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Dear Phil

PRELIMINARY SITE INVESTIGATION FOR PŌRANGAHAU STOPBANK

1.0 Introduction

Pattle Delamore Partners Limited (PDP) was engaged by Hawke's Bay Regional Council (HBRC) to undertake a Preliminary Site Investigation (PSI; desktop site history review) for the proposed Pōrangahau stop bank site.

PDP was originally engaged by HBRC to assist with Land Categorisation Engineering Solutions (South Zone) in Pōrangahau, following the devastating impact of Cyclone Gabrielle in February 2023. The project assessed a broad set of possible remedial options, which were reduced in number as non-viable options were eliminated. This resulted in a preferred option comprising a combination of stop bank, sheet piled wall and a diversion bund as shown on Figure 1 provided in Appendix B (the site).

The proposed remedial option crosses many properties. The site is laterally defined as an approximate 60m wide strip representing the proposed area of soil disturbance associated with building the stop bank, sheet piled wall and diversion bund. The properties the proposed stop bank, sheet piled wall and diversion bund will cross have been included in Figure 1 and labelled A to W to assist with identification.

In order to assess the viability of the preferred option geotechnical, contaminated land and ecological investigations were required. This PSI should be read in conjunction with these reports:

- PDP, April 2025. *Geotechnical Assessment Report for the Proposed Pōrangahau Stopbanks and Southern Buildings, Central Hawke's Bay* (PDP, 2025a); and
- PDP, April 2025. *Pōrangahau Flood Mitigation – Ecological Impact Assessment* (PDP, 2025b).

2.0 Objectives and Work Scope

The objective of the PSI is to:

- Identify any potential sources of contamination from past and/or present land use activities at the site, which could be listed on the HAIL[1] (Ministry for the Environment; MfE, 2023); and

[1] *The Hazardous Activities and Industries List guidance: Identifying HAIL land* (HAIL; MfE, 2023) is a compilation of activities and industries that are considered likely to cause land contamination resulting from hazardous

- Assess, as far as practicable, the potential risk to human health posed by the proposed soil disturbance.

Based on the proposed works to be undertaken as part of the proposed Pōrangahau stop bank, sheet piled wall and diversion bund works and the MfE's *Contaminated Land Management Guidelines (CLMG) No. 1*[2] *and 5*[3], the scope of works will include:

- A site visit and discussions with those familiar with the site;
- Review of publicly available historical aerial photographs;
- Review of publicly available information for the site held by Central Hawke's Bay District Council (CHBDC) and HBRC;
- An assessment of the potential risk to human health within the context of the *Environmental Standard for Assessing and Managing Contaminants in Soils to Protect Human Health Regulations 2011* (NES-CS) [4].
- Completion of a PSI report (this report).

The PSI has been prepared in general accordance with the MfE CLMG No. 1 (MfE; 2021a) and has been certified by a Suitably Qualified and Experienced Practitioner (SQEP) as outlined by the NES-CS. A certifying statement to this effect is attached in Appendix A.

3.0 Investigation Area Details

3.1 Site Identification and Description

The proposed works cross many properties. The site is defined as an approximate 60m wide strip representing the proposed area of soil disturbance associated with building the stop bank, sheet pile wall, and bund. The approximate site is shown on Figure 1 in Appendix B. The properties the proposed developments will cross have been included in Figure 1 and labelled A to W to assist with identification and are summarised as follows:

- Stopbanks (Red Line): These alignments address open rural and semi-urban areas, crossing properties A, B, C, D, E, F, H, I, J, R and S. A 10-meter buffer on either side has been considered to allow for construction activities and associated works;
- Block Sheet Pile Walls (Green Line): The block wall alignments provide protection through more confined areas within the Pōrangahau township, extending through properties F,G, K, L, M, N, O, P, Q, and R. A 5-meter buffer on either side has been included to minimise disturbance; and
- Bunds (Blue Line): Located in the southwestern and western sections, bund alignments traverse properties T, U, V, and W near Pah Road, with a 5-meter buffer on either side to accommodate construction requirements.

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substance use, storage or disposal. The HAIL is intended to identify most situations in New Zealand where hazardous substances could cause, and in many cases have caused, land contamination.

[2] Ministry for the Environment. 2021. *Contaminated land management guidelines No 1: Reporting on contaminated sites in New Zealand (Revised 2021).* Wellington: Ministry for the Environment. (MfE, 2021a)

[3] Ministry for the Environment. 2021. *Contaminated land management guidelines No 5: Site investigation and analysis of soils (Revised 2021).* Wellington: Ministry for the Environment. (MfE, 2021b)

[4] *Resource Management Act (National Environmental Standard for Assessing and Managing Contaminants in Soils to Protect Human Health) Regulations 2011* (referred to as the NESCS).

The combination of these solutions has been selected to provide effective flood protection while accounting for site-specific constraints and the surrounding land use.

The site details are summarised below in Table 1. The information has been accessed from the CHBDC-Land online map viewer. Current site use, surrounding land use, and topography information is presented in Table 2.

Table 1: Legal Description

Property	Address	Legal Description (LINZ)	Property Area (m^2)[1]	Approximate Site Area (m^2)[2]	Current Land Use[3]
A	36 Beach Road, Pōrangahau	PART SUB SECTION 49 PŌRANGAHAU BLK XII PŌRANGAHAU S D	58,072	68	General Rural Zone
B	Jones Street, Pōrangahau	LOT 1 DP 20711 BLK XII PŌRANGAHAU SD	9,833	1707	General Rural Zone
C	186 Beach Road, Pōrangahau	Lot 6 DP 562529	67,800	2706	General Rural + Settlement Zone
D	2B Jones Street, Pōrangahau	Lot 5 DP 562529	4,009	1641	General Rural Zone
E	2A Jones Street, Pōrangahau	Lot 4 DP 562529	4,010	1562	General Rural Zone
F	56 and 58 Keppel Street, Pōrangahau	HOUSE ID NO 3176-PŌRANGAHAU SCHOOL-PT SECS 48 72 187-194 211 212 BLK XII PŌRANGAHAU SD	6,070	1109	Settlement Zone
F-G	Picton Street	Road	-	240 (approx.)	Paper Road
G	Keppel Street, Pōrangahau	Town Section 212 Pōrangahau	859	530	Settlement Zone
Section2	Keppel Street, Pōrangahau	Road	-	930 (approx.)	Road

Table 1: Legal Description

Property	Address	Legal Description (LINZ)	Property Area (m^2)[1]	Approximate Site Area (m^2)[2]	Current Land Use[3]
Section 3 -H	Graham Street	Road	-	5,150 (approx.)	Paper Road / riverbank
H	6 Moore Street, Pōrangahau	Part Suburban Section 18 Pōrangahau	236	216	Settlement Zone
I	2A Abercromby Street, Pōrangahau, 6 Moore Street, Pōrangahau	Lot 1 DP 398599	5,420	399	Settlement Zone
J	2 Abercromby Street, Pōrangahau	Lot 2 DP 398599	29,240	4527	Settlement Zone
K	Abercromby Street, Pōrangahau	Part Town Section 214 Pōrangahau	104	104	Settlement Zone
L	1 Abercromby Street, Pōrangahau	Town Section 215 Pōrangahau	971	284	Settlement Zone
M	Abercromby Street, Pōrangahau	Part Town Section 214 Pōrangahau	1255	118	Settlement Zone / river
N	9 Abercromby Street, Pōrangahau	Part Section 1 SO 10194	3,240	608	Settlement Zone
O	6 Franklin Street, Pōrangahau	Town Section 173 Pōrangahau	1,011	178	Settlement Zone
O - P	Campbell Street	Road	-	250 (approx.)	Paper road
P	9 Abercromby Street, Pōrangahau	Section 2 SO 10194	640	74	General Rural Zone
P - Q	Franklin Street	Road		300 (approx.)	Paper road
Q	-	Crown Land Survey Office Plan 6143	1,111	372	General Rural Zone
R	Keppel Street, Pōrangahau	Section 8 SO 6143	7,701	1565	General Rural Zone

Table 1: Legal Description

Property	Address	Legal Description (LINZ)	Property Area (m^2)[1]	Approximate Site Area (m^2)[2]	Current Land Use[3]
S	902 Old Hill Road, Pōrangahau	Lot 2 DP 410062	373,000	1335	General Rural Zone
T	Pah Road, Pōrangahau	Pōrangahau 2B11 Block	32,880	1700	General Rural Zone
U	Pōrangahau Road, Waipukurau	Pōrangahau 2B9B13 Block	3,465	340	General Rural Zone
V	Pōrangahau Road, Waipukurau	Pōrangahau 2B9B12 Block	6,930	325	General Rural Zone
W	Pōrangahau Road, Waipukurau	Lot 5 DP 28275	57,590	730	General Rural Zone

Notes:

1. *Property (Lot) areas obtained from CHBDC-Land online map viewer.*
2. *Approximate Site Area calculated in QGIS using the 'Intersection' geoprocessing tool, by intersecting stopbank boundaries (buffered by 30 meters) with Regional Council parcel data.*
3. *Land Use as per CHBDC- District Plan online map viewer.*

Table 2: Current Site Use and Surrounding Land Use		
Property		
A	**Current site use**	Riverbank and pasture.
	Immediate Surrounding Land Uses	Wastewater pond in site section B to the north and river to the south.
	Topography	Flat then sloping down to the river.
B	**Current site use**	Riverbank and pasture.
	Immediate Surrounding Land Uses	Wastewater pond and pasture to the north and river to the south.
	Topography	Flat then sloping down to the river.
C	**Current site use**	Riverbank and pasture.
	Immediate Surrounding Land Uses	Flat pasture to the north and riverbank to the south.
	Topography	Flat then sloping down to the river.
D	**Current site use**	Riverbank and pasture.
	Immediate Surrounding Land Uses	Flat pasture to the north and riverbank to the south.
	Topography	Flat then sloping down to the river.
E	**Current site use**	Riverbank and pasture.
	Immediate Surrounding Land Uses	Flat pasture with a shed to the north and riverbank to the south.
	Topography	Flat then sloping down to the river.
E - F (Jones Street)	**Current site use**	Vacant (paper road).
	Immediate Surrounding Land Uses	Jones Street to the north, flat pasture to the east, riverbank to the south and Pōrangahau school to the west.
	Topography	Riverbank, road and stormwater drains.
F	**Current site use**	School.
	Immediate Surrounding Land Uses	Keppel Street to the north, Jones Street to the east, riverbank to the south and Picton Street with three garages to the west.
	Topography	Flat land.
F – G (Picton Street)	**Current site use**	Car sheds (paper road).
	Immediate Surrounding Land Uses	Keppel Street to the north, school to the west, riverbank to the south and riverbank to the west.
	Topography	Flat then sloping down to river.
G	**Current site use**	Road and riverbank.

Table 2: Current Site Use and Surrounding Land Use		
Property		
	Immediate Surrounding Land Uses	Keppel Street with residential to the north, Picton Street with garages to the west, riverbank to the south and Keppel Street and riverbank to the west.
	Topography	Flat then sloping down to river.
G-H - Section 2	**Current site use**	Keppel Street and riverbank.
	Immediate Surrounding Land Uses	Keppel Street with residential beyond to the north and riverbank to the south.
	Topography	Flat then sloping down to river.
G-H – Section 3 (Graham Street)	**Current site use**	Riverbank with mixed commercial and residential (paper road).
	Immediate Surrounding Land Uses	Keppel Street with residential beyond to the north, riverbank to the east, relatively flat pasture with river to the south, and mixture of residential and commercial to the west.
	Topography	Flat then sloping down to river.
H	**Current site use**	Pasture.
	Immediate Surrounding Land Uses	Moore Street road corridor to the north, riverbank to the east, relatively flat pasture with river beyond to the south, and pasture with a mixture of residential beyond to the west.
	Topography	Flat then sloping down to river.
I	**Current site use**	Pasture.
	Immediate Surrounding Land Uses	Moore Street road corridor to the north, riverbank to the east, relatively flat pasture with river beyond to the south, and pasture with a mixture of residential and commercial beyond to the west.
	Topography	Flat then sloping down to river.
J	**Current site use**	Pasture.
	Immediate Surrounding Land Uses	Mixture of pasture and commercial to the north, riverbank to the east, relatively flat pasture with river beyond to the south, and Abercromby Street with residential and riverbank beyond to the west.
	Topography	Flat.
J – K	**Current site use**	Road.

Table 2: Current Site Use and Surrounding Land Use		
Property		
	Immediate Surrounding Land Uses	Road to the north, pasture to the east, road to the south, and riverbank to the west.
	Topography	Flat.
K	**Current site use**	Riverbank.
	Immediate Surrounding Land Uses	Residential / commercial building to the north, Abercromby Street to the east, and riverbank to the south and west.
	Topography	Sloping down to river.
K – L	**Current site use**	Parking.
	Immediate Surrounding Land Uses	Road to the north, residential / commercial building to the east, and riverbank to the south and west.
	Topography	Sloping down to river.
L	**Current site use**	Riverbank.
	Immediate Surrounding Land Uses	Road and residential / commercial building to the north, road to the east, and riverbank to the south and west.
	Topography	Sloping down to river.
M	**Current site use**	Riverbank.
	Immediate Surrounding Land Uses	Riverbank and river, bordering on residential / commercial to the east.
	Topography	Sloping down to river.
N	**Current site use**	Riverbank.
	Immediate Surrounding Land Uses	Residential / commercial properties to the north and east and riverbank to the south and west.
	Topography	Sloping down to river.
O	**Current site use**	Riverbank with residential sheds.
	Immediate Surrounding Land Uses	Residential properties to the north and east and riverbank to the south and west.
	Topography	Sloping down to river.
O – P (Campbell Street)	**Current site use**	Riverbank and driveway (paper road).
	Immediate Surrounding Land Uses	Franklin Street with residential and pasture beyond to the north, residential to the east, and riverbank to the south and west.

Table 2: Current Site Use and Surrounding Land Use		
Property		
	Topography	Flat then sloping down to river.
P	**Current site use**	Riverbank.
	Immediate Surrounding Land Uses	Franklin Street with pasture beyond to the north, road corridor to the east, riverbank and road corridor to the south, and riverbank to the east.
	Topography	Flat then sloping down to river.
P – Q (Franklin Street)	**Current site use**	Riverbank, animal enclosure (paper road).
	Immediate Surrounding Land Uses	Pasture to the north, Franklin Street to the east, and riverbank to the south and west.
	Topography	Flat then sloping down to river.
Q	**Current site use**	Riverbank and pasture.
	Immediate Surrounding Land Uses	Pasture to the north and east, riverbank and animal encloser to the south, and riverbank to the west.
	Topography	Flat then sloping down to river.
R	**Current site use**	Pasture.
	Immediate Surrounding Land Uses	Keppel Street to the north with pasture beyond. The rest of the surrounding land use is pasture.
	Topography	Flat then sloping down to west to part of the oxbow.
R – S (Keppel Street)	**Current site use**	Road.
	Immediate Surrounding Land Uses	Keppel Street runs east-west and is surrounded by pasture.
	Topography	Flat then sloping down to west to part of the oxbow.
S	**Current site use**	Pasture.
	Immediate Surrounding Land Uses	Pasture to the north, residential to the east, Keppel Street to the south, and pasture to the west.
	Topography	Flat then sloping down to west to part of the oxbow.
T	**Current site use**	Pasture.
	Immediate Surrounding Land Uses	Pasture to the north, Pōrangahau Road with pasture beyond to the east, Kaiwhitikitiki Urupā with Pōrangahau Road beyond to the south, and pasture with riverbank beyond to the west.

Table 2: Current Site Use and Surrounding Land Use		
Property		
	Topography	Flat
U	**Current site use**	Pasture.
	Immediate Surrounding Land Uses	Pasture with riverbank beyond to the north, pasture with Kaiwhitikitiki Urupā to the east, pasture with Pōrangahau Road beyond to the south, and pasture to the west.
	Topography	Flat
V	**Current site use**	Pasture.
	Immediate Surrounding Land Uses	Surrounded by pasture on all sides, with the remains of a building to the south.
	Topography	Flat.
W	**Current site use**	Pasture.
	Immediate Surrounding Land Uses	Surrounded by pasture on all sides.
	Topography	Flat.

3.2 Site Walkover

The site was reviewed by a PDP professional from 18 -22 November 2024, during the geotechnical investigation. Photographs taken during the site visit are included in Appendix C. The photographs are referenced against Figure 1 for easy identification of the different properties that are part of the site.

In general, the riverbank is well vegetated, especially on the northern side of the river. From property A to E, the site is relatively flat (Photographs 1 – 4) and the riverbank becomes less steep as you move upstream. The area appears to be primarily used for grazing and as an access road to the wastewater pond. Property E also contains a farm shed located on the inland side of the site. Properties F and G contain buildings (a school, a residential house and two car sheds and a carport) adjacent to the highly vegetated riverbank (Photographs 5 and 6). Further upstream from the car sheds, the site becomes more constrained between the river and Keppel Street (Photograph 7), with a steep riverbank. Around the bend in the river, between Properties G-H, the riverbank (and site) is more open and gently sloped (Photographs 8 and 9). Property J is a relatively flat and featureless paddock (Photograph 10).

From the Abercromby Street bridge, as you move upstream, the riverbank by the site becomes steeper and is well vegetated (Photograph 11). Between the bridge and Franklin Road, there are a number of residential and commercial buildings with sheds located next to the riverbank. From the end of Franklin Street (Photograph 12), the site follows the natural contours of the oxbow north, away from the river (Photographs 13 and 14). This area appears to be used predominantly for grazing.

The site is also on the southern side of the river, upstream of the township of Pōrangahau. The part of the site is located on a relatively flat section of land (Photographs 15 - 17). The site is situated between Kaiwhitikitiki Urupā, Pōrangahau Road, and the river. Near the middle of this part of the site there are remnants of trees and a farm shed with vehicle parts scattered across the grassed area. The area appears to be predominantly used for grazing.

4.0 Environmental Setting

4.1 Geology

The Geological & Nuclear Sciences (GNS) 1:250 000 Geological Map of New Zealand indicates that the site is underlain by Holocene River deposits. The deposits are described as "Loose gravel, sand, silt, and clay in modern flood plains and low terraces".

Beneath the Holocene alluvial deposits, the Whangai Formation (Tinui Group) is present at the site. The formation consists predominantly of mudstone with minor greensand and glauconitic sandstone from the Late Cretaceous to Paleogene period.

A review of the HBRC online well information on 17 December 2024 indicated that the surrounding subsurface geology generally comprises alternate layers of silt, clay, sand, gravel, and organic material, including peat/vegetation (Well IDs 4476, 5658, and 5661). These deposits are typical of alluvial floodplain environments and reflect the site's proximity to watercourses.

Bore logs from Well ID 17102 (Tipenes Access Road) and Well ID 1425 (Beach Road), located just outside the investigation area, a few meters toward the coast, record mudstone (papa) at depths ranging from approximately 15 m to 47.5 m. A copy of the well reports is included in Appendix D. The location of the reported wells closest to the site are also included in Figure 1.

The geotechnical investigation undertaken by PDP in November 2024 (PDP, 2025a) included the drilling of four boreholes (BH01 to BH04), 21 Cone Penetration Tests (CPTs), and four Hand Auger (HA) tests across the site. The investigation aimed to characterise the subsurface materials and identify groundwater levels. The results revealed subsurface geology consisting of clay, silt, sand, gravels, and occasional peat and shells, typical of alluvial and floodplain deposits. The borehole locations are also shown in Figure 1.

4.2 Hydrology and Hydrogeology

The site is situated within the Pōrangahau River floodplain, approximately 4 km as the crow flies from the Pacific Ocean coastline. The site is approximately 8 km upriver from where the Pōrangahau River discharges into the ocean. Groundwater conditions are inferred to be affected by the base level of the Pōrangahau River and, due to the proximity to the Pacific Ocean, groundwater is expected to be affected by tidal fluctuations. The PDP ecological impact assessment (PDP, 2025b) confirmed that the river is tidal within the site, with conductivity fluctuating with the tides. A full description of the area's hydrology and associated ecology can be found in the PDP ecological impact assessment report (PDP, 2025b).

The local drainage system combines natural waterways and engineered solutions to manage runoff, particularly in rural and residential areas. Multiple wells are located within a 500-meter radius of the site, with noted uses including environmental monitoring (Wells ID 4476, 5658, and 5661) and domestic water supply / stock drinking water (Well ID 17102). PDP's geotechnical investigation (PDP, 2025a) recorded water levels between 3.2 m and 6.6 m below ground level (bgl) in boreholes. No water was encountered in the shallow HA tests, which were progressed to approximately 3 m bgl.

The site's location within a floodplain and near the coast exposes it to variable wind conditions and potential flooding events, especially during extreme weather events. In February 2023, Cyclone Gabrielle caused significant flooding in Pōrangahau, with about 35 homes, the marae, kaumatua housing, and the urupā all inundated when the river overflowed its banks.

5.0 Desktop Review of Investigation Area History

A desktop assessment was undertaken to provide an overview of any potential contaminants of concern that may be present within the site as a result of any documented past and present activities. The following information was sourced in order to establish the history of the site:

- Historical aerial photographs and images;
- HBRC information; and
- CHBDC information.

4.1 Historical Aerial Photographs and Images

A desktop review of available historical aerial images was undertaken. Aerial photographs dating from 1944 to 1978 were accessed via the Retrolens website (http://retrolens.nz/) in November 2024 and historical aerial images from 2004 to 2023 were accessed from Google Earth Pro in November 2024. The historical aerial images reviewed are summarised below in Table 3 below. A selection of historical aerial images is also included in Appendix E.

Table 3: Historical Aerial Photography

1944	In the 1944 aerial photography, the river winds naturally through a predominantly rural landscape, following a meandering course with pronounced curves and bends with a similar configuration to the current river, with the exception of the area in property A. The river follows a different path in property A than is seen currently. There was also no pond visible in property B. The properties E, F and G have a different configuration to the current site. A dwelling is visible to the north of the current shed in property E and another dwelling is visible in the area occupied by the current school in property F. The car sheds currently present between properties F and G are not visible. The site between property G and the Abercromby Street bridge has a similar configuration to current conditions except that the land to the west of the site has not yet been developed and only contains a few buildings. The site from the bridge to Franklin Street has a similar configuration to the current site except fewer buildings are visible in the half of the site closest to Franklin Street. There also appears to be less vegetation on the riverbank than currently present. The site from property P to S has a similar configuration to the current site. The site from property T to W has a similar configuration to the current site, except for two dwellings visible between the site and Pōrangahau Road and no shed visible in property V in 1944. The surrounding land has a similar configuration to the current area, but with fewer dwellings in the township and more dwellings on the southern side of the river.
1961	The 1961 aerial photograph only provides partial coverage of the area and excludes properties A to D. The surrounding landscape still appears predominantly rural and

Table 3: Historical Aerial Photography	
	has a similar configuration to the current area. Development near the river in the township seems to have increased slightly, with additional structures. Property F now has a similar configuration to the current school. The area between properties F and G now has a similar configuration to the current car sheds. The area immediately north of Keppel Street and Section 2 and property G has a similar configuration to the current area. To the west of Section 3 at the eastern end of Franklin Street, the area in the 1961 aerial photograph shows what appears to be worked earth which is possibly associated with the clearance of the vegetation that was visible in the 1944 aerial photograph. Small, rectangular structures (indicative trucks, trailers or sheds) are arranged on the earthworks area. Some of the earthworks area appears to contain stockpiles of material. The site in properties H to S appears to have a similar configuration to that seen in the 1944 aerial photograph. However, in property J, near Abercromby Street, there are patterns on the land that resemble garden plots. The site on the southern boundary of property S appears to have been filled and regraded, with visible signs of land modification along the scarp edge. The surface shows evidence of smoothing or levelling, suggesting possible early landfilling or earthworks. The site in properties T – W appear to have a similar configuration to that seen in the 1944 aerial photograph.
1976	The site has a similar configuration to that observed in the 1961 aerial photograph. The 1976 aerial photograph now includes properties A – D which have a similar configuration to the 1944 aerial photograph. However, one major difference is that the river now cuts through property A by property B. The house that was present in the 1961 aerial photograph on property E is no longer visible, but two structures resembling sheds remain. The site in properties T – W has a similar configuration to the 1961 aerial photograph. However, the two dwellings to the east of the site that were visible in the 1961 aerial photograph, are no longer visible.
1978	The site has a similar configuration to that observed in the 1976 aerial photograph. However, the aerial photograph does not show properties D – G and parts of Section 2 along Keppel Street. The site at property P appears to have a number of structures, two of them are round and resemble tanks. There is also a new building(s) adjacent to these structures that was not visible in the 1976 aerial photograph. The site in properties T – W has a similar configuration to the 1976 aerial photograph. However, the shed that is currently present on property V is now visible. There are also patterns on property U that resemble newly planted trees.

Table 3: Historical Aerial Photography	
2004	The site has a similar configuration to that observed in the 1978 aerial photograph, except for the presence of the pond in property B, which has a similar configuration to the current wastewater pond. The site at property P does not appear to have the structures observed in the 1978 aerial photograph. However, it is possible that they are hidden by the vegetation. The site in properties T – W has a similar configuration to the 1978 aerial photograph, except that the patterns on property U now appear to resemble grown trees.
2010	The configuration of the site and surrounding land is similar to that in the 2004 aerial image. There is a new building visible on the site on property O. It is noted that a large tree previously visible by the building was removed between 2004 and 2010 based on a review of the aerial images. It is possible that the tree previously hid the building from aerial views. The site between properties P and Q has a structure resembling the current configuration of a pig and chicken enclosure. The trees previously visible in property U in the 2004 aerial image have been removed.
2013	The configuration of the site and surrounding land is similar to that seen in the 2010 aerial image.
2017	The configuration of the site and surrounding land is similar to that seen in the 2013 aerial photograph.
January 2023 **Pre-Cyclone Gabrielle**	The configuration of the site and surrounding land is similar to that seen in the 2017 aerial photograph.
March 2023 **Post-Cyclone Gabrielle**	The configuration of the site and surrounding land is similar to that seen in the 2023 Pre-Cyclone Gabrielle aerial photograph, with the extent of some of the flooding visible by the mud deposited on the land.

5.1 Hawke's Bay Regional Council Information

5.1.1 Selected Land Use Register

An online search was made on November 2024 via HBRC website for information from their Selected Land Use Register (SLUR). The HBRC SLUR is used to hold information about sites that have used, stored or disposed of hazardous substances, based on activities detailed on the HAIL (MfE, 2023). It should be noted that the SLUR is not complete, and new sites are regularly being added as HBRC receives information or conduct their own investigations into current and historical land uses.

There are several properties listed on the SLUR that are adjacent to the site, as follows:

- **HAIL – G6**: Verified HAIL - Risk not quantified – Waste recycling or waste or wastewater treatment (Pōrangahau Wastewater Treatment Plant) – located next to the site in property B;
- **HAIL – X2**: Verified HAIL - Risk not quantified – fishing depot – located on the other side of Keppel Street from the site in Section 2; and
- **HAIL – G3**: Verified HAIL - Risk not quantified – Landfill sites - 0 Keppel Street, Landfill – located approximately 90 m west of the site and adjacent to properties Q, R and S.

In close proximity to the sites, but outside the boundaries of the properties of interest, the following locations are registered on the SLUR:

- **HAIL – F8:** Verified HAIL - Risk not quantified – Transport depots or yards including areas used for refuelling or the bulk storage of hazardous substances - 17 Franklin Street, Cassidy Transport Ltd – located approximately 100 m to the west of Section 3 of the site; and
- **HAIL – F7:** Verified HAIL - Risk not quantified – Service stations including retail or commercial refuelling facilities - 9 Franklin Street, Pōrangahau Garage R D Fair Ltd – located approximately 110 m to the northeast of property O.

During the site visit it was noted that there were two obvious HAIL areas that had not been included on the SLUR. These include:

- **HAIL – G1**: Cemeteries – 33 Keppel Street cemetery - located on the other side of Keppel Street from the site in Section 2; and
- **HAIL – G1**: Cemeteries – Kaiwhitikitiki Urupā located between Pōrangahau Road and the site on property T.

5.1.2 Resource Consents

The HBRC GIS database was reviewed for resource consents recorded within a 500 m radius of the site boundary. There are three land use consents to drill a bore (belonging to wells ID 4476, 5658, and 5661), and three discharge permits. The current consents reviewed consist of:

- **Discharge Permit – DP030861A**: Central Hawke's Bay District Council - to discharge contaminants (odour) to air associated with the operation of the Pōrangahau Township Oxidation Pond – granted 22 October 2009 (AUTH-113842-01) – the permit is associated with the site in property B;
- **Discharge Permit – DP030233W**: Central Hawke's Bay District Council - to discharge treated domestic effluent into the Pōrangahau River – granted 22 October 2009 - the permit is associated with the site in property B; and

- **Discharge Permit – DP950131La/A:** Central Hawke's Bay District Council - to discharge leachate derived from the decomposition of refuse within a closed landfill into or onto land in circumstances which will result in those contaminants entering water, **and** to discharge landfill gas derived from the decomposition of refuse within a closed landfill into the air, at the following sites – originally granted 27 May 1998 and varied 31 March 2005 (AUTH-107800-04) – landfill is located approximately 90 m west of the site and adjacent to properties Q, R and S;

A copy of the consents listed is included in Appendix F.

5.2 Central Hawkes Bay District Council (CHBDC)

5.2.1 Property Files

Information for 16 out of 23 property files was obtained from CHBDC. Some properties share the same legal description (i.e. properties K and M). Properties T and Q were not found in the council files, and no council information was available for properties U, V and W. A copy of the property file documents listed below are included in Appendix G.

Generally, the property files provided limited information related to contaminated land. The files that include information related to contaminated land are as follows:

- Property B – Jones Street (Lot 1 DP 20711): Document labelled as "Hazards and Contamination" record a Hazard Register Form for "Contamination: Effluent Ponds", dated 11 February 2009. Also included is the Pōrangahau and Te Paerahi Wastewater Treatment Plant Discharge Resource Consent and Assessment of Environmental Effects document dated August 2021. This document provides a good description of the wastewater pond's history.
- Property E – 186 Beach Road: Geotechnical Assessment on 186 Beach Road, Pōrangahau by RDCL and dated 4 February 2018 – Test pit 04 (TP04) on property E was excavated on 19 December 2018 and 0.75 m of fill consisting of "*predominantly topsoil with bricks incorporated*" was recorded – TP04 is located adjacent to the site.
- Property L – 1 Abercromby Street: Building consent application BC076831, dated 1979, shows that the proposed kitchen, bathroom and laundry extension plan has the wording "Highline asbestos sheathing" as a label on the walls.
- Property O – 6 Franklin Street: Building Consent application BC106557, dated 1995, states that the building is to be storage rooms – the building referred to is believed to be the one visible on the site in property O.
- Properties Q, R and S – Abercromby Street (Part Town Section 214 Pōrangahau): Document labelled as "Hazards and Contamination" recorded a Hazard Register Form for "Types of Landfill: Closed Landfill", dated 16 December 2008. However, the legal description refers to the known landfill located beside Keppel Street rather than Abercromby Street.

It is worth mentioning that among the property files obtained from CHBDC and related to property A, there is a Planning and Heritage document pertaining to the property's registration under the New Zealand Historic Places, Historic Areas, Wāhi Tapu, and Wāhi Tapu Areas categories in accordance with the Historic Places Act 1993. However, it is unclear whether this applies to the site based on the change in the river channel noted between 1961 and 1976.

6.0 Summary of Investigation Area History

The site use has generally been the same from 1944 to present day. The main areas of change have occurred between properties A and H. In property A the river channel changed sometime between 1944 and 1976. It is not known whether the new channel was excavated or was the result of the many flood events. The wastewater pond was constructed in property B sometime between 1976 and 2004 from historical aerial imagery. Based on the resource consent dates and council documents associated with the upgrade of the Pōrangahau wastewater system, it is more than likely that the pond was excavated in the early 1990s and has been discharging the treated effluent into the river. The pond is on the HBRC SLUR (HAIL – G6 – Waste recycling or waste or wastewater treatment).

Another part of the site that has changed over the years is property E, which used to contain a dwelling up until sometime between 1961 and 1976 from the aerial photographs. The site is located between the former dwelling and the river. A geotechnical investigation by RDCL in 2018 indicated the top 0.75 m of soil near the site, in property E, was fill which consisted predominantly of topsoil with bricks incorporated. It is possible that the fill placed on the site was from the removal of the house. Based on the age of the house, it is possible that asbestos and lead paint may have been associated with the house and therefore maybe in the fill on the site in this property.

The paper road end of Jones Street, between properties E and F, has not changed but based on its location near the outskirts of the township, with easy access to the riverbank; it is possible that this area may have been used for fly tipping in the past. However, there is no evidence to support this and it is more likely that the documented landfill by properties Q, R and S was used instead.

Property F landuse has changed from residential to a school. This would have required a lot of earthworks and involved the removal of several buildings. It is not known if these buildings were demolished onsite or removed offsite.

Between properties F and G, the landuse has changed from vacant to containing two car sheds and a carport. It is not known what (if anything) was stored in the sheds, but from the age of these buildings (they were first visible in the 1961 aerial photograph), it is possible that asbestos and lead paint maybe associated with them. In addition, if the sheds were used to store vehicles, there is the possibility of hydrocarbon and solvent contamination in surface soils.

The site beside Keppel Street has not changed much over the years but the surrounding land use has. On the north side of Keppel Street, the area on either side of the cemetery has been developed for what appears to be commercial/industrial use, with associated vehicle parking. One property is listed on HBRC SLUR as HAIL – X2 – Fishing depot, while the other resembles an unsealed parking area in the 1961 aerial photograph. The 1944 aerial photograph shows both properties were residential or vacant.

Around the river bend in Section 3, the site has remained undisturbed until about 2021 when the aerial images show that earthworks had occurred on the site and possibly a large garden had been developed. Much of this area was subsequently underwater during the Cyclone Gabrielle floods.

The site in properties H to I has not changed much since 1944, with the exception of a possible garden by Abercromby Street (property J) around the 1960s.

The site on properties K to P has not significantly changed except for the addition of several sheds. It was noted in the council files that the building by the bridge in property L may have asbestos walls on some parts of the building. Although asbestos cladding was proposed in the building consent application in 1979, there is no confirmation that this occurred. However, it does highlight that many of the buildings adjacent to the site may contain asbestos building materials and possibly had lead based paint. The landuse in this area has been residential/commercial with the major change being to the addition of a

residential dwelling with storage building in property O. The storage building was possibly built in the late 1990s based on the building consent and aerial images.

The site on properties Q to S has not changed much since at least 1944. The site follows the curve of the oxbow, which still gets filled with water in flood events. Across the oxbow channel is a landfill. The landfill is on HBRC SLUR and has a current resource consent (discharge permit) and monitoring bores. The landfill site appears to be approximately 120 m from the proposed stop bank site.

Across the bridge and on the southern side of the river, the site located in properties T to W has not changed much since the 1944 aerial photograph except for the presence of two residential houses to the east of the site on properties T and U. These houses were removed sometime between 1961 and 1976 based on the aerial photographs. Houses of this age were more than likely to contain asbestos and have lead paint. Property U was subsequently used to grow trees from around the 1978 until sometime between 2004 and 2010. A shed was also built close to the site on property V between 1976 and 1978. This shed is still present but is now surrounded by discarded vehicle and equipment parts.

The site on property T is located between the Kaiwhitikitiki Urupā and the river.

Therefore, based on the available information, the potential contamination sources from past and present land use activities may be restricted to the following:

- **Property E – HAIL – I –** *'Any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment'*- associated with the fill identified during the RDCL geotechnical investigation.
- **Property F to G (Picton Street) – HAIL – I** - Based on the current condition and age of the car sheds it is highly likely that elevated concentrations of lead from lead paint maybe present in surface soils, and possibly hydrocarbons from vehicle storage.
- **Section 2 (between Property G and the bend in the river) – HAIL – H** -*'Any land that has been subject to the migration of hazardous substances from adjacent land in sufficient quantity that it could be a risk to human health or the environment'* – associated with stormwater discharging from the HAIL sites across Keppel Street as well as from the street itself.
- **Properties L to N – HAIL – I** –Based on the current condition and age of the houses in these properties it is highly likely that elevated concentrations of lead from lead paint maybe present in surface soils, and possibly asbestos as well, from the deterioration of the buildings.
- **Property – U – HAIL I** – Based on the current condition and age of the shed it is highly likely that elevated concentrations of lead from lead paint maybe present in surface soils. There may also be surface soil contamination associated with the discarded vehicle/equipment in the surrounding area.

These possible HAIL activities would need to be confirmed through a soil sampling investigation. Whilst noting these possible HAIL activities, it should be noted that the flooding and clean up from Cyclone Gabrielle may have moved much of the original topsoil that may have contained any asbestos and/or lead paint residues historically released from the buildings or heavy metals from stormwater discharges.

The primary persistent contaminants of concern associated with the identified HAIL activities over the site include (but not necessarily limited to) heavy metals and asbestos.

7.0 Consideration of the NES-CS

The NES-CS seeks to control activities on contaminated land so as to protect human health. The regulations apply to land, which is described as having, has had or is more likely than not to have had an activity or industry described in the HAIL undertaken on it. As mentioned in Section 6.0 of this document, possible HAIL activities have been identified within the site. Therefore, under regulation 5(7), the NES-CS regulations need to be taken into consideration for the proposed redevelopment.

The NES-CS sets outs regulations for the following activities as described in sub-clauses (2) – (6) of regulation 5:

(2) An activity is removing a fuel storage system from the piece of land or replacing a fuel storage system in or on the piece of land.

(3) An activity is sampling the soil of the piece of land, which means sampling it to determine whether or not it is contaminated and, if it is, the amount and kind of contamination.

(4) An activity is disturbing the soil of the piece of land.

(5) An activity is subdividing land.

(6) An activity is changing the use of a piece of land which, means changing it to a use that, because the land is as described in sub clause (7), is reasonably likely to harm human health.

Based on the proposed development, the NESCS may apply to soil disturbance (sub-clause 4 above).

7.1 Soil Disturbance

Soil disturbance is a permitted activity under regulation 8(3) provided that controls are put in place to minimise contact with soil during the disturbance, that the soil be reinstated to an erosion-resistant state within one month of completion of the works and that offsite disposal of removed soil is at a facility authorised to receive such waste. The NES-CS also sets limits on the volume of soil disturbance (no more than 25 m^3 per 500 m^2 is disturbed), soil removal (no more than 5 m^3 per 500 m^2 is removed from the site (property) per year) and duration of works (no longer than two months).

Currently, no specific plans have been provided to detail the duration of earthworks and exact volume of soil disturbance involved to develop the stopbank, sheet pile wall and diversion bund or whether this material will be removed offsite of the properties. Once this has been established, an assessment can then be made with regards to whether the bulk earthworks can be completed as a permitted activity in accordance with the NESCS regulations.

7.2 NES-CS Consenting Summary

Based on a review of the available site history information, and due to the presence of possible HAIL activities in parts of the site, a potential risk exists to human health. If the proposed stopbank, sheet piling and diversion bund works are unable to meet the permitted activity requirements for soil disturbance, then further assessment (e.g. soil sampling investigation) maybe required. Irrespective, a soil sampling investigation maybe required to characterise the soils to be excavated from to inform offsite disposal requirements and health and safety management measures for site contractors and future site occupiers.

8.0 Conclusions

PDP has reviewed site history information for the proposed stop bank/sheet pile area, located on the properties highlighted in Figure 1. The objective of the investigation was to identify any potential HAIL activities/sources of contamination from past and/or present land use activities at the site and to assess compliance with the NESCS for the development of the stopbank, sheet pile wall and diversion bund in Pōrangahau.

The investigation included a review of available site history information including historical aerial photographs, CHBDC and HBRC information, and a site walkover.

In summary, the available historical information for the site indicates that the landuse in the area has remained relatively similar over the years except for increased in residential houses and a wastewater pond site built in the early 1990s.

Through the process of this review, potential HAIL activities have been identified at the site, as follows:

- HAIL reference I – for the identified fill containing bricks in property E.
- HAIL reference I – associated with the deterioration of the car sheds in property F to G (Picton Street).
- HAIL reference H – associated with the movement of materials from HAIL sites by stormwater into Section 2 by Keppel Street.
- HAIL reference I – associated with the deterioration of buildings in properties L to N that may contain lead paint and asbestos.
- HAIL reference I – associated with the deterioration of a farm shed and associated farm equipment and vehicles in property U.

Soil contamination from the above HAIL activities would need to be confirmed through a soil sampling investigation. In addition to the above identified HAIL activities, it is possible that the site soils contain other contaminants above local background concentrations, primarily as a result of the effects of Cyclone Gabrielle.

Based on a review of the available site history information, and due to the presence of likely HAIL activities at the site, a potential risk exists to human health. If the proposed stop bank and sheet pile works are unable to meet the NES-CS permitted activity requirements for soil disturbance, then further assessment (e.g. soil sampling investigation) maybe required. Irrespective, a soil sampling investigation maybe required to characterise the soils to be excavated to inform offsite disposal requirements and health and safety management measures for site contractors and future site occupiers.

9.0 References

GNS Science. (2012). Geological Map of New Zealand [Data set]. GNS Science.

Ministry for the Environment. 2023. *Hazardous Activities and Industries List guidance: Identifying HAIL land*. Wellington: Ministry for the Environment.

Ministry for the Environment. 2021. *Contaminated land management guidelines No 1: Reporting on contaminated sites in New Zealand (Revised 2021).* Wellington: Ministry for the Environment. (MfE, 2021a)

Ministry for the Environment. 2021. *Contaminated land management guidelines No 5: Site investigation and analysis of soils (Revised 2021).* Wellington: Ministry for the Environment. (MfE, 2021b)

PDP. April 2025a. Geotechnical Assessment Report for the Proposed Pōrangahau Stopbanks and Southern Buildings, Central Hawke's Bay.

PDP. April 2025b. Pōrangahau Flood Mitigation – Ecological Impact Assessment.

Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011.

10.0 Limitations

This report has been prepared by Pattle Delamore Partners Limited (PDP) on the basis of information provided by Hawkes Bay Regional Council (HBRC). PDP has not independently verified the provided information and has relied upon it being accurate and sufficient for use by PDP in preparing the report. PDP accepts no responsibility for errors or omissions in, or the currency or sufficiency of, the provided information.

This report has been prepared by PDP on the specific instructions of HBRC for the limited purposes described in the report. PDP accepts no liability if the report is used for a different purpose or if it is used or relied on by any other person. Any such use or reliance will be solely at their own risk.

Yours faithfully

PATTLE DELAMORE PARTNERS LIMITED

Prepared by

pp

Nicole Bidart

Environmental Scientist – Contaminated Land

Sally McKinnon

Service Leader - Contaminated Land

Reviewed and Approved by

Jordan Vaughn

Technical Director - Contaminated Land

Appendix A - Certifying Statements

Certifying Statements

I, Jordan Vaughn of Pattle Delamore Partners Limited, certify that:

1. This preliminary site investigation meets the requirements of the *Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011* (the NES-CS) because it has been:

    a. done by a suitably qualified and experienced practitioner, and

    b. reported on in accordance with the current edition of *Contaminated land management guidelines No 1 – Reporting on contaminated sites in New Zealand*, and

    c. the report is certified by a suitably qualified and experienced practitioner.

2. This preliminary site investigation concludes that NES-CS regulations are considered to be applicable on the parts of the site identified as being on the HAIL, for the activities covered by the NES-CS (i.e. soil disturbance) associated with the development of the stopbanks, sheet pile walls and diversion bund.

Evidence of the qualifications and experience of the suitably qualified and experienced practitioner who has done this investigation and certified this report is provided below.

This certification applies to the date of this report.

Signed

Jordan Vaughn

Technical Director – Contaminated Land

Jordan Vaughn – Project Director

Jordan is a geologist with over 20 years of experience in contaminated land, hydrogeology and environmental emergency response. She has a MSc in Geology and is a Certified Environmental Practitioner (CEnvP). She specialises in contaminated land assessments and remediation, with a special interest in waste reduction and environmental sustainability. Additionally, she oversees soil, groundwater and landfill/ground gas assessments and remediation projects. Jordan is experienced across the housing, energy, transport, solid waste, and agricultural sectors throughout New Zealand.

Jordan has experience with and an understanding of the current contaminated land regulation and practice in New Zealand including assessments against the NES-CS and in the consenting of contaminated sites.

Appendix B – Figures

0 20 40 60 m
SCALE 1:3800 (A3)

NO.	REVISION	DATE	BY
B	FINAL	JAN 25	NB
A	DRAFT	NOV 24	NB

SOURCE:
1. SITE SURVEY AERIAL SOURCED FROM ##DATA SOURCE## PROVIDED ON ##DATE##.
2. BASEMAP AERIAL SOURCED FROM LINZ AERIAL IMAGERY.
3. SITE INVESTIGATION LOCATIONS ARE NOT SURVEYED AND ARE APPROXIMATE.
4. GEOLOGY MAPPING IS BASED ON SITE OBSERVATIONS MADE BY PDP STAFF DURING A SITE VISIT IN ##DATE##. MAPPING IS NOT SURVEYED AND ARE APPROXIMATE.
5. ##OTHER RELEVANT INFORMATION##

CLIENT
HAWKE'S BAY REGIONAL COUNCIL

FIGURE
FIGURE 1: Site Plan

PROJECT
HB01041700L001_Pōrangahau Stopbank_Preliminar Site Investigation

PATTLE DELAMORE PARTNERS LTD

Appendix C – Site Photo Log

***Note**: The property references are from Figure 1. Property A is the downstream end of the proposed stop bank and properties V and W are the upstream extent of the proposed stop bank.*

Photograph 1: Properties A and B - The photograph is taken from the northern side of the river looking downstream. The wastewater pond is located behind the sign and fence near the middle left of the photograph.

Photograph 2: Property C - The photograph is taken from the northern side of the river looking downstream. The wastewater pond is located behind the sign and fence near the middle of the photograph.

Photograph 3: Property D - The photograph is taken from the northern side of the river looking downstream.

Photograph 4: Property E - The photograph is taken from the northern side of the river, by Jones Street, looking downstream.

Photograph 5: Property F - The photograph is taken from the northern side of the river, looking directly towards the river, with the school behind the photographer.

Photograph 6: Properties F and G - The photograph is taken from the southern side of the river, looking northeast towards the other side of the river, which is part of properties F and G.

Photograph 7: Section 3 between Properties G and H - The photograph is taken from the northern side of the river, looking southeast (downstream) along the riverbank (site), with Keppel Street on the left of the photograph.

Photograph 8: Section 3 between Properties G and H - The photograph is taken from the southern side of the river, looking northwest across the river at the site.

Photograph 9: Properties H and J - The photograph is taken from the southern side of the river, looking southwest (and upstream) across the river at the site.

Photograph 10: Property J - The photograph is taken from the northern side of the river, looking west across the site towards Abercromby Street and the bridge.

Photograph 11: Properties L, K and M - The photograph is taken from the bridge, on the northern side of the river, looking west (upstream) across the site.

Photograph 12: Properties P - O - The photograph is taken from Franklin Street, on the northern side of the river, looking southeast. The river is on the other side of the trees in the middle of the picture.

Photograph 13: Properties R and Q - The photograph is taken from Keppel Street, on the northern side of the river, looking southwest across the site.

Photograph 14: Property S - The photograph is taken from Keppel Street, on the northern side of the river, looking north across the site.

Photograph 15: Property T - The photograph is taken from the bridge, on the northern side of the river, looking southwest across the river at one end of the site located on the southern side of the river. The site in located in the left of the photograph.

Photograph 16: Properties T, U and V - The photograph is taken from beside Kaiwhitikitiki Urupā looking southwest across the site. The urupā is not in sight but is located to the left of the photograph. The river is located to the right of the photograph.

Photograph 17: Properties U and V - The photograph is taken from Section U, looking southwest across the site. The river is located to the left of the photograph.

Appendix D – Well Information

HAWKES BAY REGIONAL COUNCIL
TE KAUNIHERA Ā-ROHE O TE MATAU-A-MĀUI

Well Number: 4476

IDENTIFICATION		WELL INFORMATION	
WQ Site		**Drill Date**	
NZTM Easting	1906627.159	**Driller**	Baylis Brothers Limited
NZTM Northing	5532401.469	**Casing Diameter (mm)**	50
Method	Map estimate	**Bore Depth (m)**	11.8999996185303
Address	KEPPELL STREET, PORONGAHAU	**Well Depth (m)**	10.6999998092651
		Screen top (m)	5.09999990463257
		Screen bottom (m)	10.6999998092651
		Open hole top (m)	
		Open hole bottom (m)	
		Water access	Yes

Aquifer Information

Initial Water Level	-5
Initial Water Level Date	
Aquifer Lithology	
Aquifer Condition	Unknown
Comments	100mm bore drilled and 50mm PVC casing and screen installed within. Screen from 5.1 to 10.7m. Bentonite clay in annulus from surface to 4m. Wilton Park sand pack filling annulus around PVC screen from 4 - 11.9m.. Drilled in 2000.

Aquifer Test

Bore Log

From Depth (m)	To Depth (m)	Lithology
0	0.5	brown SILT
0.5	6.1	blue SILT with peat/veg/wood
6.1	6.3	coarse blue SAND

6.3	11.8	SILTSTONE with gravel
11.8	11.9	MUDSTONE (papa)

HAWKES BAY REGIONAL COUNCIL
TE KAUNIHERA Ā-ROHE O TE MATAU-A-MĀUI

Well Number: 5658

IDENTIFICATION		WELL INFORMATION	
WQ Site		**Drill Date**	26/04/2007
NZTM Easting	1906689.203	**Driller**	Baylis Brothers Limited
NZTM Northing	5532462.506	**Casing Diameter (mm)**	50
Method	Hand-held GPS	**Bore Depth (m)**	10.6000003814697
Address	KEPPEL STREET, PORANGAHAU	**Well Depth (m)**	10.6000003814697
		Screen top (m)	7.59999990463257
		Screen bottom (m)	10.6000003814697
		Open hole top (m)	
		Open hole bottom (m)	
		Water access	Unknown

Aquifer Information

Initial Water Level	-6.39
Initial Water Level Date	26-04-2007
Aquifer Lithology	Other
Aquifer Condition	
Comments	

Aquifer Test

Bore Log

From Depth (m)	To Depth (m)	Lithology
0	3	brown SILT (FIRM)
3	10.6	brown SILT (SOME SHALE - SOFT)

HAWKES BAY REGIONAL COUNCIL
TE KAUNIHERA Ā-ROHE O TE MATAU-A-MĀUI

Well Number: 5661

IDENTIFICATION		WELL INFORMATION	
WQ Site		**Drill Date**	24/04/2007
NZTM Easting	1906683.196	**Driller**	Baylis Brothers Limited
NZTM Northing	5532392.46	**Casing Diameter (mm)**	50
Method	Hand-held GPS	**Bore Depth (m)**	7.5
Address	KEPPEL STREET, PORANGAHAU	**Well Depth (m)**	7.5
		Screen top (m)	4.5
		Screen bottom (m)	7.5
		Open hole top (m)	
		Open hole bottom (m)	
		Water access	Unknown

Aquifer Information

Initial Water Level	-4.95
Initial Water Level Date	24-04-2007
Aquifer Lithology	Other
Aquifer Condition	
Comments	

Aquifer Test

Bore Log

From Depth (m)	To Depth (m)	Lithology
0	0.45	brown SILT (FIRM)
0.45	7.5	brown SILT (SOME SHALE - SOFT)

HAWKES BAY REGIONAL COUNCIL
TE KAUNIHERA Ā-ROHE O TE MATAU-A-MĀUI

Well Number: 1425

IDENTIFICATION		WELL INFORMATION	
WQ Site		**Drill Date**	17/01/1984
NZTM Easting	1909028.764	**Driller**	Honnor Drilling Limited
NZTM Northing	5532299.279	**Casing Diameter (mm)**	100
Method	Map estimate	**Bore Depth (m)**	
Address	BEACH RD, PORANGAHAU	**Well Depth (m)**	26.2099990844727
		Screen top (m)	22.5599994659424
		Screen bottom (m)	24.9899997711182
		Open hole top (m)	
		Open hole bottom (m)	
		Water access	Unknown

Aquifer Information

Initial Water Level	0
Initial Water Level Date	
Aquifer Lithology	
Aquifer Condition	Confined
Comments	Permit number is 1425 Driller is HONNOR Owner is R.H. STODDART & CO. Well location is BEACH RD, PORANGAHAU Screen type is SLOTTED Depth of casing is 24.69 Legal description is LOT 5, D.P. 515, BLK XII, PORANGAHAU S.

Aquifer Test

Test Date	17-01-1984
Report Number	
Maximum Pumping Rate (l/s)	
Maximum DrawDown (m)	

HAWKES BAY REGIONAL COUNCIL
TE KAUNIHERA Ā-ROHE O TE MATAU-A-MĀUI

Well Number: 1425

Duration (hours)	
Number Of Pumping Steps	
Aquifer Thickness (m)	
Transmissivity (m^2/d)	
Storativity	
Hydralic Conductivity (m/d)	
Specific Capacity ((l/s)/m)	

Bore Log

From Depth (m)	To Depth (m)	Lithology
0	1.22	TOPSOIL
1.22	3.35	brown CLAY
3.35	4.27	blue CLAY with shell
4.27	23.47	blue SILT with clay (banded)
23.47	24.99	blue/brown MUDSTONE (shale)
24.99	26.21	SILTSTONE (soft, Papa)

HAWKES BAY REGIONAL COUNCIL
TE KAUNIHERA Ā-ROHE O TE MATAU-A-MĀUI

Well Number: 17102

IDENTIFICATION		WELL INFORMATION	
WQ Site		**Drill Date**	23/06/2021
NZTM Easting	1908122.046	**Driller**	Baylis Brothers Limited
NZTM Northing	5530490.126	**Casing Diameter (mm)**	100
Method	Hand-held GPS	**Bore Depth (m)**	47.5
Address	49 Tipenes Access Road, Porongahau	**Well Depth (m)**	47.5
		Screen top (m)	
		Screen bottom (m)	
		Open hole top (m)	
		Open hole bottom (m)	
		Water access	Unknown

Aquifer Information

Initial Water Level	-3.46
Initial Water Level Date	23-06-2021
Aquifer Lithology	
Aquifer Condition	
Comments	Open hole -9.55 to -47.50. High in sodium & chloride.

Aquifer Test

Test Date	23-06-2021
Report Number	
Maximum Pumping Rate (l/s)	0.08
Maximum DrawDown (m)	34.85
Duration (hours)	0.6
Number Of Pumping Steps	
Aquifer Thickness (m)	
Transmissivity (m^2/d)	
Storativity	
Hydralic Conductivity (m/d)	

HAWKES BAY REGIONAL COUNCIL
TE KAUNIHERA Ā-ROHE O TE MATAU-A-MĀUI

Well Number: 17102

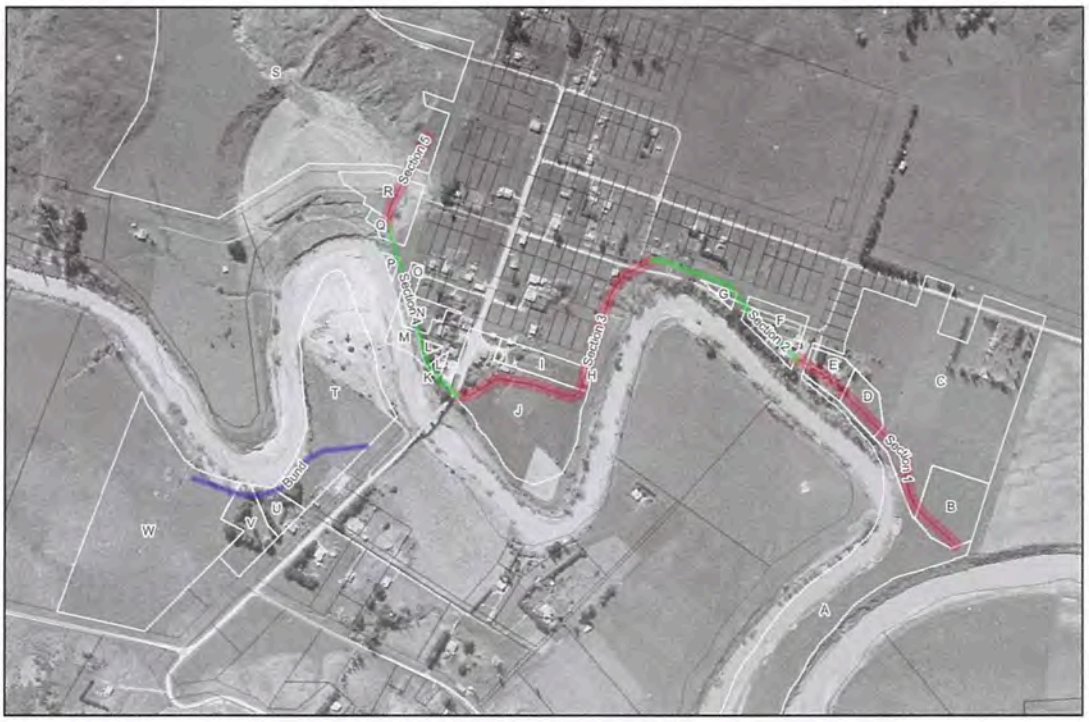
Specific Capacity ((l/s)/m)	0

Bore Log

From Depth (m)	To Depth (m)	Lithology
0	2	TOPSOIL
2	11	brown CLAY
11	15	blue CLAY (Puggy)
15	47.5	MUDSTONE (Firm (papa) fractured)

Appendix E – Historical Aerial Photographs and Images

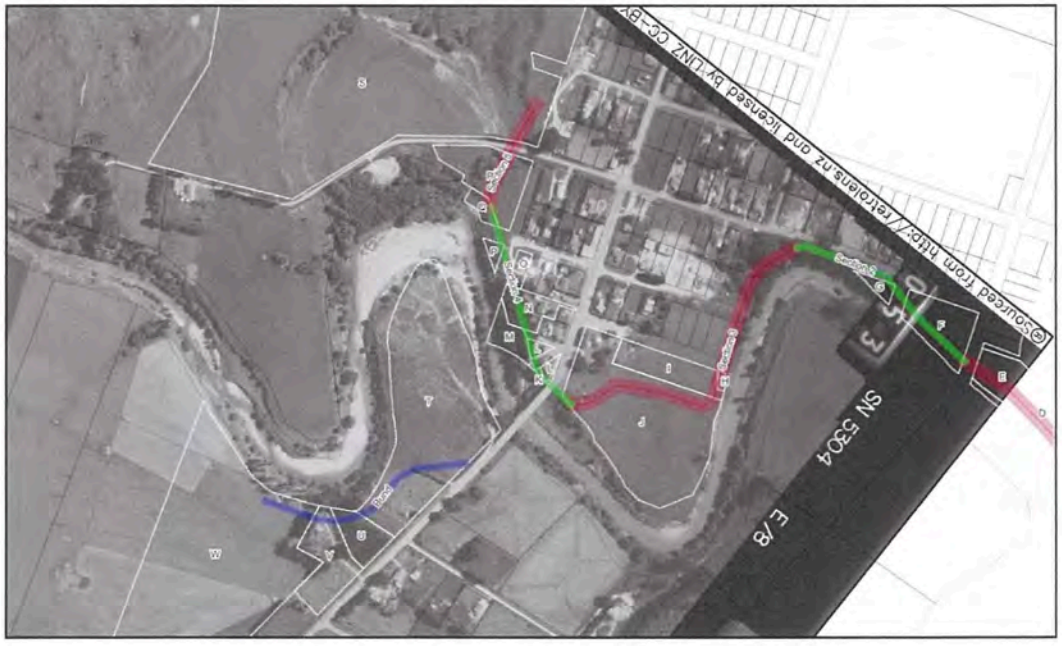
Historical Aerial Photograph: 1944 (Source - Retrolens).



Historical Aerial Photograph: 1961 (Source - Retrolens).

Note: This image provides only partial coverage of the site investigation area.

Historical Aerial Photograph: 1976 (Source - Retrolens).

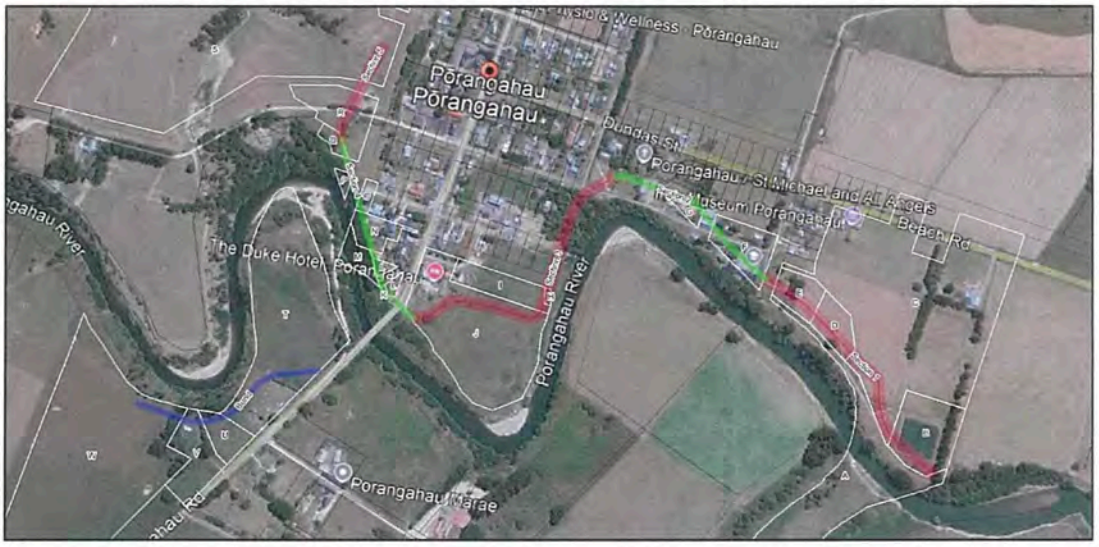


Historical Aerial Photograph: 1978 (Source - Retrolens).

Note: This image provides only partial coverage of the site investigation area.

Historical Aerial Image – 2004 (Source – Google Earth Pro).

Historical Aerial Image – 2010 (Source – Google Earth Pro).



Historical Aerial Image – 2013 (Source – Google Earth Pro).

Historical Aerial Image –2017 (Source – Google Earth Pro).

Note: This image provides only partial coverage of the site investigation area.

Historical Aerial Image – January 2023, Pre - Cyclone Gabrielle (Source – Google Earth Pro).

Note: This image provides only partial coverage of the site investigation area.

Historical Aerial Image – March 2023, Post - Cyclone Gabrielle (Source – Google Earth Pro).

Note: This image provides only partial coverage of the site investigation area.

Appendix F – Hawke's Bay Regional Council Information

HAWKE'S BAY
REGIONAL COUNCIL

RESOURCE CONSENT
Discharge Permit

In accordance with the provisions of the Resource Management Act 1991, and subject to the attached conditions, Hawke's Bay Regional Council (the Council) grants a resource consent for a discretionary activity to:

Central Hawke's Bay District Council
PO Box 127
WAIPAWA

to discharge treated domestic effluent into the Porangahau River.

LOCATION

Address of site:	Keppel Street, Porangahau
Legal description:	Lot 1 DP 20711
Map reference:	V24: 2817660 6093657

CONSENT DURATION

This consent is granted for a period expiring on 31 May 2021.

Christine Scott
Chairperson
HEARING PANEL
22 OCTOBER 2009

CONDITIONS

Activity Definition

1. All works and structures relating to this resource consent shall be designed and constructed to conform to the best engineering practices and at all times maintained to a safe and serviceable standard.

2. The consent holder shall undertake all operations substantially in accordance with any drawings, specifications, statements of intent, proposed mitigation measures and other information supplied as part of the application for this resource consent. Specifically this includes the following documents provided in support of the application:

   a) Resource Consent application received by Hawke's Bay Regional Council on 28 March 2003

   b) Assessment of Environment Effects received by Hawke's Bay Regional Council on 2 December 2003

   c) S92 further information received by Hawke's Bay Regional Council on 1 October 2008

   d) Mixing Zone Study Final Report received by Hawke's Bay Regional Council on 2 March 2009

   If a conflict arises between any conditions of this consent and the application, the conditions of this consent will prevail.

   Limits

3. The volume of wastewater discharged from the pond shall not exceed 1.5 l/s for more than 50% of the time over any 12 month period, nor shall it exceed 4.8 l/s for more than 5% of the time over any 12 month period, as determined by daily flow records collected in accordance with condition 13.

4. The average daily volume of wastewater discharged from the pond over any 12 month period shall not exceed 130 m^3/d for more than 50% of the time, nor shall it exceed 415 m^3/d for more than 5% of the time, as determined by daily flow records collected in accordance with condition 13.

5. The effluent discharged from the oxidation pond (collected at the sample point specified in condition 14) shall comply with the following standards:

   a) over any 12 month period the concentration of unfiltered $cBOD_5$ shall not exceed 30 mg/L for more than 50% of the time, nor shall it exceed 60 mg/L for more than 10% of the time;

   b) over any 12 month period the concentration of suspended solids shall not exceed 50 mg/L for more than 50% of the time, nor shall it exceed 90 mg/L for more than 10% of the time;

   c) the pH shall be within the range of 6.5 – 9.

   These standards are deemed to have been breached if:

   i) more than 16 samples taken over any 12 month period in accordance with condition 15 have an unfiltered $cBOD_5$ concentration exceeding 30 mg/L or more than 5 have an unfiltered $cBOD_5$ concentration exceeding 60 mg/L;

ii) more than 16 samples taken over any 12 month period in accordance with condition 15 have a suspended solids concentration exceeding 50 mg/L or more than 5 have a suspended solids concentration exceeding 90 mg/L;

iii) any sample taken is outside a pH range of 6.5 – 9.

Mitigation of effects

6. Within 3 months of the date of commencement of this consent, the consent holder shall prepare and forward to the Council a 'Stormwater Infiltration Management Plan'.

The report shall be to the satisfaction of the Council (Manager Compliance) and shall, as a minimum, address the following:

a) The incidence of stormwater infiltration into the reticulated wastewater system and measures available to reduce such infiltration as far as practicable;

b) A strategy for reducing stormwater infiltration into the reticulated wastewater system and an implementation plan for achieving the strategy to be reported as the Stormwater Infiltration Management Plan;

c) Any proposed works or methods to address sources of stormwater infiltration into the reticulated wastewater system where those sources have been identified as part of the Stormwater Infiltration Management Plan.

7. Within 3 months of the date of commencement of this consent the consent holder shall prepare an operations and management plan for the Porangahau Township Wastewater treatment system and submit to Council (Manager Compliance) for approval.

The plan shall include:

a) Details of the procedures for ensuring that the system is managed, maintained and sampled sufficiently to ensure compliance with the conditions of consent.

b) Details of the procedure for determining the accumulated volume of sludge in the oxidation pond, and criteria for determining when 'desludging' of the pond will occur.

c) Details of a regular maintenance programme that will ensure that the system continues to a function at optimum performance.

d) Contingency plans in the event of system malfunction.

The consent holder shall undertake all operations in accordance with the approved plan. This operations and management plan shall be reviewed within 3 months of any improvements to the wastewater treatment system taking place.

8 Within 12 months of the date of commencement of this consent, the consent holder shall install a baffle system within the oxidation pond to improve the retention time of the effluent within the pond. The baffle system shall be designed by a suitably qualified person and design plans shall be submitted to the Council (Manager Compliance) for approval prior to construction.

9. Within 6 months of the date of commencement of this consent, signs shall be erected and maintained for the duration of the consent at the oxidation pond, and at other suitable locations where a potential public health risk exists as a result of the discharge. The signs shall give the public clear indication of the location of the discharge point and the extent of the risk zone. The form, content and location of signs shall be identified in a signage and fencing plan, developed in consultation with the Public Health Unit and shall be submitted to the Council (Manager Compliance) prior to the erection of any new signs.

10. Within 6 months of the date of commencement of this consent a fence shall be erected and maintained around the oxidation pond and wetlands which prevents the public entering into those areas. The form and location of the fence shall be identified in a signage and fencing plan, developed in consultation with the Public Health Unit and shall be submitted to the Council (Manager Compliance) prior to the erection of any fence.

11. Wetland A shall be constructed within 12 months of submitting to Council the report required by condition 23, in general accordance with the following documents:

b) Resource consent application received by Hawke's Bay Regional Council on 15 December 2008

c) Wastewater wetland concept design, 2-TO364.00, Plot date 14/11/08 @ 15:48, Revision R1.

12. Other than discharges associated with necessary maintenance works, the discharge shall not, from a point approximately 200 m upstream of the point of discharge into the Porangahau River to a point 200 m downstream of the point of discharge into the Porangahau River, give rise to any of the following effects in the Porangahau River:

(a) The production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials.

(b) Any conspicuous change in the colour or visual clarity.

(c) Any emission of objectionable odour

(d) The rendering of fresh water unsuitable for consumption by farm animals.

(e) Any significant adverse effects on aquatic life.

Monitoring

13. The measuring device and recording system installed shall be maintained to continually measure and record the rate and volume of effluent discharged from the oxidation pond. Measuring and recording shall be at intervals not exceeding 30 minutes and to an accuracy of +/- 5%. The volume of effluent discharged daily (i.e. midnight to midnight) shall be provided to the Council (Environmental Regulation Section) no later than 31 January, 30 April, 31 July and 31 October each year in a digital format compatible with the Council's computer system.

14. The consent holder shall ensure that there is a suitable location available for sampling at the following location:

(a) The existing monitoring point in the manhole where the flow measuring device is located.

15. The consent holder shall ensure that samples are taken from the place described in condition 14

(a) at 14 day intervals between 7 am and noon and tested for:

i. Unfiltered cBOD5;
ii. Suspended solids;
iii. pH;

(b) at monthly intervals between 7 am and noon and tested for:

iv. Total ammoniacal nitrogen
v. Total nitrogen;
vi. Nitrate
vii. TKN
viii. Total phosphorus;
ix. Soluble reactive phosphorus;
x. E coli;
xi. Enteroccoci.

16. The consent holder shall ensure samples are taken from the following locations at monthly intervals two hours after high tide

(a) 200 m upstream of where the discharge enters the Porangahau River
(b) 200 m downstream of where the discharge enters the Porangahau River
(c) At Kate's Quarry

and tested for:

i. Unfiltered cBOD5
ii. Total ammoniacal nitrogen
iii. Nitrate
iv. TKN
v. Total phosphorus
vi. Soluble reactive phosphorus
vii. Suspended solids
viii. pH
ix. E Coli
x. Enterococci

17. At the same time the samples required by condition 16 are taken, measurements should also be taken for colour (Munsell colour scale) turbidity, dissolved oxygen, conductivity, temperature and clarity (black disc method) at the sampling points referred to as a) and b) in condition 16.

18. The consent holder shall undertake an investigation into the effects of the discharge on the biota in the vicinity of the discharge. Design of the investigation shall be submitted to the Council (Manager Science) within 12 months of the commencement of consent. The investigation shall occur within 3 years of the commencement of the consent.

19. All sampling shall be carried out by a person suitably qualified and experienced in environmental monitoring and approved by the Council (Manager Compliance).

20. All analyses in accordance with conditions of this consent shall be carried out by an independently accredited laboratory in accordance with the most appropriate version of Standard Methods for the Examination of Water and Wastewater published jointly by the American Public Health Association, American Wastewater Association, and Water Environment Federation, for the wastewater being sampled.

21. Results of all analyses undertaken in accordance with conditions of this consent shall be provided to the Council (Manager Compliance) within 14 days of being received by the consent holder. Results provided shall be in a digital format compatible with Council computer systems that has been approved by the Council (Manager Compliance). Original laboratory reports shall be forwarded to the Council on request for auditing purposes.

22. The consent holder shall nominate a person who is responsible for the maintenance of the wastewater treatment system and the return of information (as required by conditions of this consent). The consent holder shall advise the Council (Manager Compliance) who this person is within one month of the commencement date of this consent and within ten working days of any change occurring.

Reporting

23. Within 30 months of the date of commencement of this consent the consent holder in accordance with the agreement entitled "Finding a solution to wastewater disposal at Porangahau and Te Paerahi" shall lodge with the Council a report entitled "Wastewater Treatment for Porangahau and Te Paerahi - Long Term Treatment Strategy."

The purpose of the report is to document the environmental effects of the discharge from the Porangahau and Te Paerahi wastewater treatment facilities and to set out the options available to address the effects on the receiving environment resulting from wastewater generated within these communities.

The report shall be to the satisfaction of the Council (Manager Compliance) and shall, as a minimum, address the following:

(a) the environmental effects of any discharges to land, air or water;

(b) the cultural effects of any discharges;

(c) the loadings (such as flows, organic loads, nutrient) on which the design for a long term strategy will be based;

(d) options available for treatment of wastewater from the Porangahau and Te Paerahi communities to address the environmental and cultural effects of wastewater in these communities;

(e) Recommended changes to the wastewater disposal processes used in Porangahau and Te Paerahi including an implementation strategy and timeline.

24. Before 1 September of each year the consent holder shall provide a report to the Council covering the 12-month period ending 30 June. As a minimum this report shall include the items listed below and a comparison with previous years:

(a) a summary of all monitoring undertaken as required by this consent, and any additional monitoring undertaken by the consent holder to better characterise the effects of the discharge on the receiving waters;

(b) a review of compliance with the conditions of this consent, including the effluent standards and compliance limits;

(c) identification and comment on any trends in data collected;

(d) a waste profile analysis which assesses the source of wastewater entering the system and identifies any potential increases in risk as a result of this;

(e) comment on any non-compliances and operational problems, and any actions undertaken to address these;

(f) details of any works undertaken or proposed to improve the performance of the treatment system, and the timeframe for completion of any proposed works;

(g) the number of Porangahau Environmental Management Team meetings convened and the actions and/or outcomes agreed.

25. The consent holder shall establish and maintain a 'complaints register' to record the date and time of any complaints received and from whom, the nature and location of the complaint, and any actions taken in response to that complaint. A copy of the complaints register shall be made available to the Council on request.

26. Any malfunctions or breakdowns shall be reported to the Regional Council as soon as practicably possible, and within 12 hours of the problem becoming known. Corrective action shall be undertaken as soon as practicable.

27. The consent holder shall notify, as soon as reasonably practicable, the Public Health Unit and the Regional Council if an event occurs that may have an adverse effect on the drinking water of Porangahau Township or recreational uses of the surrounding area.

Kaitiaki Liaison

28. The consent holder shall, in accordance with the agreement entitled "Finding a solution to wastewater disposal at Porangahau and Te Paerahi" facilitate the establishment and provide reasonable administrative support for the Porangahau Environmental Management Team (PEMT). The PEMT shall be convened within 6 months of the commencement of this consent. The PEMT shall comprise representatives of Central Hawke's Bay District Council, including at least one senior officer, and representatives as nominated by Ngati Kere. A minimum of 1 meeting shall be arranged every 12 months, and the Regional Council shall be notified of all meeting dates.

Advice Notes

The 'Stormwater Infiltration Management Plan' may be the same plan required in accordance with resource consent DP030234L.

Condition 3 is intended to ensure compliance of "instantaneous" peak outflow volumes (measured every 30 minutes) from the pond with the specified discharge limits over an annual period rather than a daily period.

The consent holder will supply annually to the consent authority a continuous record of 30 minute pond outflow readings for the preceding 12 month period (48 readings per day x 365 days per year = 17,520 readings per year). The consent authority will review this pond outflow record to ensure compliance with condition 3. For compliance, no more than 50% of all pond outflow readings in any one year (8,760) must be more than 1.5 L/s and no more than 5% of all readings (876) must be more than 4.8 L/s.

1. The 'Operations and Management Plan' may be the same plan required in accordance with resource consents DP080621L and DP030861A.

2. The annual report should be the same report as required in accordance with resource consents DP080621L and DP030861A.

3. The complaints register may be the same register established in accordance with resource consents DP080621L and DP030861A, and DP030234L and DP030862A.

4. The Porangahau Environmental Management Team shall be the same group as established in accordance with resource consent DP030234L.

5. The functions of the Porangahau Environmental Management Team shall be to:

   - Receive information that the consent holder has available about the operations of the wastewater treatment plants and the effects on the receiving environments of the treated effluent.

   - Investigate, analyse, consider, and within 30 months from the commencement date of this consent, report in association with the consent holder to the Hawke's Bay Regional Council on future wastewater disposal options for Porangahau and Te Paerahi.

   - Facilitate access to any external funding sources that may be available to help implement a long term solution for wastewater disposal at Porangahau and Te Paerahi.

   Liaison between the Porangahau Environmental Management Team and the Central Hawke's Bay District Council shall be undertaken in accordance with the agreement entitled "Finding a solution to wastewater disposal at Porangahau and Te Paerahi" attached in Appendix A.

6. Where conditions require the approval of the Council (Manager, Compliance) such approval is to be provided in a certifying capacity only.

7. For the purpose of condition 19, 'qualified' means "make competent or knowledgeable enough to do something", Oxford English Dictionary.

8. For the purpose of condition 11, if the consent holder decides not to proceed with construction of the wetland as part of its long term wastewater treatment strategy for Porangahau and Te Paerahi (in accordance with the agreement it has with Ngati Kere), then a resource consent application will need to be made to the Council to change condition 11.

Review of Consent Conditions by the Council

The Council may review conditions of this consent pursuant to sections 128, 129, 130, 131 and 132 of the Resource Management Act 1991. The actual and reasonable costs of any review undertaken will be charged to the consent holder, in accordance with s.36(1) of the Resource Management Act.

Times of service of notice of any review: Annually during the month of September.

Purposes of review:

To deal with any adverse effect on the environment that may arise from the exercise of this consent, which it is appropriate to deal with at that time or which became evident after the date of issue.

To require the adoption of the best practicable option to remove or reduce any effects on the environment.

To modify any monitoring programme, or to require additional monitoring if there is evidence that current monitoring requirements are inappropriate or inadequate.

Monitoring Note

Routine monitoring

Routine monitoring inspections will be undertaken by Council officers at a frequency of no more than once every year to check compliance with the conditions of the consent. The costs of **any** routine monitoring will be charged to the consent holder in accordance with the Council's Annual Plan of the time.

Non-routine monitoring

"Non routine" monitoring will be undertaken if there is cause to consider (e.g. following a complaint from the public, or routine monitoring) that the consent holder is in breach of the conditions of this consent. The cost of non-routine monitoring will be charged to the consent holder in the event that non-compliance with conditions is determined, or if the consent holder is deemed not to be fulfilling the obligations specified in section 17(1) of the Resource Management Act 1991 (RMA) shown below.

Section 17(1) of the RMA 1991 states:

> *Every person has a duty to avoid, remedy, or mitigate any adverse effect on the environment arising from an activity carried on, by or on behalf of that person, whether or not the activity is in accordance with a rule in a plan, a resource consent, section 10, section 10A, or section 20.*

Consent Impact Monitoring

In accordance with section 36 of the RMA (which includes the requirement to consult with the consent holder) the Council may levy additional charges for the cost of monitoring the environmental effects of this consent, either in isolation or in combination with other nearby consents. Any such charge would generally be set through the Council's Annual Plan process.

Debt Recovery

It is agreed by the consent holder that it is a term of the granting of this resource consent that all costs incurred by the Hawke's Bay Regional Council for, and incidental to, the collection of any debt relating to the monitoring of this resource consent shall be borne by the consent holder as a debt due to the Council, and for that purpose the Council reserves the right to produce this document in support of any claim for recovery.

Consent History

Consent No. (Version)	Date	Event	Relevant Rule Number	Plan
DP030233W	22/10/09	Consent initially issued	52	Regional Resource Management Plan

APPENDIX A

AGREEMENT

BETWEEN

TANGATA WHENUA OF PORANGAHAU
(Ngati Kere, Ngati Manuhiri and Ngati Pihere)

and

CENTRAL HAWKES BAY DISTRICT COUNCIL

ABOUT

FINDING A SOLUTION TO WASTEWATER DISPOSAL AT PORANGAHAU AND TE PAERAHI

Dated _____day of _____2009

PREAMBLE

Ko te wehi ki te Atua, timatanga o te Kupu, whakamaua te rongo pai, kia u ki te whenua, arohanui ki te tangata. Ko Kere, Manuhiri, Pihere nga hapu, ko Rongomaraeroa te marae, ko Ngarangiwhakaupoko te tangata, ko Taurekaitai te awa, ko Te Awa Putahi te maunga, ko Porangahau te kainga

This agreement has been entered into in good faith between the Central Hawkes Bay District Council and the tangata whenua of Porangahau and seeks long term solutions for the effective and sustainable management of effluent in Porangahau and at Te Paerahi.

Presently, the Te Paerahi Oxidation and Porangahau Township oxidation ponds affect the integrity of sacred sites (wahi tapu) including the river and in particular the Te Paerahi oxidation pond, located between the Te Taure Kai Tai River (Porangahau) and Te Paerahi beach on a cultural Landscape which is known as Puketauhinu. Puketauhinu is associated with the original occupants of the district. Tangata whenua have occupied this region for no less than 800 years. There have been many layers of occupation with many successive key peoples in this region. Puketauhinu is sacred to tangata whenua.

This agreement seeks solutions that provide for social, cultural, economic, and environmental wellbeing of those living in Porangahau.

WHY WE HAVE THIS AGREEMENT

This Agreement between tangata whenua of Porangahau and Central Hawke's Bay District Council has been made due to the desire of both parties to find and implement long term solutions for wastewater disposal at Porangahau and Te Paerahi.

REPRESENTATION

With a view to ensuring this agreement has a broad mandate it has been entered into with all the bodies currently representing the interests of Ngati Kere, Ngati Manuhiri, Ngati Pihere and Puketauhinu in Porangahau including the Ngati Kere Rohe Trust, the Puketauhinu Trustees, the Porangahau Marae Committee, and the Porangahau Marae Maori Committee. All are signatories to this Agreement with the Central Hawke's Bay District Council and it is appropriate to include signatories representing these interests to acknowledge the significance of this Agreement.

BACKGROUND

Council operates wastewater treatment plants at Porangahau and Te Paerahi. These plants take wastewater collected from the communities of Porangahau

and Te Paerahi, treat it, and discharge the treated effluent into the Porangahau River (for Porangahau) and into sand dunes (for Te Paerahi).

Tangata whenua have expressed concern at the way wastewater is disposed of because of the adverse effects of the treated effluent on the environment and on the cultural requirements of tangata whenua.

During the resource consent renewal hearing process tangata whenua and Council meet to discuss their ideas for wastewater disposal. There was general agreement on the way forward in principle and this Agreement provides details as to how those principles should be implemented.

AGREED AIM

We agree that our intention is to find a long term solution for the treatment of effluent from Porangahau and Te Paerahi which is sustainable environmentally, economically, culturally and socially.

WHAT WE AGREE ON

- There is a need for improvements to the oxidation ponds as described in the proposed resource consents, including baffles and extra monitoring of the environment. These improvements are to improve the effectiveness of the existing oxidation ponds.
- Water from effluent should not be discharged directly into waterways (rivers, streams, sea) or places close to a drinking water source.
- The Te Paerahi oxidation pond needs to be removed.
- A level of flexibility must be adopted in considering improved wastewater treatment options to allow us to take advantage of new technological or other opportunities which may arise.
- A timeframe needs to be constructed that includes specific milestones that must be met to give certainty to the community. Some flexibility can be included as agreed by the parties from time to time.
- An ongoing relationship between the parties (the community and Council) must be maintained to ensure the achievement of our Aim.
- We agree on a mechanism to do this, as described in this Agreement.

PORANGAHAU KAITIAKI LIAISON GROUP

The requirement for a Kaitiaki Liaison Group has been included in the resource consents for the wastewater treatment plants. Council and Ngati Kere agree to use this Group as the means to implement this Agreement, and to call the group the Porangahau Environmental Management Team.

WHAT WE WILL DO

Council and Ngati Kere will work together to investigate, design and construct a long term solution for wastewater treatment in Porangahau and Te Paerahi. In working together, we expect to be able to do the following:

- We will provide members for the Porangahau Environmental Management Team.
- Council will provide administrative resources for the implementation of this Agreement and the operation of the Porangahau Environmental Management Team.
- Council will provide information it has available about the operations of the wastewater treatment plants and of the effects on the receiving environments of the treated effluent to the Porangahau Environmental Management Team.
- Council will provide resources to the Porangahau Environmental Management Team for the investigation, analysis, consideration and reporting of options for wastewater disposal.
- We will facilitate access to any external funding sources that may be available to help implement a long term solution for wastewater disposal at Porangahau and Te Paerahi.
- We will work with all expediency to implement the preferred solutions as soon as they are accepted by Council and tangata whenua and by the Hawke's Bay Regional Council.

TIMEFRAMES AND MILESTONES

We expect to achieve the following results:

1. Within 30 months of the granting of resource consents for the Porangahau and Te Paerahi wastewater treatment plants we will report the preferred solutions to the Regional Council.
2. Within 6 to 8 years of the granting of resource consents we will have implemented the preferred solutions for wastewater treatment and disposal. These solutions will mean that the use of the Te Paerahi oxidation pond will stop and the discharge of treated effluent into the Porangahau River will stop.

AMENDMENTS

The expectations described in this Agreement can be amended by the agreement of the parties who have signed this Agreement. Such amendments must be recorded in writing.

We sign this Agreement to confirm our desire to provide a sustainable wastewater system for Porangahau and Te Paerahi.

SIGNED by
as Chairman of trustees)
Ngati Kere Rohe Trust)

SIGNED by
as Chairman of trustees)
Puketauhinu Trust)

SIGNED by
as Chairman of Rongomaraeroa)
Marae Committee)

SIGNED by
as Chairman of Porangahau Marae)
Maori Committee)

EXECUTED by THE)
CENTRAL HAWKES BAY)
DISTRICT COUNCIL)
by the affixing of its common seal)

HAWKE'S BAY
REGIONAL COUNCIL

RESOURCE CONSENT
Discharge Permit

In accordance with the provisions of the Resource Management Act 1991, and subject to the attached conditions, Hawke's Bay Regional Council (the Council) grants a resource consent for a discretionary activity to:

Central Hawke's Bay District Council
PO Box 127
WAIPAWA

to discharge contaminants (odour) to air associated with the operation of the Porangahau Township Oxidation Pond

LOCATION

Address of site:	Keppel Street, Porangahau Township
Legal description:	Lot 1 DP 20711
Map reference:	V24: 2817660 6093657

CONSENT DURATION

This consent is granted for a period expiring on 31 May 2021.

Christine Scott
Chairperson
HEARING PANEL

22 October 2009

CONDITIONS

1. All works and structures relating to this resource consent shall be designed and constructed to conform to the best engineering practices and at all times maintained to a safe and serviceable standard.

2. The consent holder shall undertake all operations substantially in accordance with any drawings, specifications, statements of intent, proposed mitigation measures and other information supplied as part of the application for this resource consent. Specifically this includes the following documents provided in support of the application:

   a) Resource Consent application received by Hawke's Bay Regional Council on 28 March 2003

   b) Assessment of Environment Effects received by Hawke's Bay Regional Council on 2 December 2003

   c) S92 further information received by Hawke's Bay Regional Council on 1 October 2008

   d) Mixing Zone Study Final Report received by Hawke's Bay Regional Council on 2 March 2009

   If a conflict arises between any conditions of this consent and the application, the conditions of this consent will prevail.

3. Within 3 months of the date of commencement of this consent the consent holder shall prepare an operations and management plan for the Porangahau Township Wastewater treatment system and submit to Council (Manager Compliance) for approval.

   The plan shall include:

   a) Details of the procedures for ensuring that the system is managed and maintained sufficiently to ensure compliance with the conditions of consent.

   b) Contingency plans in the event of system malfunction.

   The consent holder shall undertake all operations in accordance with the approved plan. This maintenance plan shall be reviewed as improvements to the wastewater treatment system take place.

4. The treatment system and any discharge shall not result in any offensive or objectionable odour to the extent that it causes an adverse effect beyond the area designated for wastewater management purposes in the Central Hawke's Bay District Plan. For the avoidance of doubt, this condition includes any emission of offensive or objectionable odour from the oxidation pond and wetland beyond the boundary of the subject property.

5. Within 30 months of the date of commencement of this consent the consent holder in accordance with the agreement entitled "Finding a solution to wastewater disposal at Porangahau and Te Paerahi" shall lodge with the Council a report entitled "Wastewater Treatment for Porangahau and Te Paerahi - Long Term Treatment Strategy."

   The purpose of the report is to document the environmental effects of the discharge from the Porangahau and Te Paerahi wastewater treatment facilities and to set out the options

available to address the effects on the receiving environment resulting from wastewater generated within these communities.

The report shall be to the satisfaction of the Council (Manager Compliance) and shall, as a minimum, address the following:

a) the environmental effects of any discharges to land, air or water;

b) the cultural effects of any discharges;

c) the loadings (such as flows, organic loads, nutrient) on which the design for a long term strategy will be based;

d) options available for treatment of wastewater from the Porangahau and Te Paerahi communities to address the environmental and cultural effects of wastewater in these communities;

e) Recommended changes to the wastewater disposal processes used in Porangahau and Te Paerahi including an implementation strategy and timeline.

6. Before 1 September of each year the consent holder shall provide a report to the Council covering the 12-month period ending 30 June. As a minimum this report shall include the items listed below and a comparison with previous years:

   a) a review of compliance with the conditions of this consent;

   b) details of any complaints received;

   c) comment on any non-compliances and operational problems, and any actions undertaken to address these;

   d) details of any works undertaken or proposed to improve the performance of the treatment system, and the timeframe for completion of any proposed works.

7. The consent holder shall establish and maintain a 'complaints register' to record the date and time of any complaints received and from whom, the nature and location of the complaint, and any actions taken in response to that complaint. A copy of the complaints register shall be made available to the Council on request.

Advice Notes

1. The 'Operations and Management Plan' may be the same plan required in accordance with resource consents DP030233W and DP080621L.

2. The annual report should be the same report as required in accordance with resource consents DP030233W and DP080621L.

3. The complaints register may be the same register established in accordance with resource consents DP030233W and DP080621L, and DP030234L and DP030862A.

4. Where conditions require the approval of the Council (Manager Compliance) such approval is to be provided in a certifying capacity only.

Review of Consent Conditions by the Council

The Council may review conditions of this consent pursuant to sections 128, 129, 130, 131 and 132 of the Resource Management Act 1991. The actual and reasonable costs of any review undertaken will be charged to the consent holder, in accordance with s.36(1) of the Resource Management Act.

Times of service of notice of any review: Annually during the month of September.

Purposes of review:

To deal with any adverse effect on the environment that may arise from the exercise of this consent, which it is appropriate to deal with at that time or which became evident after the date of issue.

To require the adoption of the best practicable option to remove or reduce any effects on the environment.

To modify any monitoring programme, or to require additional monitoring if there is evidence that current monitoring requirements are inappropriate or inadequate.

Monitoring Note

Routine monitoring

Routine monitoring inspections will be undertaken by Council officers at a frequency of no more than once every year to check compliance with the conditions of the consent. The costs of **any** routine monitoring will be charged to the consent holder in accordance with the Council's Annual Plan of the time.

Non-routine monitoring

"Non routine" monitoring will be undertaken if there is cause to consider (e.g. following a complaint from the public, or routine monitoring) that the consent holder is in breach of the conditions of this consent. The cost of non-routine monitoring will be charged to the consent holder in the event that non-compliance with conditions is determined, or if the consent holder is deemed not to be fulfilling the obligations specified in section 17(1) of the Resource Management Act 1991 (RMA) shown below.

Section 17(1) of the RMA 1991 states:

> *Every person has a duty to avoid, remedy, or mitigate any adverse effect on the environment arising from an activity carried on, by or on behalf of that person, whether or not the activity is in accordance with a rule in a plan, a resource consent, section 10, section 10A, or section 20.*

Consent Impact Monitoring

In accordance with section 36 of the RMA (which includes the requirement to consult with the consent holder) the Council may levy additional charges for the cost of monitoring the environmental effects of this consent, either in isolation or in combination with other nearby consents. Any such charge would generally be set through the Council's Annual Plan process.

Debt Recovery

It is agreed by the consent holder that it is a term of the granting of this resource consent that all costs incurred by the Hawke's Bay Regional Council for, and incidental to, the collection of any debt relating to the monitoring of this resource consent shall be borne by the consent holder as a debt due to the Council, and for that purpose the Council reserves the right to produce this document in support of any claim for recovery.

Consent History

Consent No. (Version)	Date	Event	Relevant Rule Number	Plan
DP030861A	22 /10/09	Consent initially granted	28	Regional Resource Management Plan

Hawke's Bay Regional Council
Safeguarding Your Environment

Resource Consent

DISCHARGE PERMIT

In accordance with Rule 6.1 of the Proposed Regional Water Resources Plan (November 1996), Rule 20 of the Regional Air Plan (January 1998), Rule 4.4.1.2 of the Regional Waste and Hazardous Substances Plan (April 1995), Rule 40 of the Proposed Regional Resource Management Plan (June 2001), the provisions of the Resource Management Act 1991, and subject to the attached conditions, the Hawke's Bay Regional Council (the Council) grants a resource consent to:

Central Hawke's Bay District Council
P.O. Box 127
WAIPAWA

to discharge leachate derived from the decomposition of refuse within a closed landfill into or onto land in circumstances which will result in those contaminants entering water, and to discharge landfill gas derived from the decomposition of refuse within a closed landfill into the air, at the following sites:

Consent Number	Address of Site	Legal Description	Map Reference
DP950130La/A	Blackburn Rd, Onga Onga	Sec 4 Blk XI Ruataniwha SD	U22: 9911-3730
DP950131La/A	Keppel Street, Porangahau	Sec 7 Blk XII Porangahau SD	V20: 1660-9412
DP950132La/A	Holden Rd, Tikokino	Sec 1 Blk XVI Wakarara SD	U22: 0355-4875
DP950133La/A	River Rd, Tamamu	Lt 1 DP 12148 Blk IX Oero SD	V22: 2458-3209
DP950134La/A	Mt Herbert Rd, Waipukurau	Pt Res 4B Pt Sec 36 Blk XV Waipukurau SD	V23: 1592-2905
DP950136La/A	Kairakau Rd, Kairakau	Kairakau 1A Sec 3 Blk IV Waimarama SD	V22: 4510-3233
DP950137La/A	Paulsen Rd, Takapau	Otawhao A3 Sec 49A2 Blk III Takapau SD	U23: 9552-2473
DP950138La/A	Tikokino Rd, Waipawa	Pt Lt 1 DP 16272 Pt Lt 1 DP 18339 Pt 2402 Blk XI Waipukurau SD & Pt Sec 61 Blk XI Waipukurau SD	V22: 1539-3392

DETAILS OF RESOURCE CONSENT

Effluent to be discharged: Landfill leachate and landfill gas
Consent duration: Granted for a period expiring on 31 May 2033.

Helen Codlin
MANAGER ENVIRONMENTAL REGULATION
31 March 2005

This resource consent was originally granted on 27 May 1998 and subsequently changed (see page 5).

CONDITIONS

General

1. The Consent Holder shall undertake all works generally in accordance with the drawings, specifications, statements of works techniques and other information supplied with the application. Where a conflict exists between the application and the conditions of this consent the conditions shall prevail. This specifically includes:

   a) The individual application documents for each landfill site titled *Central Hawke's Bay District Council Application For Resource Consent Under Section 88 Of The Resource Management Act 1991*, dated 9 December 1996.

   b) The individual Landfill Management Plans titled *Management Plan* that accompanied each of the application documents, dated 9 December 1996.

Water Quality

2. The Consent Holder shall sample ground water from each of the sites Ongaonga, Tamumu, Waipukurau, Waipawa, Porangahau, Takapau, and Tikokino during the months of February, May, August, and November of each year in accordance with the monitoring schedules as attached. These samples shall be analysed for the parameters shown in Group One of the monitoring schedules, and in accordance with the detection limits and methods shown in the attached detection limit schedule. Results of analyses shall be provided to the Council in an electronic form compatible with Council software by 30 January and 30 June of each year.

3. Samples collected in accordance with Condition 2 shall also be analysed for the parameters shown in Group Two of the monitoring schedules at a frequency of every three years, in May, following the first year of the exercise of this consent. Monitoring shall be in accordance with the detection limits and methods shown in the attached detection limit schedule. Results of the analyses shall be provided to the Council in an electronic form compatible with Council software by 30 June of each required year.

4. To ensure that ground water samples are representative, before sampling any bore it shall be purged by pumping at a low rate until the conductivity of the purged water stabilises.

5. The Consent Holder shall measure and record, at the time of sampling undertaken in accordance with Condition 2, the date, time and corresponding water level in each of the monitoring bores established in accordance with Condition 2. The water level shall be measured from the top of the casing, and shall be recorded to the nearest 0.01 of a metre. Results of the analyses shall be provided to the Council in an electronic form compatible with Council software by 30 June of each year.

6. The level of the top of the casing of each monitoring bore shall be surveyed by the Consent Holder or their agents, and advised to the Council

7. The Consent Holder shall undertake surface water monitoring at each of the sites Ongaonga, Tamumu, Waipukurau, Waipawa, Porangahau, Tikokino, Takapau, and Kairakau once annually between the period from 1 January to 31 March. These samples shall be analysed for the parameters shown under Surface Water Monitoring in the attached schedules, and in accordance with the detection limits and methods shown in the detection limit schedule. Results of analyses shall be provided to the Council in an electronic form compatible with Council software by 30 June of each year.

8. The Consent Holder shall undertake macroinvertebrate sampling at each of the sites Waipukurau, Waipawa, Porangahau, Takapau, Tikokino, and Kairakau once annually between the period from 1 January to 31 March pursuant to the monitoring schedules. Benthic macroinvertebrate sampling shall be in accordance with recognised ecological sampling techniques for the determination of MCI indices. Results of analyses shall be provided to the Council in an electronic form compatible with Council software by 30 June of each year.

9. All water quality analysis shall be carried out in accordance with either the 18th edition 1992 and its 1994 supplement of *Standard Methods for the Examination of Water and Wastewater*, published jointly by the American Public Health Association, American Waste Water Association, and Water Environment Federation, or other appropriate standards approved in writing by the Chief Executive. All water quality analysis shall be undertaken by an independently accredited laboratory.

Landfill Gas

10. There shall be no offensive or objectionable discharge of odours beyond any boundary of any of the sites Waipukurau, Waipawa, Porangahau, Takapau, Tikokino, Kairakau, Ongaonga, or Tamumu.

Site Management

11. Within three years of this Resource Consent being issued, the Consent Holder shall have:

    a) Introduced sufficient capping material to each of the sites Waipukurau, Waipawa, Porangahau, Takapau, Kairakau, Ongaonga, and Tamamu to ensure that a minimum cover of 200 mm of capping material covers each landfill site completely;

    b) Compacted all capping material at each of the sites Waipukurau, Waipawa, Porangahau, Takapau, Kairakau, Ongaonga, and Tamamu to ensure that sufficient compaction is achieved so far as is reasonable to prevent the percolation of rain water through the landfill cap, and;

    c) Contoured all capping material at each of the sites Waipukurau, Waipawa, Porangahau, Takapau, Kairakau, Ongaonga, and Tamamu to ensure that rain water does not pond on the surface of any of the landfill sites.

12. No vegetation species with the potential to perforate the completed landfill capping shall be planted on any of the completed landfill surfaces.

Review of Consent Conditions by the Council

The Council may review conditions of this consent by serving notice of its intention to do so pursuant to section 128 and section 129 of the Resource Management Act 1991.

Times of service of notice of any review: During the month of July, 2008, 2013, 2019, 2027.

Purposes of review:

To ensure Resource Consent conditions are consistent with any policies and rules in regional plans that may be established after the commencement of this Resource Consent.

To deal with any adverse effect on the environment which may arise from the exercise of this Resource Consent, which it is appropriate to deal with at that time, or which became evident after the date of issue.

To require the Consent Holder to adopt the best practicable option to remove or reduce any adverse effect on the environment.

To modify the monitoring programme if the record of monitoring to date indicates that it is appropriate to do so.

Reasons for Decision

The reasons for the granting of the original consent, and any subsequent changes, are in documents previously issued. The reason for the decision on this application to change the consent is that the change has minor effect and is consistent with relevant plans and policies and with the requirements of the RMA.

Monitoring by the Council

Routine inspections of the site of this consent will be undertaken by Council officers at a frequency appropriate to the discharge period. The costs of these routine inspections and any formal monitoring programme that may be established in consultation with the consent holder will be charged to the consent holder.

"Non routine" inspections will be made on other occasions if there is reason to believe (e.g. following a complaint from the public, or monitoring) that the consent holder is in breach of the conditions of this consent. The cost of non-routine inspections will be charged to the consent holder in the event that non-compliance with conditions is determined, or if the Consent holder is deemed not to be fulfilling the obligations specified in section 17(1) of the Resource Management Act (RMA) 1991 shown following.

Section 17(1) of the RMA 1991 states:

Every person has a duty to avoid, remedy, or mitigate any adverse effect on the environment arising from an activity carried on, by or on behalf of that person, whether or not the activity is in accordance with a rule in a plan, a resource consent, section 10, section 10A, or section 20.

Debt Recovery

It is agreed by the consent holder that it is a term of the granting of this resource consent that all costs incurred by the Hawke's Bay Regional Council of and incidental to the collection of any debt relating to the monitoring of this resource consent shall be borne by the consent holder as a debt due to the Council and for that purpose the Council reserves the right to produce this document in support of any claim for recovery.

Consent History

Consent No. (Version)	Date	Event	Relevant Rule Number	Relevant Rule Plan
DP950130L, DP950131L, DP950132L, DP950133L, DP950134L, DP950136L, DP950137L, DP950138L	17/May/98	Consents initially granted.	6.1 20 4.4.1.2	Proposed Regional Water Resources Plan (November 1996 Regional Air Plan (January 1998) Regional Waste and Hazardous Substances Plan (April 1995)
DP950131La, DP950132La, DP950134La, DP950136La, DP950137La, DP950138La	17/Dec/04	Conditions 2, 5 & 8 have been changed in accordance with s 127 of the RMA 1991.	40	Proposed Regional Resource Management Plan (June 2001)
DP950130La, DP950133La	18/Mar/05	Conditions 2, 3, 7 & 9 have been changed in accordance with s 127 of the RMA 1991.	40	Proposed Regional Resource Management Plan (June 2001)

Ongaonga Closed Landfill
Monitoring Schedule

Groundwater Monitoring

One bore downstream of the landfill shall be constructed for monitoring purposes. The bore shall be installed in accordance with the appropriate groundwater quality monitoring bore specifications, which requires well head protection, PVC slotted screen and bentonite sealing. The bore shall be placed in a down gradient (to groundwater flow) position, and shall be drilled to the first water yielding layer (upper aquifer).

- Groundwater monitoring shall consist of quarterly sampling for group one parameters, to be carried out for a period of one year. At the completion of that year the results shall be analysed with a review of frequency of sampling undertaken. Sampling to occur in February, May, August and November of each year. It is anticipated that sampling will reduce to once per year upon analysis of the first years data.

- Sampling of group two parameters (includes group one) shall be carried out every three yearsduring the month of May. If as a result of the sampling, significant levels of contamination are detected (which could result in an adverse environmental effect), then a review of the consent will be undertaken at the initiation of either the Central Hawke's Bay District Council or Hawke's Bay Regional Council.

Group One Parameters

Test	
Dissolved Oxygen	Potassium
pH	Total Organic Carbon
Conductivity	NH4-N
Absorbance	NO3-N/NO2-N
Chloride	VFA (individual)

Group Two Parameters

Test			
COD	DRP	Cr (acid sol)	PCP
Sodium	Total Phosphorus	Cu (acid sol)	ON, OP pesticides
Calcium	Total Phenols	Mn (acid sol)	
Mg	Total CN	Ni (acid sol)	
SO4	Al (acid sol)	Pb (acid sol)	
Zn (acid sol)	As (acid sol)	Hg (acid sol)	
Fe (acid sol)	B (acid sol)	Se (acid sol)	
Sulphide	Cd (acid sol)	VOC (inc BTEX)	
TKN	Co (acid sol)	SVOC	

Surface Water Monitoring

Two sites, one upstream and one downstream of the landfill shall be monitored. Sampling shall be undertaken once per year in the period January to March. Sampling shall be carried out in accordance to HBRC sampling procedures manual or similar. The parameters to be analysed are:

Test
Dissolved Oxygen
pH
Conductivity
Absorbance
Chloride
Potassium
Total Organic Carbon
NH4-N
NO3-N/NO2-N
Benthic Macro Invertebrate species
density and abundance.

Porangahau Closed Landfill
Monitoring Schedule

Groundwater Monitoring

One bore downstream of the landfill shall be constructed for monitoring purposes. The bore shall be installed in accordance with the appropriate groundwater quality monitoring bore specification, which requires well head protection, PVC slotted screen and bentonite sealing. The bore shall be established in a down gradient (to ground water flow) position, and shall be drilled to the first water yielding layer (upper aquifer).

- Groundwater monitoring shall consist of quarterly sampling for group one parameters, to be carried out for a period of one year. At the completion of that year the results shall be analysed with a review of frequency of sampling undertaken. Sampling to occur in February, May, August and November of each year. It is anticipated that sampling will reduce to once per year upon analysis of the first years data.

- Sampling of group two parameters (includes group one) shall be carried out in the first year of the exercise of this consent and every third year thereafter. If as a result of the sampling, significant levels of contamination are detected (which could result in an adverse environmental effect), then a review of the consent will be undertaken at the initiation of either the Central Hawke's Bay District Council or Hawke's Bay Regional Council.

Group One Parameters

Test	
Dissolved Oxygen	Potassium
pH	Total Organic Carbon
Conductivity	NH4-N
Absorbance	NO3-N/NO2-N
Chloride	VFA (individual)

Group Two Parameters

Test			
COD	DRP	Cr (acid sol)	PCP
Sodium	Total Phosphorus	Cu (acid sol)	ON, OP pesticides
Calcium	Total Phenols	Mn (acid sol)	
Mg	Total CN	Ni (acid sol)	
SO4	Al (acid sol)	Pb (acid sol)	
Zn (acid sol)	As (acid sol)	Hg (acid sol)	
Fe (acid sol)	B (acid sol)	Se (acid sol)	
Sulphide	Cd (acid sol)	VOC (inc BTEX)	
TKN	Co (acid sol)	SVOC	

Surface Water Monitoring

Two sites, one upstream and one downstream of the landfill shall be monitored. Due to the nature of the substrate and the saline influence from the Porangahau coast, analysis by MCI indexes is not possible. Analysis of species diversity and density using recognised taxonomic identification shall be undertaken. The tidal influence within the Porangahau River extends to over 500 metres upstream of the landfill site; accordingly positioning of the monitoring sites will need to reflect this. The upstream site shall be situated 100 metres west of the landfill, and the downstream site 100 meters downstream of the landfill (at road bridge). Sampling is to be undertaken once per year in the period January to March. Sampling is to be carried out in accordance to HBRC sampling procedures manual or similar.

The parameters to be analysed are:

Test
Dissolved Oxygen
pH
Conductivity
Absorbance
Chloride
Potassium
Total Organic Carbon
NH4-N
NO3-N/NO2-N
Benthic Macro Invertebrate species
density and abundance.

Tikokino Closed Landfill
Monitoring Schedule

Groundwater Monitoring

One bore upstream of the landfill, and one downstream of the landfill shall be constructed for monitoring purposes. The bores shall be installed in accordance with the appropriate groundwater quality monitoring bore specifications, which requires well head protection, PVC slotted screen and bentonite sealing. The bores shall be placed in a down gradient (to groundwater flow) position, and shall be drilled to the first water yielding layer (upper aquifer).

- Groundwater monitoring shall consist of quarterly sampling for group one parameters, to be carried out for a period of one year. At the completion of that year the results shall be analysed with a review of frequency of sampling undertaken. Sampling to occur in February, May, August and November of each year. It is anticipated that sampling will reduce to once per year upon analysis of the first years data.

- Sampling of group two Parameters (includes group one) shall be carried out in the first year of the exercise of this consent and every third year thereafter. If as a result of the sampling, significant levels of contamination are detected (which could result in an adverse environmental effect), then a review of the consent will be undertaken at the initiation of either the Central Hawke's Bay District Council or Hawke's Bay Regional Council.

Group One Parameters

Test	
Dissolved Oxygen	Potassium
pH	Total Organic Carbon
Conductivity	NH4-N
Absorbance	NO3-N/NO2-N
Chloride	VFA (individual)

Group Two Parameters

Test			
COD	DRP	Cr (acid sol)	PCP
Sodium	Total Phosphorus	Cu (acid sol)	ON, OP pesticides
Calcium	Total Phenols	Mn (acid sol)	
Mg	Total CN	Ni (acid sol)	
SO4	Al (acid sol)	Pb (acid sol)	
Zn (acid sol)	As (acid sol)	Hg (acid sol)	
Fe (acid sol)	B (acid sol)	Se (acid sol)	
Sulphide	Cd (acid sol)	VOC (inc BTEX)	
TKN	Co (acid sol)	SVOC	

Surface Water Monitoring

Two sites, one upstream and one downstream of the landfill shall be monitored. Sampling shall be undertaken once per year in the period January to March. Sampling shall be carried out in accordance to HBRC sampling procedures manual or similar. The parameters to be analysed are:

Test
Dissolved Oxygen
pH
Conductivity
Absorbance
Chloride
Potassium
Total Organic Carbon
NH4-N
NO3-N/NO2-N
Macro Invertebrate Community
Index (MCI).

- Macro Invertebrate Community Index (MCI).
  Reference: Stark, J D. 1985. Macroinvertebrate Community Index of Water Quality for Stony Streams. *Water and Soil Miscellaneous Publication No. 87* MWD, Wellington, New Zealand.

Tamumu Closed Landfill
Monitoring Schedule

Groundwater Monitoring

One bore downstream of the landfill shall be constructed for monitoring purposes. The bore shall be installed in accordance with the appropriate groundwater quality monitoring bore specifications, which requires well head protection, PVC slotted screen and bentonite sealing. The bore shall be placed in a down gradient (to groundwater flow) position, and shall be drilled to the first water yielding layer (upper aquifer).

- Groundwater monitoring shall consist of quarterly sampling for group one parameters, to be carried out for a period of one year. At the completion of that year the results shall be analysed with a review of frequency of sampling undertaken. Sampling to occur in February, May, August and November of each year. It is anticipated that sampling will reduce to once per year upon analysis of the first years data.

- Sampling of group two parameters (includes group one) shall be carried out every three yearsduring the month of May. If as a result of the sampling, significant levels of contamination are detected (which could result in an adverse environmental effect), then a review of the consent will be undertaken at the initiation of either the Central Hawke's Bay District Council or Hawke's Bay Regional Council.

Group One Parameters

Test	
Dissolved Oxygen	Potassium
pH	Total Organic Carbon
Conductivity	NH4-N
Absorbance	NO3-N/NO2-N
Chloride	VFA (individual)

Group Two Parameters

Test			
COD	DRP	Cr (acid sol)	PCP
Sodium	Total Phosphorus	Cu (acid sol)	ON, OP pesticides
Calcium	Total Phenols	Mn (acid sol)	
Mg	Total CN	Ni (acid sol)	
SO4	Al (acid sol)	Pb (acid sol)	
Zn (acid sol)	As (acid sol)	Hg (acid sol)	
Fe (acid sol)	B (acid sol)	Se (acid sol)	
Sulphide	Cd (acid sol)	VOC (inc BTEX)	
TKN	Co (acid sol)	SVOC	

Surface Water Monitoring

Two sites, one upstream and one downstream of the landfill shall be monitored. Sampling shall be undertaken once per year in the period January to March. Sampling shall be carried out in accordance to HBRC sampling procedures manual or similar. The parameters to be analysed are:

Test
Dissolved Oxygen
pH
Conductivity
Absorbance
Chloride
Potassium
Total Organic Carbon
NH4-N
NO3-N/NO2-N
Benthic Macro Invertebrate species
density and abundance.

Waipukurau Closed Landfill
Monitoring Schedule

Groundwater Monitoring

One bore upstream of the landfill, and one downstream of the landfill, shall be constructed for monitoring purposes. The bores shall be installed in accordance with the appropriate groundwater quality monitoring bore specification, which requires well head protection, PVC slotted screen and bentonite sealing. The downstream bore shall be placed in a down gradient (to groundwater flow) position, and shall be drilled to the first water yielding layer (upper aquifer).

- Groundwater monitoring shall consist of quarterly sampling for group one parameters, to be carried out for a period of one year. At the completion of that year the results are to be analysed with a review of frequency of sampling undertaken. Sampling to occur in February, May, August and November of each year. It is anticipated that sampling will reduce to once per year upon analysis of the first years data.

- Sampling of group two parameters (includes group one) shall be carried out in the first year of the exercise of this consent and every third year thereafter. If as a result of the sampling, significant levels of contamination are detected (which could result in an adverse environmental effect), then a review of the consent will be undertaken at the initiation of either the Central Hawke's Bay District Council or Hawke's Bay Regional Council.

Group One Parameters

Test	
Dissolved Oxygen	Potassium
pH	Total Organic Carbon
Conductivity	NH4-N
Absorbance	NO3-N/NO2-N
Chloride	VFA (individual)

Group Two Parameters

Test			
COD	Sulphide	Cd (acid sol)	VOC (inc BTEX)
Sodium	TKN	Co (acid sol)	SVOC
Calcium	DRP	Cr (acid sol)	PCP
Mg	Total CN	Cu (acid sol)	ON, OP pesticides
SO4	Al (acid sol)	Pb (acid sol)	
Zn (acid sol)	As (acid sol)	Hg (acid sol)	
Fe (acid sol)	B (acid sol)	Se (acid sol)	

Surface Water Monitoring

Two sites, one upstream and one downstream of the landfill shall be monitored. Sampling shall be undertaken once per year in the period January to March. Sampling shall be carried out in accordance to HBRC sampling procedures manual or similar. The parameters to be analysed are:

Test
Dissolved Oxygen
pH
Conductivity
Absorbance
Chloride
Potassium
Total Organic Carbon
NH4-N
NO3-N/NO2-N
Macro Invertebrate Community
Index (MCI).

- Macro Invertebrate Community Index (MCI).
  Reference: Stark, J D. 1985. Macroinvertebrate Community Index of Water Quality for Stony Streams. *Water and Soil Miscellaneous Publication No. 87* MWD, Wellington, New Zealand.

Kairakau Closed Landfill
Monitoring Schedule

Surface Water Monitoring

Two sites, one upstream and one downstream of the landfill shall be monitored. Sampling shall be undertaken once per year in the period January to March. Sampling shall be carried out in accordance to HBRC sampling procedures manual or similar. The parameters to be analysed are:

Test
Dissolved Oxygen
pH
Conductivity
Absorbance
Chloride
Potassium
Total Organic Carbon
NH4-N
NO3-N/NO2-N
Macro Invertebrate Community
Index (MCI).

- Macro Invertebrate Community Index (MCI).
  Reference: Stark, J D. 1985. Macroinvertebrate Community Index of Water Quality for Stony Streams. *Water and Soil Miscellaneous Publication No. 87* MWD, Wellington, New Zealand.

Takapau Closed Landfill
Monitoring Schedule

Groundwater Monitoring

One bore shall be constructed for monitoring purposes. The bore shall be sited downstream of the landfill and within 100 meters of the Porangahau stream. The bore shall be installed in accordance with appropriate groundwater quality monitoring bore specifications, which requires well head protection, PVC slotted screen and bentonite sealing. The bore shall be placed in a down gradient (to groundwater flow) position, and shall be drilled to the first water yielding layer (upper aquifer).

- Groundwater monitoring shall consist of quarterly sampling for group one parameters, to be carried out for a period of one year. At the completion of that year the results shall be analysed with a review of frequency of sampling undertaken. Sampling shall occur in February, May, August and November of each year. It is anticipated that sampling will reduce to once per year upon analysis of the first years data.

- Sampling of group two parameters (includes group one) shall be carried out in the first year of the exercise of this consent and every third year thereafter. If as a result of the sampling, significant levels of contamination are detected (which could result in an adverse environmental effect), then a review of the consent will be undertaken at the initiation of either the Central Hawke's Bay District Council or Hawke's Bay Regional Council.

Group One Parameters

Test	
Dissolved Oxygen	Potassium
pH	Total Organic Carbon
Conductivity	NH4-N
Absorbance	NO3-N/NO2-N
Chloride	VFA (individual)

Group Two Parameters

Test			
COD	DRP	Cr (acid sol)	PCP
Sodium	Total Phosphorus	Cu (acid sol)	ON, OP pesticides
Calcium	Total Phenols	Mn (acid sol)	
Mg	Total CN	Ni (acid sol)	
SO4	Al (acid sol)	Pb (acid sol)	
Zn (acid sol)	As (acid sol)	Hg (acid sol)	
Fe (acid sol)	B (acid sol)	Se (acid sol)	
Sulphide	Cd (acid sol)	VOC (inc BTEX)	
TKN	Co (acid sol)	SVOC	

Surface Water Monitoring

Two sites, one upstream and one downstream of the landfill shall be monitored. The parameters to be analysed are:

Test
Dissolved Oxygen
pH
Conductivity
Absorbance
Chloride
Potassium
Total Organic Carbon
NH4-N
NO3-N/NO2-N
Macro Invertebrate Community
Index (MCI).

- Macro Invertebrate Community Index (MCI).
  Reference: Stark, J D. 1985. Macroinvertebrate Community Index of Water Quality for Stony Streams. *Water and Soil Miscellaneous Publication No. 87* MWD, Wellington, New Zealand.

Waipawa Closed Landfill
Monitoring Schedule

Groundwater Monitoring

One bore upstream of the landfill, and one downstream of the landfill are proposed for monitoring purposes. The bores shall be installed in accordance with the appropriate groundwater quality monitoring bore specification, which requires well head protection, PVC slotted screen and bentonite sealing. The downstream bore shall be placed in a down gradient (to groundwater flow) position, and shall be drilled to the first water yielding layer (upper aquifer).

- Groundwater monitoring shall consist of quarterly sampling for group one parameters, to be carried out for a period of one year. At the completion of that year the results shall be analysed with a review of frequency of sampling undertaken. Sampling to occur in February, May, August and November of each year. It is anticipated that sampling will reduce to once per year upon analysis of the first years data.

- Sampling of group two parameters (includes group one) shall be carried out in the first year of the exercise of this consent and every third year thereafter. If as a result of the sampling significant levels of contamination are detected (which could result in an adverse environmental effect), then a review of the consent will be undertaken at the initiation of either the Central Hawke's Bay District Council or Hawke's Bay Regional Council.

Group One Parameters

Test	
Dissolved Oxygen	Potassium
pH	Total Organic Carbon
Conductivity	NH4-N
Absorbance	NO3-N/NO2-N
Chloride	VFA (individual)

Group Two Parameters

Test			
COD	Sulphide	Cd (acid sol)	VOC (inc BTEX)
Sodium	TKN	Co (acid sol)	SVOC
Calcium	DRP	Cr (acid sol)	PCP
Mg	Total CN	Cu (acid sol)	ON, OP pesticides
SO4	Al (acid sol)	Pb (acid sol)	
Zn (acid sol)	As (acid sol)	Hg (acid sol)	
Fe (acid sol)	B (acid sol)	Se (acid sol)	

Surface Water Monitoring

Two sites, one upstream and one downstream of the landfill shall be monitored. Sampling shall be undertaken once per year in the period January to March. Sampling shall be carried out in accordance to HBRC sampling procedures manual or similar. The parameters to be analysed are:

Test
Dissolved Oxygen
pH
Conductivity
Absorbance
Chloride
Potassium
Total Organic Carbon
NH4-N
NO3-N/NO2-N
Macro Invertebrate Community
Index (MCI).

- Macro Invertebrate Community Index (MCI).
  Reference: Stark, J D. 1985. Macroinvertebrate Community Index of Water Quality for Stony Streams. *Water and Soil Miscellaneous Publication No. 87* MWD, Wellington, New Zealand.

Schedule of Detection Limits
Central Hawke's Bay Closed Landfill Monitoring

Groundwater Detection Limits

Group One Parameters

Test	Units	Detection limit	Method
Dissolved Oxygen	g/m^{-3}	on site	
pH		0.2	Meter, NAWSCO
Conductivity	mS/m	0.1	APHA 2510-B
Absorbance	AU	0.002	Spectro, APHA 5910
Chloride	g/m^{-3}	0.5	APHA 4500-C1B
Potassium	g/m^{-3}	0.02	AA Flame/ICP-OES
Total Organic Carbon	g/m^{-3}	0.5	
NH4-N	g/m^{-3}	0.01	Colorimetric
NO3-N/NO2-N	g/m^{-3}	0.02	Cd reduction, colorimetry
VFA (individual)	g/m^{-3}	.5	GC-FID

Group Two Parameters

Test	Units	Detection limit	Method
COD	g/m^{-3}	6	NAWSCO
Sodium	g/m^{-3}	0.02	AA Flame/ICP-OES
Calcium	g/m^{-3}	0.05	AA Flame/ICP-OES
Mg	g/m^{-3}	0.02	AA Flame/ICP-OES
SO4	g/m^{-3}	1	Turbidimetric
Zn (acid sol)	g/m^{-3}	0.005	GF AA or ICP-MS
Fe (acid sol)	g/m^{-3}	0,04	AA Flame/ICP-OES/ICP-MS
Sulphide	g/m^{-3}	0.02	APHA 4500-S^{2-}D
TKN	g/m^{-3}	0.1	Acid digestion, colorimetry
DRP	g/m^{-3}	0.004	NAWSCO
Total Phosphorus	g/m^{-3}	0.004	NAWSCO
Total Phenols	g/m^{-3}	0.002	APHA 5530 B,C,D
Total CN	g/m^{-3}	0.001	APHA 4500-CN C,E
Al (acid sol)	g/m^{-3}	0.005	ICP-MS
As (acid sol)	g/m^{-3}	0.001	ICP-MS
B (acid sol)	g/m^{-3}	0.05	ICP-MS
Cd (acid sol)	g/m^{-3}	0.001	ICP-MS
Co (acid sol)	g/m^{-3}	0.0005	ICP-MS
Cr (acid sol)	g/m^{-3}	0.0005	ICP-MS
Cu (acid sol)	g/m^{-3}	0.0004	ICP-MS
Mn (acid sol)	g/m^{-3}	0,02	ICP-MS
Ni (acid sol)	g/m^{-3}	0.001	ICP-MS
Pb (acid sol)	g/m^{-3}	0.0005	ICP-MS
Hg (acid sol)	g/m^{-3}	0.0001	Cold vapour AA
Se (acid sol)	g/m^{-3}	0.001	Hydride AA
VOC (inc BTEX)	g/m^{-3}	0.001	USEPA 524 P&T GC-MS
SVOC	g/m^{-3}	0.001	USEPA 625, GC-MS
PCP	g/m^{-3}	0.001	Solvent extraction, GC-MS
ON & OP pesticides	g/m^{-3}	varies	Extraction, GC-NPD/ECD

Detection limits are based on current laboratory detection limits (for the test method stated) and may vary from MfE guidelines.

Surface Water Detection Limits

Test	Units	Detection limit	Method
Dissolved Oxygen	g/m^{-3}	on site	
pH		0.2	Meter, NAWSCO
Conductivity	mS/m	0.1	APHA 2510-B
Absorbance	AU	0.002	Spectro, APHA 5910
Chloride	g/m^{-3}	0.5	APHA 4500-C1B
Potassium	g/m^{-3}	0.02	AA Flame/ICP-OES
Total Organic Carbon	g/m^{-3}	0.5	
NH4-N	g/m^{-3}	0.01	Colorimetric
NO3-N/NO2-N	g/m^{-3}	0.02	Cd reduction, colorimetry
Macro Invertebrate Community 1 Index (MCI).			see below

- Macro Invertebrate Community Index (MCI).
  Reference: Stark, J D. 1985. Macroinvertebrate Community Index of Water Quality for Stony Streams. *Water and Soil Miscellaneous Publication No. 87* MWD, Wellington, New Zealand.

Appendix G – Central Hawke's Bay District Council Information

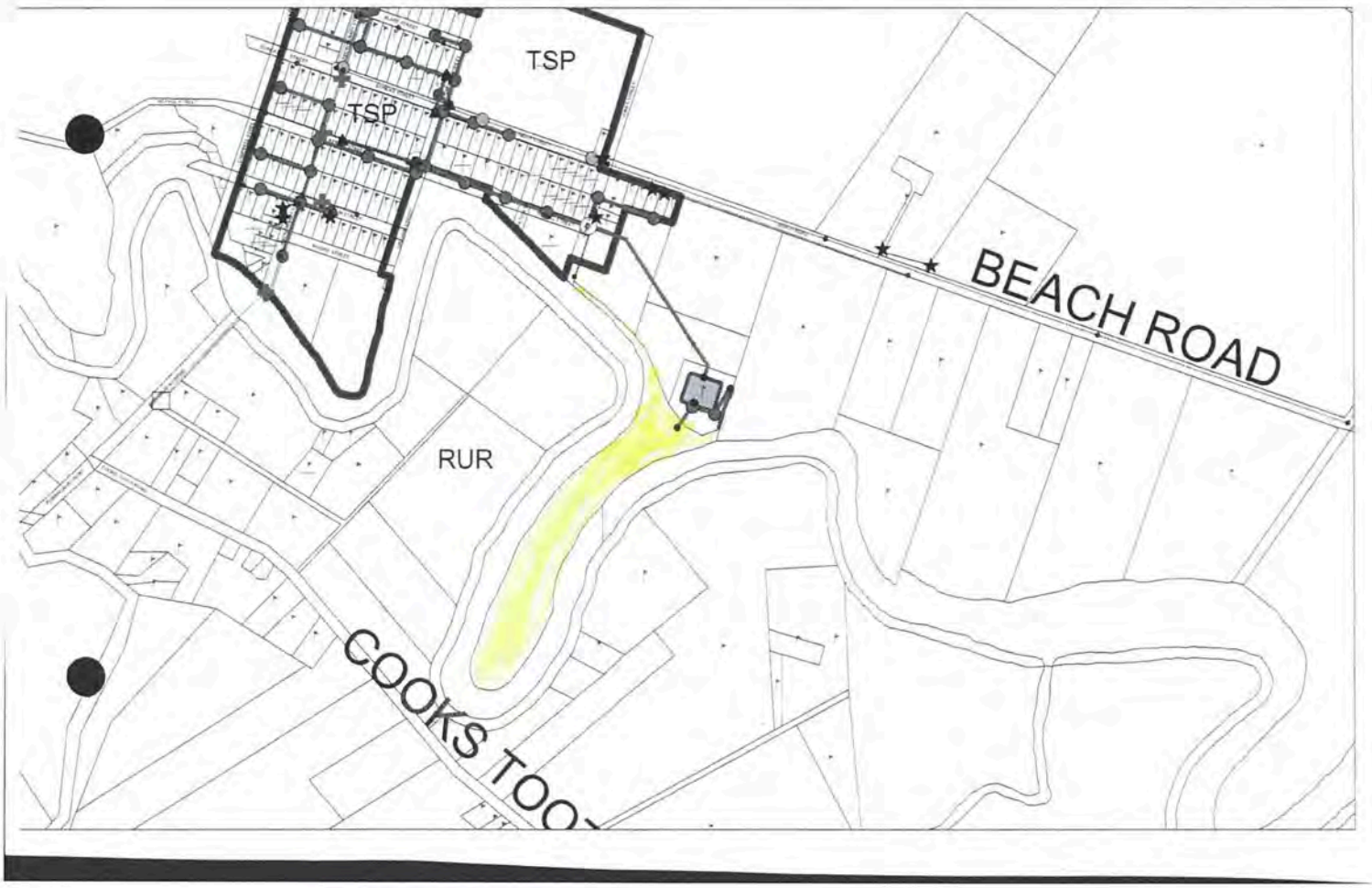
File No: 1094040200

Planning and Heritage

(F) 10940400200

OWNER: HAWKES BAY REGIONAL COUNCIL

PT SUB SEC 49 PORANGAHAU BLK XII PORANGA 3D



NEW ZEALAND HISTORIC PLACES TRUST REGISTER OF HISTORIC PLACES, HISTORIC AREAS, WĀHI TAPU AND WĀHI TAPU AREAS

WĀHI TAPU AREA REGISTRATION PROPOSAL

1. NAME OF WAHI TAPU PLACE

Name to appear on Register:
Te Awakari a Tamanui

Other name

Awakari

Te Awakari

Photograph Kevin Jones, 1994

2. LOCATIONAL INFORMATION (refer to maps in Appendix 2)

Location: Cooks Tooth Road

Rural Town: Porangahau

Region: Central Hawkes Bay

Legal Description: (to be completed)

Gazette Noctice: 14 December 1961, *New Zeland Gazette* 1961, no 80, p 1905

GPS Coordinates:

Te Awakari – *etrex* (4 m error marjon)

Northing 6093200
Easting 2817200 (northern point

Northing 6093458
Easting 2817433 (Pits)

Northing 6093139
Easting 2817278 (river end)

3. EXTENT OF PLACE TO BE REGISTERED

Te Awakari pā

Te Awakari Pā is located near Cooks Tooth Road, south east of Porangahau township. The site is located on a 500m long point in an abandoned meander on the south side of the Porangahau river which used to flow past the site as late as the 1960s. The pā site consists of transverse ditches and on the down-river aspect of the site, it comprises of a low level terrace that sits 2 metres below the rest of the site. At the northern end of the pā site there are a group of 7 pits.

The site is on a Matawhero terrace that was periodically prone to flooding.

4. OWNERSHIP / INTERESTED PARTIES

Owner(s): Central Hawkes Bay Regional Council

Iwi/ hapu/ whanau: Ngāti Kere, Ngāti Hinetewai, Ngāti Manuhiri

Territorial Local Authority: Central Hawkes Bay District Council

Regional Council: Hawkes Bay Regional Council

Parties advised of the registration proposal:
Ngāti Kere, Ngāti Hinetewai, Ngāti Manuhiri, Central Hawkes Bay District Council.

5. REGISTRATION DETAILS

General nature of the Wāhi Tapu

Te Awakari or Te Awakari a Tamanui is a Pātuwatawata and urupā.

Statement of values (traditional, spiritual, ritual, mythological, traditional)

Te Awakari is wāhi tapu in the traditional and spiritual sense.

The values associated with Te Awakari a Tamanui Pā include:

- Urupā – burial site
- Waka tapu – sacred waka
- Awakari drainage system

6. DOCUMENTED HISTORY (refer Appendix 4 for documented supporting evidence)

The Pātuwatawata known as Te Awakari was occupied in the late 1840s by the descendants of the ancestor Kere, and was considered by many to be the last palisade pā in the Porangahau area.

Much of the archaeological evidence associated with this pā has been destroyed by floods and extensive pastoral farming. What remains however, demonstrates an interesting past.

Tamanui was one of the tūpuna whom developed an elaborate drainage system to save the gardens from constant flooding. The drain surface trenches are still evident today and the local hapū consider these drainage systems as a symbol of traditional resourcefulness. [1]

Also, Te Awakari is the burial site of Te Korohu Matua, one of the chiefs that remained on the land during the 1820s exodus to Nukutaurua.[2]

Ngāti Kere is one of the hapū associated with the extended tribes Ngai Te Whatuiapiti and Ngāti
Kahungunu. In the early 1800s, much of the region occupied by these two iwi, Kahungunu and Te Whatuiapiti, was abandoned because of the constant fighting in this area.

Due to the musket wars in the 1820s, Tuwharetoa, Raukawa, Ngāti Te Kohera and Waikato joined in the local hapū skirmishes which witnessed a migration of many hapū to Māhia and Nukutaurua for refuge and trade. Many of the pā in the Porangahau region were deserted except for Te Awakari. Te Korohu, the father of Wi Matua, was one of the chiefs that remained at Te Awakari pā and was present when Ngāti Kere returned to Porangahau in 1843 after living in exile for more than 15 years. [3] Ngāti Hamua and other hapū also joined those living at Te Awakari where they all celebrated their repatriation before moving onto their own areas. The principal chiefs of Porangahau at that time were Aperahama Te Whakaanga, Ropiha Te Takou and Hoani Matua.

[redacted] (Is this included in the registration)?

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[1] Matua, H. (1887), *Hastings Maori Land Court Minute Book* - Includes evidence of Henare Matua (Ngati Kere) at a hearing at Waipawa concerning the Porangahau Block. A copy of this minute book is held by the Tipene-Matua whanau, Pouwhakarae Trust.

[2] Ibid

[3] Ibid

FUTHER DOCUMENTED HISTORY

Apihai Te Kawau seated on the left.

TE KAWAU, APIHAi

(*c.* 1790–1869).

Ngati Whatua chief.

Te Kawa was the chief of the Ngati Taou hapu of the Ngati Whatua tribe and lived at Kaipara. As a young man he probably took part in the various tribal wars against the Ngapuhi. Marsden met him on 27 July 1820 when he boarded the *Dromedary* to sell spars cut from his forests on the Waitemata. Later, he accompanied Marsden when he made his survey of the Manukau Harbour. In June 1821, according to some authorities, Te Kawau took part in the defence of Mauinaina pa against Hongi Hika, but, if this were so, he must have been one of the few survivors of the siege. It is more likely, however, that he was then preparing for the famous Amiowhenua expedition in which he was the principal leader.

The Amiowhenua expedition was one of the longest ever undertaken by a Maori taua. Its pretext was probably no stronger than a desire to emulate the successful expedition made by Patuone and Te Rauparaha in the previous year. The party left One-one-nui (South Kaipara) toward the end of August 1821 and made its way across the Kaingaroa Plains to the headwaters of the Mohaka River. They crossed the main range into Hawke's Bay near the Titiokura Pass and continued down the Tutaekuri River before turning south-east into the Raukawa hills (to the south-west of Hastings). At Lake Te Roto-a-Tara (near Te Aute College) they captured an island pa belonging to the Ngai-te-Whatu-i-apiti tribe. The party then crossed the Ruataniwha Plains, but failed to reduce Horehore pa, near Takapau. They passed through the Seventy Mile Bush and took several small villages at Te Apiti in Manawatu Gorge before continuing through the Pahiatua district to Maungarake (near Masterton). Here they captured Hakikino pa. The

party went on to Port Nicholson, where they took Tapu-te-Ranga, the Ngati Ira pa on the island in Island Bay. News of their presence preceded them, however, and they found that the Porirua and Waikanae Maoris had abandoned their settlements. At Otaki they attacked a Muaupoko pa, but were tricked into lifting their siege. The taua next invaded the Wanganui district, where one section was destroyed in an ambush at Mangatoa. The remaining sections, under Te Kawau, moved on through the Patea and Taranaki districts. They were attacked by a strong Ngati Awa force at Waitara and were obliged to entrench themselves in Pukerangiora pa. From Pukerangiora Te Kawau sent word to Te Wherowhero, who came from the Waikato to lift the siege. About this time news of Hongi's expedition into the Waikato reached Taranaki and the combined force hastened to Matakitaki pa, where Te Kawau assisted the defenders. The Amiowhenua expedition returned to Kaipara about June 1822, after having covered more than 1,000 miles.

Because he feared that the Ngapuhi meditated taking revenge upon those Ngati Whatua hapus which had taken part in the defence of Matakitaki, Te Kawau moved his people to Pukewha, on the Waipa River. They remained there until after Hongi's death, when they returned to their lands in the Auckland district. After this they came under the missionaries' influence.

In 1840 Te Kawau, who was now the paramount chief of the Ngati Whatua, invited Governor Hobson to visit the Waitemata district. He used all his influence to persuade the Governor to move his capital to Auckland and put land at his disposal for that purpose. In the later years Te Kawau lived at Orakei, where he became a close friend of Sir William Martin. He was baptised and took the name Apihai (Abishai). Te Kawau died at Ongarahu, Kaipara, in November 1869.

Towards the close of his life Te Kawau is said to have abhorred warfare and deplored his people's sufferings at the hands of the Ngapuhi.

by Bernard John Foster, M.A., Research Officer, Department of Internal Affairs, Wellington.

Intertribal Conflicts –By Angella Ballara

Throughout the greater part of the settlement of New Zealand by the Maoris in the pre-European era, the only source of information on the movements and activities of the various tribes is tradition. In some districts where traditions have been recorded in detail, it is probable that archaeology will in future be able to reinforce or reject traditional material, but this is a line of research which has hardly begun.

In the proper sense of the word, history of the Maori tribes begins with material written down at the time of the events or recorded subsequently from eyewitness accounts. Thus the beginnings of history in New Zealand date from a little before the arrival of Captain Cook in 1769. This is not to say that traditional accounts of events prior to that time should be discounted. On the contrary, these traditions contain matter of such prime importance to Maori society that, even allowing for the high degree of partisanship arising from tribal pride, it is probable that they are reasonably accurate descriptions of actual events.

Tribal history is largely a story of intertribal warfare and, at the time at which written history begins, the whole aspect of warfare was about to be changed by the introduction of firearms and new methods of fighting. It is probable that in earlier times intertribal encounters were less serious affairs and that the number of fatalities was not very high. Moreover, the odds were more even in that combat was hand to hand; missiles were not greatly used and were not very effective.

Shortly after Europeans began to visit the country various Maori chiefs were quick to see the advantages of the musket and the power it gave them over enemies without such weapons. Chiefs who managed to acquire muskets by trading set out on a scale of slaughter and destruction quite unknown before. In the first 30 years of the nineteenth century thousands of Maoris must have died in the campaigns of Hongi Hika and Te Rauparaha alone.

It would be idle to attempt to give a comprehensive account of the complex pattern of intertribal relations in early historical times, but a summary of the campaigns of some of the outstanding Maori leaders will illustrate the conditions prevailing at that time.

One of the first Maori chiefs to take advantage of new weapons and new techniques of warfare was Hongi Hika, a chief of the Ngapuhi tribe of North Auckland. Ngapuhi were a numerous people of many subtribes mainly concentrated in the Whangarei, Bay of Islands, and Whangaroa areas. According to S. P. Smith (*Maori Wars of the Nineteenth Century*), there are no traditions to indicate that Ngapuhi ever penetrated further south than the Hauraki Gulf until the early years of the nineteenth century. With the coming of firearms, however, when roving bands of well-armed men could move through large but ill-armed tribes, Ngapuhi war parties roamed the North Island even as far as Wellington. As early European settlement was mainly concentrated in the North Auckland area, Ngapuhi were thus well placed for the acquisition of muskets, and they were not backward in the use of these new weapons against their neighbours.

Te Hapuku, sometimes called Te Ika-nui-o-te-moana, was born in the late eighteenth century. He was a leader of Ngati Te Whatu-i-apiti. Kinship links within Ngati Kahungunu, Rangitane, Ngati Ira and other major tribal groups in Hawke's Bay made him influential throughout the region. Te Hapuku's father was Kurimate, also known as Te Rangi-ko-ia-anake II, whose main hapu were Ngati Te Manawa-kawa and Ngati Te Rangi-ko-ia-anake, named after his grandfather, Te Rangi-ko-ia-anake I. His mother was Tatari of Ngai Tapuhara, and Ngati Hinepare, of Ngati Kahungunu. One brother, Haurangi, sometimes called Te Waihiku, may have been an older son of Kurimate with a junior wife. Another brother was Ihaka Motoro. His kinswoman, Hine-i-paketia, though a generation younger, was his contemporary and ranked as ariki of Ngati Te Whatu-i-apiti. Te Hapuku was overshadowed within Ngati Te Whatu-i-apiti and Ngai Tapuhara by the war leader Te Pareihe, his senior by one generation.

Wars rent Hawke's Bay in the 1820s as a result of invasion. When Te Pakake pa was attacked about 1824 by Waikato, Te Hapuku was among the many prisoners. He was then exchanged for obsidian with a Ngati Raukawa war party. In one version of events, having, perhaps, been permitted to escape at Tarawera, he made his way to his people on the Mahia peninsula. In another version he was recaptured at Te Haroto and taken to

Te Wherowhero of Waikato, who sent for Tiakitai to escort him and the other prisoners home. Later that year Te Momo-a-Irawaru of Ngati Te Kohera, a hapu of Ngati Raukawa, invaded central Hawke's Bay with the intention of settling there. Te Hapuku was inclined to make peace with Te Momo, a policy which others regarded as treachery. Te Pareihe and his allies subsequently killed Te Momo and drove out the remnants of Ngati Te Kohera. A party of Ngati Te Upokoiri who had been Te Momo's allies came to take revenge for this defeat, killing Te Hapuku's sister, Hine-i-hoaia.

After this battle Te Hapuku lived with Tiakitai at Te Pakake for about eight years. He forcibly opposed Te Pareihe for agreeing to make peace with Waikato. Te Hapuku may have joined in the campaign to punish Ngati Raukawa and its Rangitane allies for their attack on Hawke's Bay, in which the mother of Kurupo Te Moananui had been killed. It is recorded that he consumed part of the body of the son of Te Hirawanu Kaimokopuna. One of the prisoners taken was a female cousin of Te Hirawanu; Te Hapuku took her to wife; their son was Watene Te Hapuku.

About 1833 Te Hapuku joined the exodus of Ngati Te Whatu-i-apiti and Ngati Kahungunu at Heretaunga (Hawke's Bay) to the Mahia peninsula, where they had taken refuge from the continuous invasions. From there he joined the Wairarapa leader Nuku-pewapewa in a punitive raid against the Taranaki tribes who had occupied Wairarapa, only to withdraw when he realised the numbers of the enemy. He is reputed to have asked Nuku-pewapewa: 'Where are we going to get enough water to put all those fires out?'

On the Mahia peninsula Te Hapuku had established himself at the township of Te Mahia, near the neck of the peninsula, which whalers frequented in the 1830s. He became notorious for his overbearing conduct towards the whaling community, to such an extent that British Resident James Busby threatened him with the visitation of a warship. Te Hapuku seems to have held all Europeans in contempt at this stage of his life, and he fiercely rejected Christianity.

In 1838 Te Hapuku visited the Bay of Islands where, on 25 September, he signed the 1835 Declaration of the Independence of New Zealand. In 1840, therefore, Major Thomas Bunbury deemed it important to obtain his agreement to the Treaty of Waitangi. He called at the Tukituki River in Hawke's Bay where Te Hapuku had recently returned. At first Te Hapuku refused to sign, saying that Nga Puhi were now slaves through the treaty, but Bunbury convinced him that his assent to the treaty could only increase his mana; he gave it on 24 June 1840.

Te Hapuku's rise to eminence within Ngati Te Whatu-i-apiti was assisted by the death of Te Pareihe in 1844. His dignity and deep knowledge of tradition were reflected in his public utterances. Like those of other chiefs and skilled orators, his utterances were often cryptic to the uninitiated; he was often satirical or laconic. He delighted to tease the missionary William Colenso when the behaviour of the latter's sometimes shaky converts failed to measure up to the Christian ideal. His temperament was unusually autocratic, not only with Europeans but also with his kin. He deeply resented slights to his personal mana, but was gracious to Europeans he respected, and inclined to protect them.

Te Hapuku's personal household was large, suited to his rank and importance. Te Heipora, his principal wife, had become his spouse in the late 1820s. She was the mother of his recognised heir, Karanama (Cranmer) Te Nahu, the father of Arihi Te

Nahu. Karanama was to die of measles in 1854. Other wives were Whaitiri, the mother of Eke-nga-rangi and Arapata; and Hinerangi, the mother of Tangata-ke and Te Pohuka. Other sons were Te Whakahemo and Nepia. Colenso knew of eight wives in 1850; Donald McLean reported ten. There may have been strife among them; one wife strangled herself in 1850 in a fit of jealousy.

Although Te Hapuku continued to resist Christianity, he permitted his people and his own children to become converts, and found both the Protestant and Catholic missionaries useful. He had learned to write by 1852 but made use of a Catholic priest, at the pa of his kinsman, Puhara, as an amanuensis, especially in communication with the governor. He listened to Colenso's advice concerning his land in 1848, although missionary efforts to persuade him to set up extensive reserves with natural boundaries did not succeed.

In December 1850 Donald McLean arrived in Hawke's Bay to investigate the availability of land for purchase by the government; he encountered Te Hapuku on 13 December. McLean learnt from Colenso that Tareha, Kurupo Te Moananui and Puhara were of equal mana to Te Hapuku but he seems to have made a conscious decision that his best chance of acquiring extensive territory was through the latter. In January 1851 McLean recorded that, 'Hapuku is acting precisely as I have directed him, that is he goes about negotiating and arranging with his tribe for the sale of more land.' Te Hapuku arranged extensive land sales in Hawke's Bay. He encountered little initial opposition, such was the enthusiasm for selling; indeed, he had difficulty in persuading some groups to retain any reserves. Te Hapuku was motivated by a grand vision of the future. Both he and Hine-i-paketia realised that much of their forested land had now become virtually useless economically; the game hunted there in former times had been destroyed by introduced pests. He wanted to enrich his territory by settling on it respectable Europeans with whom his people could trade their grain and other crops for clothes, tools, horses and horse-tackle, tobacco and spirits. In May 1851 Te Hapuku told McLean he intended to sell all his land except the block known as Raukawa, 'which was as sacred as his brains'. He also promised to assist McLean in purchasing Wairarapa.

Tareha and Kurupo Te Moananui soon began to resent Te Hapuku's assumption of the role of Crown land agent in chief as well as McLean's apparent acceptance of his pre-eminence. Their insistence on selling land on their own behalf forced McLean to arrange simultaneous surveys of the Waipukurau and Ahuriri blocks, and to negotiate with Te Moananui.

Te Hapuku ignored advice from Taupo, Manawatu and Wairarapa not to sell land. No prices had been settled, and those offered were much less than Te Hapuku expected. Twenty thousand pounds was asked for the 300,000 acre Waipukurau block; McLean offered £3,000. Te Hapuku, who seems to have been forewarned, was annoyed at the sudden announcement; he told McLean that the proposed price was too little to satisfy 'his numerous tribes', and pointed out that although the land was now depopulated through war and disease, it was capable of sustaining thousands. He drew a parallel with Wairarapa, telling McLean he offered too little there as well, and regretting that he had offered to help him purchase land in that region. He was anxious to have European settlers to replace his tribes, now nearly extinct; he reminded McLean that the Crown would recoup the money it expended through subsequent sales to settlers, whereas the Maori sellers got only perishable articles. Te Hapuku's appeal resulted in the price being raised by some £1,800, which he distributed among the more than 200 hapu, but some

of the occupiers remained unsatisfied. Nevertheless, Te Hapuku's mana was never higher than at this period. He was the influential friend of the governor and the governor's most powerful agent; he was appointed a magistrate in 1852. He was at McLean's side in September and October 1853 when the major purchases in Wairarapa took place. Colenso made further efforts to get him and the other major leaders to set up substantial reserves, but their jealousies prevented anything being achieved. Te Hapuku agreed to the setting up of Te Aute College trust, established on Crown land which had been Ngati Te Whatu-i-apiti territory.

In late December 1853 Te Hapuku visited Wellington with his son Karanama Te Nahu, Puhara, Hine-i-paketia, Hori Niania Te Aroatua and others. A dinner was put on at which Te Hapuku said that he would like more Europeans in Hawke's Bay. With his companions, Te Hapuku arranged with McLean the sale of four large blocks for a total of £3,200 in January 1854. These sales were undertaken without the knowledge of many of the owner-occupants of the land, and without the agreement of others; outrage spread and protests were made to the land commissioners. In 1855 Te Hapuku, who had bought a small schooner for trade, visited Auckland to protest the non-arrival of payments for some of the lands sold. While there he sold the Manga or Rangipeke block, claimed by Ngai Takaha; he failed to distribute any purchase money to the occupiers.

Opposition to Te Hapuku's course began to mount; the leaders of the non-sellers were Kurupo Te Moananui, Tareha, Karaitiana Takamoana and Renata Kawepo. In 1856 the quarrel came to a head over a block offered for sale by a woman, Tawhara. G. S. Cooper, the district commissioner, found that he could not make a payment for this land in the face of the determination of Te Hapuku's opponents to fight him if it was made. Te Hapuku declared that unless Cooper did make a payment on Tawhara's land he would refuse to receive any money for the Ruataniwha and Aorangi blocks, and would turn off the settlers. When Cooper tried to patch up a peace Te Hapuku aborted it by sending a sarcastic message to Tareha and others, telling them not to forget their guns and ammunition when they came to the proposed meeting.

Part of Te Hapuku's stubborn determination to sell land in the face of mounting opposition arose from his indebtedness. The money he was to receive as instalments later that year would not cover his existing liabilities; he could no longer get goods on credit, and a fall in grain prices meant that he could not trade his way out of his difficulties. His changed lifestyle had made continuous supplies of imported goods a necessity, and he had no alternative but to continue selling land.

In February--March 1857 Cooper took Kurupo Te Moananui, Tareha and others with him to point out their lands included in Te Hapuku's sales. Cooper knew that Te Hapuku would regard this as interference in his 'special work'; the 'survey' went armed. Cooper regarded himself as forced to continue to trust and work with Te Hapuku because a quarrel with him would have spoiled his chances of acquiring the Forty Mile Bush.

Te Hapuku, determined to assert his right to sell Tawhara's block, camped at Whakawhiti in August 1857 and began to build a pa with timber taken from Te Pakiaka, a stand of bush near Whakatu, thus contravening a previous agreement that his people could have as much firewood as they wished but no growing timber. Hostilities began, with clashes on 18 August, 14 October and 9 December 1857; in each case Te Hapuku's party came off slightly the worse and in the last battle his kinsman Puhara lost his life. Te Hapuku's

opponents kept him besieged, cutting off all access to Clive and Napier, and preventing the conveyance of any goods to his pa. They declared they would be satisfied with nothing less than Te Hapuku's withdrawal from Whakatu to his inland residence at Poukawa. Eventually Donald McLean persuaded the reluctant Te Hapuku to retire, literally smoothing the way by preparing the Te Aute road for cart and dray traffic. Having sent his non-combatants and goods on ahead, he finally withdrew with his fighting force in March 1858, having burnt down his pa before he left. In spite of his refusal to ratify the peace made in September 1858, he seemed to feel it precluded any more fighting, and turned his attention to farming, the building of a watermill and other improvements to his Poukawa lands. He offered a piece of land there for sale, hoping to get a trading store established.

Deserted by 1859 by most of his followers, Te Hapuku was still held in awe by his contemporaries. In 1859 a King movement deputation visited him, but he remained totally opposed to the King and runanga movements. In 1859 his brother Haurangi raised the King's flag in his pa in his absence. In 1860 Te Hapuku was among those who attended the Kohimarama conference of Maori leaders called by the government. Despite his reinforced loyalty to the Crown, his relations with Europeans continued to be difficult; they sometimes found him overbearing and lawless. Cooper confessed to McLean that Te Hapuku was 'beyond him to manage'. In 1862 he seized a flock of 2,400 sheep when a lessee refused to pay increased rent. His relations with his Maori opponents continued to be acrimonious; he refused to allow the sale of their interests in various blocks; Cooper found it would be unsafe to purchase the land or to occupy it.

In 1864 Te Hapuku permitted the followers of Pai Marire to settle at Te Hauke, even though he himself was averse to their doctrines; their presence strengthened him against his enemies. A number of his own people joined the movement and Te Hapuku's support was believed to have encouraged the adoption of the new religion in Wairarapa. He made a temporary alliance with Tareha, who was also playing host to Pai Marire disciples, against Karaitiana Takamoana and Renata Kawepo. In March 1866 Governor George Grey visited Te Hapuku, and induced him and his brother Haurangi to sign an oath of allegiance; they surrendered their Pai Marire flags to the governor. Subsequently Te Hapuku tried to negotiate with the Pai Marire prophet Panapa, but when that failed, he fought against the Pai Marire occupiers of Omarunui, near Napier. In 1868 he took part in the campaign against Te Kooti.

In 1866 the Native Land Court began its Napier sittings. Te Hapuku gave evidence in a few cases, but was not enthusiastic about some of the results. At one point he was forcibly ejected from the court for disorderly conduct. His debts continued to mount; in April 1870 his trap and his sheep were seized for debt, and by 1871 his creditors were seeking to have him declared a bankrupt. Various Europeans, including H. R. and T. P. Russell, sought to use this bankruptcy in an attempt to wrest control of Te Hapuku's interests in the Ngatarawa block from Donald McLean, who was a lessee and attempting to purchase on his own account. McLean and J. D. Ormond were similarly determined to profit from the situation. Te Hapuku benefited financially from the European contention for his interests; he was offered £400, perhaps as a loan to cover his most pressing debts, and traders were once again happy to accept his credit. His pension, first granted in the 1860s, was increased to £100 a year in 1871.

Despite his support for the movement to repudiate land sales, once their economic

effects had become obvious, Te Hapuku retained his friendship for McLean, and was devastated when McLean lost office in 1872. He took several cases to the Hawke's Bay Native Lands Alienation Commission in 1873, most of which were either withdrawn or repudiated. Those which did come before the commission showed that he had known what he was doing when he signed deeds, or that he had failed to distribute moneys fairly. Dissatisfied with this result, Te Hapuku attended the meeting at Pakipaki at which the Repudiationists planned a monster petition to demand a new commission with greater judicial powers. But he was too much a rival of Karaitiana Takamoana to co-operate whole-heartedly with him.

Land matters continued to plague Te Hapuku throughout his last years, but other activities were more productive. He continued to run sheep at Poukawa. He became involved in efforts by Hawke's Bay leaders to improve the standard of education offered to their people, particularly with regard to Te Aute College. Te Hapuku was concerned that children from other tribal areas seemed to be reaping most of the benefits. In 1876 Te Hapuku, in response to an ancient prophecy, caused the house Kahuranaki to be built at Te Hauke.

Te Hapuku died on 23 May 1878 at Te Hauke. His last illness continued for five weeks. As he lay dying he asked to be placed so that his eyes should close watching the sacred Kahuranaki hill. He was visited on his deathbed by Sir George Grey. His funeral was attended by 400 Maori and Pakeha; the service was conducted by Samuel Williams. He was buried in a vault, 12 feet deep, 200 feet from the pa.

ANGELA BALLARA

Bagnall, A. G. & G. C. Petersen. *William Colenso*. Wellington, 1948

Boyd, M. B. *City of the plains*. Wellington, 1984

Buchanan, J. D. H. *The Maori history & place names of Hawke's Bay*. Ed. D. R. Simmons. Wellington, 1973

Orange, C. *The Treaty of Waitangi*. Wellington, 1987

Wilson, J. G. *The founding of Hawke's Bay*. Napier, 1951

Wilson, J. G. *History of Hawke's Bay*. Dunedin, 1939

Musket warfare and migration

The chiefs and people of the principal settlements on the shores of Te Whanganui-a-Orotu had little, if any, direct dealings with Pakeha until the 1830s, when many of them were living at Nukutaurua on the Mahia Peninsula. For them, the early contact period had been marked by the intensification of tribal warfare, decimation, enslavement, and migration.

The catalyst for these unprecedented changes was a series of raids on Heretaunga and Ahuriri by musket-armed war parties from the north (see fig 5). The brunt of the invasion was borne by Ngati Whatuiapiti and the surrounding hapu at Roto a Tara (Te Aute), an area that abounded in eels, freshwater fish, and waterfowl. Most of Ngati Whatuiapiti then went to Nukutaurua at Mahia, `from which place they could make an attack on any outsiders who attempted to occupy Heretaunga'.5 A general migration of people from the district followed.

Island pa commanding the outlets of valuable fishing grounds and shellfish beds in Te Whanganui-a-Orotu were then attacked and fell. Most of the defenders of Parapara and Te Ihu o Te Rei near the old Keteketerau outlet were slain by invaders armed with pu (guns) and thereafter were known as Ngati Matepu (`those who die by the gun' (D37)).6 Te Pakake, `a communal gathering place in times of trouble' near the new Ahuriri outlet (see fig 5), was defended by those who had refused to accompany Ngati Whatuiapiti to Nukutaurua. They were mainly the local hapu of Ngati Kahungunu: Ngati Tuku a Te Rangi, Ngati Te Rangikamangungu, Ngati Hinepare, and Ngati Matepu, under Tareha, Tareahi, and other chiefs, assisted by Ngati Hawea and Ngati Kautere (H1:11-12).7 They also included Te Hapuku, then a young chief of Ngati Whatuiapiti, and Tiakitai of Ngati Kurukuru of Waimarama (H1:12, fn 42). The pa was taken with great loss of life, and the survivors took refuge with those who had migrated to Nukutaurua (D4:15-16).

For some years, hapu of the Ahuriri and Heretaunga remained at Mahia under the protection of the Ngapuhi chief Were Hauraki, who had settled there and become the acknowledged leader.8 At Mahia they participated in the flax and provisions trade with European shipping and onshore agents to acquire firearms, hardware, cloth, tobacco, and rum. The establishment of a shore whaling station at Mahia in 1837 gave them opportunities to engage in whaling operations, ship building, and sailing.

At the end of 1839, the missionary William Williams took up residence at Turanga and with his native teachers began regular visits to Maori settlements at Mahia. Entries in his Turanga journals indicate that from about this time Ahuriri chiefs and people began to return to their ancestral lands. Early in February 1840, the chief Tohutohu told Williams that he was going to visit his proper home at Ahuriri to see his people and look after his land. On his return, Tohutohu told Williams that he had found Europeans arriving in `great numbers' and had seen nine vessels. Captain Rhodes had made a nominal purchase from one chief, but the people were generally opposed to the selling of land and the principal chiefs were living upon Table Cape.9

3.2.3 Missionary activity

Ahuriri became the southern extremity of Williams's parish and was visited by a native teacher, Joseph, in June and July 1840. The following month, a chief asked Williams to send him 1000 books.10 At Ahuriri in October, Williams visited two small settlements of no more than 50 people and held two services, attended by not more than 100. Others, he was told, were scattered about on their cultivations or away hunting.

For the most part, Williams found the people willing to receive instruction and clamorous for books.11 At Ahuriri on 1 November 1842, he examined 20 Maori, of whom 10 passed for baptism. At Awapuni, native teachers had erected a 60-by-30-foot chapel:

As a missionary station Ahuriri will be highly important because though the population is not large, having been decimated by attacks from natives of the Waikato, yet there are several hundreds still remaining. It is a place moreover to which Europeans are likely soon to resort, where the natives unless taken special care of, will many of them fall a prey to temptation. (A12:66)12

Late in December 1844, William Colenso arrived to open a permanent mission station at Waitangi on 10 acres of land granted by the chiefs. A wilderness of swamp, it was utterly unsuitable for a place of residence. Initially, with the help of his native teacher, Renata Kawepo, his success was impressive, but by 1850 his dictatorial manner and methods had led to a break with Renata.13 The rate of conversion to Christianity at Ahuriri in the 1840s did not match the scale and speed of conversion on the east coast in the late 1830s, where Christianity had offered deliverance and protection from vengeful enemies.14 After the signing of the Treaty of Waitangi, chiefs and people looked more to the Queen and her officials, and to a respectable class of settlers, than to the missionaries to maintain peace, good order, and quiet living.

3.2.4 Extending the Treaty

In April and May 1840, when most of the people from the Ahuriri district were still at Nukutaurua, Williams was deputed by his brother Henry to obtain signatures to the Treaty of Waitangi from East Cape to Ahuriri. He informed Hobson that he intended to seek Treaty adherents among mixed tribal groupings south of Turanga at the end of July or in August, but for some undisclosed reason he did not pursue his intention.15

Meanwhile, on his way back north after obtaining signatures and proclaiming British sovereignty in the South Island, Major Thomas Bunbury put into shore in the *Herald* near the mouth of the Tukituki River on 23 June. Bunbury was trying to secure the signature of a Ngati Whatuiapiti chief, Te Hapuku, because, on 25 September 1839, he had signed the 1835 Declaration of Independence when he was visiting the Bay of Islands. At first Te Hapuku refused, alleging that Ngapuhi were now slaves through the Treaty, but Bunbury assured him that his signature could only increase his mana and a Ngapuhi chief present advised him to sign. This he did on board the *Herald* on 24 June.16

Mr Parsons cited evidence later given to the Native Land Court by F W C Sturm that Te Hapuku also signed with Puhara at Nukutaurua (D4:19). Although Sturm was at Nukutaurua in May 1840, when the Treaty was brought to the district,17 the story seems unlikely. Sturm did not witness the signing himself, and Te Hapuku later refused to sign. Mr Parsons went on to say that Te Hapuku, Harawira Te Mahikai, and Hoani Waikato

signed in June after the *Herald* entered Waipureku Harbour to the north of the Tukituki River and that documents supplied by the descendants of Harawira state that he signed on board the *Herald* in the harbour on 23 June. Mr Parsons also said that three other chiefs of Heretaunga signed: Te Tore of Petane, a Ngati Matepu chief, at Uawa; and Rawiri Paturoa and his brother Wiremu Te Ota of Ngati Upokoiri in the Manawatu. The seventh chief to sign was Matenga Tukareaho of Nuhaka (D4:19).

The Wai 55 claimants seek a finding that 'Ngati Kahungunu signed the Treaty' (1.2(d):4). On the basis of the evidence, it seems more accurate to say that Te Hapuku's signature was sought and obtained, and that four, possibly five, others signed, probably by chance. Williams left no record of having sought Treaty adherents at Nukutaurua, and most Ngati Kahungunu chiefs did not sign the Treaty, although they subsequently identified themselves with Te Hapuku and others who did.18

3.2.5 The return from Mahia and relocation

Figure 7: Wahi tapu sites. Based on the sketch map in A12 at page 131.

To Ngati Kahungunu living at Mahia, the Treaty held out the prospect of their being able to return to their ancestral lands in peace. No pa or kainga in use prior to the exodus were reoccupied. Places where blood had been spilt were wahi tapu (see fig 7). Understandably, people were still security conscious and chose to be within calling distance of each other, although they spent extended periods at flax growing swamps such as Lake Oingo, dressing flax to sell for firearms (D4:20). Parehe established the principal settlement at Te Awapuni, north of Waitangi across a stretch of water. Tareha of Ngati Parau abandoned Te Pakake and Pukemokimoki for Awatoto, just north of Awapuni, and used Te Koau (Gough Island) as a camping ground for fishing. Kurupo Te Moananui and Ngati Hawea established themselves at Waipureku, south of Waitangi. Ngati Hinepare and Ngati Mahu did not return to Ohuarau or Kouturoa but reoccupied ancestral lands at Te Poraiti and Wharerangi. Hapu who had occupied island pa at the northern end of Te Whanganui-a-Orotu abandoned them in favour of two locations further north: Kapemaihe near the beach on the south side of the present Esk River mouth and Petane on the north side (D4:21-23) (see fig 5).

3.2.6 The beginnings of peaceful trade and agriculture

From these new locations, close to the shores of Te Whanganui-a-Orotu and Te Matau a Maui (Hawke Bay), people resumed their regular seasonal fishing and food gathering expeditions for subsistence and gift exchange. They also began to supply pigs, potatoes, and other provisions to Europeans visiting or settling in the district in exchange for a widening range of trade goods.

In 1846 Alexander Alexander established a trading store at Onepoto and obtained a de facto Maori wife (A12:68). Later he entered into a partnership with the first grog seller, Ankatell, who arrived in 1849 (F9:5). Subsequently, he sold his store and went to live and farm among his wife's people, the Ngati Hinepare at Wharerangi.

In 1850 James McKain and his brother-in-law, William Villers, moved from Wellington to Ahuriri to trade with the Maori. Sarah McKain and Robin Villers, each with two children, followed and settled on the western spit.19

By 1851 there were tiny beach communities on both sides of the Ahuriri Harbour, one at Onepoto and one on the western spit, as well as half a dozen or so shore whaling stations strung around the coast from Mahia to Kidnappers. Each of these stations had two or three boats and 18 to 20 men.20 Being the only safe harbour between Wellington and Tauranga, and with a hinterland occupied by Maori, who were beginning to produce wheat, maize, fruit, vegetables, pigs, and potatoes for the European trade, Ahuriri Harbour had the potential to develop into a port town where both races mixed and mingled in the market place. But, as we shall see, the rapid advance of pastoralists from the Wairarapa was to overtake the development of Maori agriculture and trade, and the town and port of Napier were to become the centre of government, administration, and business for a pastoral province.

7. MAJOR BIBLIOGRAPHIC REFERENCES

Arvidson C, *Archaeology in New Zealand Volume 48, Number 3, September 2005,* Excavation at V23/21, Black Head, Porangahau.

Best E, *The Maori Pa; an account of the fortified villages of the Maori in the pre-European and modern times,* Wellington, Te Papa press, 2005

Buchanan J *The Māori history and place names of Hawkes Bay*, Reed, Gazetteer of Māori place, 1973

Matua H. *Hastings Maori Land Court Minute Book 1887* - Includes evidence of Henare Matua (Ngati Kere) at a hearing at Waipawa concerning the Porangahau Block. A copy of this minute book is held by the Tipene-Matua whanau, Pouwhakarae Trust.

Jones K & Tanner V *Archaeological Survey of the Southern Hawke's Bay coast from the air,* Department of Conservation, 2002

Foster J *Apihai Te Kawau*, Wellington, Department of Internal Affairs

Ballara A Te Hapuku, *Dictionary of New Zealand Biography*, 2006

APPENDICES

Appendix 1: Certificate of Title HB171/40 (highlighting proclamation 168618)

171/40

Vol. 171 fol. 40

Land and Deeds FORM No. 1

H.B. Vol. 111, Folio 21 (part)

References: Transfer No.

Order for N/C No. 116019

NEW ZEALAND

Register-book, H.B. Vol. 171, folio 40

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

LIMITED AS TO PARCELS

Under Part XII of the Land Transfer Act 1952

This Certificate, dated the [illegible] day of January one thousand nine hundred and fifty-nine under the hand and seal of the District Land Registrar of the Land Registration District of HAWKE'S BAY WITNESSETH that [illegible] of Porangahau Farmer

is seised of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial under written or endorsed hereon, subject also to any existing right of the Crown to take and lay off roads under the provisions of any Act of the General Assembly of New Zealand) in the land hereinafter described, as the same is delineated by the plan hereon bordered GREEN, be the several admeasurements a little more or less, that is to say: All that parcel of land containing [illegible] acres 1 rood and 33.7 perches more or less situate in Block XII of the Porangahau Survey District being part of Suburban Sections 49 and 33 Porangahau

District Land Registrar.

Blk XII Porangahau S. D

Scale 10 chs to an inch

9.9989 ha.

LIMITED AS TO PARCELS

Mortgage 135252 [illegible] to Thomas Richard [illegible] 1957 at 2.32 p.m.

DISCHARGED

Transmission [illegible] of Mortgage 135252 to Margaret Morgan [illegible] Walker, Widow and Ivat Thomas [illegible] Walker, Executors [illegible] at 2.24 pm

Transmission [illegible] entered 26.9.1961 at [illegible]

Proclamation 168618 taking part of within land containing 16 acres 1 rood and 16 perches coloured red on diagram hereon for soil conservation and river control purposes, Gazette No. 80 [illegible] 1961 produced [illegible] 12 1961 at 1.33 pm

Transfer 178597 of balance to [illegible] of Porangahau Widow produced [illegible] at [illegible]

Cancelled as to balance and C.T. Vol. A2 Fol. 1104 issued 26-6-1969 at [illegible]

CNC 179538.

CANCELLED

THIS REPRODUCTION (ON A REDUCED SCALE) CERTIFIED TO BE A TRUE COPY OF THE ORIGINAL REGISTER FOR THE PURPOSES OF SECTION 215A LAND TRANSFER ACT 1952

D.L.R.

171/40

enxi

Proclamation declaring land taken for soil conservation and river control purposes in Blk XII, Porangahau Survey District; extract from 14 December 1961, *New Zealand Gazette,* 1961, no 80, p 1905

[illegible] N.Z. Gazette, 14 Dec. 1961, No. 80, page 1905

Land Taken for Soil Conservation and River Control Purposes in Block XII, Porangahau Survey District

COBHAM, Governor-General

A PROCLAMATION

PURSUANT to the Public Works Act 1928, I, Charles John Lyttelton, Viscount Cobham, the Governor-General of New Zealand, hereby proclaim and declare that the land described in the Schedule hereto is hereby taken for soil conservation and river control purposes and shall vest in the [illegible] Catchment Board as from the [illegible] day of December 1961; and I also declare that this Proclamation shall take effect on and after the [illegible] day of December 1961.

SCHEDULE

HAWKE'S BAY LAND DISTRICT

ALL that piece of land containing [illegible] situated in Block XII, Porangahau Survey District, and being part [illegible] Sections 69 and 73, [illegible] as the same is more particularly delineated on the plan marked M.O.W. [illegible] deposited in the office of the Minister of Works at Wellington, and thereon coloured blue.

Given under the hand of His Excellency the Governor-General, and issued under the Seal of New Zealand, this [illegible] day of December 1961.

[L.S.] JOHN RAE, for the Minister of Works

God Save the Queen!

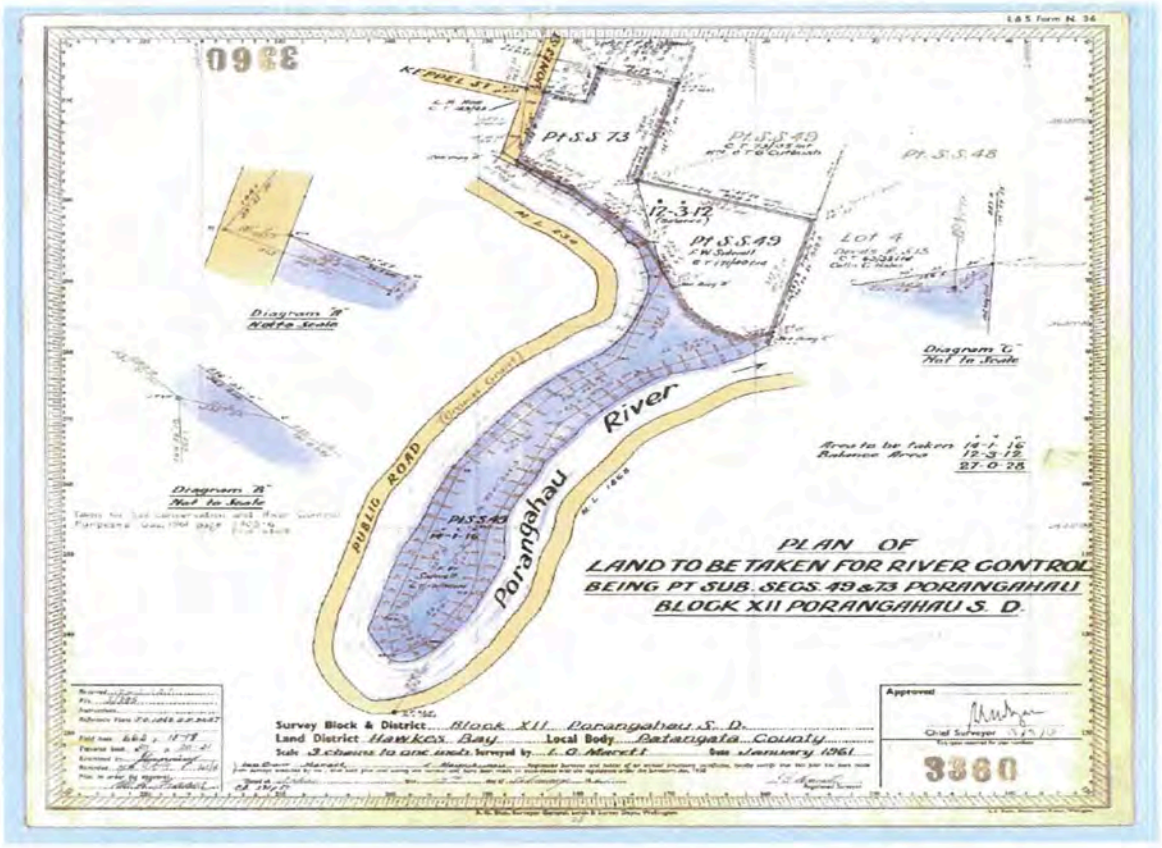
(P.W. [illegible])

[illegible] Government Printer, Wellington, New Zealand

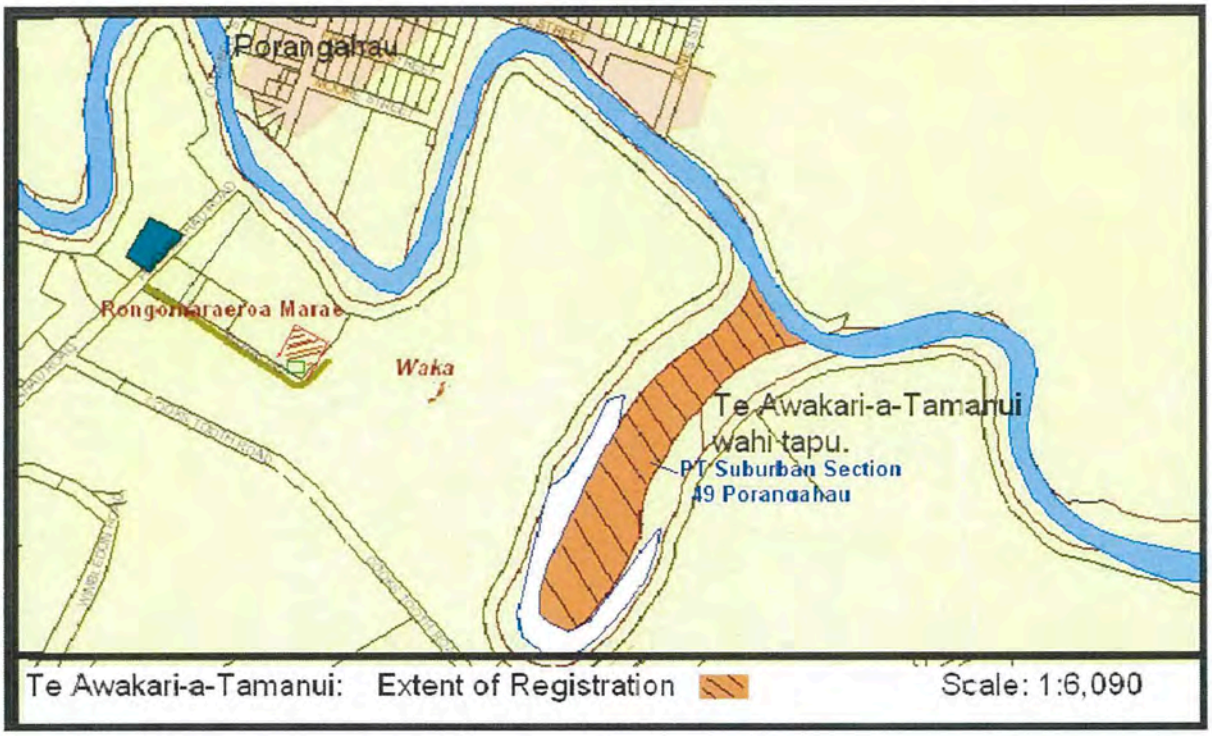
see note on attached P.W. file

NOTED ON
Plans [illegible]
S. O. Records [illegible]
L. T. Records [illegible]
Reg. Copy [illegible]
Dep. Copy [illegible]

SO 3360 Plan – LINZ 5 March 2007

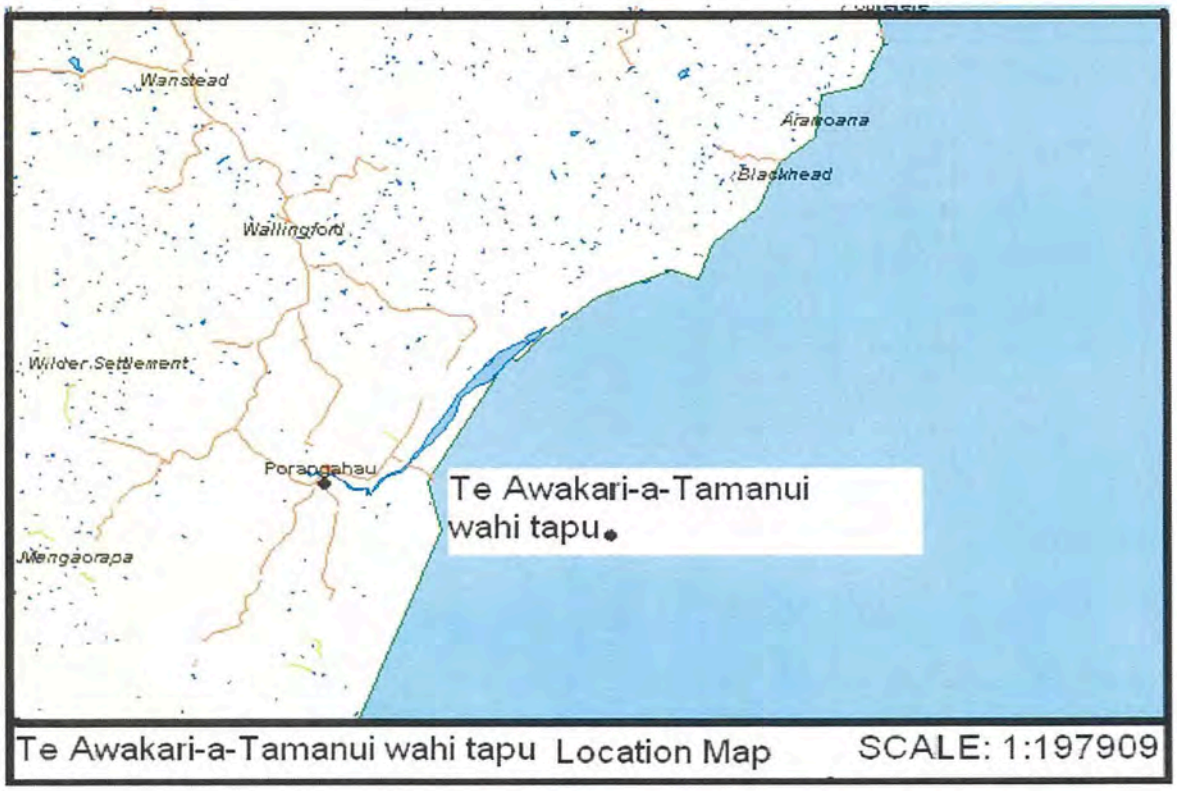


Appendix 2: Location information



(i) **Specific location map**

(ii) **General location map.**



Appendix 3: Photographs - Looking north easterly at Te Awakari a Tamanui

Kevin Jones, 1994, Aerial Photograph

Taure-Kai-Tai River (looking from the northern point of Te Awakari pa)

Looking South at a group of pits 234m south from Te Taure Kai Tai River.

Looking at one of the drain systems 376m south of Te Taure Kai Tai River.

Photographs, Anthony Tipene, 2005

Remmants of a waka tete

Looking north

Photographs, Anthony Tipene, 2005

Kevin Jones, 1994, Photographer.

Appendix 4: Other information including plans, drawings and supporting information

(i) New Zealand Archaeological association file report
(ii) Archaeological sketch of Te Awakari
(iii) Further documented history regarding the inter-tribal wars of New Zealand

(i) New Zealand Archaeological Association File

NZMS260 Map Number	V24
NZMS260 Map name	Porangahau
NZMS260 Map edition	1st 1978

Aids to relocation of site:
Site is on a long (500m) point in abandoned meander on the South side of the river accessed by Cooks Tooth Road, about 1km east of the intersection with the road to Porangahau/SH52.

Description of site:

- A single traverse ditch and bank 52m long and 8m wide from the inner edge of bank to outer edge of ditch.
- A possible entrance is at (A). An (earlier?) levelled ditch (B) separates an inner area of 85 by 46m.
- This ditch peters out on the down-river levee slope of the pa. The down river aspect of the site is comprised of a low terrace about 2m below the rest of the site.
- At (C) about 170, from ditch (A) is a group of 7 raised rim pits up to 7m in length. They are on a slightly raised area of terrace.
- The site lies on a Matawhero age terrace, therefore is likely to be less than 300 years old. In 1944 the river still ran past the site.

(ii)

(ii)

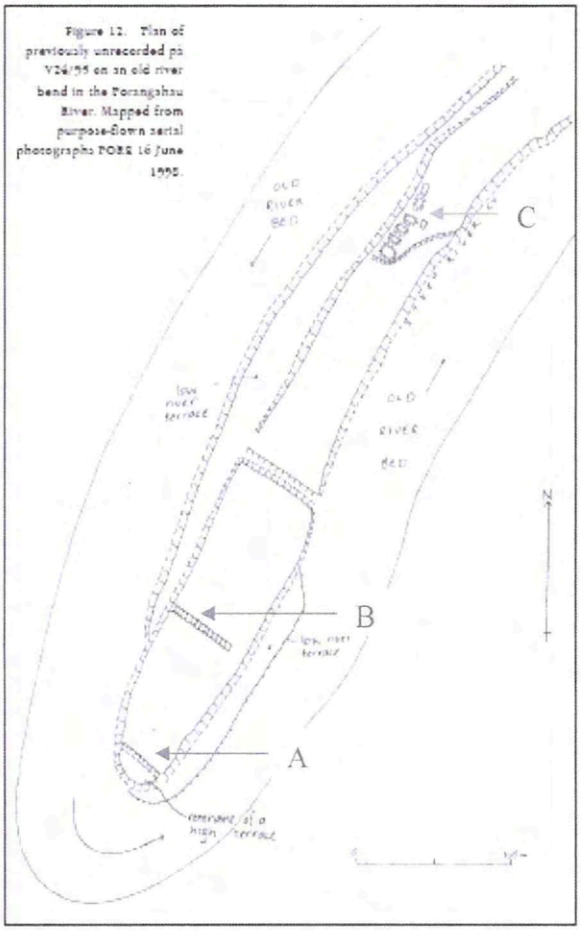


Figure 12. Plan of previously unrecorded pa V24/55 on an old river bend in the Tarangahau River. Mapped from purpose-flown aerial photographs FORE 16 June 1995.

(F) 10940402 00

PORANGAHAU OXIDATION PONDS

CULTURAL IMPACT ASSESSMENT

Prepared for

Hawkes Bay Regional Council

By

Anthony Tipene & Morry Black

September 2007

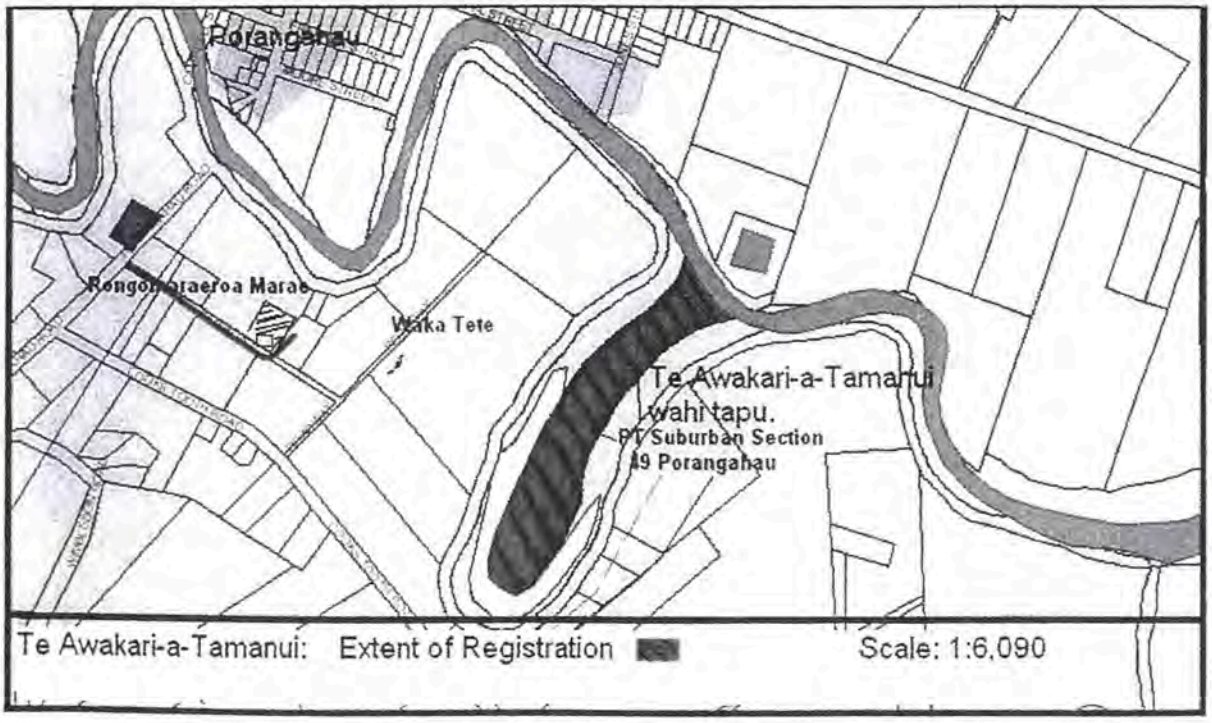
Heritage Landscape
Puketauhinu
Porangahau

Aerial Photograph 382m

6.8.2 Te Awakari a Tamanui

The Porangahau Township wastewater system is located approximately 250 metres from the end of Jones Street, around 50 metres from the Porangahau River. The adjoining land use is predominantly pastoral. It discharges through a strainer basket to a gravel filter built into a farm drain which discharges to a tidally influenced reach of the Porangahau River.

The Porangahau township Oxidation pond is located adjacent from two of our Pa sites, Te Awakari a Tamanui, (Te Pou o Pakiua, Te Papa) and Te Pa o Porangahau (Waipuna). These are both registered "Wahi Tapu" under the Historic Places Act 1993.



Te Awakari a Tamanui pa

The extent of the place registered as Te Awakari wāhi tapu is the former Pa site known as Te Awakari pa or Te Awakari a Tamanui Pa, located off Cooks Tooth Road, Porangahau.

Archaeologist Kevin Jones has summarised the extent of the place.

The site is located on a 500m long point in an abandoned meander on the south side of the river, (today, it is across the river from the township's sewage plant). It consists of a transverse ditches and bank cutting off point. The ditch is 52m long and 8m wide from the inner bank edge. The other, possibly earlier, levelled ditch is located 85m to the south; the ditches creating an inner area of 85x46m. This second ditch peters out on the down-river levee slope of pa. The down-river aspect of the site comprises a low terrace at a level about 2m below the rest of the site. At the northern end, 170m beyond the ditches on a slightly raised terrace area, there is a group of 7 pits. 5 of the pits are of the raised rim form, with some up to 7m in length.

The site lays on a Matawhero terrace i.e. a surface that was periodically flooded. The Porangahau River ran in the loop past this site as late as the 1960s.

General nature of the Wāhi Tapu

The general nature of Te Awakari or Te Awakari a Tamanui wāhi tapu is an old pā tūwatawata and site of a urupā.

Statement of values (traditional, spiritual.)

Te Awakari is a wāhi tapu in the traditional and spiritual senses.
Wahi tapu values associated with Te Awakari a Tamanui Pa include.

- Urupā – burial site
- Waka tapu – sacred waka
- Awakari drainage system
- Te Hokinga mai – repatriation/ historical significance

The Patuwatawata known as Te Awakari or Te Awakari was occupied by the ancestor Kere, his predecessors and his descendants. Te Awakari Pa was the last palisade pa occupied in this area, it was last occupied in the late 1840s.

Much of the archaeological evidence has disappeared due to ongoing floods and extensive pastoral farming. However, Archaeologist Kevin Jones believes hundreds may have occupied this area. The archaeology remains and the name of the site validates the ingenuity of the ancestor Tamanui.

Tamanui was one of the pioneering ancestors of the area whose Whakapapa has been lost but his efforts to establish an elaborate drainage system to save the gardens from constant flood is an amazing feat.
Henare Matua's historical accounts in the Māori land courts of the 1870's suggest that Tamanui was pre Kere times. The drain surface trenches are still evident today. The local hapū consider these drainage systems as a symbol of traditional resourcefulness.

Te Awakari is also a burial site for Te Korohu Matua one of the chiefs that remained on the land during the 1820's exodus to Nukutaurua. He was buried on this site among other Kaumatua returned to the last occupied pa site of the Porangahau district.

Ngāti Kere is one of the hapū associated with the extended tribes Ngai Te Whatuiapiti and Ngāti Kahungunu. In the early 1800s much of the region of Kahungunu and Te Whatuiapiti was abandoned and became a battle field between feuding tribes.

In the late 1700s and early 1800s saw a fundamental change in the character of Māori warfare. Before contact with Europeans the Māori, had no weapon which was effective at any great distance. Until the introduction of the musket, with the increase in the number of muskets available, and with more skill and experience in their use, the northern tribes, who had better opportunities of acquiring these weapons, became aware of the devastating superiority these Pu or muskets gave them. They embarked on a series of campaigns that shattered the more or less settled tribal district.

In the far north, Nga Puhi, of the Bay of Islands, were the first aggressors, but the people of Waikato and Hauraki were not long in following suit. In Heretaunga the invaders were mainly from the Waikato and Taupo.

Due to these musket wars in the 1820s in which Tuwharetoa, Raukawa, Ngāti Te Kohera and Waikato joined in the local hapū skirmishes which witnessed a migration of many hapū to Mahia and Nukutaurua for refuge and trade. All the pa in the Porangahau region deserted except Te Awakari. Ngāti Hamua and other hapū joined the local hapū at Te Awakari. Te Korohu the father of Wi Matua was one of the Chiefs that remained behind and survived this era, they were still at Te Awakari on the return of the tribe in 1843.

In the late 1830's led by the great Te Whatuiapiti Toa Pareihe and Te Wera, saw the return of Kahungunu and Whatuiapiti people to their homelands. In 1843, Ngāti Kere returned to Porangahau, a fleet of waka first landing at Kairakau staying at the pa of the area Kaimanawa. The next day they stopped at Parimahu then finally arrived at Pariwhakaruru. At Pariwhakaruru this ended Ngāti Kere's long journey and various Hapū gathered at Te Awakari in 1843 to welcome back those who had been in exile for no less then 20 years. Te Awakari is where they all stayed to celebrate their repatriation before moving onto their own areas. The principal chiefs of the time at Porangahau were Aperahama Te Whakaanga, Ropiha Te Takou and Hoani Matua.

In the early 1900's a waka-tete associated with this site of Te Awakari was hauled out of Te Taure-kai-tai River as it was considered to be a Taniwha and it was thought to be associated with many of the deaths that was occurring during that era. The waka was left abandoned and was never to be lifted as the Kaumatua of the time decided it was tapu and associated with makutu or spells and the waka has never been moved to date.

Te Awakari is an old Pa site and is significant to the local hapū as one of the principal pa, and last Pa last occupied by the Ngāti Kere people. To now have waste water and contaminant s discharged into the river from the oxidation pond on the other side of the river is seen as culturally and spiritually insensitive to Tangata Whenua.

File No: 1096-03950

Hazards and Contamination

Hazard Register

New Site ☑ Amendment to existing site ☐ (Circle choice)

Street No:		Street: Jones street			
Town:	Waipukurau	Waipawa	Otane	Takapau	(Porangahau)
	Te Paerahi	Kairakau	Rural		
Owner: CHBDC				Valuation No: 10940395 01	
Legal desription: Lot 1 DP 20711 BLK XII Pohui SD					
Building consent no:					
Resource consent no:					

Site Information:

☑ **Contamination:**

Asbestos	Bio-waste	Chemical waste	Dosing Strip
Offal	Petroleum products	Sewage holding tanks	
(Effluent ponds)	Timber chemicals		Sheep dip

☐ **Fill:**

Rubbish fill	Mixed concrete fill	Sawdust	Engineered fill

☐ **Flooding:**

Ponding	Flowing water	General flooding	HBRC flood zone

☐ **Industries:**

Bulk storage tanks	Car wreckers	Dry cleaners	Garages
Shop/paint/workshop	Taxidermy	Service station	

☐ **Types of landfill:**

Closed landfill	Current land fill	Private dump site	Transfer station

☐ **Quarry:**

Old gravel pit	Current gravel pit	General quarry

☐ **Unstable ground:**

Slip	Benonite

☑ **Data verified by:** _____

☐ **Data unverified**

Notes: _____

Data collected by: jo Date: 11/2/09

CENTRAL HAWKE'S BAY DISTRICT COUNCIL

PŌRANGAHAU AND TE PAERAHI WASTEWATER TREATMENT PLANT DISCHARGE

RESOURCE CONSENT AND ASSESSMENT OF ENVIRONMENTAL EFFECTS

August 2021

CHBDC, 2021:P:D.1

Pōrangahau and Te Paerahi Wastewater Treatment Plant Discharge Resource Consent Application and Assessment of Environmental Effects

Central Hawke's Bay District Council

This report has been prepared by the Central Hawke's Bay District Council with assistance and input from various technical advisors. No liability is accepted by Central Hawke's Bay District Council, any employee or sub-consultant with respect to its use by any other parties.

Task	Responsibility
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Prepared by:	Hamish Lowe, Katie Beecroft, Sam Morris
Reviewed by:	Darren de Klerk, Anna Lewis, Hamish Lowe
Approved for Issue by:	Josh Lloyd
Status:	Final

Central Hawke's Bay District Council
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Ref: PD.1-Porangahau-Te_Paerahi-Application _&_AEE-210827.docx

Revision Status: Final

Date: August 2021

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1 EXECUTIVE SUMMARY

1.1 Introduction, Consent and Project Highlights

This resource consent application is part of Central Hawke's Bay's "Big Wastewater Story", a vision and strategy for managing wastewater throughout the Central Hawke's Bay District (the District). This resource consent application provides a pathway to achieving the long-term goal of removing wastewater discharges from the Pōrangahau River and Te Paerahi coastal dune area. The Big Wastewater Story has a commitment to improving environmental health not just related to wastewater – but in a holistic way. A wider programme of actions aims to reduce direct discharges of wastewater to water across the District.

Central Hawke's Bay District Council (CHBDC) is responsible for the management of wastewater from the communities of Pōrangahau and Te Paerahi. Currently the Pōrangahau WWTP has a pond treatment system with treated wastewater being discharged via a wetland drain to the Pōrangahau River. The Te Paerahi WWTP has a pond treatment system with treated wastewater being discharged to sand dunes. The development of the discharge system of Pōrangahau and Te Paerahi's wastewater is proposed to be staged, with initial stages forming a short-term solution and a later stage being the long-term solution.

This resource consent application seeks to enable discharges from the two existing community WWTPs (short term solution) while a new combined long term WWTP and discharge system is built, and then the phasing out of the existing facilities (long term solution). This process is to be implemented in stages as shown below.

By way of background, a multi-stage consenting process has been undertaken. Due to the pending expiry of consents and the need to develop a long-term solution, transitional consent applications were submitted for continued discharges at Te Paerahi and Pōrangahau while the long-term solution was finalised. This was ensuring that s124 requirements were met. This application seeks to address the long-term land discharge aspects of the project and the continuation of the existing discharges while the long-term solution is being built. Once processed, this consent package will have superseded the earlier transitional application which can then be withdrawn.

Specifically, key actions include:

Short Term

- **Stage 0:**
  allows the existing discharges to occur for **up to 6 years** from **Te Paerahi** and **up to 9 years** from **Pōrangahau**;
- **Stage 1:**
  commences **within 4 years** and results in ceasing discharge to the coastal foredunes at Te Paerahi, and conveying the treated wastewater from Te Paerahi to the **New Discharge Property** located at 474 Beach Road. The treated wastewater from Te Paerahi is to be discharged via irrigation to 4 ha of farmland. Pōrangahau wastewater will continue with its existing discharge;
- **Stage 2:**
  commences **within 6 years** and results in treated wastewater from Pōrangahau being transferred to the same property which receives Te Paerahi wastewater. The irrigation system is to be expended to 10 ha. Discharge to the Pōrangahau River would almost cease except for wet weather events when irrigation was limited and river flow is above median;

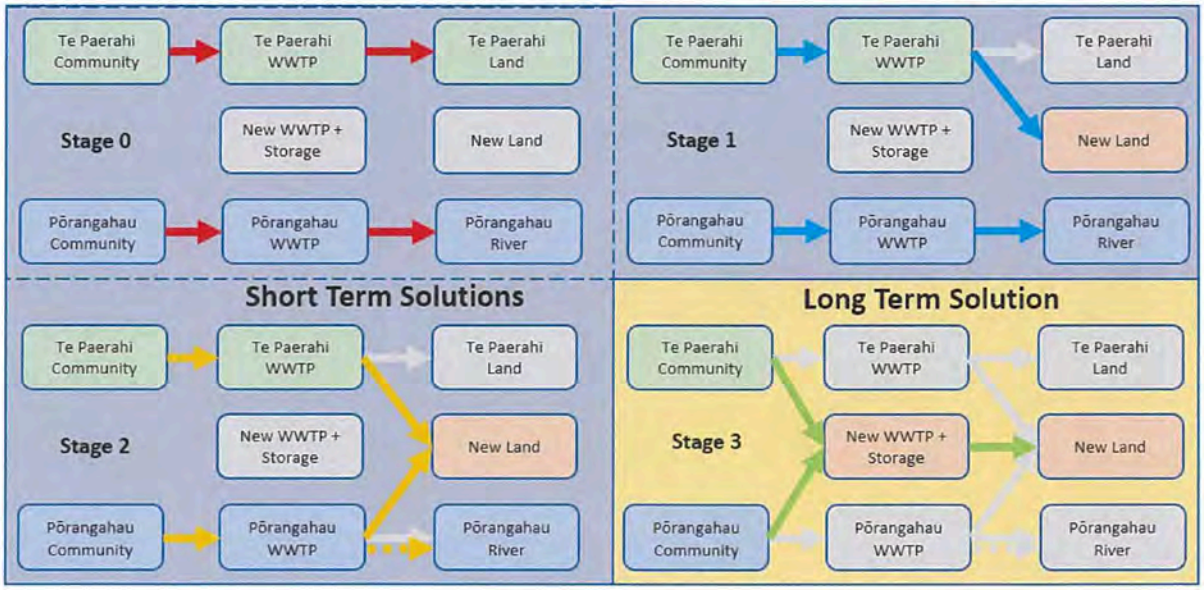
Long Term

- **Stage 3**
- commences **within 9 years** and includes the use of a new combined wastewater treatment system at the discharge property, and provision of storage for treated wastewater. The WWTPs at Te Paerahi and Pōrangahau will cease to be used for treatment and the pond at Te Paerahi will eventually be decommissioned. The irrigation area is to be expanded to at least 40 ha.

Each stage sees a progressive reduction in wastewater derived contaminants reaching the Pōrangahau River catchment and at Te Paerahi.

The solutions and stages are also be described in the following image:

Staging of the Te Paerahi and Pōrangahau Wastewater Upgrade



1.2 Objectives of Consents

The development of a preferred discharge option was driven by improving the environmental, cultural and social impact of the current discharges. Key objectives of the consents are:

- Avoid direct surface water discharge;

- Reduce nitrogen and phosphorus discharge to the river and coast;
- Exclude wastewater derived pathogens from surface water;
- Address iwi and community concerns; and
- Provide a solution that considers the long term and is appropriate for the location.

1.3 Setting

During the consenting process (prior to granting) for the existing resource consents for both communities, iwi gave a strong direction that wastewater discharge to the Pōrangahau River and culturally significant dunes should be ceased. CHBDC have subsequently entered into discussions and consultation with the community to progress changes to the treatment and discharge systems. The community reiterated the desire to avoid wastewater to these current receiving environments. This was reflected in an undertaking by CHBDC during this reconsenting process to determine a Best Practicable Option (LEI, 2021:P:C.12).

Discharge options were examined (LEI, 2021:P:C.12) and discharge to land emerged as the preferred means to cease the current discharges. Investigations were undertaken to determine the suitability of land within 10 km of the treatment plants to receive a wastewater discharge (LEI, 2020:P:B.11). Feedback was sought from the community and iwi regarding land areas that should be avoided. The result sees the development of a 100 % land based discharge system.

This consent application refers and relates to activities at and around three locations. These are Te Paerahi, Pōrangahau and the Discharge Property. Accompanying this consent application are a number of technical reports which outline the proposed activities. These documents have been produced as part of an iterative process and therefore have evolved over time, incorporating additional information and conclusions along the way. Additionally, over this period, the terminology used in reporting to describe these three locations has also evolved.

Te Paerahi refers to the Te Paerahi WWTP which includes the sand dune discharge field and all reticulation and treatment infrastructure. Pōrangahau refers to the Pōrangahau WWTP, the Pōrangahau River discharge, as well as all reticulation and treatment infrastructure associated with the plant. The Discharge Property refers to the location for future wastewater irrigation located at 474 Beach Road, Pōrangahau. Over the consenting process, the terminology to describe the Discharge Property in particular has varied, with previous names including, the site, discharge site and land application site, with each of these terms essentially all meaning the same thing.

1.4 Structure of the Application

This report is in support of the resource consent applications for the discharges of wastewater from the Te Paerahi and Pōrangahau communities. After setting out a description of the current wastewater system, this report details the long-term discharge solution proposed for the communities. An evaluation of the effects and planning considerations is then provided.

The preparation of these consent applications has been informed by work undertaken over the last two years and brings together a collective approach to wastewater management throughout the District.

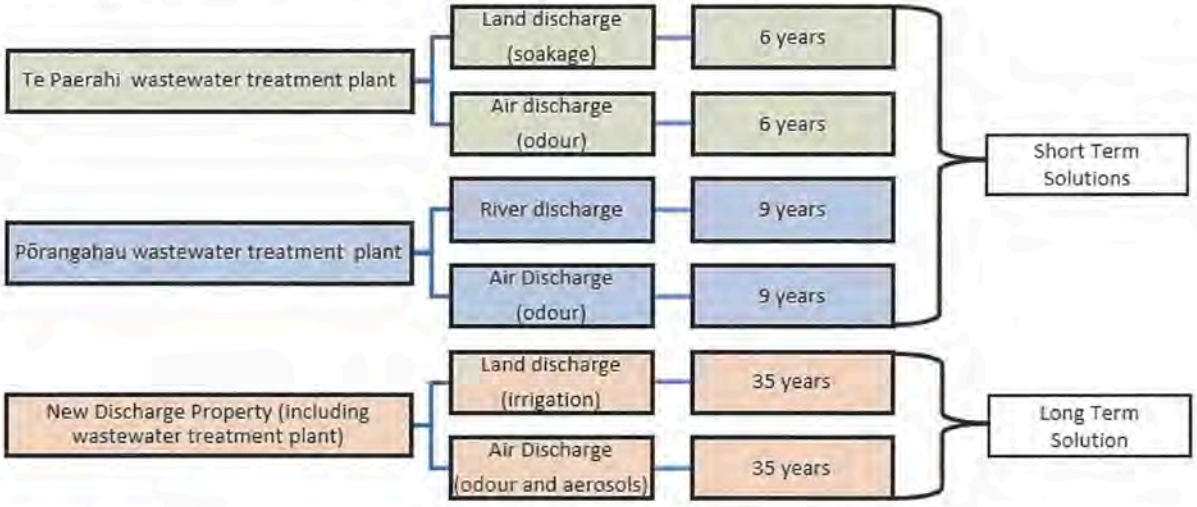
This document is a single report that summarises applications for discharges at the two communities using their current discharge regimes, and then adds a third component being a set of consent applications for a new discharge where wastewater is combined and discharged at a common location.

The following report serves as a summary bringing together a range of reporting. Rather than repeating, this document provides extensive referencing of supporting documents. It is intended to provide a summary and direct the reader to the relevant reports and text. While bringing together discretely separate but similar activities, the content and structure has been crafted to meet the requirements of Section 88 and Schedule 4 of the Resource Management Act (RMA).

A reference list is provided in Section 14, and in order to manage the bulk of reproduction and the overwhelming extent of documentation, only key reports are included with this document as appendices. Related documents not included are supplied electronically[1] and can be obtained upon request from CHBDC. A diagram showing the relationships between all of the reports that directly relate to the production of this application is presented in Figure A0 in Appendix A.

1.5 Resource Consent Requirements

This application provides a full assessment of effects seeking the following consents for the three groups of activities:



1.6 Consultation

During the previous consent process that saw the granting of the current consents, iwi gave a strong direction that discharge to the Pōrangahau River should be ceased. A preference for removal of the treatment system at Te Paerahi was also indicated, and this has subsequently been reinforced as an essential item to address the cultural sensitivity of the peninsula and its many wahi tapu. The Pōrangahau Environmental Management Team (PEMT) was established as a condition of the existing consents for both Pōrangahau and Te Paerahi and included representatives for Ngāti Kere, Ngāti Manuhiri, Ngāti Pihere and Puketauhinu. The PEMT identified potential treatment options for the two communities and recommended further investigation. Investigations were undertaken but were not able to be progressed at the time.

CHBDC have subsequently entered into discussions and consultation with the community since 2019 to progress changes to the two treatment and discharge systems. The community reiterated the desire to avoid wastewater in the Pōrangahau River and to move the Te Paerahi WWTP away from the current dune location. An updated investigation was carried out into the previously identified treatment options.

Discharge options were also examined. Discharge to land emerged as the preferred means to cease the current discharges. Feedback was sought from the community and iwi regarding areas that should be avoided.

CHBDC has connected with the community and iwi in a number of forums over the course of the current consent. This engagement is summarised in Section 7 of this application.

[1] Other referenced documents not included with this report can be obtained upon request from CHBDC.

1.7 Assessment of Environmental Effects

Te Paerahi - The overall effects of the wastewater discharges from the Te Paerahi wastewater treatment plant on the coastal environment will be less than minor to negligible. Following the removal of the Te Paerahi WWTP and discharge field, there will be zero effects on the coastal environment. Table 1.1a summarises effects.

Table 1.1a: Summary of Potential Risk and Actual Effects from Wastewater – Te Paerahi

		Sensitivity	Source / Contaminant			
			Organic matter Nitrogen Phosphorus	Pathogens	Water	Wastewater
Receptor / Pathway / Vector	Soil	Potential risk	Low	Moderate	High	N/A
		Actual effect	Less than minor	Less than minor	Less than minor	N/A
	Groundwater	Potential risk	High	High	Moderate	N/A
		Actual effect	Less than minor	Less than minor	Less than minor	N/A
	Habitat	Potential risk	High	Moderate	Moderate	N/A
		Actual effect	Less than minor	Less than minor	Less than minor	N/A
	Cultural	Potential risk	N/A	N/A	N/A	High
		Actual effect	N/A	N/A	N/A	Less than minor
	Air	Potential risk	Moderate	High	Moderate	N/A
		Actual effect	Less than minor	Less than minor	Less than minor	N/A

Pōrangahau - Overall, the effects of the wastewater discharges from the Pōrangahau wastewater treatment plant on the local receiving environment (Pōrangahau River) will be less than minor for of the majority of river flow conditions. However, during certain conditions there is a theoretical potential for moderate effects, namely faecal coliforms and nitrogen. Table 1.1b summarises the potential for effects.

Table 1.1b: Summary of Potential Risk and Actual Effects from Wastewater – Pōrangahau

		Sensitivity	Source / Contaminant			
			Organic matter Nitrogen Phosphorus	Pathogens	Water	Wastewater
Receptor / Pathway / Vector	Surface water	Potential risk	High	High	Low	N/A
		Actual effect	Less than minor	Less than minor	Less than minor	N/A
	Habitat	Potential risk	High	Moderate	Low	N/A
		Actual effect	Less than minor	Less than minor	Less than minor	N/A
	Cultural	Potential risk	N/A	N/A	N/A	High
		Actual effect	N/A	N/A	N/A	Less than minor
	Air	Potential risk	Moderate	High	Moderate	N/A
		Actual effect	Less than minor	Less than minor	Less than minor	N/A

Discharge Property - The overall effects of discharges at the new Discharge Property can be sufficiently mitigated through appropriate design such that the effects will be less than minor. Table 1.1c summarises the potential for effects.

Table 1.1c: Summary of Potential Risk and Actual Effects from Wastewater – New Discharge Property

			Sensitivity	Source / Contaminant			
				Organic matter Nitrogen Phosphorus	Pathogens	Water	Wastewater
Receptor / Pathway / Vector	Soil	Potential risk		Low	Moderate	High	N/A
		Actual effect		Less than minor	Less than minor	Less than minor	N/A
	Groundwater	Potential risk		High	High	Moderate	N/A
		Actual effect		Less than minor	Less than minor	Less than minor	N/A
	Surface water	Potential risk		High	Low	Low	N/A
		Actual effect		Less than minor	Less than minor	Less than minor	N/A
	Coast	Potential risk		High	Moderate	Moderate	N/A
		Actual effect		Less than minor	Less than minor	Less than minor	N/A
	Habitat	Potential risk		High	Moderate	Moderate	N/A
		Actual effect		Less than minor	Less than minor	Less than minor	N/A
	Cultural	Potential risk		N/A	N/A	N/A	High
		Actual effect		N/A	N/A	N/A	Less than minor
	Air	Potential risk		Moderate	High	Moderate	N/A
		Actual effect		Less than minor	Less than minor	Less than minor	N/A

1.8 Statutory Assessment

This report is prepared in accordance with s88 and the Fourth Schedule of the Resource Management Act 1991 (RMA). Appendix L provides the assessment of the activity against the objectives and policies of the relevant statutory plans and regulations addressing the Schedule 4(2)(2) and 104(1)(b) matters.

The proposal has been assessed against relevant legislation and planning documents in Section 5 and Appendix L of this application and is found to be in accordance with the identified statutory requirements and consistent with relevant plan provisions relating to surface water and groundwater quality, ecology, air quality and land management.

The proposal will contribute towards achieving beneficial social and cultural outcomes through the steady diversion of treated wastewater discharge from the river and dunes to adjacent farmland at the discharge property. The UV treatment and likely nutrient attenuation of treated wastewater through on-site soils will further contribute to water quality improvements for the Pōrangahau Catchment, thus, satisfying positive water quality directives outlined in the NPS:FM, the RCEP, and the future HBRC RRMP Plan Changes. The beneficial effects associated with the reduction of the direct discharge to the Pōrangahau River is consistent with the local community's, tāngata whenua and regional and national directives.

1.9 Positive Effects

1.9.1 Existing Systems

For Te Paerahi, positive effects relate to the ceasing of the discharge from Te Paerahi to culturally significant sand dunes. Environmentally, positive effects are relatively small due to the existing discharge having negligible effect to the environment.

For the Pōrangahau River, positive effects relate to the eventual ceasing of the surface water discharge, driven strongly by the local community and, regional and national directives. The potential benefits in a reduction of discharge to surface water are an improvement in water quality and habitat value,

improvements in the cultural health of the water ways and the communities' relationship (amenity and recreational) with the waterway.

1.9.2 New System

The long-term discharge to land results in positive effects resulting from wastewater passing through the soil profile at a rate which allows for filtration, absorption and beneficial use of wastewater components (nutrients, contaminants and water), providing mitigation and avoidance of environmentally adverse effects. The adoption of a land discharge regime achieves the beneficial use (for plants and soil biota) and retention (by soil storage) of wastewater components, thereby minimising their release into the groundwater or the surface water environment.

This consent achieves a multitude of positive effects environmentally, culturally and socially for the Pōrangahau and Te Paerahi communities. This consent enables wastewater nutrients to be beneficially returned to the land where they were once derived, increasing land productivity and closing the wastewater loop.

2 CONSENTING OVERVIEW

2.1 Summary of Te Paerahi and Pōrangahau Wastewater Discharges

At Pōrangahau, wastewater is conveyed from the community to the oxidation pond adjacent to the Pōrangahau River at the end of Jones Street for treatment. Wastewater is discharged to a small drain flowing into the river.

At Te Paerahi, wastewater is conveyed from the community to the oxidation pond within coastal sand dunes. Wastewater is discharged from the plant to a small discharge field via soakage.

At both WWTPs, over the course of the current consents, regular testing has occurred which has been used to predict future flows and wastewater quality. A detailed evaluation of the existing systems, alongside flow and quality characteristics is provided in Beca (2020:P:C.10 - Te Paerahi and Pōrangahau Options Report).

Following new population growth projections, future wastewater flows and quality were revised and are described in the memo Beca (2021:P:C.16). The future predicted flows will be used for design of the long-term land discharge regime. The proposed long term discharge for wastewater flows incorporate 2057 population projections and are as follows:

- Te Paerahi - Average annual and daily wastewater volumes of 27,010 m^3/year and 74 m^3/day; and
- Pōrangahau - Average annual and daily wastewater volumes of 160,000 m^3/year and 438 m^3/day.

2.2 Historic and Existing Resource Consents

Te Paerahi

The Hawke's Bay Regional Council (HBRC) granted resource consent for discharges at the Te Paerahi WWTP on the 14th May 2012 (Consent No. DP030234La). This was to enable CHBDC to discharge treated domestic wastewater from the Te Paerahi oxidation pond into or onto land (via soakage) in circumstances where that contaminant may enter water (Beca, 2020:P:C.10).

The consent authorises no more than 87 m^3/day for more than 50% of the time nor 190 m^3/day for more than 5% of the time, of treated effluent to be discharged over any 12 month period. This consent expired on the 31 May 2021.

HBRC granted resource consent for the Te Paerahi WWTP on the 22nd October 2009 (Consent No. DP030862a) for the CHBDC to discharge contaminants (odour) to air associated with the operation of the Te Paerahi (Pōrangahau Beach) oxidation pond. This consent expired 31 May 2021.

Pōrangahau

HBRC granted resource consent for discharges at the Pōrangahau WWTP on the 22nd October 2009 (Consent No. DP030233W). This was to enable the CHBDC to discharge treated domestic wastewater from the Pōrangahau oxidation pond into or onto land (via soakage) in circumstances where that contaminant may enter water (Beca, 2020:P:C.10).

The consent authorises no more than 130 m^3/day for more than 50% of the time nor 415 m^3/day for more than 5% of the time, of treated effluent to be discharged over any 12 month period. The consent expired on the 31 May 2021.

HBRC granted resource consent for the Pōrangahau WWTP on the 22nd October 2009 (Consent No. DP030861a) for the CHBDC to discharge contaminants (odour) to air associated with the operation of the Pōrangahau Township oxidation pond. The consent expired 31 May 2021.

Transitional consents for the continuation of the discharges at each of the WWTPs were lodged with HBRC on the 26th of February 2021. These consents allow for the existing discharges to occur whilst a land application regime is investigated, designed and consented. Processing of these transitional consents has been suspended pursuant to Section 37A (2)(b) whilst land discharge consents are lodged.

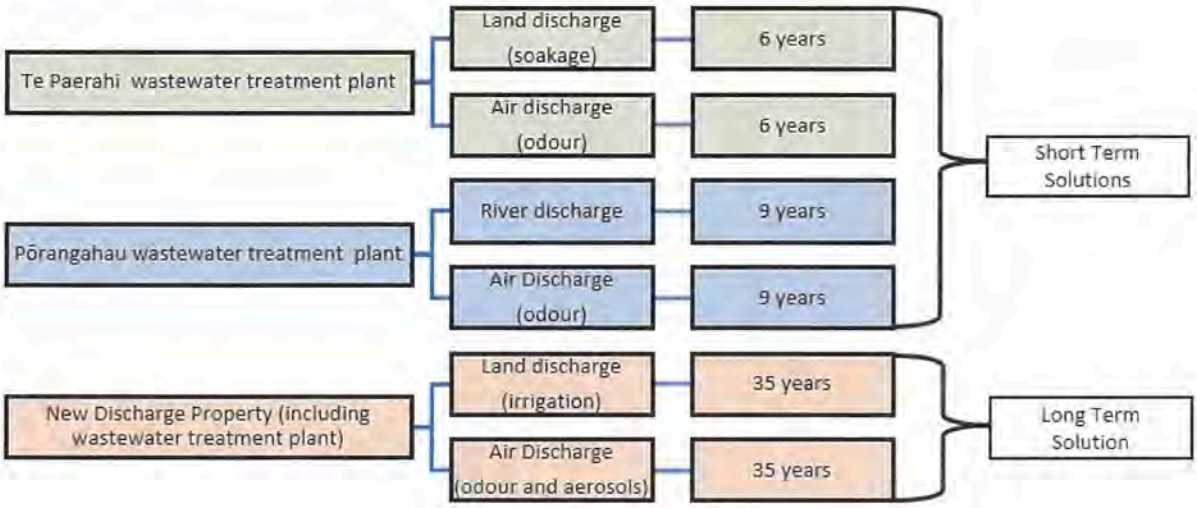
2.3 Terminology

This consent application refers and relates to activities at and around three locations. These are Te Paerahi, Pōrangahau and the Discharge Property. Accompanying this consent application are a number of technical reports which outline the proposed activities. These documents have been produced as part of an iterative process and therefore have evolved over time, incorporating additional information and conclusions along the way. Additionally, over this period, the terminology used in reporting to describe these three locations has also evolved.

Te Paerahi refers to the Te Paerahi WWTP which includes the sand dune discharge field and all reticulation and treatment infrastructure. Pōrangahau refers to the Pōrangahau WWTP, the Pōrangahau River discharge, as well as all reticulation and treatment infrastructure associated with the plant. The Discharge Property refers to the location for future wastewater irrigation located at 474 Beach Road, Pōrangahau. Over the consenting process, the terminology to describe the Discharge Property in particular has varied, with previous names including, the site, discharge site and land application site, with each of these term essentially all meaning the same thing.

2.4 Resource Consenting Requirements and Activity Status

The figure below provides a summary of the activities for which consent is sought from each of the three wastewater treatment plants and their term.



Below is the activity status and Hawke's Bay Regional Resource Management Plan (RRMP) and Regional Coastal Environment Plan (RCEP) provisions that relate to the proposed activities for each WWTP that consent is being applied for –

Activity	Plan/Status	Rule
Te Paerahi WWTP		
Treated wastewater Discharge to Land relating to the discharge field	RRMP- Discretionary Activity	Rule 52 – Non-compliance with other Rules – Discharge to Land/Water
The discharge of contaminants into air from any industrial or trade premises arising from any of the following activities (waste disposal), that is not specifically regulated by any other rule within this Plan.	RRMP – Discretionary Activity	Rule 28 - Miscellaneous industrial & trade premises – Discharge to Air
The discharge of contaminants onto or into land, and any ancillary discharge of contaminants into air, in the Coastal Margin from any existing wastewater system with a rate of discharge exceeding $2m^3$/day averaged over any 7 day period	RCEP – Restricted Discretionary Activity	Rule 29 Existing high discharge volume wastewater systems

Pōrangahau WWTP		
Treated wastewater discharge at the Pōrangahau WWTP	RRMP - Discretionary Activity	Rule 52 - Non-compliance with other Rules – Discharge to Land/Water
The discharge of contaminants into air from any industrial or trade premises arising from any of the following activities (waste disposal), that is not specifically regulated by any other rule within this Plan.	RRMP – Discretionary Activity	Rule 28 - Miscellaneous industrial & trade premises – Discharge to Air

Combined Discharge Property		
Treated wastewater Discharge to Land relating to the discharge field	RRMP- Discretionary Activity	Rule 52 – Non-compliance with other Rules – Discharge to Land/Water
Discharges of contaminants not regulated by, or not complying with, other rules. The proposed activity does not meet the conditions of the permitted activity rules of Rule 19 (Discharge of contaminants to land that may enter water) and Rule 28 (New wastewater systems). Therefore, the activity defaults to a discretionary activity under Rule 9.	RCEP- Discretionary Activity	Rule 9 – Discharges to land in the Coastal Margin

As identified in Section 5 and Appendix L, **consent is required as a Discretionary Activity for all three WWTP discharges**.

2.5 Permitted activity considerations

Rule - RRMP	Comment
Rule 7 - *Vegetation clearance and soil disturbance (Permitted)*	Any vegetation clearance and soil disturbance required for the proposed works will need to be assessed against the permitted standards of Rule 7. However, thrusting, boring, trenching or mole ploughing associated with cable or pipe laying or a **network utility operation** is excluded from this rule.
Rule 21 - Waste & other matter, excluding industrial & trade premises (Permitted) The discharge of contaminants into air arising from the storage, use, transfer, treatment or disposal of waste and other matter, excluding: - discharges into air from any industrial or trade premises; - discharges into air addressed by other Rules in this Plan; and - discharges into air from moveable sources	The wastewater treatment plants are captured in the definition of industrial or trade premises, and subsequently any discharges to air are excluded from consideration under Rule 21.
Rule 31 Discharge of water (Permitted) The discharge of water (excluding drainage water) into water.	The discharge of water to water from any dewatering activities will need to be assessed against the permitted standards of this rule. However, there are no dewatering activities proposed as part of this consent application.
Rule 37 New sewage systems (Permitted) Except as provided for in Rule 35 or Rule 36, the discharge of contaminants (including greywater) onto or into land, and any ancillary discharge of contaminants into air, from a new sewage system	*New* sewage systems and discharges need to be assessed against the permitted standards of this rule. The proposed land discharge area and discharge volumes exceed the conditions in this Rule. Hence resource consent is being sought as a discretionary activity under Rule 52 (refer to section 2.3).
Rule 42 Diversion and discharge of stormwater (Permitted)	There are no stormwater discharges into constructed open drainage system or a piped stormwater drainage system.
Rule 49 Discharges to land that may enter water (Permitted) The discharge of contaminants onto or into land, in circumstances which may result in those contaminants (or any other contaminant emanating as a result of natural processes from those contaminants) entering water.	The discharge to land from the leakage of the existing unlined pond is provided for under this permitted activity rule. The technical assessments regarding hydrogeology and surface water quality provide evidence of meeting the permitted activity conditions of this rule.
Rule RCEP	**Comment**
Rule 19 Discharge of contaminants to land that may enter water (Permitted)	Discharges to land need to be assessed against the permitted standards of this rule. The proposed land discharge volumes exceed the conditions in this Rule. Hence resource consent is being sought as a discretionary activity under Rule 9 (refer to section 2.3).
Rule 28 New wastewater systems (permitted)	New sewage systems and discharges need to be assessed against the permitted standards of this rule. The proposed land discharge area and discharge volumes exceed the conditions in this Rule. Hence resource consent is being sought as a discretionary activity under Rule 9 (refer to section 2.3)

2.6 Other (Including Future) Consents and Approvals

A multi-stage consenting process is being undertaken. CHBDC lodged transitional consent applications for each of the existing Pōrangahau and Te Paerahi community discharges in February 2021 to allow for the long-term discharge described by this consent application to be refined. This was ensure that s124 requirements were met.

This application seeks to address the long term land discharge aspects of the project and the continuation of the existing discharges while the long term solution is being built. Once processed, this consent package will have superseded the earlier transitional application which can then be withdrawn.

Following the grant of this consent the process includes detailed design, construction and commissioning of the new treatment plant and discharge system. It is anticipated that additional consents relating to the construction activities and proposed infrastructure will be sought following confirmation of detailed design requirements.

3 PROJECT BACKGROUND

3.1 Development of a District Wide Wastewater Strategy

CHBDC is committed to the health, safety, and wellbeing of the Central Hawke's Bay community. In September 2020 around 2 years of community consultation and technical investigations culminated in the delivery of a district wide Wastewater Strategy (CHBDC, 2020:A:O.3, #theBIGWasteWaterStory). The overarching goal of the strategy is to:

> *The Wastewater Strategy developed and set out in this report outlines a process to achieve our vision for resilient and sustainable wastewater management for the next 50 years. The Strategy's aim is to ensure that wastewater systems in the district are developed to be managed efficiently, effectively and sustainably, with one eye on the present and one eye on the future. It will serve as a guide to inform the Council's asset management and planning processes surrounding wastewater.*

The Wastewater Strategy aligns with Council's THRIVE objectives (https://www.chbdc.govt.nz/our-council/about/project-thrive/). The Strategy provides a cohesive and long-term vision for wastewater management across the district's six reticulated communities (Waipawa, Waipukurau, Otane, Takapau, Pōrangahau and Te Paerahi). The Strategy outlines 5 lynchpin projects for wastewater management in the district. Development of long term wastewater solutions for Pōrangahau and Te Paerahi is Project 2.

The long-term planning for Pōrangahau and Te Paerahi follows the process outlined by the strategy. This includes the use of a series of subsequent phases as follows:

- Phase A: Engagement;
- Phase B: Data gathering;
- Phase C: Optioneering/Concept;
- Phase D: Consent;
- Phase E: Design;
- Phase F: Procure;
- Phase G Construct; and
- Phase H: Commission and Operate.

Following this phasing structure enables the Pōrangahau and Te Paerahi project to be developed, consented and implemented in a logical and incremental manner. The phases are represented in the reporting codes for all documentation associated with the consent application. Each report has a prefix representing the community (Pōrangahau/Te Paerahi = P), followed by the phase reference (Phase A to D) and then a unique report code. Figure A0, Appendix A lists the reports associated with this consent application and shows how they relate to this phasing structure.

This consent approach enables the development of a wastewater management system which meets Council's wider infrastructure strategy of d*urable infrastructure which outlines principles of "dig once" and "no bandaids", "Smart Growth" and "Environmentally Responsible".*

3.2 Development of a Long Term Solution

CHBDC has run a community stakeholder engagement programme over the last three years to consider options for managing wastewater at Waipawa and Waipukurau. The output of this programme was extended and covered all the Council's six sewered communities. Further to this work was the development of a strawman (LEI, 2020:P:C.36), being a programme of works that could see wastewater at each of the communities being discharged to land. This included Pōrangahau and Te Paerahi, and while

Te Paerahi is currently to land, it was proposed to consider alternative locations due to sensitivities with wahi tapu at the current discharge location.

This Strawman approach, and a review of potential discharge options (Beca, 2020:P:C.10), has subsequently led to the development of long term options. These options have been articulated with the community and are summarised in Beca (2020:P:C.10).

The options provide for a progressive change in wastewater management, namely ceasing discharges and ultimately treatment at Te Paerahi, the same at Pōrangahau, and the combining of the sewers from both communities to a new treatment plant and combined land application scheme.

The initial step is to redirect the existing wastewater discharges to a common land discharge property, leading to the ceasing of the current discharges.

3.3 Long Term Plan

In order to develop an alternative discharge solution funding is required, and a staging process of changing over time assists with managing funding. Staging is set out in a Conceptual Design report (LEI, 2020:P:C.36). The key change is the setting up of a new land treatment system and reticulating initially Te Paerahi wastewater, followed by Pōrangahau's wastewater to this new discharge property. Ceasing treatment and creating a new treatment system is intended to come at a later date, albeit within a 9 year planning window.

The ability to implement change is primarily limited by funding. Council has through their 2021-31 Long Term Plan allocated $17.6 M over the next 9 years, with the full system to be commissioned by 2030.

3.4 Development of the Best Practicable Option

The RMA consenting process has a requirement to demonstrate that a Best Practical Option (BPO) has been considered and is being sought. This requires an evaluation of alternatives and justification provided as to why one option is preferred over another.

A BPO report has been prepared (LEI, 2021:P:C.12) and provides options and rational for selecting the preferred option, being the continuation of the existing discharges while a new land based discharge system is commissioned.

4 RECEIVING ENVIRONMENT

4.1 Pōrangahau River Catchment

Detail of the Pōrangahau River catchment is provided in Appendix I (Beca, 2021:P:D.25), with a summary below.

The Pōrangahau River catchment is approximately 705 km^2 and located in the south-eastern corner of the Hawke's Bay Region (Figure 4.1). The Pōrangahau River is known locally to Māori as the Tāurekaitai River. The catchment is constrained by a series of low hill country (~400 m above sea level); it stretches inland from the coast to Flemington and from Blackhead Beach in the north to the Hawke's Bay – Manawatu – Wanganui Regional boundary in the south.

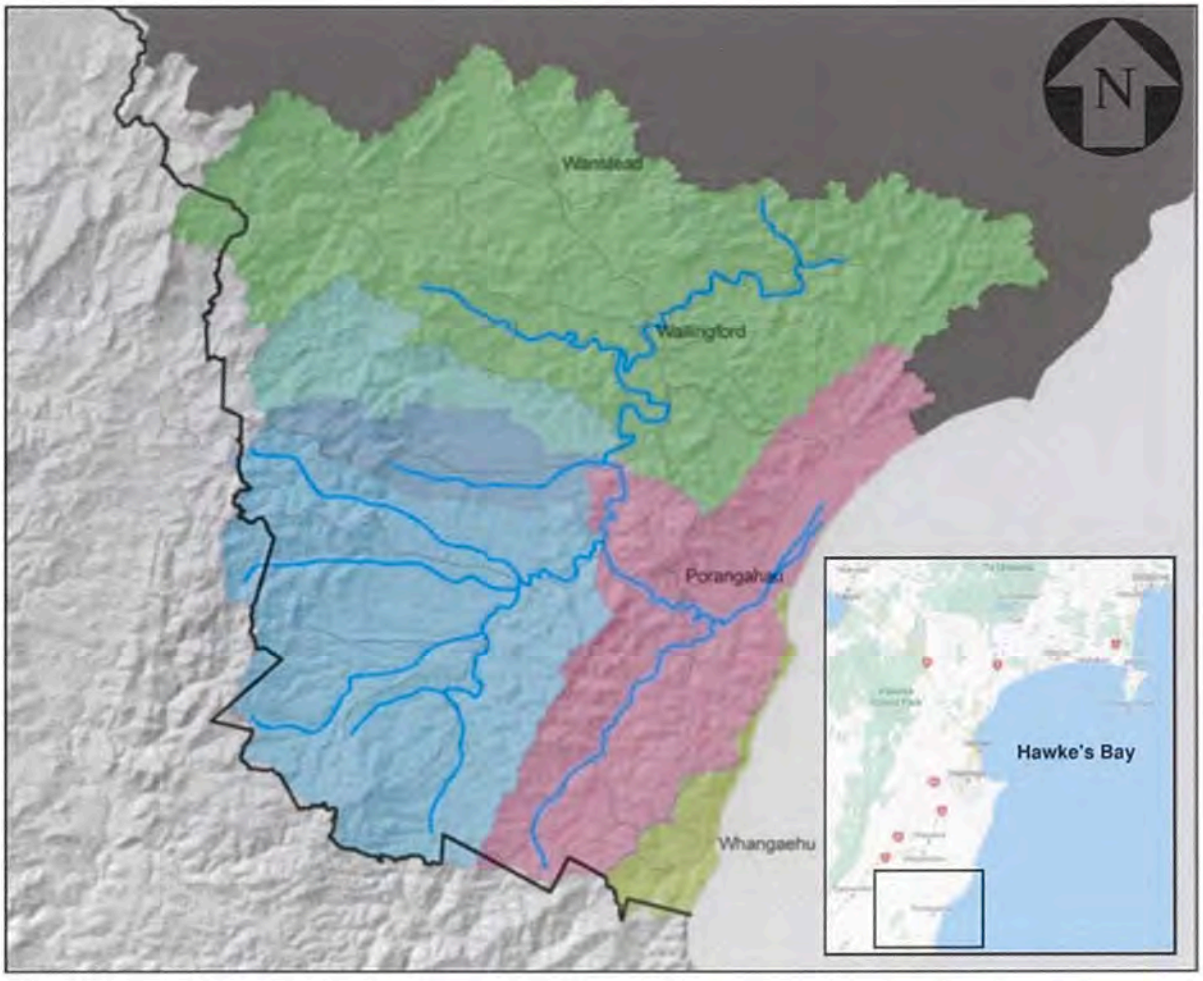


Figure 4.1. Pōrangahau River catchment zone and sub-catchments (Reed & Ide, 2012).

Land use in the Pōrangahau River catchment is predominantly sheep and beef farming. A small amount of forestry, deer, cropping and one vineyard are also present in the catchment. Rainfall is moderate with typically 1,200 mm per year in the lower areas to over 2,200 mm in the higher country. Additionally, the catchment is prone to prolonged summer dry spells.

The Pōrangahau River catchment is underlain by predominantly soft marine sedimentary rocks from the Palliser (lower) and Mangatu (Wanstead Formation) Groups.

4.2 Pōrangahau River Hydrology

Detail of the Pōrangahau River hydrology is provided in Appendix I (Beca, 2021:P:D.25) with a summary below.

The flow in the Pōrangahau River is subject to extremes. HBRC monitor flow conditions at Saleyards Bridge, approximately 6 km upstream of the Pōrangahau WWTP discharge. The median flow is 1.312 m^3/s, the highest flow recorded is 456 m^3/s and low flows of nil are not uncommon. Very low flows are recorded in summer, with flows of less than 0.1 m^3/s common.

The section of the Pōrangahau River around the Pōrangahau WWTP discharge is strongly influenced by the tides with a measured difference between high and low tide of approximately 0.5 m. This tidal influence is stronger during late summer when the contributing flows from the river catchment can decrease below 100 L/s. The river is considered typically saline at the point of discharge for the Pōrangahau WWTP under background, low flow conditions.

4.3 Pōrangahau River Water Quality and Recreational Use

The Pōrangahau River is used by fishermen, kayakers and passive recreation users, predominantly upstream of the WWTP discharge. Shellfish collection at the mouth of the river also occurs.

Water quality in the Pōrangahau River is analysed in detail in Appendix I (Beca, 2021:P:D.25). In summary, the Pōrangahau River is nutrient enriched and water quality worsens downstream. The median values of Total Phosphorus (TP), Dissolved Reactive Phosphorus (DRP) and Total Nitrogen (TN) at a monitoring location 200 m upstream from the Pōrangahau WWTP discharge point are above their respective ANZECC trigger values which indicates a consistent contribution of these nutrients exists in the upstream catchment (ANZECC, 2018). Diffuse agricultural runoff is assumed to be the major contributor of dissolved nutrients and bacterial contamination.

Elevated bacteria levels (E.Coli and faecal coliforms) upstream of the discharge point appear to be a significant issue. The 95th percentile of monitoring data analysed for E.coli (collected between 2014 – 2019, 200 m upstream of the Pōrangahau WWTP discharge point) is 1,644 cfu/100mL, which is classified as a Band D attribute state under the National Policy Statement for Freshwater Management (NPS:FM) and equivalent to a predicted average infection risk of >3% for recreational human contact. The median value for E.coli concentrations is significantly lower at 96 cfu/100mL (equivalent to a Band A under the NPS:FM, with a predicted average infection risk of 1%).

4.4 Pōrangahau River Estuarine Environment

Detail of the Pōrangahau River estuarine environment is provided in Appendix K (Beca, 2021:P:D.65) with a summary below.

The Pōrangahau estuary is a long and narrow estuary that becomes shallow and more open to the north where it spreads across broad tidal flats. A long sandy beach separates the estuary from the open coast, and with the estuary discharging through the beach to the open coast in the northeast. The estuary entrance is relatively mobile and moves along the beach in response to changes in coastal sand movement, wave action and river flow (Stevens & Robertson, 2006). It is strongly river dominated in its upper reaches.

An Area of Significant Conservation Value (ASCVs) was identified by the Department of Conservation and is adopted as a Significant Conservation Area 1 (SCA 1) and an Outstanding Water Body (Pōrangahau Estuary) within the Hawkes Bay Regional Coastal Environment Plan (Harper, 2018). The area extends along the coast and up to the coastal marine boundary alongside the Discharge Property. The SCA is as a nationally significant wildlife and fisheries habitat and supports nationally significant dune vegetation

types. The estuary, adjacent dune systems and wetlands have been identified as a recommended area for protection within the Eastern Hawke's Bay Ecological District.

The ecological value of the Pōrangahau estuary is assessed as Very High based on high ratings for rarity/distinctiveness (ecologically significant for native fishery and threatened avifauna) and representativeness (Significant Conservation Area), and moderate ratings for ecological context, diversity and pattern.

4.5 Te Paerahi Coastal Environment

Details of the Te Paerahi Coastal environment are provided in Appendix N (Beca, 2021:P:D.60) with a summary below.

The Pōrangahau River flows into the Pacific Ocean at Pōrangahau Beach, approximately 2 km north of the Te Paerahi WWTP. The section of Pōrangahau Beach adjacent to the Te Paerahi WWTP is scheduled as a Significant Conservation Area in the *Hawke's Bay Regional Coastal Environment Plan*. Additionally, coastal areas are of significance to tāngata whenua both spiritually, and as a source of resources such as food, weaving and carving materials, and will continue to be a source of sustenance and identity to tāngata whenua.

Ngāti Kere, a local hapu, are concerned about the depletion of important species and kaimoana in the area (Wakefield & Walker, 2005). Mana for the hapu is maintained in the ability to share in the abundance of kaimoana, including shellfish collected from Pōrangahau Beach.

Detail of coastal waters near the Te Paerahi discharge as it relates to public health is provided in Appendix N, with a summary below.

The Te Paerahi community is largely a holiday destination and is located beside Pōrangahau Beach. During summer months, the Te Paerahi population swells and people engage in recreational activities, such as swimming, boating and fishing. HBRC monitor water quality fortnightly at Pōrangahau Beach during summer months as it is popular with swimmers and boaties: historical water quality results show "*it has excellent water quality and is generally not affected by changes in the weather*" (LAWA, 2021). The maximum enterococci value from the last five years of sampling was 115 cfu/100mL.

Kai moana, including shellfish, collected from Pōrangahau Beach is culturally important to local hapu Ngāti Kere. A report (Wakefield & Walker, 2005) produced on behalf of Ngāti Kere in 2005 notes that as Te Paerahi (Pōrangahau) Beach has become less isolated and better known, the pressures of tourism are increasingly visible. Activities such as land yachting, fishing competitions, horse races, unlimited vehicular beach access and an increasing number of recreational vessels launching from the beach are of concern to the hapu because of the potential impact on shellfish and wet fish populations.

4.6 Pōrangahau River Ecology Near Current WWTP Discharge

Detail of the Pōrangahau River ecology is provided in Appendix I, with a summary below. Its location is shown in Figure 4.2.

The Pōrangahau River and Estuary have been designated as outstanding water bodies by HBRC under Proposed Plan Change 7 due to their ecological, significant landscape, cultural and spiritual values. According to HBRC (2019):

> *The Pōrangahau Estuary is the largest and least modified estuary in Hawke's Bay. The river mouth barrier system is the largest barrier system in Hawke's Bay and the surrounding dune system demonstrates a rare cross-cutting relationship of a series of echelon sand dunes and estuarine strand lines. The Pōrangahau River and Estuary supports large population of wrybill and banded dotterel and is the only location where Caspian terns and royal spoonbill nest. It is an important*

feeding and wintering area for migratory waders. The Pōrangahau Estuary has two main īnanga spawning sites and the only estuary in Hawke's Bay to contain the seagrass, zostera muelleri. Tāngata whenua of the region have advised that the Pōrangahau River and Estuary have outstanding cultural and spiritual values.

Previous investigations (Opus, 2012) have classified water quality adjacent to and upstream of the WWTP discharge as generally poor. Low quality habitat for freshwater macro-invertebrates is attributed to the soft and silty tidally influenced riverbed rather than pollution effects.

4.7 Discharge Property

The property that will receive wastewater irrigation is described as the Discharge Property. A detailed discussion of the Discharge Property that is proposed to receive wastewater is given in the Site Investigation report (LEI, 2020:P:B.15) and is summarised in the Assessment of Effects to Land (LEI, 2021:P:D.10). Figure 4.2 outlines the location of the Discharge Property with respect to the existing Pōrangahau and Te Paerahi WWTPs. Key receiving environment parameters are given in Table 4.1.

Figure 4.2: Location Map

Table 4.1: Discharge Property - Information

Location	474 Beach Road, Pōrangahau
Area	114.3 ha
Legal Description	LOT 2 DP 3877 & LOT 3 DP 2741
Records of Title	HBE3/424 & HBE3/423
Map Reference	1910345 E, 5533282 N & 1910729 E, 5533831 N
Current Land Use	Pastoral grazing, low intensity rotational cropping
Surrounding Land Use	Pastoral grazing, low intensity rotational cropping
Landform	Wind-blown sand dunes & alluvial floodplain
Soil type(s)	Kairaki Sandy Loam & Kaiapo Silt Loam
Nearest surface water body	Pōrangahau River
Average annual rainfall	912 mm
Average annual potential evapotranspiration	909 mm
Wind conditions	Dominant wind direction from south-west

4.7.1 Locality and surrounding land use

The Discharge Property land use is described in further detail in LEI (2021:P:B.13) and LEI (2020:P:B.15). In summary, the Discharge Property is currently managed as low intensity sheep and beef finishing, with rotational cropping of chicory, raphno, turnips and oats for stock feed. Pastoral grazing is dominant across the Discharge Property. Similarly, the Discharge Property is surrounded to the north, west and south by farmland of largely low to moderate intensity sheep and beef finishing and rotational cropping.

Approximately 400 m east of the Discharge Property boundary is the CHBDC operated Pōrangahau and Te Paerahi Water Treatment Plant (WTP) servicing both communities. Behind this, a further 200 m eastward of the WTP is the Pōrangahau Country Club and Golf Course. Additionally, approximately 400 m north-west of the Discharge Property boundary is the Pōrangahau aerodrome.

4.7.2 Soils

Soils of the discharge property are described in LEI (2020:P:B.15) and LEI (2021:P:D.10). Areas with similar characteristics have been grouped into land management units (LMU). Key characteristics of the LMU across the Discharge Property are summarised in Table 4.2.

Table 4.2: Discharge Property - Soil Types

LMU	Parameter	Description	
LMU 1	Area (ha)	50.8	
	Landform	Southern alluvial plain	
	Soil type	Kaiapo Silt Loam (Flax_69a.1)	The clay soil noticed contained a 30 cm deep, silty loam topsoil with a nutty/crumb structure, overlying a heavy clay. Rooting depth was to ~40 cm with the barrier limiting rooting depth being the clay layer. There were no signs of anoxic conditions, other than mottling within the clay layer, indicating a varying water table. The topsoil contained minimal clay content, which is likely to have had a low P retention and a poorly drained permeability status.
	LUC[1]	III	
	K_{sat}[2]	37 ± 28 mm/h	
	K_{-40}[3]	11 ± 4 mm/h	
LMU 2	Area (ha)	16.5	
	Landform	Northern sand/alluvial plain	
	Soil type	Kairaki Sandy Loam (Association)	For lower elevation land to the north-east, the same heavy clay layer noticed in the south, was located deeper at approximately 60 cm depth. Overlying this is a silty/sandy topsoil, with fine roots to 50 cm. Topsoil at this location appears similar to that noticed on the central sand dunes, however pasture growth here is significantly higher. It is likely that its position on the landscape influences this soil to the north-east and is thus deemed an association. Due to being positioned at a lower elevation, it is influenced by both the deposition of the Pōrangahau River depositing the lower lying clay layer, which has subsequently received wind-blown sandy material supplying the dunes.
	LUC[1]	III	
	K_{sat}[2]	88 ± 22 mm/h	
	K_{-40}[3]	9 ± 4 mm/h	
LMU 3	Area (ha)	39.9	
	Landform	Central Sand Dunes	
	Soil type	Kairaki Sandy Loam (Kyra_15a.2)	This soil is classified as being a raw soil with a sand texture with no barrier to rooting depth. This soil is deep and well drained with a rapid permeability profile. This soil contains a very low profile available water, with fine roots noticed to ~ 45 cm. This soil extends throughout much of the north and central extent of the property, occupying the steeper slopes typical of sand dunes.
	LUC[1]	VI	
	K_{sat}[2]	124 ± 17 mm/h	
	K_{-40}[3]	18 ± 2 mm/h	

[1]Land Use Capability
[2]Soil saturated hydraulic conductivity
[3]Soil unsaturated hydraulic conductivity

4.7.3 Geology and Hydrogeology

Details of the topography, underlying geology and property characteristics are given in (Tonkin + Taylor, 2021:P:B.14a & LEI, 2020:P:B.15). The Discharge Property is located on the alluvial floodplain of the Pōrangahau River which extends from the Pōrangahau township to the river mouth. The alluvial plain is bounded to the south and north-west by steep hill country, underlain by Late Cretaceous to Paleogene aged sedimentary mudstones typical of the Whangai Formation (GNS, 2021). The floodplain is derived from erosion of these hills and is relatively confined, primarily consisting of poorly draining silty and clayey soils (GNS, 2021).

Near to the coast, overlying this alluvial floodplain are a series of westerly wind-blown coastal sand dunes. Two distinctive dune ridgelines, 2-3 m higher than the surrounding plain run throughout the northern

portion of the property (LEI, 2020:P:B.15). Overall, elevations across the Discharge Property vary between 1-8 m.a.s.l*.

*Lidar imagery provided by HBRC contained a z value of +10 m which has been accounted for within elevation imagery and numbers supplied within this report.

4.8 Cultural and Heritage Values

There is a strong history of Māori settlement in the wider area of Pōrangahau dating back to pre-European times. These is also a more recent history of early European settlement in the area that saw land developed leading to its current land use.

Nigel How prepared a summary report titled Māori World View (How, 2020:A:B.42) that describes Māori connection with wastewater. This is an informative document as it provides an overview in so far as various states of water as they relate to wastewater management.

In addition, Council have recently engaged the preparation of a Cultural Impact Assessment (CIA) covering off the significance of the local area and wastewater management considerations. A further report detailing Mahinga kai, particularly addressing the accessibility, use and practices associated with gathering food resources in the areas around the Pōrangahau area, is also being commissioned.

These two reports are yet to be provided to Council, but will be made available to support the applications when ready.

4.9 Amenity, Community, Recreational, and Social Values

The Te Paerahi discharge area is located in back dunes away from the foreshore. Fences around the area exclude public access. Visually, the ponds are obvious, but the discharge is not apparent as it is subsurface.

The Pōrangahau WWTP is located some 300 m from Pōrangahau School and accessed over privately owned land. The WWTP is located close to the riverbank and while walking the riverbank could be possible it would be difficult due to limited access points and its steep banks in places. The discharge is via a drain, similar in characteristics to many drains that enter the river.

4.10 Natural Hazards

Key natural hazards likely to influence the existing WWTPs and Discharge Property are flooding, tsunami and earthquakes.

4.10.1 Earthquake

Earthquakes will impact on both communities and if significant enough potentially cause a failure of the wastewater treatment plant and storage pond walls. Such an event is also likely to create significant structural damage to other infrastructure, including the sewer system conveying the wastewater to the ponds.

There are no active faultlines within proximity to the Discharge Property or either of the WWTPs (HBRC, 2021). Additionally, GNS (2021) outlines an inactive faultline running along the hills parallel to the coast south of Te Paerahi.

4.10.2 Tsunami

The existing Te Paerahi WWTP and discharge field, as well as the alluvial plain to the north-east and stream channels of the discharge property fall within the red zone for tsunami inundation as identified in HBRC

(2021) and shown in LEI (2020:P:B.11). The remainder of the Discharge Property, as well as the existing Pōrangahau WWTP falls within the yellow zone for inundation.

4.10.3 Flooding

Due to being situated on the alluvial floodplain of the Pōrangahau River, all of the Discharge Property is classified by HBRC as being at risk of flooding (LEI, 2021:P:D.10). Flood modelling done by HBRC for a 100 year return period flood, indicates that much of the land outside of the central coastal sand dunes is classified as being 'flood risk areas' with the remaining property area deemed to be 'low risk' for flooding.

Additionally, discussions with the landowner identified that during the February 2004 floods much of the lower elevation alluvial floodplain of the Pōrangahau River was partially or fully inundated by flood waters.

5 STATUTORY CONTEXT

A Statutory Evaluation for Te Paerahi and Pōrangahau WWTP's and the new combined land Discharge Property has been prepared and is included in Appendix L. The relevant statutory provisions for the WWTP's are summarised below.

5.1 Section 9 of the Resource Management Act 1991 (RMA)

Section 9 of the RMA describes certain restrictions on land use. This includes activities that contravene Regional Rules (RMA s9(2)a)) such as the discharges described in Chapter 6 of this report. Activities that contravene regional rules cannot be undertaken unless expressly allowed for by resource consent, as such resource consent is being sought to allow for the activities associated with this proposal.

5.2 Section 15 of the Resource Management Act 1991 (RMA)

Section 15 of the RMA describes restrictions on the discharge of contaminants into the environment. No person may discharge any 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 (s15(1)(b)). The discharge of contaminants cannot be undertaken unless it is expressly allowed by a national environmental standard or other regulations, a rule in a regional plan or a resource consent. As such resource consent is being sought to allow for the discharge activities associated with this proposal.

5.3 Section 104 of the Resource Management Act 1991 (RMA)

Before making a decision on a discretionary activity pursuant to Section 104B of the RMA, Council must consider the proposal in terms of Section 104 of the RMA. In addition to an assessment of the actual and potential effects of the proposal, the following provisions must be given regard to under section 104 as stated below:

> *Section 104 - When considering an application for a resource consent and any submissions received, the consent authority must, subject to Part 2, 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.*

Consistent with s104 (a), the actual and potential effects on the environment of the proposed activity for Te Paerahi and Pōrangahau have been assessed in Chapter 9 (Te Paerahi), Chapter 10 (Pōrangahau) and Chapter 11 (Combined land application Discharge Property) of this report.

Consistent with s104 (b), Appendix L identifies the relevant provisions of the documents referred to in Section 104(1)(b) of the RMA that apply to the various activities involved in the proposal; these being the New Zealand Coastal Policy Statement, Regional Policy Statement and Regional Coastal Environment Plan as they apply to the Coastal Environment, and the National Policy Statement for Freshwater Management and Regional Plan as they apply to the freshwater/land environment. The documents listed in section 104(1)(b) have been assessed in Appendix L.

5.4 Section 105 Matters relevant to certain applications

Section 105 of the RMA refers to certain applications (discharges and coastal consents) that require information in addition to the matters set out in section 104(1). Section 105 states:

1) If an application is for a discharge permit or coastal permit to do something that would contravene section 15 or section 15B, the consent authority must, in addition to the matters in section 104(1), have regard to—

(a) the nature of the discharge and the sensitivity of the receiving environment to adverse effects; - **provided in Chapter 4***; and*

(b) the applicant's reasons for the proposed choice; - **provided in Chapter 3** *and*

(c) any possible alternative methods of discharge, including discharge into any other receiving environment. **– provided in Chapter 8.**

The section 105 matters have been addressed in the relevant chapters noted above.

5.5 Section 107 Restrictions on grant of certain discharge permits

Section 107 of the RMA sets out certain restrictions on specific discharge consents including discharge of contaminants to land and/or water (Te Paerahi and Pōrangahau) and/or the coastal environment (Te Paerahi and the combined land Discharge Property).

(1) Except as provided in subsection (2), a consent authority shall not grant a discharge permit or a coastal permit to do something that would otherwise contravene section 15 or section 15A allowing—

(a) the discharge of a contaminant or water into water; **provided in Chapter 10** *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; – **provided in Chapter 9, 10 and 11** *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, — **N/A**

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: - **N/A**

(d) any conspicuous change in the colour or visual clarity: - **N/A**

(e) any emission of objectionable odour: - **provided in Chapter 9, 10 and 11**

(f) the rendering of fresh water unsuitable for consumption by farm animals: - **N/A**

(g) any significant adverse effects on aquatic life. – **provided in Chapter 10 and 11**

The relevant matters set out in section 107 have been addressed in the chapters noted above.

5.6 Part 2 Assessment

Part 2 matters of the RMA are relevant to the proposal and are addressed in Appendix L. This includes Section 6 – Matters of National Importance, Section 7- Other Matters and Section 8 – Treaty of Waitangi.

5.7 New Zealand Coastal Policy Statement (NZCPS)

The relevant provisions of the New Zealand Coastal Policy Statement (NZCPS) have been considered for Te Paerahi and the combined land Discharge Property and are included in the Statutory Evaluation (Appendix L). This is not relevant to the Pōrangahau discharge.

5.8 National Policy Statement – Freshwater Management (NPS – FM)

The National Policy Statement for Freshwater Management 2020 (NPS-FM) came into force on the 3rd September 2020 and supports improved freshwater management in New Zealand by directing Regional Councils to establish objectives and set limits for fresh water in their regional plans.

The intent of the NPS-FM includes prioritisation of the management of the natural and physical resources and has a particular focus on the concept of Te Mana o Te Wai. Te Mana o Te Wai refers to the fundamental importance of water and recognises that protecting the health of freshwater protects the health and wellbeing of the wider environment.

The relevant provisions of the NPS - FM have been considered for Te Paerahi, Pōrangahau and the combined land Discharge Property discharge activities and are included in the Statutory Evaluation (Appendix L).

5.9 National Environmental Standards for Freshwater (NES – F)

The National Environmental Standards for Freshwater 2020 (NES-F) regulates the undertaking of activities that pose risks to freshwater and freshwater ecosystems and rules specifically relate to works in, or adjacent to, wetlands, structures in waterbodies that may impact on fish passage and the diversion or reclamation of water bodies. The works meet the definition of specified infrastructure in the NPS-FM (Subpart 3 Section 3.21(1)) as the WWTP is a lifeline utility (as defined in the Civil Defence Emergency Management Act 2002).

The relevant provisions of the NES - F have been considered for Te Paerahi, Pōrangahau and the combined land Discharge Property discharge activities and are included in the Statutory Evaluation (Appendix L).

5.10 National Environmental Standards for Sources of Human Drinking Water 2007 (NES-DW)

The National Environmental Standard for Sources of Human Drinking Water 2007 (NES- DW) sets requirements for protecting sources of human drinking water from becoming contaminated. Contaminants such as microorganisms can pose a risk to human health when they enter drinking water supplies and that water is then consumed. The NES-DW requires regional councils to ensure that effects of activities on drinking water sources are considered in decisions on resource consents and regional plans.

Regulation 12 of the NES-DW sets out that when considering a resource consent application, a consent authority must consider whether the activity may lead to an event occurring that may have a significant adverse effect on the quality of the water at any abstraction point; or as a consequence of an event (for example, an unusually heavy rainfall) have a significant adverse effect on the quality of the water at any abstraction point.

The relevant provisions of the NES - DW have been considered for the combined land Discharge Property discharge activities and are included in the Statutory Evaluation (Appendix L).

5.11 Regional Resource Management Plan (RRMP)

The relevant provisions of the Regional Resource Management Plan (RRMP), which includes air discharge activities, have been considered for Te Paerahi, Pōrangahau and the combined land Discharge Property discharge activities and are included in the Statutory Evaluation (Appendix L).

5.12 Hawke's Bay Regional Coastal Environmental Plan

The relevant provisions of the Hawke's Bay Regional Coastal Environmental Plan have been considered and included in the Statutory Evaluation (Appendix L) for the Te Paerahi discharge and combined land Discharge Property (this is not relevant to the Pōrangahau Discharge).

6 DESCRIPTION OF ACTIVITIES

6.1 Discharge Context

CHBDC is required under Local Government legislation to provide wastewater services as part of its sanitary and community health and well-being purpose. The existing systems at Te Paerahi and Pōrangahau were constructed in 1990, with the complete installation of the plants and additional components such as fencing, baffles and earth bunds provided in 2010 (Beca, 2020:P:C.10). The WWTPs are authorised under resource consents DP030234La and DP030233W respectively, with both expiring on the 31st of May 2021. Community engagement has identified that the existing systems are no longer acceptable from a cultural and community perspective for the long-term management of wastewater at these locations.

At Te Paerahi, there is a strong desire from the owners (Puketauhinu Trust) of the land on which the WWTP (and discharge) is located to have the system relocated. The main reason is that the area is considered wahi tapu.

At Pōrangahau, the community holds the view that discharging to the Pōrangahau River is no longer considered acceptable and a discharge to land is desirable. There is a strong desire to have more advanced wastewater treatment technology used and a new combined WWTP location for both communities.

To address those concerns a range of treatment and effluent discharge options were developed that provided a sustainable long-term solution that meet the needs of the environment and the community These are discussed in Section 8 and in the BPO report (LEI, 2021:P:C.12). CHBDC has engaged with relevant stakeholders and has identified a land discharge regime and property as outlined in Section 4 to receive the wastewater. Changes proposed will see discharges to the existing receiving environments be significantly reduced and eventually ceased, with irrigation from both communities to land being the primary receptor for the wastewater. In the long term, discharge to land will be assisted with the use of storage.

6.2 What's proposed

The development of the discharge system for Pōrangahau and Te Paerahi's wastewater is proposed to be staged, with initial stages forming a short-term solution and a later stage being the long-term solution. This allows for a rapid reduction in the amount of treated wastewater discharged via the current discharge systems to the respective receiving environments, while managing the costs to Council and the time for procurement and construction to occur. Detail around the staging of the Project is outlined in the Conceptual Design report (LEI, 2021:P:C.15). A summary is as follows:

- **Stage 0** allows for the current discharge for both communities to their respective receiving environments to occur for up to six years at Te Paerahi and nine years at Pōrangahau from consent granting while the subsequent stages are enacted;

- **Stage 1** (commencing in 4 years) involves provision of 500 m^3 of storage within the Te Paerahi WWTP and development of a minimum 4 ha on the new Discharge Property. This stage **only** includes Te Paerahi flows and applies all to the new Discharge Property, while the existing river discharge for Pōrangahau will continue.

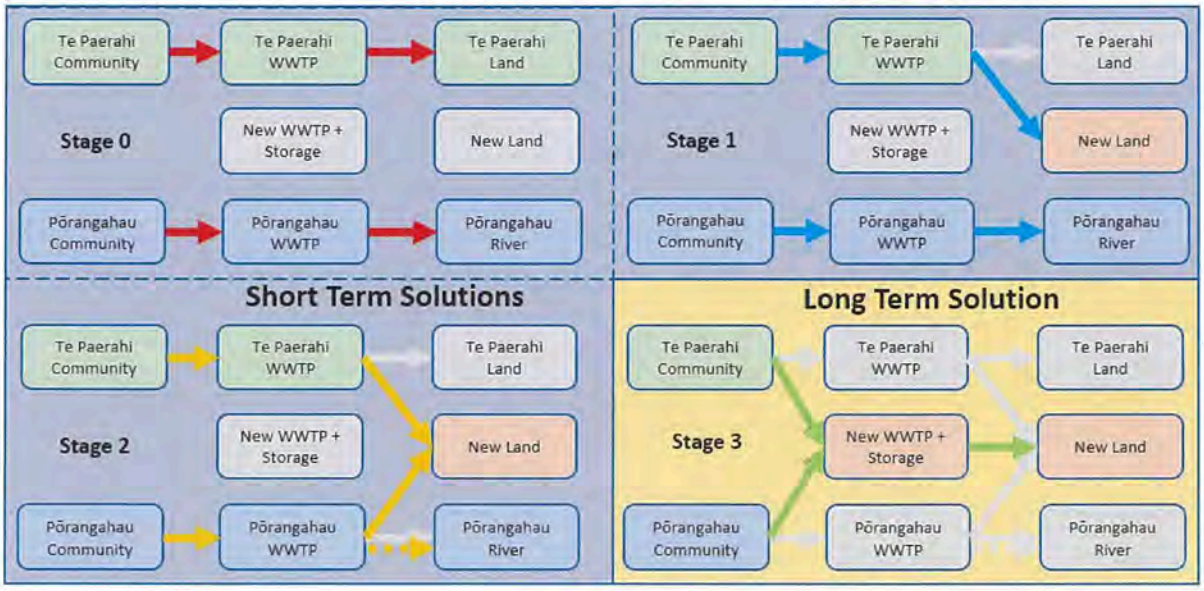
  The discharge regime assumes that the currently occurring wastewater flows occur (no allowance for future growth), up to 500 m^3 of storage is available at the Te Paerahi WWTP and discharge under a wet soil regime can occur when soils cannot receive wastewater under typical irrigation conditions;

- **Stage 2** (commencing in 6 years) involves development of an additional 6 ha of irrigation for sandy soils (IMU 3), allowing for a minimum 10 ha of irrigation at Stage 2. This stage includes **both** Pōrangahau and Te Paerahi flows, but allows for between 0 % to 39 % of all flows to continue to the Pōrangahau River (when storage is not possible and soil conditions are too wet).

- **Stage 3** (commencing in 9 years) involves development of an additional 10 ha of irrigation for sandy soils (IMU 3) and incorporation of 20 ha of silty/clay soils (IMU 1), allowing for a minimum 40 ha of irrigation at Stage 3. A new combined WWTP and storage pond is to be built at the Discharge Property to receive Pōrangahau and Te Paerahi flows with a capacity of (up to) 35,000 m^3.

From a consenting perspective there are essentially **three groups of activities at three locations**, with changes proposed over time which have been grouped into the **four stages**. Stages 0 to 2 are essentially **short term** solutions to manage wastewater at the three locations and Stage 3 is the **long term** solution solely focused at the new Discharge Property.

Staging of the Te Paerahi and Pōrangahau Wastewater Upgrade



Further detail on each of the stages grouped into Short Term and Long Term solutions is provided below. This includes a discussion on the effluent to be managed and its discharge.

6.3 Background

As noted above, Stage 0 represents a continuance of the current discharge system for each of Pōrangahau and Te Paerahi. Stage 1 and Stage 2 see the progressive removal of the discharge to coastal dunes at Te Paerahi and river discharge at Pōrangahau. For both Stage 1 and Stage 2, wastewater from the existing wastewater plants will continue to be discharged.

Land discharge via a low-rate irrigation system is introduced at Stage 1 and expanded at Stage 2. A summary of the wastewater currently discharged (what is produced) and of the discharge activity is as follows.

6.3.1 Wastewater System - Te Paerahi

Description

The Te Paerahi wastewater treatment plant is located approximately 500 m north of the Te Paerahi (Pōrangahau Beach) Freedom Camping grounds at the end of Te Paerahi Road, Pōrangahau Beach. It is located on a wahi tapu site (Beca, 2020:P:C.10). The owner of the land is Puketauhinu Trust and an agreement between the trustees and CHBDC was made in 1981 to construct the plant on the 152 ha property. In 1981 the Te Paerahi wastewater was reticulated to a new centralised oxidation pond and discharged to a soakage field.

At the time this was a relatively modern system and avoided the operation and use of onsite wastewater systems which had been used within the community. It also provided for a discharge to land, something many small rural communities were not doing at that time. The change was largely driven to mitigate effects associated with localised failure of onsite systems and the cumulative effects of drainage passing to the coast.

The relevant land titles associated with this resource consent application are listed in Table 6.1 below.

Table 6.1: Land Parcel Legal Descriptions

Land Use or Purpose	Street Address	Legal Description	Record of Title	Approximate Value of Asset	Surveyed Area (ha)	Land Owner
Te Paerahi WWTP	Te Paerahi Road	Lots 52 54 DP 15951 Lot 4 DP 16750 Pt Puketauhinu	HBJ2/1161	$2.08M	152	Puketauhinu Trust

As detailed in the Beca report (2020:P:C.10) wastewater from the community flows to a pumpstation located on the corner of Te Paerahi Road and Puketauhinu Place and is pumped to the Te Paerahi WWTP, which consists of a single clay lined oxidation pond. There is no influent flow monitoring or screening facilities. Therefore, the only treatment that occurs is within the 0.1 ha pond. Within the pond, some of the solids settle to the bottom where they undergo anaerobic treatment. The remaining solids and nutrients undergo aerobic treatment by bacteria and algae within the pond. The pond remains aerobic through wind, photosynthesising algae and one surface aerator (Beca, 2020:P:C.10).

Wastewater Flow Rates

The consented average daily flow is 87 m^3/day for no more than 50% of the time and 190 m^3/day for no more than 5% of the time.

Te Paerahi is largely a holiday destination and there is no officially reported number of permanent residents, however there is an estimated population of 312 people (Beca, 2021:P:C.16). Population growth is not projected for Te Paerahi and is expected to remaining stable for the consent duration, with the population doubling over summer months (Beca, 2021:P:C.16). The Te Paerahi WWTP does not have a flow meter on the inlet pipe, only effluent daily volumes are monitored. Historical effluent average flows, as well as peak season for the 2008 to 2057 are shown in Table 6.2 below.

Table 6.2: Te Paerahi WWTP Inflows (after Beca, 2021:P:C.16)

Flow	Average Inflow (Current – 2008-2019)	Average Inflow (Future - 2057)	Peak Season Inflow (Current – 2008-2019)	Peak Season Inflow (Future - 2057)
Average Dry Flow per capita (l/p/d)	144	144	144	144
Dry Weather Flow (ADWF) (m^3/d)	45	45	90	90
Average Daily Flow (ADF) (m^3/d) **	130	99	260	197***

Effluent volumes include infiltration in the network and rainfall in the pond and population seasonality.

Influent Quality

Influent wastewater quality samples have been taken from the Te Paerahi Pump station every two months for the period of 2011-2019 (May). The Beca (2020:P:C.10) report summarises the results for the five-year period 2014-2019 (May). The incoming wastewater characteristics compare well to typical municipal wastewater. TKN, Ammonia, and TP values are close to typical average wastewater concentrations, with the remainder comparing with typical weak municipal characteristics. There is no significant infiltration with a calculated wet weather factor of 1.6. The average concentrations of the typical wastewater composition has been used to consider future treatment plant loads (Table 6.3), which is considered to be a conservative approach (Beca, 2020:P:C.10).

Table 6.3: Te Paerahi WWTP Influent Wastewater Characteristics (2014-2019) (Beca, 2020:P:C.10)

Parameter	Average
COD, mg/l	381
Unfiltered cBOD5, mg/l	137
TSS, mg/l	136
TKN, mg/l	36.2
Ammonia, mg/l	23.2
TP, mg/l	5.7
Faecal coliforms cfu/100ml	0.31M
E. coli cfu/100 ml	0.26M

Discharge Quality

The quality of the discharge over the period 2018 to 2019 has been summarised in Table 6.4.

Table 6.4: Treated Wastewater Quality During 2018-2019 (Beca, 2020:P:C.10)

Parameter	Percentile	Current Mean	Existing Consent Limit
$CBOD_5$ (g/m^3)	50th	13	<30
	90th	23	<60
TSS (mg/l)	50th	39	<60
	90th	82	<140
pH		7.4-8.4	6.5-9

Consent Compliance History

A detailed evaluation of consent compliance for the Te Paerahi wastewater discharge is given in:

- Section 3.1.4 of Te Paerahi and Pōrangahau Options Report (Beca, 2020:P:C.10);
- Section 3.3 of Te Paerahi Wastewater Treatment Plant Discharge Water Quality Assessment (Beca, 2021:P:D.60); and
- Annual compliance reports prepared by HBRC.

The Te Paerahi WWTP has been generally in compliance with conditions of consent. A high rainfall period during the 2017/2018 monitoring period corresponds to exceedances of the 50th percentile flow limit of 87 m^3/day. Results from this period continued to influence rolling the mean into the 2018/2019 monitoring period. Results for $cBOD_5$, TSS and pH did not breach the consent between 2009 and 2019 although minor exceedances of the 50th percentile or 90th percentile limits were recorded.

6.3.2 Wastewater System – Pōrangahau

Description

The Pōrangahau WWTP is located at the end of Jones Street adjacent to Pōrangahau River, approximately 800 m south-east of the Pōrangahau village centre. The plant treats wastewater from the township, which is then discharged to the Pōrangahau River through the drain adjacent to the plant. Pōrangahau's wastewater system is a lot older than the neighbouring Te Paerahi. Initial sewerage reticulation discharged effectively raw wastewater to the Pōrangahau River using a gravity system. In 1990 a pump station was installed and this pumped wastewater to a new single oxidation pond some 300 m away from the community, with the discharge continuing to the Pōrangahau River.

The land is owned by Central Hawke's Bay District Council and has a shared access with a local farm. The parcel of land is 1.1 ha in total. However, the WWTP is limited to the 0.3 ha oxidation pond in the middle of the land parcel.

The relevant land titles associated with this resource consent application are listed in Table 6.5 below.

Table 6.5: Land Parcel Legal Descriptions

Land Use or Purpose	Street Address	Legal Description	Record of Title	Approximate Value of Asset	Surveyed Area (ha)	Land Owner
Pōrangahau WWTP	Jones St, Pōrangahau	Lot 1 DP 20711 BLK XII Pōrangahau SD	HBL4/1314	$1.76M	1.1	CHBDC

As detailed in the Beca report (2020:P:C.10) wastewater from the Pōrangahau village centre is pumped to the Pōrangahau WWTP, which consists of a single clay lined stabilisation pond (0.3 ha in size). There is no influent flow monitoring or screening facilities. Within the pond, some of the solids settle on the bottom of the pond and undergo anaerobic treatment. The remaining solids and nutrients undergo aerobic treatment by bacteria and algae within the suspension. The ponds are maintained in an aerobic state through wind and photosynthesising algae (Beca, 2020:P:C.10).

Wastewater Flow

The current consented average daily flow is 130 m^3/day for no more than 50% of the time and 415 m^3/day for no more than 5% of the time; and instantaneous flow of 1.5 l/sec (50th percentile) and 4.8 l/sec (95th percentile).

Historical effluent flows for the period 2008 to 2019 (LEI, 2021:P:C.15), as well as predicted changes to wastewater flows in future due to population growth, infiltration and stormwater inflow works and trade waste (Beca, 2021:P:C.16) are presented in Table 6.6. Population projections indicate a significant increase in population for the Pōrangahau township described in Beca 2021:P:C.16).

Table 6.6: Pōrangahau WWTP Outflows (2019-2057) (LEI, 2021:P:C.15)

Parameter	2008-2019	2028	2057
Median Flow (m^3/d)	94	155	374
Average Daily Flow (m^3/d)	141	205	437
99%ile Flow (m^3/d)	849	953	1,330
Maximum Flow (m^3/d)	2,250	2,354	2,731
Average Annual Flow (m^3)	51,500	75,000	160,000

Influent Quality

Influent wastewater quality samples have been taken from the Jones Street Pump station every two months for the period of 2011-2019 (May). The Beca (2020:P:C.10) report summarises the results for the five-year period 2014-2019 (May). The incoming wastewater characteristic average concentrations are very weak for municipal wastewater, with only TKN and Ammonia values close to that of typical weak municipal wastewater concentrations (Beca, 2020:P:C.10). This could be due to diluted wastewater or the quality of the sampling program and protocols. Due to this uncertainty, the average concentrations of the typical wastewater composition is used for the future treatment plant loads (Table 6.7), which is a conservative approach (Beca, 2020:P:C.10).

Table 6.7: Pōrangahau WWTP Influent Wastewater Characteristics (2014-2019) (Beca, 2020:P:C.10)

Parameter	Average
COD, mg/l	297
Unfiltered cBOD5, mg/l	103
TSS, mg/l	92
TKN, mg/l	25
Ammonia, mg/l	18
TP, mg/l	4
Faecal coliforms cfu/100ml	2.7M
E. coli cfu/100 ml	1.9M

Discharge Quality

The current discharge quality from the Pōrangahau WWTP discharge over the period 2014-2019 is summarised in Table 6.8 below.

Table 6.8: Pōrangahau WWTP Treated Wastewater Quality Discharge between July 2014 and June 2019 (Beca, 2021:P:D.25)

Parameter	5 %	Median	95 %
pH	7.4	7.8	8.6
E.coli (cfu/100 ml)	48.5	2,150	38,800
Faecal Coliforms (cfu/100 ml)	310	8,090	101,500
Total Phosphorus (mg/L)	1.0	1.9	3.2
Dissolved Reactive Phosphorus (mg/L)	0.5	1.3	2.3
Total Nitrogen (mg/L)	7.9	12.7	19.9
Total Ammoniacal Nitrogen (mg/L)	2.3	7.3	14.7
Suspended Solids (mg/L)	3	29	91
$cBOD_5$ (mg/L)	3	18	41
Dissolved Oxygen (ppm)	0.3	2.8	10.6

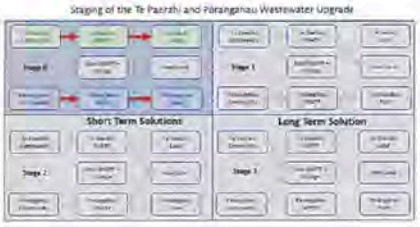
Consent Compliance History

A detailed evaluation of consent compliance for the Pōrangahau wastewater discharge is given in:

- Section 3.2.4 of Te Paerahi and Pōrangahau Options Report (Beca, 2020:P:C.10);
- Section 2.3.3 of Water Quality Assessment: Pōrangahau River (Beca, 2020:P:B.24a); and
- Annual compliance reports prepared by HBRC.

As with Te Paerahi, the Pōrangahau WWTP was generally in compliance with conditions of consent. No exceedances of the 50th percentile flow limit of 130 m^3/day were recorded. The 90th percentile flow limit of 415 m^3/day was exceeded during the 2017/2018 monitoring period due to large volumes of rainfall during winter and spring, including two ex-tropical-cyclone events (Beca, 2021:P:D.60). Results for cBOD5, TSS and pH did not breach the consent between 2009 and 2019, although minor exceedances of the 50th percentile or 90th percentile limits were recorded.

6.3.1 Stage 0 – Existing Activity



Te Paerahi

Following treatment in the oxidation pond, wastewater then passes through and under a vegetated area of the pond for final treatment (polishing) before passing through a perforated basket in an effluent channel, designed to catch eels and debris that didn't settle in the pond (Beca, 2020:P:C.10). There is outflow monitoring in this channel. From the channel wastewater is then pumped to a buried distribution system at the base of the adjacent sand dunes. Wastewater is discharged via soakage to land and ultimately, groundwater.

The existing wastewater treatment and discharge system is proposed to continue in the short term (up to 6 years) to allow for the design and development of the new land based irrigation regime.

All flows from Te Paerahi are to be piped to the new Discharge Property from Stage 1 onwards.

Pōrangahau

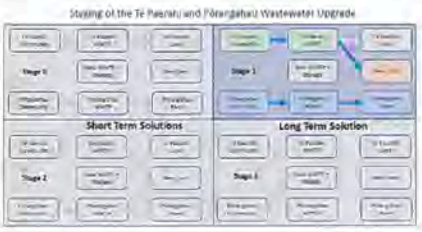
The treated wastewater from Pōrangahau WWTP is discharged to an adjacent drain via effluent chamber where the outflow volume is monitored. Prior to this, there is a perforated basket in the chamber to catch eels and debris. From the effluent chamber the treated wastewater is discharge to a drain that merges discharges into Pōrangahau River.

The existing wastewater treatment and discharge system is proposed to continue in the short term (up to 9 years as outlined in the previous transitional consent) to allow for the design and development of the land based irrigation regime. The transitional consent outlines the only modification proposed to the WWTP is to reinstate the wetland system in the adjacent drain to provide a more culturally robust land passage system, at least for the short-term whilst the land irrigation regime becomes operative.

The transitional consent proposed a slightly higher flow of an average daily flow of 145 m^3/day for no more than 50% of the time and 640 m^3/day for not more than 5% of the time.

All flows, except for contingency high flows, from Pōrangahau are to be piped to the discharge property from Stage 2 onwards.

6.3.2 Stage 1



Te Paerahi

All flows will be piped to the Discharge Property for irrigation.

Pōrangahau

All flows will continue to be discharged as per the existing system.

Transfer to Land Application

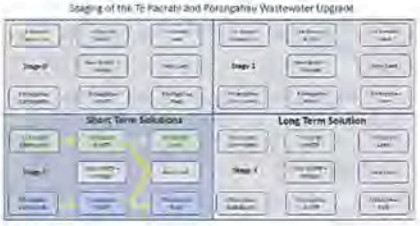
For the duration of Stage 1 and Stage 2, treated wastewater from the existing Te Paerahi WWTP will be pumped to the new Discharge Property as described in Section 4.7. There are no proposed changes to the Te Paerahi wastewater quality, other than the addition of UV treatment (at the Discharge Property to manage pathogen concentrations prior to wastewater being applied to the discharge property).

No wastewater from Pōrangahau is to be received at the new Discharge Property during this Stage. Year round irrigation to at least 4 ha is allowed. Table 6.4 gives a summary of the discharge regime parameters. Additional detail can be found in LEI (2021:P:C.15).

The wastewater discharge to land happens within an existing farming operation at the new Discharge Property. Details of how the discharge and farming operations are managed together is given in LEI

(2021:P:C.15) and LEI (2021:P:C.14a). Potential nutrient losses from the discharge property are expected to occur due to both activities and effects are assessed on the basis of total losses from the Discharge Property. Details of nutrients drained from the soil are given in LEI (2021:P:C.14a).

6.3.3 Stage 2 – Transfer to Land Application



Te Paerahi

All flows will be piped to the Discharge Property for irrigation.

Pōrangahau

All flows except wet weather flows will be piped to the Discharge Property for irrigation.

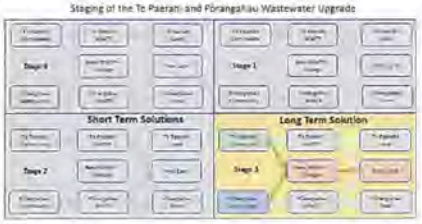
Transfer to Land Application

At the commencement of Stage 2, treated wastewater from the existing Pōrangahau WWTP will be pumped to the Discharge Property described in Section 4.7. Additionally, as with Te Paerahi, the addition of UV treatment to manage pathogen concentrations will be implemented prior to wastewater being applied to the discharge property. Details of the property are given in Table 6.5 above.

Year round irrigation from the Stage 1 minimum of 4 ha will be expanded to at least 10 ha in total. Table 6.4 and 6.8 gives a summary of the discharge regime parameters. Additional detail can be found in LEI (2021:P:C.15).

The wastewater discharge to land happens within an existing farming operation. Details of how the discharge and farming operations are managed together is given in LEI (2021:P:C.15) and LEI (2021:P:C.14a). Potential nutrient losses from the discharge property are expected to occur due to both activities and effect are assessed on the basis of total losses from the Discharge Property. Details of nutrients drained from the soil are given in LEI (2021:P:C.14a).

6.4 Stage 3 - Long Term Solution



At Stage 3 (within 9 years) wastewater treatment will no longer occur at the Pōrangahau and Te Paerahi WWTPs. Untreated wastewater is to be conveyed to a new combined WWTP and the irrigation system will be expanded following the construction of storage for treated which will enable the irrigation to be preferentially discharged during optimum climate and growth conditions. Consent requirements for the new wastewater treatment plant will be sought at a later stage.

A summary of the wastewater for discharge and of the discharge activity is as follows.

6.4.1 Wastewater System – Combined Pōrangahau and Te Paerahi Flows

A combined wastewater treatment plant servicing both the Pōrangahau and Te Paerahi communities located at the land discharge property is still be designed, and will be consented at a later stage. For the combined WWTP, a minimum treatment standard is proposed with Beca (2021:P:C.16) outlining a range of treatment systems that could be implemented to the combined WWTP to achieve this.

Wastewater Design Flows

The proposed discharge system has been designed to manage future wastewater flows for the communities. Beca (2021:P:C.16) and LEI (2021:P:C.15) outline the projected population increases for the current system, as well as future 2028 and 2057 flows.

Wastewater Design Quality

Wastewater quality from the combined WWTP will achieve mean values in wastewater parameters, no greater than the existing wastewater systems. It is expected than less variance in these parameters will be noticed. Additionally, all flows discharged to the land discharge system across all three stages will be UV treated to manage pathogen concentrations.

Following the establishment of a new WWTP at Stage 3, the wastewater quality has been assumed to achieve **an average quality** of:

- 20 g O/m^3 carbonaceous biochemical oxygen demand;
- 30 g/m^3 total suspended solids;
- 20 g/m^3 total nitrogen;
- 5 g/m^3 total phosphorus;
- 5,000 MPN/100 mL *E.coli* (following UV disinfection).

Additional detail regarding future wastewater treatment and performance is given in Beca (2021:P:C.16).

6.4.2 Provision of Storage

Up to a maximum of 35,000 m^3 of storage is proposed to be provided in a new pond and WWTP at the commencement of Stage 3. CHBDC intend to purchase land at the Discharge Property for the construction of a pond. The indicative location is given in Figure 6.6. A final location and design of the pond and WWTP is subject to a landform assessment and geotechnical investigations.

Figure 6.6: Indicative Storage Pond and WWTP Location

6.4.3 Proposed Discharge Activity

At Stage 3 the discharge is from a new WWTP located at the Discharge Property (LEI, 2021:P:C.15). Storage of a minimum of 10,000 m^3 and up to a maximum of 35,000 m^3 is available to optimise the irrigation system and enable wastewater to be held and irrigated when soil conditions are better suited

to receiving wastewater. Year round irrigation with a combination of deficit and non-deficit irrigation will be used across the property. The irrigation regime is proposed to be a two-step process. As a priority, wastewater is applied under regular irrigation conditions to irrigate up to 2 mm above field capacity, at a rate of up to 10 mm/h and allowing up 20 mm per application to at least 40 ha. When irrigation under these conditions is not possible, wastewater will be firstly directed to storage, where if not available, to the non-deficit (wet soils) system. The wet soils discharge utilises existing regular irrigation infrastructure but enables irrigation up to 10mm/h and 20 mm per event to be applied to 10 ha, irrespective of field capacity restrictions. Table 6.4 and 6.8 gives a summary of the discharge regime parameters. Additional detail can be found in LEI (2021:P:C.15).

The wastewater discharge to land happens within an existing farming operation. Details of how the discharge and farming operations are managed together is given in LEI (2021:P:C.15) and LEI (2021:P:C.14a). Potential nutrient losses from the discharge property are expected to occur due to both activities and effect are assessed on the basis of total losses from the Discharge Property. Details of nutrients drained from the soil are given in LEI (2021:P:C.14a).

6.5 Summary of Discharge Parameters at Each Stage

Table 6.9 provides a summary of the key discharge parameters on which an assessment of effects is based.

Table 6.9: Land Discharge and Management Summary

Parameter	Current Stage 0	Stage 1 (TP)	Stage 2 (P+TP)	Stage 3 (P+TP)
Storage volume (m^3)	~1,000	~500	~1,000	~10,900
Average annual outflow from WWTPs (m^3)	~76,600	~24,600 (~76,600)	~102,000	~ 183,000
Discharge to Pōrangahau River and Te Paerahi Coast				
Volume per year (m^3)	~52,000	~52,000	0	0
N mass loading from wastewater (kg/y)	1,532	1,076	0	0
P mass loading from wastewater (kg/y)	353	269	0	0
Deficit/Non-Deficit Irrigation – Regular Irrigation (Dry Soils)				
Irrigation regime	Nil	Deficit	Deferred, non-deficit	
Landform	Nil	Coastal sand dunes		Coastal sand dunes and alluvial plains
Total area – including non-irrigated (ha)	114.3	114.3	114.3	114.3
Wastewater irrigated area (ha)	-	4	10	40
Irrigation event application (mm/event)	-	Up to 20	Up to 20	Up to 20
Average annual irrigation volume (m^3/y)	-	~10,000	~31,000	~121,000
Average annual application depth (mm)	-	255	307	305
Wastewater Nitrogen load (kg N/ha/y)	-	51	61	61
Wastewater Phosphorus load (kg P/ha/y)	-	13	15	15

Parameter	Current Stage 0	Stage 1 (TP)	Stage 2 (P+TP)	Stage 3 (P+TP)
Non-Deficit Irrigation – Wet Soils				
Maximum application rate per event (m^3)	-	20	20	20
Volume per year (m^3)	-	~14,000	~71,000	~66,300
Average annual application depth (mm)	-	350	710	663
Wastewater Nitrogen load (kg N/ha/y)	-	70	142	133
Wastewater Phosphorus load (kg P/ha/y)	-	18	35	33
Sand Dunes (LMU 3/IMU 3)				
Farm Management current/proposed	Pastoral grazing, rotational cropping			
Vegetation current/proposed	Cocksfoot & marram grasses, winter oats			Cocksfoot & marram grasses
Alluvial Plains (LMU 1 & 2/IMU 1)				
Farm Management current/proposed	Low intensity pastoral grazing/ rotational cropping			
Vegetation current/proposed	Ryegrass pasture; crops (e.g. chicory, raphno, oats, turnips)			

6.6 Design as the Basis of Avoiding Effects

6.6.1 General

The generally less than minor adverse effects (discussed in Sections 9, 10 and 11 below) on the receiving environments do not require mitigation. Investigations have identified specific actions that have the potential to impact on the receiving environment. Consequently, design solutions have been developed to result in less than minor effects, and therefore further mitigation is not needed.

To support the ongoing assurance that the effects will be less than minor, proposed consent conditions (as provided in Appendix E) are provided to ensure residual adverse effects are no different to those currently experienced or as predicted for the future system.

6.6.2 Proposed Condition Framework

The applications as described in this report are to essentially allow for business as usual until a new system is developed. This is anticipated to be up and operational within 9-10 years, with parts of the final solution implemented within the next three years. The implementation programme is described in more detail in Section 8.8 and in Te Paerahi and Pōrangahau – Community Wastewater Management into the Future – A Strawman Approach (LEI, 2020:P:C.36).

In general, it is proposed that the existing discharge systems at both WWTPs will continue until such time as a replacement discharge is implemented. Therefore, it is expected that conditions of consent for the existing systems would be much the same as they are now.

For the Te Paerahi application, a term of 6 years is sought in which time the discharge from the WWTP to sand dunes will have ceased. The WWTP will continue to be used, albeit it is intended that this will also cease to be used in time.

For Pōrangahau, it is anticipated that within 9 years the continuous flow from the WWTP to the river will have ceased, with flows being discharged to land. While design is yet to be confirmed, there may be the need for some form of indirect discharge during periods of wet weather and when the river is in flood.

6.7 Proposed Monitoring

This application document recommends that the existing monitoring should continue as outlined in the proposed consent conditions included as Appendix E. Additional monitoring is proposed at both WWTP's and at the new Discharge Property.

7 CONSULTATION

7.1 General

This section provides a brief account of consultation undertaken with regard to wastewater management.

7.2 Iwi Engagement

Early iwi engagement was seen as critical for this Project. Iwi were consulted through numerous channels, including formal and informal meetings and commissioning of the Tāngata Whenua Worldviews report (How, 2020:A:B.42). The overarching direction given to Council was to avoid direct discharges to surface water, as well as culturally significant dunes as these were seen to be culturally abhorrent. LEI (2021:P:C.34) provides a detailed consultation summary outlining all engagement between CHBDC and stakeholders during the consenting process.

A Cultural Impact Assessment (CIA) and Mahinga Kai Assessment has been commissioned for the Discharge Property. This is to build on the Māori World View report and assess issues specific to Pōrangahau and Te Paerahi and the surrounding area. These reports are in the process of being finalised and will be made available as soon as these come to hand.

In the absence of this CIA, it is clear that the proposal seeks to eventually apply all wastewater directly to land, ceasing the existing discharges to the respective receiving environments.

7.3 Public Engagement

Consultation with the community has involved meetings, preparation of newsletters and online communication through the Councils portal. While the consultation programme was significantly impacted by the COVID-19 Levels 2-4 limitations, community meetings were held on the 16th of December 2019 and the 20th of March 2020, with a third scheduled for the 15th of February 2021 but unfortunately cancelled due to COVID-19 alert level changes (LEI, 2021:P:C.34).

Council have been working on a district wide wastewater strategy (#Big Wastewater Story) that requires considerable funding. A series of engagement documents to support the Long Term Plan were released in February 2021. This included a district wide update on proposed wastewater changes, including that at Pōrangahau and Te Paerahi.

Discussions and feedback from each meeting have informed the progress of the investigations leading to a series of options for inclusion in CHBDC's Long Term Plan.

7.4 District Health Board

Hawke's Bay District Health Board (HBDHB) public health staff have been recently consulted. The wider district wastewater strategy has been communicated, along with the plan for Pōrangahau and Te Paerahi.

7.5 HBRC

HBRC staff have been involved in early district wide discussions and the engagement group that lead to the formulation of the Wastewater Strategy (CHBDC:A:O.3, #theBIGWasteWaterStory). They have also been invited in community presentations and participated in one of the recent community meetings.

Senior CHBDC staff have been regularly meeting with HBRC staff and advising of progress for developing alternative long term wastewater solutions and their consenting requirements.

7.6 Customary Marine Title Applicants

The ongoing discharge to coastal dunes at Te Paerahi for the short term triggers the need for engagement with Customary Marine Title (CMT) applicants. The RMA requires that consultation is undertaken with the Customary Marine Title applicants (as lodged in accordance with the Marine and Coastal Area (Takutai Moana) Act) discharge activities within the immediate area of any discharge.

Applicants identified within the Crown Engagement Application Areas are:

- Ngāti Kere Hapu (MAC-01-09-013)
- Heretaunga Tamatea (MAC-01-09-001)

A letter advising the applicants of the intentions of the consent process and discharges has been sent. A copy of this letter is attached as Appendix G.

7.7 Summary

CHBDC has connected with the community and iwi in a number of forums over the course of the current consent. These are detailed within LEI (2021:P:C.34) which provides a detailed consultation summary outlining all engagement between CHBDC and stakeholders during the consenting process. Since 2019 a more directed programme of consultation was undertaken with a list of these engagement for the reconsenting process provided in Appendix B.

Discussions and feedback from each meeting have informed the progress of the investigations leading to a series of options for inclusion in CHBDCs Long Term Plan.

8 CONSIDERATION OF ALTERNATIVES

8.1 General

A brief summary of the alternatives considered is given here. Alternatives for treatment and discharge were identified in the Pōrangahau and Te Paerahi Options Report (Beca, 2020:P:C.10). A detailed discussion is provided in the Best Practicable Option (BPO) report (LEI, 2021:P:C.12) on alternatives considered and the process taken to evaluate them.

Figure 8.1 presents a simplified flowchart of the selection process used by CHBDC to nominate a suitable BPO for the Pōrangahau and Te Paerahi WWTP discharges.

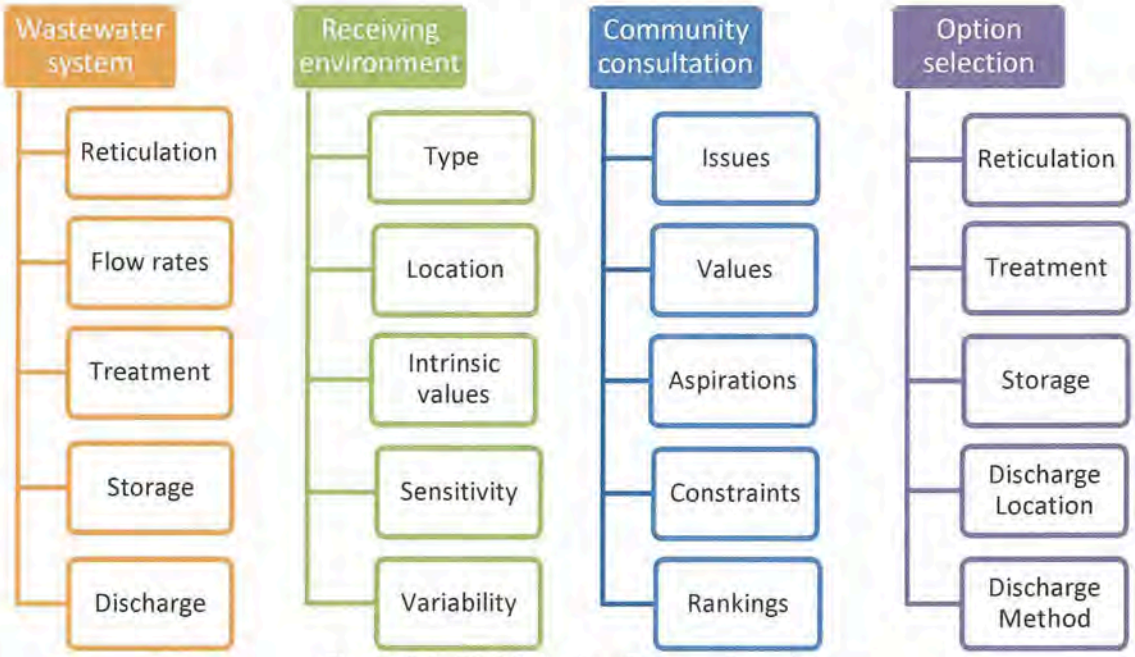


Figure 8.1: BPO Selection Process Overview

A summary of the key outcomes are as follows.

8.2 Alternative Receiving Environments

Potential receiving environments for the Pōrangahau and Te Paerahi WWTP discharges were identified as follows:

- **Discharge System:**
  1. Status quo (River and culturally significant dunes);
  2. Ocean;
  3. Land;
  4. Groundwater; or
  5. Combination

Following consultation the discharge options were further refined to include:

- **Discharge**
  1. Status quo discharge regimes - River + land discharges for Pōrangahau and Te Paerahi respectively;
  2. Ocean discharge;

3. Land irrigation – non-deficit;
4. Land irrigation – deficit;
5. Land irrigation – rapid infiltration basin; or
6. Deep bore injection.

Discharges to groundwater (i.e. by deep bore injection) and ocean were discounted for financial, social and cultural reasons. Direction through consultation was that a combined discharge environment that could avoid the respective existing discharges and get some beneficial use of the wastewater was preferred. Options which focussed on a low rate discharge to land were pursed to meet the communities' expectations.

8.3 Alternative Discharge Locations

CHBDC has investigated the use of land within 10 km of the two WWTP for application of wastewater (LEI, 2020:P:B.11). It has been determined that suitable and feasible land opportunities are available near to the WWTPs.

Following identification of suitable land areas surrounding the WWTPs, correspondence with potential landowners commenced to which engagement with five landowners occurred. From this, the Discharge Property at 474 Beach Road, Pōrangahau was identified as being the preferred discharge location.

8.4 Combined Land and Water Discharge Options

A continuum of options is theoretically available, in combination with storage, for combined land and water discharge systems. The proposed system transitions from a 100 % only discharge (to the river and culturally significant dunes) system towards the ultimate aspirational goal of 100 % land irrigation to a location deemed culturally acceptable for wastewater irrigation.

8.5 Alternative River Discharge Regimes

As with land and water options, there is a continuum of options available for surface water discharges, in combination with storage, for varying the timing and volumes of discharges to the river. A revised regime could be developed to time the discharge so that water quality in the Pōrangahau River was not impacted by the wastewater discharge. Storing all wastewater for discharging only during large flood events that occur a few times a year imposes unrealistically large and expensive storage on the community. It also perversely means that the very large discharge volumes required to be released during such storm events may have greater adverse effects than smaller volumes discharged more often during less elevated river flow conditions.

8.6 Consultation Outcomes

Consistently the community aspiration was for cessation of the river discharge and dune discharge. A further direction from consultation is to investigate and implement ways for the community and local iwi to be involved in the environmental outcomes for their community.

8.7 Financial Implications

The long-term solution will impose a significant cost on the small rating base of the Central Hawke's Bay. Key to the successful implementation of a long solution is security of funding.

8.8 Developing a Preferred Option

As part of the future consent application, an analysis of whether the selected discharge method and its location is the best practicable option (BPO) as defined by the Resource Management Act 1991 (RMA), is required.

A thorough BPO selection process has been undertaken by CHBDC using technical advisors, affected parties (landowners and iwi) and the Pōrangahau and Te Paerahi communities through a series of consultations. These consultations aimed to understand the concerns, aspirations, and design constraints from the respective parties to assess potential discharge and treatment options. For each aspect of the wastewater system, a series of options have been considered, where these were narrowed down through community engagement and technical advice and refined based around BPO principles to arrive at a concept considered the BPO.

For discharge of Pōrangahau and Te Paerahi's wastewater, the BPO is the construction of a new WWTP servicing both communities where the discharge regime is to land under combination of a deficit and non-deficit irrigation system. The choice of suitable soil type and the optimisation of the irrigation system through storage, will effectively allow the ceasing of any direct discharge to the Pōrangahau River and dunes. The Discharge Property for land application is 474 Beach Road, Pōrangahau located between the townships.

The components of the BPO include:

- construction of a new WWTP between Pōrangahau and Te Paerahi servicing both communities;
- a combined wastewater discharge for both communities to land under combination of a deficit and non-deficit irrigation system depending on soil type and the optimisation of storage, allowing the ceasing the discharge to the Pōrangahau River entirely;
- the construction of a storage pond of between 10,000 m^3, up to 35,000 m^3 to capture wastewater flows; and
- the desired Discharge Property is 474 Beach Road, Pōrangahau located between the two communities.

Each of these aspects are believed to be the BPO for Pōrangahau and Te Paerahi's wastewater discharge system because:

- all components of the BPO have been selected in order to function effectively as an integrated wastewater management and discharge system;
- although costly initially, construction of a new WWTP servicing both communities is considered to be beneficial long term. This also involves the removal of the Te Paerahi WWTP;
- implementation of a land discharge regime is affordable to the respective communities in comparison to other discharge options;
- wastewater flows are to be applied to the land under deficit and non-deficit irrigation, aligning with community aspirations of ceasing a river discharge entirely;
- wastewater is able to be beneficially returned to the land, increasing pasture productivity rather than wasted under a river discharge, rapid infiltration basin, ocean outfall or deep bore injection system;
- environmental impacts are expected to be reduced as wastewater can be filtered through the soil, reducing risks of nitrogen leaching or contamination of waterways;
- combination of a non-deficit and deficit system enables wastewater to be selectively discharged to varying locations across the Discharge Property at varying rates, reducing the demand for excessively high storage requirements; and
- the BPO system has the ability of accommodating for future flows in response to projected population growth for each of the townships.

The BPO report (LEI, 2021:P:C.12) formed the foundation for refining the details of the design, operation, and implementation timing of each aspect of the treatment, storage, and discharge systems. Many of these details are developed and described in the Conceptual Design report (LEI, 2021:P:C.15).
This BPO is considered to satisfy the RMA requirement that a nominated discharge is the BPO for the system and its locality.

9 ASSESSMENTS - TE PAERAHI (STAGES 0, 1 AND 2)

9.1 Effects on the Environment

9.1.1 Receiving Environment

The Te Paerahi coastline is not considered a sensitive receiving environment for discharges of Te Paerahi's treated wastewater because of it is a high energy coastline and due to the modest rate of discharge and long travel times leading to contaminant attenuation.

9.1.2 Positive Effects

With respect to this application, positive effects relate to the wastewater treatment and discharge system providing for the health and wellbeing of the Te Paerahi community; and without it there is the potential for localised effects from poorly functioning onsite wastewater facilities and any residual contaminants making their way to the coast via the beach in front of the community.

9.1.3 Effects on Marine Environment

Groundwater flows from the Te Paerahi WWTP discharge area flow towards the coast. Potential migration of wastewater contaminants from the WWTP via groundwater into the marine environment is assessed in the Beca (2021:P:D.60) report.

Low nutrient levels (nitrogen and phosphorus indicator species) have been recorded in the groundwater monitoring wells located around the Te Paerahi WWTP discharge field. The nutrient levels in the groundwater are not considered to contribute to adverse effects within the marine environment due to the travel time for groundwater to reach the coast (between 60 and 340 days), a degree of attenuation of contaminants within the soil, and the dilution and mixing that occurs with regional groundwater and within the coastal zone.

For similar reasons, the very low levels of faecal coliforms observed in the groundwater monitoring wells (majority of results below laboratory detection limits) are not considered to contribute to adverse effects within the marine environment. Expected microbial die-off and filtration of pathogens, such as *E.coli*, in sandy soils are further anticipated to reduce faecal coliform concentrations in groundwater.

Overall, the effects on the marine environment are considered to be negligible.

9.1.4 Effects on Public Health Risks

There are no reported records of public health concern attributed to the current discharge. This includes harvesting shellfish and finned fish, as well as recreational contact with the contaminated water. As discussed in the Beca (2021:P:D.60) report, the low faecal coliform contaminant levels in groundwater surrounding the discharge area and long travel times to reach the coast will contribute to mitigating any risk.

The effects on public health are considered to be negligible.

9.1.5 Effects on Amenity, Community, Recreational, and Social Values

The discharge area is subsurface and while adjacent to the foredunes, is away from community access. The discharge itself will have a negligible effect on existing amenity, community, recreational and social values.

9.1.6 Effects on Air Quality

Odours from the WWTP are generally of low intensity and readily dissipate within the WWTP's boundaries. Where odours become apparent these usually indicate significant failures of treatment