no such submissions and neither of the submitters now require to be heard there is no statutory requirement to hold a hearing and we are able to determine, in accordance with section 100 RMA, whether a hearing needs to be held.

We resolve, pursuant to section 100 of the RMA, that a hearing of the application is not needed because neither the applicant nor the two submitters have requested to be heard and further, we see no reason to do so.

7.0 RELEVANT STATUTORY PROVISIONS THAT HAVE BEEN CONSIDERED

The application is a discretionary activity. It has been considered in terms of sections 12, 15, 104, 104B, 105, 107 and 127 and Part 2 of the RMA.

8.0 OTHER RELEVANT PROVISIONS THAT HAVE BEEN CONSIDERED

The provisions of the following documents were considered in reaching this decision:

- New Zealand Coastal Policy Statement 2000
- Gisborne Regional Policy Statement 2002
- Gisborne Transitional Regional Coastal Plan 1991
- Gisborne Proposed Regional Coastal Environment Plan, notified 2007
- Gisborne Part Operative Combined Regional Land and District Plan 2007
- Gisborne District Council Long Term Council Community Plan 2012 to 2022
- Health Act 1956.

9.0 THE PRINCIPAL ISSUES IN CONTENTION

The principal issues in contention are:

- a) Impacts on tangata whenua values and interests.
- b) The partnership between Council and tangata whenua
- c) The extent of actual or potential adverse effects on the environment from deferral of the disinfectant treatment process.

- d) The effects from amendments to the monitoring clauses.
- e) Are the extended dates sought reasonable.
- f) The positive effects.
- g) Whether the application/proposal is in accordance with the relevant planning documents.
- h) Sections 105 and 107 RMA considerations.
- i) Whether the proposal will promote the sustainable management of natural and physical resources and be consistent with the associated principles in accordance with Part 2 of the RMA.

10.0 MAIN FINDINGS ON THE PRINCIPAL ISSUES IN CONTENTION

10.1 Impacts on tangata whenua values and interests

Tangata whenua have a long and well-known relationship with Turanganui a Kiwa (Poverty Bay) and its waters, fisheries and special sites. The waters have been identified as a taonga to local Iwi and as such their relationship should be protected as a matter of importance.

A major driver for the new wastewater system was to provide for tangata whenua and the wider community's values and interests in the coastal environment of the Bay. The 2009 decision of the independent Commissioners made clear:

*"The effects on tangata whenua from the existing wastewater arrangements at Gisborne and of the upgrade proposals has been a paramount consideration. It has been made very clear at all times, and over many years now, that the continued discharge of untreated wastewater to the waters of Poverty Bay violates Māori tikanga and is a major effect on the cultural and spiritual sensitivities of tangata whenua. A key component of the on-going action to implement an improved wastewater treatment scheme is the input from tangata whenua, in partnership with the other interested parties"*²

As stated in the 2014 report from WTAG:

*"Restoring the mauri is a key theme for tangata whenua and many others in the community, and this is reflected in the consent and other regional planning documents. It is integral to the management of waste streams and water bodies in the District. The restoration of the mauri should be seen, however, as an iterative process. That is, in the context of the current consent, the process of developing and implementing a wastewater management system is itself critical to the concept: both the journey and the destination contribute to restoring the mauri, and so both must be valued and supported by the consent holder."*³

² Decision Report by the Independent Commissioners, June 2009, section 16.6

³ Wastewater Technical Advisory Group (WTAG) Report, July 2014, page 11

The Council has taken steps to involve tangata whenua in the technical and management aspects of the proposals. This is evidenced by the establishment of the WMC and WTAG that both have broad iwi representation. It appears, based on the application and supporting information, that appropriate time and resources have been deployed to address concerns and identify solutions to meet cultural preferences. The proposal includes reference to programmes of work that will explore and address restoring the mauri of Turanganui a Kiwa at a catchment level, encompassing a holistic approach consistent with a Māori world view.

We note there do not appear to be any relevant iwi planning documents or cultural impact assessments, rather the iwi have had opportunities to directly input into the proposal development.

We are satisfied that regard has been given to the impacts on tangata whenua values and interests and provision made for tangata whenua involvement accordingly.

10.2 The partnership between Council and tangata whenua

An important and relevant Treaty principle is a partnership between tangata whenua and the Crown. In this context providing opportunities for a partnership that gives effect to meaningful engagement and participation in decision-making processes is essential.

The Council has provided for active participation of tangata whenua in the decision-making process through the involvement of tangata whenua representatives on the WMC and WTAG. This partnership provides opportunities to express and implement cultural preferences.

Whilst a partnership does not in itself mean all parties will agree, the evidence provided suggests that all parties are supportive of the application to change the conditions of consent. This is referred to in the application, in sections 5.3 and 6, in describing discussions with Te Runanga o Turanganui a Kiwa and with WMC and WTAG with *“the input of tangata whenua being a key consideration”* for the proposal.

The conditions of consent and the feasibility programme provide an ongoing role for tangata whenua in the implementation and monitoring of the consents.

We are satisfied that the current proposal to change consent conditions has taken into account the principles of the Treaty of Waitangi.

10.3 The extent of actual or potential adverse effects on the environment from deferral of the disinfectant treatment process

This has been considered under the following headings:

- Ecological effects
- Recreational health effects
- Amenity effects.

10.3.1 Ecological effects

These are primarily assessed by prediction and monitoring of the following parameters;

- Accumulation and bioaccumulation of heavy metals on the sea bed.
- Sediment organic and chemical characteristics of the sea bed.
- Diversity and abundance of infauna (the animals living in the sediments of the ocean floor).
- Metal contamination of crayfish and crabs.
- Nutrients and ammonia concentrations in the discharged wastewater.

Overall, based on the previous research and recent monitoring results, the applicant's consultant considers that there will be less than minor adverse ecological effects arising from the proposal.⁴ We agree following our perusal of the application details.

10.3.2 Recreational health effects

These are assessed primarily by consideration of the number of enterococci in the discharge wastewater in the ocean water adjoining the discharge location that can be attributed to the wastewater discharge. Enterococci are bacteria that are indicators of the possibility of pathogens, i.e. disease causing organisms within the wastewater.

The recent assessment of enterococci levels at Location 2 after the BTF found that the discharge contained an average of 67,000 enterococci CFU/100ml with a minimum of 4,000 CFU/100ml and a maximum of 340,000 CFU/100ml. These monitoring results show there is a significant reduction in enterococci levels provided by existing treatment, including by the BTF. The levels of enterococci levels are, however, greater than the standard of 1,000 CFU/100ml that would be required to be met at Location 4 after the installation of wastewater disinfection.

Analysis of enterococci levels in the receiving environment has also shown a large reduction since commissioning of the BTF. The recreational and water quality assessment recently undertaken⁵ has found that:

- The mean *Enterococci* content has reduced significantly across all of the sites monitored as part of the consent following the installation of the BTF.
- At the five sites located 500m from the diffuser there appears to be limited influence from the wastewater discharge on the number of indicator organisms.

The applicant's consultant has assessed the potential adverse public health effects from the discharge. This takes into account the mixing zone surrounding the outfall and background levels of enterococci and other contaminants which are influenced by high sediment and contaminant loadings from the rivers discharging into Poverty Bay. Overall, based on the previous research and recent monitoring results of key indicator organisms the consultant considers there will be less than minor adverse recreational health effects arising from the

⁴ Gisborne District Council Wastewater Treatment Plant - Section 127 consent variation, Andrew Stewart Ltd, December 2014, Section 5.1

⁵ Ibid, Section 3.3.1

proposal both in terms of recreational bathing and shellfish gathering⁶. We agree following our perusal of the application details.

10.3.3 Amenity Effects

These are related to the visibility of the discharge plume and can be expected to be primarily related to concentrations of suspended solids and oil and grease in the discharged wastewater.

Monitoring of plumes since the commissioning of the BTF has identified a very low incidence of plumes. From the end of 2010, the Council staff member monitoring plumes observed a number of Grade 2 plumes but nothing greater. Grade 2 is a plume just visible but it is contained within the mixing zone allowed in the consent. Since that time, it is understood from the Council's wastewater staff that there has continued to be a very low incidence of plumes⁷.

Monitoring data shows that suspended solids concentrations already comply with current consent Clause 33 for both before and after commissioning of the preferred long term management option. This is consistent with the applicant's assessment that the effects of suspended sediment concentrations in the wastewater discharge on the receiving marine environment are minor and no change is proposed to these levels through this proposal.⁸

The effects of total oil and grease (TOG) concentrations in the wastewater discharge on the receiving marine environment which are primarily related to visual effects have been assessed as minor and no change is proposed to these levels through this proposal.

We agree with the above information and assessments following our perusal of the application details and that any adverse effects on amenity will be minor.

10.3.5 Council Officers

The report to the Commissioners prepared by Mr Whittaker dated 19 March 2015 advised that the quality of the existing discharge is at a level which is not causing adverse effects on the ecology of the receiving environment. He also advised in his report that it is apparent from the monitoring data that the discharge is generally well within the prescribed limits of the existing consent.

10.3.6 Findings

We find that the information provided by the applicant, including the results of a significant amount of monitoring, shows the current discharge is causing less than minor adverse effects

⁶ Ibid, Section 5.2

⁷ Ibid, Section 3.2.4

⁸ Ibid, Section 3.3.2

in terms of ecological and health and recreation (public health) considerations and minor adverse amenity effects on the receiving environment. We find that the extent of actual or potential adverse effects on the environment from deferral of the disinfectant treatment process are then minor at worst and certainly in our view acceptable.

10.4 The effects from amendments to the monitoring clauses

10.4.1 Discussion

The proposed changes to the monitoring requirements for the existing discharge are addressed in Mr Paul Murphy's technical report of 18 March 2015. Mr Murphy is Senior Water Conservator with the Council and provided advice to Mr Whittaker regarding the proposed changes to the consent conditions.

As explained by Mr Whittaker in his report of 19 March 2015 there are two main drivers for the amendments proposed by the applicant. The first is that some of the specific monitoring requirements are no longer best practice and can be considered redundant given the performance of the BTF plant and treatment process to date. The second driver is that the cost of providing the monitoring data is significant and that it is important to justify the need for the various components of monitoring. Some of the current monitoring cannot be justified from consideration of cost and information provided.

In his technical report Mr Murphy discusses each of the proposed amendments sought by the applicant and he is in general agreement with most of the changes proposed by the applicant. Mr Murphy considers that Clause 36 should be amended to include further monitoring of the effluent quality at Location 4 as this is to become the compliance monitoring point for measuring the environmental performance of the WWTP and the quality of the effluent.

The only apparent difference between the changes proposed by the applicant and that recommended by Mr Murphy and Mr Whittaker is Condition 61 – Visual Plume Inspection. The applicant argues⁹ that given the low incidence of plumes since 2010 and the resources needed to check and maintain the camera at Kaiti Hill, they want to amend the condition to a complaints based system and remove the requirement to maintain a camera at Kaiti Hill.

We requested some clarification from Messrs Whittaker and Murphy regarding the intent of their recommended Clause 61, the requirement that the camera be operated at all times, information about operation of the camera including operating requirements and costs, including attendance by personnel.

Advice from Messrs Whittaker and Murphy on this matter¹⁰ is summarised as follows:

- That the archived camera photos provide a method of demonstrating ongoing section 107 compliance if a complaint is received; wholly relying on complaints received does not demonstrate ongoing compliance with section 107 requirements and the camera should be operated at all times.

⁹ Ibid, Page 19,

¹⁰ Page 2 of Response to Commissioners' Questions, 17 April 2015 and pages 1-3 of Supplementary Response to Commissioners' Questions, 22 April 2015, Email from Paul Murphy to Commissioners dated 23 April 2015

- The current and accepted practice is for a full time camera monitoring.
- Existing operational practice is to take a photo every 30 minutes which is uploaded to a website.
- It appears unnecessary to check the camera regularly throughout the day as stated in the application report.
- Time taken for ongoing monitoring is 2.5 to 3 hours per week for salaried staff together with \$2,736 per year for camera maintenance and back up CDs.
- They provided recommended amendments to Clause 61 which clarify requirements for operation of the camera and manual surveillance in the event of a conspicuous plume or slick being identified that may be attributable to the discharge.

10.4.2 Findings

We are satisfied that a robust and appropriate monitoring regime will remain in place subject to the amendments outlined in Mr Murphy's memo and in Messrs Murphy and Whittaker's response to our further questions. We accept the Council officer's view that the camera at Kaiti Hill should continue to be operated at present to method of demonstrating ongoing section 107 RMA compliance. We do not consider the cost of continuing to maintain the camera at Kaiti Hill is excessive given the importance of obtaining a photographic record in order to demonstrate on-going compliance.

10.5 Are the extended dates sought reasonable

10.5.1 Discussion

The application proposes to defer the date for the wastewater disinfection to enable further evaluation of the treatment plant process and the most appropriate long term option for wastewater treatment and disposal including the assessment of wetland treatment.

The amendment to Clause 4 proposes a series of dates in terms of the evaluation process with key dates as follows:

- By 31 December 2016 confirm the feasibility of an alternative wastewater management system.
- By 31 December 2018, lodge the necessary consent applications and notices to implement the preferred alternative wastewater management system.
- 31 December 2019 intent to commence construction (and no later than 12 months after commencement of necessary authorisations) for any new treatment plant process.
- If the consent holder decides not to further investigate, seek consent for or implement an alternative wastewater management system or the permit holder fails to confirm feasibility of an alternative system by 31 December 2016 or fails to lodge necessary applications and/or notices by 31 December 2018 the permit holder shall

install wastewater disinfection within 24 months of the date of notice of not proceeding or failing to confirm feasibility or lodge consents.

10.5.2 Finding

The above time frames are reasonable given the amount of work and number of parties involved in the feasibility studies and also the detailed design and assessment work and reporting to support consent applications.

We note that Clause 26 allows review of Clause 4 and Mr Whittaker recommends an additional review criterion (j) in Clause 26 to consider any unreasonable delays in the investigation and consenting process of alternative treatment options and to determine alternative time frames for the implementation and commissioning of alternative treatment options.

We find that the proposed time frames are reasonable and the recommended additional criterion (j) in Clause 26 is appropriate to acknowledge the uncertainty in outcomes and timing of the alternative treatment options

We have deleted reference in Clause 4(e) to the milestone in 4(b) given there is no milestone in Clause 4(b).

10.6 The positive effects

Positive effects from the current application are:

- The opportunity to investigate and proceed with alternative forms of treatment which may represent a better long term solution in terms of environmental values, endorsement by tangata whenua and also for the community who will need to fund any upgrade to the treatment process.
- The various amendments that are sought to the monitoring and testing requirements of the existing discharge consent will reduce the monitoring costs which are a direct cost to the applicant to the Gisborne community.
- The application supports the ongoing relationship and community partnership which has been developed through the introduction of the WMC and the WTAG. The current situation wholly contrasts with the highly confrontational and volatile relationship between stakeholders, GDC and tangata whenua which has occurred in the past. The current partnership supports community wellbeing by ensuring that tangata whenua and other stakeholders are directly involved with the decision-making process on how the wastewater issues for the Gisborne community can best be resolved.

10.7 Whether the application/proposal is in accordance with the relevant planning documents.

10.7.1 General

The section 42A report includes a detailed account of the relevant planning documents in the context of the current proposal. We agree with that account and the conclusion reached that the proposal is consistent with the provisions in those documents. Further, we address our considerations of the impacts on tangata whenua values and interests and the actual and potential effects on the environment from the proposed deferral of the disinfection treatment process above. Our findings in respect of those matters means the proposal is consistent with the planning documents which include specific provisions addressing these two principal issues that are in contention in the consideration of the proposal. Consequently we only highlight some main points below in terms of our considerations of the planning documents.

We are also mindful that it is only the effects of the proposed changes to the clauses which need to be assessed and determined for the current application and the effects and assessment of issues associated with the existing discharge cannot be re-considered.

10.7.2 New Zealand Coastal Policy Statement (“NZCPS”)

The NZCPS has key provisions that are relevant to the application that include:

- Safeguarding the integrity, form, functioning and resilience of the coastal environment and sustaining its ecosystems, including by maintaining coastal water quality, and enhancing it where it has deteriorated from what would otherwise be its natural condition.
- Taking account of the principles of the Treaty of Waitangi, recognising the role of tangata whenua as kaitiaki and providing for tangata whenua involvement in management of the coastal environment.
- Managing discharges to water in the coastal environment and, in managing the discharge of human sewage, to not allow the discharge of human sewage directly to water in the coastal environment without treatment and the discharge of treated human sewage to water in the coastal environment unless there has been adequate consideration of alternative methods, sites and routes for undertaking the discharge and it is informed by an understanding of tangata whenua values and the effects on them.

The current 2010 version of the NZCPS has been revised since the earlier consents and variations decisions which authorised the existing discharge. However the earlier 1994 version of the NZCPS included similar provisions in terms of protecting the coastal environment and recognising the special significance of tangata whenua in managing coastal resources.

The existing discharge consent has recognised the need to achieve the highest form of treatment that aligns with environmental, cultural and community values and the existing clauses from the 2009 variation set up the WTAG and the WMC, both with representation from tangata whenua.

It may be considered that the assessment of alternative options should have been more advanced at this stage given the 2014 deadline to install disinfectant treatment. However, from the background information it is apparent that a genuine commitment and process has been developed between Council, tangata whenua and other key stakeholders to ensure that a sustainable and long term option

is achieved. Any assessment of alternative options will need to be supported by robust technical analysis and there must also be time for all parties to engage with the assessment process. Ultimately the disinfectant treatment option will still have to be provided if no other preferred option is possible and we are comfortable that the timeframes proposed in the current application are appropriate.

10.7.3 Regional Policy Statement (“RPS”)

The RPS highlights a range of issues of particular relevance to the coastal discharge. Three chapters are particularly relevant:

- Involvement of Tangata Whenua in Resource Management
- Water Management
- Coastal Management.

The current application is consistent with the objectives and policies contained in these respective chapters of the RPS. It allows the opportunity for further investigations into alternative forms of land based treatment and the best long term option for wastewater discharge for the whole community. Tangata whenua also have a primary role as part of the related decisions from the process which has been implemented to assess the options for wastewater disposal. The arrangements represent a genuine partnership in working towards the best long term solution for wastewater disposal. The need to achieve a positive, successful environmental and cultural outcome is at the forefront of the need for the current application.

The deferral of the disinfectant treatment will lead to a deferral of the higher grade or quality of the effluent which would have otherwise been achieved with the disinfectant treatment in the interim period. However the existing monitoring data has demonstrated that the BTF process is working very well and that the existing discharge is well within the prescribed limits to ensure that the adverse effects on the receiving environment are minor and acceptable.

10.7.4 Proposed Regional Coastal Environmental Plan (“PRCEP”)

The PRCEP is in proposed form but with only one issue remaining to be resolved, which is not relevant to this current application, it can be considered the effective planning instrument. The provisions in the PRCEP are particularly relevant to the considerations of the current proposal. We quote key objectives and policies below because these are fundamental to our considerations of the application.

Tangata Whenua

Objectives

To protect the special value sites of tangata whenua.

To maintain the integrity of the relationship of Māori with their culture, traditions, ancestral lands, and other resources.

Policies

The Council and consent authorities will take into account the guarantees of rangitiratanga and its relationship with kawanatanga in resource management planning and decision-making.

People exercising powers, duties and functions under the Resource Management Act 1991 will recognise that each hapu has its own priorities and preference for the management of coastal resources and will respect those priorities and preferences.

The Council will encourage applicants for resource consents in the Coastal Environment to demonstrate that the tangata whenua have been consulted in respect of applications.

The Council and consent authorities shall have regard to the need to protect the mauri of coastal resources and, where necessary and appropriate, will encourage the restoration of the mauri of coastal resources.

Consent authorities will, in respect of activities or developments which involve the discharge of contaminants into the Coastal Marine Area, have particular regard to Māori spiritual and cultural values and physical use of the Coastal Marine Area.

The Council will give consideration to appointing to a hearing committee considering a resource management issue where values important to Maori are being considered, a commissioner or commissioners with expertise in Māoritanga including Kawa (protocol) and Kaitiakitanga. Any commissioner so appointed should have sufficient mana to address issues of sensitivity to Māori but must not be affiliated with any hapu affected by the resource consent issue or plan change under consideration.

The Council will establish a consultation network acceptable to tangata whenua with the constituent hapu of the Gisborne District who have mana whenua or mana moana in the Coastal Environment. This is for the purpose of determining hapu preferences for appropriate coastal management measures and to provide for those hapu or iwi to effectively participate in the resource management process.

Discharges

Objectives

To maintain or where practicable enhance the physical and cultural quality of air, water (including that found in aquifers) and land in the Coastal Environment.

The progressive upgrade of the quality of existing point and non-point discharges to water of the Coastal Environment.

Policies

Council will seek to enhance Poverty Bay water quality through:

- a) Phased improvement over a period of time in the quality of wastewater discharge from the city outfall including monitoring and controlling the quality of trade wastes from commercial and industrial premises.*
- b) Continued encouragement of on-site treatment of effluent prior to discharge particularly within the horticultural processing sector...*

A discharge of human sewage, excluding discharges of Human Sewage from ships, direct into the water of the Coastal Environment that does not pass through land, shall only occur where:

- a) It better meets the purpose of the Act than disposal onto land; and*
- b) There has been consultation with the tangata whenua in accordance with Tikanga Māori and due weight has been given to Sections 6, 7 and 8 of the Act; and*
- c) There has been consultation with the community generally.*

The discharge of a contaminant (either by itself or in combination with other discharges) directly into the coastal marine area should only be allowed in circumstances where:

- a) The existing water quality is maintained and where appropriate enhanced;*
- b) The effects on the community of not allowing the discharge would not promote the social and economic wellbeing of the community; or*
- c) The discharge to an alternative receiving environment would create a greater adverse effect than the proposed discharge to sea.*

All discharges of contaminants to water, land or air of the Coastal Environment shall avoid creating adverse effects on habitats, feeding grounds or ecosystems by:

- a) Not locating where locally important habitats, feeding grounds, or ecosystems are likely to be adversely affected by the contaminant; and*
- b) Not having physical or chemical properties such as a temperature, toxicity, pH or turbidity suspended solids which alone, or in combination with other discharge properties is likely to cause fish mortality, a failure of fish spawning or passage, significant changes in the abundance and composition of aquatic flora and fauna in the receiving environment.*

The Council will consult fully with the community and will have regard to community expectations for coastal water quality when:

- a) Setting minimum standards for water quality in the Coastal Environment;*
- b) Providing works or services involving a discharge to waters in the Coastal Environment.*
- c) Reviewing options for the treatment and ultimate disposal of Gisborne City sewage.*
- d) In other situations where it is reasonable to believe that the wider community stands to be affected by the works.*

As discussed above, these provisions are all addressed by the manner in which the current application has been advanced. The need to preserve and enhance the quality of the coastal environment and

the role of tangata whenua values are recognised in the application details and also in the consultation and decision-making process.

10.7.5 Conclusion on the planning documents

The decision-making process has a uniqueness to it which comes from the implementation of the WTAG and the WMC to lead and direct the assessment of options for wastewater disposal and the value that this brings to establishing a genuine partnership with the community, tangata whenua and stakeholders. We find the application to be consistent with the PRCEP and the other planning documents above. The application provides for an investigation process which may ultimately lead to a more positive and long term solution for wastewater disposal at Gisborne.

10.8 Sections 105 and 107 RMA considerations

In terms of section 105 we note that the nature of the discharge is not proposed to be changed under this application. The dilution of the discharge in the receiving marine environment assists in keeping the adverse effects to a localised area near the marine outfall and within the mixing zone provided in the PRCEP. Further, the proposal is to consider an alternative management system to better align with tangata whenua and the community's aspirations. In these respects the proposal is entirely consistent with section 105 of the RMA.

The restrictions on the grant of consent to discharge and coastal permits is contained within section 107. Of particular relevance for this application are the restrictions relating to any conspicuous material or change in the colour or visual clarity of the receiving waters. The current application proposes no change to the current discharge. Therefore the proposal remains consistent with section 107 of the RMA.

10.9 Whether the proposal will promote the sustainable management of natural and physical resources and be consistent with the associated principles in accordance with Part 2 of the RMA

The proposal is in accordance with the sustainable management purpose of the RMA. It will enable the Gisborne community to provide for its wellbeing and for its health and safety whilst sustaining the potential of the natural and physical resources of the area to meet the reasonably foreseeable needs for future generations. We recognise the funding and financial implications for the community and, although the deferral of the disinfection treatment process will delay the introduction of a higher quality effluent, it will provide the opportunity for the investigation of the alternative treatment process which may provide for better environmental and cultural outcomes. In the meantime the quality of the existing discharge is not resulting in adverse effects on the receiving environment.

The section 6, 7 and 8 RMA matters relating to the relationship of Māori and their culture and traditions with natural and physical resources, Kaitiakitanga and the Treaty of Waitangi are all recognized and provided for by the unique decision-making process which allows tangata whenua direct involvement in the investigations and decision-making. Particular regard is being given to the other section 7 matters relating to efficient use and development of natural and physical resources,

amenity values and the quality of the environment in deferring the disinfectant process and the proposed amendments to the monitoring and testing regime given the existing performance of the BTF plant and that a robust monitoring and testing regime will be retained. In all the circumstances we find the proposal to be consistent with the purpose and principles of the RMA.

11.0 CONCLUSION

We have given consideration to all the relevant RMA provisions in relation to this discretionary activity proposal, along with all the information presented by the applicant and the reporting officer for the Council. We find the application is able to be granted consent in accordance with our commentary above in this decision report.

12.0 DECISION

PURSUANT TO sections 105, 107 and 127 and Part 2 of the Resource Management Act 1991, and in accordance with the delegation from the Minister of Conservation through section 119A of the Resource Management Act 1991, the application by the Engineering and Works Department of the Gisborne District Council is granted for variation or change to conditions for the Coastal Permits CP-2008-1202-01, CP-2008-1203-01, CP-2008-1204-01, CP-2008-1205-01, CP-2008-1206-01, CP-2008-1207-01, CP-2008-1208-01, CP-2008-1209-01, and CP-2008-1210-01, as Restricted Coastal Activities, for a duration until 2 July 2042 (to accord with the 35 year terms of the existing consents), at or about grid reference NZMS 260 Gisborne Y18 : 2945300, 6269400 landward end and 2945200, 6267600 seaward end, subject to the conditions that follow as Appendix A, and for the reasons and findings stated in this decision report.

Pursuant to section 113 of the Resource Management Act 1991, the reasons for this decision are as above in the text of this decision report but can be summarised as:

- a) The proposal has particular regard to tangata whenua interests in further investigation and the decision-making process. Further, the potential adverse effects on the environment are found to be acceptable.
- b) The proposal will have positive effects in providing for the investigation of alternative forms of treatment which may represent a better long term solution in terms of environmental values and in terms of the values of tangata whenua and the community.
- c) The proposal is consistent with the provisions of the relevant planning documents.
- d) The proposal has been supported by comprehensive information which has addressed all relevant matters.
- e) Overall the proposal is consistent with the purpose and principles of the Resource Management Act 1991.

13.0 CONDITIONS

The amended conditions are attached as **Appendix 1** to this decision report.

A handwritten signature in black ink, appearing to read 'Alan Watson', written in a cursive style.

AR Watson (chair, for Commissioners Nigel Mark-Brown, Antoine Coffin and Alan Watson)

29 April 2015



Gisborne WWTP 2015 Variation/Change of consent conditions

Appendix 1

Amendments to Clauses:

Strike Through and underline text shows amendments proposed by applicant. These are supported as part of the Decision unless amended.

Yellow highlighted text shows amendments as part of the Decision.

CONDITIONS

“Definitions” section

In and for the purposes of this permit the following definitions will apply:

Single BTF means the Single Biological Tricking Filter (BTF) component of the Wastewater Treatment Plant

Wastewater Disinfection means the wastewater disinfection component of the Wastewater Treatment Plant

Wastewater Technical Advisory Group (WTAG) means a group formed by the permit holder to monitor and undertake studies to assess the effectiveness of wastewater plant performance and make recommendations as defined in clause 4A of these conditions.

Wastewater Management Committee (WMC) means a standing committee of the Gisborne District Council formed under clause 30 of the seventh schedule of the Local Government Act 2002, See clause 12 of these conditions. Functions of the WMC are defined in clause 16 of these conditions.

BTF Plant Monitoring and Investigation Study means a study undertaken by the permit holder stipulated in clause 4A of these conditions.

Alternative Use and Disposal (AUD) means beneficial use and non ocean disposal of ~~disinfected~~ treated wastewater

Preferred Long-Term Management Option means either the preferred alternative management system sought and commissioned under Clause 4(c) or Wastewater Disinfection commissioned under Clause 4(e) or (f)

Independent Review Panel (IRP) means a review group established under clause 21 to undertake reviews and make recommendations as set out in condition 22. The IRP reports to the Wastewater Management Committee.

BOD means 5-day carbonaceous Biochemical Oxygen Demand

LTCCP means Long Term Council Community Plan

Location 1, Location 2, Location 3 and Location 4 means locations as shown on Figure 2 (located at the end of the conditions) where wastewater is sampled or wastewater flow rate is measured

WWTP means Wastewater treatment plant

RMA means the Resource Management Act 1991.

Note:

Figure 1 Benthic Survey, clauses 58, 59 and 60

Figure 2 Single BTF Monitoring Diagram, clauses 33, 35, 36, 37, 41, 42, 43, 44 and 45.

Location 1: Influent immediately prior to the BTF

Location 2: Immediately after WWTP prior to mixing with industrial flow

Location 3: Industrial flow prior to mixing with domestic flow from BTF

Location 4: Immediately beyond the existing milliscreens

General Conditions

In Accordance With The Application

Clause 1

The activity consented by this permit shall be carried out in general accordance with the consent applications dated 30 September 2005 and the applications for variations to these permits dated 7th December 2008 and 19 December 2014.

Upgrading of the Wastewater Network

Clause 2

The permit holder shall undertake pipe network improvement works to limit flows to the treatment plant to 33,000 m³/day except in extreme events. The extent of improvement works shall be determined using computer modelling of the network and in accordance with the best practicable option requirements of the Resource Management Act 1991 (RMA), and subject to review by the Independent Review Panel (IRP). The permit holder shall report on progress in 2012 and shall provide a report to the consent authority setting out a programme for the completion of any works outstanding at that time.

Clause 3

The permit holder shall submit to the consent authority by 31 December 2017 a report confirming that all practicable steps have been taken to ensure compliance with condition 2.

Installation, Monitoring and Investigation of Wastewater Treatment Plant

Clause 4

The permit holder shall:

(a) Use its best endeavours to ensure that the Single BTF Plant Commissioning occurs by 31 December 2010; and Wastewater Disinfection by 31 December 2012 and in any event no later than 31 December 2014.

b) Undertake further feasibility work to confirm the most appropriate long-term management option for Gisborne's wastewater, including the feasibility and level of community acceptance of an alternative wastewater management system, which may involve a range of alternative, use and disposal (AUD) options, to wastewater disinfection, provided that any alternative wastewater management system to wastewater disinfection must meet or exceed the standards for wastewater discharge set out in clauses 40 – 62 of this consent; and

c) By 31 December 2016, confirm the feasibility of an alternative wastewater management system and commit to undertaking the further consultation, detailed design, and consenting processes in order to implement this system; and

d) By 31 December 2018, lodge the necessary applications and/or notices required under the RMA to implement the preferred alternative wastewater management system with the intention for construction to commence by 31 December 2019 and in any event no later than 12 months after the commencement of all necessary authorisations.

e) If at any of the milestones in **b)**, c) and d) above, the permit holder decides not to further investigate, seek consent for or implement an alternative wastewater management system as the preferred long-term option to manage Gisborne's wastewater, the permit holder must notify the consent authority in writing and shall install wastewater disinfection within 24 months of the date of that notice.

f) If the permit holder fails to confirm feasibility of an alternative system by 31 December 2016 or fails to lodge the necessary applications and/or notices by 31 December 2018 in accordance with clauses 4(c) and (d) above, the permit holder shall install wastewater disinfection within 24 months of those relevant milestone dates.

Clause 4A

BTF Plant Monitoring and Investigation Study

- (a) The permit holder shall establish and retain by appointment of suitably qualified persons, the Wastewater Technical Advisory Group (WTAG), to initiate the BTF Plant Monitoring and Investigation Study and provide advice and peer review for the Wastewater Alternative Use and Disposal (AUD) Programme.
- (b) The permit holder shall provide resources for organisational and administrative support to facilitate the development, role and function of the WTAG.

The WTAG shall comprise representatives of:

- Medical Officer of Health
- Tairāwhiti District Health Board
- Department of Conservation
- Te Runanga O Turanganui A Kiwa
- Ngāti Oneone
- Environmental Groups
- Gisborne District Council staff
- Others who may have a particular contribution to make to the workings of the group.

The WTAG may appoint, or invite, other persons to participate in an advisory capacity.

The composition of the WTAG is subject to invitees' willingness to participate.

- (c) (i) The permit holder shall initiate the BTF Plant Monitoring and Investigation Study within 3 months of the issue of this permit.

(ii) Within six months of the issue of this permit the WTAG shall formulate the scope and methodology of the study, which is: a study into the scientific rationale and relevance of existing permit conditions 36, 37, 42, 43 and 44 and will have reviewed work to date on the AUD Programme.

(iii) The WTAG shall report at least annually and at such other times as may be necessary to the Wastewater Management Committee (WMC) and consent authority, and present such reporting to any public forum that the WMC considers appropriate. The report shall review progress on the BTF Plant Monitoring and Investigation Study, permit conditions 36, 37, 42, 43 and 44, and advice provided on the AUD Programme.

(iv) The third annual report from the WTAG, (3 years after Single BTF Plant Commissioning) shall report and recommend to the WMC and Council in regard to:

- a) Summaries of monitoring results of the BTF Plant Monitoring and Investigation Study.
- b) The extent of biotransformation being achieved by the BTF Plant.
- c) Appropriate parameters and a monitoring programme for ongoing assessment of biotransformation.
- d) Appropriate parameter limits to ensure biotransformation is being achieved.
- e) Review of existing permit conditions: 37, 42 and 43 and recommend any changes to these.
- f) Recommend what additional treatment steps (if any) are required to achieve biotransformation and other requirements that may be necessary to improve the quality of the discharge to avoid adverse effects.
- g) In the event of the WTAG being unable to make a recommendation to the permit holder as per f) above, or the permit holder refusing to implement any recommendations as per f) above, then clause 37 and clause 43 shall take effect.

(d) The BTF Plant Monitoring and Investigation Study shall:

- Investigate the extent of biotransformation achieved by the Single BTF plant, ~~including the disinfection plant once it is installed:~~
 - Define biotransformation
 - Determine the relevance of BOD as a measure of biotransformation
 - Determine the relationship between Suspended Solids and biotransformation of wastewater
 - Determine through monitoring, data analysis and research relevant parameters to be used in assessing biotransformation
- Investigate the extent of micro-organism reduction achieved by the BTF plant ~~and wastewater disinfection plant.~~
- Investigate through surveys, literature reviews and research the importance of social, cultural and environmental components of biotransformation in the treatment of wastewater.

- Determine the relationship if any between the BTF plant BOD loading and micro-organism reduction.
- Investigate the relationship between wastewater treatment processes and their carbon footprint.

(e) Peer review of the AUD Programme shall –

ensure that the appropriate range of advice is being received by the WMC and that the advice is presented in a timely and transparent manner.

Alternative Use and Disposal

Clause 5

The permit holder shall initiate a research/study programme (“the programme”) within three months of the issue of this permit to investigate AUD of wastewater trials and undertake trials designed to identify feasible options for AUD ~~after installation of Wastewater Disinfection.~~

Clause 6

The permit holder shall invite individuals or organisations who could be directly affected by particular alternative use or disposal trials, or subsequent works that arise from them, to participate in relevant parts of the programme. Such parties shall include, but not necessarily be limited to, larger waste producing industries, Federated Farmers and relevant tangata whenua groups on any matters relating to the use of productive land.

Clause 7

The programmes required under condition 4A and condition 5 shall be developed having regard to the Best Practicable Option principles set out in the RMA and shall include consideration of:

- a) The alternative management options available to avoid, remedy or mitigate adverse effects of the discharge of treated wastewater on the marine environment and the financial implications of the alternatives, and their effects on the environment compared to discharge to the marine environment;
- b) The state of technical and scientific knowledge and the likelihood that the alternatives can be successfully implemented;
- c) The effects of alternatives on existing land uses and the options available to ensure compatibility.

Clause 8

The permit holder shall use its best endeavours to adopt those AUD options that are identified as feasible and which will enable the progressive removal of the treated human sewage from the discharge, via the marine outfall, with the objective of complete removal by 2020.

Industrial Treatment

Clause 9

The permit holder shall take all practicable steps to ensure that any industrial wastewater entering the wastewater network, after 31 December 2012, will not result in the combined discharge of wastewater from the Council's wastewater system to the marine environment failing to meet the requirements of section 107 of the RMA. As a minimum, the permit holder shall seek the advice of the IRP described in condition 21 on the adequacy of existing or future industrial wastewater management methods to ensure this condition will be met.

Clause 10

The permit holder shall investigate the feasibility of minimising, reusing or further beneficially treating the separated industrial component of the wastewater stream and shall use its best endeavours to secure the co-operation of local industry for this purpose.

Clause 11

The permit holder shall use its best endeavours to identify partial or possible complete reuse or further beneficial treatment of the industrial discharge.

Wastewater Management Committee

Clause 12

The permit holder shall establish, and retain, a Wastewater Management Committee (WMC) as a standing committee of the Gisborne District Council under clause 30 of the Seventh Schedule of the Local Government Act 2002 within three months of the issue of this permit, or as soon as practical thereafter.

Clause 13

The permit holder shall provide organisational and administrative support to facilitate the development, ongoing role and function of the WMC.

Clause 14

The membership of the WMC shall comprise four Councillors and four Tangata Whenua representatives and other members that the WMC itself shall determine from time to time.

Clause 15

The WMC may appoint, or invite participation in an advisory or consultative capacity, other persons from:

- Gisborne District Council staff
- Tairāwhiti District Health Board
- Department of Conservation
- Industry
- Recreational groups
- Environmental groups
- Federated Farmers
- Others who may have a particular contribution to make to the workings of the WMC.

Clause 16

The functions of the WMC shall include, but not be limited to:

- Monitoring the implementation and commissioning of the Wastewater Treatment Plant (WWTP) including the development of a WWTP operating manual.
- Monitoring the BTF Plant Monitoring and Investigation Study.
- Monitoring AUD research.
- Recommending AUD trials.
- Monitoring the AUD trials.
- Recommending AUD implementation.
- Monitoring compliance with permit conditions and separated industry wastewater standards.
- Ensuring the development of appropriate educational information to encourage reductions in domestic and industrial wastewater.
- Ensuring the development of appropriate educational information to encourage AUD.
- Developing and administering the Turanganui A Kiwa Water Quality Enhancement Project.
- Recommending the membership of and receiving reports from the IRP.

- Providing an annual report on the exercise of its activities and functions, including where appropriate a report on the effectiveness of measures undertaken by the Turanganui A Kiwa Water Quality Enhancement Project.

This report shall be provided to the Chief Executive of the Gisborne District Council during the month of June of each year for the duration of this permit.

Clause 17

The WMC shall be convened by the permit holder and shall meet four times annually until 31 December ~~2015~~ 2020 and thereafter at least twice a year for the remainder of the duration of the permit, or as determined by the WMC.

Turanganui a Kiwa Water Quality Enhancement Project

Clause 18

The permit holder shall establish, administer, retain and be responsible for the Turanganui A Kiwa Water Quality Enhancement Project within three months of the issue of this permit, or as soon as practical thereafter.

Clause 19

The project shall be defined and developed by the WMC as a vehicle for integrated research, monitoring, planning and specific projects that will aim to improve the mauri and the water quality of Turanganui A Kiwa.

Clause 20

Removed by Variation of Consent Conditions, June 2009

Independent Review Panel

Clause 21

The permit holder shall appoint an IRP to undertake reviews as set out in condition 22 and report to the WMC. The IRP shall comprise two to four members, depending on the subject of the particular review. IRP members shall have expertise of direct relevance to the subject of the review and shall generally include one person with expertise in wastewater management, including treatment, and one person with expertise in resource management. For reviews undertaken in accordance with condition 22 (d) and (e), the IRP shall include a person with expertise in kaupapa Maori.

Reviews to be Undertaken

Clause 22

The permit holder shall ensure the following reviews are undertaken:

- a) Review of industrial wastewater discharges in terms of condition 10.
- b) Review of progress of:
- the wastewater upgrade, including pre-tender reviews for the Single BTF Plant, ~~Wastewater Disinfection~~, and additional plant requirements if any, that are recommended by the WTAG in their 3rd Annual Report in 2013;
 - the Odour Management Plan;
 - and performance reviews of the WWTP one year after the commissioning of the initial BTF and one year after the commissioning of the disinfection system (if installed pursuant to Clauses 4 (e) or (f)).
- c) Review of the AUD Programme one year after it is initiated in 2012 and in 2018, or as otherwise determined by the permit holder, taking into account recommendations from the WMC.
- d) Six yearly reviews, co-ordinated with the timing of the Long Term Council Community Plan (LTCCP) reviews, starting in 2012 or as otherwise necessary to suit LTCCP timeframes. The purposes of the six yearly reviews shall include to the extent appropriate, but not be limited to:
- Review of progress in relation to sewer network improvement works as required by condition 2.
 - Review of monitoring and compliance of the coastal permit.
 - Review and recommend any necessary changes to consent conditions.
 - Review of the BTF Plant Monitoring and Investigation study as per 22 b).
 - Review and recommend any necessary changes to the Turanganui A Kiwa Water Quality Enhancement Project.
 - Recommend additional experts and any necessary changes to the functions of the IRP.
 - Address any other matters identified by the WMC as requiring review.
 - Adequacy of spares kept in store in Gisborne to ensure the wastewater treatment plant can be maintained in full operating condition at all times, except during normal maintenance and replacement of spares.
- e) Review the recommendations of the BTF Plant Monitoring and Investigation Study.

Clause 23

The IRP may consult with parties it considers can provide information that may assist the review process, subject to the approval of the WMC.

Clause 24

The IRP shall report to the WMC within one month of the completion of each review, and send a copy to the permit holder and to the consent authority and the Minister of Conservation.

General Review Clause

Clause 25

The consent authority may review the conditions of this permit by serving notice of its intention to do so on the permit holder pursuant to section 128 and section 129 of the RMA in the month of June at yearly intervals for the duration of the permit.

Clause 26

There shall be general reviews undertaken by the consent authority of the consent conditions as follows:

- (a) Review conditions in clauses 4, 37, 41, 42, 43, 44 and 45 of this permit by serving notice of its intention to do so on the permit holder pursuant to section 128 and section 129 of the RMA. The review will be notified to all submitters to consent applications CP20516, CP205017, CP205018, CP205019, CP205020, CP205021, CP205022, CP205023 and CP205024.
- (b) To require the permit holder to adopt the best practicable option to remove or reduce any adverse effect on the environment resulting from the discharge.
- (c) To modify the monitoring programme if the record of monitoring to date indicates that it is appropriate to do so, including in order to meet the environmental outcomes required of the permit.
- (d) To deal with any adverse effect on the environment which may arise from inadequate biotransformation of waste.
- (e) To implement, as appropriate, recommendations of the WTAG contained in its BTF Monitoring and Investigation Study Report.
- (f) To require amendments to plant configuration (including the number of BTF filters) necessary to achieve appropriate levels of biotransformation, where the review indicates the level of biotransformation being achieved is not what could be expected in terms of considerations of Part II of the RMA.
- (g) To review the appropriateness of conditions if there are changes to relevant national standards, regulations and guidelines, and the Council's relevant regional and district level plans.
- (h) To consider any new technological changes in assessing micro-organisms where relevant to monitoring of the WWTP and the receiving environment.
- (i) To assess the Single BTF Plant and ~~Wastewater Disinfection and the need for further treatment stages.~~ the Preferred Long-term Management Option.
- (j) To consider any unreasonable delays in the investigation and consenting process of alternative treatment options and to determine alternative timeframes for the implementation and commissioning of alternative treatment options.

The review of conditions shall allow for:

- (i) The deletion or amendment of any of the conditions of these consents; and/or
The addition of new conditions as necessary to avoid, remedy or mitigate any adverse effects on the environment, including any unforeseen adverse environmental effects and to take into account recommendations of the WMC.

Actual and reasonable costs associated with the undertaking of each review shall be borne by the permit holder.

Specific Review Clause

Clause 27

The consent authority ~~shall~~ may review conditions of this permit by serving notice of its intention to do so on the permit holder pursuant to section 128 and section 129 of the RMA during the month of June ~~2015~~ 2016 and June ~~2021~~2020 to review the following specific matters:

- (a) To review progress in relation to condition 2, and in particular to consider the report from the IRP required under condition 22 (d) and to set a date for completion of any outstanding works.
- (b) To review progress in relation to AUD as set out in conditions 5 to 8 and to require the permit holder to undertake such other work identified by the IRP in accordance with condition 22 (c) and accepted as appropriate by the WMC as being reasonably necessary to satisfy the “best endeavours” requirements of condition 8.
- (c) To review, in 2018, the “Best Practicable Option” based on the outcomes of the AUD Trials and the requirements of the RMA and to determine what changes to the conditions of this consent, if any, are required.
- (d) To implement, as appropriate, recommendations of the WTAG contained in its BTF Plant Monitoring and Investigation Study report.
- (e) To require amendments to plant configuration (including the number of BTFs) necessary to achieve appropriate levels of biotransformation, consistent with achieving the RMA’s purpose.

Term of Consents

Clause 28

The Term of Consents is 35 years from 2007 when the consents were granted..

Note: CP-2008-1208-01 and CP-2008-1210-01 expire 21 September 2042

CP-2008-1202-01 to CP-2008-1207-01 (inclusive) and CP-2008-1209-01 expire 2 July 2042.

Specific Conditions CP-2008-1208-01 (ex CP205022)

Clause 29

This permit shall be carried out in accordance with the consent application and supporting documentation except to the extent that these are required to be modified to comply with the terms and conditions of the permit.

Clause 30

The conditions of this permit shall be read in conjunction with the conditions of the designations from the Notices of Requirement for Designation, PZ-103653-00 and the conditions of consents: DA-103680-00, CP-1202-01, CP-1203-01, CP-1204-01, CP-1205-01, CP-1206-01, CP-1207-01, CP-1208-01, CP-1209-01 and CP-1210-01.

Discharge to Outfall Monitoring Up Until Single BTF Plant Commissioning

Clause 31

The permit holder shall install and operate at a point beyond the existing milliscreens, at Location 4 in Figure 2, such systems and measuring devices as are necessary, to monitor, analyse and record wastewater discharge in cubic metres per second for maximum and average daily flow rates from the discharge point.

Clause 32

The permit holder shall sample, analyse and record from a composite flow proportional sample the following from the wastewater discharge beyond the existing milliscreens, at Location 4:-

- (i) Floatable oil and grease in terms of g/m³ and kg/day.
- (ii) Total oil and grease in g/m³ and kg/day.
- (iii) Suspended solids in g/m³ and kg/day.
- (iv) 5-day carbonaceous BOD and COD in g/m³ and kg/day.
- (v) Particles retained by a 1-mm x 25 mm screen in g/m³ and kg/day.
- (vi) Particles retained by a 1-mm 2-dimensional sieve in g/m³ and kg/day
- (vii) Enterococci in cfu/100 ml.

Clause 33

Based upon weekly sampling taken thereafter until Single BTF Commissioning, at Location 4:

- (i) There shall be no particles retained on a test section of a 1 mm screen; and
- (ii) The following standards shall be met:

Parameter	Sample Type	Concentration Limit (g/m ³)	Mass Load Limit (kg/day)
Total Oil and Grease	Composite	60	1080
Floatable Oil and Grease	Composite	20	360
Suspended Solids, Until Wastewater Disinfection	Composite	900	16,200

commissioning of Preferred Long-Term Management Option

Suspended Solids, After Wastewater Disinfection	Composite	600	10,800
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Preferred Long-Term Management Option commissioning

Compliance with the concentration and mass load based limits shall be determined on the basis of there being no more than 3 exceedances of the concentration and mass load limits in any discrete period of 26 consecutive samples.

Clause 34

Once every three months separate 'grab' samples shall be taken from Location 4, on a randomly selected day and the same day in that week as the flow proportional sample and analysed for the following parameters:

- Suspended Solids
- Total Oil and Grease
- Floatable Oil and Grease
- 5-day carbonaceous BOD

These 'grab' samples shall be taken at 1100 and 1500 NZST.

Wastewater Treatment Plant Monitoring Subsequent to Single BTF Plant Commissioning and up
Until ~~Wastewater Disinfection~~ commissioning of Preferred Long-Term Management Option.

Clause 35

(a) The permit holder shall install and operate such systems and measuring devices as are necessary to monitor, analyse and record wastewater discharge in cubic metres per second for maximum and average daily flow rates from the following discharge points:

(i) Immediately after the discharge leaves the WWTP and prior to it mixing with the industrial flow, at Location 2.

(ii) The industrial flow prior to mixing with the discharge from the BTF, at Location 3.

(b) The permit holder shall install and operate such systems and measuring devices as are necessary to monitor, analyse and record wastewater BOD (soluble and total) and suspended solids (volatile and total) characteristics from influent immediately prior to the BTF, at Location 1.

Advice Note

The total discharge flow shall be calculated by adding the flows at Location 2 (Clause 35 (a) (i)) and Location 3 (Clause 35 (a) (ii)), see Figure 2 for Locations 2 and 3.

Clause 36

The permit holder shall sample, analyse and record from a composite flow proportional sample the following parameters from the wastewater discharge at:

(a) Location 1 and Location 2 for:-

- (i) Floatable oil and grease in terms of g/m^3 and kg/day .
- (ii) Total oil and grease in g/m^3 and kg/day .
- (iii) Suspended solids in g/m^3 and kg/day .
- (iv) 5-day carbonaceous BOD and COD in g/m^3 and kg/day .
- (v) Enterococci in cfu/100 ml (by 'grab' sample, not composite flow proportional sample)
- (vi) Further parameters as agreed in the BTF Plant Monitoring and Investigation Study.

(b) Location 3 for:

- (i) Floatable oil and grease in terms of g/m^3 and kg/day .
- (ii) Total oil and grease in g/m^3 and kg/day .
- (iii) Suspended solids in g/m^3 and kg/day .
- (iv) 5-day carbonaceous BOD and COD in g/m^3 and kg/day .
- (v) Enterococci in cfu/100 ml (by 'grab' sample, not composite flow proportional sample)

~~(c) And additionally at Location 1 and Location 3 for:~~

~~(i) Particles retained by a 1 mm x 25 mm screen in g/m^2 and kg/day .~~

~~(ii) Particles retained by a 1 mm x 2-dimensional sieve in g/m^2 and kg/day~~

(c) Location 4 for:

(i) Floatable oil and grease in terms of g/m^3 and kg/day .

(ii) Total oil and grease in g/m^3 and kg/day .

(iii) Suspended solids in g/m³ and kg/day.

(iv) 5-day carbonaceous BOD and COD in g/m³ and kg/day.

(v) Enterococci in cfu/100 ml (by 'grab' sample, not composite flow proportional sample)

Clause 37

This condition is to be implemented only if required as set out in condition

4A (c) (iv).

The permit holder shall sample, analyse and record BOD in g/m³ and kg/day prior to the initial BTF at Location 1. Based on the results of analyses of weekly sampling the annual average daily loading of the BOD on the BTF or BTFs shall not exceed 0.4 kg per cubic metre of media.

Clause 38

Based upon twice weekly sampling, taken over the first six months after the Single BTF Plant Commissioning and weekly sampling thereafter until 31 December 2012, all industrial wastewater discharged at Location 3, shall meet the following standards:

Parameter	Sample Type	Concentration Limit
Suspended Solids	Composite	600 g/m ³
Total Oil and Grease	Composite	60 g/m ³

Compliance with the concentration and mass load based limits shall be determined on the basis of there being no more than 3 exceedances of the concentration and mass load limits in any discrete period of 26 consecutive samples.

All other parameters in condition 36 (b) shall also be sampled at the same frequency.

Grab Samples

Clause 39

Once every three months separate 'grab' samples shall be taken from monitoring points at Location 2 and Location 3 on a randomly selected day of the week and the same day in that week as the flow proportional sample and analysed for the following parameters:

- Suspended Solids
- Total Oil and Grease
- Floatable Oil and Grease
- 5 day carbonaceous BOD

These 'grab' samples shall be taken at 1100 and 1500 NZST.

Subsequent to ~~wastewater disinfection~~ commissioning of Preferred Long-Term Management Option and for the Remaining Duration of the Permit

Clause 40

The permit holder shall continue to operate such systems and measuring devices as are necessary, to monitor, analyse and record wastewater discharge in cubic metres per second for maximum and average daily flow rates from Location 2 and Location 3.

Clause 41

(a) The permit holder shall sample, analyse and record from a composite flow proportional sample the following from the wastewater discharge at Location 2 and Location 3:

- (i) Floatable oil and grease in terms of g/m^3 and kg/day .
- (ii) Total oil and grease in g/m^3 and kg/day .
- (iii) Suspended solids in g/m^3 and kg/day .
- (iv) 5-day BOD or COD equivalent in g/m^3 and kg/day .
- (v) Enterococci in cfu/100 ml (by 'grab' sample, not composite flow proportional sample)

And immediately beyond the milliscreens:

- ~~(i) Particles retained by a 1 mm x 25 mm screen in g/m^2 and kg/day .~~
- ~~(ii) Particles retained by a 1 mm x 2 dimensional sieve in g/m^2 and kg/day .~~

(b) The permit holder shall maintain and operate such systems and measuring devices as necessary to sample, analyse and record the following parameter from the wastewater at Location 1 for :-

- (i) BOD in g/m^3 and kg/day .

Clause 42

Stipulates enterococci limit on wastewater discharge to Poverty Bay.

Enterococci shall be sampled on a daily basis for the first 100 days immediately subsequent to ~~wastewater disinfection~~ commissioning of Preferred Long-Term Management Option and thereafter at weekly intervals for the duration of this permit. The discharge shall meet the following standards:

Parameter	Sample Type	Parameter limit, as cfu/100 ml sample
Enterococci	Grab	1000

Compliance with this condition shall initially be determined on the basis of there being no more than 8 exceedances of the specified number limit within the initial 100 day period of operation and, thereafter no more than 3 exceedances of the concentration based limit in any discrete period of 26 consecutive samples.

Clause 43

This condition is to be implemented only if required as set out in condition 4A (c) (iv).

Based upon weekly sampling after ~~wastewater disinfection~~ commissioning of Preferred Long-Term Management Option from a composite flow proportional sample taken over a period of 24 hours on a randomly selected day of the week for the term of the permit, all wastewater discharged beyond the wastewater treatment plant at Location 2 shall meet the following standards:

Parameter	Sample Type	Parameter Limit, Concentration Limit
Suspended Solids	Composite	30 g/m ³
Total Oil and Grease	Composite	10 g/m ³

Compliance with the concentration based limits shall be determined on the basis of there being no more than 16 exceedances of the concentration limit in any discrete period of 26 consecutive samples.

Clause 44

Stipulates enterococci limit on separated industrial wastewater stream

Based upon daily sampling immediately subsequent to ~~wastewater disinfection~~ commissioning of the Preferred Long-Term Management Option for the first 100 days and sampling weekly thereafter, all industrial wastewater discharged at Location 3 shall meet the following standards:

Parameter	Sample Type	Parameter limit as cfu/100 ml Sample
Enterococci	Grab	1000

Compliance with this condition shall initially be determined on the basis of there being no more than 8 exceedances of the specified number within the initial 100 day period of operation and, thereafter no more than 3 exceedances of the concentration based limit in any discrete period of 26 consecutive samples.

Clause 45

Based upon twice weekly sampling for 6 months subsequent to installation of ~~wastewater disinfection~~ of the Preferred Long-Term Management Option and sampling weekly thereafter for the term of the consent, all industrial wastewater discharged at Location 3 shall meet the following standards:

Parameter	Sample Type	Concentration Limit
Suspended Solids	Composite	600 g/m ³
Total Oil and Grease	Composite	60 g/m ³

Compliance with the concentration and mass load based limits shall be determined on the basis of there being no more than 3 exceedances of the concentration and mass load limits in any discrete period of 26 consecutive samples.

Plume Monitoring

Clause 46

The permit holder shall collect samples at hourly intervals from the wastewater beyond the existing milliscreens (Location 4) and store these samples for a minimum of 24 hours. If a “conspicuous” plume or slick attributable to the outfall discharge is identified (by a suitably trained person), sample analysis for suspended solids and total oil and grease shall be carried out on those samples coinciding with the observance of the “conspicuous” plume or slick. After 24 hours subsequent to samples being collected, samples not required for sample analysis may be discarded.

The permit holder shall inform the consent authority within 24 hours of a “conspicuous” plume or slick being identified and samples being analysed and shall provide the sample analysis results within 10 working days of the samples being collected.

This condition shall apply until Single BTF Plant Commissioning or an approved methodology as described in condition 47 is in place.

Clause 47

The permit holder shall provide a methodology to the approval of the consent authority, within 24 months from the date of issue of the consent, to investigate the possible relationship between the occurrence of a conspicuous plume or slick, as identified by the relevant authority, and the concentrations of suspended solids and oil and grease in the discharge, as referred to in condition 46.

Grab Samples

Clause 48

Once every three months separate ‘grab’ samples shall be taken from monitoring points at Location 2 and Location 3, on a randomly selected day and the same day in that week as the flow proportional sample and analysed for the following parameters:

- Suspended Solids
- Total Oil and Grease
- Floatable Oil and Grease
- 5-day carbonaceous BOD

These ‘grab’ samples shall be taken at 1100 and 1500 NZST.

Additional Monitoring For The Duration Of This Permit

Heavy Metals & Organic Compounds

Clause 49

The permit holder shall carry out heavy metal and organic compound analysis of the combined wastewater stream, at Location 4, at intervals not exceeding six months for heavy metals and not exceeding 12 months for organic compounds, or at such other occasions that the consent authority considers circumstances so require or as required by the WMC. A copy of each analysis report shall be

forwarded to the consent authority within 30 days of samples being collected. The following parameters are to be tested for:-

Parameter(s)	Units
Cadmium	g/m ³ , g/d
Chromium	g/m ³ , g/d
Copper	g/m ³ , g/d
Lead	g/m ³ , g/d
Mercury	g/m ³ , g/d
Zinc	g/m ³ , g/d
Semi Volatile Organic Compounds	g/m ³ , g/d
Volatile Organic Compounds	g/m ³ , g/d

The sample is to be taken from a 24-hour flow proportional composite sample and the results are to be given in both g/m³ and g/day.

Clause 50

The levels of heavy metals in the combined wastewater stream shall not be greater than:

Parameter(s)	Parameter Limits (g/m ³)
Cadmium	0.8 g/m ³
Chromium	2.0 g/m ³
Copper	0.2 g/m ³
Lead	0.2 g/m ³
Mercury	0.004 g/m ³
Zinc	2.0 g/m ³

If on any sampling occasion, any sample exceeds any of the above limits, the permit holder shall resample the discharge for the non-compliant parameter as soon as practical after the exceedance is found, notify the consent authority as soon as possible and as a maximum within 24 hours and shall carry out investigations into the likely cause of that exceedance. The permit holder shall forward an investigation report to the consent authority within 30 days of that sampling occasion.

Nutrients

Clause 51

The permit holder shall monitor the combined wastewater stream at Location4 for the following nutrients:

<u>Nitrogen</u>	<u>Units</u>
Total Kjeldahl Nitrogen	g/m ³

Ammonium Nitrogen	g/m ³
Nitrate Nitrogen	g/m ³
Dissolved Inorganic Nitrogen	g/m ³

Phosphorus

Total Phosphorus	g/m ³
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The permit holder shall carry out nutrient analysis for nitrogen compounds, as outlined above and phosphorus from the combined wastewater stream at intervals not exceeding 3 months or at such other occasions when the consent authority considers circumstances so require. A copy of each analysis report shall be forwarded to the consent authority within 30 days of samples being collected.

The samples shall be taken from a 24-hour flow proportional composite sample and results provided in both grams per cubic metre (g/m³) and kilograms per day (kg/d).

Pathogens

Clause 52

The permit holder shall sample, analyse and record the following from wastewater samples taken at Location 2 and Location 3:

- (i) Bacteria, sample for the species Salmonella and Campylobacter.
- (ii) Viruses, sample for human enterovirus and adenovirus.
- (iii) Protozoa, sample for the species Giardia and Cryptosporidium.
- (iv) Sample for Enterococci.

Clause 53

Subsequent to and within one month of Single BTF Plant Commissioning the wastewater discharge shall be sampled at the locations and for the species outlined in conditions 52 (i), (ii), (iii) and (iv). Monitoring shall continue at six monthly intervals for two years and annually thereafter until superseded by condition 54.

Clause 54

Subsequent to and within one month of ~~wastewater disinfection~~ wastewater disinfection commissioning of the Preferred Long-Term Management Option, including ultraviolet disinfection, the wastewater discharge shall be sampled at the locations and for the species outlined in conditions 52 (i), (ii), (iii) and (iv). Monitoring shall continue at six monthly intervals for two years and annually thereafter for the duration of this permit.

Clause 55

Sample analysis results shall be provided to the consent authority within 60 days of samples being collected. Sample analysis results shall include a ratio of indicator organisms with each pathogen sampled in conditions 53 and 54.

Whole Effluent Toxicity

Clause 56

The permit holder shall commission a programme of effluent toxicity testing and reporting. The programme shall include a 24-hour flow weighted composite sample of the combined discharge taken once every three months and tested for toxicity using standard protocols for suitable toxicity testing species for the following three organisms ~~three test species~~:

- (i) Marine Algae (*Minutellus polymorphus*)
- (ii) Blue Mussel Embryo (*Mytilus galloprovincialis*)
- (iii) ~~Amphip Wedge Shell~~ (*Macmona liliانا*) Amphipod

The frequency shall be changed to once ~~each~~ every two years if no toxicity is demonstrated in four successive summer peak load samples. No toxicity is defined as: "TEC (threshold effect concentration) value for the most sensitive of the three test organisms shall represent a dilution in uncontaminated near shore water of no more than 200 times."

Results for testing and analysis shall be reported to the consent authority, within three months of testing. The programme shall also identify the management response to be undertaken by the permit holder in the event that more than 200 times dilution is required for no toxicity.

Monitoring of the Receiving Environment for the Duration of the Permit

Indicator Organisms

Clause 57

The permit holder shall carry out monitoring of the indicator organisms Enterococci and Faecal Coliforms, and provide results as colony forming units per 100 ml samples, from the following sites:

(a) Up until 31 December 2015 or commissioning of ~~wastewater disinfection~~ the Preferred Long-Term Management Option, whichever occurs sooner :

- The Outfall Mid-Diffuser
- Any Visible Plume at 250 metres and 500 metres from the Outfall Diffuser
- 250 metres Northwest of the Diffuser
- 250 metres North of the Diffuser
- 250 metres Northeast of the Diffuser
- 250 metres Southwest of the Diffuser
- 250 metres South of the Diffuser
- 250 metres Southeast of the Diffuser
- 500 metres Northwest of the Diffuser

- 500 metres North of the Diffuser
- 500 metres Northeast of the Diffuser
- 500 metres Southwest of the Diffuser
- 500 metres Southeast of the Diffuser
- Background Site.

Sample analysis shall occur twice monthly during the months November to March inclusive and monthly during the months April to October inclusive and shall coincide with state of the environment monitoring of beach and coastal river sites.

(b) Subsequent To Installation of Wastewater Disinfection the Preferred Long-Term Management Option:

- The Outfall Mid-Diffuser
- Any Visible Plume at 250 metres and 500 metres from the Outfall Diffuser
- 250 metres Northwest of the Diffuser
- 250 metres North of the Diffuser
- 250 metres Northeast of the Diffuser
- 250 metres Southwest of the Diffuser
- 250 metres South of the Diffuser
- 250 metres Southeast of the Diffuser
- Background Site.

Sample analysis shall occur twice monthly during the months November to March inclusive and monthly during the months April to October inclusive and shall coincide with state of the environment monitoring of beach and coastal river sites.

Benthic Survey

Clause 58

A benthic survey shall be carried out by the permit holder:

- (i) More than six months but less than one year subsequent to ~~31 December 2015 or~~ commissioning of the ~~wastewater disinfection~~ Preferred Long-Term Management Option, whichever comes sooner.
- (ii) Thereafter at no more than 10-year intervals for the duration of this permit.
- (iii) There shall be a minimum of four benthic surveys during the 35-year duration of this permit.

The survey shall be comparable with former benthic surveys of Poverty Bay (Cawthron), as outlined in Figure 1, unless otherwise approved by the consent authority.

Soft Bottom Substrate

Clause 59

Transects shall be sampled, as outlined on Figure 1:

- (i) SW orientation at the following intervals:
50W, 100W, 200W, 300W, 400W, 800W, 1200W, 1600W, 2000W and 2400W
- (ii) SE orientation at the following intervals:
0 (outfall), 50SE, 100SE, 200SE, 300SE, 400SE, 800SE and 2400SE.

The following parameters shall be sampled and analysed at each site outlined in sub-clauses (i) and (ii):

- Grain size
- Heavy metals,
- Organic matter,
- Stable isotopes,
- Infauna

Rocky Reef Substrate

Clause 60

The following parameters sub-clause (i) shall be sampled and analysed at each of the sites outlined in sub-clause (ii) for the species outlined in subclause (iii)

- (i) Parameters:
 - Stable isotopes,
 - Heavy metals,
 - Poly Aromatic Hydrocarbons,
- (ii) From rocky reef communities, species as sampled during the Cawthron survey:
 - Tokomaru Rock.
 - Te Moana Rock.
 - Waihora Rock.

(iii) Species

Crayfish tissue for trace metals and polyaromatic hydrocarbons

Crayfish gut content and red macro algae for stable isotopes.

Visual

Clause 61

Suspended solids shall be monitored continually on-line by a suspended solids meter which shall continue to be maintained at an agreed location after mixing of all wastewater streams prior to discharge from the outfall. When the suspended solids meter records a sustained result exceeding the concentration limits specified in conditions 33 or 38 or 43 and 45, whichever are relevant and appropriate, for a period exceeding 5 minutes duration the permit holder shall visually inspect the bay from Kaiti Hill/Titirangi either on-site or using the on-site digital camera if weather conditions allow use of the camera.

A camera with focal length, field of vision, magnification and image quality (as defined by an independent suitably qualified and experienced professional) and approved by the consent authority shall continue to be maintained at the existing vantage point on Kaiti Hill /Titirangi and directed at the outfall zone. The camera shall be operated and maintained by a suitably trained person employed by the consent authority permit holder to provide a permanent and ongoing automated photographic log of the outfall to maintain a complaints log of any reports of conspicuous plume/or slick from the outfall, to visually inspect the reported determine the occurrence of any conspicuous plume/or slick and to determine and record the likelihood of this being attributed to the discharge from the marine outfall. The automated photographic log shall record photographs at a minimum of 30 minute intervals during daylight hours or at any other interval agreed between the consent authority and the consent holder.

Should a conspicuous plume/or slick be identified that may be attributable to the discharge from the Outfall Pump Station then twice daily manual surveillance at 11.00 am and 1.00 pm from Kaiti Hill /Titirangi shall commence and shall continue for the ensuing week with appropriate inspection notes and additional photographic images to be recorded. Surveillance photographs shall also continue to be taken by the camera at half hourly intervals during daylight hours over the same period. Images of surveillance photographs shall be forwarded to the consent authority within five working days of being taken. The images shall be stored for the duration of the seasonal horticultural processing season.

This condition shall apply until an approved methodology as described in condition 47 is in place.

Sampling and Analysis

Clause 62

Sampling and analysis shall be carried out by a IANZ registered laboratory or equivalent and procedures shall be in accordance with Standard Methods for the Examination of Water and Wastewater prepared and published jointly by:

American Public Health Association

American Water Works Association

Water Pollution Control Federation, twentieth or newer edition.

Note: Procedures for sieve and screen tests have been developed by the Gisborne District Council and are not registered procedures. These tests have proven very useful in determining effective operation of the existing milliscreens and are considered an effective procedure for use in this permit. Consequently, these tests can continue to be used in terms of these permit conditions.

Sample analysis results shall be provided to the consent authority within 10 days of samples being collected for micro-organism, oil and grease, suspended solids, biochemical oxygen demand, sieve and screen tests or as specifically required in conditions 49 to 61. Any non-compliant results shall be reported to the consent authority as soon as practicable after the sample analysis reveals a non-compliant result, and in any event within 24 hours.

Note: Monitoring frequency and parameters sampled may be reviewed by the WMC, taking advice from the IRP, where appropriate. In the event that the WMC considers changes to monitoring frequency and parameters sampled should be made, it may request the consent authority to consider proposed changes as part of the next review of consent conditions.

Further advice note: In the event of clarification processes being implemented, further conditions are recommended to be sought and amended by way of variation to this permit.

Attachment D

List of reports and other work carried out through this process:

- Avifaunal Risk Assessment, Morphum Environmental Limited
- Hydrodynamic Model Results Summary, Hawkes Bay Regional Council
- Discharge Plume and Dilutions Study, MetOcean Solutions
- A Cultural Framework For Addressing Wastewater Management In Turanganui A Kiwa, Te Runanga O Turanganui A Kiwa
- Denitrifying Filters, Beca
- Membrane Filtration, Beca
- Chemical Phosphorus Removal, Beca
- Sludge Reed Bed Summary, Beca
- Biological Trickling Filter Solids Settling Options Discussion, Beca
- Gisborne Dune Effluent Discharge Concept Assessment, Beca
- Solar Sludge Drying Assessment, Beca
- Hourly Analysis, Beca
- Gisborne 1 BTF vs 2 Water Quality, Beca
- Flow Balancing, Beca
- Outfall Capacity Review, Beca
- Vermicomposting Assessment, Beca
- Comparing Overall Costs of Sludge Disposal Options, Beca
- Stage 2 Refined Options Technical Memo – Summary of Capex and Opex, Beca

- Water Quality Considerations, Coast & Catchment
- Assessment of Beca's Report on Solid Settling Options, EnviroKnowledge
- Wastewater Quality Assessment of the Biological Trickling Filter, EnviroKnowledge
- Assessment of Beca's Report on Effluent Discharge to Sand Dunes, EnviroKnowledge
- Analysis of Emerging Organic Contaminants – Part 1, Northcott Research Consultants
- Analysis of Emerging Organic Contaminants - Part 2 - Appendices, Northcott Research Consultants
- Marine Outfall Renewal Process and Costs, GDC
- Wastewater Options Review Group Terms of Reference, GDC
- Wetland Review, Morphum Environmental
- Assessment of NIWA Wetland System Proposal, EnviroKnowledge
- Wetland Groundwater, Golder
- DrainWise Wastewater Management Options Interrelationships, GDC
- High Level Benefits and Risk Assessment, GDC
- High Rate Algal Ponds, GDC
- Wastewater Consent Requirements and Costs, GDC
- Alternate Use and Disposal Summary, GDC
- National Standards Comparison, GDC