

# South Taranaki District Council Kaponga, Manaia, Patea, and Waverley WWTPs

Monitoring Programme

Annual Report

2022-2023

Technical Report 2023-17



Working with people | caring for Taranaki

Taranaki Regional Council  
Private Bag 713  
Stratford

ISSN: 1178-1467 (Online)  
Document: 3166291 (Word)  
Document: 3237506 (Pdf)  
March 2024

**South Taranaki District Council**  
**Kaponga, Manaia, Patea and Waverley**

**WWTPs**

Monitoring Programme

Annual Report

2022-2023

Technical Report 2023-17



**South Taranaki District Council**  
**Kaponga, Manaia, Patea and Waverley**  
**WWTPs**  
**Monitoring Programme**  
**Annual Report**  
**2022-2023**

**Technical Report 2023-17**

Taranaki Regional Council  
Private Bag 713  
Stratford

ISSN: 1178-1467 (Online)  
Document: 3166291 (Word)  
Document: 3237506 (Pdf)  
March 2024



## Executive summary

The South Taranaki District Council (STDC) operates eight wastewater treatment plant (WWTP) systems within the district of South Taranaki. This report addresses performances of four of these systems, located in the Kaponga, Manaia, Patea and Waverley townships<sup>1</sup>.

This report for the period July 2022 to June 2023 describes the monitoring programme implemented by the Taranaki Regional Council (the Council) to assess STDC'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 STDC's activities.

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

STDC holds seven resource consents for the Waverley, Kaponga, Manaia and Patea treatment plants, which include a total of 92 conditions setting out the requirements that they must satisfy. Four consents allow STDC to discharge treated wastewater from the various municipal oxidation ponds sewage treatment systems, one consent is held to discharge treated stock truck effluent (Waverley), one consent covers the discharge of untreated municipal sewage in emergencies (Patea), and one consent allows for the placement and use of a discharge structure in the Coastal Marine Area (Patea).

Monitoring was undertaken to ensure continued maintenance and efficient operation of all treatment systems, plus compliance with discharge permit conditions.

During the year, STDC demonstrated a high level of environmental and high level of administrative performance with the resource consents held in relation to the Kaponga WWTP. The Kaponga WWTP was well maintained and operated, and performed satisfactorily throughout the monitoring period. The effluent quality data was indicative of well-treated wastewater, with parameters typical of a municipal oxidation pond system receiving minimal industrial waste loadings. No significant impacts on the Kaupokonui River were recorded from the physicochemical parameters analysed during the mid-summer survey conducted in January 2023, when a low discharge rate of well-treated wastewater characterised this system. No significant impacts of the effluent discharge were indicated by MCI scores through the reach of the river surveyed.

During the year, STDC demonstrated a good level of environmental and a high level of administrative performance with the resource consents held in relation to the Manaia WWTP. The Manaia WWTP was generally well maintained and operated, and performed satisfactorily throughout the monitoring period. Although localised impacts of the pond discharge on the receiving waters have reduced markedly following the incorporation of wetlands into the treatment system, impacts from the discharge in relation to bacteria and aesthetic water quality of the Manaia Creek were observed.

During the year, STDC demonstrated a high level of environmental and administrative performance with the resource consents in relation to the Patea WWTP. The Patea WWTP and emergency overflow was well maintained and operated, and performed satisfactorily throughout the monitoring period. Since the upgrade to the system and the pumping station, the discharge effluent quality has shown marked improvement over the quality typical of the previous single pond treatment system receiving minimal industrial waste loadings. No significant impacts associated with the discharges were measured on the bacteriological quality of the lower reaches of the Patea River.

During the year, STDC demonstrated a good level of environmental and a high level of administrative performance with the resource consents in relation to the Waverley WWTP. The Waverley WWTP was well

---

<sup>1</sup> The Eltham, Wai-inu, Hawera, and Opunake Wastewater Treatment Plants are the subject of separate reports by the Taranaki Regional Council.

maintained and operated, and performed satisfactorily throughout the monitoring period. The performance of the system was considered to be typical of a biological treatment system receiving essentially domestic wastes, and continued to show some improvements compared to historical wastewater quality. Minor impacts from the discharge were noted on the water quality of the Wairoa Stream tributary. However, these and other effects were readily assimilated, first by the aquatic weed growth in the tributary, and then in the extensive Ihupuku Wetland area located downstream of Beach Road.

This report also addresses monitoring of the use of STDC stock truck wastewater disposal system near Waverley, where the consent allows for on-site land discharge of anaerobic-aerobic ponds' treated stock truck effluent. The presence of appropriate signage and surveillance by the consent holder have been effective in maintaining compliance at the facility. Increased monitoring of this facility was instigated by the Council and will continue in conjunction with the programme for the Waverley municipal oxidation ponds system (where the stock truck wastes were disposed of originally).

For reference, in the 2022-2023 year, consent holders were found to achieve a high level of environment performance and compliance for 878 (87%) of a total of 1007 consents monitored through the Taranaki tailored monitoring programmes, while for another 96 (10%) of the consents a good level of environmental performance and compliance was achieved. A further 27 (3%) of consents monitored required improvement in their performance, while the remaining one (<1%) achieved a rating of poor.

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 an overall high level.

This report includes recommendations for the 2023-2024 year.



# Table of contents

		Page
1	Introduction	1
1.1	Compliance monitoring programme reports and the Resource Management Act 1991	1
1.1.1	Introduction	1
1.1.2	Structure of this report	1
1.1.3	The Resource Management Act 1991 and monitoring	1
1.1.4	Evaluation of environmental performance	2
1.2	Resource consents	2
1.3	Monitoring programme	3
1.3.1	Introduction	3
1.3.2	Programme liaison and management	3
1.3.3	Kaponga WWTP	3
1.3.3.1	Site inspections	3
1.3.4	Chemical sampling	4
1.3.5	Biomonitoring surveys	4
1.3.6	Manaia WWTP	4
1.3.6.1	Site inspections	4
1.3.6.2	Chemical sampling	4
1.3.6.3	Biological inspection	5
1.3.7	Patea WWTP and emergency outfall	5
1.3.7.1	Site inspections	5
1.3.7.2	Chemical sampling	5
1.3.8	Waverley WWTP and stock truck wastes disposal	5
1.3.8.1	Site inspections	5
1.3.8.2	Chemical sampling	5
1.3.9	Biomonitoring surveys	6
2	Kaponga WWTP	7
2.1	Inspections	7
2.2	Results of effluent monitoring	8
2.2.1	Dissolved oxygen levels	9
2.2.2	Microfloral component	10
2.3	Results of receiving environment monitoring	11
2.3.1	Receiving water surveys of July 2022 and May 2023	12

	2.3.2	Low flow receiving water survey January 2023	12
	2.3.3	Biological monitoring survey	14
2.4		Investigations, interventions, and incidents	14
2.5		Discussion	16
	2.5.1	Discussion of site performance	16
	2.5.2	Environmental effects of exercise of consents	16
	2.5.3	Evaluation of performance	16
	2.5.4	Recommendations from the 2021-2022 Annual Report	17
	2.5.5	Alterations to monitoring programmes for 2023-2024	17
	2.5.6	Recommendations	18
3		Manaia WWTP	19
	3.1	Background	19
	3.2	Inspections	20
	3.3	Results of effluent monitoring	21
	3.3.1	Dissolved oxygen levels	22
	3.3.2	Microfloral component	23
	3.4	Results of receiving environment monitoring	23
	3.4.1	Receiving water surveys	23
	3.4.2	Biological inspection	24
	3.5	Investigations, interventions, and incidents	27
	3.6	Discussion	27
	3.6.1	Discussion of site performance	27
	3.6.2	Environmental effects of exercise of consents	28
	3.6.3	Evaluation of performance	28
	3.6.4	Recommendations from the 2021-2022 Annual Report	29
	3.6.5	Alterations to monitoring programmes for 2023-2024	30
	3.6.6	Recommendations	30
4		Patea WWTP and emergency outfall	31
	4.1	Background	31
	4.2	Inspections	32
	4.2.1	Pumping station and emergency outfall	32
	4.3	Results of effluent monitoring	33
	4.3.1	Dissolved oxygen levels	33
	4.3.2	Microfloral component	34
	4.4	Results of receiving environment monitoring	34

4.4.1	Lower Patea receiving water surveys	35
4.4.2	Contact recreational bacteriological monitoring	38
4.4.3	Additional monitoring requested by STDC	40
4.5	Investigations, interventions, and incidents	42
4.6	Discussion	42
4.6.1	Discussion of site performance	42
4.6.2	Environmental effects of exercise of consents	42
4.6.3	Evaluation of performance	43
4.6.4	Recommendations from the 2021-2022 Annual Report	45
4.6.5	Alterations to monitoring programmes for 2023-2024	46
4.6.6	Recommendations	46
5	Waverley WWTP and stock truck wastes disposal	47
5.1	Inspections	47
5.2	Results of effluent monitoring	48
5.2.1	Dissolved oxygen levels	49
5.2.2	Microfloral component	50
5.3	Results of receiving environment monitoring	50
5.3.1	Low flow receiving water survey of January 2023	50
5.3.2	Biological monitoring survey	53
5.4	Investigations, interventions, and incidents	54
5.5	Discussion	54
5.5.1	Discussion of site performance	54
5.5.2	Environmental effects of exercise of consents	55
5.5.3	Evaluation of performance	55
5.5.4	Recommendations from the 2021-2022 Annual Report	56
5.5.5	Alterations to monitoring programmes for 2023-2024	57
5.5.6	Recommendations	57
6	Summary of recommendations	58
6.1	Kaponga WWTP	58
6.2	Manaia WWTP	58
6.3	Patea WWTP and emergency outfall	58
6.4	Waverley WWTP and stock truck wastes disposal	58
	Glossary of common terms and abbreviations	59
	Bibliography and references	61
	Appendix I Resource consents held by STDC	

## List of tables

Table 1	Resource consents held by STDC in relation to the Kaponga, Manaia, Patea and Waverley WWTP's	2
Table 2	Results of effluent monitoring for the Kaponga WWTP	8
Table 3	Dissolved oxygen measurements from the Kaponga WWTP	9
Table 4	Chlorophyll-a levels and primary pond appearance	11
Table 5	Sampling sites for Kaponga WWTP	12
Table 6	Receiving water results July 2022 and May 2023	12
Table 7	Low flow receiving water results January 2023	13
Table 8	Summary of performance for consent 0861-3	16
Table 9	Sampling site locations for the Manaia WWTP	21
Table 10	Results of summer effluent monitoring for the Manaia WWTP	22
Table 11	Dissolved oxygen measurements from the Manaia WWTP	22
Table 12	Chlorophyll-a levels and primary pond appearance	23
Table 13	Receiving water results for Manaia Creek	24
Table 14	Receiving water results for Tasman Sea either side of Manaia Creek mouth	24
Table 15	Summary of performance for consent 1204-4	28
Table 16	Results of effluent monitoring for the Patea WWTP	33
Table 17	Dissolved oxygen measurements from the Patea WWTP	34
Table 18	Chlorophyll-a levels and primary pond appearance	34
Table 19	Sampling site locations for the Patea WWTP	35
Table 20	Receiving water results for the lower Patea River	37
Table 21	Summary of results for lower Patea River at boat ramp (PAT000995)	38
Table 22	Summary of results for Mana Bay (SEA907022)	39
Table 23	Additional monitoring at two sites in the Patea River; PAT000970 (upstream) and PAT000995 (downstream)	41
Table 24	Summary of performance for consent 0067-3	43
Table 25	Summary of performance for consent 0145-2	44
Table 26	Summary of performance for consent 4576-2	45
Table 27	Results of summer effluent monitoring for the Waverley WWTP	49
Table 28	Dissolved oxygen measurements from the Waverley WWTP	49
Table 29	Chlorophyll-a levels and primary pond appearance	50
Table 30	Sampling sites for Waverley WWTP	50

Table 31	Low flow receiving water results January 2023	52
Table 32	Summary of performance for consent 0072-3	55
Table 33	Summary of performance for consent 6621-1	56

## List of figures

Figure 1	Aerial location map of sampling sites in relation to Kaponga WWTP	11
Figure 2	Biomonitoring sites in the Kaupokonui River in relation to the Kaponga WWTP discharge with taxa number, MCI scores and SQMCI scores for each site	15
Figure 3	Aerial location map of sampling sites in relation to Manaia WWTP	21
Figure 4	Layout of Patea WWTP	35
Figure 5	Map showing sampling sites in relation to Patea WWTP	36
Figure 6	<i>E. coli</i> numbers for lower Patea River at the boat ramp	39
Figure 7	Enterococci numbers for Mana Bay	40
Figure 8	Aerial location map of sampling sites in relation to Waverley WWTP	51
Figure 9	Taxa number, MCI scores and SQMCI scores for each biomonitoring site (March 2023)	53
Figure 10	Block diagram of proposed Waverley WWTP upgrade	54

## List of photos

Photo 1	Kaponga WWTP	7
Photo 2	Algal bloom on the surface of the pond caused by high microfloral levels.	10
Photo 3	Manaia WWTP	19
Photo 4	Manaia Creek waterfall (Unnamed Stream 27), and discharge onto reef, 1 June 2023	25
Photo 5	Examples of species found in the high shore intertidal zone in the direct influence of Manaia Creek	25
Photo 6	Examples of species found in the low shore intertidal zone in the direct influence of Manaia Creek	26
Photo 7	Examples of species found in the low shore intertidal zone, 50m northwest of Manaia Creek	27
Photo 9	View of Patea WWTP	31
Photo 10	View of Patea boat ramp sampling site	38
Photo 11	Waverley WWTP	47



# 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 2022 to June 2023 by the Council describing the monitoring programme associated with resource consents held by STDC for four of these wastewater treatment plants (WWTPs). These plants are located at Kaponga, Manaia, Patea, and Waverley. The Waverley programme also includes the consent held for the discharge of treated stock truck effluent from the SH3 system to land in the Waitotara catchment. The municipal systems located at Wai-inu Beach, Eltham, Hawera and Opunake are reported on separately by the Council.

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 discharges of wastewater in the Kaupokonui (Kaponga), Waiokura/Motumate (Manaia), Patea (Patea), and Wairoa (Waverley) and Waitotara (Waverley Stock Truck) catchments. This is the 28<sup>th</sup> annual report to be prepared by the Council for STDC.

### 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;
- the nature of the monitoring programme in place for the period under review; and
- a description of the activities and operations conducted in the Company's site/catchment.

**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 2023-2024 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 performance

Besides discussing the various details of the performance and extent of compliance by the consent holders, this report also assigns a rating as to each Company's environmental and administrative performance during the period under review. The rating categories are high, good, improvement required and poor for both environmental and administrative performance. The interpretations for these ratings are found in Appendix II.

For reference, in the 2022-2023 year, consent holders were found to achieve a high level of environment performance and compliance for 878 (87%) of a total of 1007 consents monitored through the Taranaki tailored monitoring programmes, while for another 96 (10%) of the consents a good level of environmental performance and compliance was achieved. A further 27 (3%) of consents monitored required improvement in their performance, while the remaining one (<1%) achieved a rating of poor.<sup>2</sup>

## 1.2 Resource consents

STDC holds seven resource consents the details of which are summarised in the table below. Summaries of the conditions attached to each permit are set out in the 'Evaluation of performance' section of the relevant treatment plant.

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 STDC during the period under review.

**Table 1** Resource consents held by STDC in relation to the Kaponga, Manaia, Patea and Waverley WWTP's

Consent number	Purpose	Granted	Review	Expires
<i>Water discharge permits</i>				
0067-3	To discharge up to 455 cubic metres per day of treated municipal wastewater from the Patea WWTP into the Coastal Marine Area of the Patea River	July 2007	-	June 2028
0072-3	To discharge up to 450 cubic metres per day of treated municipal wastewater from the Waverley municipal oxidation ponds system into an unnamed tributary of the Wairoa Stream	August 2017	-	June 2022*
0145-2	To discharge untreated municipal sewage in emergencies only into the Coastal Marine Area of the Patea River	July 2007	-	June 2028

<sup>2</sup> The Council has used these compliance grading criteria for more than 19 years. They align closely with the 4 compliance grades in the MfE Best Practice Guidelines for Compliance, Monitoring and Enforcement, 2018



Consent number	Purpose	Granted	Review	Expires
0861-3	To discharge up to 500 cubic metres per day of treated wastewater from the Kaponga WWTP into the Kaipokonui Stream	June 2007	-	June 2029
1204-4	To discharge up to 600 cubic metres per day of treated municipal wastewater from the Manaia WWTP into an unnamed coastal stream between the Waiohira Stream and the Motumate Stream	June 2007	-	June 2029
<i>Discharges of waste to land</i>				
6621-1	To discharge treated stock truck effluent from an oxidation pond treatment system onto and into land in the vicinity of the Waiau Stream in the Waitotara catchment	Sept 2005	-	June 2022 <sup>^</sup>
<i>Coastal permit</i>				
4576-2	To erect, place and maintain an oxidation pond discharge structure and an emergency overflow discharge structure as part of the Patea WWTP within the coastal marine area of the Patea River	Nov 2005	-	June 2028

\* renewal currently on hold due to s92 request (for further information)

<sup>^</sup> renewal underway, consent continues to operate under s.124

## 1.3 Monitoring programme

### 1.3.1 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.

### 1.3.2 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.

### 1.3.3 Kaponga WWTP

#### 1.3.3.1 Site inspections

The Kaponga WWTP was visited three times during the monitoring period, with each inspection conducted during early to mid-morning. With regard to consents for the discharge to water, the main points of interest were maintenance and operating condition of the WWTP, and the discharge of treated wastewater. Air quality surveys for odours associated with the system were included with each inspection. 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.

### 1.3.4 Chemical sampling

The Council undertook sampling of both the discharges from the site and the water quality upstream and downstream of the discharge point and mixing zone.

The primary oxidation pond was sampled for dissolved oxygen and microfloral component on three occasions.

Water quality samples were collected from upstream and downstream sites in the Kaipokonui River during the winter and late autumn inspections. Samples were analysed for filtered uninhibited biochemical oxygen demand (filtered BOD), pH, turbidity, temperature, unionised ammonia ( $\text{NH}_3$ ), and ammonia-N ( $\text{NH}_4$ ).

The treated pond effluent and three sites on the Kaipokonui River were sampled on one occasion in mid-summer under low river flow conditions. The samples were analysed for total and filtered BOD, chloride, conductivity, dissolved oxygen, *E. coli* bacteria, pH, suspended solids (SS), turbidity, temperature, dissolved reactive phosphorus (DRP), unionised ammonia ( $\text{NH}_3$ ), ammonia-N ( $\text{NH}_4$ ), and nitrate-nitrite nitrogen (NNN).

### 1.3.5 Biomonitoring surveys

A biological survey was performed on one occasion at three sites in the Kaipokonui River to determine whether or not the discharge of treated effluent from the Kaponga WWTP has had a detrimental effect upon the communities of the stream.

### 1.3.6 Manaia WWTP

#### 1.3.6.1 Site inspections

The Manaia WWTP was visited three times during the monitoring period, with each inspection conducted during early to mid-morning. With regard to consents for the discharge to water, the main points of interest were maintenance and operating condition of the WWTP and associated wetlands, and the discharge of treated wastewater. Air quality surveys for odours associated with the system were included with each inspection. 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.

#### 1.3.6.2 Chemical sampling

The Council undertook sampling of both the discharges from the site and the water quality upstream and downstream of the discharge point and either side of the mixing zone.

The primary oxidation pond was sampled for dissolved oxygen and microfloral component during each of the inspections. Water quality samples were also collected from upstream and downstream sites in the Manaia Creek, and either side of the mixing zone in the Tasman Sea. The freshwater samples were analysed for chloride, conductivity, *E. coli* bacteria, turbidity, and temperature. The sea samples were analysed for conductivity, *E. coli* bacteria, and temperature.

The primary pond and the treated wetlands effluents were sampled on one occasion in early summer during low river flow conditions. The samples were analysed for total and filtered BOD, chloride, conductivity, dissolved oxygen, *E. coli* bacteria, pH, suspended solids, turbidity, temperature, unionised ammonia ( $\text{NH}_3$ ), and ammonia-N ( $\text{NH}_4$ ).

### 1.3.6.3 Biological inspection

A low tide beach ecological inspection was performed on one occasion in winter 2023 to assess the impact of the discharge on the marine environment.

## 1.3.7 Patea WWTP and emergency outfall

### 1.3.7.1 Site inspections

The Patea WWTP and Emergency Overflow were visited three times during the monitoring period, with each inspection conducted during mid-morning. With regard to consents for the discharge to water, the main points of interest were maintenance and operating condition of the WWTP, and usage and maintenance of the emergency overflow system. Air quality surveys for odours associated with the system were included with each inspection. 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.

### 1.3.7.2 Chemical sampling

The Council undertook sampling of both the discharges from the site and the water quality upstream and downstream of the discharge point and either side of the mixing zone.

The primary oxidation pond was sampled for dissolved oxygen, microfloral component, total and filtered BOD, chloride, conductivity, dissolved oxygen, faecal coliform bacteria, pH, suspended solids, turbidity, temperature, unionised ammonia (NH<sub>3</sub>), and ammonia-N (NH<sub>4</sub>) during the summer inspection. During two of the three inspection occasions, water quality samples were also collected from upstream and downstream sites in the Patea River. These samples were analysed for conductivity, *E. coli* and enterococci bacteria, turbidity, and temperature. In addition, analyses for BOD, chloride, ammonia-N (NH<sub>4</sub>), DRP and pH were included in the summer samples.

Contact recreational bacteriological water quality at Patea Boat Ramp and Mana Bay was monitored by the Council on 22 occasions between early November 2022 and late March 2023. The samples were analysed for conductivity, *E. coli* and enterococci bacteria, and temperature.

Additional monitoring was undertaken upstream and downstream of the discharge at the request of STDC. This data will be used to get a better understanding of the river water quality as part of determining the best option for upgrading the WWTP in the near future.

## 1.3.8 Waverley WWTP and stock truck wastes disposal

### 1.3.8.1 Site inspections

The Waverley WWTP was visited three times during the monitoring period. These inspections were conducted during mid-morning, and focused on the maintenance and operation of the treatment plant and any effects on the receiving environment. Air quality surveys associated with the operation of the plant were included with each inspection.

The nearby stock truck effluent disposal was inspected four times throughout the year.

### 1.3.8.2 Chemical sampling

The second cell of the oxidation pond was sampled for dissolved oxygen, temperature, and microfloral component during each of the three inspections.

The Council undertook sampling of the discharge from the site and water quality upstream and downstream of the discharge during low flow conditions on one occasion in mid-summer, in conjunction with sampling from the oxidation pond. The discharge and receiving water samples were analysed for ammonia ( $\text{NH}_3$  and  $\text{NH}_4$ ), total and filtered BOD, chloride, conductivity, dissolved oxygen, DRP, *E. coli* bacteria, pH, suspended solids, temperature, and turbidity.

### 1.3.9 Biomonitoring surveys

A biological survey was performed on one occasion at three sites in an unnamed tributary of the Wairoa Stream to determine whether or not the discharge of treated effluent from the Waverley WWTP has had a detrimental effect upon the communities of the stream.

## 2 Kaponga WWTP

The Kaponga WWTP is a single oxidation pond system (constructed in 1971) that has been separated into two sections by a wooden dividing barrier. The pond is gravity-fed mainly domestic wastes from a population of approximately 330 people, although it was designed for a population of 650. A sludge survey performed by consultants for the consent holder (MWH, 2005) found that there had been a slow rate of sludge accumulation and at such a rate, it was estimated that the system would not require desludging for another 17 years. Sludge surveys will be repeated at five-yearly intervals (STDC, 2015). Issues of stormwater infiltration, improved mixing within the ponds' system, and reduction of the microfloral component of the treated wastewater discharge, were identified in consideration of upgrading the treatment system during the consent renewal process in the 2007-2008 period (CH2M Beca Ltd, 2006). Upgrades to the system were completed by late May 2008. Infiltration remedial work has a lesser priority for the Kaponga township collection system than elsewhere in South Taranaki.

Riparian fencing and planting of the river margin adjacent to the ponds system has also been undertaken. The installation of a mechanical step-screen at the inlet was undertaken during the latter months of the 2012-2013 monitoring period. This screen system has telemetry alarming. A flow meter was installed on the pond inlet in the 2017-2018 year as per consent conditions.



Photo 1 Kaponga WWTP

### 2.1 Inspections

25 July 2022

The step screen was operating and wastes were fully contained. A new Instrumental panel by the step screen had been constructed. The pond influent flow was reasonably clear with an estimated flow rate of 10 L/s. The pond appearance was light green-brown and relatively clear, while pond 2 was light green and also relatively clear. No wildlife was noted on either pond.

The discharge flow rate into the Kaupokonui River was estimated at 10 -15 L/sec with no noticeable environmental effect on the receiving waters. The Kaupokonui River was running at a moderate swift flow and was clear and uncoloured.

The WWTP surrounds were found to be satisfactory.

### 23 January 2023

The step screen was operating and wastes were fully contained. The influent flow rate was estimated at 3 L/s. Pond 1 was green-yellow and turbid. Six paradise ducks were observed on the pond surface.

The effluent discharge into the Kaupokonui River was estimated at 2.5 L/sec with a visual reduction in water clarity downstream (confirmed by black disc).

The WWTP surrounds were found to be satisfactory and no significant odour was noted.

### 3 May 2023

The step screen was operating and wastes were fully contained. The influent flow was reasonably clear and a light grey colour with an estimated flow rate of 3 L/s. The ponds were turbid green. No wildlife was present.

The discharge flow rate into the Kaupokonui River was estimated at 2 L/s with no visual environmental effects on the receiving waters observed.

The surrounds were tidy.

## 2.2 Results of effluent monitoring

Effluent monitoring was carried out in the second section of the oxidation pond, adjacent to the outlet, for the purpose of monitoring the effectiveness of the WWTP up to that point. 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 each inspection. These are discussed in Sections 2.2.1 and 2.2.2 respectively.

The primary pond was sampled for total and filtered BOD, chloride, conductivity, dissolved oxygen, faecal coliform bacteria, pH, suspended solids, turbidity, temperature, dissolved reactive phosphorus (DRP), unionised ammonia (NH<sub>3</sub>), ammonia-N (NH<sub>4</sub>), and nitrate-nitrite nitrogen (NNN) during the summer inspection, with a reduced suite of analyses undertaken on the autumn sample. The results of these surveys are presented in Table 2 and compared with the results from previous monitoring years.

The effluent quality data was indicative of well-treated wastewater, with parameters typical of a municipal oxidation pond system receiving minimal industrial waste loadings. All measured parameters were within the ranges of median values monitored to date for this system.

**Table 2 Results of effluent monitoring for the Kaponga WWTP**

Site		OXP002004		
Date		23 January 2023	3 May 2023	2000-2022 Range
Parameter	Unit	0945	1125	
Flow	L/s	3.0	2.0	0.1 - 15
BOD	g/m <sup>3</sup>	18	-	12 - 140
BODF	g/m <sup>3</sup>	2.4	2.4	0.7 - 5.8
Chloride	g/m <sup>3</sup>	17	-	12 - 34
Conductivity	mS/m@25°C	17.0	-	17.2-26.0

Site		OXP002004		
Date		23 January 2023	3 May 2023	2000-2022 Range
Parameter	Unit	0945	1125	
DO (concentration)	g/m <sup>3</sup>	12.3	9.6	1.7 - 17.6
DO (saturation)	%	144	99	18 - 190
<i>E. coli</i>	/100 ml	3,870	-	210 - 38,000*
pH	pH	10.0	8.5	7.4 - 10.3
SS	g/m <sup>3</sup>	148	-	38 - 320
Turbidity	FNU	280	57	30 - 350
Temperature	°C	22.2	16.2	6.5 - 25.4
<b>Nutrient Analyses</b>				
NH <sub>3</sub>	g/m <sup>3</sup> N	<0.009	0.103	0.006 - 0.0988
NH <sub>4</sub>	g/m <sup>3</sup> N	<0.010	1.26	<0.010 - 2.090
NNN	g/m <sup>3</sup> N	0.0013	-	<0.001 - 0.160
NO <sub>3</sub> <sup>-</sup>	g/m <sup>3</sup> N	<0.001	-	< 0.0001 - 0.009
NO <sub>2</sub> <sup>-</sup>	g/m <sup>3</sup> N	0.0011	-	<0.001 - 0.004
DRP	g/m <sup>3</sup> P	0.36	-	<0.003 - 6.38

\* parameter previously measured as faecal coliforms

### 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 the 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 Kaponga WWTP effluent was analysed for dissolved oxygen and temperature, and the results are displayed in Table 3.

**Table 3 Dissolved oxygen measurements from the Kaponga WWTP**

Date	Time (NZST)	Temperature (°C)	Dissolved Oxygen	
			Concentration (g/m <sup>3</sup> )	Saturation (%)
25 July 2022	1015	9.5	12.8	115
23 January 2023	0945	22.2	12.3	144
3 May 2023	1125	16.2	9.6	99

The dissolved oxygen concentrations measured during inspections were very high throughout the monitoring period (between 99% and 144% saturation). Super-saturation is a common occurrence in this



pond, with median and average dissolved oxygen saturation levels of 100% (from 105 samples collected since February 1988).

### 2.2.2 Microfloral component



Photo 2 Algal bloom on the surface of the pond caused by high microfloral levels.

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 on all 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/m<sup>3</sup> 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 effluent analyses are provided in Table 4 together with field observations of pond appearance.



Table 4 Chlorophyll-a levels and primary pond appearance

Date	Time (NZST)	Appearance	Chlorophyll-a (mg/m <sup>3</sup> )	Range for the period July 2013 to June 2022	
				Range	Median
25 July 2022	1015	Turbid, green-brown	290	0.6 - 1,100	400
23 January 2023	0945	Turbid, bright green	710		
3 May 2023	1125	Turbid, brown	800		

Levels of chlorophyll-a in the primary pond were high in all samples collected. The median of 400 mg/m<sup>3</sup> and average of 426 mg/m<sup>3</sup> in the samples collected prior to the current monitoring period (n=27) suggests that the Kaponga WWTP is maintaining stable conditions with regards to the algal population.

### 2.3 Results of receiving environment monitoring

Monitoring of the impacts of the Kaponga WWTP on the receiving waters was measured using both chemical analyses of the receiving waters of the Kaipokonui River beyond the boundary of the mixing zone, and biological monitoring surveys at the same locations. Chemical sampling was carried out on three occasions during the 2022-2023 period (Section 2.1.3.1). One biomonitoring survey was conducted during summer 2022 (Section 2.1.3.2). The locations of sampling sites are listed in Table 5 and displayed in Figure 1 below.



Figure 1 Aerial location map of sampling sites in relation to Kaponga WWTP

Table 5 Sampling sites for Kaponga WWTP

Site Code	Description	Location
KPK000500 (site 1)	Approximately 250 m upstream of the WWTP discharge	Kaupokonui River
OSP002004	Adjacent to outlet of second section of the oxidation pond	Effluent
KPK000520 (site 2)	50 m downstream of the WWTP discharge	Kaupokonui River
KPK000550 (site 3a)	Approximately 1 km downstream of the WWTP discharge	Kaupokonui River

### 2.3.1 Receiving water surveys of July 2022 and May 2023

Receiving water samples were collected on 25 July 2022 and 27 April 2022 at two sites in the Kaupokonui River, upstream and downstream of the Kaponga WWTP discharge point. The results of these surveys are displayed in Table 6.

Table 6 Receiving water results July 2022 and May 2023

Date		25 July 2022		3 May 2023		Consent limits
Parameter	Unit	Upstream KPK000500	Downstream KPK000520	Upstream KPK000500	Downstream KPK000520	
Time		0930	0945	1140	1055	-
BOD	g/m <sup>3</sup>	1.1	<1.0	<1.0	<1.0	2.0
pH	pH	7.6	7.6	7.7	7.8	-
Turbidity	FNU	0.73	0.69	0.69	0.84	Less than 50% increase
Temperature	°C	8.7	8.6	14.1	14.1	-
NH <sub>3</sub>	g/m <sup>3</sup> N	<0.00007	< 0.00007	<0.00013	<0.00015	0.025
NH <sub>4</sub>	g/m <sup>3</sup> N	<0.010	< 0.010	<0.010	<0.010	-

There were no significant effects noted in the Kaupokonui River in relation to the parameters tested. BOD<sub>5</sub>, turbidity and unionised ammonia (NH<sub>3</sub>) complied with consent conditions.

### 2.3.2 Low flow receiving water survey January 2023

A late summer low flow assessment of the impact of the WWTP's effluent discharge on the receiving waters of the Kaupokonui River was performed on 23 January 2023, 12 days after a significant river fresh. Results of the survey are displayed in Table 7. There was a moderate rate of discharge from the ponds system (estimated at approximately 3 L/s) at the time of the survey. The river flow was gauged at 0.86 m<sup>3</sup>/s upstream of the discharge.

Even though there was a large amount of dilution, there was a significant decrease in clarity of the stream immediately downstream of the discharge point (31% decrease in black disc clarity). A black disc measurement was not able to be obtained at the lower downstream site. Suspended solids levels were similar and low at all sites. There was a 47% increase in turbidity between the upstream (KPK000500) and downstream (KPK000520) sites, with a further increase at the lower downstream site (a 63% increase compared with upstream). Despite these high percentage changes, turbidity remained below 1.0 FNU (0.87 and 0.96 FNU for the two downstream sites), indicating fairly good water quality.

No significant impacts on the river were recorded for all other parameters measured (Table 7) with minimal or no increases in measured levels of conductivity, bacteria, BOD, pH and nutrients (including un-ionised ammonia). These results were indicative of compliance with Special Conditions 9, 11, and 12 of the consent.

Dissolved oxygen concentrations exceeded 100% saturation at all sites upstream and downstream of the discharge.

Table 7 Low flow receiving water results January 2023

		KPK000500		KPK000520		KPK000550	
Date		23 Jan 2023	2000-2022 Range	23 Jan 2023	2000-2022 Range	23 Jan 2023	2000-2022 Range
Parameter	0845	0845		1000		1030	
Flow	L/s	858	329-820	-	-	-	-
Black disc	m	6.20	2.55-5.95	4.27	2.44-5.75	-	2.00-4.86
BOD	g/m <sup>3</sup>	<0.7	<0.5-0.6	<0.6	<0.5-0.8	0.7	<0.5-0.9
BODF	g/m <sup>3</sup>	0.7	<0.5-0.9	<0.5	<0.5-0.5	0.4	<0.5-0.5
Chloride	g/m <sup>3</sup>	7	7.0-10.2	7	7.0-9.0	7	7.2-8.9
Conductivity	mS/m@25°C	90	9.3-10.1	91	7.8-10.2	91	8.6-10.2
DO (conc)	g/m <sup>3</sup>	10.0	9.46-11.1	9.8	9.7-11.2	9.8	9.6-11.2
DO (saturation)	%	102	97-106	101	98-107	102	100-108
<i>E. coli</i>	/100 ml	93	120-700*	61	80-630*	52	68-540*
pH	pH	7.6	7.3-8.0	7.6	7.4-8.4	7.7	7.6-8.2
SS	g/m <sup>3</sup>	<3	<2.0-4.0	<3	<2	<3	<2-4
Turbidity	FNU	0.59	0.25-1.4	0.87	0.4-1.8	0.96	0.35-1.3
Temperature	°C	15.0	3.4-19.2	15.5	3.4-19.6	16.3	10.1-19.8
<b>Nutrient Analyses</b>							
NH <sub>3</sub>	g/m <sup>3</sup>	<0.00011	0.00001-0.00021	<0.00013	0.00002-0.00024	<0.00017	0.00005-0.00014
NH <sub>4</sub>	g/m <sup>3</sup> N	<0.010	<0.003-0.016	<0.010	<0.003-0.043	<0.010	<0.003-0.030
NNN	g/m <sup>3</sup> N	0.30	0.07-0.23	0.29	0.07-0.22	0.28	0.06-0.22
NO <sub>3</sub> <sup>-</sup>	g/m <sup>3</sup> N	0.299	0.069-0.189	0.289	0.069-0.189	0.279	0.059-0.163
NO <sub>2</sub> <sup>-</sup>	g/m <sup>3</sup> N	0.0011	<0.001-0.002	0.0014	<0.001-0.002	0.0014	<0.001-0.002
DRP	g/m <sup>3</sup> P	0.007	0.003-0.023	0.008	<0.003-0.030	0.006	<0.003-0.022

\* parameter previously measured as faecal coliforms

### 2.3.3 Biological monitoring survey

The Council's standard 'kick-sampling' technique was used at three established sites (Table 5, Figure 2) on 4 April 2023 to collect streambed macroinvertebrates from the Kaupokonui River. Samples were processed to provide the number of taxa (richness), MCI score, SQMCI score, and percentage EPT taxa for each site (Figure 2).

The MCI is a measure of the overall sensitivity of the macroinvertebrate community to the effects of organic pollution in stony streams. It is based on the presence/absence of taxa with varying degrees of sensitivity to environmental conditions. The SQMCI takes into account taxa abundance as well as sensitivity to pollution, and may reveal more subtle changes in communities. It may provide more relevant information in relation to non-organic impacts. Differences in either the MCI or the SQMCI between sites indicate the degree of adverse effects (if any) of the discharges being monitored.

Macroinvertebrate richness was moderate at all sites, but decreased in a downstream direction. Site 1 exhibited a taxa richness of 20 taxa, whereas both site 2 and 3a had 17 taxa. All sites had a lower macroinvertebrate richness compared to their historic median, which may be related to the wet summer and frequent flushing flows that preceded the survey.

The MCI scores were similar at all three sites and indicative of 'very good' health. All three sites had scores that were higher than their respective historic medians (significantly so for site 2), suggesting that macroinvertebrate communities were in above typical health. The SQMCI values indicated 'very good' health at the control site and 'excellent' health at site 2 and 3a. Although site 1 recorded an SQMCI score lower than that recorded at sites 2 and 3a, this difference was not statistically significant. Site 2 and 3a displayed very similar SQMCI scores, differing by just 0.1 unit. When compared to historical medians, all three sites recorded higher SQMCI scores, with site 2 and 3a notably standing out, differing by 1.6 and 1.7 units, respectively). These SQMCI results also indicate that the macroinvertebrate communities at these sites were in better than average health.

EPT taxa comprise the pollution sensitive mayfly, stonefly and caddisfly groups. The number of EPT taxa decreased in a downstream direction (14, 11, and 10 EPT taxa for sites 1, 2, and 3a respectively), with the percentage of EPT taxa in the community declining similarly (70%, 65%, and 59% for sites 1, 2, and 3a respectively). This change in EPT taxa is quite subtle and only involved taxa recorded as rarities at one or two sites. It is not considered to be an indication of impacts caused by the oxidation pond discharge.

There were no heterotrophic growths detected on the river's substrate.

Overall, the results indicated that discharges from the Kaponga WWTP had not caused a significant decline in macroinvertebrate health of the Kaupokonui River.

A copy of the biomonitoring report for this site is available from the Council upon request.

## 2.4 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 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).

In the 2022-2023 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with STDC's conditions in resource consents or provisions in Regional Plans for the Kaponga WWTP.

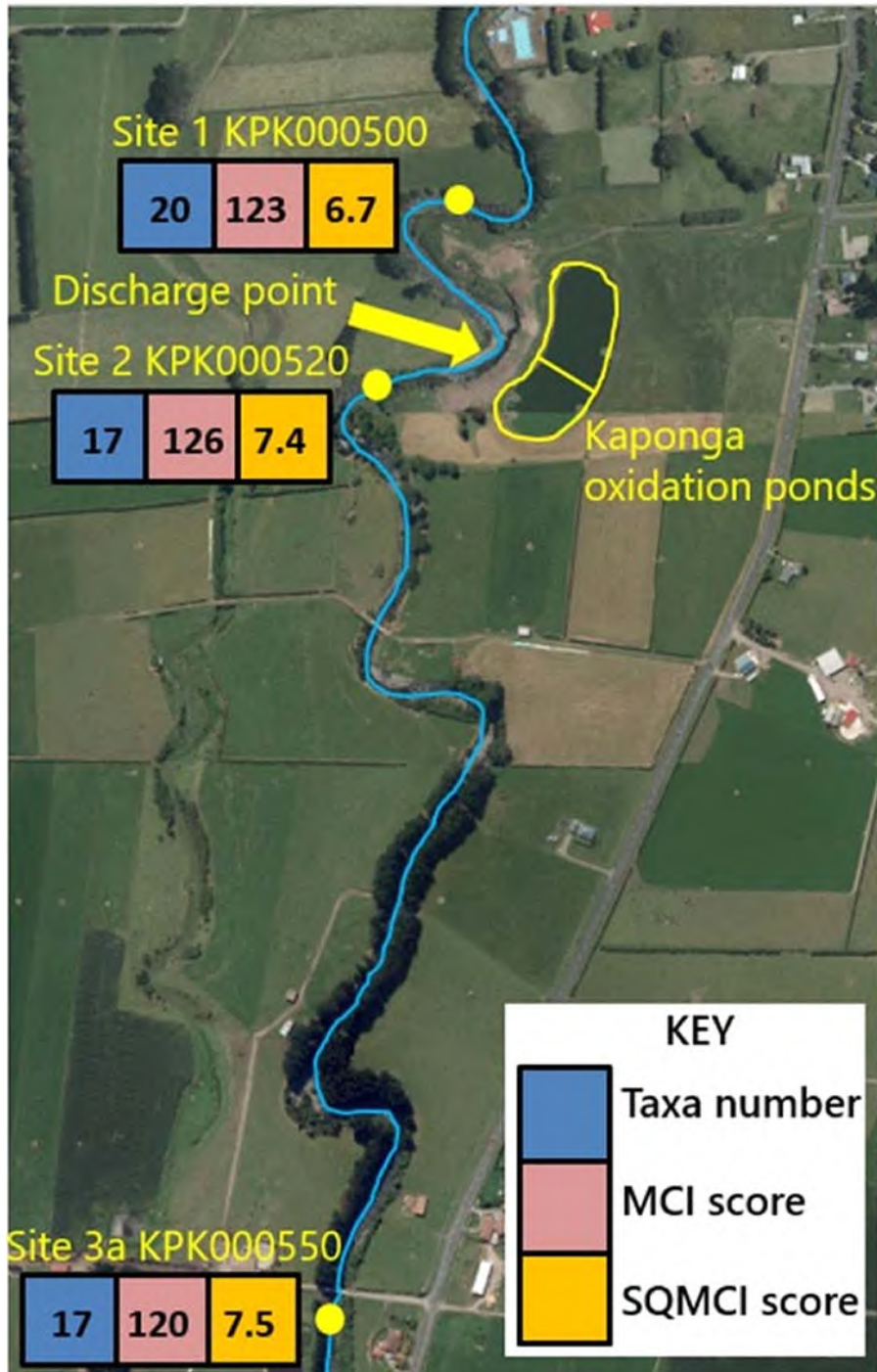


Figure 2 Biomonitoring sites in the Kaupokonui River in relation to the Kaponga WWTP discharge with taxa number, MCI scores and SQMCI scores for each site



## 2.5 Discussion

### 2.5.1 Discussion of site performance

The Kaponga WWTP was well maintained and operated, and performed satisfactorily throughout the monitoring period.

The effluent quality data was indicative of a well-treated wastewater with parameters typical of a municipal oxidation pond system receiving minimal industrial waste loadings. All measured parameters were within the ranges of median values monitored to date for this system. Monitoring of the microfloral component of the second pond by means of chlorophyll-a measurements indicated effective pond performance with microfloral population concentrations within the historical range.

Previous flow monitoring has indicated inflow and infiltration into the sewage system, however investigative work (such as smoke testing for damaged or illegal pipework and gully traps, and CCTV of pipework) was not undertaken in the Kaponga district during 2022-2023 as other areas are deemed more urgent with Kaponga currently scheduled last for this work.

### 2.5.2 Environmental effects of exercise of consents

No significant impacts on the Kaipokonui River were recorded from the physicochemical parameters analysed during the mid-summer survey conducted in January 2023. There were no significant changes in the measured concentrations of almost all parameters downstream under low receiving water flow conditions, mainly due to the small amount of high quality effluent discharging at the time. Turbidity was below the 50% increase allowed by consent conditions and downstream values were low (<1 FNU).

The Kaipokonui River continued to have high aesthetic water quality in the reaches near the Kaponga township and for 1 km downstream of the oxidation pond discharge under summer low flow conditions.

A summer macroinvertebrate survey found no evidence to suggest that the discharge had caused a significant decline in macroinvertebrate health in the Kaipokonui River. The absence of heterotrophic growths on the river's substrate was evidence of no acute impacts of the discharge on the biological communities of the Kaipokonui River.

### 2.5.3 Evaluation of performance

A tabular summary of STDC's compliance record for the year under review is set out in Table 8.

**Table 8 Summary of performance for consent 0861-3**

<b>Purpose: To discharge treated municipal wastewater from the Kaponga Wastewater Treatment Plant into the Kaipokonui River</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Upgrade to plant within one year	Reporting by consent holder; upgrade completed	Yes
2. Exercise in accordance with documentation	Liaison with consent holder and inspections	Yes
3. Minimisation of effects	Inspections and sampling	Yes
4. Limits on volume	Reporting by consent holder and inspections	Yes
5. Implementation of a management plan	Plan updated May 2022	Yes

<b>Purpose: To discharge treated municipal wastewater from the Kaponga Wastewater Treatment Plant into the Kaipokonui River</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
6. Provision of operator	Liaison with consent holder	Yes
7. Maintenance of aerobic ponds conditions	Inspections, sampling and data provided by consent holder	Yes
8. Trade wastes connections	Liaison with consent holder	N/A
9. Limits on receiving water effects	Inspections and physicochemical sampling and biomonitoring	Yes
10. Monitoring provisions	Physicochemical sampling and biomonitoring	Yes
11. Limits on receiving water effects for ammonia and filtered BOD <sub>5</sub>	Physicochemical sampling	Yes
12. Limits on aesthetic water effects	Physicochemical sampling	Yes
13. Provision for lapse of consent	Consent exercised	N/A
14. Optional review provision re environment effects	No further option for review prior to expiry	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

During the year, STDC demonstrated a high level of environmental and high level of administrative performance with the resource consents as defined in Appendix II.

## 2.5.4 Recommendations from the 2021-2022 Annual Report

In the 2021-2022 Annual Report, it was recommended:

1. THAT in the first instance, monitoring of consented activities at Kaponga WWTP in the 2022-2023 year continue at the same level as in 2021-2022.
2. THAT should there be issues with environmental or administrative performance in 2022-2023, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.
3. THAT the option for a review of resource consent 0861-3 in June 2023, as set out in condition 14 of the consent, not be exercised, on the grounds that the current conditions are adequate.

Recommendations one and three were implemented, while it was not considered necessary to carry out further investigations or interventions as per recommendation two.

## 2.5.5 Alterations to monitoring programmes for 2023-2024

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.

No planned changes have been made to the 2023-2024 monitoring programme.

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 2023-2024.

### 2.5.6 Recommendations

1. THAT in the first instance, monitoring of consented activities at Kaponga WWTP in the 2023-2024 year continue at the same level as in 2022-2023.
2. THAT should there be issues with environmental or administrative performance in 2023-2024, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.



### 3 Manaia WWTP

The Manaia WWTP (Photo 3) is a single treatment oxidation pond (constructed in 1984), followed by twin wetlands (in parallel) receiving mainly domestic sewage together with trade wastes from the bakery industry. These trade wastes are regulated by the STDC Trade Waste Bylaw 2017.



Photo 3 Manaia WWTP

#### 3.1 Background

Issues relating to the historical operation and performance of the reticulation and treatment system have been presented in previous annual reports (see TRC, 2004 and TRC, 2007 in particular).

Consent renewal (1999) issues relating to the upgrade of the treatment plant are also summarised in previous reports and the final design of the required upgrade was addressed by the consent renewal in 2007. An assessment of the wastes loadings to the pond system was also included in this process. The upgrade now provides additional screening of the influent and wetlands polishing of the final effluent principally to improve the bacteriological quality of the treated wastewater prior to discharge. Desludging of the oxidation pond was also a component of the upgrade, and was completed in November 2007 with the last of the de-watered sludge used onsite as a base for the constructed wetlands.

The installation of the mechanical screening at the plant was completed by June 2009. The wetlands installation was completed by early summer 2009 with the planting of 24,000 reeds followed by filling with water. The northern wetland was lined with water treatment plant sludge to prevent seepage. Hedging was planted along the northern and eastern boundary of the WWTP.

Both wetlands were commissioned in the 2010-2011 period. The consent holder constructed an emergency high level overflow pipe between the oxidation pond and the northern wetland in August 2010 (see TRC, 2011) to prevent overtopping of the pond onto neighbouring farmland. This pipe has been used only occasionally following heavy rainfall periods (e.g. September, 2010 and August, 2011) with a gate-valve installed to provide greater pond storage before use.

The Manaia WWTP is located adjacent to an eroding coastal cliff face, and regular cliff erosion topographical surveys are carried out by STDC's consultant, the most recent occurring in 2014. The coastal access track also requires regular checks and maintenance.

## 3.2 Inspections

3 August 2022

The influent screen was operating and wastes were fully contained. The pond level was high and this was discharging via the high level discharge pipe to the wetland pond. The influent flow rate was estimated at 15 L/sec. The aeration sparge was operating at the influent end. The pond had a turbid appearance and was green-brown in colour. Minimal odour was noted. Wildlife consisted of approximately 40 ducks and several black swans (many of which were nesting).

The northern wetland pond had a level of 1.78 m, while the southern pond remained isolated. Pond effluent was relatively clear with a light pale green colour. The treated wastewater discharge flow into the Manaia Creek was estimated at 25 L/s, with no visual environmental impact on the receiving water. The Manaia creek was running at a moderate swift flow and was clear and uncoloured. Sea samples either side of the tributary were not able to be collected on this occasion due to unsafe track conditions.

The ponds and surrounds were found to be tidy.

20 February 2023

The influent screen was operating and wastes were fully contained. The air sparge system at the influent end was operating. The influent flow rate was estimated at 5 L/s. The pond was turbid and dark green in colour with a slightly noticeable odour. Several paradise ducks and black swans were observed.

The northern wetland pond level was 1.60 m and wastewater was discharging via the weir. It was noted that an overflow discharge pipe now connects to the southern pond, however this remained empty. The pond effluent was slightly turbid and green in colour. No wildlife was noted. The treated wastewater discharge flow rate to the stream was estimated at 4 L/s and there was a slight visual discolouration at the downstream site when compared to the upstream site.

Coastal seawater samples were collected either side of the tributary, although it was noted that the coastal track required remedial works to make it safe. The ponds and surrounds were tidy.

15 May 2023

The influent screen was operating and wastes were fully contained. Aerator lines were operating in the inlet section of the pond. The influent flow rate was estimated at 25 L/s. The pond was turbid and pale green-brown in colour with a slightly noticeable odour. Several mallard ducks and black swans were observed. The pond level was high and was discharging via the overflow to the wetland.

The northern wetland pond level was 1.80 m and wastewater was discharging via the weir. The southern pond was isolated, although there was a small amount of discharge from the north pond. The pond effluent was slightly turbid and pale green in colour. The treated wastewater discharge flow rate to the stream was estimated at 25 L/s and there was a slight visual discolouration at the downstream site when compared to the upstream site.

Coastal seawater samples were collected either side of the tributary, although it was noted that the coastal track required remedial works to make it safe. The ponds and surrounds were tidy.

### 3.3 Results of effluent monitoring

Effluent monitoring was carried out from both the primary oxidation pond, adjacent to the outlet, and the final discharge from the wetlands for the purpose of monitoring the effectiveness of the treatment plant. Sampling sites for both effluent monitoring and receiving water monitoring are described in Table 9 and displayed in Figure 2. Measurements of dissolved oxygen levels (DO) and the microfloral component of the primary pond (Sections 3.3.1 and 3.3.2 respectively) were taken on each of the three inspections.

Table 9 Sampling site locations for the Manaia WWTP

Site code	Location	Site
MNA000090	5 m upstream of the WWTP discharge	Manaia Creek
OXP003001	WWTP oxidation pond effluent at outfall	Effluent
OXP006005	WWTP wetland at outfall	Outlet
MNA000093	10 m downstream of the WWTP discharge	Manaia Creek
SEA905086	200 m east of mouth of Manaia Creek	Tasman Sea
SEA905080	200 m west of mouth of Manaia Creek	Tasman Sea

The primary pond and wetland discharge were sampled for total and filtered BOD, chloride, conductivity, dissolved oxygen, *E. coli* bacteria, pH, suspended solids, turbidity, temperature, dissolved reactive phosphorus (DRP), and ammonia-N (NH<sub>4</sub>) on one occasion during the summer inspection. The results of this survey are presented in Table 10.



Figure 3 Aerial location map of sampling sites in relation to Manaia WWTP

Table 10 Results of summer effluent monitoring for the Manaia WWTP

Site		OXP003001		OXP006005	
Parameter	Unit	20 Feb 2023	2000-2022 Range	20 Feb 2023	2000-2022 Range
Time		0900	-	0900	-
BOD	g/m <sup>3</sup>	23	11-90	23	4.0-34
BODF	g/m <sup>3</sup>	2.0	3.2-54	2.0	3.1-13
Chloride	g/m <sup>3</sup>	38	40-66	40	37-53
Conductivity	mS/m@25°C	34.7	35.1-40.7	34.1	35.0-37.6
DO (concentration)	g/m <sup>3</sup>	7.6	0.22-17.9	2.9	0.55-6.0
DO (saturation)	%	86	2-179	29	4-64
Faecal coliforms	/100 ml	52,000	2,500-340,000	9,000	7-16,000
pH	pH	7.5	6.8-8.8	7.2	6.8-7.6
SS	g/m <sup>3</sup>	112	8.0-230	63	3.0-49
Turbidity	FNU	191	4.3-120	71	2.0-81
Temperature	°C	21.1	7.4-25.3	19.8	8.4-20.5
<b>Nutrient Analyses</b>					
NH <sub>4</sub>	g/m <sup>3</sup> N	4.2	1.8-17.8	2.9	2.6-19.5
DRP	g/m <sup>3</sup> P	0.63	0.446-4.89	0.59	0.593-3.06

Results of effluent monitoring show that the primary pond effluent quality was typical of a municipal single oxidation pond system receiving a relatively low industrial waste component coincidental with variable pond microfloral populations and a relatively typical bacterial level.

Comparison with previous results shows that the early summer pond effluent quality was within the historical range for most of the parameters.

Results from the treated wetland discharge were within the expected range.

Variability in the pond's microfloral population (Table 12) has contributed to differences in effluent quality over the period since monitoring commenced.

### 3.3.1 Dissolved oxygen levels

The Manaia WWTP effluent was analysed for dissolved oxygen and temperature, and the results are displayed in Table 11.

Table 11 Dissolved oxygen measurements from the Manaia WWTP

Date	Time (NZST)	Temperature (°C)	Dissolved Oxygen	
			Concentration (g/m <sup>3</sup> )	Saturation (%)
22 August 2022	1115	12.6	5.73	54
20 February 2023	0900	21.1	7.57	86
15 May 2023	1120	15.2	9.52	95

Results indicate a very wide range of dissolved oxygen concentrations (between 54% and 95% saturation) in the surface layer of the primary pond near the outlet. These results are slightly higher than usual (the mean of previous results is 52%, with around 25% of results recording super-saturation).

### 3.3.2 Microfloral component

Samples of the primary pond effluent were collected on all 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/m<sup>3</sup> 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 effluent analyses are provided in Table 12 together with field observations of pond appearance.

Table 12 Chlorophyll-a levels and primary pond appearance

Date	Time (NZST)	Appearance	Chlorophyll-a (mg/m <sup>3</sup> )	Range for the period July 2013 to June 2022	
				Range	Median
22 August 2022	1115	Slightly turbid, light green	10.4	0.4 - 2,850	170
20 February 2023	0900	Turbid, green	1,100		
15 May 2023	1120	Turbid, pale green-brown	160		

There was a wide range of concentrations of chlorophyll-a in the primary pond, with an unusually low level recorded in August 2022. The results are roughly consistent with historical chlorophyll-a data for the Manaia WWTP which shows a clear seasonal pattern of lower values recorded in winter (103 mg/m<sup>3</sup> average) and spring (130 mg/m<sup>3</sup> average), increasing over summer (423 mg/m<sup>3</sup> average) with the highest levels recorded in autumn (1,133 mg/m<sup>3</sup> average).

## 3.4 Results of receiving environment monitoring

Monitoring of the impacts of the Manaia WWTP on receiving waters is measured using chemical analyses of the Manaia Creek upstream and downstream of the final wetlands discharge, and beyond the boundary of the mixing zone with the receiving waters of the Tasman Sea. An annual biological inspection is also carried out on the intertidal zone at the boundary of the mixing zone. Chemical sampling was carried out on three occasions during the 2022-2023 period (Section 3.4.1). One biomonitoring inspection was conducted during early winter 2023 (Section 3.4.2). The locations of sampling sites are listed in the previous section, in Table 9 and Figure 2.

### 3.4.1 Receiving water surveys

Receiving water samples were collected on 3 August 2022, and 20 February and 15 May 2023 at two sites in the Manaia Creek upstream and downstream of the Manaia WWTP discharge point, and two coastal sites in the Tasman Sea, either side of the boundary with the mixing zone. The results of these surveys are displayed in Tables 13 and 14.



Table 13 Receiving water results for Manaia Creek

Site		MNA000090				MNA000093			
Date/time		3 Aug 2022	20 Feb 2023	15 May 2023	2000-2022 Range	3 Aug 2022	20 Feb 2023	15 May 2023	2000-2022 Range
Parameter	Unit	1145	0920	1005		1200	0930	1015	
Chloride	g/m <sup>3</sup>	57	51	45	34.0-142	51	49	43	31.8-85.1
Conductivity	mS/m@25°C	44.4	44.1	41.4	29.1-70.4	40.4	41.0	36.7	31.1-64.4
Faecal coliforms	/100 ml	50	360	600	50-33,000	590	1,200	1,400	68-260,000
Turbidity	FNU	1.6	2.0	1.9	1.2-70	1.6	16	6.6	1.8-75
Temperature	°C	12.1	16.9	14.7	8.2-18.6	12.3	17.5	14.3	8.0-19.2

Effects were noted on the Manaia Creek with increased faecal coliforms and turbidity downstream. However, there were no breaches of consent conditions as the receiving water is considered to be the Tasman Sea.

Table 14 Receiving water results for Tasman Sea either side of Manaia Creek mouth

Site		SEA905080				SEA905086			
Date/time		3 Aug 2022	20 Feb 2023	15 May 2023	2000-2022 Range	3 Aug 2022	20 Feb 2023	15 May 2023	2000-2022 Range
Parameter	Unit	-	0940	1045		-	1020	1030	
Conductivity	mS/m @25°C	-	5,140	5,040	849-5,340	-	5,030	3,960	858-5,330
Faecal coliforms	/100 ml	-	11	18	<1-1,300	-	110	160	1-300
Temperature	°C	-	20.5	15.9	7.5-23.3	-	20.0	15.4	7.6-24.4

These results show questionable water quality was achieved in the Tasman Sea either side of the boundary of the mixing zone at the mouth of the Manaia Creek. Levels of faecal coliforms found at the site to the west of the mouth of the stream were fairly low, however, with just two results, the median of MPN 14/100 ml was exceeded. While for the site to the east, both the median and maximum (no more than 10% of samples to exceed MPN 43/100 ml) were exceeded.

These results indicate non-compliance with condition 10 (iii) of the consent which requires compliance with the guideline for shellfish gathering waters as specified in the document 'Microbiological Water Quality Guidelines for Marine and Freshwater Recreational Areas'. However, the guidelines note that 'a sufficient number of samples should be gathered throughout the gathering season to provide reasonable statistical power in testing for compliance for both the median limit and the 90% samples limit'. Assessing the entire data set (from 1999), and data from the previous five years, the median for both sites is under 14/100ml. The number of samples exceeding 43/100ml was 16% (entire data set) and 15% (previous five years) at SEA905080. While at SEA905086 it was 25% (entire data set) and 31% (previous five years). As the area around the outfall is not regularly used for shellfish gathering, testing is only carried out occasionally so the data is best used as a guide rather than an assessment with the guidelines.

### 3.4.2 Biological inspection

During the monitoring period under review, one beach ecological inspection was performed. This survey was performed in winter 2023, and provided a qualitative assessment of the intertidal area for species present and also to assess the general 'ecological health' of the area. The results of the inspection are discussed below.

A marine ecological inspection of the rocky intertidal shore in the vicinity of the discharge from the Manaia Oxidation Ponds was carried out on 1 June 2023 at 14:00. Low tide on this day was at 13:36, at a height of 0.8 m above chart datum.

The weather was overcast and cool at the time of inspection, with turbid seas and a moderate sea breeze. There was a steady flow in the Manaia Creek (Unnamed Stream 27, Photo 4) which was clear, colourless, and had no foam or sheen present at the time of inspection. There were no visual discolouration, foam or odours detected in the stream, or on the reef during the inspection.



Photo 4 Manaia Creek waterfall (Unnamed Stream 27), and discharge onto reef, 1 June 2023

The high shore intertidal zone in the direct influence of Manaia Creek had low species richness compared to further downshore (Photo 5). Algal species included *Ulva* sp., *Ralfsia* sp. and *Gelidium* sp., and animal species included the highly abundant top shell snail *Diloma aethiops*, limpet *Cellana radians*, periwinkle *Austrolittorina antipodum*, oyster *Magallana gigas*, little black mussels *Xenostrobus pulex* and the barnacles *Austrominius modestus* and *Epopella plicata*.



Photo 5 Examples of species found in the high shore intertidal zone in the direct influence of Manaia Creek

There was an increase in species richness at the low shore intertidal zone within direct influence of Manaia Creek (Photo 6). Algal species present included those found higher up the shore, as well as *Champia* sp.



and encrusting *Corallina* sp. Animals present at the low shore site included limpets *Cellana ornata*, and *C. radians*, snails *D. aethiops*, *Diloma bicanaliculata*, *Haustrum haustorium*, *Haustrum scobina*, mussels *X. pulex*, and *Perna canaliculus*, and chiton *Sypharochiton pelliserpentis*. The encrusting tubeworm *Spirobranchus cariniferus* and barnacles *A. modestus*, *E. plicata*, and *Chamaesipho columna* were also observed in abundance downshore.



Photo 6 Examples of species found in the low shore intertidal zone in the direct influence of Manaia Creek

In the high intertidal zone 50 metres northwest of the stream mouth, the diversity of algae was similar to that of the corresponding site in the direct influence of the stream and included *Ulva* sp., *Ralfsia* sp., *Gelidium* sp., and *Corallina* paint. Animal species included *A. antipodum*, *C. radians*, *D. aethiops*, *C. columna*, *Epopella plicata*, as well as tubeworms *S. cariniferus* and *Neosabellaria kaiparaensis*.

The low intertidal zone 50 metres northwest of the stream mouth had a higher number of both algae and animal species than at the low shore site with direct influence from the stream (Photo 7). There were six algal species observed at this site, including *Champia* sp., *Corallina* paint and turf, *Gelidium* sp., *Hormosira banksii*, and *Ralfsia* sp. Algal biomass was notably higher here than at other sites surveyed. Animal species observed at this site were similar to the corresponding downshore site, and included *C. ornata*, *C. radians*, *D. aethiops*, *D. bicanaliculata*, *H. haustorium*, *H. scobina*, *P. canaliculus*, *S. pelliserpentis*, *A. modestus*, *C. columna*, *E. plicata*. Also observed in this zone was tubeworm *N. kaiparaensis*, cats eye snail *Lunella smaragdus*, and spiny sea star *Coscinasterias muricata*.

The discharge from Manaia Creek appears to have a small localised effect on the intertidal reef ecology within its direct influence. The most notable difference in the high intertidal zone was the slightly lower animal diversity and absence of the algae *Corallina* paint in the direct influence of the creek. In the low intertidal zone there was higher algal biomass away from the influence of the creek, and a slight increase in and animal richness. The effects of the stream on the reef did not appear to extend beyond the designated mixing zone, and were consistent with that found at other reef sites around Taranaki that are similarly influenced by freshwater sources.

A copy of the full marine inspection report for this site is available from the Council upon request.





Photo 7 Examples of species found in the low shore intertidal zone, 50m northwest of Manaia Creek

### 3.5 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 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).

In the 2022-2023 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with STDC's conditions in resource consents or provisions in Regional Plans for the Manaia WWTP.

### 3.6 Discussion

#### 3.6.1 Discussion of site performance

The Manaia WWTP was generally well maintained and operated, and performed satisfactorily throughout the monitoring period. The performance of the oxidation pond showed typical seasonal variability, with aerobic conditions occurring throughout the monitoring period with variable dissolved oxygen levels.

Wetland effluent surveys, which have been conducted since completion of the upgrade, have shown wastewater parameter concentrations indicative of a well-treated effluent. It can be concluded that the pond

continues to perform adequately and that the addition of the wetlands has improved wastewater quality in the interim in terms of bacteriological numbers, BOD<sub>5</sub>, suspended solids, and turbidity levels.

Stormwater inflow and infiltration works undertaken during the 2022-2023 monitoring year consisted of three manhole repairs and some sewer main patch repairs. Work planned for the 2023-2024 period consists of CCTV inspections to determine pipe faults.

### 3.6.2 Environmental effects of exercise of consents

Impacts of the wetlands discharge on the water quality of the Manaia Creek into which the effluent discharges were recorded visually (colour and turbidity), along with increased bacteria numbers.

Water monitoring continues to record marked improvements in the aesthetic water quality of the Manaia Creek, following incorporation of the wetlands into the system. However, the poor water quality often recorded upstream of the discharge warrants some investigation as this may have contributed to past 'sewage fungus' outbreaks and the potential for elevated coastal water bacteria levels on occasions. It was recommended that additional work be conducted in the 2020-2021 monitoring period to investigate the water quality upstream of the discharge. The water quality of Manaia Creek upstream of the WWTP was investigated in terms of the source of bacteria in both the stream and coastal waters, during the 2020-2021 period. The results have so far been inconclusive and further investigation of this will be carried out when time and budget allows.

The 1998 MfE/MoH Bacteriological Water Quality Guidelines for Marine and Fresh Water guidelines (subsequently updated in 2003) are used as the basis for determining compliance with special condition 10(iii) of consent 1204-4 for recreational shellfish-gathering purposes. Results of bacteriological monitoring conducted at the two coastal sites showed standards for shellfish gathering were not complied with in regards to both the median guideline and the 90% samples limit at both of the sites either side of the stream mouth. However, care needs to be exercised in drawing too many inferences from the data due to the small sample size.

An ecological beach survey found that the effects of the stream on the intertidal zone were highly localised and did not appear to extend beyond the designated mixing zone. The diversity and abundance of intertidal communities away from the influence of the stream was typical of that found at other reef sites around Taranaki.

### 3.6.3 Evaluation of performance

A tabular summary of STDC's compliance record for the year under review is set out in Table 15.

Table 15 Summary of performance for consent 1204-4

<b>Purpose: To discharge treated municipal wastewater from the Manaia Wastewater Treatment Plant into the Unnamed Stream</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Upgrade to plant within two years	Reporting by consent holder; upgrade commenced and completed	Yes
2. Provision of annual progress reports	Reporting completed by consent holder	Yes
3. Exercise in accordance with documentation	Liaison with consent holder and inspections	Yes
4. Best practicable option to minimise adverse effects	Inspections and sampling	Yes

<b>Purpose: To discharge treated municipal wastewater from the Manaia Wastewater Treatment Plant into the Unnamed Stream</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
5. Limits on volume	Reporting by consent holder – this is based on inflow readings and does not allow for pond buffering effects. An outflow meter was operational from May 2023 so future data should be accurate	<b>No – exceeded on 43 days</b>
6. Implementation of a management plan	Update provided July 2023	Yes
7. Provision of operator	Liaison with consent holder	Yes
8. Maintenance of aerobic ponds conditions	Sampling check and reporting by consent holder	Yes
9. Trade wastes connections	Liaison with consent holder	Yes
10. Limits on receiving water effects	Inspections and physicochemical sampling and biomonitoring	<b>Mostly</b>
11. Monitoring provisions	Performance of tailored programme	Yes
12. Implementation of infiltration programme	Reporting by consent holder	Yes
13. Provision for lapse of consent	Consent exercised	N/A
14. Optional review provision re environmental effects	No further option for review prior to expiry	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>Good</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

During the year, STDC demonstrated a good level of environmental and high level of administrative performance with the resource consents as defined in Appendix II.

### 3.6.4 Recommendations from the 2021-2022 Annual Report

In the 2021-2022 Annual Report, it was recommended:

1. THAT in the first instance monitoring of consented activities at Manaia WWTP in the 2022-2023 year continue at the same level as in 2021-2022.
2. THAT should there be issues with environmental or administrative performance in 2022-2023, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.
3. THAT the option for a review of resource consent 1240-4 in June 2023, as set out in condition 14 of the consent, not be exercised, on the grounds that the current conditions are adequate.

Recommendations one and three were implemented, while it was not considered necessary to carry out further investigations or interventions as per recommendation two.

### 3.6.5 Alterations to monitoring programmes for 2023-2024

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.

No planned changes have been made to the 2023-2024 monitoring programme.

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 2023-2024.

### 3.6.6 Recommendations

1. THAT in the first instance monitoring of consented activities at Manaia WWTP in the 2023-2024 year continue at the same level as in 2022-2023.
2. THAT should there be issues with environmental or administrative performance in 2023-2024, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.



## 4 Patea WWTP and emergency outfall

The Patea WWTP (constructed in 1973 for a population of 2,400) was originally comprised of a single large oxidation pond which was upgraded to a three cell system in 2008 (Photo 8, Figure 4). There are currently no significant industrial wastes being discharged into this system, which services a population of 1,191 (as measured in 2018). The nearby York Street pumping station has provision for river overflow via a separate outfall in the event of emergencies.



Photo 8 View of Patea WWTP

### 4.1 Background

Historical information relating to the operation of the WWTP, particularly the consented York Street pumping station overflow, is presented in several earlier annual reports (see TRC, 2004). Upgrades to the pump station and reticulation have significantly reduced sewage overflows to the river in recent years, to the extent that relatively few (seven), mainly short duration (less than 2 hours), overflows occurred during the six year period from mid-2004 to mid-2010. No overflows were recorded for the period mid-2010 to mid-2016.

Upgrades to the reticulation and treatment system were addressed by the consent holder and consultant in the consents' renewal process associated with the oxidation pond system and pump station. These consents were renewed in February 2006 (see section 1.1.2.4), with a minor variation granted in July 2007 to extend the date for completion of the upgrade modifications. The upgrading of all facilities was complete by June 2008 (TRC, 2008 & 2015).

Inspections of the WWTP system by the Council have also incorporated inspections of the pump station and emergency outfall area in the annual monitoring programmes since 1996 and the frequency of bacteriological receiving water quality surveys of the Patea River has increased since the 1997-1998 year and more recently since the renewal of consents in 2006. Recreational bacteriological water quality of two sites (the Lower Patea River and Mana Bay) is now also monitored as a requirement of the renewed consents.

## 4.2 Inspections

### 1 September 2022

Influent was flowing at the time of inspection, with a flow rate estimated at 8 L/sec. The pond was light grey and relatively clear. No floatables were observed on the pond surface. Several Canadian geese, mallard and teal ducks were observed. No odours were noted.

The final pond was also light grey with an abundance of *Daphnia* (water fleas) observed in the sample. The treated discharge flow rate was estimated at 9 L/sec, with no significant visual environmental impact noted around the outlet into the Patea River, which was turbid brown in colour.

The WWTP surrounds and facilities were found to be satisfactory with no odours noted.

The emergency outfall and pump station was also inspected, with no evidence of any recent overflow discharge into the Patea River. The lower pump station was not operating.

### 22 February 2023

Influent was flowing at the time of inspection. The ponds were a turbid pale green and no floatables were visible on the surface. Over 80 ducks were present.

The final pond was green and turbid. The treated discharge flow rate was estimated at 5 L/s with a green plume observed at the outlet into the Patea River. This dissipated around 20 m downstream.

The WWTP and facilities were satisfactory and there were no odour issues noted at the time of the inspection.

The emergency outfall and pump station were inspected and found to be satisfactory. There was no evidence of any recent overflow discharge.

### 14 June 2023

Influent was flowing at the time of the inspection. Ponds 1 and 2 were pale green and slightly turbid. Two black swans and approximately 350 ducks were noted.

The final pond was pale green. The treated discharge flow rate was estimated at 4 L/s, with no significant visual environmental impact noted at the outlet into the Patea River. The WWTP and facilities were satisfactory and there were no odour issues noted at the time of inspection.

There was no evidence of any recent overflow discharge at the pump station and emergency overflow site.

#### 4.2.1 Pumping station and emergency outfall

Additional pre-screening of the raw wastewater prior to the pump station, called the York St Screening Facility, was added to the system during the 2007-2008 upgrades. A new emergency outlet and rock rip-rap was installed at the same time, to provide for discharge of untreated municipal sewage in emergencies only into the coastal marine area of the Patea River as per consent 0145-2.

Inspections in the area of the flume shed, pump station, and outfall to the Patea River were made by the Council in conjunction with each inspection occasion.

No evidence of discharges to the river was found during the inspections and the visual alarm system appeared to have remained in working order. STDC advised that regular checking of the system was performed. The area was maintained in tidy condition throughout the period.

A history of recent overflows is contained in the 2014-2015 Annual Report (TRC, 2015), and the issues pertaining to these events have been satisfactorily addressed by the consent holder.

## 4.3 Results of effluent monitoring

Effluent analysis was carried out at the outlet of the final treatment cell on two of the three inspection occasions. Samples were analysed for dissolved oxygen (Section 4.3.1) and microfloral component (Section 4.3.2), as well as total and filtered BOD, chloride, conductivity, dissolved oxygen, *E. coli* bacteria, pH, suspended solids, turbidity, temperature, unionised ammonia (NH<sub>3</sub>), and ammonia-N (NH<sub>4</sub>). The results of these surveys are presented in Table 16.

Table 16 Results of effluent monitoring for the Patea WWTP

Site		OXP008001		
Date/time		21 Feb 2023	14 Jun 2023	2000-2022 Range
Parameter	Unit	0930	1245	
BOD	g/m <sup>3</sup>	15	-	5.1-31
BODF	g/m <sup>3</sup>	3	-	1.0-15
Conductivity	mS/m@25°C	55.9	52.4	62.3-83.6
DO (concentration)	g/m <sup>3</sup>	7.9	12.4	1.1-14.8
DO (saturation)	%	89	115	12-165
<i>E. coli</i>	/100 ml	766	600	16-15,500
pH	pH	9.6	-	7.9-10.1
SS	g/m <sup>3</sup>	132	-	11-150
Turbidity	FNU	300	14	6.5-240
Temperature	°C	21.4	10.6	10.4-25.8
Nutrient Analyses				
NH <sub>4</sub>	g/m <sup>3</sup> N	0.014	-	0.018-4.09
DRP	g/m <sup>3</sup> P	0.27	-	0.005-4.98

Effluent results indicate a relatively high effluent quality, typical of a municipal pond treatment system receiving mainly domestic wastes. Comparison with historical results shows that effluent quality was within the expected range for all parameters.

### 4.3.1 Dissolved oxygen levels

The Patea WWTP effluent was analysed for dissolved oxygen and temperature, and the results are displayed in Table 17.

Results indicate a wide range of dissolved oxygen concentrations (between 24% and 115% saturation) in the surface layer of the final cell near the outlet. This was typical of the results generally recorded in this oxidation pond. Monitoring by STDC showed that the pond remained in aerobic condition throughout the year.

Table 17 Dissolved oxygen measurements from the Patea WWTP

Date	Time (NZST)	Temperature (°C)	Dissolved Oxygen	
			Concentration (g/m <sup>3</sup> )	Saturation (%)
1 September 2022	1040	13.5	2.6	24
21 February 2023	0930	21.4	7.9	89
14 June 2023	1245	10.6	12.4	115

### 4.3.2 Microfloral component

Samples of the primary pond effluent were collected on all 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/m<sup>3</sup> 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 effluent analyses are provided in Table 18 together with field observations of pond appearance.

Table 18 Chlorophyll-a levels and primary pond appearance

Date	Time (NZST)	Appearance	Chlorophyll-a (mg/m <sup>3</sup> )	Range for the period 2013-mid 2022	
				Range	Median
1 September 2022	1040	Clear, pale grey	0.8	1.7-930	156
21 February 2023	0930	Turbid, green	660		
14 June 2023	1245	Turbid, pale green	200		

Chlorophyll-a levels were extremely low in the September sample, the lowest recorded in the pond to date. The February and June samples were significantly higher and both above the median.

## 4.4 Results of receiving environment monitoring

Monitoring of the impacts on receiving waters is measured using both chemical analyses of the Lower Patea River, and contact recreational bacteriological quality surveys of the coastal marine area at the Patea Boat Ramp and the Tasman Sea at Mana Bay (Figure 4). Chemical sampling was carried out on two occasions during the 2022-2023 period (Section 4.4.1). Contact recreational bacteriological water quality monitoring (section 4.4.2) at the Patea Boat Ramp and Mana Bay was carried out by the Council on 22 separate occasions between early November 2022 and late March 2023. The sampling sites are detailed in Table 19 and shown in Figure 5.



Table 19 Sampling site locations for the Patea WWTP

Site code	Location	Site
PAT000970	SH3 bridge, approx. 1 km upstream of WWTP	Patea River
PAT000975	Approx. 500 m downstream of SH3 bridge; downstream of emergency overflow	Patea River
OXPO08001	Outlet of the Patea WWTP final cell	Effluent
PAT000985	Approx. 200 m downstream of WWTP discharge	Patea River
PAT000995	Boat ramp (approx. 0.6 km downstream of WWTP discharge)	Patea River
SEA907022	Mana Bay	Tasman Sea
SEA907020	Patea Beach	Tasman Sea

#### 4.4.1 Lower Patea receiving water surveys

Receiving water samples were collected on the 21 February and 26 April 2023 at four sites in the Lower Patea River; upstream and downstream of the Patea WWTP discharge point and emergency overflow structure. The surveys were timed towards low tide on each occasion, and results are displayed in Table 20.

The February 2023 survey was carried out under summer low flow (well below median) conditions (as measured at McColl's bridge). The discharge from the outfall was estimated at 5 L/s at the time. Enterococci and *E. coli* bacteria numbers showed an increase downstream of the discharge, however levels were low for both parameters at the lower sampling site. There were no significant changes below the WWTP for most of the other parameters measured.

The June 2023 survey was carried out during low flow (well below median) conditions (as measured at McColl's bridge). Bacterial water quality was similar at all sites. Turbidity doubled at the site below the discharge but had reduced to a level similar to upstream at the boat ramp site.



Figure 4 Layout of Patea WWTP



Figure 5 Map showing sampling sites in relation to Patea WWTP

Table 20 Receiving water results for the lower Patea River

Site		PAT000970			PAT000975			PAT000985			PAT000995		
Date/time		21 Feb 2023	14 Jun 2023	2000-2022 Range	21 Feb 2023	14 Jun 2023	2000-2022 Range	21 Feb 2023	14 Jun 2023	2000-2022 Range	21 Feb 2023	14 Jun 2023	2000-2022 Range
Parameter	Unit	0825	1145		0845	1155		0915	1300		0810	1120	
BOD (total)	g/m <sup>3</sup>	1.0	-	<0.8-1.0	0.5	-	0.5-<0.8	0.7	-	<0.8	0.4	-	<0.8-1.1
Chloride	g/m <sup>3</sup>	5,400	-	2,900-7,700	19,600	-	2,200-8,300	18,400	-	2,700-19,100	19,000	-	2,700-16,400
Conductivity	mS/m @25°C	1,636	1,722	62.3-2,250	5,100	2,110	561-2,430	5,020	2,010	139-5,150	5,070	2,690	158-5,350
<i>E. coli</i>	/100 ml	96	25	10-1,200	131	30	30-1,200	435	<10	<10-1,000	20	28	<1-1,200
Enterococci	/100 ml	40	12	10-500	20	30	10-1,700	90	20	<10-830	10	17	<1-20,000
Ammoniacal-N	g/m <sup>3</sup>	0.016	-	<0.010-0.038	<0.10	-	<0.010-0.038	<0.10	-	0.011-0.100	0.010	-	0.015-0.046
DRP	g/m <sup>3</sup>	<0.04	-	0.006-0.04	<0.04	-	<0.04	<0.04	-	<0.04	<0.04	-	0.0077-0.04
pH	pH	7.8	-	7.4-8.0	8.1	-	7.5-8.0	8.1	-	7.5-8.2	8.1	-	7.6-8.2
Turbidity	FNU	36	13	3.2-120	87	13	3.6-200	54	26	3.3-140	60	12	3.1-260
Temperature	°C	19.5	11.8	9.5-24.3	19.4	11.8	9.5-24.6	19.7	11.8	9.8-24.9	19.7	11.8	10.0-24.5

#### 4.4.2 Contact recreational bacteriological monitoring

The 1998 MfE/MoH Guidelines for Bacteriological Water Quality for Marine and Fresh Waters (revised in 2003), recommend *E. coli* as the indicator bacteria for freshwater sites with a single sample 'Alert' limit of 260 per 100 ml, and an 'Action' limit of 550 per 100 ml (MfE, 2003). For marine waters, the recommended indicator is enterococci, with a single sample 'Alert' limit of 140 cfu per 100 ml, and an 'Action' limit of 280 cfu per 100 ml. There are two areas near the WWTP discharge commonly used for contact recreational purposes, one at the Patea Boat Ramp (PAT000995, Photo 9) and the other in the nearby coastal waters at Mana Bay (SEA907022), and more intensive contact recreational monitoring at these sites was programmed in relation to conditions on the renewed consents. This was integrated with the Council's contact recreational bacteriological monitoring programme 'Can I swim here?' (CISH). Samples are collected once per week on the same day, regardless of weather or tide.

Sampling at the two sites during the summer monitoring period occurred between early November 2022 and late March 2023 with 22 samples collected from each site. The results are summarised in Tables 21 and 22, and illustrated in Figures 6 and 7. Results of <10 are displayed as 5 in the graphs.

**Table 21 Summary of results for lower Patea River at boat ramp (PAT000995)**

Parameter	Unit	Number of samples	Minimum	Maximum	Median
Conductivity	µS/cm@25°C	22	115	53,100	15,115
<i>E. coli</i>	/100 ml	22	<10	2,760	120
Enterococci	/100 ml	22	<10	171	20
Turbidity	NTU	22	5.5	69	20
Temperature	°C	22	16.0	22.0	18.9



**Photo 9 View of Patea boat ramp sampling site**

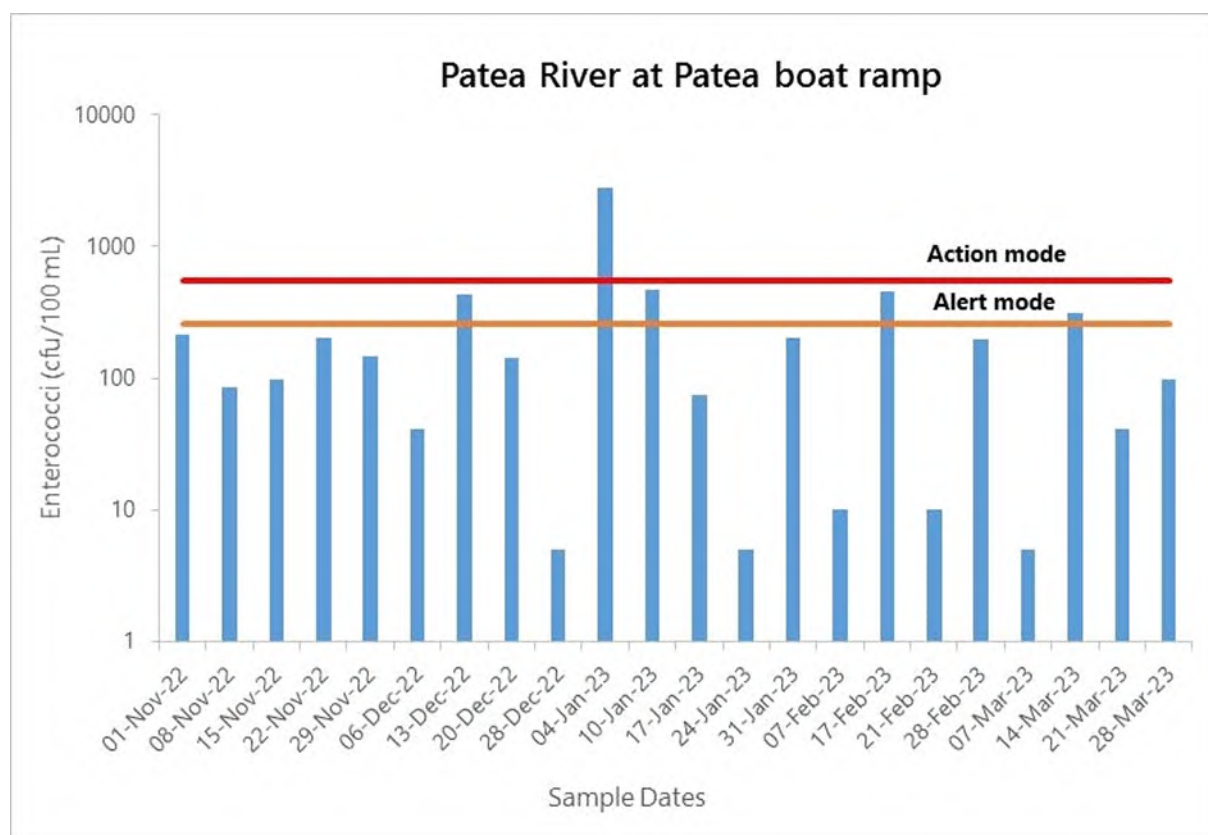


Figure 6 *E. coli* numbers for lower Patea River at the boat ramp

Bacteriological water quality was typical of the lower reaches of a large ringplain-eastern hill country catchment, with moderate numbers under river (freshwater) dominated conditions and fewer when influenced by saline penetration of the coastal seawater. The number of *E. coli* exceeded the 'Action' limit on one occasion in January 2023, the low conductivity indicating that the sample was mostly freshwater when there was the least dilution available. This data is indicative of relatively good bacteriological water quality conditions and within the expected range for this site. No bathing activity was noted during the 2022-2023 period at this site, which is used mainly for boating access and occasionally for fishing and walking. The Council had undertaken microbial source tracking (MST) using DNA marker techniques over the 2011-2012 period at this site and at the upstream site at SH3 bridge on two occasions (high and low tides) (see TRC, 2012). Faecal coliform bacteria were found to have been sourced predominantly from cattle on both occasions at the two sites while gulls contributed to populations at the boat ramp site under both tidal conditions. A faint trace of human source derivation was found (downstream of the Patea WWTP treated discharge) at the boat ramp site only under low tidal flow conditions.

Table 22 Summary of results for Mana Bay (SEA907022)

Parameter	Unit	Number of samples	Minimum	Maximum	Median
Conductivity	µS/cm@25°C	22	545	52,900	41,350
<i>E. coli</i>	/100 ml	22	<10	857	98
Enterococci	/100 ml	22	<10	171	20
Turbidity	NTU	22	7.7	181	30
Temperature	°C	22	16.6	21.9	19.2



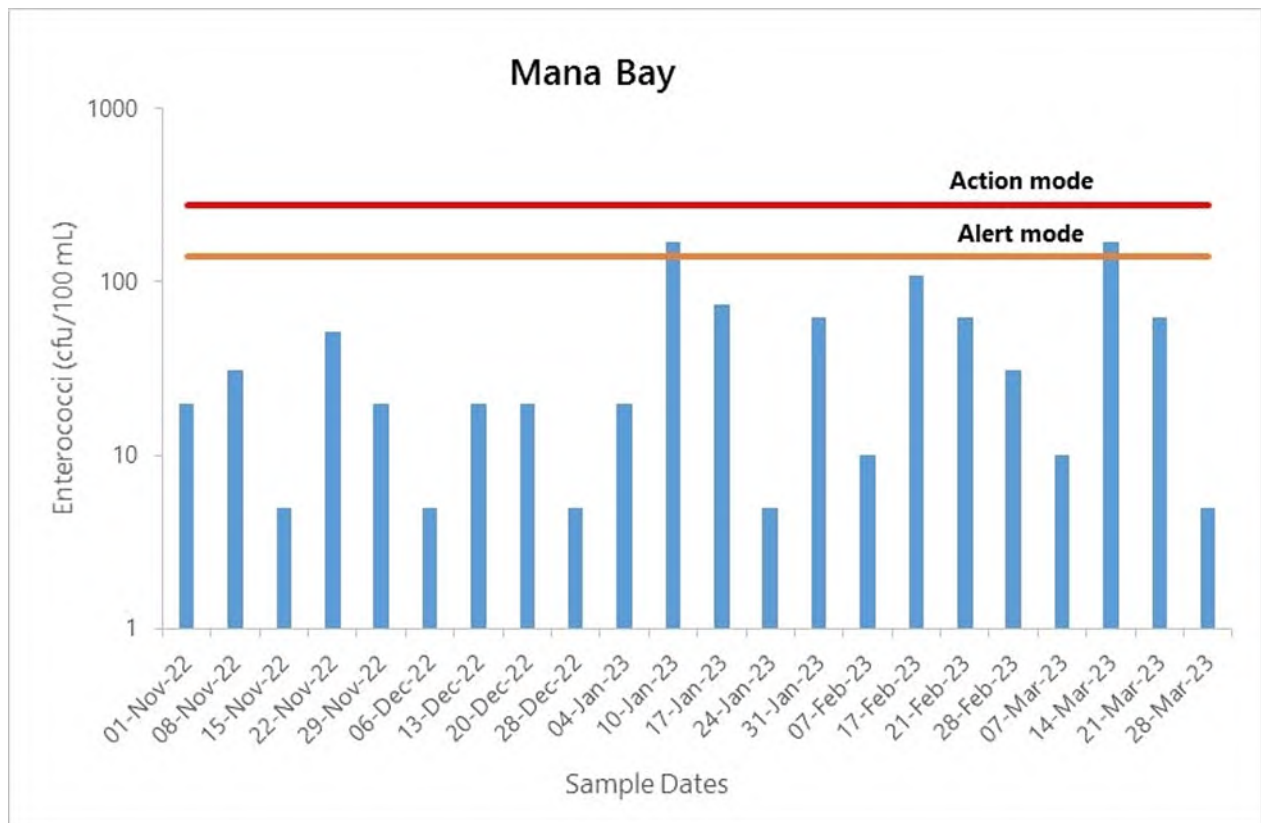


Figure 7 Enterococci numbers for Mana Bay

Water quality at Mana Bay was fairly good throughout the season, with all but two of the samples below the 'Alert' level guideline. (Figure 7).

#### 4.4.3 Additional monitoring requested by STDC

STDC are currently exploring options for the renewal of consent 0067-3 (expiry June 2028). This will likely require an upgrade to the existing WWTP. As a part of this investigation STDC requested additional monitoring from January 2023 at sites both upstream and downstream of the WWTP in order to get a better understanding of the current water quality of the river. The sampling is carried out monthly on a mid to outgoing tide (to ensure downstream flow). The results of this monitoring are presented in Table 23 below. Norovirus testing was undertaken in February and March 2023 but this was discontinued as norovirus was not detected in any of the samples.

Further analysis of this data will be undertaken once a years' worth of samples have been collected.

Table 23 Additional monitoring at two sites in the Patea River; PAT000970 (upstream) and PAT000995 (downstream)

Parameter	Unit	18 Jan 2023		21 Feb 2023		20 Mar 2023		26 Apr 2023		29 May 2023		14 Jun 2023	
		u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s	u/s	d/s
Chloride	g/m <sup>3</sup>	2,400	2,100	8,900	19,500	8,300	21,000	21	83	830	2,400	5,500	9,200
Conductivity	µS/cm@25°C	7,840	6,830	27,000	51,000	20,800	44,000	163	394	2,830	7,330	16,980	26,500
DRP	g/m <sup>3</sup>	<0.04	<0.04	<0.04	<0.04	<0.004	<0.04	0.007	<0.004	0.007	0.01	<0.04	<0.04
<i>E. coli</i>	cfu/100 ml	110	340	110	20	230	140	70	60	40	60	33	20
Enterococci	cfu/100 ml	35	110	30	10	100	40	20	60	40	40	13	10
Total Kjeldhal Nitrogen (TKN)	g/m <sup>3</sup>	0.22	0.28	<0.10	0.17	1.62	0.16	0.19	0.21	0.23	0.28	0.18	0.16
Ammoniacal nitrogen	g/m <sup>3</sup>	<0.01	<0.01	<0.10	<0.10	0.02	<0.01	<0.01	0.015	<0.010	0.021	<0.10	<0.10
Nitrite-N	g/m <sup>3</sup>	<0.02	<0.02	<0.02	<0.02	<0.002	<0.002	<0.002	<0.002	0.009	0.008	<0.02	<0.02
Nitrate-N	g/m <sup>3</sup>	0.37	0.38	0.189	0.022	0.22	0.081	0.39	0.41	0.69	0.59	0.57	0.42
Nitrate-N + Nitrite-N	g/m <sup>3</sup>	0.37	0.38	0.192	0.024	0.22	0.081	0.39	0.41	0.70	0.60	0.57	0.43
Norovirus GI	gc/L	-	-	NP	NP	NP	NP	-	-	-	-	-	-
Norovirus GII	gc/L	-	-	NP	NP	NP	NP	-	-	-	-	-	-
Phosphorus (total)	g/m <sup>3</sup>	0.027	0.030	0.052	0.097	0.038	0.012	0.031	0.025	0.034	0.063	0.032	0.033
Turbidity	NTU	8.4	12.1	37	41	24	8.8	9.9	11	16	47	15	15
Temperature	°C	22.3	22.2	19.5	19.7	19.4	19.0	15.7	15.5	13.8	13.8	11.8	11.8

NP = not present

## 4.5 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 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).

In the 2022-2023 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with STDC's conditions in resource consents or provisions in Regional Plans for the Patea WWTP.

## 4.6 Discussion

### 4.6.1 Discussion of site performance

The Patea WWTP and emergency overflow was well maintained and operated, and performed satisfactorily throughout the monitoring period. Since the upgrade to the system and the pumping station, the discharge effluent quality has shown marked improvement over the quality typical of the previous single pond treatment system receiving minimal industrial waste loadings.

Sampling undertaken by both Council and STDC showed that the ponds remained in aerobic condition throughout the year.

The discharge from the plant remained below the dry weather (without rainfall in the previous three days) consented limit of 455 m<sup>3</sup>/day throughout the year.

There was one overflow to the Patea River from the York Street pump station during the 2022-2023 period. This occurred on 10 December 2022 due to heavy rain. The overflow was approximately 5 m<sup>3</sup> over a 30 minute period. Signage was displayed at the site, Mana Bay and at the Patea boat ramp.

Inflow and infiltration work undertaken during 2022-2023 consisted of pipe renewals (611 m total) and 13 manhole inspections.

### 4.6.2 Environmental effects of exercise of consents

No significant impacts associated with the discharges were measured on the water quality of the lower reaches of the Patea River. With regard to bacteriological quality, the effect of the WWTP's discharge has generally been limited to occasional small rises in bacteria numbers on the right bank Patea River site immediately upstream or downstream of the discharge (dependant on tide conditions) with the bacterial water quality measured a further 600 m downstream usually similar to that measured upstream of the discharge at SH3 bridge. Minimal impacts were measured during the 2022-2023 monitoring period, continuing the good performance shown during the previous period.

More intensive monitoring of the Boat Ramp and Mana Bay sites during the summer contact recreational period found that bacterial numbers exceeded the MfE/MoH's 2003 Recreational Water Quality Guidelines 'Alert' and 'Action' modes on several occasions during the summer bathing season. This was generally



accompanied by low conductivity indicating a freshwater source rather than seawater, however as shown in historically, samples collected upstream of the discharge often contain more bacteria than those collected downstream making it unlikely that the WWTP discharge is a major contributor to any high numbers found.

### 4.6.3 Evaluation of performance

A tabular summary of STDC's compliance record for the year under review is set out in Tables 23-25.

Table 24 Summary of performance for consent 0067-3

<b>Purpose: To discharge treated municipal wastewater from the Patea WWTP into the Coastal Marine Area of the Patea River</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Provision for upgrade	Upgrade completed	N/A
2. Exercise in accordance with documentation	Liaison with consent holder	Yes
3. Progress reports of upgrade	Reporting by consent holder; upgrade completed	N/A
4. Minimisation of effects	Inspections and sampling	Yes
5. Limits on volume	Reporting by consent holder	Yes
6. Implementation of management plan	Update provided July 2023	Yes
7. Provision of operator	Liaison with consent holder	Yes
8. Maintenance of aerobic pond condition	Inspections, sampling and reporting by consent holder	Yes
9. Trade wastes connections	Liaison with consent holder	Yes
10. Limits on receiving water effects	Inspections and physicochemical/bacteriological assessments	Yes
11. Monitoring provisions	Performance of tailored monitoring programme	Yes
12. Contact recreational monitoring provisions	Water sampling	Yes
13. Provision for lapse of consent	Consent exercised	N/A
14. Optional review provisions	No further option for review prior to expiry	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

Table 25 Summary of performance for consent 0145-2

<b>Purpose: To discharge untreated municipal sewage in emergencies only into the Coastal Marine Area of the Patea River</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Adopt best practicable option	Inspection and chemical sampling	Yes
2. Exercise in accordance with documentation	Liaison with consent holder	Yes
3. Provision of contingency plan	Updated plan received July 2023	Yes
4. Rip rap upgrade requirements	Inspections	Yes
5. Provision for mitigation works with excessive overflow events	Liaison with consent holder, works undertaken	Yes
6. Limits upon reasons for discharge	Liaison with consent holder	Yes
7. Discharge shall not occur during pump station maintenance	Liaison with consent holder	Yes
8. Discharge shall not exceed 4 hrs duration when practicable	Liaison with consent holder	Yes
9. Requirements for alarm system	Liaison with consent holder, inspection	Yes
10. Maintenance requirements for alarm system	Inspections, reporting by consent holder	Yes
11. Overflow notification requirements	Notification received	Yes
12. Overflow recording requirements	Records supplied by STDC	Yes
13. Provision of signage following overflow discharge events	Liaison with consent holder – signage displayed	Yes
14. Notification to Taranaki Healthcare following discharge	Notification received	Yes
15. Triennial meetings	Liaison with consent holder and submitters	Yes
16. Receiving water monitoring	Additional monitoring not required	N/A
17. Lapse condition	Consent exercised	N/A
18. Optional review of consent	No further option for review prior to expiry	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

Table 26 Summary of performance for consent 4576-2

<b>Purpose: To erect, place and maintain an oxidation pond discharge structure and an emergency overflow discharge structure as part of the Patea WWTP within the Coastal Marine Area of the Patea River</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Notification of works	No recent works undertaken	N/A
2. Construction and maintenance in accordance with documentation	Works completed	N/A
3. Upgrade oxidation pond discharge in accordance with documentation	Upgrade completed	N/A
4. Adopt best practicable option	Inspections and liaison with consent holder	Yes
5. Minimise riverbed disturbance	No recent works undertaken	N/A
6. Maintain public access	Public walkway maintained	Yes
7. Riverbed disturbance to coincide with dry weather periods	No recent works undertaken	N/A
8. Requirement for fish passage	Inspection	Yes
9. Requirements for signage during work	No recent works undertaken	N/A
10. Removal and reinstatement requirements	Structures still in use	N/A
11. Lapse condition	Consent exercised	N/A
12. Optional review of consent	No further option for review prior to expiry	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

During the year, STDC demonstrated a high level of environmental and high level of administrative performance with the resource consents as defined in Appendix II.

#### 4.6.4 Recommendations from the 2021-2022 Annual Report

In the 2021-2022 Annual Report, it was recommended:

1. THAT in the first instance, monitoring of consented activities at Patea WWTP and emergency outfall in the 2022-2023 year continue at the same level as in 2021-2022.
2. THAT should there be issues with environmental or administrative performance in 2022-2023, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

Recommendation one was implemented, while it was not considered necessary to undertake any additional investigations or interventions as per recommendation two.

#### 4.6.5 Alterations to monitoring programmes for 2023-2024

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.

No planned changes have been made to the 2022-2023 monitoring programme.

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 2023-2024.

#### 4.6.6 Recommendations

1. THAT in the first instance, monitoring of consented activities at Patea WWTP and emergency outfall in the 2023-2024 year continue at the same level as in 2022-2023.
2. THAT should there be issues with environmental or administrative performance in 2023-2024, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

## 5 Waverley WWTP and stock truck wastes disposal

The Waverley WWTP (Photo 10) is a single oxidation pond system that is divided into two sections by a wooden/asbestos wall which has been operative since 1973. It receives mainly domestic wastes (population 820 in 2018) with a small commercial area; there is no significant industry.

It previously received wastes from the stock truck facility on SH3 sited approximately 2 km south of the township. However, the stock truck wastes disposal was changed to a self-contained anaerobic-aerobic pond system, with on-site discharge to adjacent land during the 2006-2007 period.

The WWTP system was reconfigured during the 2008-2009 period with the existing outfall abandoned, the secondary pond converted to a primary pond with a new inlet design, repairs made to the dividing wall, and the primary pond converted to a secondary pond with a repositioned outlet connected into the original outfall to the Wairoa Stream. 'Sludge-bugs' were introduced into the system for the purpose of microbial sludge digestion in September 2013 and this was completed by December 2014 with more than 5,000 m<sup>3</sup> of sludge removed (STDC, 2015). Inlet flow monitoring was added in 2010. Mechanical screening of the incoming wastes was installed at the inlet during the latter half of the 2012-2013 period, which has associated telemetry alarming.



Photo 10 Waverley WWTP

### 5.1 Inspections

17 August 2022

The step screen was operating and wastes were fully contained. The influent flow rate was estimated at 6 L/s. A mild odour was noted in the vicinity of the pond inlet and step screen areas. Both ponds were turbid with a dark green colour. Wildlife consisted of 12 teal ducks.

The discharge flow rate was estimated at 7 L/s, with a small amount of foaming at the discharge point into the unnamed tributary of the Wairoa Stream.

The stock truck disposal facility was relatively tidy. The effluent dump grate had recently been washed down. All three ponds were near full but not discharging to land.

### 24 January 2023

The influent flow was estimated at 3 L/s. The ponds were a turbid, green-brown colour. A small area of scum had accumulated at the inlet to Pond 1. Wildlife on both ponds consisted of 15 ducks and two black swans. The step screen wastes were fully contained with a noticeable but not significant odour observed around this area.

The pond discharge was estimated to be 2.5 L/s. Water quality samples were collected along the unnamed tributary of the Wairoa Stream as per the summer low flow monitoring program. No visual environmental effects from the discharge were observed at any of the monitoring sites.

The stock truck disposal facility was also inspected. This facility was found to be reasonably tidy. Rubbish and debris floating on the first pond had been removed.

### 2 May 2023

The step screen was operating and wastes were fully contained. A mild but noticeable odour was noted to be emanating from around this area. The influent flow was estimated at 4 L/s. Both ponds were turbid with a dark green colour. No wildlife was noted at the time of the inspection.

The pond discharge was estimated at 4 L/s with a small amount of foaming observed at the point of discharge into the unnamed tributary.

The stock truck disposal facility was also inspected. The three ponds were near full but not discharging. All of the ponds were dark brown in colour with some debris noted floating on the first two ponds. There was a mild odour in the vicinity.

## 5.2 Results of effluent monitoring

Effluent monitoring was carried out in the second cell of the oxidation pond, adjacent to the outlet. 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 each inspection. These are discussed in Sections 5.2.1 and 5.2.2 respectively.

A full suite of chemical analyses was carried out on the pond effluent on one occasion in summer, with samples analysed for ammonia ( $\text{NH}_3$  and  $\text{NH}_4$ ), total and filtered BOD, chloride, conductivity, dissolved oxygen, DRP, *E. coli* bacteria, pH, suspended solids, temperature, and turbidity. The results of this survey are presented in Table 27.

The pond effluent was within the range expected for all parameters measured, and the quality was typical to the effluent from a biological treatment system receiving essentially domestic wastes, as emphasised by the fairly low filtered BOD<sub>5</sub> concentration, and in the absence of the disposal of stock truck or any other significant industrial wastes to the system.

Similarly to the previous monitoring period, dissolved reactive phosphorus and ammoniacal nitrogen were both quite low when compared with previous results. Unionised ammonia however was the highest recorded at the site to date.

Table 27 Results of summer effluent monitoring for the Waverley WWTP

Site		OXPO02005	
Date/time		24 Jan 2023	1989-2022 Range
Parameter	Unit	0930	
Flow	L/s	2.5	0.14-8.0
BOD	g/m <sup>3</sup>	10	11-66
BODCF	g/m <sup>3</sup>	3.4	3.4-14
Chloride	g/m <sup>3</sup>	49	47-76
Conductivity	mS/m@25°C	42.3	43.3-68.7
DO (concentration)	g/m <sup>3</sup>	8.0	0.9-28.5
DO (saturation)	%	95	10-318
<i>E. coli</i>	/100 ml	107	30-82,000
pH	pH	9.4	7.7-10.2
SS	g/m <sup>3</sup>	78	11-220
Turbidity	FNU	31	9.4-210
Temperature	°C	23.9	8.2-26.0
Nutrient Analyses			
NH <sub>3</sub>	g/m <sup>3</sup>	0.75	0.021-0.5456
NH <sub>4</sub>	g/m <sup>3</sup> N	1.3	0.100-26.2
DRP	g/m <sup>3</sup> P	0.93	0.63-7.98

### 5.2.1 Dissolved oxygen levels

The Waverley WWTP effluent was analysed for dissolved oxygen and temperature, and the results are displayed in Table 28.

The dissolved oxygen concentration in the surface layer of the primary pond near the outlet varied widely (23-113%). Super-saturation is quite common, with 33% of the samples collected by Council since 1988 greater than 100% dissolved oxygen saturation.

Table 28 Dissolved oxygen measurements from the Waverley WWTP

Date	Time (NZST)	Temperature (°C)	Dissolved Oxygen	
			Concentration (g/m <sup>3</sup> )	Saturation (%)
17 August 2022	1015	12.1	2.56	23
24 January 2023	0955	23.9	8.04	95
2 May 2023	1100	16.3	11.3	113

STDC also undertook continuous measurement of DO in the pond, with results showing that daily values were maintained above 0 g/m<sup>3</sup>.

## 5.2.2 Microfloral component

Samples of the primary pond effluent were collected on all 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/m<sup>3</sup> 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 effluent analyses are provided in Table 29 together with field observations of pond appearance.

Table 29 Chlorophyll-a levels and primary pond appearance

Date	Time (NZST)	Appearance	Chlorophyll-a (mg/m <sup>3</sup> )	Range for the period 2013-mid 2022	
				Range	Median
17 August 2022	1015	Turbid, dark green	830	5.9 -1,100	230
24 January 2023	0955	Turbid, green-brown	350		
2 May 2023	1100	Turbid, dark green	420		

Levels of chlorophyll-a recorded in the primary pond were quite high during the 2022-2023 year, well above the median of 230 mg/m<sup>3</sup>.

## 5.3 Results of receiving environment monitoring

Monitoring of the impacts of the Waverley WWTP on the receiving waters was measured using chemical analyses of the receiving waters of the unnamed tributary of the Wairoa Stream. Sampling was carried out on one occasion during the summer period, when stream flows were at a seasonal low. The locations of sampling sites are listed in Table 30 and displayed in Figure 8 below.

Table 30 Sampling sites for Waverley WWTP

Site code	Location	Site
WRO000069	Upstream of confluence with WWTP discharge	Unnamed trib. of Wairoa Stream
EXP002005	At outfall to stream	Effluent
WRO000077	Approx. 400 m downstream of WWTP discharge (Waverley Beach Rd)	Unnamed trib. of Wairoa Stream
WRO000150	Outlet of Ihupuku Swap, approx. 3 km d/s of WWTP discharge (Beach Rd)	Wairoa Stream

### 5.3.1 Low flow receiving water survey of January 2023

A midsummer low flow assessment of the impact of the WWTP's effluent discharge on the receiving waters of the unnamed tributary of the Wairoa Stream was performed on 24 January 2023. Results of the survey are displayed in Table 31.

A discharge rate of 2.5 L/s was measured from the pond discharge at the time of the survey.



Upstream water quality (at site WRO000069) was generally good, with a dissolved oxygen saturation of 94%, and low levels of dissolved reactive phosphorus and filtered BOD<sub>5</sub>. The number of *E. coli* bacteria was moderate.

Due to the moderate dilution ratio, impacts of the discharge on the stream (downstream of the effluent discharge at site WRO000077) were less pronounced and included mainly small increases in conductivity, biochemical oxygen demand, and DRP, and a decrease in dissolved oxygen saturation. Unionised ammonia and ammoniacal nitrogen decreased below the mixing zone. *E. coli* bacteria increased significantly despite the very low level in the discharge. The stream was not visually impacted, with a slight increase in the black disc reading downstream. There was also only a small increase in suspended solids and a decrease in turbidity.

The water quality measured at the furthest downstream site (site WRO000150), after approximately 3 km of the Ihupuku Swamp wetlands, continued to record a relatively low dissolved oxygen concentration and small decrease in pH, similar trends to those found by all previous years' surveys. This was in contrast to the site immediately downstream of the discharge which was similar to the upstream site in relation to these parameters. Relatively low dissolved oxygen levels are typical of outflows from extensive wetland areas, in which more stagnant, less aerated reducing conditions and lower pH are typical. Water quality of the stream improved, when compared with upstream conditions (at site WRO000077) with regard to nutrient concentrations following filtration and nutrient uptake by wetland vegetation. Visual quality increased, with black disc, suspended solids and turbidity all higher than recorded at the upstream site.



Figure 8 Aerial location map of sampling sites in relation to Waverley WWTP

Table 31 Low flow receiving water results January 2023

Site		WRO000069		WRO000077		WRO000150	
Date/time		24 Jan 2023	2000-2022 Range	24 Jan 2023	2000-2022 Range	24 Jan 2023	2000-2022 Range
Parameter	Unit	0920		1015		1055	
Flow	L/s	16	6-23	22	0.28-34	-	-
Black disc	m	0.60	0.36-1.66	0.62	0.41-1.30	0.95	0.70-1.50
BOD	g/m <sup>3</sup>	0.9	<0.5-2.8	2.4	0.7-4.2	<0.8	<0.5-1.4
BODCF	g/m <sup>3</sup>	0.6	<0.4-0.8	0.6	<0.5-0.5	<0.5	<0.5-0.6
Chloride	g/m <sup>3</sup>	26	26.4-38.0	28	27-42	31	29.8-52.7
Conductivity	mS/m@25°C	30.7	24.0-34.9	32.7	25.7-36.9	32.5	24.3-33.5
DO (conc.)	g/m <sup>3</sup>	9.1	8.5-9.9	7.8	4.0-8.8	3.6	2.1-4.9
DO (saturation)	%	94	87-97	81	40-91	38	23-48
<i>E. coli</i>	/100 ml	517	118-4,700	1,203	100-4,200	345	52-3,500
pH	pH	8.0	7.5-8.0	8.0	7.2-7.7	7.5	7.2-7.4
SS	g/m <sup>3</sup>	18	<3-35	19	4.0-32	16	5.0-27
Turbidity	FNU	7.1	1.1-20	6.6	1.8-23	5.9	2.3-15
Temperature	°C	16.8	13.0-17.7	17.1	13.4-17.9	17.8	13.3-20.7
Nutrient Analyses							
NH <sub>3</sub>	g/m <sup>3</sup>	0.0054	0.00023-0.00697	0.0022	0.00012-0.00218	<0.0001	0.00007-0.00023
NH <sub>4</sub>	g/m <sup>3</sup> N	0.196	<0.003-0.314	0.072	0.010-0.249	<0.010	0.003-0.030
DRP	g/m <sup>3</sup> P	0.007	<0.003-0.033	0.120	0.053-0.455	0.034	0.024-0.064

### 5.3.2 Biological monitoring survey

The Council collected streambed macroinvertebrates from three sites in an unnamed tributary of the Wairoa Stream in March 2023 to investigate the effects of the Waverley WWTP discharge on macroinvertebrate health. Macroinvertebrates were identified, the number of different types of taxa counted (taxa richness), and the MCI and SQMCI scores were calculated for each site.

The MCI is a measure of the overall sensitivity of the macroinvertebrate community to the effects of nutrient pollution in streams. It is based on the presence/absence of taxa with varying degrees of sensitivity to pollution. The SQMCI takes into account taxa abundance as well as sensitivity to pollution, and may reveal more subtle changes in communities. Significant differences in either the MCI or the SQMCI between sites indicate the degree of adverse effects (if any) of the discharges being monitored and enable the overall health of the macroinvertebrate communities to be determined.

Taxa richness ranged from five to 12 taxa and increased in a downstream direction (Figure 9). MCI scores were reflective of 'poor' macroinvertebrate community health at sites 1 and 3, and 'very poor' health at site 2. There was a significant decline of 16 MCI units between sites 1 and 2, followed by an increase of 9 MCI units between sites 2 and 3. The MCI score recorded at site 1 was the highest recorded for the site to date and significantly higher than the median for the site, however this score was based on only five taxa, signifying a depauperate macroinvertebrate community. SQMCI scores were similar between sites and were reflective of 'poor' macroinvertebrate health. SQMCI scores were either the same (site 1) or higher than site medians. .

The significant decrease in MCI score between 'control' site 1 and the downstream sites 2 and 3, together with an increase in the low scoring 'tolerant' taxa oligochaete worms and *chironomus* blood worms suggests the macroinvertebrate community has likely been effected by nutrient enrichment related to the WWTP discharges. However, habitat differences between the sites has also likely influenced the survey results.

Overall, there was some evidence to suggest that the discharge from the Waverley WWTP has adversely effected the macroinvertebrate communities of the unnamed tributary of the Wairoa Stream. However, the results were also influenced by environmental differences between the sites.

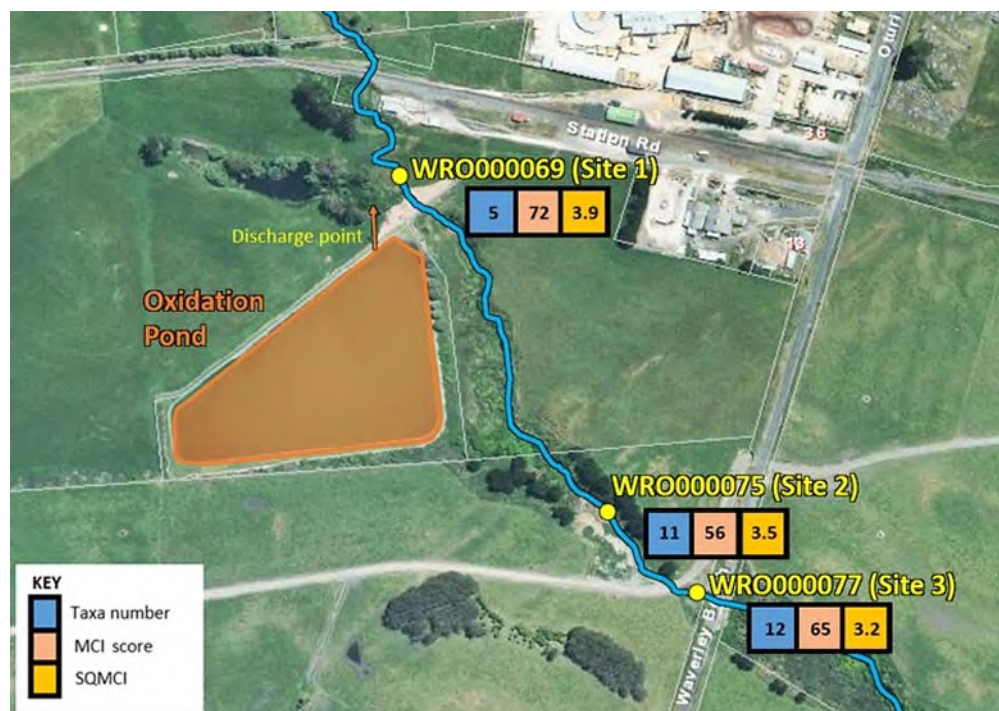


Figure 9 Taxa number, MCI scores and SQMCI scores for each biomonitoring site (March 2023)

A copy of the biomonitoring report for this site is available from the Council upon request.

## 5.4 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 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).

In the 2022-2023 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with STDC's conditions in resource consents or provisions in Regional Plans in relation to the Waverley WWTP.

## 5.5 Discussion

### 5.5.1 Discussion of site performance

The Waverley WWTP was well maintained and operated, and performed satisfactorily throughout the monitoring period. The performance of the system was considered to be typical of a biological treatment system receiving essentially domestic wastes, and continued to show some improvements compared to historical wastewater quality.

Inflow and infiltration work carried out during the 2022-2023 year consisted of several pipe renewals (total 709 m), and 17 manhole inspections.

The 'Wastewater Options Assessment Report' (WOAR) required by condition 10 of consent 0072-3 was submitted in April 2021. After consideration of the shortlist of options a renewal application for consent 0072-3 was lodged in February 2022. The agreed outcome consists of using the existing inlet screen and oxidation pond. The upgrade focuses on making minor improvements to the oxidation pond treatment system and adding tertiary treatment by way of Membrane Filtration (MFU). A block diagram and indicative schematic of the proposed upgrade is shown in Figure 10 below.

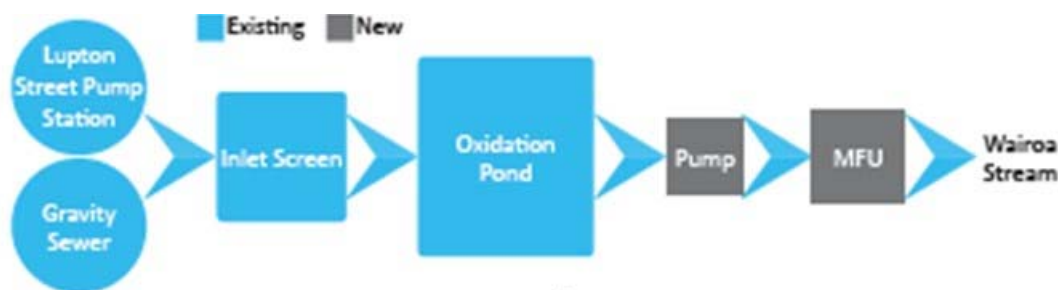


Figure 10 Block diagram of proposed Waverley WWTP upgrade

During the 2022-2023 monitoring year a location on site for this equipment was identified and the power upgrade required is underway. Tendering for the construction will commence in late 2023 and the potential of a new technology alternative Supercritical-UV is also being explored.

### 5.5.2 Environmental effects of exercise of consents

There were no 'sewage fungus' growths observed by inspections performed under varying flow conditions in the short section of the receiving tributary immediately downstream of the effluent outfall.

The discharge rate recorded during the summer receiving water survey was low, which ensured that there was sufficient dilution with the receiving waters, even during low flow conditions. This survey recorded minor impacts of the discharge on the water quality of the Wairoa Stream tributary. However, these and other effects were readily assimilated, first by the aquatic weed growth in the tributary, and then in the extensive Ihupuku Wetland area located downstream of Beach Road. Lowered pH, nutrient, and dissolved oxygen levels below the wetland were consistent with past monitoring results and typical of wetland drainage streams.

Macroinvertebrate monitoring found that there was some evidence to suggest nutrient enrichment downstream of discharges from the Waverley WWTP, however there was inconclusive evidence to suggest that discharges had significantly affected the macroinvertebrate communities of the unnamed tributary of the Wairoa Stream, with some of the discrepancies in results related to subtle habitat differences between the three sites.

### 5.5.3 Evaluation of performance

A tabular summary of STDC's compliance record for the year under review is set out in Tables 32 and 33.

Table 32 Summary of performance for consent 0072-3

<b>Purpose: To discharge treated wastewater from the Waverley municipal oxidation ponds system into an unnamed tributary of the Wairoa Stream</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Limits on discharge volume	Monitoring by consent holder – 99% compliance	Mostly – exceedance on two days due to heavy rain
2. Discharge notification requirements	Liaison with consent holder	Yes
3. Limits on dissolved oxygen	Inspections and sampling, monitoring by consent holder	Yes
4. Flow meter requirements	Flow meter installed and operational	Yes
5. OMMP requirements	Plan received, inspections confirming compliance	Yes
6. Limits on nutrients in receiving waters	Sampling by Council and STDC	Yes
7. Limits on effects in receiving waters	Inspections, sampling and biomonitoring	Mostly – potential adverse effects on macroinvertebrates
8. Turbidity not to increase by more than 50% in receiving waters	Sampling	Yes
9. SAS report requirements	Report received	Yes
10. WOAR report requirements	Submitted April 2021	Yes
11. WWTP requirements	Working Party created	Yes



<b>Purpose: To discharge treated wastewater from the Waverley municipal oxidation ponds system into an unnamed tributary of the Wairoa Stream</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
12. Minimum affected parties for WWTP	All parties included in WWTP	Yes
13. Riparian planting requirements	Liaison with consent holder	Yes
14. Trade wastes notifications	Liaison with consent holder	Yes
15. Lapse and review provisions	Consent has expired (renewal underway)	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>Good</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

Table 33 Summary of performance for consent 6621-1

<b>Purpose: To discharge treated stock truck effluent from an oxidation pond treatment system onto and into land in the vicinity of the Waiau Stream in the Waitotara catchment</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Adopt best practicable option	Inspections	Yes
2. Limits on receiving water effects	Inspections	Yes
3. Minimisation of effects	Inspections	Yes
4. Operation and maintenance requirements	Inspections	Yes
5. Optional review provision	Consent has expired (renewal underway)	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

During the year, STDC demonstrated high levels of both environmental and administrative performance with the resource consents in relation to the Waverley WWTP as defined in Appendix II.

### 5.5.4 Recommendations from the 2021-2022 Annual Report

In the 2021-2022 Annual Report, it was recommended:

1. THAT in the first instance monitoring of consented activities at Waverley WWTP and stock truck wastes disposal in the 2022-2023 year continue at the same level as in 2021-2022.
2. THAT should there be issues with environmental or administrative performance in 2022-2023, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.



Recommendations one was implemented, while it was not considered necessary to carry out any additional investigations or interventions as per recommendation two.

### 5.5.5 Alterations to monitoring programmes for 2023-2024

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.

No planned changes have been made to the 2023-2024 monitoring programme.

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 2023-2024.

### 5.5.6 Recommendations

1. THAT in the first instance monitoring of consented activities at Waverley WWTP and stock truck wastes disposal in the 2023-2024 year continue at the same level as in 2022-2032.
2. THAT should there be issues with environmental or administrative performance in 2023-2024, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

## 6 Summary of recommendations

The following is a summary of the recommendations for each WWTP system as presented in the individual sections of this report.

### 6.1 Kaponga WWTP

1. THAT in the first instance, monitoring of consented activities at Kaponga WWTP in the 2023-2024 year continue at the same level as in 2022-2023.
2. THAT should there be issues with environmental or administrative performance in 2023-2024, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

### 6.2 Manaia WWTP

1. THAT in the first instance monitoring of consented activities at Manaia WWTP in the 2023-2024 year continue at the same level as in 2022-2023.
2. THAT should there be issues with environmental or administrative performance in 2023-2024, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

### 6.3 Patea WWTP and emergency outfall

1. THAT in the first instance, monitoring of consented activities at Patea WWTP and emergency outfall in the 2023-2024 year continue at the same level as in 2022-2023.
2. THAT should there be issues with environmental or administrative performance in 2023-2024, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

### 6.4 Waverley WWTP and stock truck wastes disposal

1. THAT in the first instance monitoring of consented activities at Waverley WWTP and stock truck wastes disposal in the 2023-2024 year continue at the same level as in 2022-2032.
2. THAT should there be issues with environmental or administrative performance in 2023-2024, 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:

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.
<i>E. coli</i>	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.
FC	Faecal coliforms, an indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units per 100 millilitre sample.
Fresh	Elevated flow in a stream, such as after heavy rainfall.
g/m <sup>3</sup>	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 <sup>2</sup>	Square Metres
MCI	Macroinvertebrate community index; a numerical indication of the state of biological life in a stream that takes into account the sensitivity of the taxa present to organic pollution in stony habitats.
mS/m	Millisiemens per metre.

Mixing zone	The zone below a discharge point where the discharge is not fully mixed with the receiving environment. For a stream, conventionally taken as a length equivalent to 7 times the width of the stream at the discharge point.
NH <sub>4</sub>	Ammonium, normally expressed in terms of the mass of nitrogen (N).
NH <sub>3</sub>	Unionised ammonia, normally expressed in terms of the mass of nitrogen (N).
NNN	Nitrate-nitrite nitrogen.
NO <sub>3</sub> <sup>-</sup>	Nitrate, normally expressed in terms of the mass of nitrogen (N).
NO <sub>2</sub> <sup>-</sup>	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.
SS	Suspended solids.
SQMCI	Semi quantitative macroinvertebrate community index.
Temp	Temperature, measured in °C (degrees Celsius).
Turb	Turbidity, expressed in NTU.
WWTP	Wastewater Treatment Plant

For further information on analytical methods, contact an Environment Quality Manager.

## Bibliography and references

- CH2M Beca, 2006: 'Assessment of environmental effects for the Kaponga Wastewater Treatment Plant'. Report prepared for South Taranaki District Council.
- Department of Health 1992: 'Provisional microbiological water quality guidelines for recreational and shellfish gathering waters in NZ'. Public Health Services, Department of Health, Wellington.
- MfE 1998: 'Bacteriological water quality guidelines for marine and freshwater: Guidelines for the management of recreational and marine shellfish-gathering waters'. Ministry for the Environment publication.
- MfE 2003: 'Microbiological water quality guidelines for marine and freshwater recreational areas'. Ministry for the Environment publication.
- Ministry for the Environment. 2018. Best Practice Guidelines for Compliance, Monitoring and Enforcement under the Resource Management Act 1991. Wellington: Ministry for the Environment.
- MWH, 2005: 'Kaponga Oxidation Pond Sludge Survey'. Report prepared for South Taranaki District Council.
- Pearson, HW 1996: 'Expanding the horizons of pond technology and application in an environmentally conscious world'; Water Science and Technology 33(7): 1-9.
- Taranaki Catchment Board 1988: 'Report on Taranaki Municipal Oxidation Ponds 1987/88'. TCB Report.
- Taranaki Catchment Board 1989: 'Report on Taranaki Municipal Oxidation Ponds 1988/89'. TCB Technical Report 89/10.
- Taranaki Regional Council 1990: 'South Taranaki District Council Oxidation Ponds Monitoring 1989/90'. TRC Technical Report 90-25.
- Taranaki Regional Council 1991: 'South Taranaki District Council Municipal Oxidation Ponds Systems Monitoring Programmes Annual Report 1990/91'. TRC Technical Report 91-16.
- Taranaki Regional Council 1992: 'South Taranaki District Council Municipal Oxidation Ponds Systems Monitoring Programmes Annual Report 1991-92'. TRC Technical Report 92-13.
- Taranaki Regional Council 1993: 'South Taranaki District Council Municipal Oxidation Ponds Systems Monitoring Programmes Annual Report 1992-93'. TRC Technical Report 93-21.
- Taranaki Regional Council 1994: 'South Taranaki District Council Municipal Oxidation Ponds Systems Monitoring Programme Annual Report 1993-94'. TRC Technical Report 94-9.
- Taranaki Regional Council 1995: 'South Taranaki District Council Municipal Oxidation Ponds Systems Monitoring Programme Annual Report 1994-95'. TRC Technical Report 95-46.
- Taranaki Regional Council 1996: 'South Taranaki District Council Municipal Oxidation Ponds Systems Monitoring Programme Annual Report 1995-96'. TRC Technical Report 96-43.
- Taranaki Regional Council 1997: 'South Taranaki District Council Municipal Oxidation Ponds Systems Monitoring Programme Annual Report 1996-97'. TRC Technical Report 97-68.
- Taranaki Regional Council 1998: 'South Taranaki District Council Municipal Oxidation Ponds Systems Monitoring Programme Annual Report 1997-98'. TRC Technical Report 98-48.
- Taranaki Regional Council 1999: 'South Taranaki District Council Waverley, Kaponga, Manaia and Patea Municipal Oxidation Ponds Systems Monitoring Programmes Annual Report 1998-1999'. TRC Technical Report 99-78.

- Taranaki Regional Council 2000: 'South Taranaki District Council Waverley, Kaponga, Manaia and Patea Municipal Oxidation Ponds Systems Monitoring Programmes Annual Report 1999-2000'. TRC Technical Report 2000-83.
- Taranaki Regional Council 2001: 'South Taranaki District Council Waverley, Kaponga, Manaia and Patea Municipal Oxidation Ponds Systems Monitoring Programmes Annual Report 2000-2001'. TRC Technical Report 2001-28.
- Taranaki Regional Council 2002: 'South Taranaki District Council Waverley, Kaponga, Manaia and Patea Municipal Oxidation Ponds Systems Monitoring Programmes Annual Report 2001-2002'. TRC Technical Report 2002-29.
- Taranaki Regional Council 2003: 'South Taranaki District Council Waverley, Kaponga, Manaia and Patea Municipal Oxidation Ponds Systems Monitoring Programmes Annual Report 2002-2003'. TRC Technical Report 2003-45.
- Taranaki Regional Council 2004: 'South Taranaki District Council Waverley, Kaponga, Manaia and Patea Municipal Oxidation Ponds Systems Monitoring Programmes Annual Report 2003-2004'. TRC Technical Report 2004-30.
- Taranaki Regional Council 2005: 'South Taranaki District Council Waverley, Kaponga, Manaia and Patea Municipal Oxidation Ponds Systems Monitoring Programmes Annual Report 2004-2005'. TRC Technical Report 2005-21.
- Taranaki Regional Council 2006: 'South Taranaki District Council Waverley, Kaponga, Manaia and Patea Municipal Oxidation Ponds Systems Monitoring Programmes Annual Report 2005-2006'. TRC Technical Report 2006-56.
- Taranaki Regional Council 2007: 'South Taranaki District Council Waverley, Kaponga, Manaia and Patea Municipal Oxidation Ponds Systems Monitoring Programmes Annual Report 2006-2007'. TRC Technical Report 2007-53.
- Taranaki Regional Council 2007a: 'Bathing beach water quality. State of the environment monitoring report summer 2006-2007'. TRC Technical Report 2007-19.
- Taranaki Regional Council 2008: 'South Taranaki District Council Waverley, Kaponga, Manaia and Patea Municipal Oxidation Ponds Systems Monitoring Programmes Annual Report 2007-2008'. TRC Technical Report 2008-62.
- Taranaki Regional Council 2009: 'South Taranaki District Council Waverley, Kaponga, Manaia and Patea Municipal Oxidation Ponds Systems Monitoring Programmes Annual Report 2008-2009'. TRC Technical Report 2009-44.
- Taranaki Regional Council 2009a: 'South Taranaki District Council Eltham Wastewater Treatment Plant Monitoring Programme Annual Report 2008-09'. TRC Technical Report 2009-42.
- Taranaki Regional Council 2010: 'South Taranaki District Council Waverley, Kaponga, Manaia and Patea Municipal Oxidation Ponds Systems Monitoring Programmes Annual Report 2009-2010'. TRC Technical Report 2010-14.
- Taranaki Regional Council 2011: 'South Taranaki District Council Waverley, Kaponga, Manaia and Patea Municipal Oxidation Ponds Systems Monitoring Programmes Annual Report 2010-2011'. TRC Technical Report 2011-18.
- Taranaki Regional Council 2012: 'South Taranaki District Council Waverley, Kaponga, Manaia and Patea Municipal Oxidation Ponds Systems Monitoring Programmes Annual Report 2011-2012'. TRC Technical Report 2012-05.



- Taranaki Regional Council 2013: 'South Taranaki District Council Waverley, Kaponga, Manaia and Patea Municipal Oxidation Ponds Systems Monitoring Programmes Annual Report 2012-2013'. TRC Technical Report 2013-16.
- Taranaki Regional Council 2013a: 'Freshwater contact recreational water quality at selected Taranaki sites. State of the environment monitoring report Summer 2012-2013'. TRC Technical Report 2013-01
- Taranaki Regional Council 2013b: 'Bathing beach water quality. State of the environment monitoring report Summer 2012-2013'. TRC Technical Report 2013-17.
- Taranaki Regional Council 2014: 'South Taranaki District Council Waverley, Kaponga, Manaia and Patea Municipal Oxidation Ponds Systems Monitoring Programmes Annual Report 2013-2014'. TRC Technical Report 2014-18.
- Taranaki Regional Council 2014a: 'Freshwater Contact Recreational Water Quality at selected Taranaki sites. State of the environment monitoring report Summer 2013-2014'. TRC Technical Report 2014-01.
- Taranaki Regional Council 2014b: 'Freshwater macroinvertebrate fauna biological monitoring programme Annual State of the Environment Monitoring Report 2012-2013'. TRC Technical Report 2013-48.
- Taranaki Regional Council 2014c: 'Bathing beach water quality. State of the environment monitoring report Summer 2013-2014'. TRC Technical Report 2014-13.
- Taranaki Regional Council 2015: 'Freshwater Contact Recreational Water Quality at selected Taranaki sites. State of the environment monitoring report Summer 2014-2015'. TRC Technical Report 2015-01.
- Taranaki Regional Council 2015a: 'Freshwater macroinvertebrate fauna biological monitoring programme Annual State of the Environment Monitoring Report 2013-2014'. TRC Technical Report 2014-20.
- Taranaki Regional Council 2015b: 'Bathing beach water quality. State of the environment monitoring report Summer 2014-2015'. TRC Technical Report 2015-11.
- Taranaki Regional Council 2015: 'South Taranaki District Council Waverley, Kaponga, Manaia and Patea Municipal Oxidation Ponds Systems Monitoring Programmes Annual Report 2014-2015'. TRC Technical Report 2015-9.
- Taranaki Regional Council 2016: 'Freshwater Contact Recreational Water Quality at selected Taranaki sites. State of the environment monitoring report Summer 2015-2016'. TRC Technical Report 2016-01.
- Taranaki Regional Council 2016a: 'Bathing beach water quality. State of the environment monitoring report Summer 2015-2016'. TRC Technical Report 2016-2.
- Taranaki Regional Council 2016: 'South Taranaki District Council Waverley, Kaponga, Manaia and Patea Municipal Oxidation Ponds Systems Monitoring Programmes Annual Report 2015-2016'. TRC Technical Report 2016-30.
- Taranaki Regional Council 2017: 'State of the Environment Monitoring Report. Bathing Beach Water Quality 2016-2017'. TRC Technical Report 2017-01.
- Taranaki Regional Council 2017: 'South Taranaki District Council Waverley, Kaponga, Manaia and Patea Municipal Oxidation Ponds Systems Monitoring Programmes Annual Report 2016-2017'. TRC Technical Report 2017-78.
- Taranaki Regional Council 2018: 'State of the Environment Monitoring Report. Bathing Beach Water Quality 2017-2018. TRC Technical Report 2018-33.
- Taranaki Regional Council 2018: 'South Taranaki District Council Kaponga, Manaia, Patea, and Waverley WWTP's Monitoring Programmes Annual Report 2017-2018'. TRC Technical Report 2018-99.

- Taranaki Regional Council 2019: 'State of the Environment Monitoring Report. Bathing Beach Water Quality 2018-2019. TRC Technical Report 2019-36.
- Taranaki Regional Council 2020: 'South Taranaki District Council Kaponga, Manaia, Patea, and Waverley WWTP's Monitoring Programmes Annual Report 2018-2019'. TRC Technical Report 2019-41.
- Taranaki Regional Council 2021: 'South Taranaki District Council Kaponga, Manaia, Patea, and Waverley WWTP's Monitoring Programmes Annual Report 2019-2020'. TRC Technical Report 2020-20.
- Taranaki Regional Council 2022: 'South Taranaki District Council Kaponga, Manaia, Patea, and Waverley WWTP's Monitoring Programmes Annual Report 2020-2021'. TRC Technical Report 2021-06.
- Taranaki Regional Council 2023: 'South Taranaki District Council Kaponga, Manaia, Patea, and Waverley WWTP's Monitoring Programmes Annual Report 2021-2022'. TRC Technical Report 2022-09.
- Taranaki Regional Council 2023: Biomonitoring of an unnamed tributary of the Wairoa Stream in relation to the Waverley Wastewater Treatment Plant, March 2023. Internal memorandum AN005. #3200632
- Taranaki Regional Council 2023: Biomonitoring of the Kaupokonui River in relation to the South Taranaki District Council's Kaponga oxidation ponds system discharge, April 2023. Internal memorandum AB009. #3208863
- Taranaki Regional Council 2023: 'Marine Ecological Inspection for Manaia Oxidation Ponds' discharge, June 2023'. Internal memorandum #3178840.

## Appendix I

### Resource consents held by STDC

(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

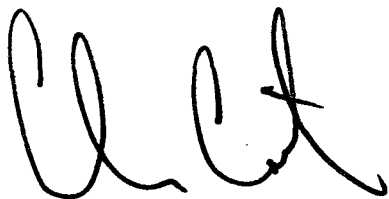
Section 12(1)(b) of the RMA stipulates that no person may erect, reconstruct, place, alter, extend, remove, or demolish any structure that is fixed in, on, under, or over any foreshore or seabed, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national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

## COASTAL PERMIT

TRC – Applications: 2752  
2753

Pursuant to the provisions of section 119 of the Resource Management Act 1991, I Chris Carter, Minister of Conservation, hereby grant South Taranaki District Council a coastal permit (No. SAR-05-49-04-03) to (i) discharge up to 455 cubic metres per day of treated wastewater; and (ii) discharge untreated wastewater only in emergency situations, to the Patea River, within the coastal marine area, generally in accordance with the application and subject to the attached conditions of consent.

Dated at *Wellington* this *7<sup>th</sup>* day of *February* 2006

A handwritten signature in black ink, appearing to be 'C. Carter', written in a cursive style.

Hon Chris Carter

Minister of Conservation

63-01-01/01

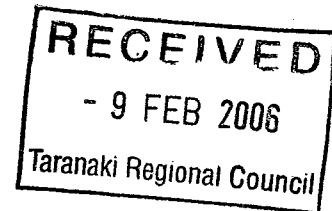
139518



**Office of Hon Chris Carter**  
**MP for Te Atatu**  
Minister of Conservation  
Minister of Housing  
Minister for Ethnic Affairs

- 7 FEB 2006

Peter Canvin  
Consents Manager  
Taranaki Regional Council  
Private Bag 713  
Stratford



Dear Mr Canvin

Attached for your information is a copy of the coastal permit that I have recently granted to South Taranaki District Council to discharge treated and untreated wastewater to the Patea River.

I have made the permit subject to the conditions recommended to me by the Hearing Committee.

My reasons for the decision are that:

- the upgrades are an improvement on the existing treatment system, resulting in a higher quality of effluent, and
- it meets the requirements of the: New Zealand Coastal Policy Statement; Regional Coastal Plan for Taranaki; Regional Policy Statement for Taranaki; relevant provisions of the RMA, including section 104 and Part 2.

Please note that I have advised the applicant and my appointee on the Hearing Committee, Mr Richard Heerdegen, of my decision. I understand you will be notifying other interested parties of my decision in line with the provisions of section 119A(b) and section 114 of the Resource Management Act 1991.

Yours sincerely

**Hon Chris Carter MP**  
**Minister of Conservation**

Encl.



Marine Area, in respect of the matters considered under section 104 of the Resource Management Act 1991 as follows:

- *Application 2752 [to renew and change consent 0067]: To discharge treated municipal wastewater from the Patea Wastewater Treatment Plant into the coastal marine area of the Patea River;*
  - *Application 2753 [to renew and change consent 0145]: To discharge untreated municipal sewage in emergencies only into the coastal marine area of the Patea River.*
10. The Hearing Committee resolved to recommend to the Minister of Conservation that the consents be granted and all members of the Committee supported the recommendations.
11. Pursuant to section 118 of the Resource Management Act 1991, the Committee's reasons for its recommendations are that:
- a) It accepts the assessment of the application given in the Taranaki Regional Council's officer's report; and
  - b) Monitoring will continue to be undertaken by the Taranaki Regional Council to ensure that there are no significant adverse effects on the environment as a result of the exercise of this consent, should it be granted.

### **Recommendation of the Hearing Committee**

13. The Hearing Committee recommends that the Minister of Conservation approves application 2752, to discharge treated municipal wastewater from the Patea Wastewater Treatment Plant into the coastal marine area of the Patea River, be submitted to the Minister of Conservation for approval for a period to 1 June 2028, with provision for review in June 2010 and/or June 2016 and/or June 2022, subject to the policies and conditions of the Taranaki Regional Council, including the following general conditions and special conditions:

#### **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. The wastewater treatment systems shall be upgraded, substantially in accordance with recommended Option 3 contained in the document supporting the application entitled '*Assessment of Environmental Effects for the Upgraded Wastewater Treatment Plant*' [CH2M Beca], May 2004. Implementation of this upgrade shall be completed two years from the date of grant of this consent.
2. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 2752. In the case of any contradiction between the documentation submitted in support of application 2752 and the conditions of this consent, the conditions of this consent shall prevail.
3. The consent holder shall supply progress reports on implementation of the upgrade referred to under special condition 1, by June 2006 and June 2007 to the Chief Executive, Taranaki Regional Council.
4. Notwithstanding any conditions within this consent, the consent holder shall at all times adopt the best practicable option or options, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or potential effect on the environment arising from the exercise of this consent.
5. The volume of treated wastewater discharge shall not exceed 455 cubic metres per day, unless there has been rain on any of the previous three days [as measured at the Taranaki Regional Council rain gauge on Durham Street, Patea], in which case the instantaneous treated wastewater discharge flow rate shall not exceed 20 litres per second.
6. The consent holder shall implement and maintain a management plan which shall include operating procedures to avoid, remedy or mitigate against potential adverse effects arising from:
  - i) operation of the wastewater treatment plant; and
  - ii) plant failure.
7. The consent holder shall use a suitably trained operator to ensure proper and efficient operation and maintenance of the wastewater treatment system to the satisfaction of the Chief Executive, Taranaki Regional Council.
8. The oxidation pond shall be maintained in an aerobic condition at all times during daylight hours.
9. The consent holder shall undertake to advise and consult with the Taranaki Regional Council prior to accepting new trade wastes, which may contain toxic or hazardous wastes, into the consent holder's wastewater system.
10. After allowing for reasonable mixing, being a mixing zone extending 200 metres downstream and 200 metres upstream of the discharge point, the discharge shall not give rise to any of the following effects in any surface water body:
  - a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;

- b) any conspicuous change in the colour or visual clarity;
  - c) any emission of objectionable odour;
  - d) any significant adverse effects on aquatic life.
11. The consent holder shall, in conjunction with the Taranaki Regional Council, undertake additional chemical, bacteriological and ecological monitoring of the oxidation pond and Patea River as deemed necessary by the Chief Executive, Taranaki Regional Council subject to Section 35 (2)(d) and Section 36 of the Resource Management Act 1991.
  12. As a component of the monitoring required by Special Condition 11, the consent holder shall undertake bacteriological monitoring of the receiving waters of the Patea River and at 'Mana Bay' for contact recreational purposes. The monitoring programme shall be consistent with the provisions of the 'Microbiological Water Quality Guidelines for Marine and Freshwater recreational area' [Ministry for the Environment and Ministry of Health, 2003].
  13. This consent shall lapse on the expiry of five years after the date of issue of this consent, 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.
  14. 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 2010 and/or June 2016 and/or June 2022, for the purpose of ensuring that the conditions are adequate to deal with an adverse effects on the environment arising from the exercise of this resource consent, which were not either foreseen at the time the application was considered or which it was not appropriate to deal with at the time.
  14. The Hearing Committee recommends that application 2753, to discharge untreated municipal sewage in emergencies only into the coastal marine area of the Patea River, be submitted to the Minister of Conservation for approval for a period to 1 June 2028, with provision for review in June 2010 and/or June 2016 and/or June 2022, subject to the policies and conditions of the Taranaki Regional Council, including the following general conditions and special conditions:

#### **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. 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 exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 2753. In the case of any contradiction between the documentation submitted in support of application 2753 and the conditions of this consent, the conditions of this consent shall prevail.
3. The consent holder shall prepare and maintain a contingency plan, to the satisfaction of the Chief Executive, Taranaki Regional Council, detailing action to be taken in the event of accidental spillage or discharge of contaminants, the initial plan to be provided no later than three months prior to the exercise of this consent.
4. In addition to the existing outfall, rip rap shall be installed adjacent to the river bank which shall be adequately maintained and cleared following any discharge authorised under this permit. The outfall upgrade shall be completed no later than two years from the date of issue of this consent.
5. If the frequency of overflows exceeds one per year, the consent holder shall implement works for reducing the frequency and mitigate the effects of such overflows by way of:
  - increasing the capacity of the pipe leading from the pump[s] to the rising main;
  - duplication of the rising main between the pump station and the oxidation pond system; and/or
  - additional storage available for treated wastewater.
6. The intermittent discharge of wastewater into the Patea River shall only occur when:
  - i. storm and groundwater inflows to the system is such that the capacity of the wastewater treated system pump station is exceeded; and/or
  - ii. pump or power failure at the pump station occurs.
7. The intermittent discharge of wastewater into the Patea River shall not occur during routine maintenance of the pump station.
8. The consent holder shall ensure that, whenever practicable, the duration of the discharge authorised by this consent shall not exceed four hours.
9. The consent holder shall install and constantly monitor an alarm system to the satisfaction of the Chief Executive, Taranaki Regional Council. The alarm shall operate when the duty pump fails to cope with the inflow.

10. The consent holder shall inspect the installation regularly and at least once per week shall check that the alarm is operative and the electrical equipment is in good working order.
11. The consent holder shall immediately notify the Chief Executive, Taranaki Regional Council, following any discharge under this permit, including the time, reason[s], and duration of wastewater discharged and remedial measures implemented by the consent holder.
12. The consent holder shall forward a summary of records referred to in special condition 11 no later than 31 July of each year to the Chief Executive, Taranaki Regional Council.
13. The consent holder shall install and maintain suitable signage advising the public of the health risk on each and every occasion that a discharge occurs in terms of this consent. Signage shall be sited at appropriate positions upstream and downstream of the discharge point and at the river mouth, to warn the public of the presence of contaminants in the river.
14. The consent holder shall immediately notify Taranaki Healthcare following any discharge under this permit, in order to enable any measures necessary for the protection of public health to be undertaken.
15. The consent holder and staff of the Taranaki Regional Council shall meet as appropriate, and at least every three years with interested submitters to the consent to discuss any matter relating to the exercise of this consent.
16. The consent holder shall, in junction with the Taranaki Regional Council, undertake additional chemical, bacteriological and ecological monitoring of the Patea River as deemed necessary by the Chief Executive, Taranaki Regional Council subject to Section 35 (2)(d) and Section 36 of the Resource Management Act 1991.
17. This consent shall lapse on the expiry of five years after the date of issue of this consent, 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.
18. 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 2010 and/or June 2016 and/or June 2022, for the purpose of ensuring that the conditions are adequate to deal with an adverse effects on the environment arising from the exercise of this resource consent,

which were not either foreseen at the time the application was considered or which it was not appropriate to deal with at the time.



Approved:  
DL Lean  
Chairperson  
Taranaki Regional Council  
Consents and Regulatory Committee and  
Chairperson of the Hearing Committee

Date: 28/11/2005.

---



**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

Change To  
Conditions Date: 9 July 2007 [Granted: 7 February 2006]

**Conditions of Consent**

Consent Granted: To discharge treated municipal wastewater from the Patea Wastewater Treatment Plant into the Coastal Marine Area of the Patea River at or about 2637404E-6159017N

Expiry Date: 1 June 2028

Review Date(s): June 2010, June 2016, June 2022

Site Location: Beach Road, Patea

Legal Description: Lot 1 DP 9100 Blk VII Carlyle SD

Catchment: Patea

### **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**

#### **Condition 1 – changed**

- 1. The wastewater treatment system shall be upgraded in accordance with drawing number 77031, entitled *Patea Wastewater Treatment Plant: Pond General Arrangement and Bund Details* (dated 10.10.06) provided with application number 4617. Implementation of this upgrade shall be completed before 31 March 2008.

#### **Conditions 2 to 14 – unchanged**

- 2. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 2752. In the case of any contradiction between the documentation submitted in support of application 2752 and the conditions of this consent, the conditions of this consent shall prevail.
- 3. The consent holder shall supply progress reports on implementation of the upgrade referred to under special condition 1, by June 2006 and June 2007 to the Chief Executive, Taranaki Regional Council.
- 4. Notwithstanding any conditions within this consent, the consent holder shall at all times adopt the best practicable option or options, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or potential effect on the environment arising from the exercise of this consent.
- 5. The volume of treated wastewater discharge shall not exceed 455 cubic metres per day, unless there has been rain on any of the previous three days [as measured at the Taranaki Regional Council rain gauge on Durham Street, Patea], in which case the instantaneous treated wastewater discharge flow rate shall not exceed 20 litres per second.

6. The consent holder shall implement and maintain a management plan which shall include operating procedures to avoid, remedy or mitigate against potential adverse effects arising from:
  - i) operation of the wastewater treatment plant; and
  - ii) plant failure.
7. The consent holder shall use a suitably trained operator to ensure proper and efficient operation and maintenance of the wastewater treatment system to the satisfaction of the Chief Executive, Taranaki Regional Council.
8. The oxidation pond shall be maintained in an aerobic condition at all times during daylight hours.
9. The consent holder shall undertake to advise and consult with the Taranaki Regional Council prior to accepting new trade wastes, which may contain toxic or hazardous wastes, into the consent holder's wastewater system.
10. After allowing for reasonable mixing, being a mixing zone extending 200 metres downstream and 200 metres upstream of the discharge point, the discharge shall not give rise to any of the following effects in any surface water body:
  - a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - b) any conspicuous change in the colour or visual clarity;
  - c) any emission of objectionable odour;
  - d) any significant adverse effects on aquatic life.
11. The consent holder shall, in conjunction with the Taranaki Regional Council, undertake additional chemical, bacteriological and ecological monitoring of the oxidation pond and Patea River as deemed necessary by the Chief Executive, Taranaki Regional Council subject to Section 35 (2)(d) and Section 36 of the Resource Management Act 1991.
12. As a component of the monitoring required by Special Condition 11, the consent holder shall undertake bacteriological monitoring of the receiving waters of the Patea River and at 'Mana Bay' for contact recreational purposes. The monitoring programme shall be consistent with the provisions of the 'Microbiological Water Quality Guidelines for Marine and Freshwater recreational area' [Ministry for the Environment and Ministry of Health, 2003].
13. This consent shall lapse on the expiry of five years after the date of issue of this consent, 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.

14. 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 2010 and/or June 2016 and/or June 2022, for the purpose of ensuring that the conditions are adequate to deal with an adverse effects on the environment arising from the exercise of this resource consent, which were not either foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 9 July 2007

For and on behalf of  
Taranaki Regional Council

---

**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  
(Change): 9 December 2020

Commencement Date  
(Change): 9 December 2020 (Granted Date: 9 August 2017)

**Conditions of Consent**

Consent Granted: To discharge treated wastewater from the Waverley  
Municipal Oxidation Ponds System into an unnamed  
tributary of the Wairoa Stream

Expiry Date: 1 June 2022

Review Date(s): As per special condition 15

Site Location: South Road, SH 3, Waverley

Grid Reference (NZTM) 1739140E-5596588N & 1739160E-5596380N

Catchment: Wairoa

*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 discharge shall not exceed 450 cubic metres per day.
2. In the event of a recorded daily discharge exceeding 450 cubic metres/day, the consent holder shall notify the Council as soon as is practicable and, within 10 working days, investigate and report the reasons for the exceedance. The consent holder shall report the findings of the investigation to the Chief Executive, Taranaki Regional Council ('the Chief Executive') by completing and submitting the 'Notification of work' form on the Council's website (<http://bit.ly/TRCWorkNotificationForm>), or an alternative method that may be advised by the Chief Executive.
3. The dissolved oxygen concentration in the oxidation pond shall exceed 0 gm<sup>-3</sup> during each 24-hour period.
4. From 1 January 2018, the consent holder shall install, and thereafter maintain a flow meter at the pond outlet. The flow meter shall be tamper-proof and shall measure and record the rate and volume of the discharge to an accuracy of  $\pm 5\%$ , at intervals not exceeding 15 minutes. Records of the date, the time and the rate and volume of the discharge shall be made available to the Chief Executive, Taranaki Regional Council on request.

*Note: Water meters must be installed, and regularly maintained, in accordance with manufacturer's specifications in order to ensure that they meet the required accuracy. Even with proper maintenance water meters have a limited lifespan.*

5. From 1 October 2017 the Waverley Wastewater Treatment Plant site shall be operated in accordance with an 'Operations and Maintenance Management Plan' (OMMP). The OMMP shall be prepared by the consent holder and approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity. The OMMP shall detail how the site is managed to achieve compliance with the conditions of this consent and shall include, but not be limited to:
  - a) a description of the oxidation ponds including site map identifying the inlet and discharge points and monitoring sites;
  - b) operational control and maintenance of the oxidation pond;
  - c) general site maintenance and planned expenditure;
  - d) contingency measures and procedures in the event of spillages or other non-planned for incidents;
  - e) monitoring procedures covering all aspects of this discharge permit to demonstrate compliance with the conditions; and
  - f) procedures to ensure that reporting requirements are met.

6. After allowing for reasonable mixing, being a mixing zone extending from the discharge point, to a point 400 metres downstream of the discharge point, the discharge shall not cause the receiving waters of the unnamed tributary of the Wairoa Stream to exceed the following concentrations:

Contaminant	Concentration
Unionised ammonia	0.025 gm <sup>-3</sup>
Filtered carbonaceous BOD <sub>5</sub>	2.0 gm <sup>-3</sup>

7. After allowing for reasonable mixing, within a mixing zone extending 400 metres downstream of the discharge point, the discharge shall not, either by itself or in combination with other discharges, give rise to any or all of the following effects in the receiving water:
- the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - any conspicuous change in the colour or visual clarity;
  - any emission of objectionable odour;
  - the rendering of fresh water unsuitable for consumption by farm animals;
  - any significant adverse effects on aquatic life.
8. After allowing for reasonable mixing, within a mixing zone extending 400 metres downstream of the discharge point, the discharge shall not give rise to an increase in turbidity of more than 50% (as determined using NTU (nephelometric turbidity units)) in the unnamed tributary of the Wairoa Stream.
9. Before 1 July 2019, the consent holder shall prepare and submit a '*Stream Assimilative Capacity*' (SAS) report which assesses the assimilative capacity of the receiving waters, being the unnamed tributary of the Wairoa Stream. The report shall assess the ability and capacity of the receiving waters to receive treated wastewater without significant effect on aquatic life. Once finalised, the report shall be circulated to the parties identified in condition 12, who may provide comments to the Taranaki Regional Council within 20 working days of receipt.
10. Before 30 September 2021, the consent holder shall prepare and submit to the Chief Executive, Taranaki Regional Council, a '*Wastewater Options Assessment Report*' (WOAR) for the Waverley WWTP. The WOAR shall document the on-going environmental effects of the discharge from the Waverley Wastewater Treatment Plant, and set out the options available to address the effects on the receiving environment resulting from the discharge. The report shall, as a minimum, address the following:
- Assess the environmental effects of the discharge on the Ihupuku Swamp Wildlife Management Reserve and the Wairoa Stream, including effects on water quality, periphyton growth and aquatic biota;
  - Investigate a range of alternative sites, options and/or methods to manage wastewater from the Waverley WWTP;
  - Document consultation initiatives and their outcomes with potentially affected parties, as part of assessing alternative sites, options and methods; and
  - Identify a best practicable long-term option for the treatment and disposal of Waverley wastewater.



11. Before 31st October 2017, the consent holder shall establish a Waverley Wastewater Working Party (WWWP) for the purpose of assisting the consent holder to achieve the requirements of Condition 10. The consent holder shall hold meetings no less often than every 12 months with the WWWP members for the duration of the consent, or until such time as all parties agree in writing that the WWWP can be disbanded. Those parties listed in condition 12 below shall be invited to be members of the WWWP.
12. The parties referred to in conditions 9, 10 and 11 and the Waverley Wastewater Working Party (WWWP), shall include as a minimum:
  - a) Ngaa Rauru Kiitahi;
  - b) The Department of Conservation (DoC);
  - c) Fish and Game New Zealand (Fish and Game);
  - d) The Taranaki District Health Board (TDHB);
  - e) RJ and AE Bremer (adjacent landowner); and
  - f) Warwick Isaac Lupton (downstream landowner).
13. Subject to the agreement of the landowner, the consent holder shall, in consultation with the Council's Land Services Manager, arrange for the riparian fencing and planting to the value of \$3,000, to a point no greater than 400 metres downstream of the discharge point. The fencing and/or planting shall be completed by 1 December 2017 and confirmed in writing to the Taranaki Regional Council.
14. The consent holder shall undertake to notify and advise the Chief Executive, Taranaki Regional Council ('the Chief Executive') if trade wastes are accepted from any trade premises into the consent holder's wastewater system, for which it may be appropriate or necessary to place limits on the concentrations in the final discharge of any toxic or hazardous compounds which may be contained in that trade waste. Notification shall include the consent number, a brief description of the activity consented and an assessment of the environmental effects of any changes. It shall be submitted to the Taranaki Regional Council by using the 'Notification of work' form on the Council's website (<http://bit.ly/TRCWorkNotificationForm>), or an alternative method that may be advised by the Chief Executive.
15. 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:
  - a) during the month of June 2018 and/or June 2020; and/or
  - b) within 3 months of receiving a notification under special condition 14 above;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 9 December 2020

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

Consent Granted  
Date: 6 June 2007

**Conditions of Consent**

Consent Granted: To discharge treated municipal wastewater from the  
Kaponga Wastewater Treatment Plant into the Kaupokonui  
Stream at or about GR: P20:087-961

Expiry Date: 1 June 2029

Review Date(s): June 2011, June 2017, June 2023

Site Location: Egmont Street, Kaponga

Legal Description: Pt Sec 69 Blk XI Kaupokonui SD

Catchment: Kaupokonui

### 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. Within 1 year of the commencement of this consent, the wastewater treatment system shall be upgraded by:
  - a) the installation of stub baffles in accordance with drawing no. 6511929-CK02 provided in the '*Assessment of Environmental Effects for the Kaponga Wastewater Treatment Plant*' [CH2M Beca], March 2006.
  - b) Lower the discharge pipe so that all effluent if discharged at least 400mm below water level at all times.
- 2. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 3423. In the case of any contradiction between the documentation submitted in support of application 3423 and the conditions of this consent, the conditions of this consent shall prevail.
- 3. Notwithstanding any conditions within this consent, the consent holder shall at all times adopt the best practicable option or options, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or potential effect on the environment arising from the exercise of this consent.
- 4. The volume of treated wastewater discharge shall not exceed 500 cubic metres per day, unless there has been rain on any of the previous three days [as measured at Taungatara, Te Kiri], in which case the instantaneous treated wastewater discharge flow rate shall not exceed 15 litres per second.
- 5. The consent holder shall implement and maintain a management plan which shall include operating procedures to avoid, remedy or mitigate against potential adverse effects arising from:
  - i) the operation of the wastewater treatment plant;
  - ii) the build up of sludge in the pond system; and
  - iii) stormwater and groundwater infiltration into the sewerage system.

## Consent 0861-3

6. The consent holder shall use a suitably trained operator to ensure proper and efficient operation and maintenance of the wastewater treatment system.
7. The oxidation pond shall be maintained in an aerobic condition at all times during daylight hours.
8. The consent holder shall advise and consult with the Taranaki Regional Council prior to accepting new trade wastes, which may contain toxic or hazardous wastes, into the consent holder's wastewater system.
9. After allowing for reasonable mixing, being a mixing zone extending from the discharge point, to a point 50 metres downstream of the discharge point, the discharge shall not give rise to any of the following effects in any surface water body:
  - a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - b) any conspicuous change in the colour or visual clarity;
  - c) any emission of objectionable odour;
  - d) any significant adverse effects on aquatic life.
10. The consent holder shall, in conjunction with the Taranaki Regional Council, undertake chemical, bacteriological and ecological monitoring of the oxidation pond and Kaupokonui Stream as deemed necessary by the Chief Executive, Taranaki Regional Council subject to Section 35 (2)(d) and Section 36 of the Resource Management Act 1991.
11. After allowing for reasonable mixing, being a mixing zone extending from the discharge point, to a point 50 meters downstream of the discharge point, the discharge shall not cause the receiving waters of the Kaupokonui Stream to exceed the following concentrations:

<b>Contaminant</b>	<b>Concentration</b>
Unionised ammonia	0.025gm <sup>-3</sup>
Filtered carbonaceous BOD <sub>5</sub>	2.0 gm <sup>-3</sup>

12. After for allowing for reasonable mixing within a mixing zone extending 50 meters downstream of the discharge point, the discharge shall not give rise to an increase in turbidity of more than 50% [as determined using NTU (nephelometric turbidity units)] in the Kaupokonui Stream.
13. This consent shall lapse on the expiry of five years after the date of issue of this consent, 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.

14. 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 2011 and/or June 2017, and/or June 2023 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 6 June 2007

For and on behalf of  
Taranaki Regional Council

---

**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

Consent Granted  
Date: 6 June 2007

**Conditions of Consent**

Consent Granted: To discharge treated municipal wastewater from the  
Manaia Wastewater Treatment Plant into the Unnamed  
Stream 27 at or about GR: P21:062-803

Expiry Date: 1 June 2029

Review Date(s): June 2011, June 2017, June 2023

Site Location: Sutherland Road, Manaia

Legal Description: Lot 1 DP 20670 Blk VII Waimate SD

Catchment: Unnamed Stream 27

### 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. From 6 June 2009, the wastewater treatment plant shall comprise of:
  - (a) the existing 1ha oxidation pond with inlet screen; and
  - (b) two wetlands operating in parallel, each of 4800 m<sup>2</sup> ;

in accordance with recommended Option 3C and drawing no. 6513417/CK008 contained in the document supporting the application entitled '*Manaia Wastewater Treatment Plant Application for Discharge Permit and Assessment of Environmental Effects*' [CH2M Beca], Feb 2007.
2. The consent hold shall supply progress reports on implementation of the upgrade referred to under special condition 1, by 30 June 2008 and 30 June 2009, to the Chief Executive, Taranaki Regional Council.
3. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 4068. In the case of any contradiction between the documentation submitted in support of application 4068 and the conditions of this consent, the conditions of this consent shall prevail.
4. Notwithstanding any conditions within this consent, the consent holder shall at all times adopt the best practicable option or options, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or potential effect on the environment arising from the exercise of this consent.
5. The volume of treated wastewater discharge shall not exceed 600 cubic metres per day, unless there has been rain on any of the previous three days [as measured at the Kaupokonui, Glenn Road rain gauge station].



## Consent 1204-4

6. The consent holder shall implement and maintain a management plan which shall include operating procedures to avoid, remedy or mitigate against potential adverse effects arising from:
  - i) the operation of the wastewater treatment plant;
  - ii) the build up of sludge in the pond system; and
  - iii) stormwater and groundwater infiltration into the sewerage system.
7. The consent holder shall use a suitably trained operator to ensure proper and efficient operation and maintenance of the wastewater treatment system.
8. The oxidation pond shall be maintained in an aerobic condition at all times during daylight hours.
9. The consent holder shall advise and consult with the Taranaki Regional Council prior to accepting new trade wastes, which may contain toxic waste or hazardous wastes or any significant additional organic loading, into the consent holder's wastewater system.
10. Allowing for a mixing zone of 50 metres extending either side of the mouth of the receiving stream the discharge shall not give rise to all or any of the following effects in the coastal waters of the Tasman Sea:
  - i) any conspicuous change in the colour or visual clarity; and
  - ii) any significant adverse effects on aquatic life, habitats, or marine ecology; and
  - iii) exceedance of the guideline for shellfish gathering waters, as specified in the document 'Microbiological Water Quality Guidelines for Marine and Freshwater Recreational Areas' [Ministry for the Environment, 2002].
11. The consent holder shall, in conjunction with the Taranaki Regional Council, undertake chemical, bacteriological and ecological monitoring of the wastewater treatment system, Manaia Creek and coastal receiving waters, as deemed necessary by the Chief Executive, Taranaki Regional Council, subject to Section 35 (2)(d) and Section 36 of the Resource Management Act 1991.
12. The consent holder shall implement a stormwater/ groundwater infiltration reduction programme, and shall carry out all practicable actions to ensure that all unauthorised stormwater connections to the sewage reticulation system are removed and remain disconnected. The consent holder shall report on progress under this condition to the Chief Executive, Taranaki Regional Council, by 30 June 2008 and each subsequent year.
13. This consent shall lapse on the expiry of five years after the date of issue of this consent, 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.

## Consent 1204-4

14. 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 2011 and/or June 2017, and/ or June 2023 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 6 June 2007

For and on behalf of  
Taranaki Regional Council

---

**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 4800

Consent Granted  
Date: 16 November 2005

**Conditions of Consent**

Consent Granted: To erect, place and maintain an oxidation pond discharge structure and an emergency overflow discharge structure as part of the Patea Wastewater Treatment System within the coastal marine area of the Patea River at or about GR: Q22:374-590

Expiry Date: 1 June 2028

Review Date(s): June 2010, June 2016, June 2022

Site Location: Beach Road, Patea

Legal Description: Lot 1 DP 9100 Beach Road Whenuakura Dist Blk VII  
Carlyle SD

Catchment: Patea

### 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. The consent holder shall notify the Chief Executive, Taranaki Regional Council, at least 48 hours prior to the commencement and upon completion of the initial construction and again at least 48 hours prior to and upon completion of any subsequent maintenance works which would involve disturbance of or deposition to the riverbed or discharge to water.
- 2. The structures authorised by this consent shall be constructed and maintained generally in accordance with the documentation submitted in support of application 2754 and shall be maintained to ensure the conditions of this consent are met. In the case of any contradiction between documentation submitted in support of application 2754 and the conditions of this consent, the conditions of this consent shall prevail.
- 3. The consent holder shall upgrade the oxidation pond discharge structure, substantially in accordance with recommended Option C [rock diffuser] contained in the document supporting the application entitled '*Assessment of Environmental Effects for the Upgraded Wastewater Treatment Plant*' [CH2M Beca], May 2004. Implementation of this upgrade shall be completed no later than two years from the date of issue of the consent.
- 4. The consent holder shall at all times during construction and maintenance works, adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to avoid or minimise the discharge of silt or other contaminants into water or onto the riverbed and to avoid or minimise the disturbance of the coastal marine area and any adverse effects on water quality from the exercise of this consent.
- 5. The consent holder shall ensure that the area and volume of riverbed 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 exercise of this consent shall not restrict public access to and along the coastal marine area.
- 7. Any disturbance of parts of the riverbed covered by water and/or works which may result in downstream discolouration of water shall be timed to coincide, as far as possible, with dry weather periods.
- 8. The structures which are the subject of this consent shall not obstruct fish passage.

## Consent 4576-2

9. The consent holder shall install and maintain suitable signage advising the public during construction of the structure[s] or any significant maintenance works.
10. 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.
11. This consent shall lapse on the expiry of five years after the date of issue of this consent, 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.
12. 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 2010 and/or June 2016 and/or June 2022, 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 November 2005

For and on behalf of  
Taranaki Regional Council

---

**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

Consent Granted  
Date: 19 September 2005

**Conditions of Consent**

Consent Granted: To discharge treated stock truck effluent from an oxidation pond treatment system onto and into land in the vicinity of the Waiau [2] Stream in the Waitotara catchment at or about GR: R22:525-580

Expiry Date: 1 June 2022

Review Date(s): June 2010, June 2016

Site Location: State Highway 3, RP352-5.070,  
150 m south of State Highway 3/Waiau Road intersection,  
Road Reserve, Waverley

Legal Description: Lot 2 DP 7820 Pt Lot 2 DP 84280 Blk VIII Wairoa SD

Catchment: Waitotara

Tributary: Waiau [2]



## 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. 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 of the discharge.
- 2. After allowing for reasonable mixing, within a mixing zone extending 50 metres below the discharge point, the discharge shall not cause the concentration of the following constituents to be exceeded in the receiving water:

Constituent	Concentration
Unionised ammonia	0.025 gm <sup>-3</sup>
Filtered carbonaceous BOD <sub>5</sub>	2.0 gm <sup>-3</sup>

- 3. After allowing for reasonable mixing, within a mixing zone extending 50 metres below the discharge point, the discharge shall not give rise to any of the following effects in the receiving waters of the Waiau [2] Stream in the Waitotara catchment:
  - a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - b) any conspicuous change in the colour or visual clarity;
  - c) any emission of objectionable odour;
  - d) the rendering of fresh water unsuitable for consumption by farm animals;
  - e) any significant adverse effects on aquatic life.
- 4. The treatment and discharge system shall be designed, managed, operated and regularly maintained to ensure that the conditions of this consent are met.

## Consent 6621-1

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 2010 and/or June 2016, 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 19 September 2005

For and on behalf of  
Taranaki Regional Council

---

**Director-Resource Management**



## Appendix II

Categories used to evaluate environmental and  
administrative performance

## Categories used to evaluate environmental and administrative performance

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.