



**Resource Consent  
Application  
Kohukohu Waste  
Water Treatment  
Plant**



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# Resource Consent Application

## Kohukohu Waste Water Treatment Plant

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# 1 Introduction

The Kohukohu Wastewater Treatment Plant (WWTP) has been owned and operated by the Far North District Council (FNDC) since the 1980s. The WWTP collects the discharge from individual septic tanks on 76 properties in Kohukohu. The treatment consists of a single oxidation pond followed by a constructed wetland. After treatment the effluent is discharged into a catchment drain, which flows for a short distance before discharging into the Hokianga Harbour.

Since commissioning the Kohukohu WWTP resource consent from Northland Regional Council (NRC) has been renewed a number of times. The most recent resource consent was obtained from NRC in the early 2000's and is due to expire on 31 August 2016.

A new consent must be obtained, and this consent will again cover the same activities as no changes to the WWTP are envisaged. The requested term for this consent is 15 years.

The activities sought by this application meet the criteria under s124 (2) (d) (ii) of the *Resource Management Act 1991* (RMA) for lodgement within the period ending 3 months before the expiry of the existing consent (expiry date 31 August 2016). Accordingly, FNDC seeks that NRC allow the continued operation of the Kohukohu WWTP pursuant to s124 (2) (e) of the RMA, until a decision is made on this application and it is beyond challenge (s124 (3)).

The application also seeks to lodge with a request to extend timeframes under s37 of the RMA. This extension will allow for full consultation with affected marae's to occur.

## 1.1 Relevant Rules

The WWTP discharges treated wastewater into the environment both directly (discharge into the Hokianga Harbour) and indirectly (through seepage into the ground). In addition to this the WWTP also generates minor air emissions (odour and gases). As a result the operation of the WWTP triggers a number of rules under the NRC Water and Soil Plan (2004) and Air Quality Plan(2005). The relevant rules have been summarised below in **Table 1**.

**Table 1: Relevant Regional Rules**

Plan and Rule	Description	Trigger
Soil and Water Plan	The discharge of treated sewage effluent directly into a water course from a sewage treatment and disposal system	15.03. 02 Discretionary Activity
	The discharge of sewage effluent into land in a manner outside the scope of or unable to meet the conditions pertaining to the permitted activity rules	15.03.01 Discretionary Activity
Air Quality Plan	Any activity not complying with permitted activity rules	9.03(2) Discretionary Activity

Plan and Rule	Description	Trigger
Coastal Plan	The discharge of treated effluent to coastal water from land-based wastewater treatment plants	31.4.6(f) Discretionary Activity

## 1.2 Scope and Objectives

The scope of this report is limited to providing necessary information requirements under Section 88 and Schedule 4 of the *Resource Management Act 1991*. Accordingly the scope includes:

- A description of the proposed activity;
- An assessment of environmental effects – with particular focus on Section 35.1 of the Regional Water and Soil Plan – *Information Requirements for Discharge Permit Applications*;
- Assessment of the activity against Part 2 and section 104 (1)(b) of the RMA all relevant Regional Council Policies; and
- Consultation with relevant stakeholders including the local community and iwi/hapu.

The objective of this report is to present the above scope in sufficient detail to allow a thorough and efficient assessment by NRC.

## 2 Proposed Activity

### 2.1 Location

The Kohukohu WWTP is located approximately 1km south of Kohukohu, a township located on the northern/western side of the Hokianga Harbour (**Figure 1**). The site is located on reclaimed land that has been utilised for this activity since 1984. The WWTP oxidation pond has a surface area of 0.1 ha and the constructed surface flow wetland covers approximately 0.12 hectares.



**Figure 1: Site Location**

### 2.2 Activity Description

The effluent at Kohukohu township receives primary treatment by septic tanks that are located on individual residential properties. These septic tanks are maintained by FNDC. Solids are separated and deposited as sludge in these septic systems and the septic tanks are de-sludged every three to five years.

Once reaching Kohukohu WWTP the effluent undergoes secondary treatment. This involves oxidation followed by anoxic periods. This process encourages the eventual decline of biochemical oxygen demand, nitrogen and bacterial content in the effluent. The effluent receives further treatment as it flows through a constructed surface flow wetland. Here the wetland plants take up

phosphorus, and what remains of the nitrogen content. Finally the effluent discharged into a catchment drain, where it flows into Hokianga Harbour.

Once the effluent reaches the Hokianga Harbour it mixes and disperses with this large body of water within a defined mixing zone. During a half tide and falling situation (when water in the harbour is moving out to sea), the end of this mixing zone is considered to be the Channel Beacon at coordinates 2559832 – 6647261. This process is illustrated in **Figure 2** and explained in further detail in **Section 3.1**.



**Figure 2: Effluent Discharge Process**

### 2.2.1 Effluent Quantity

Flow rates leaving the WWTP vary substantially throughout the year.

- In dry summer periods there are long periods where no outflow discharge occurs at all.
- During wet weather periods substantial increases in outflow discharge occur as a result of inflow and infiltration into the reticulation. Generally, based on a 50mm rainfall event, the system experiences around a 4 fold peaking factor.
  - » The 99%ile outflow is 208 m<sup>3</sup>/day,
  - » The 95%ile outflow is 105 m<sup>3</sup>/day and
  - » The 90%ile outflow is 73 m<sup>3</sup>/day.



- » The median is only 15 m<sup>3</sup>/day. During dry weather the quantity discharged is usually around this amount.

Water loss from the WWTP can be relatively significant and is obvious during dry periods with minimal rainfall. During dry periods it is common to record inflow volumes ~10 – 20 m<sup>3</sup>/day with no outflow recorded. Water loss from the WWTP can be attributed to a combination of evaporation and loss from the unlined oxidation pond and constructed wetland.

As discussed, significant amount of this loss is likely to be attributed to evaporation. To demonstrate this, actual open water evaporation<sup>1</sup> from the NIWA electronic weather station at Kaitaia (Station number 18183) was obtained over a 10 year period (2004-2014) as a proxy for evaporation from the treatment ponds and wetland. Based on that data, and taking into account a total open water pond and wetland size of 2,300m<sup>2</sup>, the average evaporation rate over a 10 year sample period is expected to be approximately 6.7m<sup>3</sup>/day. In the summer months (December to February) average evaporation is expected to be around 10m<sup>3</sup>/day.

### 2.2.2 Effluent Quality

The quality of the final effluent leaving the WWTP has been monitored and records of monitoring data is available from 2003 until the present. These measurements, in **Table 2** represent the effluent quality before any mixing or dilution has occurred within the Hokianga Harbour Mixing Zone (**Figure 2**).

**Table 2: Summary of monitoring results from 2003-2016. Average values shown with confidence levels at 95%. Note pH and Dissolved oxygen monitoring data covers a period of 2010-2016.**

Parameter	Average	Median	95%tile	Number of samples
pH	7±0.3	7.1	7.8	53
Dissolved oxygen (g/m <sup>3</sup> )	3.4±1	3.4	13	52
Ammonium (NH <sub>4</sub> -N) (g/m <sup>3</sup> )	17±1.6	17	35	104
Total Suspended Solids	12±2.3	7	41	104
Biochemical Oxygen Demand (g/m <sup>3</sup> )	12.5±1.7	10.5	31	104
Faecal Coliforms (c/100mL)	4323±1615	900	27,700	102

<sup>1</sup> Details on the methodology can be found on the cloflo website: [http://cliflo.niwa.co.nz/pls/niwp/wh.do\\_help?id=ls\\_evap1](http://cliflo.niwa.co.nz/pls/niwp/wh.do_help?id=ls_evap1)



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## 2.3 Alternative Options

Schedule 4 (d) (ii) of the *Resource Management Act 1991* requires that the Assessment of Environmental Effects for the discharge of a contaminant includes ‘a description of any possible alternative methods of discharge, including discharge into any other receiving environment.’ The most common alternative which also aligns with kaitiakitanga principles, is the use of land based effluent disposal (i.e. irrigation). Irrigation is not considered an appropriate option in this case because of a number of reasons:

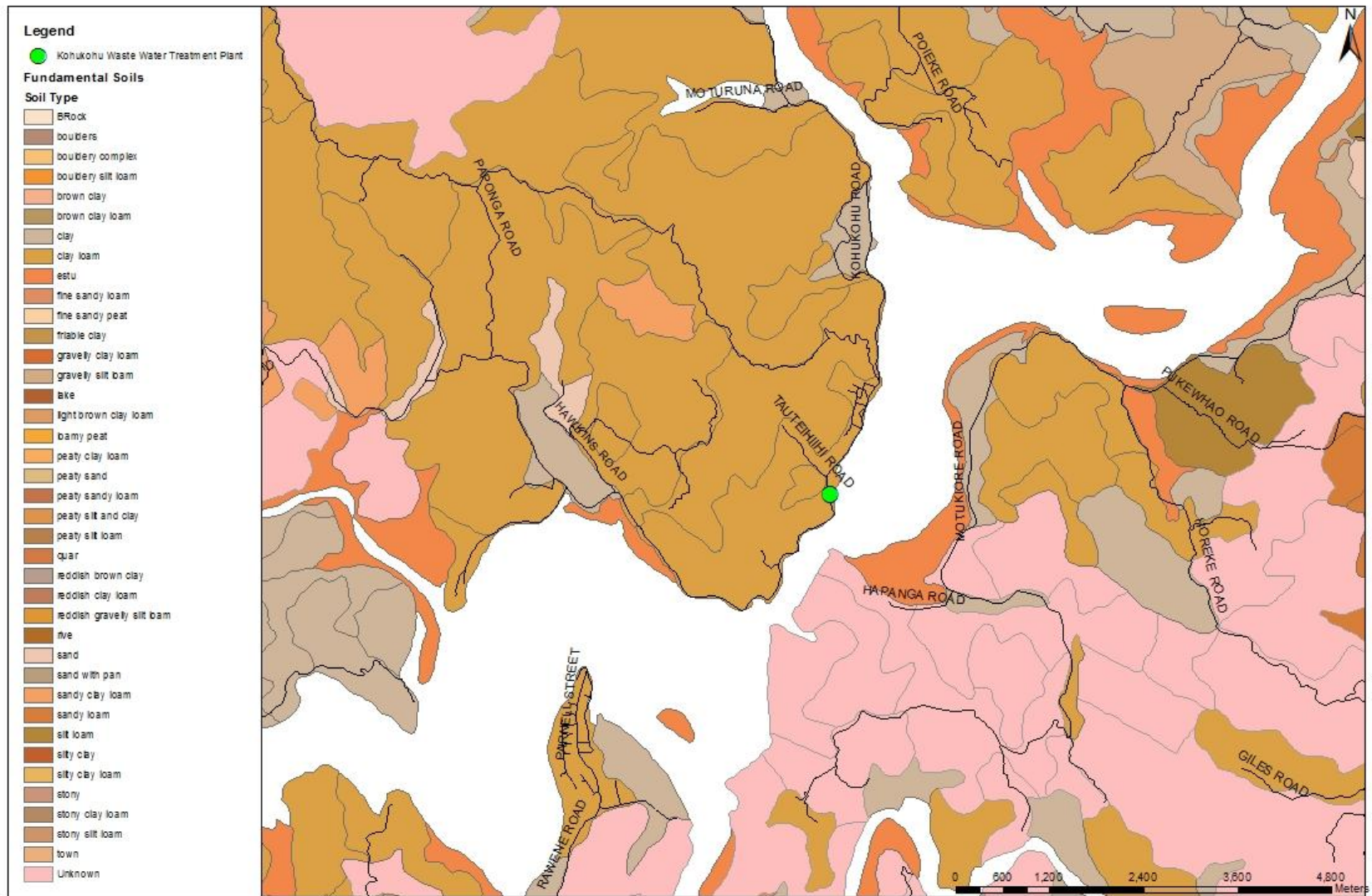
- There is a limited amount of area available to irrigate. The only nearby open grassed areas belong to a sporting facility and a Marae. These are not acceptable locations to irrigate.
- Kohukohu is low lying and directly adjacent to the Hokianga Harbour. As a result it receives surface runoff and groundwater flow from the surrounding catchment. This causes the groundwater table in Kohukohu to be quite high, particularly in winter when rainfall is frequent. Thus saturation and effluent runoff may occur.
- Northland Regional Council’s fundamental soils data (**Figure 3**) identifies Kohukohu’s main soil type as being clay loam. Clay loam has limited permeability, thus effluent runoff may occur.

## 2.4 Value of Investment by Consent Holder

As this application meets the criteria under s124 (2) (d) (ii) of the RMA, in accordance with Section 3b of Schedule 4 of the RMA, the investment made by the consent holder to date must be considered.

The reticulated sewage system in Kohukohu has cost the Far North District Council approximately \$2,093,700 excluding labour. This includes:

- Land Purchase at the WWTP site: \$5,500
- Cost of Treatment Plant: \$992,600
- Town reticulation system and pump stations: \$1,095,600



**Kohukohu Fundamental Soil Type**

**Figure 3: Northland Fundamental Soils**

## 3 Existing Environment

The purpose of this section is to establish the existing baseline condition of the site and the surrounding environment of Hokianga Harbour. Understanding the baseline condition of an environment allows potential effects to this baseline condition to be assessed as set out in **Section 4**.

### 3.1 Water

#### 3.1.1 Regional Water Objectives – Fresh Water Ecosystem Projection

Policy 3 of the *Northland Regional Council Regional Water and Soil Plan (2004)* lists guidelines for the management of waters for ecosystem purposes. The policy makes allowance for reasonable mixing. Thus it allows for effluent to be discharged and undergo a process of mixing and dilution in the receiving water body before it must reach the given water quality objectives in the plan. The area in which this mixing and dilution occurs is referred to as the mixing zone (**Figure 4**). Currently the end of this mixing zone is considered to be the Channel Beacon at coordinates 2559832 – 6647261.



**Figure 4: WWTP release points and mixing process**

For the purpose of ecosystem protection, the plan states after reasonable mixing the contaminant, is not likely to:

- Cause the natural pH of the water to fall outside the range of 6.5-9.0.
- Cause a change in the natural temperature of the water of greater than 3 degrees Celsius.
- Cause the concentration of dissolved oxygen (daily minimum) to be reduced below 6 g/m<sup>3</sup>.
- Cause levels of toxic metals to exceed the following, except where caused by natural events:
  - » Total arsenic 50 mg/m<sup>3</sup>
  - » Total cadmium 0.2 – 2\* mg/m<sup>3</sup>
  - » Total chromium 2 mg/m<sup>3</sup>
  - » Total copper 2 – 5 mg/m<sup>3</sup>
  - » Total lead 1 – 5 mg/m<sup>3</sup>
  - » Total zinc 5 – 50\* mg/m<sup>3</sup>
  - » Total mercury 0.1 mg/m<sup>3</sup>
- Cause the four- day average concentration of ammonium to exceed that detailed in **Table 3**.

**Table 3: Four day average concentration of ammonium**

Ammonium, NH <sub>4</sub> -N g/m <sup>3</sup>					
pH	10 <sup>o</sup> c	15 <sup>o</sup> C	20 <sup>o</sup> C	25 <sup>o</sup> C	30 <sup>o</sup> C
6.50	1.81	1.81	1.22	0.86	0.60
6.75	1.81	1.81	1.22	0.86	0.60
7.00	1.81	1.81	1.22	0.86	0.61
7.25	1.81	1.81	1.23	0.86	0.61
7.50	1.81	1.81	1.23	0.86	0.61
7.75	1.73	1.64	1.15	0.81	0.58
8.00	1.13	1.09	0.76	0.54	0.39
8.25	0.64	0.62	0.44	0.32	0.23
8.50	0.37	0.36	0.26	0.19	0.14

Note: pH and temperature, where practicable, should be measured in the midday-early afternoon period (noon to 2 p.m. NZ Standard Time).

- Cause the level of nutrients to fall outside the range of:
  - » Dissolved Reactive Phosphorus 50 – 30 mg/m<sup>3</sup>
  - » Dissolved Inorganic Nitrogen (nitrate + ammonium) 40 – 100 mg/m<sup>3</sup>
- Cause the visual clarity of the water, as measured by black disc, to be reduced by more than 20% in waters where visual clarity is an important characteristic of the water body and 40% in other waters, depending on site conditions.

**Importantly**, the above limits are ecological protection objectives for any receiving water body in the Northland Region and does not consider whether the receiving environment would actually meet these objectives prior to a discharge event.

In this case, the receiving water body is the upper Hokianga Harbour, a heavily disturbed ecosystem which is already unlikely to meet these objectives. Further details on the condition of the Hokianga Harbour are presented in the following section.



### 3.1.2 Hokianga Harbour Water Quality

The upper reaches of the Hokianga Harbour are characterised by a soft substratum of silt and clays and brackish estuarine water. Water circulation is dominated by tidal flows, there are strong tidal currents in some areas and relatively long water residence times. This area of the harbour contains large areas of high tidal flats, mangroves and salt marsh habitats (Davidson and Kerr, 2001). Threats to the quality of the harbour include the exotic grass (*Spartina*), stock grazing and trampling of salt marsh, sediment deposition and turbidity derived from erosion in the catchments (Davidson and Kerr, 2001).

#### **Upstream Water Quality**

NRC has been monitoring water quality of the Utakura River, which is located upstream of the WWTP, since 2007 (**Figure 5**). The results are available on the Land Air Water Aotearoa (LAWA) website. The monitoring results provide an approximate indication of baseline conditions before any influence from the Kohukohu WWTP. The statistical median values have been summarised in **Table 4**.

**Table 4: Water Quality of the Utakura River 2007 - 2014**

Measurement	Hokianga Harbour Water Quality Objectives	Median Value Utakura River
<i>E.coli</i>	126/100mL (recreational limit)	<b>309/100mL</b>
Black Disc	-	0.7 m
Turbidity	-	13.1 NTU
Total Oxidised Nitrogen	-	0.1225 g/m <sup>3</sup>
Ammoniacal Nitrogen (NH <sub>3</sub> + NH <sub>4</sub> <sup>+</sup> )	-	0.0155 g/m <sup>3</sup>
Ammonium (NH <sub>4</sub> <sup>+</sup> )	1.81* g/m <sup>3</sup>	< 0.0155 g / m <sup>3</sup>
Dissolved Reactive Phosphorus (DRP)	0.03 – 0.05	0.01 g/m <sup>3</sup>
Total Phosphorus	-	0.0495 g/m <sup>3</sup>
pH	6.5 – 9.0	7.1

Overall the results indicate that the quality of water generally meet the NRC Harbour Water Quality Objectives, with the exception of the level of indicator bacteria (*E.coli*) which is elevated. Although objectives are not available for turbidity, the monitoring site at Utakura River is within the worst 25% of sites in New Zealand in accordance with the LAWA website.

#### **Downstream Water Quality**

Downstream of the site is classified as the Hokianga Harbour, which under NRC's monitoring programme, is classified as coastal. The coastal sites within Hokianga Harbour are only monitored for *Enterococci* which is a useful bathing quality indicator, however it is not directly comparable against *E.coli* which is the parameter measured at the WWTP and upstream in the Utakura River.



Figure 5: Utakura River Monitoring Site (LAWA 2016).

### 3.2 Ecosystem

Shaw and Maingay in the Department of Conservation Coastal Resource Inventory (1990) summarised the ecological values of Hokianga Harbour. They rated the harbour as internationally important on the grounds that the wetlands were important to a range of birds including migratory species. Other ecological values listed in the report included:

- extensive areas of salt marsh and mangrove vegetation around the Harbour;
- freshwater wetland are contiguous with salt marsh and mangrove; and
- the Harbour is important to a variety of bird species many of which are status species.

The Harbours feeding habitat is utilised by a variety of wading bird species including banded dotterel, pied stilt, godwit and ducks and less frequently lesser knots and wrybills. The mud and sand flat areas support invertebrates including shellfish (e.g. cockles), snails, crabs and worms that provide a staple food for many different wader bird species.

Limited data is available on freshwater and marine fish in the Hokianga Harbour, although a preliminary evaluation was undertaken by Davidson and Kerr (2001). This compared the values of Hokianga Harbour to other estuarine and Harbours in New Zealand. The study found that the Hokianga Harbour contains approximately 40 marine fish species.

Infilling, drainage and causeway construction have had a significant impact on the bird population of the harbour. Bird roosting areas and high tide feeding areas have been lost due to causeway construction. Causeways have also cut off and altered the upper tidal reaches of the harbour which has an effect on invertebrates and therefore bird species that feed in these areas. The proximity of roads to the estuary have also resulted in road kills of marsh birds (Davidson and Kerr, 2001).

From 2008-2012 NRC undertook a habitat assessment of the Utaura River (upstream of the WWTP) based on environmental factors, such as channel stability, periphyton abundance, riparian vegetation, the composition of organic and inorganic substrate in the stream and surrounding land use. Utaura scored in the lower third for habitat quality with a score of approximately 50/100. In particular Utaura River scored low for Riparian vegetation, hydrologic heterogeneity and bank stability.

### 3.3 Land

Much of the environment around the Harbour is dominated by pasture, forestry or early regeneration kanuka/pasture. There are, however, areas of mature forest or lowland swamp forest.

Substantial areas of Hokianga Harbour have been permanently lost through infilling, drainage and causeway construction. Modification to the Harbour has occurred through stock grazing, illegal rubbish dumping, and clearance of estuarine fringing vegetation. Davis and Bellingham (1984) reported that 246 ha of Harbour had been lost to drainage and infilling. Causeways have cut off and altered upper tidal reaches of the Harbour and caused loss or alteration of saline-freshwater zones and salt marsh to lowland forest vegetation (Davidson and Kerr, 2001).

As previously discussed, Kohukohu is low lying and directly adjacent to the Hokianga Harbour. As a result it receives surface runoff and groundwater flow from the surrounding catchment. This causes the groundwater table in Kohukohu to be quite high, particularly in winter when rainfall is frequent. Due to Kohukohu's position at the low point within its catchment, it generally contains alluvial soils that consist of silt and clays which have limited permeability.

### 3.4 Air

Kohukohu is approximately 30 km inland of the west coast of New Zealand. The WWTP is on the eastern side of an inlet and is surrounded by steep hills. The site is therefore sheltered and experiences low wind levels predominantly from the south west. The majority of land in Kohukohu is low density residential and agricultural (Statistics NZ, 2013). There are no major industries with air emissions near this area. The only activity (other than the WWTP) with some potential to generate air emissions is Kohukohu Road. This is an arterial road which connects West Coast Road to the Ferry crossing from Rawene. Some minor noise and vehicle emissions are expected from this road.

### 3.5 Community

The population of Kohukohu is 165 (Statistics NZ, 2013). The biggest industries in Kohukohu are agriculture, forestry and fishing with 75% of the population being employed in this sector. Kohukohu has a school, general store, café, art galleries, arts and crafts shop, hotel, voluntary fire and ambulance services, and a health clinic. There are also two churches and three Marae within



the locality. Kohukohu School is a co-educational full primary (years 1-8) school with a decile rating of 2 (in 2011) and a roll of 54 (in 2015).

## 4 Potential Effects to the Environment

### 4.1 Positive Effects

The WWTP provides wastewater treatment for 76 properties in Kohukohu. The renewal of this consent is vital in order to continue to provide wastewater services for the community.

The Kohukohu WWTP will enable people and communities to continue to provide for their social, economic and cultural well-being and for their health and safety, consistent with the purpose of the RMA. The Kohukohu WWTP therefore has significant positive effects.

### 4.2 Water

#### 4.2.1 Potential Effects from Discharge of Contaminants

Wastewater can contain a range of contaminants depending on its source. In this case the wastewater originates from domestic activities. Accordingly, unlike industrial/tradewaste it is unlikely to contain significant levels of toxicants (heavy metals, hydrocarbons or pesticides etc). Being domestic waste water it is most likely to contain inorganic and organic nutrients, suspended solids, and pathogens.

Potential impacts of high nutrients on water quality include:

- Direct increase to biochemical oxygen demand. Microorganisms quickly break down the nutrients in wastewater, particularly nitrogen and carbon based nutrients. In doing so they will consume the available oxygen in the water column. Thus oxygen breathers (i.e. aquatic animals) can be negatively impacted.
- Eutrophication - excess nutrients (particularly nitrogen and phosphorus) in lakes, estuaries, or slow-moving streams and rivers can stimulate excessive plant growth (phytoplankton, algae and nuisance plants and weeds). The problem with excessive plant growth (i.e. algae blooms) is it can cause:
  - » A decrease in visibility - when aquatic plant growth increases in response to nutrients it can tend to spread across the surface of the water column, thus preventing penetration of light below the water surface. In addition to this, in high numbers, phytoplankton increase the turbidity of the water column. Thus organisms utilising the water column (submerged plants and animals) experience light restriction. This prevents growth of submerged plants, and restricts the ability of some aquatic animals to catch prey etc.
  - » An altered oxygen cycle. Plants photosynthesise in the daytime causing the release of oxygen into the water column. However during the night they switch to respiration which consumes oxygen in the water column. This becomes highly pronounced when plant growth is intense (i.e. algae blooms). Also, when the intense plant growth dies off, the biochemical oxygen demand can rapidly increase as microorganisms break the algae down.

Suspended solids are mostly made up of inorganic materials such as sediment. However bacteria and algae can also contribute to the total solids concentration. Increased suspended solids in coastal waters can:

- Restrict light transmission causing a decrease in visibility as mentioned above.
- Have negative impacts on filter feeding animals (i.e. shellfish), by clogging feeding structures, interfering with particle selection and requiring the use of energy to clear away unwanted particles.
- Negatively impacting the abundance and diversity of fish assemblages by clogging gills and reducing feeding efficiency. Sediment deposition can also reduce egg and embryo survival by reducing oxygen supply and crusting over the egg, preventing the embryo from escaping.
- Discolour the water and reduce water quality making it less suitable/attractive for recreation, for example, swimming.

Pathogens are disease carrying organisms that generally occur in water that has been contaminated by human and/or animal waste. Water that contains high levels of pathogens can be harmful to human health. Swallowing water containing high levels of pathogens, or being exposed to pathogenic water through cuts in the skin or inhalation of spray, can lead to skin, eye and ear infections, and respiratory illness. Aquatic foods can also become contaminated with faecal pathogens from exposure to contaminated water. Such pathogens can stay in the flesh of shellfish long after the surrounding water quality has improved. Bacterial and viral contamination can affect both recreational and commercial shellfish gathering .

#### 4.2.2 Potential Effects from Activity

As is described in **Section 2**, the quantity of effluent released by the Kohukohu WWTP is usually around 15m<sup>3</sup>/day in the absence of rain. The quality of this effluent, based on the data available, suggests it still has biochemical oxygen demand, ammoniacal nitrogen concentration, and faecal coliform concentration that need to be mixed and diluted in order to meet NRC Water Quality Objectives. Mixing and dilution is dependent on the quantity and quality of water body that the discharge is released into.

In terms of quantity, this section of the Hokianga Harbour is 400m wide, it contains a substantial body of water which is continually refreshed by upstream to downstream flow and tidal flushing. In effect there is more than adequate quantity of water available for dilution.

In terms of quality, the concentration of ammonia within the Hokianga Harbour is well within water quality objectives, accordingly there is sufficient capacity for the harbour to absorb the ammonium from the released effluent.

**Table 5: Comparison of Upstream Hokianga Harbour Quality to Effluent Quality.**

Measurement	Hokianga Harbour Water Quality Objectives	Median Value Upstream (Utakura River)	Median Effluent Result
<i>E.coli</i>	126/100mL (recreational limit)	<b>309/100mL</b>	<b>400</b>
Black Disc	-	0.7 m	-
Turbidity	-	13.1 NTU	-
Total Oxidised Nitrogen	-	0.1225 g/m <sup>3</sup>	-
Ammoniacal	-	0.0155 g/m <sup>3</sup>	-

Measurement	Hokianga Harbour Water Quality Objectives	Median Value Upstream (Utakura River)	Median Effluent Result
Nitrogen (NH <sub>3</sub> + NH <sub>4</sub> <sup>+</sup> )			
Ammonium (NH <sub>4</sub> <sup>+</sup> )	1.81# g/m <sup>3</sup>	< 0.0155 g/m <sup>3</sup>	17
Dissolved Reactive Phosphorus (DRP)	0.03 – 0.05	0.01 g/m <sup>3</sup>	-
Total Phosphorus	-	0.0495 g/m <sup>3</sup>	-
pH	6.5 – 9.0	7.1	7.0

Parameter	Average	95%tile	Number of samples
pH	7±0.3	7.8	53
Dissolved oxygen (g/m <sup>3</sup> )	3.4±1	13	52
Ammonium (NH <sub>4</sub> -N) (g/m <sup>3</sup> )	17±1.6	35	104
Total Suspended Solids	12±2.3	41	104
Biochemical Oxygen Demand (g/m <sup>3</sup> )	12.5±1.7	31	104
Faecal Coliforms (c/100mL)	4323±1615	27,700	102

In terms of indicator bacteria (i.e. *E.coli*), the overall loading of bacteria associated with the WWTP is significantly less compared to that which is occurring from rivers discharging into the harbour. For example, the median *E.coli* concentrations in the Utakura River are approximately 309 per 100mL and in reference to daily flow rates it is possible to extrapolate a total daily *E.coli* loading rate. For the purpose of this estimate the mean flow value of Utakura River has been taken to be 3.18 cubic meters per second<sup>2</sup>. Based on that flow rate, the total daily *E.coli* load from the Utakura River is estimated to be approximately 8.5x10<sup>11</sup> E. coli per day.

For the Kohukohu WWTP, the average daily flow of 28m<sup>3</sup>/day has been used against a median faecal coliform concentration of 900 faecal coliforms per 100ml, which equates to an approximate faecal coliform load of 2.5X10<sup>8</sup> per day. Based on this, it is estimated that on average the daily *E.coli* load from the Utakura River is about 3000 times greater than the faecal coliform loading from the Kohukohu WWTP.

These estimated loading rates demonstrate that outflow from upstream catchments have a significant effect on the existing environment of Hokianga Harbour, in particular the level of *E.coli* and its associated effects.

<sup>2</sup> Flow rate sourced from the Ministry for Environment (MFE) River Flows Database available at <https://data.mfe.govt.nz/x/odt3cv>

### 4.3 Ecosystem

Impacts to an ecosystem from a WWTP occur from either construction or operational activities.

In this case, there is no construction proposed and it is intended to continue the ongoing operation of the existing WWTP. Accordingly no new disturbance will be required (no clearing, dredging, de-watering etc).

Potential ecological impacts may come about from the continued discharge of the same quantity/quality of effluent into the Hokianga Harbour, in particular effects associated with the release of domestic waste water on downstream water quality.

As discussed in **Section 4.2**, the level of treatment in combination with dilution mixing is likely to be sufficient to reduce the concentration of nutrients (i.e. ammonium) to the level accepted under the regional plan.

As discussed above, the nutrients within the effluent will be dispersed and diluted in the Hokianga Harbour. As the pathogen content of the released effluent will neither worsen nor improve the pathogen content of Harbour (as it already contains approximately the same concentration of pathogens), effects associated with the continued operation of the WWTP is considered to have no more than a minor impact on the existing ecological condition of Hokianga Harbour.

### 4.4 Land

The proposal is for the continuation of an existing activity with no changes proposed, therefore there are no plans for earth disturbance works to be undertaken with this consent. As established in **Section 2.3** discharging to land is not a viable option for the WWTP, therefore continued discharge to water will occur.

As discussed in **Section 2.2**, the WWTP loses a volume of water before it is released into the environment. This comes about from a combination of evaporation and seepage of water from unlined ponds associated with the WWTP.

With regard to water lost through the ponds, the effluent slowly flows vertically and laterally with groundwater and is filtered through the minute pore spaces in the soil profile. This filtration causes many contaminants to be filtered out and absorbed by the soil profile (the principle behind a septic land disposal system). Groundwater underlying the WWTP flows to Hokianga Harbour. In between the WWTP and Hokianga Harbour there are no users of groundwater (no bores for water supply etc). Once the groundwater reaches the Hokianga Harbour, it would seep into the harbour in a slow diffuse manner that could be readily diluted (similar manner to mixing zone).

It is considered that due to the volumes of effluent seepage, the availability of fine soil to filter contaminants, lack of groundwater users, and availability of dilution in the receiving water body, there would be no more than minor impact on the land.

### 4.5 Noise and Odour

Wastewater systems have the potential to create a nuisance to those living and working in the surrounding area due to noise and odour.

Blowers and pumps associated with the WWTP may result in some minor noise impacts. Odour effects from sewage can result if oxygen content is not maintained within the system. If oxygen content drops, anaerobic bacteria can begin to breakdown the sewage releasing odorous sulphide gases. The current resource consent requires oxygen content within the system to always be maintained above 1g/m<sup>3</sup> at all times and the WWTP will continue to comply with this resource consent condition.

The nearest habitable building to the WWTP is a Marae which is located between 250 m and 350 m to the northwest. There is also a sporting field located immediately to the north of the WWTP. The predominant wind direction is south west, therefore wind will generally carry noise and odour away from the Marae and sporting field. Noise is likely to be much lower than that generated by cars utilising the Kohukohu Road.

## 4.6 Community

Statistics New Zealand data from 1996-2013 for Kohukohu indicates the population has fluctuated slightly, but has overall faced a small decline since 1996 (**Table 6**). Based on these trends it is unlikely that the population will increase in the future, if anything a slight decline might be expected. Accordingly it is unlikely that there will be any significant additional pressure on the WWTP from additional population. Larger flows or extensions are not proposed in this application.

However the WWTP and its reticulation system are ageing, and as previously discussed the reticulation system is subject to wet weather flow infiltration. There will be times that maintenance and upgrades will be required. It is known that the costs of running and maintaining the system are of significant concern to the community.

**Table 6: Population of Kohukohu (Statistics New Zealand)**

Year	Population
1996	220
2001	165
2006	186
2013	165

### 4.6.1 Tangata Whenua

Maori culture is centred on Mauri, an energy which binds and animates all things in the physical world. Without mauri, mana (power) cannot flow into a person or object (Te Ahukaramu Charles Royal, 2012). Mauri is within all life forms including water and this is harmed through contamination. For instance, the spiritual harm that is considered to result from consuming shellfish collected from water that may have been subject to effluent and other pollution, is unacceptable to many Maori (Ministry for the Environment).

From a traditional Maori perspective polluted water needs to pass through the earth to be purified and to have its mauri, or essence, restored. This is considered necessary, irrespective of whether treatment to remove or dilute pathogens, chemicals and metals has already occurred. Even human waste found in treated wastewater must first pass through the earth before re-entering any water.

The passing of the wastewater through the wetland, while not considered to be equal to passing through earth to be purified, does provide some cleansing from a traditional Maori perspective.

Formal consultation with affected marae is yet to be undertaken. FNDC staff will be engaging with affected marae over the coming months and it is expected that the resource application process will be placed on hold to enable this consultation to occur.

## 5 Notification

### 5.1 Section 95A- Public Notification Assessment

Section 95A of the Act states that a consent authority may, at its discretion, decide whether to publicly notify an application for resource consent for an activity. Section 95A states:

- 1) *A consent authority may, in its discretion, decide whether to publicly notify an application for a resource consent for an activity.*
- 2) *Despite subsection (1), a consent authority must publicly notify the application if-*
  - a) *It decides (under section 95D) that the activity will have or is likely to have adverse effects on the environment that are more than minor; or*
  - b) *The applicant requests public notification of the application; or*
  - c) *A rule or national environmental standard requires public notification of the application.*
- 3) *Despite subsection (1) and (2)(a), a consent authority must not publicly notify the application if-*
  - a) *A rule or national environmental standard precludes public notification of the application; and*
  - b) *Subsection (2) (b) does not apply.*
- 4) *Despite subsection (3), a consent authority may publicly notify an application if it decides that special circumstances exist in relation to the application.*

#### Comment

Effects associated with the continued operation of the WWTP remain consistent with that which has occurred since the commissioning of the plant which was given consent and commissioned in the 1980s.

In addition, given the significant contribution that upstream catchments have on the *E.coli* loading of Hokianga Harbour, compared to the *E.coli* loading of the WWTP, it is expected that the continued operation of the facility will have a less than minor impact on the existing water quality of the harbour.

In reference to Section 95A, it is considered that adverse effects associated with the continued operation of WWTP are less than minor and therefore public notification of the activity is not warranted.

### 5.2 Section 95B and 95E- Limited Notification Assessment

If a consent authority does not publicly notify an application for a resource consent, it must decide (under sections 95E and 95F of the Act) if there are any affected persons in relation to the activity.



The consent authority must give limited notification of the application to any affected person unless a rule or national environmental standard precludes limited notification of the application.

Section 95B allows for such notification. Section 95B states:

- 1) *If a consent authority does not publicly notify an application for a resource consent for an activity, it must decide (under sections 95E and 95F) if there are any affected persons or affected order holders in relation to the activity.*
- 2) *The consent authority must give limited notification of the application to any affected person unless a rule or national environmental standard precludes limited notification of the application.*
- 3) *The consent authority must give limited notification of the application to any affected order holder even if a rule or national environmental standard precludes public or limited notification of the application.*

Section 95E of the Act provides for how a consent authority determines if a person is affected:

- 1) *A consent authority must decide that a person is an affected person, in relation to an activity, if the activity's adverse effects on the person are minor or more than minor (but are not less than minor).*
- 2) *The consent authority, in making its decision,-*
  - a) *May disregard an adverse effect of the activity on the person if a rule or national environmental standard permits an activity with that effect; and*
  - b) *In the case of a controlled or restricted discretionary activity, must disregard an adverse effect of the activity on the person that does not relate to a matter for which a rule or national environmental standard reserves control or restricts discretion; and*
  - c) *Must have regard to every relevant statutory acknowledgement made in accordance with an Act specified in Schedule 11.*
- 3) *Despite anything else on this section, the consent authority must decide that a person is not an affected person of-*
  - a) *The person has given written approval to the activity and has not withdrawn the approval in a written notice received by the authority before the authority has decided whether there are any affected persons; or*
  - b) *It is unreasonable in the circumstances to seek the person's written approval.*

### Comment

As discussed in **Section 2.3** and **Section 4.6**, the existing WWTP is located in proximity to a sportsfield and a marae. At least two additional marae occur within the Kohukohu locality.

Given the close proximity of the marae and the sportsfields there is potential for these localities to be effected by minor noise or odour impacts associated with the continued operation of the facility.

Thus consultation with these parties may be necessary, to notify these stakeholders of the renewal of this application.

In addition, discharge to contaminants to the local waterbody is likely to be of interest to Maori. As part of the resource consent process, local marae will be consulted and notified of the consent renewal. It is expected that upon submission of the application, the application will be placed on hold in order to allow this consultation to take place.

It is therefore considered that persons that administer the local sportsfields, and the local marae, have the potential to be affected by continued operation of the WWTP and limited notification to these parties should be considered. Notwithstanding as to whether limited notification is triggered, FNDC intends to consult with these parties regardless.

## 6 Statutory Assessment

### 6.1 Resource Management Act 1991

The sections of the RMA that are particularly relevant to this application are detailed below.

#### 6.1.1 Section 5- Purpose

Section 5 of Part II identifies the purpose of the RMA as being the sustainable management of natural and physical resources. This means managing the use of natural and physical resources in a way that enables people and their communities to provide for their social, cultural, and economic wellbeing, while avoiding, remedying or mitigating adverse effects on the environment.

The WWTP provides wastewater treatment for 76 properties in Kohukohu. The renewal of this consent provides continued wastewater services for the community and enables people and communities to continue to provide for their social, economic and cultural well-being and for their health and safety.

The oxidation pond and constructed wetland is designed to harness processes that occur in natural wetlands for the treatment of wastewater. By using a constructed wetland it avoids the contamination and degradation of large areas of land and natural wetlands, therefore protecting natural resources.

#### 6.1.2 Section 6- Matters of National Importance

Section 6 of the RMA sets out the matters of national importance that are to be recognised when managing the use, development, and protection of natural and physical resources.

The relevant matter to this application is:

- (a) the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development.*

This application is a renewal of an existing discharge where the waste water is treated through an oxidation pond and surface flow wetland. The WWTP is land based with only the discharge affecting the coastal environment. The discharge is into a catchment drain and then the Hokianga Harbour where it receives adequate dilution. More information on this is in the Assessment of Environmental Effects (**Section 4**).

#### 6.1.3 Section 7- Other Matters

Section 7 of the RMA lists certain matters to which particular regard is to be had in making resource management decisions. The following 'other matters' are considered relevant to the proposal:

- (a) Kaitiakitanga*
- (b) the efficient use and development of natural and physical resources*
- (f) maintenance and enhancement of the quality of the environment*

The WWTP is designed to harness processes that occur in natural wetlands for the treatment of wastewater. Constructed wetlands are efficiently using natural resources to enable treatment performance per unit area of land to be optimised and ensures less variable discharge quality.

By providing a system where the waste water discharges through wetland plants the treatment process is having a level of regard to kaitiakitanga. From a traditional Maori perspective polluted water needs to pass through the earth to be purified and to have its mauri, or essence, restored. While ideally a land based system is the preferred option in respect of kaitiakitanga, this offers some feasible substitution. As discussed in Section 2.3, alternative land based irrigation methods were not considered feasible due to lack of available irrigation land and the potential for surface runoff from local impermeable soils.

FNDC staff acknowledge the continued operation of the WWTP will affect Maori cultural values. FNDC staff will engage with affected marae in the coming months. This consent application will be placed on hold upon lodgement of the application in order to enable sufficient time for marae to be consulted in a meaningful manner.

#### 6.1.4 Section 8- Treaty of Waitangi

Section 8 of the RMA requires that the principles of the Treaty of Waitangi (Te Tiriti o Waitangi) must be taken into account in relation to managing the use, development, and protection of natural and physical resources.

#### 6.1.5 Section 104 Assessment

Subject to Part 2 of the RMA and in accordance with section 104(1), when considering an application for resource consent and any submissions received, the Council must have regard to:

- (a) any actual and potential effects on the environment of allowing the activity; and*
- (b) any relevant provisions of—*
  - (i) a national environmental standard;*
  - (ii) other regulations;*
  - (iii) a national policy statement;*
  - (iv) a New Zealand coastal policy statement;*
  - (v) a regional policy statement or proposed regional policy statement;*
  - (vi) a plan or proposed plan; and*
- (c) any other matter the consent authority considers relevant and reasonably necessary to determine the application*

The actual and potential effects on the environment of allowing the activity are set out earlier in **Section 4** of this report.

The relevant provisions of the policy statements and plans are set out in the following sections.

#### 6.1.6 Section 105 Matters Relevant to Certain Applications

In accordance with Section 105 (1) if an application is for a discharge permit, the consent authority must, in addition to matters in section 104(1) have regard to

- a. *The nature of the discharge and the sensitivity of the receiving environment to adverse effects; and*
- b. *The applications reasons for the proposed choice; and*
- c. *Any possible alternative methods of discharge, including discharge into any other receiving environment.*

The condition of the receiving environment is described in detail in **Section 3** and resilience in **Section 4**. **Section 2** provides reasons for discharge and alternative options.

### 6.1.7 Section 107 – Restriction on Grant of Certain Discharge Permits

In accordance with Section 107 (1) a consent authority shall not grant a discharge permit to do something that would otherwise contravene section 15 or section 15A allowing:

- a. *The discharge of a contaminant or water into water; or*
- b. *A discharge of a contaminant onto or into land in circumstances which may result in that contaminant (or any other contaminant emanating as a result of natural processes from that contaminant) entering water; or*
- ba. *The dumping in the coastal marine area from any ship, aircraft, or offshore installation of any waste or other matter that is a contaminant.*

*If, after reasonable mixing, the contaminant or water discharged (either by itself or in combination with the same, similar, or other contaminants or water), is likely to give rise to all or any of the following effects in the receiving waters:*

- c. *The production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials.*
- d. *Any conspicuous change in the colour or visual clarity.*
- e. *Any emission of objectionable odour.*
- f. *The rendering of fresh water unsuitable for consumption by farm animals.*
- g. *Any significant adverse effects in aquatic life.*

As identified in **Section 4**, overall the continued discharge associated with the WWTP will result in no more than minor impact to the existing ecological condition of Hokianga Harbour.

### 6.1.8 Section 124 Exercise of Resource Consent While Applying for New Consent

The activities sought by this application meet the criteria under s124 (2) (d) (ii) of the RMA for lodgement within the period ending 3 months before the expiry of the existing consent (expiry date 31 August 2016). Accordingly, FNDC seeks that NRC allow the continued operation of the Kohukohu WWTP pursuant to s124 (2) (e) of the RMA, until a decision is made on this application and it is beyond challenge (s124 (3)).

## 6.2 New Zealand Coastal Policy Statement

The New Zealand Coastal Policy Statement 2010 (NZCPS) is a national policy statement under the RMA. Its purpose is to state objectives and policies to achieve the purpose of the Act relative to the management of the coastal environment of New Zealand.

The NZCPS sits below and implements Part II of the RMA. It gives some guidance to Section 5 and 6 of the RMA. **Table 7** provides an assessment of the WWTP discharge against the objectives in the NZCPS.

**Table 7: NZCPS Objectives**

Objective	Response
To safeguard the integrity, form, functioning and resilience of the coastal environment and sustain its ecosystems, including marine and intertidal areas, estuaries, dunes and land.	The WWTP is discharging a minor volume of waste water that has undergone primary and secondary treatment. This level of treatment in combination with dilution is considered sufficient to reduce these risks to match that in the baseline water upstream. Accordingly relative to baseline conditions the WWTP release has no more than minor impact on the current condition of the coastal environment and its ecosystem.
To preserve the natural character of the coastal environment and protect natural features and landscape values.	The WWTP discharges a small amount of waste water into the Hokianga Harbour. Overall this discharge will have a less than minor impact on the overall natural character, natural features and landscape values of the coastal environment.
To take account of the principles of the Treaty of Waitangi, recognise the role of tangata whenua as kaitiaki and provide for tangata whenua involvement in management of the coastal environment.	FNDC staff acknowledge the proposed activity will affect Maori cultural values. FNDC staff will be engaging with the affected marae in the coming months. This consent application will be placed on hold on lodgement in order to enable sufficient time for marae to be consulted in a meaningful manner.
To maintain and enhance the public open space qualities and recreation opportunities of the coastal environment.	As per the first objective.
To ensure that coastal hazard risks taking account of climate change, are managed.	N/A
To ensure that management of the coastal environment recognises and provides for New Zealand's international obligations regarding the coastal environment, including the coastal marine area.	N/A

### 6.2.1 NZCPS Policy 23

The WWTP fits within Policy 23 for the discharge of contaminants. Policy 23 looks at managing discharges to the environment to ensure effects are no more than minor. **Table 8** provides an assessment of the activity against the relevant sections of Policy 23.

**Table 8: NZCPS Policy 23**

Policy	Response
In managing discharges to water in the coastal environment, have particular regard to: (a) the sensitivity of the receiving environment;	Please refer to <b>Section 3</b> for an overview of the receiving environment which has been taken into account for the assessment of environmental effects.
(b) the nature of the contaminants to be discharged, the particular concentration of contaminants needed to achieve the required water quality in the receiving environment, and the risks if that concentration of contaminants is exceeded;	Please refer to <b>Section 2</b> for details of the nature of the contaminants that are being discharged and <b>Section 3</b> for information on the water quality of the receiving environment. If the concentration of contaminants is exceeded then the risks are explained in <b>Section 4</b> .
(c) the capacity of the receiving environment to assimilate the contaminants;	<b>Section 4</b> covers capacity of the receiving environment to assimilate the contaminants.
(d) avoid significant adverse effects on ecosystems and habitats after reasonable mixing;	Please refer to <b>Section 4</b> for the assessment of effects on ecosystems and habitats after reasonable mixing.
(e) use the smallest mixing zone necessary to achieve the required water quality in the receiving environment; and	As described in <b>Section 4</b> the section of the Hokianga Harbour that the effluent is discharged into is a 400m wide with large flow volumes. This is considered sufficient to achieve the required regional water quality objectives.
(f) minimise adverse effects on the life-supporting capacity of water within a mixing zone.	Please refer to <b>Section 4</b> .
(2) In managing discharge of human sewage, do not allow: (a) discharge of human sewage directly to water in the coastal environment without treatment; and	The WWTP process provides primary and secondary treatment of the sewage before discharging it into the coastal environment.
(b) the discharge of treated human sewage to water in the coastal environment, unless: (i) there has been adequate consideration of alternative methods, sites and routes for undertaking the discharge; and (ii) informed by an understanding of tangata whenua values and the effects on them.	Please see <b>Section 2</b> for an assessment of alternative options and <b>Section 4</b> for the assessment of effects on Tangata Whenua.



<p>(3) Objectives, policies and rules in plans which provide for the discharge of treated human sewage into waters of the coastal environment must have been subject to early and meaningful consultation with tangata whenua.</p>	<p>FNDC staff acknowledge the proposed activity will affect Maori cultural values. FNDC staff will engage with affected marae in the coming months. This consent application will be placed on hold upon lodgement in order to enable sufficient time for marae to be consulted in a meaningful manner.</p>
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### 6.3 Regional Coastal Plan

The purpose of the Regional Coastal Plan is to promote the sustainable management of the natural and physical resources, thus giving effect to the purpose of the RMA. The Plan covers the area around Northlands coast from Mean High Water Springs to the 12 nautical mile (22.3 km) limit of New Zealand's territorial sea. **Table 9** provides an assessment of the activity against the Regional Coastal Plan.

**Table 9: Regional Coastal Plan**

Activity	Response
<p>(a) Noise generated as a result of activity within the coastal marine area shall comply with the following standards:</p> <p>(i) the activity shall not cause excessive noise as defined in section 326 of the Resource Management Act; and</p> <p>(ii) any construction or maintenance activity near coastal subdivisions or other urban areas shall comply with the noise standards of the district council which is responsible for the use of the adjoining land.</p>	<p>(i) It is considered that the activity will not cause excessive noise as defined in section 326 of the RMA</p> <p>(ii) Not applicable</p>
<p>(b) All lighting associated with activities in the coastal marine area shall not by reason of its direction, colour or intensity, create:</p> <p>(i) a hazard to navigation and safety; or</p> <p>(ii) a hazard to traffic safety on wharves, ramps, and adjacent roads; or</p> <p>(iii) a nuisance to other users of the surrounding coastal marine area or adjacent land.</p>	<p>Not applicable</p>
<p>(c) Discharges to water shall, after reasonable mixing, comply with the relevant receiving water quality standards and shall not contain any contaminants which could cause:</p> <p>(i) the production of conspicuous oil or grease films, scums or foams, or floatable or suspended materials.</p> <p>(ii) any conspicuous change in the colour or visual clarity of the receiving waters.</p> <p>(iii) any emission of objectionable odour.</p>	<p><b>Section 4</b> sets out expected quality of the discharge after dilution and mixing in Hokianga Harbour.</p>

(iv) accumulation of debris on the foreshore or seabed underlying or adjacent to the discharge point (v) any significant adverse effects on aquatic life or public health	
(d) Any modification of the contour of the foreshore caused during any authorised construction or maintenance activity other than dredging shall be restored as soon as practicable after the completion of the construction or maintenance activity.	Not applicable.
(e) Unless expressly authorised to do so by a coastal permit, structures within the coastal marine area shall not unduly impede safe navigation within natural drainage channels or unduly restrict the flow of flood waters within such channels.	Not applicable.
(f) Discharges of contaminants into air shall not: (ii) Result in the discharge of black smoke apart from coal, oil or diesel burning equipment for a period of up to 15 minutes from startup from cold, or for soot blowing. (iii) Result in any offensive or objectionable odour, or any noxious or dangerous level of gases. (iv) Result in a discharge to air of offensive or objectionable dust. (iv) Result in concentrations of air pollutants that exceed as a minimum the National Ambient quality guidelines, May 2002.	The only relevant air emission is that of odour assessed in <b>Section 4</b> .

## 6.4 Regional Water and Soil Plan

The purpose of the Regional Water and Soil Plan is to promote the sustainable management of the water and soil resources in Northland, thus giving effect to the purpose of the RMA. **Table 10** and **Table 11** assess the WWTP against the relevant objectives and policies in the Regional Water and Soil Plan.

**Table 10: Regional Water and Soil Plan: Water Quality Management**

Objective	Response
The maintenance or enhancement of the water quality of natural water bodies in the Northland region to be suitable, in the long-term, and after reasonable mixing of any contaminant with the receiving water and disregarding the effect of any natural events, for such of the purposes listed below as may be	Please refer to <b>Section 4</b> for potential effects on aquatic ecosystems, recreation and aesthetic, and cultural purposes.

<p>appropriate:</p> <p>Lakes, rivers, streams - aquatic ecosystems, contact recreation, water supplies, aesthetic and cultural purposes.</p>	
Policies	Response
<p>Until such time as the classification system referred to in Policy 7.05.02 is introduced, when processing applications for discharge permits, the Council will have regard to:</p> <p>(a) 2. 3. Existing water quality and uses of the subject water body;</p> <p>(b) Community aspirations for future use of the water body (as expressed in submissions on consent applications);</p> <p>(c) Opportunities for enhancement of water quality;</p> <p>(d) Relevant water quality guidelines (refer also Methods 7.06.07 to 7.06.10)</p>	<p>The relevant water quality objectives as stated in the regional soil and water plan have been considered and assessed in <b>Section 4</b>.</p>
<p>The Council will not grant a discharge permit which, either on its own or in combination with other lawful discharges, will result in any of the following effects in the receiving water, after reasonable mixing:</p> <p>(a) The production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;</p> <p>(b) Any conspicuous change in the colour or visual clarity;</p> <p>(c) Any emission of objectionable odour;</p> <p>(d) The rendering of freshwater unsuitable for consumption by farm animals.</p>	<p>An assessment of receiving water quality post treatment and mixing has been undertaken in <b>Section 4</b>.</p>
<p>When determining what constitutes a reasonable mixing zone, the Council will take into account:</p> <p>(a) The characteristics of the discharge and the sensitivity of the receiving water;</p> <p>(b) The assimilative capacity of the receiving water body;</p> <p>(c) The proximity and effects of other discharges;</p> <p>(d) The proximity of, and likely effects on, downstream uses;</p> <p>(e) The desirability of keeping the mixing zone as small as practicable;</p> <p>(f) The availability and cost-effectiveness of current treatment technology.</p>	<p>An assessment of receiving water quality post treatment and mixing has been undertaken in <b>Section 4</b>.</p>

Table 11: Regional Water and Soil Plan: Discharges

Objectives	Response
1. The effective treatment and/or disposal of contaminants from new and existing discharges in ways which avoid, remedy or minimise adverse effects on the environment and on cultural values.	Please refer to <b>Section 4</b> for an assessment of how adverse effects are avoided, remedied or mitigated and an assessment of the effects on Tangata Whenua.
2. The reduction and minimisation of the quantities of contaminants entering water bodies, particularly those that are potentially toxic, persistent or bio-accumulative.	The waste water has undergone primary and secondary treatment with mixing, reducing the quantities of contaminants entering the water. This is assessed in further detail in <b>Section 4</b> .
Policies	Response
To promote effective effluent treatment and disposal systems which are: (a) Low maintenance and low risk; (b) Land based, where the soil types, available disposal areas, back-up facilities and pumping systems are adequate; (c) Operated in accordance with approved maintenance and contingency plans; and (d) Designed and maintained so as to prevent the collection of catchment runoff	The WWTP system is a simple low risk and maintenance system. A land based disposal system is not feasible at this location. Therefore the WWTP has continued to operate by discharge through constructed wetland before entering water for a number of decades.
To avoid the cumulative adverse effects of sewage discharges, particularly in areas subject to concentrated development, a high water table, poorly draining soils, very free draining soils, or in areas which are ecologically and/or culturally sensitive.	The WWTP is not located in an area of concentrated development.  There is a high water table and poorly draining soils, which is why a water discharge was been selected over a land based system. <b>Section 4</b> provides an assessment of the WWTP against ecological and cultural values.
To promote the installation of reticulated community sewerage schemes in urban and rural residential areas where on-site disposal systems contribute or are likely to contribute to the contamination of water, including coastal water and groundwater.	The WWTP services a reticulated network in the Kohukohu community. Thus it avoids individual on site disposal in soils that not suitable for individual onsite disposal.
To promote alternative methods to reticulated sewage systems and septic tanks for sewage disposal.	Please refer to <b>Section 2.3</b> for a discussion related to alternative options.

## 6.5 Regional Air Quality Plan

The purpose of the Regional Air Quality Plan is to promote the sustainable management of Northlands air resources, thus giving effect to the purpose of the RMA. The plan covers all discharges of contaminants to air for the Northland region but does not include discharges to air from the coastal marine area. **Table 12** provides an assessment of the WWTP against the relevant Objectives and Policies of the Regional Air Quality Plan.

**Table 12: Regional Air Quality Plan**

Objectives	Response
The sustainable management of Northland's air resource including its physical, amenity and aesthetic qualities by avoiding, remedying or mitigating adverse effects on the environment from the discharge of contaminants to air.	Please refer to <b>Section 4</b> for an assessment of how adverse effects on the environment from the discharge of contaminants to air are avoided, remedied and mitigated.
The maintenance and, where necessary, enhancement of the quality of the environment so that it is free from noxious, dangerous, offensive or objectionable adverse effects associated with discharges to air, such as odour, dust, smoke and poor visibility.	Please refer to <b>Section 4</b> for an assessment of the quality of the environment in relation to discharges to air.  There are no recent odour complaints registered against the site.
Policies	Response
To maintain the existing high standard of ambient air quality in the Northland region, and to enhance air quality in those instances where it is adversely affected, by avoiding, remedying or mitigating adverse effects of activities discharging contaminants to air.	Please refer to <b>Section 4</b> for an assessment of how adverse effects on the environment from the discharge of contaminants to air are avoided, remedied and mitigated.
To avoid, remedy or mitigate the adverse effects generated by discharges of contaminants to air including cumulative or synergistic/interactive effects.	Please refer to <b>Section 4</b> for an assessment of how adverse effects on the environment from the discharge of contaminants to air are avoided, remedied and mitigated.
To recognise that many activities which discharge contaminants to air have a minor effect on the quality of Northland's air environment.	It is considered that this is the case with the Kohukohu WWTP, the discharge of contaminants will have a less than minor effect on the quality of Northland's air environment.
To recognise that discharges of contaminants to air may adversely affect other receiving environments.	This is recognised and it is considered that no other receiving environments will be effected from the odorous compounds.
To ensure that the discharge of contaminants to air should not result in offensive or objectionable odours that could adversely affect people and communities.	There are no recent odour complaints registered against the site.

## 7 Conclusion

This application and AEE relates to the renewal of the current resource consent for the Kohukohu WWTP which was commissioned in the 1980s. As there is no intention to change the scale of activities currently undertaken at the WWTP, the activities that relate to the current consent continue to apply to the new consent. It is requested that a 15 year term is applied to this new consent.

The WWTP discharges treated wastewater into the environment directly via an outfall into Hokianga Harbour and indirectly through unintentional seepage into the ground. The WWTP also generates minor air emissions (odour and gases). As a result the operation of the WWTP triggers a number of rules under the NRC Water and Soil Plan and Air Quality Plan. In consideration of the rules triggered, this application relates to a 'Discretionary Activity'.

Policy 3 of the *Northland Regional Council Regional Water and Soil Plan* lists guidelines for the management of waters for ecosystem purposes. The policy makes allowance for reasonable mixing. Thus it allows for effluent to be discharged and undergo a process of mixing and dilution in the receiving water body before it must reach the given water quality objectives in the plan. The WWTP discharges effluent into a receiving water body that has the quality (relatively low in nutrients) and quantity (large body of water continually flushed) that is able to dilute and disperse the contaminants within a reasonable zone of mixing.

Some minor air and noise effects may continue to occur from the activity. In consideration of the activity, and that there has been no recent complaints from local persons, it is considered that air and noise effects are less than minor.

FNDC recognises that the continued use of the facility may effect Maori cultural values and FNDC will consult with local marae on submission of the resource consent application. It is expected that the application will be placed on hold to enable sufficient time for consultation to occur.

The WWTP provides the community with a reticulation sewage system thus avoiding individual onsite disposal systems in local soils that have limited loading capacity (e.g. alluvial soils with limited permeability). It is therefore likely that the operation of the centralised treatment facility has less effect on local soils and groundwater when compared to a scenario where sewerage is disposed at individual properties. The facility therefore serves an important public function and has significant positive effects on the local community. The discontinued use of this facility, and the need to treat water in an alternative manner, has the potential to impose a significant financial burden on the small community of Kohukohu.

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