

South Taranaki District Council
Opunake WWTP
Monitoring Programme
Annual Report
2019-2020

Technical Report 2020-25



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Executive summary

South Taranaki District Council (STDC) operates a municipal wastewater treatment plant (WWTP) located on South Road at Opunake, in the Otahi and Heimama catchments. This is a three-stage treatment system comprised of a primary oxidation pond, a wetlands treatment system, and a subsurface, reticulated soakage trench system that subsequently discharges to an unnamed stream between the Otahi Stream and the Heimama Stream. This report for the period July 2019 to June 2020 describes the monitoring programme implemented by the Taranaki Regional Council (the Council) to assess the Company'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 the Company's activities.

STDC holds one resource consent to discharge treated wastewater, which include a total of 10 conditions setting out the requirements that it must satisfy. It also holds one resource consent allowing the (emergency) discharge of screened wastewater from an ocean outfall in Middleton Bay, and another to occupy the coastal marine area with the outfall structure. These include a total of 11 conditions setting out requirements that STDC must satisfy. All three consents were renewed in November 2019, replacing the previous consents which had expired in June 2018.

During the monitoring period, STDC demonstrated an overall high level of environmental performance.

The Council's monitoring programme for the year under review included five inspections and 44 water samples collected for physicochemical analysis (ten samples analysing the effluent quality from the system, four measuring effects on receiving waters, and 30 samples monitoring water quality at nearby contact recreational beach bathing sites).

As in previous years, the monitoring indicated that the treatment system was treating the municipal wastewater to the extent that no significant effects were noted in the receiving waters of the Tasman Sea, and the water quality of nearby popular beach bathing sites remained at a high standard.

During the year, STDC demonstrated an overall high level of environmental and administrative performance with the resource consents. An abatement notice was issued during the year following a complaint about a green colour in the receiving stream. STDC reduced the volume of discharge to enable adequate dilution to prevent the discolouration. The green colour was due to the large population of algae in the pond at the time, and it was unlikely that significant adverse environmental effects would have occurred further downstream as a result. There were no overflows from the Hector Place pumping station through the ocean outfall structure during the monitoring period.

For reference, in the 2019-2020 year, consent holders were found to achieve a high level of environmental performance and compliance for 81% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 17% of the consents, a good level of environmental performance and compliance was achieved.

In terms of overall environmental and compliance performance by the consent holder over the last several years, this report shows that the consent holder's performance remains at a high level.

This report includes recommendations for the 2020-2021 year, including a recommendation relating to an optional review of consent 0236-7.

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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 2019 to June 2020 by the Council describing the monitoring programme associated with three resource consents held by South Taranaki District Council (STDC). STDC operates a municipal wastewater treatment plant (WWTP) situated on South Road at Opunake.

This report covers the results and findings of the monitoring programme implemented by the Council in respect of the consents held by STDC that relate to the discharge of treated wastewater in the Otahi and Heimama catchments. This is the 30th annual report to be prepared by the Council to cover STDC's discharge and its effects.

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 *Resource Management Act 1991* (RMA) and the Council's obligations;
- the Council's approach to monitoring sites through annual programmes;
- the resource consents held by STDC in the Otahi/Heimama catchments and the Tasman Sea;
- the nature of the monitoring programme in place for the period under review; and
- a description of the activities and operations conducted at the Opunake WWTP.

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 2020-2021 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' inasmuch 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 the Company, 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 2019-2020 year, consent holders were found to achieve a high level of environmental performance and compliance for 81% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 17% of the consents, a good level of environmental performance and compliance was achieved.¹

1.2 WWTP system

1.2.1 Background

The Opunake WWTP services approximately 1360 people with around 765 sewer connections. The WWTP comprises two distinct components. The first is the interception of the town sewage by diverting the terminal sewer into a new pumping station. This pumping station is located on Hector Place, adjacent to the terminal sewer leading to the outfall and diverts the sewage to a land-based treatment system located on a headland bounded by State Highway 45 and the Heimama and Otahi Streams. Installation of storage at the pump station has been provided in the event of power outages, faults or breakdowns in the pumping system.

The second component is a land-based treatment system (Figure 1) and is comprised of an initial 1.25 hectare primary oxidation pond. Provision for aeration of this pond was made, but has not been required to date. After treatment in this pond the effluent passes through a series of two combined secondary oxidation pond/wetland systems (Photo 1). Final disposal of the effluent is via a series of soakage trenches, which are backfilled with gravel and permit effluent flow along the trenches and through the side walls into a silty sand layer. This series of trenches has been designed to allow regular intervals between use of the individual trenches. The trenches are located a minimum of 30 metres from the coastal cliff face. The end of the trenches are connected by a common pipe that then discharges any wastewater that has not soaked into the ground to an unnamed stream, via an overland rock filter along the stream bank. The land-based treatment system was constructed during the 1993-1994 period and has been operational during

¹ The Council has used these compliance grading criteria for almost two decades. They align closely with the 4 compliance grades in the MfE Best Practice Guidelines for Compliance, Monitoring and Enforcement, 2018

subsequent monitoring years. This system operates under consent 4248-2, which was renewed in November 2019.

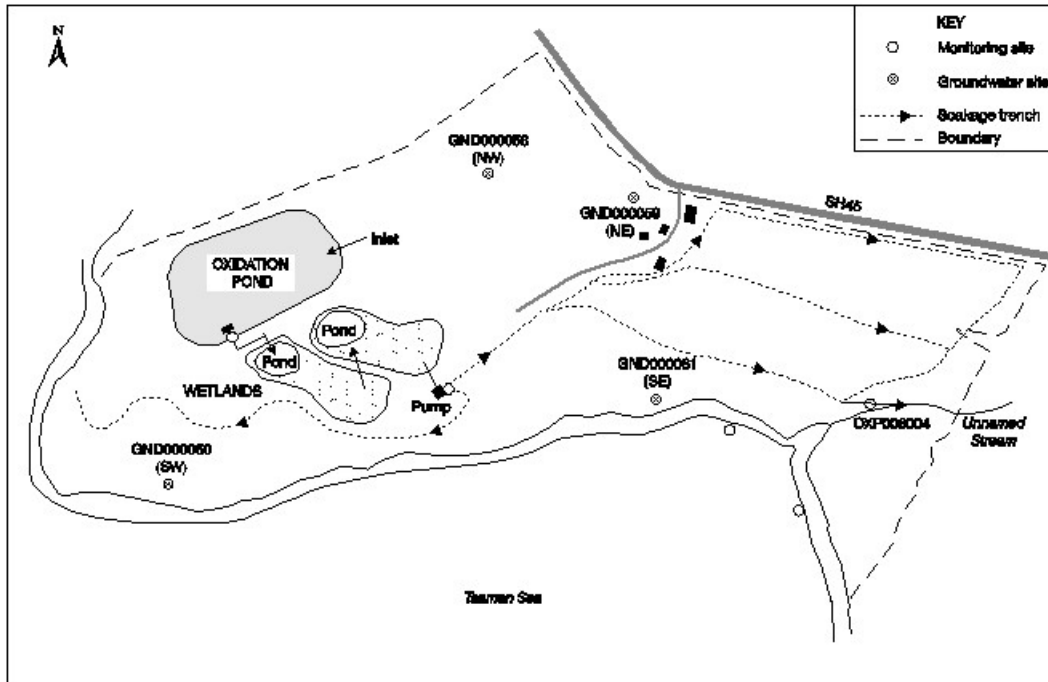


Figure 1 Schematic of Opunake WWTP design and layout

The site is currently leased for sheep farming in the sewage treatment area and two other areas of land in the treatment plant have been leased out for grazing of cattle (STDC, 2015).

In association with this land based sewage treatment scheme, a consent (coastal permit) was granted to allow for the use of the ocean outfall when storm and groundwater inflows exceed the capacity of the pump station. This allows for the emergency discharge of untreated wastewater via the ocean outfall.

1.3 Resource consents

STDC holds three renewed resource consents in relation to the Opunake WWTP, 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 Summary of resource consents held by STDC in relation to Opunake WWTP

Consent number	Purpose	Granted	Review	Expires
<i>Water discharge permits</i>				
0236-6	To discharge up to 4,666 cubic metres per day of comminuted wastewater from an ocean outfall in Middleton Bay, Opunake, to the Tasman Sea	April 2006	-	June 2018*
0236-7	To discharge screened wastewater from the Opunake treatment plant through an outfall to the Tasman Sea on occasions when the capacity of the pump station and storage is exceeded	November 2019	June 2021	June 2023

Consent number	Purpose	Granted	Review	Expires
4248-2	To discharge up to 2,074 cubic metres per day of treated municipal wastewater from the Opunake municipal oxidation pond and wetlands treatment system onto and into land and into an unnamed stream between the Otahi Stream and the Heimama Stream	June 2003	-	June 2018*
4248-3	To discharge treated municipal wastewater from the Opunake municipal oxidation pond and wetlands treatment system onto and into land and into Unnamed Stream 34	November 2019	June 2024	June 2036
<i>Coastal permits</i>				
4577-3	To place and maintain the Opunake marine outfall structure within the coastal marine area at Middletons Bay	December 2005	-	June 2018*
4577-4	To occupy the coastal marine area with the Opunake marine outfall structure	November 2019	June 2024	June 2036

* the WWTP continued to operate under these consents until the renewed consents were granted in November 2019

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 Opunake WWTP site consisted of three primary components.

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

The Opunake WWTP was visited five times during the monitoring period, consisting of four routine monitoring and one follow-up inspection. With regard to consent for discharge to water, the main points of interest were plant operation and performance, disposal trenches operation and the discharges of treated wastewater. Inspections provided for the operation, internal monitoring, and supervision of the plant to be reviewed by the Council. Sources of data being collected by STDC 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 Water quality

The Council undertook sampling of the discharges from the site, the water quality either side of the discharge point and mixing zone, and the summer water quality at nearby recreational bathing sites.

The Opunake WWTP primary pond effluent was analysed for dissolved oxygen and microfloral component on four occasions. The primary pond and wetland effluents were analysed for pH, conductivity, BOD, suspended solids, and bacterial components (*E.coli*) on three occasions.

Sampling of the soakage trench treated effluent was carried out on three occasions, while the Tasman Sea either side of the discharge was sampled twice (due to access issues), and the samples analysed for conductivity and *E.coli* bacteria.

Contact recreational bacteriological water quality at Opunake Beach and at Middleton Bay was monitored by the Council on 19 and 11 separate occasions respectively, between early November 2019 and late March 2020. Further samples had been scheduled but were unable to be collected due to a nationwide lockdown as a result of the COVID-19 pandemic.



Photo 1 Opunake WWTP wetlands

2 Results

2.1 Inspections

10 July 2019

A follow-up inspection was conducted for the purpose of determining consent compliance following the results of the inspection carried out on 21 June 2019, which found noticeable ponding in the soakage field. The soakage field was wet and soft underfoot, following recent rain. The previously ponded area was in the process of being excavated as part of ongoing investigations by STDC into the cause of the ponding. A trench had been dug that was approximately 30m x 1m x 1m and this contained approximately 0.3 m of standing water above the level of the discharge pipeline (Photo 2). This water was relatively clear with a thin film of material collecting on the surface at the western end of the trench. STDC staff were onsite carrying out routine maintenance at the WWTP facilities. They advised that the exposed pipeline had been isolated, and that all effluent was being directed to the other discharge pipelines. An investigation into the integrity of the pipe using a camera was planned over the next few weeks. The surface of the other trenches were wet underfoot, but no ponding or short-circuiting of effluent was visible. The field was being grazed by sheep. All consent conditions were being complied with at the time of the inspection.



Photo 2 Excavation in the soakage field as part of an investigation into ponding

8 August 2019

The influent screen was operating and wastes were fully contained. The pond level was relatively high (300 mm below the concrete waveband), and this was light green and slightly turbid. There was a mild odour in the area. Numerous Canadian Geese and mallard ducks were observed on the pond surface.

The wetland pond levels were high and the wetland sump pump was operating at the time of the inspection. The ponds were pale green in colour and relatively clear.

Surface water from overnight rain was discharging via two of the open trenches to the coast. Works undertaken to ensure compliance with abatement notice EAC-22064 (issued 15 June 2018) appeared to be satisfactory with no wet or boggy areas observed.

The inspecting officer was unable to access the coastal track so no sampling was carried out from the final discharge, nor were sea samples collected on this occasion. Work to restore this track was due to begin mid-August.

The Hector Place pumping station and the emergency overflow were also inspected and found to be satisfactory.

19 November 2019

The main pond was light green and slightly turbid with a mild odour noted. Approximately 150 Canadian Geese, mallard, teal and paradise ducks and several black swans were present on the pond surface. Cable ducting for the installation of a DO meter was underway.

The wetland ponds were dark green in colour and relatively turbid. Both wetland ponds were relatively high, as was the wetland sump, however the discharge pump was not operating. The inspecting officer was advised that a power cut had tripped the wetland effluent discharge pump and an operator was on the way to restart the pump.

No wet or boggy areas were observed around the trench system. Work had not begun on the coastal track, therefore no sampling was carried out at the sea sites.

The Hector Place pumping station and the emergency overflow were also inspected and found to be satisfactory.

4 February 2020

The step screen was operating and wastes were fully contained. The pond was dark green and turbid with bright green cyanobacteria observed around the pond perimeter. Numerous wildlife were present on the pond with over 500 mallard and paradise ducks, plus several black swans and Canadian geese. A DO meter was being installed near the pond outlet.

The wetland ponds were dark green and opaque. The effluent sump was almost full and the discharge sump pump was running. No wildlife was noted.

No boggy areas were showing around the overland trench system and all trenches were dry. The sump pump was operating and the treated wastewater discharge flow rate was estimated at 3 L/sec. The coastal track was accessible and sampling of the sea monitoring sites either side of the unnamed tributary was carried out.

The WWTP surrounds and facilities were found to be satisfactory. The Hector Place pump station and the emergency outfall were also inspected and found to be satisfactory.

5 May 2020

The step screen was operating and wastes were fully contained. The pond was dark brown and turbid. Odour in the vicinity was noticeable. No wildlife was noted. The DO meter had been installed near the pond outlet.

The wetland ponds were dark brown. The effluent sump was near full however the discharge sump pump was not running. The consent holder was contacted and they explained that the discharge pump was only operated at night due to the low influent flow. No wildlife was present on the ponds.

No boggy areas were observed around the overland trench system and all trenches were relatively dry considering recent wet weather. The treated wastewater discharge flow rate was estimated at 1 L/s (this was residual flow only as the sump pump was not operating).

The WWTP surrounds and facilities were found to be satisfactory. The coastal scaffold structures were last inspected on 20 April 2020 as per scaffold tags. The Hector Place pump station and the emergency outfall were also inspected and found to be satisfactory.

2.2 Results of effluent monitoring

Effluent analyses were carried out at three locations throughout the treatment system, for the purpose of monitoring the effectiveness of each stage of treatment. These locations were the primary pond effluent (OXPO01002), the partially treated wetlands effluent (OXPO06001), and the fully treated final discharge from the subsurface trench system (OXPO06004). The results of effluent monitoring at all three sites are displayed in Table 3 and discussed in section 2.2.4.

Along with a visual survey of each component of the system, dissolved oxygen levels (DO) and the microfloral component of the pond were measured during routine monitoring inspections. These are discussed in Sections 2.2.1 and 2.2.2 respectively.

All sampling sites are displayed below in Figure 2.

2.2.1 Dissolved oxygen levels

The dissolved oxygen concentration in WWTPs varies both seasonally and during the day as a result of a combination of factors. The photosynthetic activity of the pond's microflora together with fluctuations in influent waste loadings on the system are major influencing factors. Minimum dissolved oxygen concentrations are generally recorded in the early hours of daylight, and therefore pond performance has been evaluated by standardising sampling times toward mid-morning for all regular inspection visits during the monitoring period.

The results of dissolved oxygen monitoring in the primary pond recorded adjacent to outlet are included in Table 2.

Table 2 Dissolved oxygen levels at the surface of the Opunake WWTP primary pond

Date	Time (NZST)	Temperature (°C)	Dissolved Oxygen	
			Concentration (g/m ³)	Saturation (%)
8 August 2019	1005	11.2	8.6	78
19 November 2019	0930	16.0	1.6	16
4 February 2020	0900	23.6	0.9	11
5 May 2020	1050	14.0	3.5	34

The results in Table 2 show a relatively wide range of dissolved oxygen concentrations (between 11 to 78% saturation) in the surface layer of the primary pond near the outlet. These were typical of the levels generally recorded in this oxidation pond, and reflect seasonal influences. No mechanical aeration of the pond occurs.

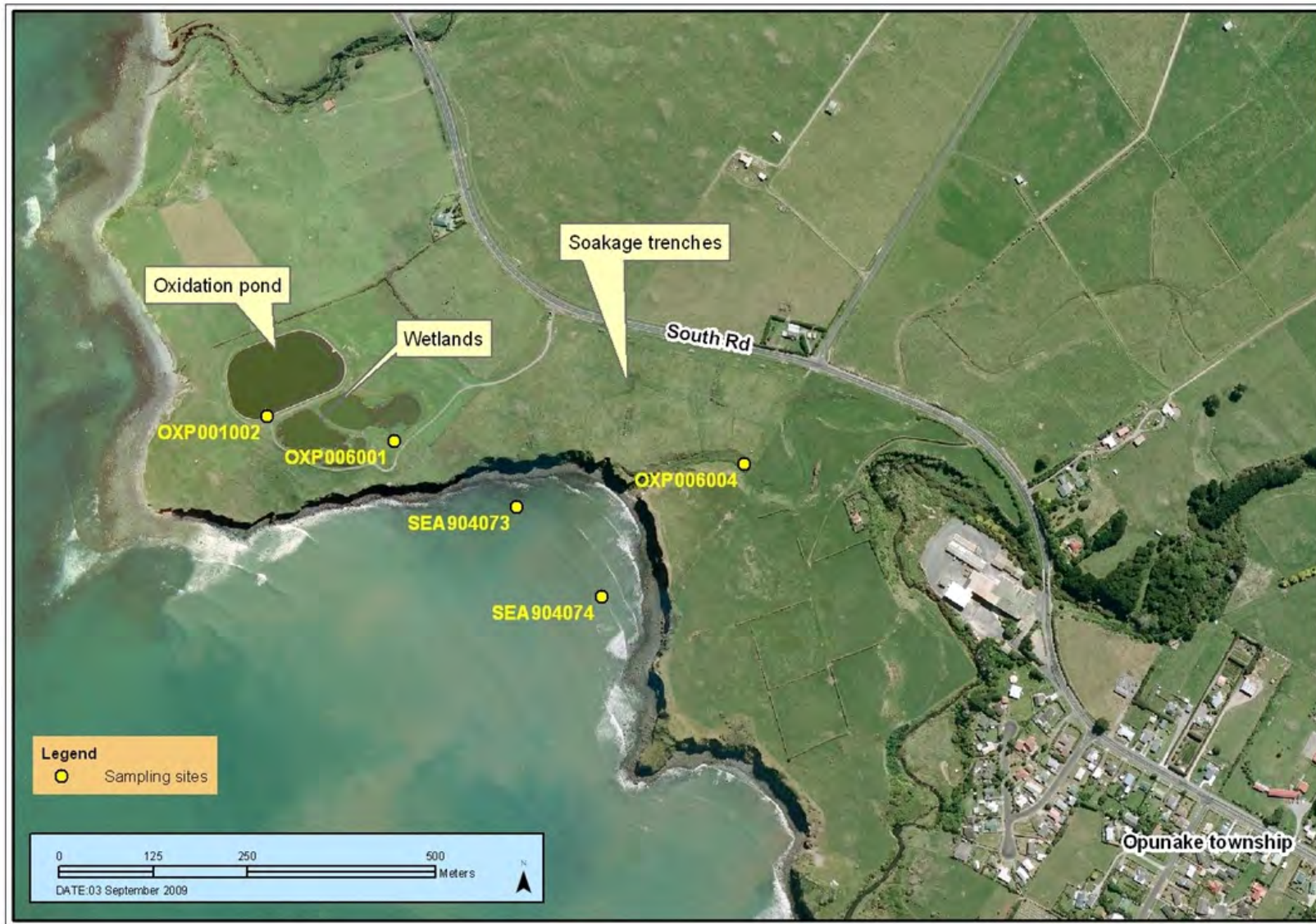


Figure 2 Aerial view of the Opunake WWTP and sampling locations

2.2.2 Microfloral component

Pond microflora are very important for the stability of the symbiotic relation between aerobic bacteria in the primary pond. These phytoplankton may be used as a bio-indicator of pond conditions, for example cyanobacteria are often present in under-loaded conditions and chlorophyceae are present in overloaded conditions. To maintain facultative conditions in a pond system there must be an algal community present in the surface layer.

The principal function of algae is the production of oxygen which maintains aerobic conditions while the main nutrients are reduced by biomass consumption. Elevated pH (due to algal photosynthetic activity) and solar radiation combine to reduce faecal bacteria numbers significantly.

Samples of the primary pond effluent were collected during the four routine monitoring inspections for chlorophyll-a analyses. Chlorophyll-a concentration can be a useful indicator of the algal population present in the system. Pearson (1996) suggested that a minimum in-pond chlorophyll-a concentration of 300 mg/m³ was necessary to maintain stable facultative conditions. However, seasonal change in algal populations and also dilution by stormwater infiltration might be expected to occur in any WWTP which, together with fluctuations in waste loadings, would result in chlorophyll-a variability.

The results of primary pond chlorophyll-a analyses are provided in Table 3 together with field observations of pond appearance.

Table 3 Chlorophyll-a levels and primary pond appearance

Date	Time	Appearance	Chlorophyll-a (mg/m ³)	Chlorophyll-a (mg/m ³) data from July 2013 to June 2019		
				N	Range	Median
8 August 2019	1005	Turbid, green brown	189	24	<2-1,400	339
19 November 2019	0930	Slightly turbid, dark green	57			
4 February 2020	0900	Turbid, dark green	500			
5 May 2020	1050	Turbid, dark brown	153			

There was a wide range of chlorophyll-a measured in the primary pond during the year. Historically relatively high concentrations of chlorophyll-a are found in the pond, indicative of a significant phytoplankton component.

2.2.3 Wetlands effluent monitoring

No odours were associated with the system at the time of any inspection visit. Effluent levels in the wetlands were controlled by the wetland discharge pump, which was in operation during two of the four routine inspections. Minor bird numbers were observed on this section of the treatment plant, which has implications for the level of bacteria in the wetland effluent. Results of wetlands effluent sampling are presented in Table 4.

2.2.4 Trench system effluent monitoring

When discharging flow rates from the trench system, estimated at the outfall of the final trench, were around 1 to 3 L/s, prior to the rock rip-rap outfall through which the final effluent discharged into the stream.

Three samples of the trench system treated effluent were collected from the discharge point (OXPO06004); the results are presented in Table 4.

2.3 Results of receiving environment monitoring

Monitoring of the impacts of the Opunake WWTP on receiving waters is measured using both water quality surveys of the receiving waters of the Tasman Sea beyond the boundary of the mixing zone with the unnamed coastal stream; and contact recreational bacteriological quality surveys of the Tasman Sea at Middleton Bay and Opunake Beach (Figure 3).

Water quality surveys were carried out twice during the 2019–2020 period (Section 2.3.1).



Figure 3 Location of receiving water sampling sites for Opunake WWTP

2.3.1 Tasman Sea monitoring

Three sampling surveys of the receiving waters of the Tasman Sea were scheduled to be undertaken during the monitoring period during mid-tide conditions. The sites have been established slightly beyond the 50 metre mixing zone in consideration of the wide and meandering nature of the stream mouth. Samples were not able to be collected during the inspection in November 2019 as the access track down the cliff to the coast was not safe. Results are presented in Table 5.

Moderate numbers of bacteria were found in the samples collected.

Table 4 Results of effluent analysis monitoring at each stage of the treatment plant

Site		Primary pond effluent				Wetlands polished effluent				Final treated discharge from soakage trenches			
Date		19 Nov 2019	4 Feb 2020	5 May 2020	2018-2019 Range	19 Nov 2019	4 Feb 2020	5 May 2020	2018-2019 Range	19 Nov 2019	4 Feb 2020	5 May 2020	2018-2019 Range
Time		0930	0900	1050		0930	0930	1105		1025	1000	1120	
Parameter	Unit												
Temp	°C	16.0	23.6	14.0	10.0 – 21.2	12.6	23.1	13.1	8.7 – 21.0	15.8	23.1	14.4	9.5 – 21.0
pH	pH	7.7	7.4	7.7	7.4 – 8.1	7.1	8.7	7.8	7.8 – 8.7	-	-	-	-
BOD ₅	g/m ³	7.4	14	27	3.2 - 25	1.2	6.5	19	3.0 - 17	-	-	-	-
Conductivity @25°C	mS/m	40.5	52.3	56.4	46.9-56.3	43.2	52.4	52.6	43.9-52.9	39.6	51.0	50.8	44.0 – 54.2
Ent	/100ml	1,900	4,200	6,900	>1,000 – 16,000	460	670	1,900	60 – 1,300	-	-	-	-
<i>E.coli</i> *	/100ml	18,000	96,000	31,000	14,000 – 80,000	4,100	2,220	7,000	800 – 15,000	1,500	10	4,200	380 – 6,000
SS	g/m ³	30	71	31	44 - 53	33	88	34	35 -82	-	-	-	-

* *E.coli* replaces FC as a bacterial indicator following 2017 TRC protocol

Table 5 Tasman Sea receiving water sampling results

Date		19 November 2019*		4 February 2020		5 May 2020	
Site		SEA904073	SEA904074	SEA904073	SEA904074	SEA904073	SEA904074
Time (NZST)		-	-	1000	1015	1210	1220
Parameter	Unit						
Temp	°C	-	-	23.6	23.6	16.2	16.2
Conductivity	µS/cm@25°C	-	-	52,700	52,700	51,200	51,400
<i>E.coli</i>	/100ml	-	-	14	290	110	80
Appearance		-		Turquoise green		Slightly turbid, greyish	

* Samples unable to be collected on this occasions due to lack of access to the sites

2.3.2 Bacteriological recreation water quality monitoring

Contact recreational bacteriological water quality at Opunake Beach and at Middleton Bay was monitored by the Council on 19 and 11 occasions, respectively, between late November 2019 and mid-March 2020.

There was no additional sampling required during the period as there was no usage of the ocean outfall.

2.3.2.1 MfE guidelines for contact recreation

Guidelines for microbiological water quality of marine recreational areas have been prepared by the Ministry for the Environment in conjunction with the Ministry of Health (MfE, 2003). The guidelines use a combination of a qualitative risk grading of the catchment, together with direct measurements of appropriate faecal indicators to assess the suitability of a site for recreation (see Section 3.2).

In addition, 'Alert' and 'Action' guideline levels are used for surveillance throughout the bathing season. These guideline levels are summarized in Table 1 and are based on keeping illness risk associated with recreational water use to less than approximately 2%. Levels are based on enterococci counts as these bacteria are the preferred indicators for marine waters. Research has shown that enterococci are the indicator most closely correlated with health effects in New Zealand marine waters, in common with general findings overseas (New Zealand Marine Bathing Study). 'Alert' and 'Action' guideline levels are used for surveillance throughout the bathing season, and are summarised in Table 6.

Table 6 Guideline levels for coastal contact recreation bathing sites

Mode	Enterococci (nos/100 ml)		
	'Acceptable' (green)	'Alert' (amber)	'Action' (red)
Marine	≤140	141-280	>280 (2 consecutive samples)

2.3.2.2 Suitability for recreation grading (SFRG)

The 2003 Microbiological Water Quality Guidelines (MfE, 2003) provide for the grading of recreational water bodies utilising Microbiological Assessment Categories (using historical data) and Sanitary Inspection Categories which generate a measure of the susceptibility of water bodies to faecal contamination. This suitability for recreation grade (SFRG) therefore describes the general condition of a site based on both risk

and indicator bacteria water quality. A grade is established on the basis of five years' data and recalculation of a grade may be performed annually although grades should be reassessed on a five-yearly basis.

SFRGs are very good, good, fair, poor, and very poor. Sites graded very good will almost always comply with the guideline values for recreation, and indicate that there are few sources of faecal contamination in the catchment. Consequently there is a low risk of illness from bathing. Sites graded very poor are in catchments with significant sources of faecal contamination, and they rarely pass the guidelines. The risk of illness from bathing at these sites is high, and swimming is not recommended. For the remaining beaches (good, fair and poor) it is recommended that weekly monitoring be carried out during the bathing season. The public are to be informed when guideline values are exceeded and swimming is not recommended (MfE, 2003).

All of the region's principal coastal recreation sites have been graded according to these criteria, using historical microbiological water quality data extending over the latest five year period (November 2013 to April 2018) preceding the current period. The relevant information for Opunake Beach is summarised in Table 7.

Table 7 SFRG for Opunake Beach for the five-year period from November 2015 to April 2019

Site	Sanitary Inspection Category	Microbiological assessment Enterococci (nos/100 ml)			SFR Grade	% of all samples in compliance (ie: <280 enterococci)
		95%ile	Number of samples	Category		
Opunake Beach	Moderate 3	34.9	108	A	Good	100

In general, high water quality has been measured at both contact recreation sites during the period from November 2015 to April 2019. Very few single samples have entered the 'Alert' mode at either of Opunake Beach or Middleton Bay over the period since 2003. Overall the seasonal enterococci medians at each of the two sites have emphasised the extremely high water quality generally present in these coastal waters over each of these recreational periods.

It should be noted that there are also multiple potential sources of bacteriological components entering both Opunake Beach and Middleton Bay, including stormwater discharges and natural runoff.

2.3.2.3 Water quality at Opunake Beach

Contact recreational bacteriological water quality at Opunake Beach was monitored by the Council on 19 separate occasions respectively between early November 2019 and late March 2020. State of Environment (SEM) samples are collected approximately four times per month when hydrological flow conditions permit, within two hours of high tide. SEM sampling is performed only under dry weather flow conditions (i.e. not within three days of a fresh) to ensure, as far as practicable, consistent environmental factors. The revised guidelines for microbiological water quality of marine recreational areas (MfE, 2003) envisaged weekly surveillance monitoring during the 5-month recreational period, with a minimum of 20 sampling dates, regardless of weather conditions or state of the tide (note: there were only 19 samples collected due to the nationwide lockdown as a result of the COVID pandemic). This number of samples each season is regarded as providing the most robust dataset for site categorisation purposes. Eight extra samples were therefore collected at Opunake Beach during the bathing period. The results of this sampling are summarised in Table 8 and illustrated in Figure 4.

Table 8 Statistical summary of bacteriological monitoring at Opunake Beach

	Parameter	Units	Number of samples	Minimum	Maximum	Median
SEM samples	Specific conductivity	$\mu\text{S/cm@25}^\circ\text{C}$	11	51,100	53,000	52,200
	Enterococci	cfu/100 ml	11	<1	110	2
	Temperature	$^\circ\text{C}$	11	16.8	21.3	18.4
SEM & MfE samples	Specific conductivity	$\mu\text{S/cm@25}^\circ\text{C}$	19	50,400	53,000	52,100
	Enterococci	cfu/100 ml	19	<1	110	1
	Temperature	$^\circ\text{C}$	19	16.5	21.6	18.4

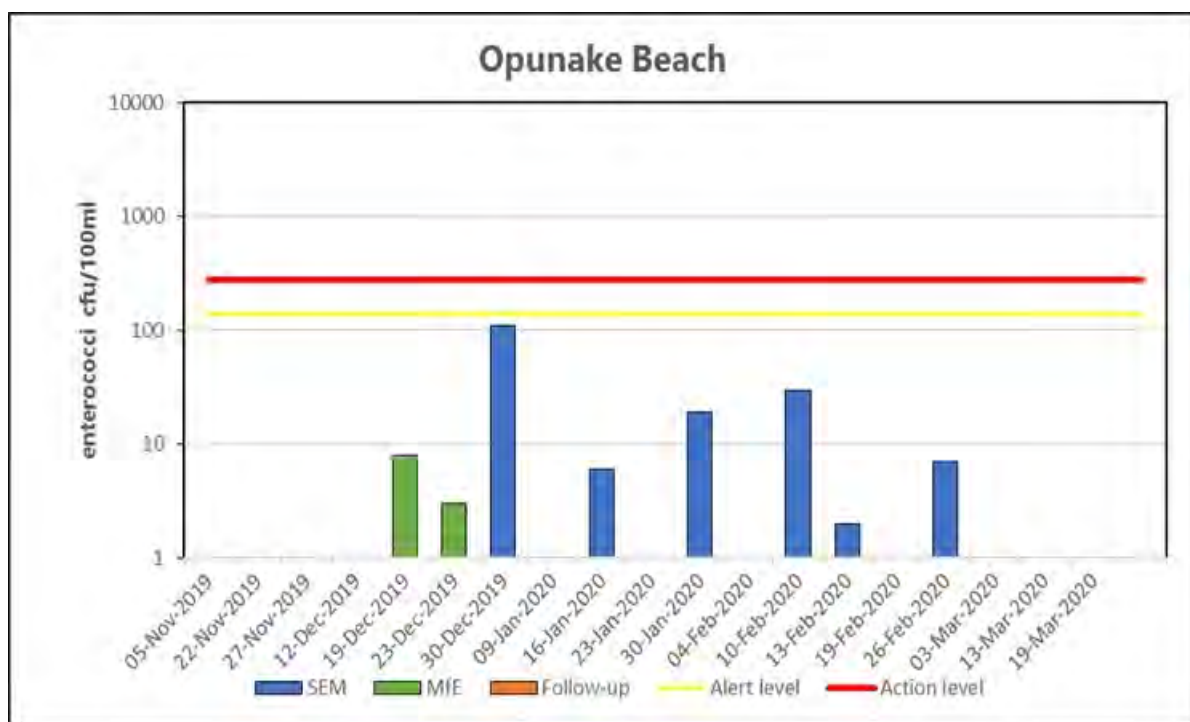


Figure 4 Enterococci results for Opunake Beach summer 2019-2020

The coastal bacteriological water quality at Opunake Beach was very good throughout the monitoring period. With a maximum enterococci of 110 per 100 ml, all samples collected were well below the 'Alert' limit.

This high water quality was emphasised by a seasonal median count of 1 enterococci (per 100 ml) for the 19 samples collected during the survey period. These results may be compared with past bacteriological survey data for Opunake Beach (Figure 5).

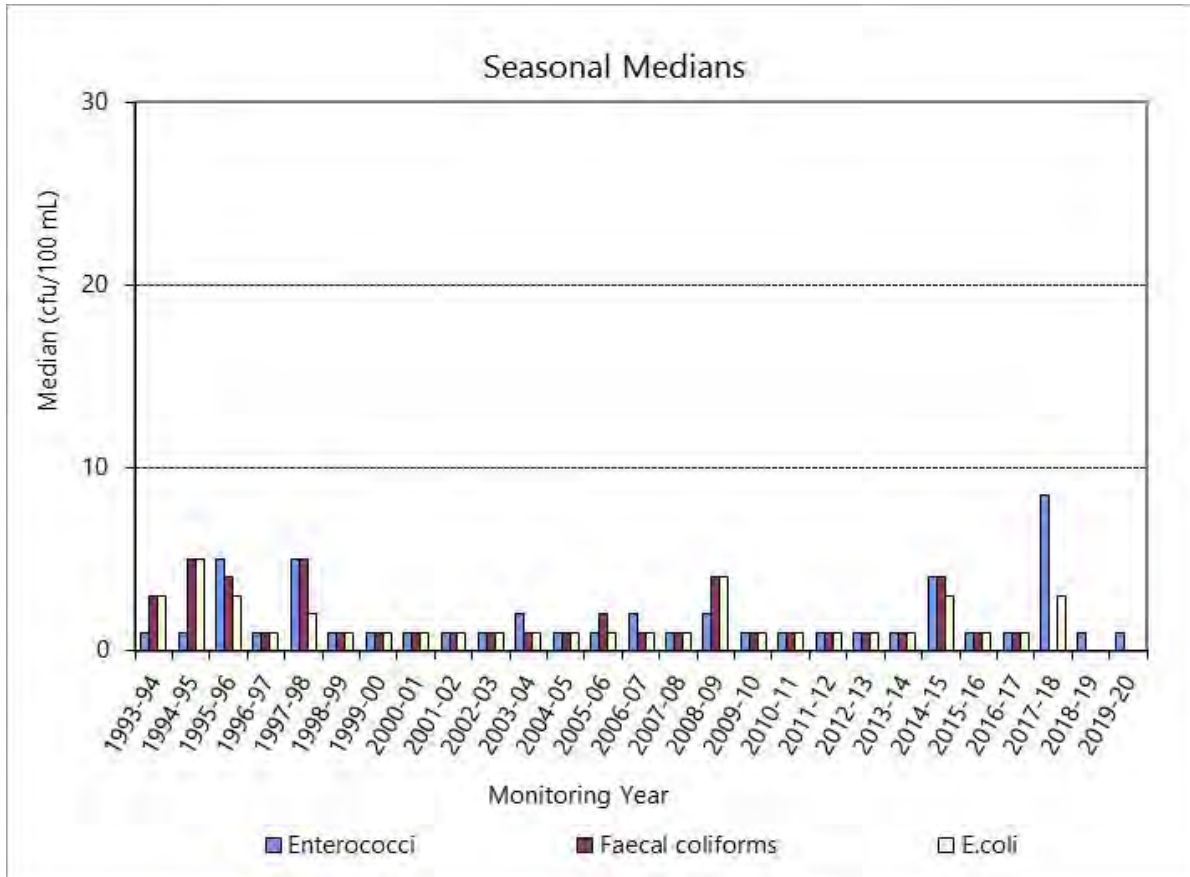


Figure 5 Median bacteriological results at Opunake Beach since summer 1993-1994

The results from Figure 5 indicate that in terms of median numbers, the high contact recreational water quality at this site in 2019-2020 was typical of the very narrow range of the median water quality recorded by past summer survey programmes.

2.3.2.4 Water quality at Middleton Bay

Contact recreational bacteriological water quality at Middleton Bay was monitored by the Council on 11 separate occasions between late November 2019 and mid-March 2020. The results of this sampling are summarised in Table 9 and illustrated in Figure 6.

Table 9 Statistical summary of bacteriological monitoring at Middleton Bay

	Parameter	Units	Number of samples	Minimum	Maximum	Median
SEM samples	Specific conductivity	$\mu\text{S}/\text{cm}@25^\circ\text{C}$	11	50,700	53,200	52,200
	Enterococci	cfu/100 ml	11	<1	75	5
	Temperature	$^\circ\text{C}$	11	17.2	21.2	18.9

Although not an intensively used contact recreational area, this site was monitored due to the potential for occasional discharges of untreated domestic sewage (generally following high stormwater infiltration conditions) into the coastal waters from the nearby ocean outfall.

The high water quality was emphasised by the seasonal median count of 5 enterococci (per 100 ml) for the 11 samples collected during the survey period.



Figure 6 Bacteriological (enterococci) results from Middleton Bay during summer 2019-2020

2.4 Incidents, investigations, and interventions

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 STDC. 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 causes 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).

Table 10 below sets out details of any incidents recorded, additional investigations, or interventions required by the Council in relation to the Opunake WWTP during the 2019-2020 period. This table presents details of all events that required further investigation or intervention regardless of whether these were found to be compliant or not.

Table 10 Incidents, investigations, and interventions summary table

Date	Details	Compliant (Y/N)	Enforcement Action Taken?	Outcome
17 Jan 2020	A complaint was received regarding a stream running green. Investigation traced this back to discharge from the Opunake WWTP soakage field. The discharge was green due to a high concentration of algae	N	Abatement notice	Re-inspection found that the discharge from the soakage field had been reduced to minimise the discharge and comply with the abatement notice.
27 Feb 2020	A complaint was received regarding a stream running green. Investigation traced this back to discharge from the Opunake WWTP soakage field. The discharge was bright green due to a high concentration of algae	N	No	STDC advised to reduce the rate of discharge from the ponds. Re-inspection found that the discharge rate had been reduced and no discolouration was noted past the mixing zone or on the foreshore.

3 Discussion

3.1 Discussion of site performance

The STDC Opunake WWTP was found to be generally well managed during the 2019-2020 year. Good liaison was maintained between STDC and the Council.

Work was carried out early in the monitoring period after ongoing issues with ponding on the soakage trenches. It appears that this issue has been resolved with no further ponding noted during any of the routine inspections carried out during the 2019-2020 monitoring period.

Complaints were received on two occasions regarding discolouration of the receiving stream. STDC reduced the rate of the discharge to allow for better dilution, mitigating the visual effect of this.

An inflow and infiltration program is in place to limit amount of storm water entering the system. During the 2019-2020 year 13 properties remained unrepaired following action requests, while 17 properties could not be accessed for various reasons. Works scheduled during 2020-2021 include CCTV analysis of 17 km of pipe (the whole town with the exception of the rising main).

An inline dissolved oxygen meter was installed at the pond outlet in February 2020 so that dissolved oxygen can be measured continuously.

Updated management and contingency plans for the site were received in April 2020.

3.2 Environmental effects of exercise of consents

Monitoring of system performance indicated that a high standard of effluent quality was produced by the oxidation pond and series of two wetlands. Wastewater quality from the wetlands was very good, reflecting the consistently high performance of the WWTP system, with significant reductions in bacterial loadings. The discharge from the reticulated soakage trench system into the unnamed coastal tributary had no measurable effects on the bacteriological quality of the coastal receiving waters of the Tasman Sea in the vicinity of the stream's mouth, however visual effects (discolouration due to algae) were noted in the stream and receiving waters.

No impacts of wastewater disposal from the WWTP were measured on bacteriological contact recreational water quality surveyed throughout the summer period at the principal coastal recreational area on Opunake Beach and at the nearby Middleton Bay. There were no exceedances of the contact recreational bacteriological 'Alert' or 'Action' guidelines during the season at either site. This continued the trend of high bacteriological water quality measured at Opunake Beach over the previous 24 summers.

3.3 Evaluation of performance

A tabular summary of the consent holder's compliance record for the year under review is set out in Tables 11-13.

Table 11 Summary of performance for consent 0236-6 (current until 11 November 2019)

Purpose: To intermittently discharge up to 4,666 cubic metres/day of comminuted wastewater, from an ocean outfall in Middleton Bay, Opunake, Taranaki, to the Tasman Sea		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adopt best practicable option	Inspection	Yes
2. Consent exercised in accordance with documentation	Inspections	Yes

Purpose: To intermittently discharge up to 4,666 cubic metres/day of comminuted wastewater, from an ocean outfall in Middleton Bay, Opunake, Taranaki, to the Tasman Sea		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
3. Upgrade design and implementation	Liaison with consent holder	Yes
4. Upgrade reporting	Upgrade completed	Yes
5. Limits upon reasons for discharge	Reporting by consent holder	Yes
6. Limits on solids discharged	Inspections and reporting by consent holder	Yes
7. Notification of discharge	No discharges during the monitoring period	N/A
8. Overflow reporting requirement	No discharges during the monitoring period	N/A
9. Provision of contingency plan	Reporting by consent holder	Yes
10. Maintenance of signage	No discharges during the monitoring period	N/A
11. Notification to TDHB	No discharges during the monitoring period	N/A
12. Biennial meetings	Liaison with consent holder and submitters	Not required
13. Implementation of infiltration reduction programme	Consent holder report	N/A
14. Receiving water monitoring	Bacteriological sampling programme as required	Yes
15. Optional review of consent	No further review provision	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

Table 12 Summary of performance for consent 0236-7 (from 12 November 2019)

Purpose: To discharge screened wastewater from the Opunake treatment plant through an outfall to the Tasman Sea on occasions when the capacity of the pump station and storage is exceeded		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adopt best practicable option	Inspection	Yes
2. Report by 1 September each year re inflow and infiltration	Consent holder reporting	Yes
3. No discharge of unscreened solids through outfall	Inspections	Yes
4. Notification following any discharge	No discharge during period under review	N/A
5. Details of any discharge to be provided	No discharge during period under review	N/A
6. Consent holder to place signage to advise of any discharges	No discharge during period under review	N/A

Purpose: To discharge screened wastewater from the Opunake treatment plant through an outfall to the Tasman Sea on occasions when the capacity of the pump station and storage is exceeded		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
7. Consent holder to prepare and maintain contingency plan	Updated plan received April 2020	Yes
8. Optional review of consent	Option for review in June 2021, recommendation attached in Section 3.6	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

Table 13 Summary of performance for consent 4248-2 (current until 3 December 2019)

Purpose: To discharge up to 2,074 cubic metres per day of treated municipal wastewater from the Opunake municipal oxidation pond and wetlands treatment system onto and into land and into an unnamed stream between the Otahi Stream and the Heimama Stream		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Requirements of system design and operation	Inspections	Yes
2. Adopt best practicable option	Inspection, chemical sampling and biomonitoring	Yes
3. Requirements of the management plan	Documents provided	Yes
4. Operator requirements	Liaison with STDC, inspections	Yes
5. Aerobic conditions in the pond	Dissolved oxygen monitoring	Yes
6. Limits to the duration of ponding on the land surface	Inspection	Yes
7. Limits on the overland flow of wastewater	Inspection	Yes
8. Monitoring requirements	Liaison with STDC, physiochemical monitoring	Yes
9. New trade wastes connections	Liaison with STDC	N/A
10. Effects of the discharge on receiving waters	Inspection, physicochemical sampling	Yes
11. Reporting requirements	Reports provided	Yes
12. Review of consent	No further review provision	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 14 Summary of performance for consent 4248-3 (from 3 December 2019)

Purpose: To discharge up to 2,074 cubic metres per day of treated municipal wastewater from the Opunake municipal oxidation pond and wetlands treatment system onto and into land and into an unnamed stream between the Otahi Stream and the Heimama Stream		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Effluent to be treated via oxidation ponds, wetlands and other facilities as described in application	Inspections	Yes
2. Adopt best practicable option	Inspections, liaison with consent holder	Yes
3. DO to exceed 0 g/m ³ for at least 3 out of 24 hours per day	Consent holder reporting	Yes
4. Consent holder to measure DO continuously and make results available to TRC	Inline DO meter installed in February 2020, results available on WaterOutlook	Yes
5. Discharge not to give rise to effects beyond mixing zone	Inspections, sampling	No. Two incidents involving discoloured stream
6. Discharge not to result in ponding on the land surface	Inspections	Yes
7. Discharge not to result in the overland flow of wastewater	Inspections	Yes
8. Requirements for waste transported by tanker	Liaison with consent holder	Yes
9. Consent holder to prepare and maintain contingency plan for the site	Updated contingency plan received in April 2020	Yes
10. Review of consent	Option to review consent in June 2024	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 15 Summary of performance for consent 4577-3 (current until 11 November 2019)

Purpose: To place and maintain the Opunake marine outfall structure within the coastal marine area at Middletons Bay		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Notification of maintenance works	No maintenance performed	N/A
2. Prevention of seabed and foreshore disturbance during maintenance works	No maintenance performed	N/A
3. General maintenance provision	Liaison with STDC	Yes

Purpose: To place and maintain the Opunake marine outfall structure within the coastal marine area at Middletons Bay		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
4. Removal and reinstatement requirements	Structure still in place	N/A
5. Optional review of consent	No further review provision	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

Table 16 Summary of performance for consent 4577-4 (current from 12 November 2019)

Purpose: To occupy the coastal marine area with the Opunake marine outfall structure		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Authorises occupation by current outlet structure		N/A
2. Consent holder to maintain structure in safe, sound and functional condition	Inspections	Yes
3. Optional review of consent	Option to review consent in June 2024	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

Table 17 Evaluation of environmental performance over time

Year	High	Good	Improvement req	Poor
2010-11	1	-	-	-
2011-12	1	-	-	-
2012-13	1	-	-	-
2013-14	1	-	-	-
2014-15	1	-	-	-
2015-16	1	-	-	-
2016-17	-	1	-	-
2017-18	-	1	-	-
2018-19	1	-	-	-
Totals	7	2	0	0

During the year, STDC demonstrated an overall high level of environmental and administrative performance with the resource consents as defined in Section 1.1.4. An abatement notice was issued during the year following a complaint about a green colour in the receiving stream. STDC reduced the volume of discharge to enable adequate dilution to prevent the discolouration. This green colour was due to the large

population of algae in the pond at the time and it was unlikely that significant adverse environmental effects would have occurred further downstream as a result. There were no overflows from the Hector Place pumping station through the ocean outfall structure during the monitoring period

3.4 Recommendations from the 2018-2019 Annual Report

In the 2018-2019 Annual Report, it was recommended:

1. THAT in the first instance, monitoring of consented activities at Opunake WWTP in the 2019-2020 year continue at the same level as in 2018-2019.
2. THAT should there be issues with environmental or administrative performance in 2019-2020, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

These recommendations were implemented.

3.5 Alterations to monitoring programmes for 2020-2021

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 2020-2021 monitoring of consented activities at the Opunake WWTP continue at the same level as in 2019-2020. A recommendation to this effect is attached to this report.

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 2019-2020.

3.6 Exercise of optional review of consent

Resource consent 0236-7 provides for an optional review of the consent in June 2021. Condition 8 allows the Council to review the consent, for the purpose of ensuring that the conditions of the consent are adequate to deal with any adverse effects on the environment.

Based on the results of monitoring in the year under review, and in previous years as set out in earlier annual compliance monitoring reports, it is considered that there are no grounds that require a review to be pursued.

4 Recommendations

1. THAT in the first instance, monitoring of consented activities at Opunake WWTP 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.
3. THAT the option for a review of Resource Consent 0236-7 not be exercised in June 2021, on the grounds that existing conditions are adequate to control the discharge and its effects.

Glossary of common terms and abbreviations

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

Biomonitoring	Assessing the health of the environment using aquatic organisms.
BOD	Biochemical oxygen demand. A measure of the presence of degradable organic matter, taking into account the biological conversion of ammonia to nitrate.
BODF	Biochemical oxygen demand of a filtered sample.
cfu	Colony forming units. A measure of the concentration of bacteria usually expressed as per 100 millilitre sample.
Conductivity	Conductivity, an indication of the level of dissolved salts in a sample, usually measured at 25°C and expressed in mS/m.
DO	Dissolved oxygen.
DRP	Dissolved reactive phosphorus.
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.
Ent	Enterococci, an indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units per 100 millilitre of sample.
Fresh	Elevated flow in a stream, such as after heavy rainfall.
g/m ³	Grams per cubic metre, and equivalent to milligrams per litre (mg/L). 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.
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.
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.
L/s	Litres per second.
m ²	Square Metres.
MfE	Ministry for the Environment
mS/m	Millisiemens per metre.
NH ₄ ⁺	Ammonium, normally expressed in terms of the mass of nitrogen (N).
NH ₃	Unionised ammonia, normally expressed in terms of the mass of nitrogen (N).
NO ₃ ⁻	Nitrate, normally expressed in terms of the mass of nitrogen (N).
NO ₂ ⁻	Nitrite, normally expressed in terms of the mass of nitrogen (N).
NTU	Nephelometric Turbidity Unit, a measure of the turbidity of water.

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.
Physicochemical	Measurement of both physical properties (e.g. temperature, clarity, density) and chemical determinants (e.g. metals and nutrients) to characterise the state of an environment.
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	<i>Resource Management Act 1991</i> and including all subsequent amendments.
SFRG	Suitability for Recreational Grading. Describes the general condition of a site based on risk as well as indicator bacteria water quality.
SS	Suspended solids.
SEM	State of Environment
Temp	Temperature, measured in °C (degrees Celsius).
TKN	Total Kjeldahl nitrogen. Combination of organic nitrogen, NH ₃ , and NH ₄ ⁺ .
Turb	Turbidity, expressed in NTU.
WWTP	Wastewater treatment plant.

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

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Appendix I

Resource consents held by South Taranaki District Council

(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.

Appendix I

Resource consents held by South Taranaki District Council

(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.

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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.

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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: South Taranaki District Council
Private Bag 902
Hawera 4640

Decision Date 12 November 2019

Commencement Date 3 December 2019

Conditions of Consent

Consent Granted: To discharge screened wastewater from the Opunake treatment plant through an outfall to the Tasman Sea on occasions when the capacity of the pump station and storage is exceeded

Expiry Date: 1 June 2023

Review Date(s): June 2021

Site Location: Hector Place, Opunake

Grid Reference (NZTM) 1673027E-5632336N

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. 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. By 1 September each year, unless otherwise agreed in writing with the Chief Executive, Taranaki Regional Council, the consent holder shall provide to the Chief Executive, Taranaki Regional Council a report covering:
 - details of the progress made towards reducing inflow and infiltration reduction over the past year;
 - the consent holder's target for reduction of inflow and infiltration in the coming year; and
 - details of the works proposed in order to meet that target.
3. There shall be no discharge of unscreened solids through the outfall.
4. The consent holder shall immediately notify the Chief Executive, Taranaki Regional Council, the Taranaki District Health Board and Te Kahui o Taranaki Trust following any discharge under this permit.
5. As soon as practicable following a discharge under this permit the consent holder shall advise the Chief Executive, Taranaki Regional Council, Taranaki District Health Board and Te Kahui o Taranaki Trust of the time, reason(s), duration and volume of wastewater discharged and remedial measures implemented.
6. The consent holder shall install and maintain suitable signage advising the public of the health risk on each and every occasion that an ocean outfall discharge occurs. The signage shall remain in place until there is no longer a public health risk.
7. The consent holder shall prepare, maintain and regularly update a 'Contingency Plan' which details measures and procedures that will be undertaken to prevent and/or to avoid environmental adverse effects from a pump or power failure, or other emergency, at the pump station. The plan and any amended versions shall be provided to the Chief Executive, Taranaki Regional Council.

Consent 0236-7.0

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 2021, 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 12 November 2019

For and on behalf of
Taranaki Regional Council

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: South Taranaki District Council
Private Bag 902
Hawera 4640

Decision Date 12 November 2019

Commencement Date 3 December 2019

Conditions of Consent

Consent Granted: To discharge treated municipal wastewater from the
Opunake municipal oxidation pond and wetlands treatment
system onto and into land and into Unnamed Stream 34

Expiry Date: 1 June 2036

Review Date(s): June 2024, June 2030

Site Location: 4443 South Road, Opunake

Grid Reference (NZTM) 1671850E-5633540N (land)
1672323E-5633419N (water)

Catchment: Unnamed Stream 34

*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. Any effluent discharged shall be treated via the oxidation ponds, wetlands and other facilities as described in the application.
2. 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.
3. The dissolved oxygen concentration in the aerobic pond shall exceed 0 gm^{-3} for minimum of 3 hours during each 24-hour period ending at midnight New Zealand Standard Time.
4. The consent holder shall measure dissolved oxygen in the aerobic ponds continuously and make the measurements available to Chief Executive, Taranaki Regional Council on a secure website within 2 hours of being recorded.
5. The discharge authorised by this consent shall not give rise to any of the following effects beyond a mixing zone of 20 metres from the mouth of the receiving stream:
 - (a) the production of conspicuous oil or grease films, scums or foams, or floatable suspended materials;
 - (b) any conspicuous change in the colour or visual clarity;
 - (c) any emission of objectionable odour; or
 - (d) any significant adverse effects on marine life.

6. The discharge shall not result in ponding on the land surface.

For the purpose of this condition, ponding means wastewater on the ground surface over a continuous area exceeding 10 m^2 or a combined area greater than 30 m^2 .

7. The discharge shall not result in overland flow of wastewater other than as authorised by this consent.
8. Other than septic tank cleanings, waste transported by tanker may only be discharged into the Opunake Wastewater Treatment Plant if:
 - (a) the waste comes from within the South Taranaki District;
 - (b) discharge of the waste is authorised by a licence, permit or consent and/or a trade waste agreement pursuant to a Trade Waste Bylaw; and/or
 - (c) the nature and volume of the waste and its inclusion in the discharge does not result in any significant change to the environmental effects of the discharge; and
 - (d) at the end of the calendar month following the acceptance of any waste in accordance with this condition, the consent holder provides to the Chief Executive of the Taranaki Regional Council a report which details the source, nature and volume of the tanker waste that was discharged and if relevant, reference to any licence, permit or consent and/or a trade waste agreement which authorised discharge of the waste.

Consent 4248-3.0

9. The consent holder shall prepare, maintain and regularly update a 'Contingency Plan' which details measures and procedures that will be undertaken to prevent and/or to avoid environmental effects from a spillage or any discharge of contaminants not authorised by this consent. The plan and any amended versions shall be provided to the Chief Executive of the Taranaki Regional Council.
10. 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 2024 and/or June 2030, 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 12 November 2019

For and on behalf of
Taranaki Regional Council

A D McLay
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: South Taranaki District Council
Private Bag 902
Hawera 4640

Decision Date 12 November 2019

Commencement Date 12 November 2019

Conditions of Consent

Consent Granted: To occupy the coastal marine area with the Opunake marine outfall structure

Expiry Date: 1 June 2036

Review Date(s): June 2024, June 2030

Site Location: Hector Place, Opunake

Grid Reference (NZTM) 1673027E-5632336N

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 outlet 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 emergency wastewater outlet and protection structure.
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 2024 and/or June 2030, 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 12 November 2019

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

