NPDC New Plymouth WWTP

Monitoring Programme

Annual Report

2020-2021

Technical Report 2021-59

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Taranaki Regional Council

Taranaki Regional Council
Private Bag 713
Stratford

ISSN: 1178-1467 (Online)
Document: 2881910 (Word)
Document: 2973614 (Pdf)
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Executive summary

The New Plymouth District Council (NPDC) operates a wastewater treatment plant (NPWWTP) located on Rifle Range Road between New Plymouth and Bell Block. This report for the period July 2020 to June 2021 describes the monitoring programme implemented by the Taranaki Regional Council (the Council) to assess NPDC's environmental and consent compliance performance during the period under review. The report also details the results of the monitoring undertaken and assesses the environmental effects of NPDC's activities.

During the monitoring period, NPDC demonstrated an overall high level of environmental performance at the NPWWTP.

In relation to the operation of the NPWWTP, NPDC holds six resource consents, which include a total of 72 conditions setting out the requirements that NPDC must satisfy. NPDC holds one consent to discharge treated wastewater into the Tasman Sea, one consent to discharge sludge leachate to groundwater, two consents relating to structures, one consent to discharge emissions into the air at the site and one consent to discharge dewatered sludge to land on a contingency basis.

The Council's monitoring programme for the year under review included the review of data supplied by NPDC, two routine site inspections, effluent samples collected for various analyses (including inter-laboratory comparison), a five site marine ecological survey, a shoreline bacteriological survey and analysis of green lipped mussels for norovirus.

Monitoring through the year found that the NPWWTP generally performed as designed, discharging highly treated effluent into the Tasman Sea. Neither the marine ecological survey, nor the survey of bacteriological water quality of shoreline waters found any evidence of adverse effects resulting from the outfall discharge. Norovirus monitoring results showed that there is still a risk of mussel contamination between Waiwhakaiho and Bell Block. Signage remains in place at these locations to advise against collecting shellfish.

Work began on decommissioning the sludge lagoon during the year under review. This process involved using a suction dredge to remove the sludge from the lagoon, to then be pumped into large geotextile bags for dewatering. There were no environmental issues that occurred as a result of this activity. No odours were detected beyond the site boundary in relation to this project, or during normal plant operations throughout the year.

There were five unauthorised incidents that occurred at the NPWWTP during the year (four relating to high rainfall, and one relating to a potable water leak). All of these incidents were deemed compliant with consent conditions upon further investigation. There were also 19 wastewater incidents that occurred throughout the wider wastewater network; 12 of which were related to high rainfall that occurred in November and December in 2020. One incident occurred when a contractor left a pipe plug in the sewer following maintenance, which resulted in an overflow into the adjacent waterway. This was the second such event during the year. NPDC were issued with an Infringement Notice as a result. This total of 24 unauthorised incidents is an increase from the 23 that occurred in 2019-2020, nine in 2018-2019, and 16 in 2017-2018.

During the year, NPDC demonstrated an overall high level of environmental and administrative compliance and performance with the resource consents related to NPWWTP operations. One incident occurred which resulted in follow up enforcement action. However, this was a reticulation overflow and not directly related to the performance of the NPWWTP. As such, this incident has not been taken into account when assigning the NPDC with an overall environmental performance grade.

For reference, in the 2020-2021 year, consent holders were found to achieve a high level of environmental performance and compliance for 86% of the consents monitored through the Taranaki tailored monitoring

programmes, while for another 11% of the consents, a good level of environmental performance and compliance was achieved.

In terms of overall environmental and compliance performance by NPDC over the last several years, this report shows that their performance has improved from recent years. NPDC were found to be generally compliant with their consents.

This report includes recommendations for the 2021-2022 year.

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1 Introduction

1.1 Compliance monitoring programme reports and the Resource Management Act 1991

1.1.1 Introduction

This report is for the period July 2020 to June 2021 by the Taranaki Regional Council (the Council) on the monitoring programme associated with resource consents held for the New Plymouth Wastewater Treatment Plant (NPWWTP). New Plymouth District Council (NPDC) is the consent holder for the operation which is situated on Rifle Range Road at New Plymouth, in the Waiwhakaiho catchment.

The report includes the results and findings of the monitoring programme implemented by the Council in respect of the consents held by NPDC that relate to discharges of air, treated wastewater and sludge leachate, a marine outfall structure and a culvert.

One of the intents of the *Resource Management Act 1991* (RMA) is that environmental management should be integrated across all media, so that a consent holder's use of water, air, and land should be considered from a single comprehensive environmental perspective. Accordingly, the Council generally implements integrated environmental monitoring programmes and reports the results of the programmes jointly. This report discusses the environmental effects of NPDC's use of water, land and air, and is the 25th combined report by the Council for NPDC's NPWWTP.

1.1.2 Structure of this report

Section 1 of this report is a background section. It sets out general information about:

- consent compliance monitoring under the RMA and the Council's obligations;
- the Council's approach to monitoring sites though annual programmes;
- the resource consents held by NPDC for the NPWWTP;
- the nature of the monitoring programme in place for the period under review; and
- a description of the activities and operations at the NPWWTP.

Section 2 presents the results of monitoring during the period under review, including scientific and technical data.

Section 3 discusses the results, their interpretations, and their significance for the environment.

Section 4 presents recommendations to be implemented in the 2021-2022 monitoring year.

A glossary of common abbreviations and scientific terms, and a bibliography, are presented at the end of the report.

1.1.3 The Resource Management Act 1991 and monitoring

The RMA primarily addresses environmental 'effects' which are defined as positive or adverse, temporary or permanent, past, present or future, or cumulative. Effects may arise in relation to:

a. the neighbourhood or the wider community around an activity, and may include cultural and social-economic effects;
b. physical effects on the locality, including landscape, amenity and visual effects;
c. ecosystems, including effects on plants, animals, or habitats, whether aquatic or terrestrial;

d. natural and physical resources having special significance (for example recreational, cultural, or aesthetic); and

e. risks to the neighbourhood or environment.

In drafting and reviewing conditions on discharge permits, and in implementing monitoring programmes, the Council is recognising the comprehensive meaning of 'effects' in as much as is appropriate for each activity. Monitoring programmes are not only based on existing permit conditions, but also on the obligations of the RMA to assess the effects of the exercise of consents. In accordance with Section 35 of the RMA, the Council undertakes compliance monitoring for consents and rules in regional plans, and maintains an overview of the performance of resource users and consent holders. Compliance monitoring, including both activity and impact monitoring, enables the Council to continually re-evaluate its approach and that of consent holders to resource management and, ultimately, through the refinement of methods and considered responsible resource utilisation, to move closer to achieving sustainable development of the region's resources.

1.1.4 Evaluation of environmental and administrative performance

Besides discussing the various details of the performance and extent of compliance by NPDC, this report also assigns them a rating for their environmental and administrative performance during the period under review.

Environmental performance is concerned with actual or likely effects on the receiving environment from the activities during the monitoring year. Administrative performance is concerned with the Company's approach to demonstrating consent compliance in site operations and management including the timely provision of information to Council (such as contingency plans and water take data) in accordance with consent conditions.

Events that were beyond the control of the consent holder and unforeseeable (that is a defence under the provisions of the RMA can be established) may be excluded with regard to the performance rating applied. For example loss of data due to a flood destroying deployed field equipment.

The categories used by the Council for this monitoring period, and their interpretation, are as follows:

Environmental Performance

High: No or inconsequential (short-term duration, less than minor in severity) breaches of consent or regional plan parameters resulting from the activity; no adverse effects of significance noted or likely in the receiving environment. The Council did not record any verified unauthorised incidents involving environmental impacts and was not obliged to issue any abatement notices or infringement notices in relation to such impacts.

Good: Likely or actual adverse effects of activities on the receiving environment were negligible or minor at most. There were some such issues noted during monitoring, from self reports, or during investigations of incidents reported to the Council by a third party but these items were not critical, and follow-up inspections showed they have been dealt with. These minor issues were resolved positively, co-operatively, and quickly. The Council was not obliged to issue any abatement notices or infringement notices in relation to the minor non-compliant effects; however abatement notices may have been issued to mitigate an identified potential for an environmental effect to occur.

For example:

- High suspended solid values recorded in discharge samples, however the discharge was to land or to receiving waters that were in high flow at the time;
- Strong odour beyond boundary but no residential properties or other recipient nearby.

Improvement required: Likely or actual adverse effects of activities on the receiving environment were more than minor, but not substantial. There were some issues noted during monitoring, from self reports, or during investigations of incidents reported to the Council by a third party. Cumulative adverse effects of a persistent minor non-compliant activity could elevate a minor issue to this level. Abatement notices and infringement notices may have been issued in respect of effects.

Poor: Likely or actual adverse effects of activities on the receiving environment were significant. There were some items noted during monitoring, from self reports, or during investigations of incidents reported to the Council by a third party. Cumulative adverse effects of a persistent moderate non-compliant activity could elevate an 'improvement required' issue to this level. Typically there were grounds for either a prosecution or an infringement notice in respect of effects.

Administrative performance

High: The administrative requirements of the resource consents were met, or any failure to do this had trivial consequences and were addressed promptly and co-operatively.

Good: Perhaps some administrative requirements of the resource consents were not met at a particular time, however this was addressed without repeated interventions from the Council staff. Alternatively adequate reason was provided for matters such as the no or late provision of information, interpretation of 'best practical option' for avoiding potential effects, etc.

Improvement required: Repeated interventions to meet the administrative requirements of the resource consents were made by Council staff. These matters took some time to resolve, or remained unresolved at the end of the period under review. The Council may have issued an abatement notice to attain compliance.

Poor: Material failings to meet the administrative requirements of the resource consents. Significant intervention by the Council was required. Typically there were grounds for an infringement notice.

For reference, in the 2020-2021 year, consent holders were found to achieve a high level of environmental performance and compliance for 86% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 11% of the consents, a good level of environmental performance and compliance was achieved. [1]

1.2 Process description

The NPWWTP (Photo 1) treats the municipal wastewater from the New Plymouth urban area, Bell Block, Oakura, Inglewood and Waitara by a process of biological nutrient removal using activated sludge. There is also a substantial industrial load, equivalent to approximately 25% of the total biochemical oxygen demand (BOD) load, treated by the plant. The plant was commissioned in 1984, and has had its capacity expanded several times since.

The wastewater enters the plant at the inlet works (Figure 1) to remove plastics and solids from the wastewater, followed by the removal of grit. The solids are collected and removed regularly for land disposal. Following this preliminary treatment, the wastewater enters the bioreactor basins where micro-organisms, collectively called "activated sludge", break down the organic matter in the wastewater. Pathogens and heavy metals stick to the activated sludge, and are removed at a later stage of the process. The mix of wastewater and activated sludge then overflows into clarifiers, which separate the activated

[1] The Council has used these compliance grading criteria for more than 17 years. They align closely with the 4 compliance grades in the MfE Best Practice Guidelines for Compliance, Monitoring and Enforcement, 2018

sludge from the water. The clear water overflows into the chlorine contact tank for disinfection prior to discharge through a 450 m marine outfall offshore of the mouth of the Waiwhakaiho River.

Photo 1 The New Plymouth Wastewater Treatment Plant

The activated sludge remaining in the clarifiers is returned to the bioreactor basins to maintain biological levels, while the surplus is diverted to the solid stream. This involves thickening and dewatering the surplus activated sludge before being processed in the thermal drying facility (TDF) for sterilisation and disposal by alternative use (soil conditioner).

Thermal drying of the sludge results in a dry granular solid (biosolid) with a moisture content of 5-10%. The temperatures used in the process are such that there is sterilisation of the micro-organisms and pathogens present in the sludge. The biosolid is registered for sale as *Taranaki Bioboost 6-2-0* fertiliser.

Major construction works were undertaken as part of an upgrade of the NPWWTP between December 2012 and December 2013. The upgrade involved major modification of the plant's two existing aeration basins to make them more efficient by introducing anoxic and anaerobic zones to the process and improving aeration within aerobic zones. The basins are therefore now referred to as the bioreactor basins.

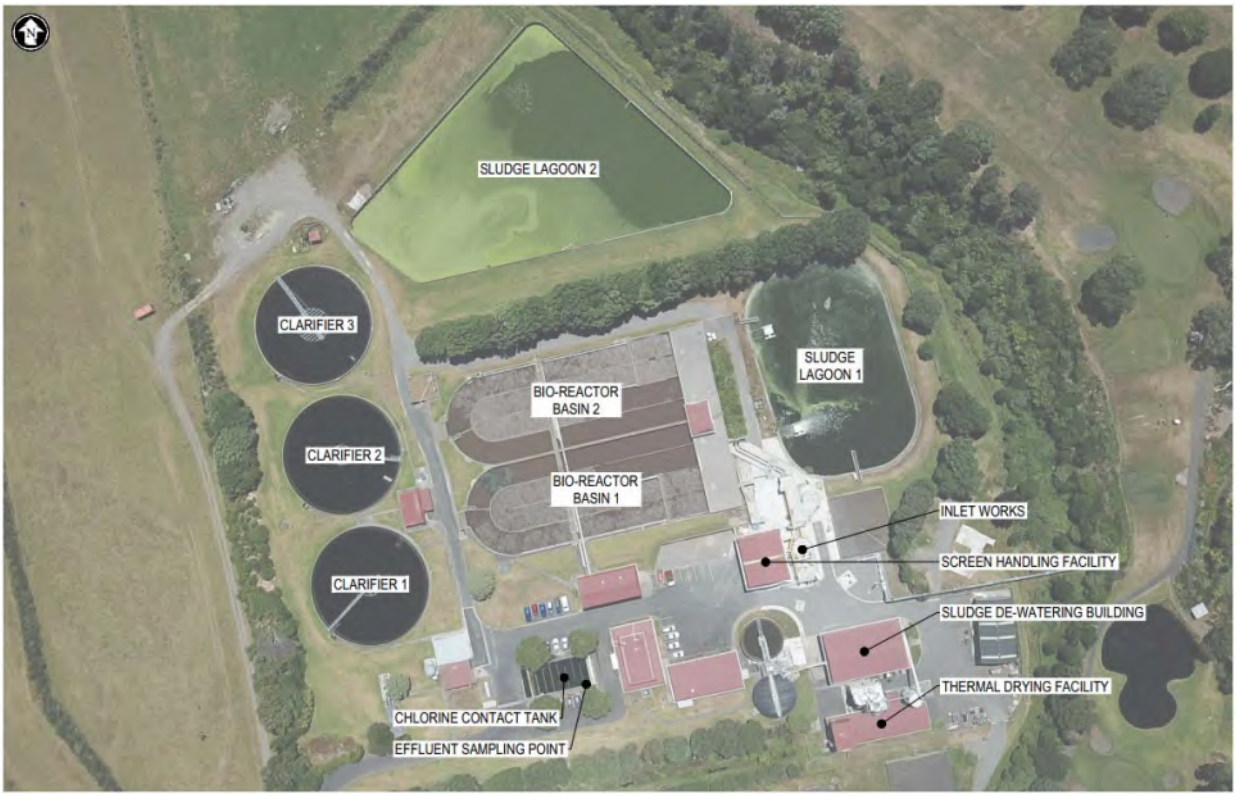

Figure 1 Layout of the New Plymouth Wastewater Treatment Plant

1.3 Resource consents

NPDC holds six resource consents in relation to the NPWWTP; the details of which are summarised in the table below. Summaries of the conditions attached to each permit are set out in Section 3 of this report.

A summary of the various consent types issued by the Council is included in Appendix I, as are copies of all permits held by the Company during the period under review.

Table 1 Resource consent summary

Consent number	Purpose	Granted	Review	Expires
Water discharge permits				
0882-4	To discharge treated municipal wastewater from the NPWWTP through a marine outfall structure into the Tasman Sea.	13 Dec 2011	1 Jun 2022	1 Jun 2041
2982-4	To discharge of up to 60 m^3/day of leachate from a sludge stabilisation lagoon to groundwater in the vicinity of the Waiwhakaiho River.	17 Oct 2002	No further reviews	1 Jun 2020 S.124 protection
Air discharge permit				
4740-2	To discharge contaminants into the air from sludge drying and processing activities at the NPWWTP.	29 May 2008	No further reviews	1 June 2026
Discharges of waste to land				
9984-1	To discharge contaminants onto and into land and into air at the NPWWTP on a contingency basis	15 Apr 2015	Special condition 23	1 June 2022

Consent number	Purpose	Granted	Review	Expires
Land use permit				
1826-2	To erect, place and maintain a twin box culvert on the Mangaone Stream for road access purposes.	16 Jan 2002	No further reviews	1 June 2020 S.124 protection
Coastal permit				
4593-3	To erect, place, maintain and use a marine outfall within the coastal marine area as part of the NPWWTP system.	10 Sep 2014	No further reviews	1 June 2041

1.4 Monitoring programme

1.4.1 Introduction

Section 35 of the RMA sets obligations upon the Council to gather information, monitor and conduct research on the exercise of resource consents within the Taranaki region. The Council is also required to assess the effects arising from the exercising of these consents and report upon them.

The Council may therefore make and record measurements of physical and chemical parameters, take samples for analysis, carry out surveys and inspections, conduct investigations and seek information from consent holders.

The monitoring programme for the NPWWTP site consisted of six primary components during the 2020-2021 monitoring period.

1.4.2 Programme liaison and management

There is generally a significant investment of time and resources by the Council in:

- ongoing liaison with resource consent holders over consent conditions and their interpretation and application;
- discussion over monitoring requirements;
- preparation for any consent reviews, renewals or new consent applications;
- advice on the Council's environmental management strategies and content of regional plans; and
- consultation on associated matters.

1.4.3 Site inspections

As programmed, two routine monitoring inspections were carried out at the NPWWTP during the monitoring period. With regard to consents for the abstraction of or discharge to water, the main points of interest were plant processes with potential or actual discharges to receiving watercourses, including contaminated stormwater and process wastewaters. Air inspections focused on plant processes with associated actual and potential emission sources and characteristics, including potential odour, dust, noxious or offensive emissions. Sources of data being collected by NPDC were identified and accessed, so that performance in respect of operation, internal monitoring, and supervision could be reviewed by the Council. The neighbourhood was surveyed for environmental effects.

1.4.4 Council effluent monitoring

1.4.4.1 Grab samples

Grab samples were collected from the final effluent twice during the monitoring period. Samples were analysed for chlorine (total and free) and faecal indicator bacteria (FIB), specifically; *Escherichia coli*, and enterococci.

1.4.4.2 Inter-laboratory comparison

Two inter-laboratory comparisons between the Council and NPDC were performed during the 2020-2021 monitoring period using 24-hour composite samples. The comparisons were performed to verify the validity of monitoring results reported by NPDC, and to provide an independent check on compliance with consent conditions. The samples were analysed by both Hill Laboratories (on behalf of Council) and NPDC, for cadmium, chromium, copper, nickel, lead and zinc (all acid soluble), cyanide (total), and phenolic compounds.

1.4.5 Review of NPDC self-monitoring data

NPDC monitors the influent and effluent for a number of chemical, biochemical and bacteriological parameters and forwards the results through to the Council on a monthly basis.

1.4.5.1 Composite samples

A number of composite samples were collected from the effluent and analysed for various parameters. Following a review of the monitoring programme in 2017, the testing frequency for cyanide, phenols, cadmium, chromium, copper, nickel, lead, zinc, and mercury, to assess compliance with condition 3 (resource consent 0882-4), was reduced from monthly to biannual. Approximately three times a week, samples were collected for the analysis of TSS and BOD to assess compliance with condition 4 (resource consent 0882-4).

1.4.5.2 Grab samples

Grab samples were collected and analysed for total available chlorine twice a day, to assess compliance with condition 10 (resource consent 0882-4). Grab samples were also collected and analysed for faecal coliform bacteria approximately three times each week.

1.4.5.3 Norovirus sampling

Following review of the monitoring programme in 2013, norovirus analysis of mussel flesh and influent and effluent from the NPWWTP was added as a new component of the monitoring programme in accordance with condition 14 (e) of consent 0882-4. Two sets of influent, clarifier composite and effluent samples were analysed for norovirus GI and GII by The Institute of Environmental Science and Research (ESR).

1.4.5.4 Sludge lagoon monitoring

Monitoring of the sludge lagoon is focused on the potential contamination of groundwater and of the drainage channel located next to the lagoon. Three groundwater bores are located around the lagoon. Samples from these bores are collected once a month and analysed for various parameters. The drainage channel is also sampled once a month at two sites, one upstream and the other downstream of the sludge lagoon.

1.4.6 Marine ecological surveys

An annual intertidal ecological survey was carried out at three potential impact sites and two control sites during the 2020-2021 monitoring period. The objective of this survey was to indicate any change in intertidal community structure attributable to discharges from the NPWWTP outfall.

1.4.7 Shoreline bacteriological survey

A survey of shoreline bacteriological water quality at three seawater sites in the vicinity of the marine outfall, as well as a site on the lower reaches of the Waiwhakaiho River, is carried out every second year during the summer months. This monitoring was undertaken in the 2020-2021 period, and is next scheduled to be carried out during the 2022-2023 monitoring period.

1.4.8 Shellfish monitoring

1.4.8.1 Metals

Mussels are collected from three sites around the outfall (Waiwhakaiho Reef, Bell Block and East End) on a biennial basis and tested for trace metals. This monitoring was not undertaken in the 2020-2021 period. It is scheduled to be carried out during 2021-2022.

1.4.8.2 Norovirus

Mussels were collected on two occasions and analysed for norovirus GI and GII by ESR. Mussels are collected from Waiwhakaiho Reef and Bell Block Reef.

2 Results

2.1 Water

2.1.1 Inspections

Two routine site inspections were carried out at the plant during the monitoring period. These inspections involved a visual assessment of the plant processes and effluent, a check of the final effluent chlorine data, a brief consultation with operations and/or laboratory staff, and an inspection of the foreshore and seawater adjacent to the outfall.

The plant and surrounds were found to be tidy and well managed during each visit. All wastewater was contained within the plant, with no evidence of any overflows or spills having occurred. The peripheral drains around the site appeared to be clear of any sewage contaminants. The sludge disposal area had been reinstated with vegetation following the disposal operation that occurred in 2019-2020. In June 2021, the TDF was shut down temporarily in order to replace a damaged seal. Otherwise, NPWWTP staff noted that the plant had been operating well and that there had been no major performance issues.

Heavy rain had preceded the first inspection, which resulted in an overwash from the clarifiers into the chlorine contact tank. This is where high influent volumes result in the wastewater passing through the plant faster than normal, which reduces the efficacy of the clarifier process and results in poorer quality effluent being discharged from the plant. On this occasion, the final effluent still appeared relatively clear and colourless, but with a higher than normal level of suspended particulate (Photo 2).

Photo 2 Final effluent discharging from the chlorine contact tank into marine outfall (11 December 2020)

The sludge lagoon de-sludging project commenced during the year under review. CleanStream NZ were operating the dredge during the June inspection. At that time, the seventh geo-bag was being filled with slurry which would then gradually dewater. The dewatering area appeared to be effectively bunded and lined; containing all of the filtrate draining from the bags. The dewatering area had been contoured so that

all of the filtrate would run back towards the sludge lagoon (see Section 3.1 for further discussion of this operation).

The wastewater effluent plume was just visible as small lighter coloured patch on the sea surface during both inspections. There was no visual evidence of contamination of the foreshore or shoreline waters on either occasion.

The twin box culvert beneath Rifle Range Road did not appear to be obstructing fish passage in the Mangaone Stream when inspected on 11 December.

The Council collected two grab samples of the final effluent during the year (Table 2). The concentration of total available chlorine was compliant with the consent limit on both occasions, and faecal bacteria counts were consistently low.

Table 2 Effluent grab samples 2020-2021 (site SWG002002)

Parameter	Unit	Date		Consent Limit
		11 Dec 2020	3 Jun 2021	
Free available chlorine	g/m^3	0.61	0.1	-
Total available chlorine	g/m^3	1.24	1.39	**0.3 ***
E. coli	cfu/100 ml	10	2	**-**
Enterococci	cfu/100 ml	< 10	7	**-**

* The total available chlorine in the effluent, prior to entering the outfall pipe, shall be no less than 0.3 g/m^3

Consent limit during bioreactor maintenance

2.1.2 Effluent monitoring

2.1.2.1 Composite samples

An annual summary of the composite effluent monitoring undertaken by NPDC in relation to Special Condition 3 is presented in Table 3, along with the associated resource consent limits and a summary of previous results. The samples were split in order to perform inter-laboratory comparisons. For these comparisons, a satisfactory agreement between two samples was reached if they were each within 10% of the resultant mean. Because both NPDC and the Council were sending samples to Hill Laboratories for mercury analysis, an inter-lab comparison was deemed unnecessary for this analyte.

Table 3 Summary results of effluent composite samples collected by NPDC and TRC (2020-2021)

Parameter	Unit	Consent limit	2020-2021							Previous results (NPDC)	
			11 Dec 2020			3 Jun 2021			% compliant	Max	No. samples
			TRC	NPDC	Inter-lab	TRC	NPDC	Inter-lab			
Cyanide	g/m^3	**0.1**	<0.02	<0.02	√	<0.02	0.04	*	100	0.1	316
Cadmium	g/m^3	**0.04**	<0.001	<0.003	√	<0.001	<0.005	√	100	0.01	321
Chromium	g/m^3	**0.15**	<0.01	0.005	√	<0.01	<0.005	√	-	0.05	321
Copper	g/m^3	**0.1**	0.012	<0.02	√	<0.01	<0.005	√	100	0.05	321
Lead	g/m^3	**0.1**	<0.002	<0.01	√	<0.002	<0.05	√	100	0.05	321

Parameter	Unit	Consent limit	2020-2021							Previous results (NPDC)	
			11 Dec 2020			3 Jun 2021			% compliant	Max	No. samples
			TRC	NPDC	Inter-lab	TRC	NPDC	Inter-lab			
Mercury	g/m^3	**0.002**	-	<0.00008	-	<0.00008	-	-	-	0.001	303
Nickel	g/m^3	**0.15**	<0.01	<0.008	√	<0.01	<0.005	√	100	0.07	321
Phenols	g/m^3	**1**	<0.02	<0.05	√	<0.02	<0.05	√	100	0.17	313
Zinc	g/m^3	**0.2**	0.05	0.06	√	0.03	<0.05	√	100	0.15	321

√ = satisfactory agreement

* = unsatisfactory agreement

During the 2020-2021 monitoring year, sample results for heavy metals, cyanide and phenols remained within consent limits, and were comparable with those previously recorded. The majority of results were below detection limits.

The inter-laboratory comparisons showed that the results were generally in good agreement. There was one out of the 16 comparisons where the results from the two laboratories differed by more than 10%. However, it should be noted that due to the low concentrations of these contaminants, even small differences between results can cause the 10% variation threshold to be exceeded.

As stated in Special Condition 4, neither BOD nor TSS shall exceed a concentration of 25 g/m^3 in more than 5% of samples of the final effluent during normal plant operation. Special Condition 5 allows concentrations of up to 130 g/m^3 BOD and 110 g/m^3 TSS when one aeration basin is off-line for planned maintenance. A summary of the BOD and TSS results from the effluent composite samples collected during the year under review is presented in Table 4.

The concentration of TSS exceeded 25 g/m^3 in one sample during the year; which coincided with a clarifier overwash due to heavy rainfall (see Section 2.3). However, this only equated to a consent limit exceedance rate of 0.6%, and as such consent compliance was maintained. Effluent BOD concentrations were under the associated consent limit in 100% of the 157 samples.

Table 4: Summary of BOD and TSS results from 24-hour effluent composite samples

Parameter	Unit	Consent limit	No. of samples	Min	Max	Median	% compliant
BOD (combined methods)	g/m^3	**25**	157	1	15	4	100%
TSS	g/m^3	**25**	159	<5	59	<5	99.4%

2.1.2.2 Grab samples

Special Condition 10 requires that the concentration of total available chlorine (TAC) in the effluent shall be no less than 0.3 g/m^3. NPDC collect regular grab samples of the effluent to assess this condition. The results from the period under review are presented in Table 5.

Table 5: Summary of chlorine concentrations and faecal coliform (FC) counts, in effluent grab samples

Parameter	Unit	No. of samples	Min	Max	Median	Consent limit	% compliant
Free Chlorine	g/m^3	499	<0.2	2.0	<0.2	-	-
Total Chlorine	g/m^3	499	0.4	3.85	0.75	**≥ 0.3**	100
Faecal Coliforms	cfu/100ml	156	<1	84	2	-	-

The concentration of TAC was found to be at or above 0.3 g/m^3 in every routine sample collected during the monitoring year. The concentrations of TAC were reflected in the relatively low counts of faecal coliform bacteria present in effluent grab samples throughout the year, with a maximum recorded count of 84 cfu/100 ml (Table 5).

2.1.2.3 Norovirus samples

Condition 14 requires shellfish to be monitored for microbial contamination in relation to the NPWWTP outfall discharge. In conjunction with this, samples of influent and effluent at the NPWWTP are also collected and analysed for norovirus (GI and GII). Two sets of samples were collected for analysis during the period under review. The wastewater results from this monitoring year are presented in Table 6.

Table 6 Norovirus concentration in the effluent and influent at the NPWWTP

Plant operation	Date	Norovirus GI (genome copies/L)			Norovirus GII (genome copies/L)		
		Influent	Effluent	Log_{10} inactivation	Influent	Effluent	Log_{10} inactivation
Normal	13 Dec 2020	5,300	<13*	2.88	480,000	130	3.57
Normal	21 Jun 2021	13,000	<13*	3.27	390,000	210	3.27

* limit of quantitation (<50 genome copies/L), detection limit (<13 genome copies/L)

The NPWWTP achieved a high level of norovirus inactivation during the year under review.

2.1.3 Sludge lagoon monitoring

The lagoon was designed with the intention that sludge would be forced by hydraulic pressure into the fine river silts and ash which underline the lagoon, thus blinding and sealing the bottom of the lagoon. Resource consent 2982-4 authorises a discharge of up to 60 m^3/day of sludge lagoon leachate to groundwater. Monitoring results of shallow groundwater bores and surface waters in the vicinity of the lagoon indicate that leakage is occurring.

NPDC collects monthly groundwater and surface water samples from selected sites in the vicinity of the sludge lagoon (Figure 2). Summarised results from the year under review are provided in Tables 7 to 12, along with a summary of previous results from 1990 to 2020.

Figure 2 NPWWTP sludge lagoon and groundwater bore and drain sampling sites

The bore and drain pH monitoring results were similar between sites during the year under review (Table 7). The 2020-2021 results were comparable and within the range of the historic data.

Table 7: Summary of 2020-2021 monthly pH data and historic results (1990-2020) at the three monitoring bores and two drain sites

Site	No. samples		Minimum		Median		Maximum	
	2020-2021	Historical	2020-2021	Historical	2020-2021	Historical	2020-2021	Historical
B1	12	331	5.4	4.9	5.9	6.2	6.3	7.1
B2	12	332	5.7	4.9	5.9	6.1	6.2	7.4
B3	11	321	6.1	5.0	6.1	6.3	6.6	7.3
D2	12	327	6.4	6.0	6.6	6.6	6.8	7.0
D3	12	326	6.7	6.4	6.7	6.7	6.8	7.1

The ammoniacal-N results from the monitoring bores were similar during the year under review (Table 8). There was a considerable increase in ammonical-N between up the upstream and downstream drain monitoring sites (as has been the subject of investigation in previous monitoring years; see Section 3.2.2). The 2020-2021 median groundwater results were much lower than the historic medians, whereas the drain results were very similar.

Table 8: Summary of 2020-2021 monthly ammoniacal-N data and historic results (1990-2020) at the three monitoring bores and two drain sites

Site	No. samples		Minimum		Median		Maximum	
	2020-2021	Historical	2020-2021	Historical	2020-2021	Historical	2020-2021	Historical
B1	12	330	<0.1	<0.1	0.44	2.4	1.7	100
B2	12	330	<0.1	<0.1	<0.1	1.7	1.6	25

Site	No. samples		Minimum		Median		Maximum	
	2020-2021	Historical	2020-2021	Historical	2020-2021	Historical	2020-2021	Historical
B3	11	320	<0.1	<0.1	<0.1	0.5	3.7	198
D2	11	326	0.51	<0.1	0.58	0.5	0.94	7.5
D3	11	326	3.44	0.13	4.2	4.45	5.6	27

The median concentrations of oxidised-N were low in all three bores during the year and were comparable with historic medians (Table 9). The maximum results were all significantly lower than the historic maximums.

Table 9: Summary of 2020-2021 monthly oxidised-N data and historic results (1990-2020) at the three monitoring bores

Site	No. samples		Minimum		Median		Maximum	
	2020-2021	Historical	2020-2021	Historical	2020-2021	Historical	2020-2021	Historical
B1	12	331	<0.05	<0.02	0.26	0.40	2.10	28.0
B2	12	332	<0.05	<0.05	0.20	0.10	0.94	40.0
B3	11	319	0.08	0.02	0.32	0.21	3.17	64.0

In 2020-2021, all DRP results at Bore 2 were below the detection limit (Table 10). The maximum results from Bores 1 and 3 were significantly lower than historic maximums.

Table 10: Summary of 2020-2021 monthly DRP data and historic results (1990-2020) at the three monitoring bores

Site	No. samples		Minimum		Median		Maximum	
	2020-2021	Historical	2020-2021	Historical	2020-2021	Historical	2020-2021	Historical
B1	12	330	<0.08	<0.01	<0.08	0.025	0.12	3.30
B2	12	331	<0.08	<0.01	<0.08	0.025	<0.08	0.36
B3	11	318	<0.08	<0.01	<0.08	<0.08	0.80	62

COD concentrations from the 2020-2021 year increased from Bore 1 to Bore 3 (Table 11). The median results from the year under review were slightly higher than the historic medians for Bores 2 and 3. However, all results were within the range of results recorded historically.

Table 11: Summary of 2020-2021 monthly COD data and historic results (1990-2020) at the three monitoring bores

Site	No. samples		Minimum		Median		Maximum	
	2020-2021	Historical	2020-2021	Historical	2020-2021	Historical	2020-2021	Historical
B1	12	330	5	<1	12.5	12	28	48
B2	12	330	11	6	26.0	17	62	181
B3	11	319	16	1	40.0	26	129	740

Median faecal coliform counts were relatively low at Bore 1 and 2 during the year, however, all three Bores had relatively high maximum counts (Table 12). The counts in Bore 3 were considerably higher than the other two Bores. It is possible that this is related to the lower water level within this bore, meaning that bottom sediments are easily disturbed when sampling; leading to higher faecal coliform counts. Faecal coliform counts were comparable between drain sites, with slight increases seen at the downstream site (Table 12). All results were within the range of results recorded historically.

Table 12: Summary of 2020-2021 monthly FC data and historic results (1990-2020) at the three monitoring bores and two drain sites

Site	No. samples		Minimum		Median		Maximum	
	2020-2021	Historical	2020-2021	Historical	2020-2021	Historical	2020-2021	Historical
B1	12	328	12	<1	5	5	750	2,300
B2	12	330	<5	<1	23	5	228	10,000
B3	12	321	1	<5	100	10	2,400	72,000
D2	12	326	30	<10	280	100	1,900	6,960
D3	12	326	140	<10	325	130	2,430	13,280

Overall, the results indicate that leakage from the sludge lagoon continued to occur during the monitoring year. However, no significant issues were identified through the monitoring in 2020-2021. Further discussion of the sludge lagoon and its recent investigations are presented in Section 3.2.2.

2.1.4 Marine ecological surveys

In order to assess the effects of the NPWWTP outfall discharge on the nearby intertidal communities, ecological surveys were conducted between 12 January and 1 February 2021 at five sites (Figure 3). These surveys included three potential impact sites (SEA902015; 500 m SW, SEA902010; 300 m NE, SEA902005; Mangati Reef) and two control sites (SEA903070; Greenwood Road, SEA900095; Turangi Reef), north and south of the outfall. Any adverse effects of the NPWWTP outfall discharge on the intertidal communities would likely have been evident as a significant decline in species diversity at the potential impact sites relative to the control sites.

The main findings of these surveys are summarised below, and are presented in Figure 4 and Figure 5.

Impacts of the NPWWTP outfall discharge on local intertidal communities were not evident based on results of the 2020-2021 survey. Aside from the site 500 m SW of the outfall, comparable or higher numbers of species and Shannon-Weiner indices were generally seen at the potential impact sites, relative to the control sites. Furthermore, over the long-term record, there has been no obvious decline in species richness or diversity at the potential impact sites relative to the control sites (Figure 4, Figure 5). In recent years, a slight decreasing trend in species diversity appears to have developed at the site 500 m SW of the outfall. However, observations from these surveys suggest that this decline is more likely related to natural changes in reef habitat, rather than adverse impacts from the wastewater discharge. Natural environmental factors, in particular sand cover, substrate type and substrate mobility, appeared to be the dominant drivers of species diversity at the sites surveyed.

A full copy of the marine ecological survey report, including a comprehensive analysis and interpretation of results, is available from the Council upon request.

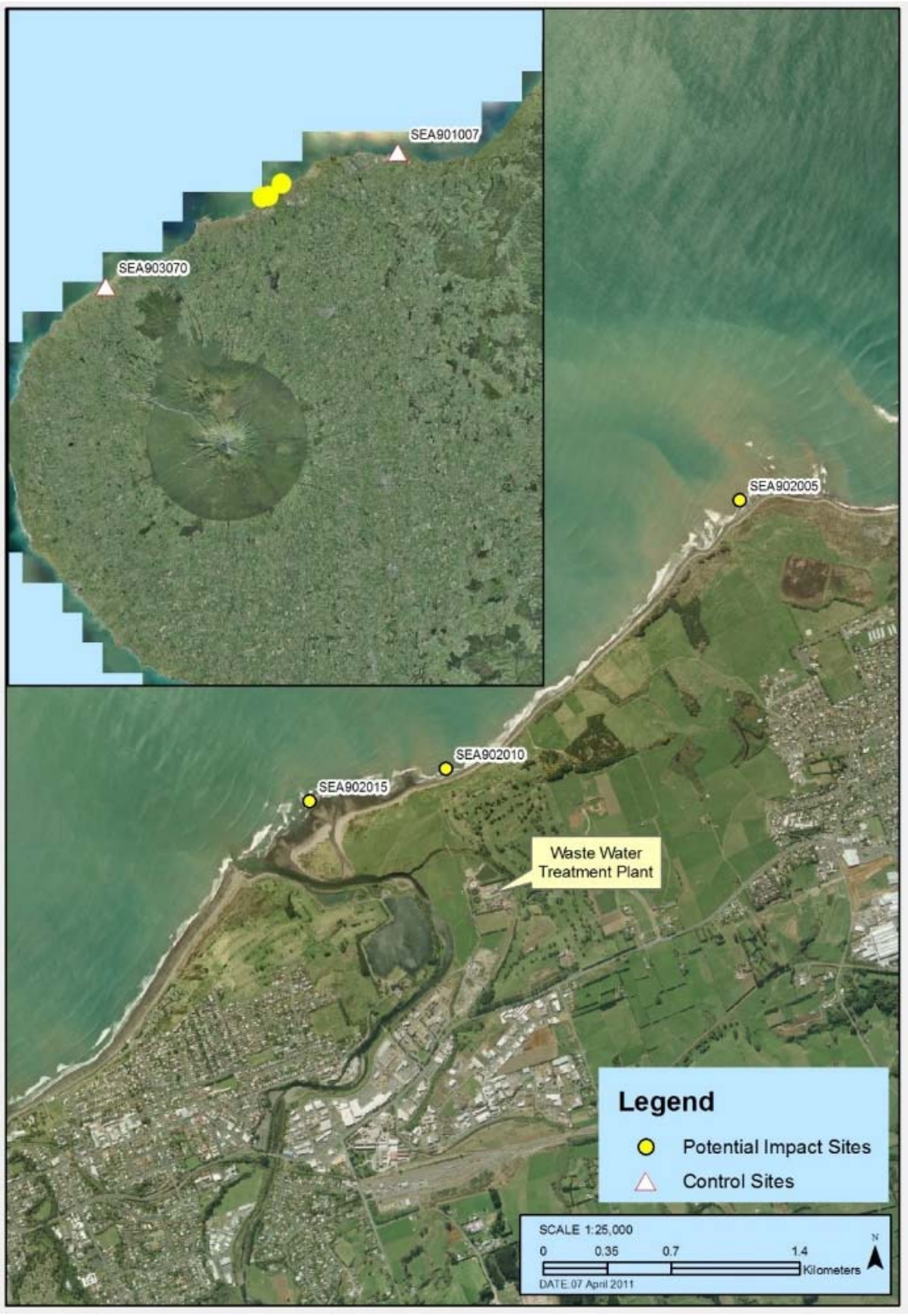

Figure 3 Marine ecological survey sites for NPWWTP

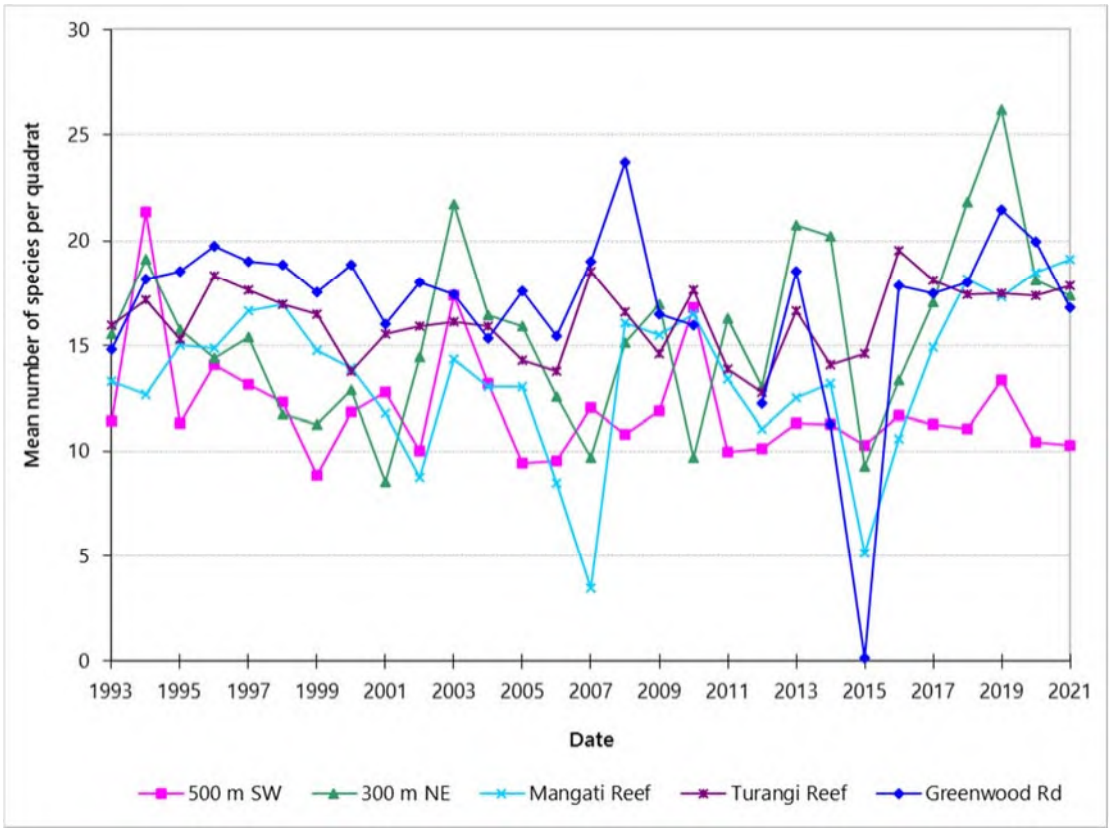

Figure 4 Mean number of species per quadrat for summer surveys (1993-2021)

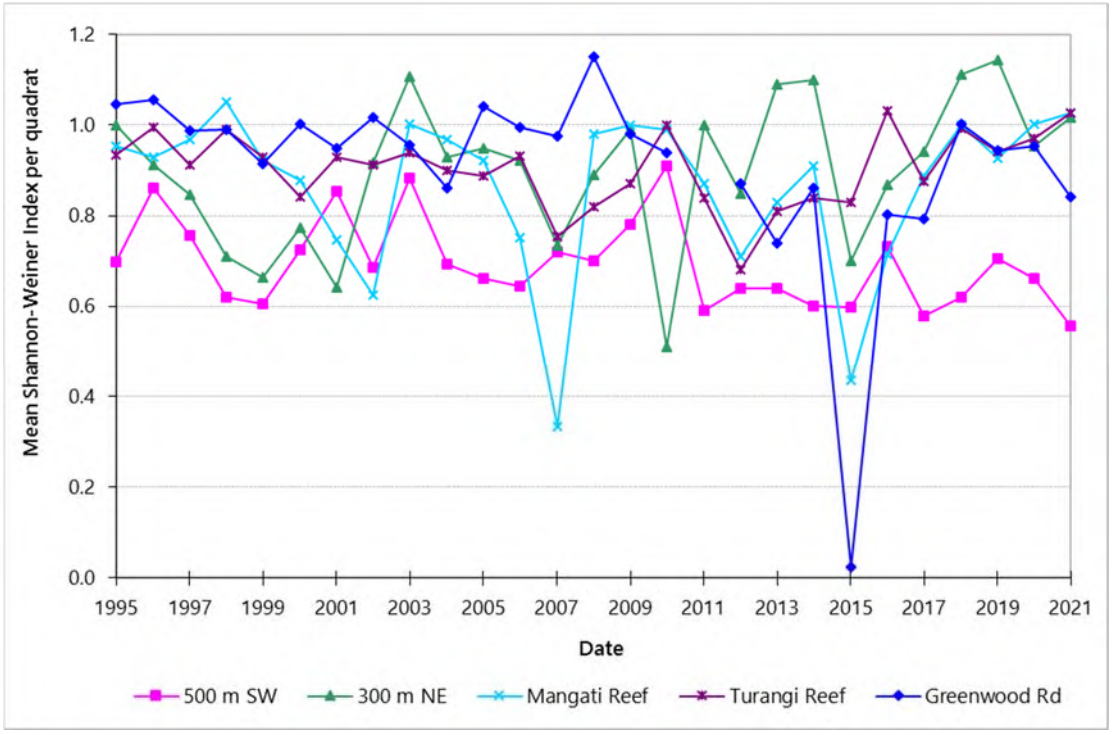

Figure 5 Mean Shannon-Weiner index per quadrat for summer surveys (1995-2021)

2.1.5 Shoreline bacteriological survey

Bacteriological water quality was monitored at three coastal sites in the vicinity of the outfall during the summer months of 2020-2021 to assess whether the discharge from the marine outfall was having any adverse effects on coastal bathing water quality (Figure 6). Monitoring was discontinued at the fourth coastal site (West Outfall), following a review of the monitoring programme in 2017. A site on the Waiwhakaiho River was also monitored in order to determine any influence of the river on the coastal waters. Thirteen samples were collected at each site during dry weather conditions and analysed for enterococci or *E. coli*, and conductivity.

Figure 6 Water quality sampling sites, in relation to the New Plymouth Wastewater Treatment Plant

During the 2020-2021 summer season, enterococci numbers were generally low at the three coastal sites (Figure 7). Median enterococci counts were < 2, 18 and 4 cfu/100 ml at the Mangati, East Outfall, and Fitzroy Beach sites, respectively. There were three instances where results exceeded the 'Alert' level threshold (>140 cfu/100 ml); twice at the East Outfall site, and once at Fitzroy Beach. At Fitzroy Beach, the exceedance coincided with wet weather, which possibly influenced water quality at the time the sample was collected. The cause of the two exceedances at the East Outfall site was less clear; however, subsequent sample results demonstrated that the high counts were short-lived. Numbers of *E. coli* at the Waiwhakaiho River Mouth were relatively high across the summer period; however, there was no obvious link between the elevated enterococci counts at the coast, and the water quality at the river mouth at the time those samples were collected. Other potential sources of faecal bacteria, including gulls, dogs or horses may have contributed to the high counts on those occasions. Routine monitoring of the effluent at the New Plymouth Wastewater Treatment Plant (NPWWTP) over the summer demonstrated that the minimum chlorine concentration required for disinfection was maintained, and levels of remaining faecal coliforms were low; with a median count of 2 cfu/100 ml.

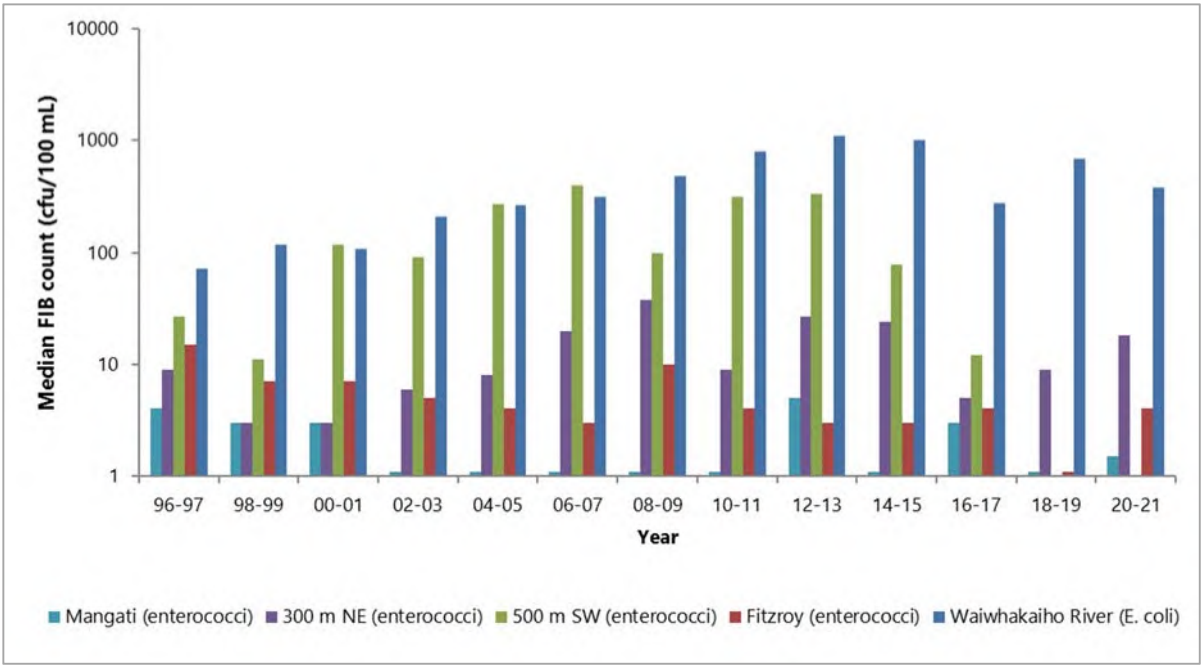

Figure 7 Median FIB counts recorded at each sampling site over the past 13 surveys, presented on a logarithmic scale

In summary, bacteriological water quality was generally high at the three coastal sites monitored during the 2020-2021 summer season. Based on the results presented here, the NPWWTP marine outfall discharge did not appear to be adversely affecting bathing water quality at the coast.

A full copy of the shoreline bacteriological survey report is available from the Council upon request. For more information on summer bathing water quality at Fitzroy, Waiwhakaiho and various other sites around the Taranaki region, monitoring reports can be found on the Council website or check the 'Can I Swim Here?' web page.

2.1.6 Shellfish monitoring

2.1.6.1 Metals in mussel flesh

Mussel samples were not analysed for trace metals during the current monitoring period. Trace metal analyses are carried out on a biennial basis and are next scheduled for 2021-2022.

2.1.6.2 Norovirus in shellfish flesh

In waters affected by discharges from wastewater treatment plants, the relationship between indicators and pathogens can be altered by the wastewater treatment process. Currently, it is norovirus that is believed to pose the greatest health risk in seawater containing treated wastewater. Norovirus is the main cause of gastroenteritis associated with shellfish consumption and only low concentrations are required to pose a high risk of infection in humans. Mussels and other filter feeding molluscs are efficient at concentrating norovirus, which can be retained in their flesh for up to 8-10 weeks.

As a requirement of condition 13, consent 0882-4, a Quantitative Microbial Risk Assessment (QMRA) was completed, which assesses the human health effects associated with norovirus in wastewater discharges from the NPWWTP (McBride, 2012).

In conjunction with the QMRA, and as a requirement of condition 14, consent 0882-4, monitoring of microbial contamination within shellfish was implemented within the consent compliance monitoring programme for the NPWWTP. Mussel flesh has been monitored for norovirus (GI and GII) at two potential

impact sites (Waiwhakaiho Reef and Bell Block) since October 2012. A control site (Oakura) was also monitored initially; however this has since been discontinued as it was decided that a control site was not required for interpretation of the results. Norovirus (GI and GII) concentrations were also measured within the NPWWTP influent and effluent (see Section 2.1.2.3).

Low levels of norovirus were present in mussels sampled from Waiwhakaiho and Bell Block in December 2020 (Table 13). No norovirus was detected in the samples collected in June 2021. There are permanent health warning signs at Waiwhakaiho and Bell Block due to the elevated risk of norovirus presence in shellfish at these sites.

Table 13 Mussel flesh norovirus results 2020-2021

Plant operation	Date	Site	Mussel flesh norovirus	
			GI	GII
Normal	15 Dec 2020	Waiwhakaiho Reef	Low	Low
		Bell Block	Negative	Low
Normal	23 Jun 2021	Waiwhakaiho Reef	Negative	Negative
		Bell Block	Negative	Negative

2.2 Air

2.2.1 Inspections

Noticeable sewage odours were detected at the plant during both routine inspections. In December, intermittent odours were detected at the southern plant boundary, near the TDF and bio-filters. However, no odours were detected beyond the site boundary during either inspection. A distinct chlorine odour was detected in the immediate vicinity of the chlorine contact tank; as is typical for this location.

The de-sludging and dewatering operation at sludge lagoon no. 2 was underway during the second inspection carried out in June. No odours were detected at the dewatering area or at the lagoon.

2.3 Investigations, interventions, and incidents

The monitoring programme for the year was based on what was considered to be an appropriate level of monitoring, review of data, and liaison with NPDC. During the year matters may arise which require additional activity by the Council, for example provision of advice and information, or investigation of potential or actual courses of non-compliance or failure to maintain good practices. A pro-active approach that in the first instance avoids issues occurring is favoured.

For all significant compliance issues, as well as complaints from the public, the Council maintains a database record. The record includes events where the individual/organisation concerned has itself notified the Council. Details of any investigation and corrective action taken are recorded for non-compliant events.

Complaints may be alleged to be associated with a particular site. If there is potentially an issue of legal liability, the Council must be able to prove by investigation that the identified individual/organisation is indeed the source of the incident (or that the allegation cannot be proven).

In the 2020-2021 period, the Council was required to undertake significant additional investigations and interventions, and record incidents, in association with NPDC's conditions in resource consents and provisions in Regional Plans.

During the year under review, there were a total of 24 incidents associated with the NPWWTP and New Plymouth District wastewater network. Five events occurred at the NPWWTP, with four attributed to heavy rainfall and one relating to a potable water leak. In the network, 19 incidents were caused by significant rainfall events, power outages and pipe blockages. A total of 12 incidents were solely attributed to the significant rainfall events that occurred in late November and early December. The number of incidents that occurred in 2020-2021 increased from the previous year by one (Table 14).

Incidents are investigated and assessed based on the cause of incident, NPDC's adherence to their Incident Response Plan (IRP) and the resulting environmental effects. For the purpose of discussion, incidents have been separated into those directly associated with the NPWWTP, sewage pump station incidents and reticulation overflows. A breakdown of all of the incidents from 2020-2021 is provided in the following sections.

Table 14 Incidents associated with the NPWWTP and New Plymouth District wastewater network since 2014-2015

Year	Number of incidents
2014-2015	40
2015-2016	24
2016-2017	20
2017-2018	16
2018-2019	9
2019-2020	23
2020-2021	24

2.3.1 New Plymouth Wastewater Treatment Plant incidents

Five incidents occurred at the NPWWTP during the 2020-2021 year (Table 15).

Table 15 Summary of incidents at the NPWWTP during the 2020-2021 monitoring year

Date	Incident details	Compliant (Y/N)	Enforcement Action Taken?	Outcome
25/11/2020	Heavy rainfall caused plant inflow to increase substantially; resulting in an overwash from the clarifiers into the chlorine contact tank. Effluent quality deteriorated due to high suspended solids load in chlorine contact tank. Overwash occurred between 11:00 and 15:20.	Y	No.	IRP training refresher for clarifier overwash events carried out with plant operators. Maintenance scheduled to clean out pipework and reduce magnitude of a reoccurrence.
26/11/2020	Heavy rainfall caused plant inflow to increase substantially; resulting in an overwash from the clarifiers into the chlorine contact tank. Effluent quality deteriorated due to high suspended solids load in chlorine contact tank. Overwash occurred between 11:20 and 13:00.	Y	No.	IRP training refresher for clarifier overwash events carried out with plant operators. Maintenance scheduled to clean out pipework and reduce magnitude of a reoccurrence.
9/12/2020	Heavy rainfall caused plant inflow to increase substantially; resulting in an overwash from the clarifiers into the chlorine contact tank. Effluent quality deteriorated due to high suspended solids load in chlorine contact tank. Overwash occurred between 21:10 and 01:30.	Y	No.	IRP amended to improve clarity of response requirements. IRP training refresher for clarifier overwash events carried out with plant operators. Maintenance scheduled to clean out pipework and reduce magnitude of a reoccurrence.
10/12/2020	Heavy rainfall caused plant inflow to increase substantially; resulting in an overwash from the clarifiers into the chlorine contact tank. Effluent quality deteriorated due to high suspended solids load in chlorine contact tank. Overwash occurred between 08:30 and 11:30.	Y	No.	IRP amended to improve clarity of response requirements. IRP training refresher for clarifier overwash events carried out with plant operators. Maintenance scheduled to clean out pipework and reduce magnitude of a reoccurrence.

Date	Incident details	Compliant (Y/N)	Enforcement Action Taken?	Outcome
23/04/2021	A water leak from a potable water line tacked through the screening bin storage area and entered a stormwater drain which discharges to an unnamed tributary of the Waiwhakaiho River.	Y	No.	Further investigation found that there was no discharge of contaminants to any waterways.

2.3.2 Sewage pump station incidents

There were eight unauthorised discharges from sewage pump stations (SPSs) during the 2020-2021 monitoring year (Table 16).

Table 16 Summary of pump station overflows during the 2020-2021 year

Date	Details	Compliant (Y/N)	Enforcement Action Taken?	Outcome
25/11/2020	Huatoki SPS overwhelmed during heavy rain resulting in an overflow into the Huatoki Stream.	N	No. Statutory defence (extreme weather event).	IRP was followed. NPDC to continue progressing the inflow and infiltration reduction programme. One new pump has been installed and another is pending installation. Non-return valves to be upgraded also.
25/11/2020	Ngamotu SPS overwhelmed during heavy rain resulting in an overflow from the pump station.	N	No. Statutory defence (extreme weather event).	IRP was followed. NPDC to continue progressing the inflow and infiltration reduction programme. Non-return valve installed on SPS overflow pipe to prevent stormwater backflowing into SPS from Hongihongi culvert.
25/11/2020	Te Henui SPS inflow exceeded pump capacity resulting in an overflow.	N	No. Statutory defence (extreme weather event).	IRP was followed. NPDC to continue progressing the inflow and infiltration reduction programme.

Date	Details	Compliant (Y/N)	Enforcement Action Taken?	Outcome
25/11/2020	High river flows held the Glen Avon SPS overflow pipe's flap gate open. This resulted in stormwater overwhelming the pump station and triggering the overflow alarm.	N	No. Statutory defence (extreme weather event).	IRP was followed. NPDC to continue progressing the inflow and infiltration reduction programme. Flap gate scheduled for replacement with a non-return valve.
1/12/2020	A third party power outage led to pump failure at the Rimu Street SPS that resulted in an overflow.	N	No. Statutory defence (unplanned power outage).	IRP was followed. Generator brought to site until power was restored and pumps were reset. A project to upgrade sewer pump stations, as required, with contingency options such as emergency storage and backup power generation has been included in the 2021-2031 LTP.
9/12/2020 – 11/12/2020	High rainfall overwhelmed Waitara Transfer SPS and Queen Street SPS, which then both overflowed to the Waitara Outfall SPS and discharged into the Tasman Sea. Discharges occurred intermittently for approximately 215 minutes over a 40-hour period. An estimated 4,000 m^3 of wastewater was discharged to the Tasman Sea during this event. Dilution of sewage by stormwater was calculated to be at least 1:10.	N (7861-1)	The screened emergency discharges that originated from the Waitara SPS were compliant with the conditions set out in resource consent 7861-1. The unscreened discharges that originated from the Queen Street SPS were non-compliant with the resource consent conditions. No enforcement action was taken as NPDC had a statutory defence given the exceptionally high rainfall.	IRP was followed. A wastewater model is being developed to improve understanding of system and interventions required (3-year project). SPS storage tank programming has been modified to avoid faults. Faulty valve on SPS storage tank has been replaced. Investigation of river water ingress into sewer network during high flows/high tides is in progress.

Date	Details	Compliant (Y/N)	Enforcement Action Taken?	Outcome
28/03/2021	Power outage due to a car accident led to pump failure at the Bell Block SPS which resulted in an overflow.	N	No. Statutory defence (unplanned power outage).	IRP was followed. Generator brought to site until power was restored and pumps were reset. A project to upgrade sewer pump stations, as required, with contingency options such as emergency storage and backup power generation has been included in the 2021-2031 LTP.
31/03/2021	A high rainfall event led to a wastewater overflow from the Glen Avon SPS.	N	No. Statutory defence (extreme weather event).	IRP was followed. NPDC to continue progressing the inflow and infiltration reduction programme. Flap gate has been replaced with a non-return valve.

2.3.3 Reticulation overflow incidents

Eleven unauthorised discharges to surface water occurred due to overflows in the reticulation network during the 2020-2021 monitoring period (Table 17).

Table 17 Summary of reticulation overflows during the 2020-2021 year

Date	Details	Compliant (Y/N)	Enforcement Action Taken?	Outcome
24/07/2020	Brois Street, NP. Sewer line blockage from tree roots and fat caused an overflow of wastewater from a manhole.	N	No. Statutory defence (unforeseen blockage).	Blockage cleared, site cleaned and sanitised.
07/08/2020	Liardet Street, NP. Sewer line blockage fat caused an overflow of wastewater from a manhole.	N	No. Statutory defence (unforeseen blockage).	Blockage cleared, site cleaned and sanitised.
03/09/2020	Belt Road, NP. Sewer line blockage from tree roots caused an overflow of wastewater from a manhole.	N	No. Statutory defence (unforeseen blockage).	Blockage cleared, site cleaned and sanitised.
04/09/2020	Browne Street, Waitara. Sewer line blockage from tree roots caused an overflow of wastewater from a manhole.	N	No. Statutory defence (unforeseen blockage).	Blockage cleared, site cleaned and sanitised.

Date	Details	Compliant (Y/N)	Enforcement Action Taken?	Outcome
12/10/2020	Banks Street, NP. Sewer line blockage due to private contractor's pipe plug accidentally being left in the pipe which resulted in an overflow of wastewater from a manhole.	N	Further explanation requested. No enforcement action taken – warning issued.	Plug removed, site cleaned and sanitised.
25/11/2020	Brougham Street, NP. High rainfall event resulted in a wastewater overflow from a manhole.	N	No. Statutory defence (extreme weather event).	Site cleaned and sanitised. NPDC to continue progressing the inflow and infiltration reduction programme.
25/11/2020	Konini Street, Inglewood. High rainfall event resulted in a wastewater overflow from a manhole.	N	No. Statutory defence (extreme weather event).	Site cleaned and sanitised. NPDC to continue progressing the inflow and infiltration reduction programme.
08/12/2020	Konini Street, Inglewood. High rainfall event resulted in a wastewater overflow from a manhole.	N	No. Statutory defence (extreme weather event).	Site cleaned and sanitised. NPDC to continue progressing the inflow and infiltration reduction programme.
10/02/2021	Bracken Street, NP. Sewer line blockage from tree roots caused an overflow of wastewater from a manhole.	N	No. Statutory defence (unforeseen blockage).	Blockage cleared, site cleaned and sanitised.
12/04/2021	Konini Street, Inglewood. Sewer line blockage due to private contractor's pipe plug accidentally being left in the pipe which resulted in an overflow of wastewater from a manhole. The wastewater overflow occurred over a prolonged period due to an issue with the overflow alarm communication system.	N	Further explanation requested. Infringement Notice issued.	Plug removed, site cleaned and sanitised. LTP project to replace all alarm communication systems. Environmental Learning Alert raised with contractors to raise awareness of the risk of leaving sewer plugs in place. A shared record keeping system to be developed in order for Council to have oversight over the installation and removal of sewer plugs.
06/05/2021	Mace Street, NP. Sewer line blockage from wet wipes and a disposable nappy resulted in an overflow of wastewater from a manhole.	N	No. Statutory defence (unforeseen blockage).	Blockage cleared, site cleaned and sanitised.

3 Discussion

3.1 Discussion of plant performance

During routine inspections, the plant was found to be well managed, with no issues noted. There were two non-routine activities which took place in 2020-2021 that were directly related to the plant's resource consents; bioreactor maintenance and the sludge lagoon de-sludging project.

Bioreactor maintenance

In August, Bioreactor One was taken offline for scheduled maintenance. The bioreactor was taken offline on 2 August, with operation resuming on 13 August; an outage lasting 12 days. This timeframe was therefore compliant with 14-day limit prescribed in condition 5 of resource consent 0882-4. During the outage, no wastewater bypassed the biological treatment process. All wastewater was directed through Bioreactor Two, as plant inflows remained sufficiently low. TSS and BOD concentrations in the final effluent remained below the normal operating consent limits during this period. During the maintenance, 136 tonnes of grit and debris was removed from the bioreactor. With the new grit trap at the inlet works, it is expected that grit accumulation in the bioreactors will be significantly reduced going forward. All 2,745 diffuser heads in the bioreactor were also replaced as part of the maintenance in order to optimise aeration efficiency.

De-sludging project

Work began on removing the sludge from Sludge Lagoon Number Two during the 2020-2021 monitoring year. The sludge lagoon had not been used for almost 30 years, and removing the sludge was the first step towards re-instating the area for other uses. The process involved removing the estimated 18,600 m^3 of sludge with an amphibious dredging unit, which would then be pumped into large geotextile bags located within a purpose built, bunded and lined dewatering area (Photo 3). The sludge would then gradually dewater over time, and once the residual solids content was high enough, the sludge could then be disposed to landfill as special waste.

Photo 3 Geotextile dewatering bags (left) and dewatering filtrate draining back towards lagoon (right)

A thorough assessment of effects was undertaken by NPDC ahead of this operation. It was determined that all of the activities could be undertaken within the parameters of the existing consents that cover the wastewater treatment activities. Environmental effects that were of particular concern included potential odour generation, and the discharge of contaminants contained within the sludge filtrate. Given the nature of trade waste that the plant was processing at the time the lagoon was in use, the sludge was known to contain heavy metals and dioxins. A series of sludge, lagoon supernatant, and sludge filtrate were tested for heavy metals and dioxins ahead of the project commencing. These results showed that the contaminants of concern remained bound to the sediments in the sludge, and that the dewatering filtrate was not going to have a measurable effect on the quality of the plant's effluent. As an additional means of effluent quality control, the dewatering filtrate was pumped to a Karina Potable Water Treatment Plant for further treatment through a 0.5 micron filter.

De-sludging commenced in November 2020. To begin with, the dewatering filtrate was directed back to the lagoon. However, eventually it was necessary to drop the water level of the lagoon in order for the suction dredge to continue removing the deeper layers of sludge. At this point, the dewatering filtrate was pumped through the filtration unit and into the plant's chlorine contact tank, where it would undergo significant dilution (approximately three orders of magnitude), prior to discharging through the outfall. Additional testing of heavy metals, dioxins and TSS confirmed that there was no measurable impact on the quality of the plant's effluent. No odour issues occurred in relation to the de-sludging or dewatering processes during 2020-2021. No significant adverse effects on the surrounding groundwater or peripheral tributary were identified based on the monitoring results.

This project is ongoing in 2021-2022.

General consent requirements

Conditions 18 and 19 relate to the ongoing peer review of the monitoring plan and provision of a technology report at various times during the consent period. The monitoring plan was reviewed in early 2017 and included a rerun of the QMRA using data collected since the original QMRA in 2012-2013. The updated monitoring plan was independently peer reviewed by John Crawford and the amended plan was approved by Council on 31 March 2017. The next review is due by 31 March 2022.

Condition 20 of consent 0882-4 requires that NPDC provide an annual report to the Council by 31 July each year. The report details progress made towards reducing inflow and infiltration reduction; NPDC's target for reduction of inflow and infiltration; and works proposed to meet that target over the coming year. A report addressing these requirements for 2020-2021 was provided by NPDC.

The NPDC Sewer System Emergency Discharge Contingency Plan is incorporated into the Infrastructure Incident Response Plan (IRP). This new format IRP was produced in August 2021 (version 1.0), and satisfies the requirements of condition 21, consent 0882-4.

An annual meeting with representatives of the Council, Ngati Tawhirikura Hapu, and interested submitters is required by condition 22 of consent 0882-4. The invitation for the meeting was extended to interested parties for both New Plymouth and Waitara wastewater treatment plant consents. This meeting was held on 9 December 2020 at the Waitara Library Meeting Room. Representatives from NPDC, TRC, TDHB, Ngatiawa, Manukorihi, Friends of the Waitara River, Ngati Mutunuga, Ngati Rahiri and the Waitara Community Board were in attendance. There were a number of administrative and informative actions that came from this meeting which have been completed. However, one standing item was to hold a forum with interested parties to define 'tolerable risk' to individual illness from shellfish consumption in relation to the WWTP discharge. NPDC were responsible for this action but have not yet been able to complete it.

3.2 Environmental effects of exercise of consents

3.2.1 Effluent discharge to Tasman Sea

Two consents cover the discharge of treated wastewater from the plant to the Tasman Sea via the marine outfall. Consent 0882-4 allows the discharge of the wastewater through the marine outfall and consent 4593-2 licenses the presence of the outfall structure in the coastal marine area.

Monitoring of the wastewater discharge to the Tasman Sea during the 2020-2021 monitoring period consisted both of monitoring of the final wastewater composition prior to discharge, and monitoring of the effects of the discharge on the receiving environment.

Monitoring of the final wastewater prior to discharge was primarily undertaken by NPDC in the form of regular grab samples and 24-hour composite samples. Inter-laboratory comparisons and checks of compliance with consent conditions were also undertaken by the Council. Through this monitoring, NPDC demonstrated 100% compliance regarding contaminants as per condition 3 of consent 0882-4. BOD and

TSS concentrations were below consent limits in 100% and 99.4% of samples, respectively, during the year; maintaining compliance with condition 4. Compliance with condition 10, regarding the minimum required effluent chlorine concentration, is assessed using results from grab samples. All routine grab samples were compliant with this condition throughout the monitoring period. The NPWWTP continued to achieve a high level of norovirus inactivation during the year under review. Overall, monitoring results indicated that the effluent discharge from the NPWWTP to the Tasman Sea was of a high quality during the 2020-2021 year.

Monitoring of effects on the receiving environment consisted of visual shoreline inspections, an intertidal marine ecological survey, a shoreline bacteriological survey and the analysis of norovirus in green lipped mussel tissue. Inspections carried out during the year found no visual evidence of adverse effects in the near shore waters from the outfall discharge. The ecological intertidal surveys found no evidence to suggest that the outfall discharge was adversely affecting rocky shore communities. Shoreline bacteriological water quality was generally high at the three coastal sites monitored during the 2020-2021 summer season. Based on the results presented in this report, the NPWWTP marine outfall discharge did not appear to be adversely affecting bathing water quality at the coast. Norovirus monitoring results showed that there is still a risk of shellfish contamination between Waiwhakaiho and Bell Block. As such, health warning signage will remain in place until the next review of the QMRA, scheduled to be undertaken as part of the Monitoring Plan review in 2022.

3.2.2 Sludge lagoon and contingency sludge disposal monitoring

NPDC holds consent 2982-4 which allows the discharge of leachate from the sludge stabilisation lagoon to groundwater.

Monitoring of the sludge lagoon facility during the 2020-2021 monitoring period consisted of monthly testing of groundwater bores and nearby surface water in an open drain by NPDC, and inspections by the Council.

As per previous years, the routine monitoring found that ongoing seepage was a source of nutrients and microbial contaminants in the groundwater system downgradient of the sludge lagoon. However, an investigation completed in 2017-2018 deemed that the measured concentrations of nutrients and metals are not of significant concern in terms of their environmental impact. Because the groundwater system downgradient of the lagoon is highly reducing in nature, it therefore has significant capacity to attenuate nitrogen. As a result any adverse effects resulting from the discharge on groundwater are likely to occur within close proximity of the lagoon itself and are unlikely to extend outside of the boundaries of the site. Ongoing monitoring is necessary to ensure that these effects do not worsen.

Elevated levels of ammoniacal-N and faecal coliforms are regularly detected within the drain downstream of the sludge lagoon. The concentrations of ammoniacal-N have been found to significantly exceed the NPS-FM national bottom line for fish toxicity. An additional targeted drain survey carried out during the 2018-2019 monitoring year failed to locate any point source discharges entering the drain. It was concluded that sub-surface groundwater seepage between the two sampling sites was the most likely pathway. Due to the limited environmental impact of this contamination (the drain is only a minor contributor to downstream receptors, i.e. the Waiwhakaiho River), and that NPDC are beginning a process to decommission the lagoon (i.e. removing the pollution source entirely), it was decided that no further action was required. However, as with the groundwater, ongoing monitoring is required to ensure the situation does not worsen.

During the year, NPDC began the process of decommissioning the sludge lagoon (see Section 3.1). The monitoring showed that this activity was well managed and appeared to have good controls in place to prevent adverse environmental effects from occurring.

3.2.3 Air discharge

NPDC holds consent 4740-2 that allows the discharge of contaminants into the air from sludge processing activities.

No odours were detected at or beyond the boundary on either routine inspection during normal plant operation. No odours were detected in relation to the de-sludging and dewatering activities that were occurring on site during the year.

3.3 Evaluation of performance

A tabular summary of NPDC's compliance record for the year under review is set out in Tables 18-23.

Table 18 Summary of performance for Consent 0882-4

Purpose: ***To discharge wastewater to the Tasman Sea***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Consent holder to adopt best practicable option to minimise environmental effects	Inspections, sampling, ecological surveys	Yes
2. Maintenance of multiport diffuser system	NPDC annual report, plant operated as per design	Yes
3. Concentration limits upon potential contaminants in discharge	Samples collected by both Council and consent holder: 100% compliance achieved	Yes
4. Concentration limits for TSS and BOD	Samples collected by both Council and consent holder: 95% compliance required, 100% and 99.4% compliance achieved for BOD and TSS	Yes
5. Concentration limits upon TSS and BOD when aeration basins off-line	Samples collected by both Council and consent holder. Parameters remained compliant with normal operation limits.	Yes
6. Public notification prior to taking aeration basin off-line	Public notification provided in Taranaki Daily News and via email to interested parties	Yes
7. Minimum duration off-line to achieve purpose	Council liaison	Yes
8. Notification to Council prior to taking aeration basins off-line	Notification received	Yes
9. Consent holder to erect signage during off-line periods	Additional signage erected at Fitzroy and Te Henui	Yes
10. Total available chlorine at least 0.3 gm^{-3} in effluent	Analysis of grab samples collected by NPDC and Council.	Yes
11. Effluent through 3 mm screen	Consent condition changed to 5 mm screen requirement due to issues with 3 mm screen	Yes
12. Consent holder to undertake monitoring	Monitoring undertaken and results supplied	Yes

Purpose: *To discharge wastewater to the Tasman Sea*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
13. Consent holder to submit a QMRA	QMRA revised February 2017; next review to occur in 2022.	Yes
14. Consent holder to submit a monitoring plan	Reviewed in June 2013.	Yes
15. Preparation of draft monitoring plan for consultation	Draft issued, consultation undertaken in April and June 2013	Yes
16. Peer review of monitoring plan	Reviewed March 2017	Yes
17. Consent holder to provide comments received during consultation and peer review to Council	Reviewed March 2017	Yes
18. Results of peer review of monitoring programme in 2017, 2022, 2027, 2032 and 2037	Approved March 2017	Yes
19. Provide Technology Report in March 2027 and 2037	Due March 2027	N/A
20. Provide Annual Report by 31 July	Report received in August, as agreed upon by Council	Yes
21. Maintain Contingency Plan	IRP reviewed August 2021 (INFRA-IRP v1.0)	Yes
22. Annual meeting with Council, iwi and others	Meeting held December 2020	Yes
23. Meeting to include future management of wastewater	Next scheduled in 2027	N/A
24. Review of consent	Next scheduled in June 2022	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

N/A = not applicable

Table 19 Summary of performance for Consent 1826-2

Purpose: *To erect, place and maintain a culvert*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Structure maintained to meet consent conditions	Inspection undertaken on 11 December 2020	Yes
2. Instream maintenance work between November and April	No maintenance required	Yes

Purpose: *To erect, place and maintain a culvert*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
3. Notification prior to maintenance work	No maintenance required	N/A
4. Best practicable option during maintenance to avoid adverse effects on environments	No maintenance required	N/A
5. Area and volume of streambed disturbance minimised during maintenance	No maintenance required	N/A
6. No obstruction of fish passage	Inspection undertaken on 11 December 2020	Yes
7. Removal and reinstatement	N/A	N/A
8. Review of consent conditions	No further provision for review	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

N/A = not applicable

Table 20 Summary of performance for Consent 2982-4

Purpose: *To discharge leachate from a sludge stabilisation lagoon to groundwater*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Monitoring of groundwater adjacent to lagoon	Monitoring undertaken by consent holder	Yes
2. Monitoring of unnamed tributary of the Waiwhakaiho River	Monitoring undertaken by consent holder	Yes
3. No direct discharge of contaminants to surface water from sludge lagoons	Inspections and results of monitoring	Yes
4. No adverse effects upon ground or surface waters	Inspections and results of monitoring	**No** Minor, relatively localised effects on groundwater and surface water downstream of the lagoon
5. Review of consent	No further provision for review	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**Good**
Overall assessment of administrative performance in respect of this consent		**High**

N/A = not applicable

Table 21 Summary of performance for Consent 4593-3

Purpose: *To erect, place, maintain and use a marine outfall*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Structures authorised as per details in application	No alterations have been made to structure	Yes
2. Consent holder to maintain structure	Outfall maintenance inspection undertaken on 25 and 26 January 2022. Inspection findings to be included in next annual report.	Yes
3. Review of consent conditions	Next scheduled in June 2020	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

N/A = not applicable

Table 22 Summary of performance for Consent 4740-2

Purpose: *To discharge contaminants to air*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
4. Best practicable option to prevent or minimise adverse effects	Inspections	Yes
5. Operation and maintenance of sludge management processes	Inspections, consent holder liaison	Yes
6. No odours beyond property boundary	Inspections	Yes
7. Statement of how biofilters are maintained	Information received	Yes
8. Preparation of contingency plan, to be reviewed biennially.	Plan received (WWTP-WI-006 version 3, Dec 2019)	Yes
9. Plan and notification prior to removal of sludge from No. 2 lagoon	Not yet undertaken	N/A
10. Review of consent	No further reviews remaining	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

N/A = not applicable

Table 23 Summary of performance for Consent 9984-1

Purpose: *To discharge contaminants onto and into land and into air on a contingency basis*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Authorised areas for sludge disposal	Site inspection	Yes
2. No discharge after 1 June 2020	Site inspection, consent holder liaison	Yes
3. Specific circumstances under which the discharge may occur	Consent not exercised during the year under review	N/A
4. Best practicable option to prevent or minimise adverse effects	Consent not exercised during the year under review	N/A
5. Consent holder to provide monitoring programme	Monitoring programme version 7 received January 2020 (contained within Management Plan)	Yes
6. Monitoring bore specifications	Bores installed as per requirements	Yes
7. Representative samples taken of waste before discharge event	Sample results provided to Council	Yes
8. Dewatered sludge and dried biosolids monitoring data provided to Council	Consent not exercised during the year under review	N/A
9. Environmental conditions under which sludge may not be discharged	Consent not exercised during the year under review	N/A
10. Discharge boundaries	Consent not exercised during the year under review	N/A
11. Spreading requirements	Consent not exercised during the year under review	N/A
12. Revegetation requirements	Site inspection	Yes
13. Soil pH requirements	Council and NPDC soil samples	Yes
14. Discharge shall not result in objectionable/offensive odour beyond site boundary	Consent not exercised during the year under review	N/A
15. Notification requirements	Consent not exercised during the year under review	N/A
16. Record keeping requirements	Information provided to Council	Yes
17. Soil concentration limits for heavy metal	Council and NPDC soil samples	Yes
18. Management plan	Management Plan version 7 received January 2020	Yes
19. Odour contingency plan provided to Council before consent is exercised	Odour management and contingency provisions included in Management Plan version 7 received January 2020	Yes

Purpose: *To discharge contaminants onto and into land and into air on a contingency basis*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
20. Provision for the discovery of archaeological remains	No archaeological remains discovered	N/A
21. Annual stakeholder meeting	Consent not exercised during the year under review	N/A
22. Consent shall lapse on 1 June 2020 unless given effect	Consent exercised	N/A
23. Review of consent	No review dates remaining	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

N/A = not applicable

Table 24 Evaluation of environmental performance over time

Year	Consent no	High	Good	Improvement req	Poor
2010	0882	-	1	-	-
	2982	1	-	-	-
	4740	1	-	-	-
	4593	1	-	-	-
	1826	1	-	-	-
2011	0882	-	1	-	-
	2982	1	-	-	-
	4740	1	-	-	-
	4593	1	-	-	-
	1826	1	-	-	-
2012	0882	-	1	-	-
	2982	1	-	-	-
	4740	1	-	-	-
	4593	1	-	-	-
	1826	1	-	-	-
2014	0882	-	-	-	1
	2982	1	-	-	-
	4740	1	-	-	-
	4593	1	-	-	-
	1826	1	-	-	-
2015	0882	-	1	-	-
	2982	1	-	-	-

Year	Consent no	High	Good	Improvement req	Poor
	4740	1	-	-	-
	4593	1	-	-	-
	1826	1	-	-	-
2016	0882	-	1	-	-
	2982	-	-	1	-
	4740	-	1	-	-
	4593	-	1	-	-
	1826	-	1	-	-
2017	0882	1	-	-	-
	2982	-	-	1	-
	4740	1	-	-	-
	4593	-	-	-	-
	1826	1	-	-	-
2018	0882	1	-	-	-
	2982	-	1	-	-
	4740	1	-	-	-
	4593	-	-	-	-
	1826	1	-	-	-
	9984	-	-	-	-
2019	0882	-	1	-	-
	2982	-	1	-	-
	4740	1	-	-	-
	4593	-	-	-	-
	1826	1	-	-	-
	9984	-	-	-	-
2020	0882	-	1	-	-
	2982	-	1	-	-
	4740	1	-	-	-
	4593	1	-	-	-
	1826	1	-	-	-
	9984	-	-	1	-
2021	0882	1	-	-	-
	2982	-	1	-	-
	4740	1	-	-	-
	4593	1	-	-	-
	1826	1	-	-	-

Year	Consent no	High	Good	Improvement req	Poor
	9984	1	-	-	-
Totals		37	13	3	1

During the year, NPDC demonstrated an overall high level of environmental and administrative compliance and performance with the NPWWTP resource consents as defined in Section 1.1.4. One incident occurred which resulted in follow up enforcement action. However, this was a reticulation overflow and not directly related to the performance of the NPWWTP. As such, this incident has not been taken into account when assigning the NPDC with an overall environmental performance grade.

3.4 Recommendations from the 2019-2020 Annual Report

In the 2019-2020 Annual Report, it was recommended:

1. THAT in the first instance, monitoring of consented activities at the NPWWTP in the 2020-2021 year continue at the same level as in 2019-2020.
2. THAT should there be issues with environmental or administrative performance in 2020-2021, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

These recommendations were implemented during the 2020-2021 monitoring year.

3.5 Alterations to monitoring programmes for 2021-2022

In designing and implementing the monitoring programmes for air/water discharges in the region, the Council has taken into account:

- the extent of information already made available through monitoring or other means to date;
- its relevance under the RMA;
- the Council's obligations to monitor consented activities and their effects under the RMA;
- the record of administrative and environmental performances of the consent holder; and
- reporting to the regional community.

The Council also takes into account the scope of assessments required at the time of renewal of permits, and the need to maintain a sound understanding of industrial processes within Taranaki exercising resource consents.

It is proposed that for 2021-2022, changes are made to the biennial shoreline bacteriological monitoring component (next due to be carried out in 2022-2023). A justification for this alteration is provided below.

The biennial shoreline bacteriological monitoring programme has always taken place in conjunction with the Recreational Water Quality Monitoring Programme, which the Council is responsible for coordinating. Changes to this programme have been made for the 2021-2022 summer period. In brief, the programme has shifted from a dry weather / trend monitoring approach, to a fixed day / all-weather approach. This change is intended to enable the collection of data that is more representative of the full range of weather conditions to better inform public health risk. Sampling during wet weather will often result in higher enterococci counts, particularly due to run-off from land into waterways and the coast. The ability to detect impacts from the marine outfall discharge will also be greatly reduced on these occasions. Therefore, in response to this change, it is recommended that this monitoring component also be altered to ensure that it remains fit for purpose.

Instead of continuing to collect water samples at the coast, it is recommended that samples of the NPWWTP effluent are collected by Council on a weekly basis throughout December, January and February. These samples would be tested for total chlorine, faecal coliforms, *E. coli*, and enterococci. Monitoring the effluent at the source would provide a direct measure of faecal contaminants that are being discharged to the coast. This avoids the difficulties associated with interpreting coastal water sample results with multiple potential contaminant sources. Although the NPWWTP laboratory already regularly tests the effluent for chlorine and faecal coliforms, *E. coli* and enterococci are not tested for. Furthermore, the Council carrying out this monitoring would provide a valuable quality and compliance check for the NPWWTP laboratory, and an added level of assurance for the public. Currently, Council only test NPWWTP effluent twice per year.

Further background is provided in the 2020-2021 shoreline bacteriological water quality memorandum (MAR2008), which is available form Council upon request.

It should be noted that the proposed programme represents a reasonable and risk-based level of monitoring for the site in question. The Council reserves the right to subsequently adjust the programme from that initially prepared, should the need arise if potential or actual non-compliance is determined at any time during 2021-2022.

4 Recommendations

1. THAT with the exception of recommendation two, monitoring of consented activities at the NPWWTP in the 2021-2022 year continue at the same level as in 2020-2021.
2. THAT the current shoreline bacteriological monitoring component be discontinued and replaced by a weekly effluent testing regime, to be carried out during December, January and February. Samples will be collected by Council and tested for total chlorine, faecal coliforms, *E. coli* and enterococci.
3. THAT should there be issues with environmental or administrative performance in 2021-2022, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

Glossary of common terms and abbreviations

The following abbreviations and terms may be used within this report:

Ammoniacal-N	Both forms of ammonia; unionised and ionised (NH_3 and NH_4).
BOD	Biochemical oxygen demand. A measure of the presence of degradable organic matter, taking into account the biological conversion of ammonia to nitrate.
Bund	A wall around a tank to contain its contents in the case of a leak.
COD	Chemical oxygen demand. A measure of the oxygen required to oxidise all matter in a sample by chemical reaction.
Conductivity	Conductivity, an indication of the level of dissolved salts in a sample, usually measured at 25°C and expressed in µS/cm.
DRP	Dissolved reactive phosphorous.
E. coli	Escherichia coli, an indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units per 100 millilitre sample.
Enterococci	An indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units (CFU) per 100 millilitre of sample.
FAC	Free available chlorine.
Faecal coliforms	An indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units (CFU) per 100 millilitre sample.
g/m^3	Grams per cubic metre, and equivalent to milligrams per litre (g/m3). In water, this is also equivalent to parts per million (ppm), but the same does not apply to gaseous mixtures.
Incident	An event that is alleged or is found to have occurred that may have actual or potential environmental consequences or may involve non-compliance with a consent or rule in a regional plan. Registration of an incident by the Council does not automatically mean such an outcome had actually occurred.
Incident Register	The Incident Register contains a list of events recorded by the Council on the basis that they may have the potential or actual environmental consequences that may represent a breach of a consent or provision in a Regional Plan.
Intervention	Action/s taken by Council to instruct or direct actions be taken to avoid or reduce the likelihood of an incident occurring.
Investigation	Action taken by Council to establish what were the circumstances/events surrounding an incident including any allegations of an incident.
L/s	Litres per second.
µS/cm	Microsiemens per centimetre.
Oxidised-N	Total oxidised nitrogen; nitrite and nitrate (NO_2 and NO_3).
pH	A numerical system for measuring acidity in solutions, with 7 as neutral. Numbers lower than 7 are increasingly acidic and higher than 7 are increasingly alkaline. The scale is logarithmic i.e. a change of 1 represents a ten-fold change in strength. For example, a pH of 4 is ten times more acidic than a pH of 5.
Quantitation limit	A quantitation limit is the smallest value of a given parameter that can be reliably quantified by a specified analytical procedure. Below this limit, the parameter in

	question may still be present, though the test method is not accurate enough to reliably quantify it.
Resource consent	Refer Section 87 of the RMA. Resource consents include land use consents (refer Sections 9 and 13 of the RMA), coastal permits (Sections 12, 14 and 15), water permits (Section 14) and discharge permits (Section 15).
RMA	*Resource Management Act 1991* and including all subsequent amendments.
TSS	Total suspended solids
TAC	Total available chlorine

For further information on analytical methods, contact a Science Services Manager.

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Appendix I

Resource consents held by NPDC

(For a copy of the signed resource consent
please contact the TRC Consents department)

Water abstraction permits

Section 14 of the RMA stipulates that no person may take, use, dam or divert any water, unless the activity is expressly allowed for by a resource consent or a rule in a regional plan, or it falls within some particular categories set out in Section 14. Permits authorising the abstraction of water are issued by the Council under Section 87(d) of the RMA.

Water discharge permits

Section 15(1)(a) of the RMA stipulates that no person may discharge any contaminant into water, unless the activity is expressly allowed for by a resource consent or a rule in a regional plan, or by national regulations. Permits authorising discharges to water are issued by the Council under Section 87(e) of the RMA.

Air discharge permits

Section 15(1)(c) of the RMA stipulates that no person may discharge any contaminant from any industrial or trade premises into air, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Permits authorising discharges to air are issued by the Council under Section 87(e) of the RMA.

Discharges of wastes to land

Sections 15(1)(b) and (d) of the RMA stipulate that no person may discharge any contaminant onto land if it may then enter water, or from any industrial or trade premises onto land under any circumstances, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Permits authorising the discharge of wastes to land are issued by the Council under Section 87(e) of the RMA.

Land use permits

Section 13(1)(a) of the RMA stipulates that no person may in relation to the bed of any lake or river use, erect, reconstruct, place, alter, extend, remove, or demolish any structure or part of any structure in, on, under, or over the bed, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Land use permits are issued by the Council under Section 87(a) of the RMA.

Coastal permits

Section 12(1)(b) of the RMA stipulates that no person may erect, reconstruct, place, alter, extend, remove, or demolish any structure that is fixed in, on, under, or over any foreshore or seabed, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Coastal permits are issued by the Council under Section 87(c) of the RMA.

Coastal Permit

Pursuant to the Resource Management Act 1991
a resource consent is hereby granted by the
Taranaki Regional Council

Name of Consent Holder:	New Plymouth District Council Private Bag 2025 New Plymouth 4342
Decision Date (Change):	31 October 2019
Commencement Date (Change):	31 October 2019 (Granted Date: 13 December 2011)

Conditions of Consent

Consent Granted:	To discharge treated municipal wastewater from the New Plymouth wastewater treatment plant through a marine outfall structure into the Tasman Sea
Expiry Date:	1 June 2041
Review Date(s):	June 2022, June 2027, June 2032, June 2037 and in accordance with special condition 13
Site Location:	Waiwhakaiho Marine Outfall (approximate 450 metres offshore)
Grid Reference (NZTM)	1696210E-5679250N
Catchment:	Tasman Sea
Tributary:	Waiwhakaiho

For General, Standard and Special conditions
pertaining to this consent please see reverse side of this document

General condition

a. The consent holder shall pay to the Taranaki Regional Council all the administration, monitoring and supervision costs of this consent, fixed in accordance with section 36 of the Resource Management Act 1991.

Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.

2. The discharge shall occur through a multiport diffuser system that ensures a minimum dilution of 13:1 at the sea surface at chart datum under dry weather discharge flow and calm sea conditions.

3. Constituents in the effluent discharged shall meet the standards shown in the table below.

Constituent	Standard
Zinc	Concentration not greater than 0.2 gm^{-3}
Chromium	Concentration not greater than 0.15 gm^{-3}
Cadmium	Concentration not greater than 0.04 gm^{-3}
Lead	Concentration not greater than 0.1 gm^{-3}
Nickel	Concentration not greater than 0.15 gm^{-3}
Copper	Concentration not greater than 0.1 gm^{-3}
Mercury	Concentration not greater than 0.002 gm^{-3}
Cyanide	Concentration not greater than 0.1 gm^{-3}
Phenols[including chlorinated phenols]	Concentration not greater than 1.0 gm^{-3}

4. Subject to condition 5 below, at least 95% of effluent discharge samples shall meet the standards shown in the table below.

Constituent	Standard
Suspended solids	Concentration not greater than 25 gm^{-3}
5-day Biochemical oxygen demand	Concentration not greater than 25 gm^{-3}

5. During:

   (a) two periods, occurring before 30 June 2015, during which one of the aeration basins is off-line while being upgraded; and

   (b) periods not exceeding 14 days, occurring no more than once per year, when one of the aeration basins is off-line for planned maintenance purposes;

   Condition 4 shall not apply and samples shall instead meet the following standards:

Constituent	Standard
Suspended solids	Concentration not greater than 110 gm^{-3}
5-day Biochemical oxygen demand	Concentration not greater than 130 gm^{-3}

6. The consent holder shall publicly notify its intention to exercise condition 5(a) at least five working days prior to taking an aeration basin off-line. The public notice shall detail the health and safety risks, reasons why the basin is being taken off line, and associated potential effects.

7. Notwithstanding any duration specified in condition 5 above, the periods when aeration basins are off-line shall be of the minimum duration necessary to achieve the purpose.

8. The consent holder shall give at least 30 working days notice to the Chief Executive, Taranaki Regional Council of the intention to take an aeration basin off-line. Unless the Chief Executive advises that an alternative electronic method is required this notice shall be served by completing and submitting the 'Notification of work' form on the Council's website (http://bit.ly/TRCWorkNotificationForm). The information provided in the notice shall include:

   (a) The intended dates that the aeration basin will be offline; and

   (b) Documentation demonstrating the off-line period complies with the requirement to be the minimum necessary.

9. The consent holder shall erect and maintain signs for a period beginning on the date that an aeration basin goes off-line, as described in condition 5(a), and ending 14 days after the date that the off-line period ends. The signs shall advise the public of the discharge of sewage that has not been fully treated and inform them of the potential health risks, and are to be placed in a prominent location at:
   - Fitzroy Beach; and
   - Bell Block Beach.

10. The total available chlorine in the effluent, prior to entering the outfall pipe, shall be no less than 0.3 gm-3.

11. All effluent discharged shall have passed through a screen with an aperture no more than 5 mm, except that during periods when the screen is non-operational for maintenance purposes, effluent may pass through a screen with an aperture no more than 6 mm.

12. The consent holder shall undertake sampling and testing necessary to:

   (a) Determine compliance with the conditions of this consent; and

   (b) Characterise the effluent to the extent necessary to identify the nature and scale of its effects on the environment, during normal operation and at times when all the effluent is not being fully treated. In particular, monitoring must occur at times when an aeration basin is off-line, and be discussed at the annual meeting required by special condition 22.

   Until the Monitoring Plan required by condition 14 is submitted to Taranaki Regional Council, monitoring will continue in accordance with the existing monitoring plan prepared under consent 0882-3.

13. Within one year of the commencement of this consent, the consent holder shall submit to the Chief Executive, Taranaki Regional Council a Quantitative Microbial Risk Assessment (QMRA) of the discharge under this consent (focusing primarily on bypass discharges).

14. Within six months of the provision of the QMRA under condition 13, the consent holder shall prepare, and submit to the Chief Executive, Taranaki Regional Council for certification, a 'Monitoring Plan' detailing the sampling, testing and measuring that will be undertaken to achieve compliance with condition 12. The Plan shall include, but not necessarily be limited to:

    (a) Details of the measuring and sampling to be undertaken including: sampling location, frequency and methodology; and

    (b) Documentation of how the measuring and sampling described in 14(a) above, adequately characterises the effluent at all times.

    As a minimum, the Monitoring Plan will require:

    (c) Monitoring of the effluent to determine compliance with conditions 3, 4 and 5;

    (d) Monitoring of ecology in the intertidal zone approximately adjacent to the point of discharge, with appropriate control sites; and

    (e) Monitoring of microbiological contamination within shellfish.

15. In preparing the Monitoring Plan, the consent holder shall issue a draft Monitoring Plan and then carry out reasonable consultation with the Department of Conservation, Ngati Tawhirikura Hapu and interested community groups, allowing at least one month for a response from those groups on the draft Plan.

16. Before submitting the Monitoring Plan to Taranaki Regional Council for certification, the consent holder shall have the Monitoring Plan peer reviewed by an independent, suitably qualified expert.

17. The consent holder shall provide any comments received from the Department of Conservation, Ngati Tawhirikura Hapu and interested community groups under condition 15, and the peer review under condition 16, to the Chief Executive, Taranaki Regional Council, at the time the final Monitoring Plan is submitted for certification under condition 14. In the event that the consent holder declines to adopt any recommendations provided by the peer reviewer under condition 16, the consent holder shall also provide, at the same time, its written reasons for declining to follow those recommendations.

18. By 31 March in the years 2017, 2022, 2027, 2032 and 2037, the consent holder shall provide to the Chief Executive, Taranaki Regional Council the results of a peer review of the Monitoring Plan by an independent, suitably qualified expert to ensure that the monitoring programme is still appropriate. The results of the peer review shall also be made publicly available. In the event that the consent holder declines to adopt any recommendations provided by the peer reviewer under this condition, the consent holder shall also provide, at the same time, its written reasons for declining to follow those recommendations.

19. By 31 March in the years 2027 and 2037, the consent holder shall provide to the Chief Executive, Taranaki Regional Council a Technology Report covering:

    (a) A summary of any improvements made to the reticulation, treatment or disposal system since the granting of this consent;

    (b) An outline of technological changes and advances in relation to wastewater management, treatment, disposal and technologies which may be available to address any residual adverse effects; and

    (c) An assessment of whether any such options or combination of options represent the Best Practicable Option to minimise the effects of the discharge and whether the consent holder intends to incorporate such changes.

    (d) The Technology Report shall also be made publicly available. The Regional Council may obtain an independent peer review of the Technology Report, and may charge the consent holder for the actual and reasonable cost of obtaining this peer review.

20. By 31 July each year, the consent holder shall provide to the Chief Executive, Taranaki Regional Council a report covering:

    (a) details of the progress made towards reducing inflow and infiltration reduction over the past year;

    (b) the consent holder's target for reduction of inflow and infiltration in the coming year; and

    (c) details of the works proposed in order to meet that target.

21. The consent holder shall maintain a Contingency Plan for the wastewater treatment plant site that shall be adhered to in the event of a spill or emergency. The Plan shall be approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity and shall detail measures and procedures to be undertaken to prevent spillage or accidental discharge of contaminants not authorised by this consent and measures to avoid, remedy or mitigate the environmental effects of such a spillage or discharge.

22. At least once every year, the consent holder shall convene a meeting with representatives of the Taranaki Regional Council, Ngati Tawhirikura Hapu, and interested submitters on application 6803, to discuss any matter relating to the operation or monitoring of this consent.[1]

23. In the years 2027 and 2037, the consent holder shall use the meeting required by condition 22 as a means of collaborating with the community and stakeholders about the strategy for the future management of wastewater in New Plymouth district.

[1] For the avoidance of doubt, this meeting can be combined with the annual meetings required under consents 7861-1 and 3397-2.

24. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review within three months of the receipt of the QMRA required by condition 13 and/or during the month of June 2017 and/or June 2022 and/or June 2027 and/or June 2032 and/or June 2037 for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time. Reviews may also be undertaken at the dates listed above to enable the Taranaki Regional Council to deal with the consequences of the consent holder declining to accept the Peer Reviewer's recommendations under condition 18.

Advice note: The consent holder intends to establish a collaborative approach with Maori to investigate a trial of land-based disposal of treated wastewater. The commencement of such a trial will be subject to the consent holder being satisfied that:

(a) the owner(s) of land which has been offered for that purpose consent to its use for effluent disposal over the period of the trial and appropriate arrangements for its use are able to be satisfactorily resolved; and

(b) the disposal is technically, economically and environmentally feasible (including addressing relevant RMA requirements).

Signed at Stratford on 31 October 2019

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Consent 1826-2

Land Use Consent

Pursuant to the Resource Management Act 1991
a resource consent is hereby granted by the
Taranaki Regional Council

Name of Consent Holder:	New Plymouth District Council Private Bag 2025 NEW PLYMOUTH
Consent Granted Date:	16 January 2002

Conditions of Consent

Consent Granted:	To erect, place, use and maintain a twin box culvert on the Mangaone Stream for road access purposes at or about GR: P19:069-400
Expiry Date:	1 June 2020
Review Date(s):	June 2008, June 2014
Site Location:	Mangaone Stream, Rifle Range Road, New Plymouth
Legal Description:	Pt Sec 161,138 & Lot 1 DP 12331 Hua Dist
Catchment:	Waiwhakaiho
Tributary:	Mangaone

For General, Standard and Special conditions
pertaining to this consent please see reverse side of this document

General conditions

a) That on receipt of a requirement from the Chief Executive, Taranaki Regional Council (hereinafter the Chief Executive), the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) That unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.

c) That the consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:

i) the administration, monitoring and supervision of this consent; and
ii) charges authorised by regulations.

Special conditions

1. The structure[s] authorised by this consent shall be maintained to ensure the conditions of this consent are met.

2. Any instream maintenance works shall take place only between 1 November and 30 April inclusive, except where this requirement is waived in writing by the Chief Executive, Taranaki Regional Council.

3. The consent holder shall notify the Taranaki Regional Council in writing at least 48 hours prior to and upon completion of any maintenance works which would involve disturbance of or deposition to the streambed or discharges to water.

4. During any maintenance of the structure[s] authorised by this consent, the consent holder shall adopt the best practicable option to avoid or minimise the discharge of silt or other contaminants into water or onto the streambed and to avoid or minimise the disturbance of the streambed and any adverse effects on water quality.

5. During any maintenance of the structure[s] authorised by this consent, the consent holder shall ensure that the area and volume of streambed disturbance shall, so far as is practicable, be minimised and any areas which are disturbed shall, so far as is practicable, be reinstated.

6. The structure[s], which are the subject of this consent, shall not obstruct fish passage.

7. The structure[s] authorised by this consent shall be removed and the area reinstated, if and when the structure[s] are no longer required. The consent holder shall notify the Taranaki Regional Council at least 48 hours prior to structure[s] removal and reinstatement.

8. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2008 and/or June 2014, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 16 January 2002

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Consent 2982-4

Discharge Permit

Pursuant to the Resource Management Act 1991
a resource consent is hereby granted by the
Taranaki Regional Council

Name of Consent Holder:	New Plymouth District Council Private Bag 2025 NEW PLYMOUTH
Consent Granted Date:	17 October 2002

Conditions of Consent

Consent Granted:	To discharge up to 60 cubic metres/day of leachate from a sludge stabilisation lagoon to groundwater in the vicinity of the Waiwhakaiho River at or about GR: P19:070-402
Expiry Date:	1 June 2020
Review Date(s):	June 2008, June 2014
Site Location:	New Plymouth Wastewater Treatment Plant, Rifle Range Road, New Plymouth
Legal Description:	Pt Sec 224 SO 11937 Hua Dist Blk II Paritiutu SD
Catchment:	Waiwhakaiho

For General, Standard and Special conditions
pertaining to this consent please see reverse side of this document

General conditions

a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council (hereinafter the Chief Executive), the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.

c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:

   i) the administration, monitoring and supervision of this consent; and
   ii) charges authorised by regulations.

Special conditions

1. The consent holder, in conjunction with the Taranaki Regional Council, shall monitor the groundwater adjacent to the lagoon. The number of monitoring sites, the parameters to be monitored and the frequency of the monitoring shall be to the satisfaction of the Chief Executive, Taranaki Regional Council.

2. The consent holder, in conjunction with the Taranaki Regional Council, shall monitor the surface water in the small open drain [an unnamed tributary of the Waiwhakaiho River] located adjacent to the northern and eastern boundary of the lagoon. The number of sites, the parameters to be monitored and the frequency of the monitoring shall be to the satisfaction of the Chief executive, Taranaki Regional Council.

3. The exercise of this consent shall not lead to a direct discharge of contaminants from the sludge stabilisation lagoon to any other surface water body.

4. That the exercise of this consent shall not result in any adverse impacts to groundwaters and surface waters such that the suitability of those waters for any use is changed as determined by the Chief Executive, Taranaki Regional Council.

5. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2008 and/or June 2014, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 17 October 2002

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Coastal Permit
Pursuant to the Resource Management Act 1991
a resource consent is hereby granted by the
Taranaki Regional Council

Name of Consent Holder:	New Plymouth District Council Private Bag 2025 New Plymouth 4342
Decision Date:	10 September 2014
Commencement Date:	10 September 2014

Conditions of Consent

Consent Granted:	To occupy the Coastal Marine Area with a marine outfall as part of the New Plymouth wastewater treatment system
Expiry Date:	01 June 2041
Review Date(s):	June 2020, June 2026, June 2032, June 2038
Site Location:	115 Rifle Range Road, Waiwakaiho
Legal Description:	Secs 5-6 SO 314271 Pt Sec 224 Hua Dist Blk II Paritutu SD (Site of structure)
Grid Reference (NZTM)	1696272E-5679362N
Catchment:	Tasman Sea

For General, Standard and Special conditions
pertaining to this consent please see reverse side of this document

General condition

a. The consent holder shall pay to the Taranaki Regional Council all the administration, monitoring and supervision costs of this consent, fixed in accordance with section 36 of the Resource Management Act 1991.

Special conditions

1. This consent authorises the occupation of space in the Coastal Marine Area by the structure existing at the time the application for this consent was lodged, and as described in the application. Any change to the nature or scale of the structure may therefore need to be authorised by a formal process in accordance with the Resource Management Act 1991.

2. The consent holder shall maintain the structure in a safe and sound condition such that it continues to function effectively as an outfall and as required in the conditions of any consent to discharge through it.

3. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2020 and/or June 2026 and/or June 2032 and/or June 2038, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 10 September 2014

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Discharge Permit

Pursuant to the Resource Management Act 1991
a resource consent is hereby granted by the
Taranaki Regional Council

Name of Consent Holder:	New Plymouth District Council Private Bag 2025 NEW PLYMOUTH 4342
Consent Granted Date:	29 May 2008

Conditions of Consent

Consent Granted:	To discharge contaminants into the air from sludge drying and processing activities at the New Plymouth Wastewater Treatment Plant at or about (NZTM) 1697041E-5678313N
Expiry Date:	1 June 2026
Review Date(s):	June 2014, June 2020
Site Location:	Rifle Range Road, New Plymouth
Legal Description:	Secs 5-6 So 314271 Pt Sec 224 Hua Dist Blk II Paritutu SD

For General, Standard and Special conditions
pertaining to this consent please see reverse side of this document

General conditions

a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.

c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:

i) the administration, monitoring and supervision of this consent; and
ii) charges authorised by regulations.

Special conditions

1. Notwithstanding any other condition of this consent, the consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or likely adverse effect on the environment associated with the discharges into air from sludge management processing activities and facilities on the site.

2. That the consent holder shall at all times operate, maintain, supervise, monitor and control all sludge management processes (including but not limited to associated emission treatment processes) so that discharges authorised by this consent are maintained at a practicable minimum.

3. That the discharges authorised by this consent shall not give rise to any odours that are offensive or objectionable at or beyond any boundaries of the property.

4. Without restricting the generality of condition 1, the consent holder shall supply a statement of how the biofilters are maintained, operated, and monitored, to give effect to condition 1. This statement shall be provided to the Chief Executive, Taranaki Regional Council, within six months of the granting of the consent.

5. The consent holder shall prepare a contingency plan addressing events at the New Plymouth Waste Water Treatment Plant that could give rise to abnormal odour release potential, and the procedures the consent holder would adopt to deal with any such event. This contingency plan shall be provided to the Chief Executive, Taranaki Regional Council, within six months of the granting of the consent. The contingency plan shall subsequently be reviewed at intervals not exceeding two years.

6. Prior to undertaking processing of, including removal of, sludge from No. 2 lagoon, the consent holder shall submit a plan, for approval by the Chief Executive, Taranaki Regional Council [such approval not to be unreasonably withheld], describing the methodology proposed for sludge recovery from the lagoon and measures proposed for mitigation of odours and any off-site effects of odours, during the recovery activity, demonstrating the capability to satisfy the conditions of this consent. The consent holder shall notify the Council at least 72 hours prior to any processing/removal activity, including associated recovery of sludge, before undertaking removal. Notification shall be emailed to worknotification@trc.govt.nz.

7. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2014 and/or June 2020, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 29 May 2008

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Discharge Permit

Pursuant to the Resource Management Act 1991
a resource consent is hereby granted by the
Taranaki Regional Council

Name of Consent Holder:	New Plymouth District Council Private Bag 2025 New Plymouth 4342
Decision Date:	23 March 2015
Commencement Date:	15 April 2015

Conditions of Consent

Consent Granted:	To discharge contaminants onto and into land and into air at the New Plymouth Wastewater Treatment Plant on a contingency basis
Expiry Date:	1 June 2022
Review Date(s):	June 2016, June 2018 and in accordance with special condition 23
Site Location:	Rifle Range Road, New Plymouth
Legal Description:	Secs 5-6 SO 314271 Pt Sec 224 Hua Dist Blk II Paritutu SD
Grid Reference (NZTM)	1696928E-5678368N
Catchment:	Waiwhakaiho

For General, Standard and Special conditions
pertaining to this consent please see reverse side of this document

General condition

a. The consent holder shall pay to the Taranaki Regional Council all the administration, monitoring and supervision costs of this consent, fixed in accordance with section 36 of the Resource Management Act 1991.

Special conditions

1. This consent only authorises the discharge of dewatered sludge from the New Plymouth Waste Water Treatment Plant on to the areas marked, 'B' and 'C' on Figure 1 (attached).

2. There shall be no discharge of sludge after 1 June 2020.

3. The discharge may occur only in the following circumstances:

   (a) the Thermal Drying Facility is not operational due to an unforeseen breakdown; or
   (b) the Thermal Drying Facility is operating as normal but sludge volume exceeds its operational capacity because:
   - of a significant temporary increase in sludge production and no onsite storage is available: or
   - process issues resulting in reduced ability to process sludge.

4. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or likely adverse effect on the environment associated with the discharge of contaminants from the site.

5. The consent holder shall undertake a programme of sampling and testing that monitors the effects of the exercise of this consent on fresh water, groundwater and soil properties to assess compliance with this consent (the 'Monitoring Programme'). The Monitoring Programme shall be submitted to the Chief Executive, Taranaki Regional Council ('the Chief Executive') for approval, acting in a certification capacity, within 60 days of this consent commencing, and shall detail the specific parameters to be analysed pursuant to conditions 7 and 8.

6. The Monitoring Programme shall include sampling of groundwater from bores installed in accordance with NZS 4411:2001. The bores shall be of a depth, location and design determined after consultation with the Chief Executive, Taranaki Regional Council.

7. The consent holder shall take representative samples of the waste before each discharge event and have it analysed for:

   (a) Heavy metals;
   (b) Pathogens; and
   (c) Nitrogen, potassium and sodium.

8. Before 31 July each year the consent holder shall also forward routine monitoring data of dewatered sludge and dried biosolids for the 12 month period ending on 30 June, or the most recent analysis if this is greater than 12 months:

   a) Heavy metals;
   b) Dioxin;
   c) Organochlorides;
   d) Pathogens; and
   e) Nitrogen, potassium and sodium.

9. No discharge of sludge shall occur at any time when any of the contaminants in the following table exceed the concentration indicated in any groundwater down gradient of the sludge disposal area or in either of the two unnamed tributaries of the Waiwhakaiho River immediately to the north and south of the treatment plant.

Contaminant	Concentration
Ammonia (NH_3)	10 g/m^3
Oxidised Nitrogen (NO_3)	50 g/m^3
Faecal Coliforms	1000 per 100 ml

10. No discharge shall occur within:

    (a) 20 metres of a surface water body;
    (b) 10 metres of a neighbouring property; or
    (c) 150 metres of a residential building.

11. Any discharged sludge shall be spread evenly as practicable over the disposal area at a rate not exceeding 1000 tonnes per hectare in any single application and incorporated into the top 150 mm as soon as practicable but no later than midnight on the day of application.

12. As soon as practicable following the discharge of dewatered sludge, areas shall be sown into pasture or crop. The consent holder shall monitor revegetation and if adequate establishment is not achieved within two months of sowing, shall provide a report to the Chief Executive, Taranaki Regional Council detailing a programme for stabilising the soil and preventing visible dust from blowing off the disposal area.

13. As soon as practicable after this consent commences the consent holder shall ensure that the pH of the receiving soil is no lower than 5.8, and at all times after that remains higher than 5.8.

14. The discharge, either by itself or in combination with discharges to air from other sources on the site of the New Plymouth Waste Water Treatment Plant, shall not cause an odour beyond the boundary of the site that is offensive or objectionable.

Note: For the purposes of this condition:

(i) The consent holder's site is defined as Secs 5-6 SO 314271 Pt Sec 224 Hua Dist Blk II Paritutu SD; and

(ii) Assessment under this condition shall be in accordance with the Good Practice Guide for Assessing and Managing Odour in New Zealand, Air Quality Report 36, Ministry for the Environment, 2003.

15. On each occasion that a discharge occurs the consent holder shall notify the Chief Executive, Taranaki Regional Council, at least 2 working days beforehand. Notification shall be emailed to worknotification@trc.govt.nz. Notification shall include the following information:

(a) the consent number;
(b) the expected volume to be discharged;
(c) the specific circumstances that have resulted in the need to discharge;
(d) the specific area over which the waste will be discharged; and
(e) the likely duration of the discharge.

16. The consent holder shall keep records of the following:

(a) volumes of material disposed;
(b) disposal area[s], including a map showing individual disposal areas with GPS co-ordinates;
(c) dates of commencement and completion disposal events;
(d) results of the sampling required by conditions 7 and 8;
(e) dates that sowing disposal areas occurred;
(f) details of monitoring, including sampling locations, sampling methods and the results of analysis.

and shall provide the records to the Chief Executive, Taranaki Regional Council on request or by 31 August of each year, a report on all records required to be kept in accordance with this condition, for the 12 month period ending on the previous 30 June.

17. The concentration of heavy metals in the soil shall not exceed the values in the following table:

Constituent	**Standard [mg/kg dry weight]**
Arsenic	20
Cadmium	1
Chromium	600
Copper	100
Lead	300
Mercury	1
Nickel	60
Zinc	300

18. The discharge shall be undertaken in accordance with a 'Management Plan' prepared by the consent holder and approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity. The plan shall detail how the discharge will be managed to achieve compliance with the conditions of this consent and shall include but not be limited to:

    (a) The situations when the consent maybe exercised;
    (b) A detailed map of the discharge site;
    (c) The process of notifying interested parties;
    (d) Steps undertaken to prepare the site;
    (e) Steps to be taken to ensure that the soil pH in the discharge areas are at a minimum of 5.8 and remains above 5.8;
    (f) Methods to ensure the generation of dust is avoided;
    (g) How the sludge will be disposed;
    (h) Details of how the disposal of sludge is to be managed to ensure no over runoff occurs;
    (i) Details of how records will be kept; and
    (j) How the site will be reinstated.

    The Management Plan shall be submitted to the Chief Executive, Taranaki Regional Council for approval within 90 days of this consent commencing.

19. Before exercising this consent, the consent holder shall prepare and thereafter regularly update a 'Contingency Plan' that details measures and procedures that will be undertaken in the event of odour beyond the boundary of the site that is offensive or objectionable . The plan shall be approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity as being adequate to avoid, remedy or mitigate the environmental effects of such an event.

20. In the event that any archaeological remains are discovered as a result of works authorised by this consent, the works shall cease immediately at the affected site and tangata whenua and the Chief Executive, Taranaki Regional Council, shall be notified within one working day. Works may recommence at the affected area when advised to do so by the Chief Executive, Taranaki Regional Council. Such advice shall be given after the Chief Executive has considered: tangata whenua interest and values, the consent holder's interests, the interests of the public generally, and any archaeological or scientific evidence. The New Zealand Police, Coroner, and Historic Places Trust shall also be contacted as appropriate, and the work shall not recommence in the affected area until any necessary statutory authorisations or consents have been obtained.

21. At least once every year, the consent holder shall convene a meeting with representatives of the Taranaki Regional Council, interested submitters on the application for this consent and adjacent landowners or occupiers. The meetings shall be for the purpose of reporting on and discussing matters relating to the exercise of this consent including, but not limited to:

    (a) Consent monitoring;
    (b) Consent compliance; and
    (c) Details of the proposed upgrade to the Thermal Drying Facility, including timing.

    This meeting may be held in conjunction with the annual meeting required by condition 22 of coastal permit 0882-4.

22. This consent shall lapse on 1 June 2020, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

23. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the:

    (a) 60 days immediately following the date that any discharge event commences; and
    (b) the months of June 2016 and/or June 2018;

    for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 15 April 2015

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

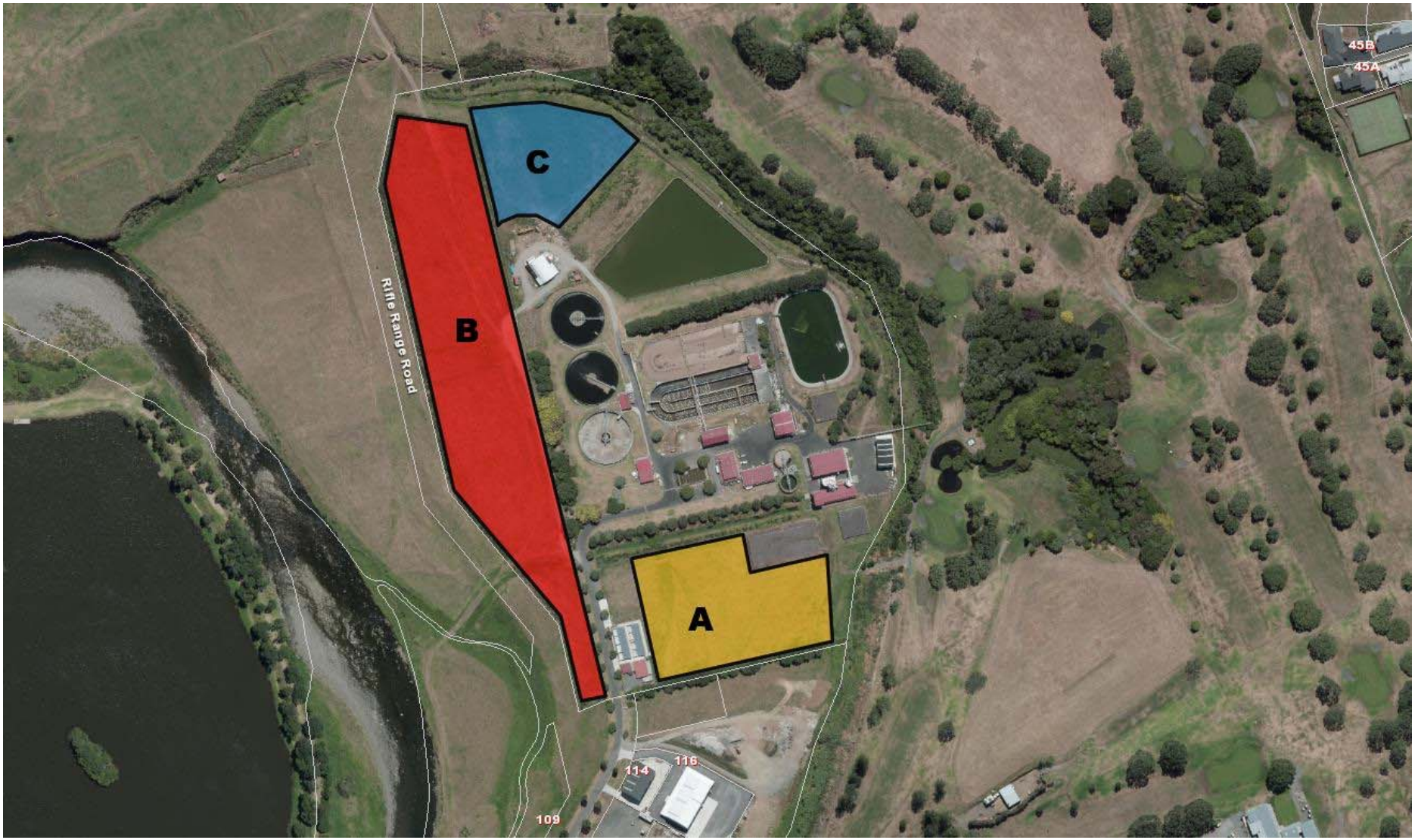

Figure 1: New Plymouth Wastewater Treatment Plant site layout