

South Taranaki District Council

Eltham WWTP

Monitoring Programme

Annual Report

2021-2022

Technical Report 2022-08



Working with people | caring for Taranaki



Taranaki Regional Council
Private Bag 713
Stratford

ISSN: 1178-1467 (Online)
Document: 3074564 (Word)
Document: 3088564 (Pdf)
February 2023

South Taranaki District Council

Eltham WWTP

Monitoring Programme

Annual Report

2021-2022

Technical Report 2022-08

South Taranaki District Council

Eltham WWTP

Monitoring Programme

Annual Report

2021-2022

Technical Report 2022-08

Taranaki Regional Council
Private Bag 713
Stratford

ISSN: 1178-1467 (Online)
Document: 3074564 (Word)
Document: 3088564 (Pdf)
February 2023

Executive summary

The South Taranaki District Council (STDC) operates a municipal wastewater treatment plant (WWTP) located on Castle Street at Eltham, in the Waingongoro catchment. This report for the period July 2021 to June 2022 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, South Taranaki District Council demonstrated a high level of environmental performance and high level of administrative performance.

The Council's monitoring programme for the year under review included four inspections and associated odour surveys, four pond effluent and 36 downstream water samples collected for physicochemical analysis. Seven additional samples (discharge, upstream and downstream) were collected in relation to a consented overflow.

The monitoring showed that activities at the Eltham WWTP were generally well managed. The majority of wastewater was pumped to the Hawera WWTP, with one consented overflow to the unnamed tributary of the Mangawhero Stream.

As in previous years, the monitoring indicated a continual improvement in water quality of the downstream environment associated with the diversion of wastes out of the Mangawhero Stream to the Hawera WWTP since the 2010-2011 period.

During the year, STDC demonstrated a high level of environmental and administrative performance with the resource consent.

For reference, in the 2021-2022 year, consent holders were found to achieve a high level of environmental performance and compliance for 88% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 10% of the consents, a good level of environmental performance and compliance was achieved.

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

This report includes recommendations for the 2022-2023 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	WWTP system	2
1.3	Resource consents	5
1.4	Monitoring programme	5
1.4.1	Introduction	5
1.4.2	Programme liaison and management	5
1.4.3	Site inspections	5
1.4.4	Chemical sampling	6
2	Results	7
2.1	Inspections	7
2.1.1	Odour surveys	7
2.2	Results of effluent monitoring	8
2.2.1	Dissolved oxygen levels	8
2.2.2	Microfloral component	9
2.2.3	Holding pond conditions	9
2.3	Results of receiving environment monitoring	10
2.3.1	Chemical sampling surveys	10
2.4	Incidents, investigations, and interventions	14
3	Discussion	15
3.1	Discussion of site performance	15
3.2	Environmental effects of exercise of consents	15
3.3	Evaluation of performance	15
3.4	Recommendations from the 2020-2021 Annual Report	17
3.5	Alterations to monitoring programmes for 2022-2023	17
4	Recommendations	18
	Glossary of common terms and abbreviations	19
	Bibliography and references	21

Appendix I Resource consents held by STDC

Appendix II Categories used to evaluate environmental and administrative performance

List of tables

Table 1	Summary of resource consent held by STDC in relation to the Eltham WWTP	5
Table 2	Dissolved oxygen levels at the surface of the Eltham WWTP primary pond	9
Table 3	Chlorophyll-a levels and primary pond appearance	9
Table 4	Water quality results downstream of the Eltham WWTP 2021-2022 (SEM samples)	10
Table 5	Discharge results overflow sampling, 18 February 2022	11
Table 6	Receiving water quality results overflow sampling, 18 February 2022	11
Table 7	Summary of performance for consent 7521-1	15
Table 8	Evaluation of environmental performance over time	16

List of figures

Figure 1	Schematic layout of Eltham WWTP prior to the diversion of wastewater to the Hawera WWTP	3
Figure 2	Aerial view of the Eltham WWTP	4
Figure 3	Aerial map showing location of sampling sites.	13

List of photos

Photo 1	Overflow pipes from the holding pond to the unnamed tributary of the Mangawhero Stream, February 2022	12
---------	---	----

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 2021 to June 2022 by the Taranaki Regional Council (the Council) on the monitoring programme associated with resource consents held by South Taranaki District Council (STDC), for the operation of a municipal wastewater treatment plant (WWTP) situated on Castle Street at Eltham.

The report includes the results and findings of the monitoring programme implemented by the Council in respect of the consent held by STDC that relates the discharge of treated wastewater in the Waingongoro catchment (limited to events associated with high rainfall). This report is the 35th annual report to be prepared by the Council to cover STDC's discharge and its effects.

1.1.2 Structure of this report

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

- consent compliance monitoring under the RMA if RMA not referenced in full in section 1.1.1 then state full title in the following format here: *Resource Management Act 1991* (RMA) and the Council's obligations;
- the Council's approach to monitoring sites through annual programmes;
- the resource consents held by STDC in the Waingongoro catchment;
- the nature of the monitoring programme in place for the period under review; and
- a description of the activities and operations conducted at the Eltham WWTP.

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

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

Section 4 presents recommendations to be implemented in the 2022-2023 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 2.

For reference, in the 2021-2022 year, consent holders were found to achieve a high level of environmental performance and compliance for 88% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 10% of the consents, a good level of environmental performance and compliance was achieved.¹

1.2 WWTP system

Historically, the Eltham township sewage treatment has been provided by a two oxidation pond system. The original design was based on a population of 5,500 persons, prior to the installation of mechanical aeration. Various industrial wastes have also been accepted for treatment by this system. Mechanical aeration of the primary oxidation pond was introduced because of overloading of the two pond system as a consequence of the incorporation of these industrial wastes.

Over time it became evident that the treatment system was not capable of coping with the waste loadings it was receiving. From time to time complaints were received by STDC and the Council concerning objectionable odours emanating from the ponds system as well as various other environmental and maintenance issues.

Poor stream water quality conditions had also been identified on occasion upstream of the oxidation ponds' discharge.

During the 2004-2005 monitoring period, investigation and reviews relating to the proposed pipeline diversion of wastes (out of the Mangawhero Stream) to the Hawera WWTP were completed. The pipeline diversion was completed in June 2010 following the pipeline and pump station construction.

¹ The Council has used these compliance grading criteria for more than 18 years. They align closely with the 4 compliance grades in the MfE Best Practice Guidelines for Compliance, Monitoring and Enforcement, 2018

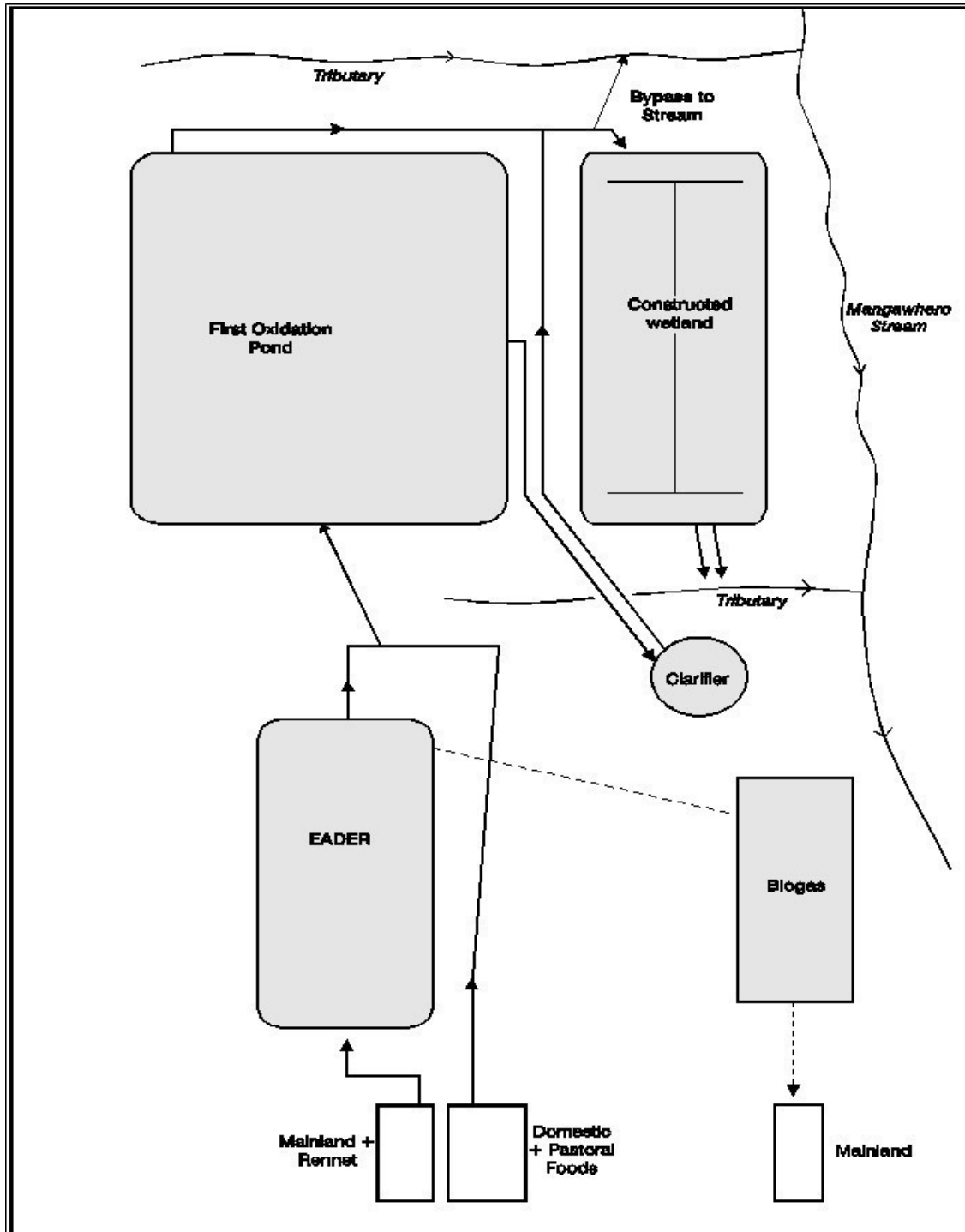


Figure 1 Schematic layout of Eltham WWTP prior to the diversion of wastewater to the Hawera WWTP

The layout of the wastewater plant as it existed prior to the new pipeline diversion is illustrated in Figure 1.

Reconfiguration of the wetland to act as a storage pond was undertaken following full diversion of wastes to the Hawera pipeline.

The primary pond was desludged during the 2006-2007 monitoring year with the dewatered sludge contained in geo-textile bags in an excavated, bunded area adjacent to the Earthen Anaerobic Digester (EADER) (Figure 1). A consent to discharge sludge from the WWTP and STDC water treatment plants to land at the Eltham WWTP site was granted in December 2009 following concerns voiced by neighbours in relation to STDC's disposal of water treatment sludge at the site.



Figure 2 Aerial view of the Eltham WWTW

Work commenced on the pipeline connection to the Hawera WWTW during the latter half of the 2008-2009 monitoring period. A step screen and new inlet to the primary pond were constructed on the raw wastewater reticulation and a new stormwater pipe from this area was directed to the wetland. The wetland was converted to a holding pond in early 2011 to provide high stormwater ingress containment in excess of the pumping capacity of the new pipeline connection. This system is anticipated to have an overflow frequency of one to two occasions in any five year period necessitating a new consent for this discharge which was granted in November, 2009 (consent 7521). Monitoring of overflows from the pond is provided and incorporated within the consent holder's telemetry system.

The new pipeline was operational by June 2010 and the full upgrade (e.g. conversion of the wetland to a storage pond) was completed in early 2011 with the vegetation removed and buried with the sludge. This was covered, levelled, and replanted by the consent holder in the latter part of the 2011-2012 monitoring period. Discharges to the stream ceased completely in late June 2010.

Stormwater infiltration investigative work has been continued by STDC, particularly in relation to illegal connections to the sewerage reticulation. Re-lining of sewerage pipelines has been undertaken by STDC since 2011. No re-lining was undertaken in the 2020-2021 period.

The EADER was decommissioned during the 2015-2016 period by way of re-lining and burial.

No usage of the Eltham WWTW for disposal of industrial tanker wastes (e.g. septic tank wastes etc.) now occurs as there are purpose-built facilities in place to accept these wastes at the nearby Stratford oxidation ponds and more appropriately, the Hawera system. Monitoring of waste influent in the ponds is performed by STDC (by way of continuous recording of volume and periodic industrial wastewater quality sampling), ensuring that stricter control of such usage now occurs.

During the 2021-2022 monitoring period there was one authorised overflow to the Mangawhero Stream as per consent 7521-1.

1.3 Resource consents

STDC holds one resource consent in relation to the Eltham WWTP, the details of which are summarised in the table below. Summaries of the conditions attached to each permit are set out in Section 3 of this report.

A summary of the various consent types issued by the Council is included in Appendix I, as is a copy of the permit.

Table 1 Summary of resource consent held by STDC in relation to the Eltham WWTP

Consent number	Purpose	Granted	Review	Expires
<i>Water discharge permit</i>				
7521-1	To discharge, as a consequence of high rainfall, partially treated wastewater from the Eltham Wastewater Treatment Plant into an unnamed tributary of the Mangawhero Stream in the Waingongoro catchment.	November 2009	-	June 2027

1.4 Monitoring programme

1.4.1 Introduction

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

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

The monitoring programme for the Eltham WWTP consisted of three primary components.

1.4.2 Programme liaison and management

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

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

1.4.3 Site inspections

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

1.4.4 Chemical sampling

The Council undertook sampling of the effluent in the primary pond adjacent to the discharge point on four occasions for microfloral quality and dissolved oxygen levels.

Routine monthly 'State of the Environment Monitoring' (SEM) occurs at three sites downstream of the WWTP. The results of this monitoring are included for comparison purposes and to provide baseline analysis in the event of any discharges from the Eltham WWTP.

Additional sampling was undertaken in relation to the overflow to the Mangawhero Stream which occurred in February 2022.

2 Results

2.1 Inspections

3 August 2021

The step screen was operating and wastes were fully contained. The old paddle aerators were being replaced and contractors were commissioning the new aerators at the time of the inspection. The primary pond was turbid and light brown. Biobugs continued to be dosed into the pond. Approximately 75 Mallard ducks were observed on the pond. The Eader was visually stable.

There was a slightly noticeable odour around the inlet and step screen areas. However, no odour issues were noted around the pond perimeter or beyond the southern boundary. The WWTP surrounds were found to be tidy.

The Eltham WWTP was discharging to the Hawera WWTP at the rate of 110 m³/hr.

24 November 2021

The step screen was operating and wastes were fully contained. The primary pond was turbid dark green and pockets of scum were floating on the pond surface near the inlet. All inlet and perimeter aerators were operating. Wildlife consisted of approximately 150 birds; mallard ducks and black swans. The Eader appeared to be stable.

There was a slightly noticeable odour around the inlet and step screen areas. There were no odours noted around the pond perimeter or beyond the southern boundary. The WWTP surrounds were observed to be tidy.

Eltham WWTP was not discharging to the Hawera WWTP.

27 January 2022

The step screen was operating and wastes were fully contained. The primary pond was turbid and dark green in colour. All aerators were operating. Approximately 350 ducks were present, mainly mallard and paradise.

There was a moderate odour around the inlet and step screen areas, and mild odour noted around the pond perimeter. No odour was noted beyond the southern boundary. The WWTP surrounds were found to be tidy.

12 April 2022

The step screen was operating and wastes were fully contained. The primary pond was turbid dark green. All aerators were operating. Contractors were removing and cleaning the bubbler diffuser lines. Approximately 150 ducks were observed.

There was a slightly noticeable odour around the inlet and step screen areas, with no odour issues noted around the pond perimeter nor beyond the southern boundary. The WWTP surrounds were found to be tidy.

Eltham WWTP was discharging to the Hawera WWTP.

2.1.1 Odour surveys

Four routine odour surveys were carried out during the monitoring period in conjunction with all programmed site inspections. Odour strength was rated according to the following scale:

- 0 = no noticeable odours;
- 1 = slight occasional wafts;

- 2 = recognisable and noticeable;
- 3 = frequently noticeable;
- 4a = unpleasant odours, frequently strong;
- 4b = unpleasant odours, continuous and noticeable; and
- 5 = putrid.

The strength of odour beyond the boundaries of the WWTP site appears to be governed largely by weather conditions. Odour is strongest under calm condition, when aerial emissions from the pond accumulate. This effect is accentuated when it is overcast, as vertical mixing with ambient air is reduced, and under warm temperatures, when odour-generating bacteria in the pond are most active. Effects may be exacerbated by reduction in aeration capacity (mechanical) in the pond and deterioration in the microfloral population of this pond. Aeration capacity was maintained adequately throughout the 2021-2022 period.

Odours from the Eltham WWTP will occur from time to time and will vary in their effect depending upon ambient weather conditions. Therefore, they may only be documented by way of continuing monitoring and recording of incidents, in conjunction with the monitoring of the system now that connection to the Hawera WWTP pipeline has been completed. It is essential that sufficient aeration is provided and capacity is maintained in the primary oxidation pond at all times, particularly coincident with seasonal changes in pond floral communities. It is also essential that the pre-treatment of industrial wastes is maintained to a satisfactory standard at all times prior to discharge into the WWTP.

No odour was detected beyond the boundary during any of the four routine inspections.

2.2 Results of effluent monitoring

With the diversion of wastes to the Hawera WWTP in the 2010-2011 period, discharges from the Eltham WWTP now occur only as a result of high rainfall events that exceed the storage capacity of the primary and holding ponds, and the pumping capacity of the reticulated system to Hawera.

Analysis of the primary pond effluent was not required during the monitoring period, although the condition of the pond and any associated odour continues to be monitored during routine inspections.

Along with a visual survey of the primary pond and surrounds, dissolved oxygen (DO) levels and the microfloral component of the pond are measured during each inspection.

2.2.1 Dissolved oxygen levels

The dissolved oxygen concentrations in WWTPs vary both seasonally and during the day as a result of a combination of factors. The photosynthetic activity of the pond's microflora together with fluctuations in influent waste loadings on the system are major influencing factors. Another significant influence in the Eltham system is the degree of mechanical aeration provided in the primary pond (required by the high industrial wastes loadings on the system). Minimum dissolved oxygen concentrations are generally recorded in the early hours of daylight, and therefore pond performance has been evaluated by standardising sampling times toward mid-morning for all regular inspection visits during the monitoring period.

The results of dissolved oxygen monitoring in the primary pond recorded adjacent to the aerators' DO probe are included in Table 2.

Results in Table 2 show a wide range of dissolved oxygen concentrations between 4.2% and 136% saturation in the surface layer of the primary pond near the outlet. These were typical of the levels generally recorded in this heavily loaded oxidation pond (i.e. supersaturation is seldom recorded). Mechanical aeration of the pond maintained positive dissolved oxygen concentrations on each survey occasion with the lowest concentration measured during the summer period.

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

Date	Time (NZST)	Temperature (°C)	Dissolved Oxygen	
			Concentration (g/m ³)	Saturation (%)
3 August 2021	1010	12.6	0.43	4.2
24 Nov 2021	0940	21.8	11.7	136
27 January 2022	0905	22.4	5.7	56
12 Apr 2022	0940	17.1	6.3	65

2.2.2 Microfloral component

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

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

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

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

Table 3 Chlorophyll-a levels and primary pond appearance

Date	Time	Appearance	Chlorophyll-a (mg/m ³)	Chlorophyll-a (mg/m ³) data from July 2013 to June 2021		
				N	Range	Median
3 August 2021	1010	Turbid, light brown	45	35	<1 -3,020	520
24 Nov 2021	0940	Turbid, dark green	2,400			
27 January 2022	0905	Turbid, dark green	900			
12 April 2022	0940	Turbid, dark green	1,030			

Levels of chlorophyll-a in the primary pond were fairly low during winter, increasing in the warmer months. The Eltham pond generally has fairly high chlorophyll-a concentration with a median of 520.

2.2.3 Holding pond conditions

No odours were associated with the holding pond at the time of any inspection visit. The pond contained stormwater or seepage following wet weather. The majority of water and wastes from the pond were pumped directly into the Hawera WWTP pipeline. One overflow occurred to the unnamed tributary of the Mangawhero Stream.

2.3 Results of receiving environment monitoring

Routine monthly 'State of the Environment Monitoring' (SEM) occurs at three sites downstream of the WWTP, and the results of this monitoring are included for comparison purposes and to provide baseline analysis in the event of any discharges from the Eltham WWTP. Water quality monitoring is carried out downstream of the WWTP as required to assess the effects of any discharges from the WWTP. There was one discharge to the stream during the 2021-2022 period and additional samples were collected.

The sampling sites are shown in Figure 3.

2.3.1 Chemical sampling surveys

Monthly water quality monitoring is carried out at the lower Mangawhero Stream and two Waingongoro River sites as part of the State of the Environment Monitoring (SEM) (Table 4), this is displayed for comparison purposes with any future discharges and to provide baseline water quality parameters for the Mangawhero Stream and Waingongoro River.

Median values of selected parameters indicate dilution of the Mangawhero Stream flow by the flow of the Waingongoro River over the sampling period.

Table 4 Water quality results downstream of the Eltham WWTP 2021-2022 (SEM samples)

Parameter	Units	MWH000498		WGG000620		WGG000640	
		Range	Median	Range	Median	Range	Median
Temperature	°C	8.2-19.7	14.0	7.2-19.3	14.4	7.6-19.8	13.5
Conductivity @ 25°C	mS/m	17.7-19.9	18.2	6.9-14.6	13.1	8.2-15.7	15.0
Chloride	g/m ³	17-20	18	6-13	13	8-15	14
pH	pH	6.7-7.9	7.4	7.0-7.9	7.2	7.0-8.0	7.4
DRP	g/m ³ P	0.0093-0.057	0.027	0.0115-0.038	0.026	0.015-0.034	0.03
Total phosphorus	g/m ³ P	0.042-0.143	0.069	0.02-0.065	0.046	0.025-0.097	0.057
Unionised Ammonia	g/m ³ N	0.00009-0.0022	0.00056	0.00005-0.0012	0.00034	0.00008-0.0016	0.00042
Ammoniacal Nitrogen	g/m ³ N	0.011-0.19	0.075	0.015-0.21	0.032	0.012-0.18	0.046
Nitrite Nitrogen	g/m ³ N	0.013-0.055	0.030	0.0041-0.014	0.0078	0.0073-0.0188	0.014
Nitrate Nitrogen	g/m ³ N	1.3-2.3	1.7	0.59-2.1	1.4	0.73-2.2	1.4
TKN	g/m ³ N	0.25-0.62	0.41	0.11-0.41	0.19	0.18-0.72	0.3
Total nitrogen	g/m ³ N	1.6-2.6	2.1	0.97-2.3	1.6	0.99-2.5	1.8
Turbidity	FNU	3.9-11.9	5.6	0.62-3.8	2.1	1.8-9	3.5

Median nutrient concentrations in the Mangawhero Stream post-diversion of WWTP wastes continue to show a reduction in concentration, with ammoniacal nitrogen and dissolved reactive phosphorus medians lower by 99% and 95% respectively than prior to wastes diversion. Most minimum nutrient concentrations have been markedly lower since the diversion. This does not take into account additional inputs to the stream, including dairy discharge, which affect water quality.

Additional samples were collected on one occasion after heavy rainfall resulted in an overflow to the Mangawhero Stream (Photo 1).

Table 5 Discharge results overflow sampling, 18 February 2022

Parameter	Units	OXP006002	Discharge from overflow pipes to Mangawhero Stream
		Wetlands treated waste	
Temperature	°C	21.0	21.1
Conductivity @ 25°C	mS/m	66.6	66.0
Chloride	g/m ³	80	83
pH	pH	7.3	7.8
DRP	g/m ³ P	9.0	13.1
Dissolved oxygen	g/m ³	8.03	12.3
DO saturation	%	92	142
Ammoniacal Nitrogen	g/m ³ N	0.51	0.034
Nitrate-N + Nitrite-N	g/m ³ N	3.5	2.5
<i>E. coli</i>	g/m ³ N	> 24,200	8,660
Turbidity	FNU	85	51
Appearance		Turbid, dark green	Turbid, bright green

Table 6 Receiving water quality results overflow sampling, 18 February 2022

Parameter	Units	MWH000375	MWH000410	MWH000498	WGG000620	WGG000640
		upstream of d/c	400m d/s of d/c	u/s confluence	u/s confluence	d/s confluence
Temperature	°C	16.8	17.2	16.4	16.0	16.0
Conductivity @ 25°C	mS/m	22.1	23.8	19.2	14.2	15.7
Chloride	g/m ³	22	23	20	15	17
pH	pH	6.7	7.0	7.4	7.6	7.3
DRP	g/m ³ P	0.031	0.37	0.12	0.015	0.053
Dissolved oxygen	g/m ³	7.38	7.17	8.76	9.30	9.14
DO saturation	%	77	76	91	96	94
Unionised Ammonia	g/m ³ N	0.0006	0.00093	0.00091	0.00025	0.00027
Ammoniacal Nitrogen	g/m ³ N	0.36	0.31	0.12	0.02	0.046
Nitrate-N + Nitrite-N	g/m ³ N	1.75	1.89	1.84	2.10	1.99
<i>E. coli</i>	g/m ³ N	354	909	1,789	1,223	860
Turbidity	FNU	7.8	9.6	5.9	1.4	3.5
Appearance		Turbid, brown	Turbid, brown	Turbid, brown	Turbid, brown	Slightly turbid, brown

Table 5 presents the results of samples collected from the wetlands (treated waste, OXP006002) and from samples collected directly from the overflow discharge to the stream. Table 6 presents the results of receiving water samples collected both upstream and downstream of the discharge.

The discharge results were fairly typical of treated oxidation pond wastes with high conductivity, chloride, dissolved reactive phosphorus (DRP), nitrate-N + nitrite-N, *E. coli* and turbidity. As a result, conductivity, DRP, turbidity, nitrate-N + nitrite-N, unionised ammonia and *E. coli* all increased at the site immediately below the discharge (MWH000410) compared with upstream. Turbidity decreased further downstream and was lower upstream of the confluence with the Waingongoro (MWH000498) than upstream of the WWTP. DRP levels had reduced at the site upstream of the confluence with the Waingongoro River (MWH000498), however the results were higher than usually found at this site and at the site downstream of the confluence (WGG000640, refer to SEM sample results in Table 4).

The stream provided some dilution of the *E. coli* (from 8,660 MPN/100 ml in the discharge to 909 MPN /100 ml 400 m downstream), however numbers were still quite high prior to the confluence with the Waingongoro (1,789 MPN /100 ml). Levels in the Waingongoro upstream of the confluence (WGG000620) were elevated anyway (1,223 MPN /100 ml), dropping downstream of the confluence (860 MPN /100 ml).



Photo 1 Overflow pipes from the holding pond to the unnamed tributary of the Mangawhero Stream, February 2022



Figure 3 Aerial map showing location of sampling sites.

2.4 Incidents, investigations, and interventions

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

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

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

In the 2021-2022 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.

3 Discussion

3.1 Discussion of site performance

The Eltham WWTP was well maintained and managed during the 2021-2022 year.

The majority of wastewater from the WWTP was pumped to Hawera during the 2022-2023 year, with one overflow to the stream occurring in February 2022.

On 17 February 2022 the Eltham WWTP ponds were full to capacity and began to discharge dilute wastewater via the overflow pond to an unnamed tributary of the Mangawhero Stream. This was a result of heavy and persistent rain, and associated inflow and infiltration into the sewer network on both private and public property. Signage was put around the nearby stream and also at Ohawe Beach. Neighbours of the WWTP were visited and informed, Iwi were notified along with a general public notification from STDC. The overflow ceased on 27 February 2022.

3.2 Environmental effects of exercise of consents

Past significant impacts on the receiving water quality of the Mangawhero Stream, and to a lesser effect on the Waingongoro River downstream of the confluence with the Mangawhero Stream, have been alleviated with the pipeline diversion of the wastewater to the Hawera WWTP. This is evidenced by the monthly SEM sampling of the lower reach of the Mangawhero Stream and mid-reaches of the Waingongoro River, which have confirmed marked improvements in water quality (such as nutrient reduction).

Additional monitoring was undertaken in conjunction with the one consented overflow that occurred during the monitoring period. Although increased levels of *E. coli* and DRP immediately below the discharge point persisted further downstream, no significant long term impacts would be expected in the Mangawhero Stream or in the Waingongoro River below the Mangawhero Stream confluence as a result of the short duration overflow. State of the environment trend monitoring over a twenty-plus year period has shown significant statistical and ecological improvements in stream and river biological health at both sites downstream of the wastewater outfall.

Future riparian planting and the movement towards dairy shed treated waste irrigation to land should further contribute to marked improvements in the water quality of the receiving waters of the Mangawhero Stream and the Waingongoro River.

3.3 Evaluation of performance

A tabular summary of the consent holder's compliance record for the year under review is set out in Table 7.

Table 7 Summary of performance for consent 7521-1

Purpose: To discharge, as a consequence of high rainfall, partially treated wastewater from the Eltham Wastewater Treatment Plant into an unnamed tributary of the Mangawhero Stream in the Waingongoro catchment.		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Limits on the timing of discharges	Inspection, liaison with consent holder - one discharge during period under review	Yes
2. Requirements of plant storage capacity	Inspection	Yes
3. Limits on plant modifications	Inspection, liaison with consent holder	Yes

Purpose: To discharge, as a consequence of high rainfall, partially treated wastewater from the Eltham Wastewater Treatment Plant into an unnamed tributary of the Mangawhero Stream in the Waingongoro catchment.		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
4. Requirements of overflow reporting	Liaison with consent holder	Yes
5. Consent holder to adopt best practicable option	Inspection	Yes
6. Requirements of overflow notification	Notification received	Yes
7. Requirements of contingency plan	Updated report received May 2022	Yes
8. Provisions for monitoring	Chemical sampling	Yes
9. Review condition	No further provision for review prior to expiry	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable

Table 8 Evaluation of environmental performance over time

Year	High	Good	Improvement req	Poor
2009	-	-	-	1
2010	-	-	-	1
2011	1	-	-	-
2012	1	-	-	-
2013	1	-	-	-
2014	1	-	-	-
2015	-	1	-	-
2016	1	-	-	-
2017	1	-	-	-
2018	1	-	-	-
2019	1	-	-	-
2020	1	-	-	-
2021	1	-	-	-
Totals	10	1	0	2

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

Downstream monitoring of receiving waters continues to document the improvement of the Mangawhero Stream health following the diversions of the treated wastes from the stream to the Hawera WWTP.

3.4 Recommendations from the 2020-2021 Annual Report

In the 2020-2021 Annual Report, it was recommended:

1. THAT in the first instance, monitoring of consented activities at Eltham WWTP in the 2021-2022 year continue at the same level as in 2020-2021.
2. THAT should there be issues with environmental or administrative performance in 2021-2022, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

These recommendations were implemented.

3.5 Alterations to monitoring programmes for 2022-2023

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 2022-2023.

4 Recommendations

1. That in the first instance, monitoring of consented activities at Eltham 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.

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.
Fresh	Elevated flow in a stream, such as after heavy rainfall.
g/m ³	Grams per cubic metre, and equivalent to milligrams per litre (mg/L). In water, this is also equivalent to parts per million (ppm), but the same does not apply to gaseous mixtures.
Incident	An event that is alleged or is found to have occurred that may have actual or potential environmental consequences or may involve non-compliance with a consent or rule in a regional plan. Registration of an incident by the Council does not automatically mean such an outcome had actually occurred.
Intervention	Action/s taken by Council to instruct or direct actions be taken to avoid or reduce the likelihood of an incident occurring.
Investigation	Action taken by Council to establish what were the circumstances/events surrounding an incident including any allegations of an incident.
Incident register	The incident register contains a list of events recorded by the Council on the basis that they may have the potential or actual environmental consequences that may represent a breach of a consent or provision in a Regional Plan.
L/s	Litres per second.
m ²	Square metres.
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.
NH ₄ ⁺	Ammonium, normally expressed in terms of the mass of nitrogen (N).
NH ₃	Unionised ammonia, normally expressed in terms of the mass of nitrogen (N).
NO ₃ ⁻	Nitrate, normally expressed in terms of the mass of nitrogen (N).
NO ₂ ⁻	Nitrite, normally expressed in terms of the mass of nitrogen (N).
NTU	Nephelometric Turbidity Unit, a measure of the turbidity of water.

pH	A numerical system for measuring acidity in solutions, with 7 as neutral. Numbers lower than 7 are increasingly acidic and higher than 7 are increasingly alkaline. The scale is logarithmic i.e. a change of 1 represents a ten-fold change in strength. For example, a pH of 4 is ten times more acidic than a pH of 5.
Physicochemical	Measurement of both physical properties (e.g. temperature, clarity, density) and chemical determinants (e.g. metals and nutrients) to characterise the state of an environment.
Resource consent	Refer Section 87 of the RMA. Resource consents include land use consents (refer Sections 9 and 13 of the RMA), coastal permits (Sections 12, 14 and 15), water permits (Section 14) and discharge permits (Section 15).
RMA	<i>Resource Management Act 1991</i> and including all subsequent amendments.
SQMCI	Semi quantitative macroinvertebrate community index.
Temp	Temperature, measured in °C (degrees Celsius).
TKN	Total Kjeldahl nitrogen. Combination of organic nitrogen, NH ₃ , and NH ₄ ⁺ .
Turb	Turbidity, expressed in NTU.
WWTP	Wastewater treatment plant.

For further information on analytical methods, contact a Manager in the Environmental Quality department.

Bibliography and references

- Don, G 2004: 'Wastewater treatment plant avifauna'. Water and Wastes in NZ. July 2004.
- Martin, ML and Tanner, CC. 2000: 'Eltham WWTP Wetlands Recommissioning'. NIWA Client Report. SC1012-30.
- Ministry for the Environment. 2018. Best Practice Guidelines for Compliance, Monitoring and Enforcement under the Resource Management Act 1991. Wellington: Ministry for the Environment.
- Royds Garden 1994a: 'South Taranaki District Council, Eltham Wastewater Management Plan'. Royds Garden Ltd, Dunedin report.
- Royds Garden 1994b: 'South Taranaki District Council Eltham Wastewater Management Plan II. Treatment and Disposal Options'. Royds Garden Ltd, Dunedin report.
- Royds Consulting 1995: 'South Taranaki District Council, Management Plan for Operation of Eltham WWTP over the Next Five Years'. Royds Consulting Ltd, Dunedin report.
- Stark, JD, Fowles, CR, 2006: 'An approach to the evaluation of temporal trends in Taranaki state of the environment macroinvertebrate data'. Cawthron report No 1135. 88p.
- Taranaki Regional Council 2021: 'South Taranaki District Council Eltham WWTP Monitoring Programme Annual Report 2020-2021'. TRC Technical Report 2021-20.
- Taranaki Regional Council 2020: 'South Taranaki District Council Eltham WWTP Monitoring Programme Annual Report 2019-2020'. TRC Technical Report 2020-10.
- Taranaki Regional Council 2020: 'South Taranaki District Council Eltham WWTP Monitoring Programme Annual Report 2018-2019'. TRC Technical Report 2019-40.
- Taranaki Regional Council 2019: 'South Taranaki District Council Eltham WWTP Monitoring Programme Annual Report 2017-2018'. TRC Technical Report 2018-35.
- Taranaki Regional Council 2017: 'South Taranaki District Council Eltham WWTP Monitoring Programme Annual Report 2016-2017'. TRC Technical Report 2017-31.
- Taranaki Regional Council 2016: 'South Taranaki District Council Eltham Wastewater Treatment Plant Monitoring Programme Annual Report 2015-2016'. TRC Technical Report 2016-29.
- Taranaki Regional Council 2016: 'South Taranaki District Council Eltham EADER Remediation Additional Monitoring Report March 2016'. Document number 1691047.
- Taranaki Regional Council 2015: 'South Taranaki District Council Eltham Wastewater Treatment Plant Monitoring Programme Annual Report 2014-2015'. TRC Technical Report 2015-21.
- Taranaki Regional Council 2015a: 'Freshwater physicochemical programme State of the Environment Monitoring Annual Report 2014-2015'. TRC Technical Report 2015-23.
- Taranaki Regional Council 2014: 'South Taranaki District Council Eltham Wastewater treatment plant Monitoring Programme Annual Report 2013-2014'. TRC Technical Report 2014-05.
- Taranaki Regional Council 2014a: 'Freshwater macroinvertebrate fauna biological monitoring programme Annual State of the Environment Monitoring Report 2013-2014'. TRC Technical Report 2014-20.
- Taranaki Regional Council 2013: 'South Taranaki District Council Eltham Wastewater treatment plant Monitoring Programme Annual Report 2012-2013'. TRC Technical Report 2013-31.
- Taranaki Regional Council 2012: 'South Taranaki District Council Eltham Wastewater treatment plant Monitoring Programme Annual Report 2011-2012'. TRC Technical Report 2012-15.

Taranaki Regional Council 2011: 'South Taranaki District Council Eltham Wastewater treatment plant Monitoring Programme Annual Report 2010-2011'. TRC Technical Report 2011-13.

Taranaki Regional Council 2010: 'South Taranaki District Council Eltham Wastewater treatment plant Monitoring Programme Annual Report 2009-2010'. TRC Technical Report 2010-33.

Taranaki Regional Council 2009: 'South Taranaki District Council Eltham Wastewater treatment plant Monitoring Programme Annual Report 2008-2009'. TRC Technical Report 2009-42.

Taranaki Regional Council 2008: 'South Taranaki District Council Eltham Wastewater treatment plant Monitoring Programme Annual Report 2007-2008'. TRC Technical Report 2008-47.

Taranaki Regional Council 2007: 'South Taranaki District Council Eltham Wastewater treatment plant Monitoring Programme Annual Report 2006-2007'. TRC Technical Report 2007-51..

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.

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: 10 November 2009

Conditions of Consent

Consent Granted: To discharge, as a consequence of high rainfall, partially treated wastewater from the Eltham Wastewater Treatment Plant into an unnamed tributary of the Mangawhero Stream in the Waingongoro catchment at or about (NZTM) 1712439E-5633480N

Expiry Date: 1 June 2027

Review Date(s): June 2015, June 2017, June 2021

Site Location: Castle Street, Eltham

Legal Description: Pt Lot 3 DP 1564 Lot 9 DP 2321

Catchment: Waingongoro

Tributary: Mangawharawhara
Mangawhero

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 discharge shall only occur as a consequence of high rainfall events when the inflows to the wastewater treatment plant are such that the holding capacity of the treatment plant is exceeded.
2. The total storage capacity of the treatment plant shall be no less than 25,000 cubic metres.
3. The consent holder shall not undertake any modifications to the treatment plant that may result in an increase in the frequency of the discharge.
4. The consent holder shall record the timing and duration of the overflow to the unnamed stream, and report these records to the Chief Executive, Taranaki Regional Council, on request.
5. 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.
6. The consent holder shall phone the Taranaki Regional Council immediately after becoming aware of each discharge authorised by this permit, in order to enable the undertaking monitoring of the discharge in accordance with special condition 8.
7. Within three months of the granting of this consent, the consent holder shall prepare and maintain a contingency plan. The contingency plan shall be adhered to in the event of a discharge and shall, to the satisfaction of the Chief Executive, Taranaki Regional Council, detail measures and procedures to be undertaken to avoid, remedy or mitigate the environmental effects of the discharge.

Consent 7521-1

8. Subject to Section 36 of the Resource Management Act [1991], monitoring, including physicochemical, bacteriological and ecological monitoring of the wastewater treatment system and receiving waters shall be undertaken, as deemed reasonably necessary by the Chief Executive, Taranaki Regional Council, to understand the effects of the discharge.
9. 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 2015 and/or June 2017 and/or June 2021, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 10 November 2009

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.