

**Todd Generation  
Junction Road Power Plant  
Monitoring Programme  
Annual Report  
2020-2021**

Technical Report 2021-90



Working with people | caring for Taranaki



Taranaki Regional Council  
Private Bag 713  
Stratford

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## Executive summary

The Todd Generation Ltd Company (the Company) operates gas fired power plant, Junction Road Power Plant (JRPP). It is located at 688 Junction Road, New Plymouth, in the Waiwhakaiho catchment. The facility is composed of two gas fired peaker plants. This report is the inaugural year for the facility and is the first report for the Company.

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

This report for the period July 2020 to June 2021 describes the monitoring programme implemented by the Taranaki Regional Council (the Council) to assess the Company's environmental and consent compliance performance during the period under review. The report also details the results of the monitoring undertaken and assesses the environmental effects of the Company's activities.

The Company holds five resource consents, which include a total of 67 conditions setting out the requirements that the Company must satisfy. The Company one consents to discharge effluent/stormwater into the Mangorei Stream, one consent to discharge emissions into the air at this site and three land use permits.

The Council's monitoring programme for the year under review included one inspection, one ambient air quality survey and two biomonitoring surveys of receiving waters.

The monitoring showed that there was no evidence that any discharges from the Junction Road Power Plant had caused any recent detrimental impacts on the macroinvertebrate communities of the Mangorei Stream.

Ambient air quality monitoring was within guideline values. Testing undertaken during the commissioning stage indicated stack emissions were within specification. Which aligns with modelling submitted to the Council during the consenting stage of the process.

There were zero unauthorised incidents recording non-compliance in respect of this consent holder during the period under review.

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

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

This report includes recommendations for the 2021-2022 year.

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# 1 Introduction

## 1.1 Compliance monitoring programme reports and the Resource Management Act 1991

### 1.1.1 Introduction

This report is for the period July 2020 to June 2021 by the Taranaki Regional Council (the Council) on the monitoring programme associated with resource consents held by name in Todd Generation Ltd (the Company). The Company operates a 100 MW Peaker Power Plant situated on State Highway 3 and Mangorei Road, in the Waiwhakaiho catchment.

The report includes the results and findings of the monitoring programme implemented by the Council in respect of the consents held by the Company that relate to abstractions and discharges of water within the Waiwhakaiho catchment, and the air discharge permit held by the Company to cover emissions to air from the site.

One of the intents of the *Resource Management Act 1991* (RMA) is that environmental management should be integrated across all media, so that a consent holder's use of water, air, and land should be considered from a single comprehensive environmental perspective. Accordingly, the Council generally implements integrated environmental monitoring programmes and reports the results of the programmes jointly. This report discusses the environmental effects of the Company's use of water, land and air, and is the 1<sup>st</sup> combined annual report by the Council for the Company.

### 1.1.2 Structure of this report

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

- consent compliance monitoring under the RMA and the Council's obligations;
- the Council's approach to monitoring sites through annual programmes;
- the resource consents held by the Company in the Waiwhakaiho catchment;
- 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 2021-2022 monitoring year.

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

### 1.1.3 The Resource Management Act 1991 and monitoring

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

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

- d. natural and physical resources having special significance (for example recreational, cultural, or aesthetic); and
- e. risks to the neighbourhood or environment.

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

#### 1.1.4 Evaluation of environmental and administrative performance

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

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

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

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

##### Environmental Performance

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

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

For example:

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

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

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

### Administrative performance

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

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

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

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

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

## 1.2 Process description

Junction Road Peaker Plant (JRPP) came into commercial operation on the 15 May 2020, following a commissioning period in March of the same year. This facility utilises open cycle gas turbine technology, based on aero-derivative gas turbines. Two turbine units are located side by side, these deliver a nominal 50 MW power output each (i.e. 100 MW in total), and fire through the combustion of natural gas (approximately 80% methane).

The JRPP is run as a 'mid merit' installation, providing a peaking operation to meet the peaks of the country's electricity demand profile, and as an occasional base load unit during periods of extended demand. The peaking operation relates to short run times for daily peak electricity demands, typically from 7.00 am - 9.00 am and from 5.00 pm - 7.00 pm. The plant would also run for extended periods when power

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

from renewable energy sources, such as wind turbines and hydro power stations, are not sufficient to meet the country's power demand.

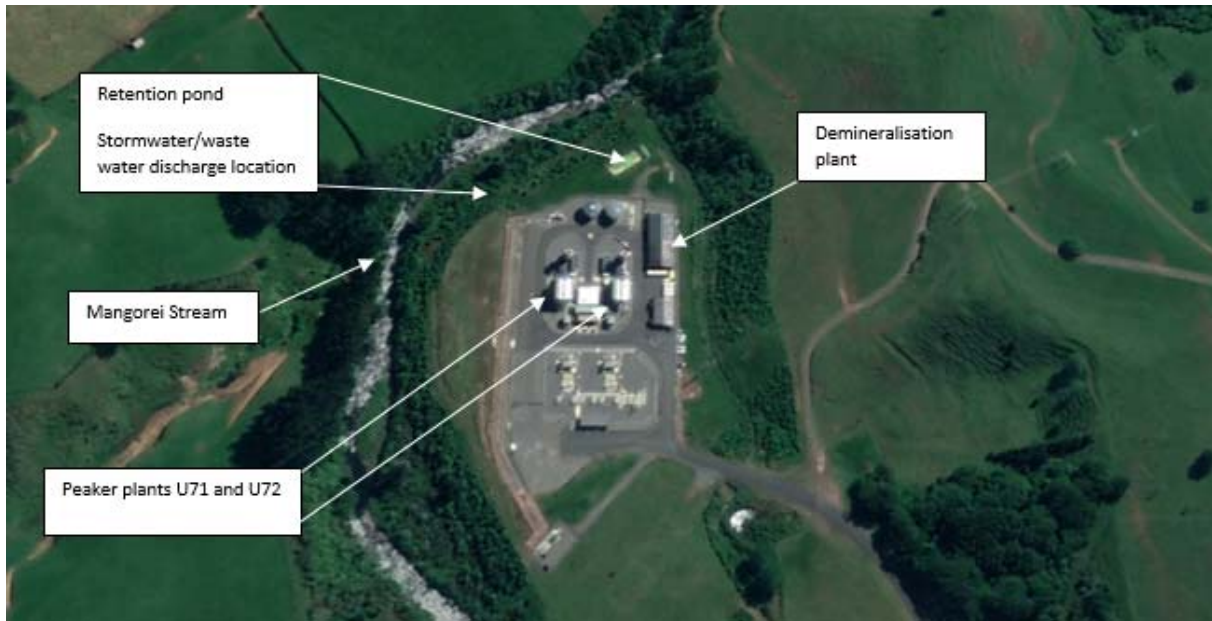


Figure 1 Birds eye view of the JRPP site State Highway 3 and the Mangorei Stream

The nature of peaker plant operations means that electricity production and the associated discharges and emissions will not be constant, as the JRPP will be dormant for periods of time.

#### Water abstraction

The demineralisation plant processes water taken directly from the reticulated supply line for New Plymouth city. This water is required for gas turbine power augmentation and NO<sub>x</sub> control, and this process produces the primary wastewater discharge from the site.

Output water from the demineralisation process is split into two streams, the pure water is used within the turbines, and the concentrate (wastewater) is discharged to the retention pond.

The maximum rate of wastewater discharge from the demineralisation process to the retention pond is 10 L/s. However the average daily discharge rate for the majority of the year is approximately 3 L/s. During the winter months there will generally be a higher level of discharge, approximately 5-10 L/s for several days, or possibly weeks during a dry year.

Other sources of wastewater are those that derive from intermittent dosing and membrane cleaning operations. The JRPP would not be operational during dosing events and the discharges would be of a low volume (approximately 2 m<sup>3</sup> per event).

#### Wastewater use

There is a single point source discharge from the site into the Mangorei Stream while the JRPP is operational. This discharge will contain both onsite stormwater and wastewater from the onsite demineralisation plant discussed above.

The Company combines both onsite stormwater and wastewater within a retention pond (approximately 250 m<sup>3</sup> in volume), prior to discharge. The maximum rate of wastewater discharge from the demineralisation plant to the retention pond is 10 L/s. However as a result of stormwater inputs to the pond, the discharge rate from the pond to the Mangorei Stream will be highly variable as it is dependent on weather conditions.

The size of the pond will allow storage for a 10% annual exceedance event (AEP) event. The maximum discharge rate from the pond during large rainfall events is 1,060 L/s as this is dictated by the size of the

outfall pipe (750 mm). However there is also provision for the pond to overflow via a spillway structure to a discharge swale (i.e. bypassing the 750 mm discharge pipe).

In situations where there has been no rainfall for prolonged periods of time, the demineralisation plant wastewater may be discharged without stormwater dilution. However in most cases, the wastewater stream will be diluted to varying degrees by uncontaminated site stormwater.

Although plant operations will be intermittent, discharges from the retention pond will also occur during dormant plant conditions. This discharge would typically consist of stormwater or stormwater including small quantities of residual wastewater.

### Stormwater

The JRPP occupies a site area of approximately 2.5 ha (Figure 1). All stormwater flows from within the site are directed to the retention pond before discharging to the Mangorei Stream. Any stormwater flows from outside of this area will be directed around the site.

The following two independent stormwater systems are proposed to deal with onsite stormwater:

- A 'clean' stormwater system; and
- A separate 'dirty' or 'potentially contaminated' stormwater system.

The clean stormwater system will drain all clean site areas and pavement surfaces within the site, and direct this water to the retention pond.

The potentially contaminated stormwater system (oily water system) will drain and treat potentially contaminated stormwater areas, site washdown water, and firewater from areas where oil is used within plant equipment. These areas include the gas turbine auxiliaries (lube oil tanks, hydraulic tank, fin fan cooler) as well as the main transformers (switchyard), and any other area that requires bunding.

A proprietary multiple-stage interceptor system (or similar) is used to ensure any oil contamination of the stormwater outputs will be below detectable limits (<15 mg/L). Polished stormwater from the interceptor system is then directed back to the retention pond.

The Council has yet to observe the retention pond discharging.

## 1.3 Resource consents

The Company holds five resource consents the details of which are summarised in the table below. Summaries of the conditions attached to each permit are set out in Section 3 of this report.

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

**Table 1** Resource consents held by the Company

Consent number	Purpose	Granted	Review	Expires
<i>Water discharge permits</i>				
<b>9383-1.1</b>	To discharge treated stormwater and wastewater from the Junction Road Power Plant into the Mangorei Stream	September 2017	June 2026	June 2033
<i>Air discharge permit</i>				

Consent number	Purpose	Granted	Review	Expires
<b>9402-1.1</b>	To discharge emissions into the air arising from combustion of natural gas and other activities associated with the operation of the Junction Road Power Plant	September 2017	June 2026	June 2033
<i>Land use permits</i>				
<b>9384-1.1</b>	To install and use a stormwater outlet structure in the Mangorei Stream	April 2017	June 2026	June 2033
<b>9385-1.0</b>	To realign an unnamed tributary of the Mangorei Stream	July 2013	June 2026	June 2033
<b>10217-1.0</b>	To install a culvert in an unnamed tributary of the Mangorei Stream, including associated disturbance of the streambed	February 2016	June 2026	June 2032

## 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 JRPP site consisted of primary components.

### 1.4.2 Programme liaison and management

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

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

### 1.4.3 Site inspections

The JRPP site was visited on one occasion during the monitoring period. With regard to consents for the abstraction of or discharge to water, the main points of interest were plant processes with potential or actual discharges to receiving watercourses, including contaminated stormwater and process wastewaters. Air inspections focused on plant processes with associated actual and potential emission sources and characteristics, including potential odour, dust, noxious or offensive emissions. Sources of data being collected by the Company 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

Originally discharge and Mangorei Stream samples were proposed to be collected on a quarterly basis through the monitoring period. However, due to the site setup. The process waters flow in to a large settling pond which soaks to land. Under extreme heavy rainfall there is some potential for this large (250 m<sup>3</sup>) settling pond to discharge by cascading over rip rack rock formation, to the Mangorei Stream. To date the Council has yet to observe the system discharging.

#### 1.4.5 Biomonitoring surveys

A biological survey was performed on two occasions in the Mangorei Stream. This was to determine whether or not the discharge of stormwater and process effluent from the site has had a detrimental effect upon the communities of the stream.

## 2 Results

### 2.1 Water

#### 2.1.1 Inspections

20 January 2021

An inspection was undertaken at the Junction Road Power Plant (JRPP). The Council's inspecting officer met with the site manager onsite prior to the inspection. Weather conditions were overcast with light rain. An inspection was carried out around the perimeter of the site.

The site appeared to be well maintained and tidy, with no signs of spills. All previous earthworks appeared to be stable and showed no signs of erosion. The stormwater system appeared to be functioning well with the pond at a low level.

The pond was not discharging at the time of inspection. The stormwater outfall appeared to be intact and well vegetated. There were no obvious effects on the receiving water. There were no issues with odour or noise around the site.

#### 2.1.2 Results of discharge monitoring

No discharge or stream samples were collected by the Council this monitoring period, as the site was not discharging at the time. A sample was collected by the Company from the stormwater pond and submitted for analysis.

Consent 9383-1.1, condition 5 requires the discharge to meet the following parameters:

Table 2 Consent 9383-1.1 condition 5 discharge parameters

Constituent	Standard
pH	Within the range 6-9
Suspended solids	< 100 g/m <sup>3</sup>
Total recoverable hydrocarbons	< 15 g/m <sup>3</sup>
Free chlorine	<0.1 g/m <sup>3</sup>

Table 3 Wastewater sample result 25 November 2020

Parameters	Unit	9383-1.1, con 5	Results 25/11/2020
Conductivity	uS/cm	-	72.4
Total dissolved solids	mg/L	-	85.6
Temperature	°C	-	16.2
Total chlorine	mg/L	-	<0.01
pH		6-9	7.28
Turbidity	NTU	-	7.97
Total suspended solids	mg/L	<100	5*
Chloride	mg/L	<50	<5*

Parameters	Unit	9383-1.1, con 5	Results 25/11/2020
Total petroleum hydrocarbons	mg/L	<15	<0.5*
*Tested by Analytica Laboratories subcontracted by Waterdoc Limited Stratford			

The singular sample (Table 3) submitted by the Company during this monitoring period was found to be compliant with condition 5 of consent 9383-1.1.

### 2.1.3 Biological monitoring

A biological monitoring survey was undertaken on two occasions this monitoring period. These were during October 2021 and February 2021.

#### Biomonitoring of the Mangorei Stream in relation to Junction Road Power Plant October 2020

This inaugural survey was the first of two biomonitoring surveys carried out in relation to the Junction Road Power Plant operated by the Company, for the 2020-2021 monitoring year. Three macroinvertebrate biomonitoring sites were established and monitored to investigate any adverse effects on the macroinvertebrate communities of the Mangorei Stream, in relation to the discharge of treated stormwater and wastewater from the JRPP. Condition 6e of consent 9383-1, stipulates "after allowing for reasonable mixing, within a mixing zone extending 25 m downstream of the discharge point, the discharge shall not, either by itself or in combination with other discharges, give rise to any significant adverse effects on aquatic life".

#### Methods

On 7 October 2020, the standard '400 ml kick-sampling' technique was used to collect samples from sites 1, 2 and 3 in the Mangorei Stream (Table 4, Figure 2).

Table 4 Biomonitoring sites in the Mangorei Stream surveyed in association with the Junction Road Power Plant

Site number	Site code	Grid reference	Location
1	MGE000850	E1695293 N5669708	Upstream of Junction Road Power Plant discharge
2	MGE000852	E1695357 N5669811	70 m upstream of pipe bridge
3	MGE000854	E1695425 N5669843	Immediately upstream of pipe-bridge

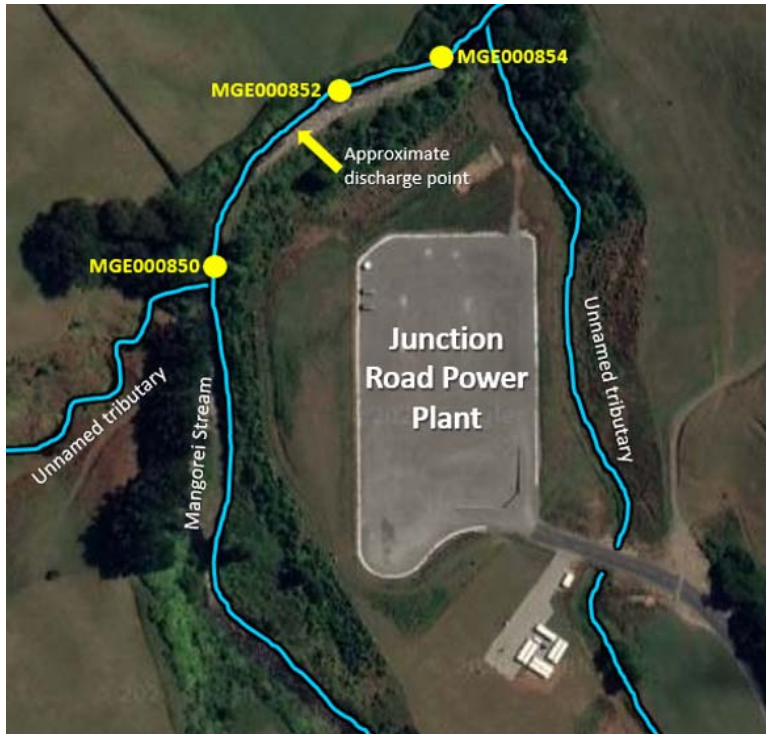


Figure 2 Biomonitoring sites in the Mangorei Stream sampled in relation to the Junction Road Power Plant

This 'kick-sampling' technique is very similar to Protocol C1 (hard-bottomed, semi-quantitative) of the New Zealand Macroinvertebrate Working Group (NZMWG) protocols for macroinvertebrate samples in wadeable streams (Stark et al, 2001). Samples were preserved with ethanol for later stereomicroscopic sorting and identification according to documented Taranaki Regional Council methodology and macroinvertebrate taxa abundances scored based on the categories in Table 5.

Table 5 Macroinvertebrate abundance categories

Abundance category	Number of individuals
R (rare)	1-4
C (common)	5-19
A (abundant)	20-99
VA (very abundant)	100-499
XA (extremely abundant)	500+

Stark (1985) developed a scoring system for macroinvertebrate taxa according to their sensitivity to organic pollution in stony New Zealand streams. Highly 'sensitive' taxa were assigned the highest scores of 9 or 10, while the most 'tolerant' scored 1. Sensitivity scores for certain taxa have been modified in accordance with Taranaki experience. By averaging the scores obtained from a list of taxa collected from one site and multiplying by a scaling factor of 20, a Macroinvertebrate Community Index (MCI) value was obtained. The MCI is a measure of the overall sensitivity of macroinvertebrate communities to the effects of organic pollution (Table 6). More 'sensitive' communities inhabit less polluted waterways. A difference of 10.83 units or more in MCI values is considered significantly different between individual kick samples (Stark 1998) and

from past TRC experience is also significantly different between individual kick-samples and other values (medians, means, limits, expected values etc).

**Table 6** Macroinvertebrate community health based on MCI and SQMCI ranges which has been adapted for Taranaki streams and rivers from Stark's classification (Stark, 1985 and Stark, 1998)

TRC Grading	MCI	SQMCI
Excellent	≥140	≥7.00
Very Good	120-139	6.00-6.99
Good	100-119	5.00-5.99
Fair	80-99	4.00-4.99
Poor	60-79	3.00-3.99
Very Poor	<60	<3.00

A semi-quantitative MCI value, SQMCI (Stark 1999) has also been calculated for the taxa present at each site by multiplying each taxon score by a loading factor (related to its abundance), totalling these scores, and dividing by the sum of the loading factors. The loading factors were 1 for rare (R), 5 for common (C), 20 for abundant (A), 100 for very abundant (VA), and 500 for extremely abundant (XA). A difference of 0.83 units or more in SQMCI values is considered significantly different between individual kick samples (Stark 1998) and from past TRC experience is also significantly different between individual kick-samples and other values (medians, means, limits, expected values).

### Results of the October 2020 biomonitoring survey

#### Site habitat characteristics and hydrology

This spring survey was performed seven days after a fresh in excess of three times median flow and 10 days after a fresh in excess of seven times median flow at the Mangorei Stream (flow gauging site at the pipe-bridge on the Mangorei Stream). Environmental data is presented in Table 7.

**Table 7** Summary of the environmental data recorded at three sites in relation to monitoring carried out for JRPP October 2020

Site number	Site 1	Site 2	Site 3
Site Code	MGE000850	MGE000852	MGE000854
Sample Number	FWB20265	FWB20266	FWB20267
Time	14:15	14:05	13:45
Temperature	15.4	15.5	15.5
Water colour	Uncoloured	Uncoloured	Uncoloured
Water clarity	Clear	Clear	Clear
Flow conditions	Moderate	Moderate	Moderate
Water speed	Swift	Swift	Swift
Sampling habitat	Riffle	Riffle	Riffle
Periphyton mats	Patchy	Patchy	Patchy
Periphyton filaments	Patchy	Patchy	Patchy
Moss	Patchy	Patchy	Patchy
Leaves	Patchy	None	None
Wood	None	None	None
Macrophytes	None	None	None

Site number	Site 1	Site 2	Site 3
Site Code	MGE000850	MGE000852	MGE000854
Sample Number	FWB20265	FWB20266	FWB20267
Bank stability	Stable	Stable	Stable
Stock damage	None	None	None
Iron oxide or silt coating	No	No	No
Substrate embedded	No	No	No
Substrate disturbed	Moderate Kicking	Moderate Kicking	Moderate Kicking
Bed shaded	Partial	Partial	Partial
Undercut banks	Yes	No	No
Overhanging vegetation	Yes	Yes	Yes
Substrate composition	Silt	5	5
	Sand	15	20
	Fine gravel	5	15
	Coarse gravel	15	15
	Cobble	30	30
	Boulder	30	15
	Bedrock	0	0
	Hard clay	0	0
	Wood/root	0	0
	Concrete/gabion	0	0

#### Macroinvertebrate communities

Comparative data is presented in Table 8 and Table 9. Current survey results are presented in Figure 3 and Table 10.

Table 8 Range and median number of taxa, MCI values and SQMCI scores for control sites (ring plain arising in the National Park) at altitudes between 80 and 124 m asl ((TRC, 1999 (updated 2019)).

	No. of taxa	MCI value	SQMCI value
No. of samples	239	239	172
Range	2-36	50-136	1.8-7.8
Median	17	102	5.2

Table 9 Range and median number of taxa, MCI values and SQMCI scores at site MGE000970, 3 km below Junction Road Power Plant

	No. of taxa	MCI value	SQMCI value
No. of samples	36	36	35
Range	12-33	84-113	2.5-7.0
Median	26	102	4.5

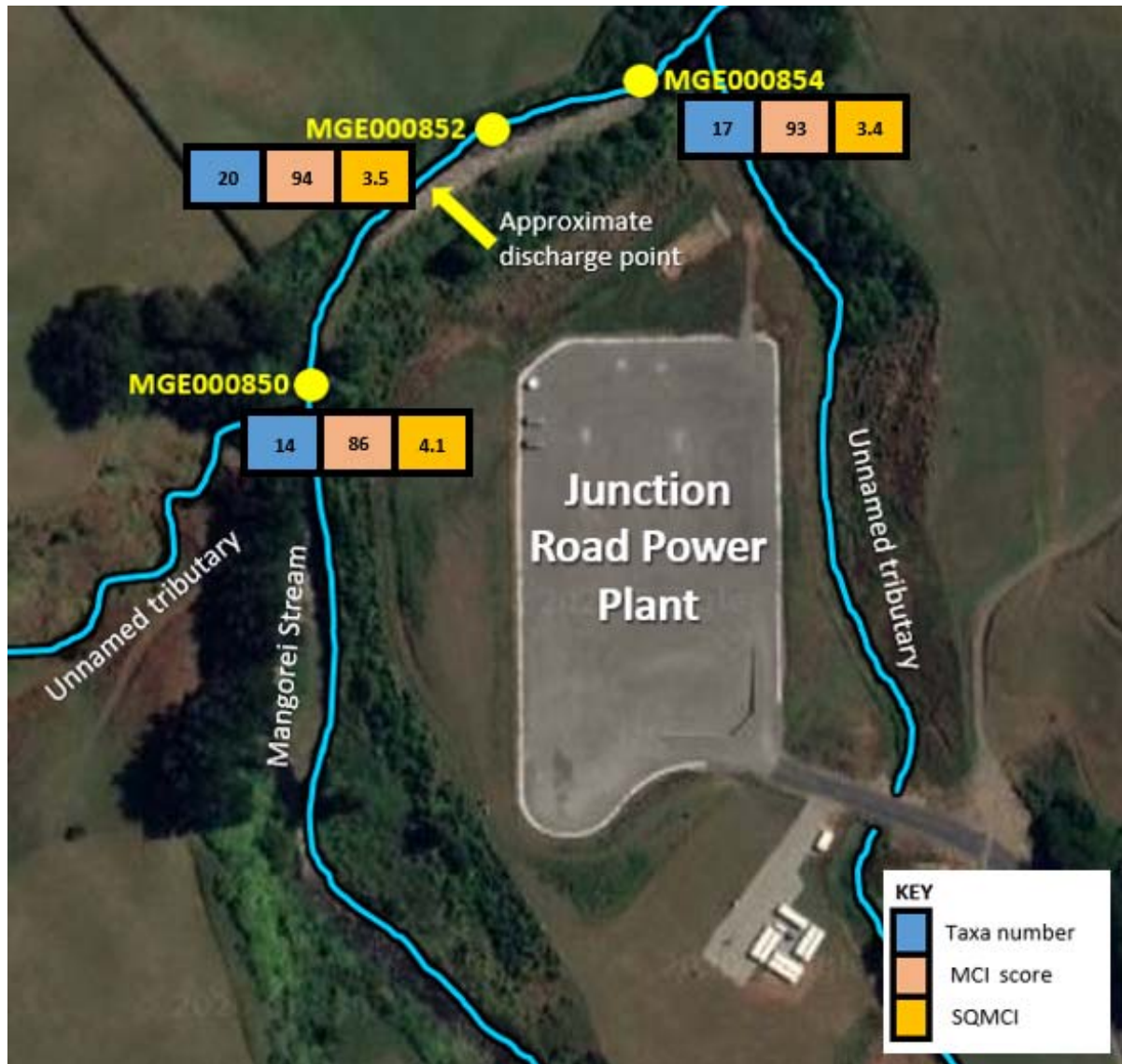


Figure 3 Biomonitoring sites in the Mangorei Stream sampled in relation to the Junction Road Power Plant with taxa number, MCI scores and SQMCI scores for each site

Table 10 Macroinvertebrate fauna of the Mangorei Stream in relation to Junction Road Power Plant sampled October 2020

Taxa List	Site Number	Taranaki MCI score	Site 1	Site 2	Site 3
	Site Code		MGE000850	MGE000852	MGE000854
	Sample Number		FWB20265	FWB20266	FWB20267
ANNELIDA (WORMS)	Oligochaeta	1	-	R	C
MOLLUSCA	Potamopyrgus	4	C	R	C
EPHEMEROPTERA (MAYFLIES)	Austroclima	7	-	R	-
	Coloburiscus	7	-	R	-
PLECOPTERA (STONEFLIES)	Deleatidium	8	-	R	R
	Acroperla	5	-	R	-
COLEOPTERA (BEETLES)	Zelandobius	5	A	C	C
	Elmidae	6	R	R	R
MEGALOPTERA (DOBSONFLIES)	Archichauliodes	7	-	-	R
TRICHOPTERA (CADDISFLIES)	Hydropsyche (Aoteapsyche)	4	R	C	C
	Costachorema	7	R	R	R
	Hydrobiosis	5	C	C	C
	Neurochorema	6	R	R	R
	Oxyethira	2	R	-	-



Taxa List	Site Number	Taranaki MCI score	Site 1	Site 2	Site 3
	Site Code		MGE000850	MGE000852	MGE000854
	Sample Number		FWB20265	FWB20266	FWB20267
	<i>Pycnocentroides</i>	5	C	R	R
	<i>Triplectides</i>	5	-	-	R
DIPTERA (TRUE FLIES)	<i>Aphrophila</i>	5	C	C	C
	<i>Maoridiamesa</i>	3	A	A	A
	Orthoclaadiinae	2	C	A	A
	Tanytarsini	3	C	A	C
	Empididae	3	R	R	-
	<i>Austrosimulium</i>	3	-	R	R
ACARINA (MITES)	Acarina	5	-	R	-
No of taxa			14	20	17
Taranaki MCI			86	94	93
Taranaki SQMCI			4.1	3.5	3.4
EPT (taxa)			6	10	8
%EPT (taxa)			43	50	47
'Tolerant' taxa		'Moderately sensitive' taxa	'Highly sensitive' taxa		

R = Rare C = Common A = Abundant VA = Very Abundant XA = Extremely Abundant

### Discussion and conclusion for October 2020 biomonitoring survey

Taxa richness is the most robust metric when ascertaining whether a macroinvertebrate community has been exposed to toxic discharges. When exposed to toxic discharges, macroinvertebrates may die and be swept downstream or deliberately drift downstream as an avoidance mechanism (catastrophic drift). Taxa richness was 14, 20 and 17 taxa at sites 1 to 3 respectively. This was similar to the median taxa richness recorded by 'control' sites at a similar altitude across the region (taxa richness of 17) (Table 8), although was slightly lower than the median richness recorded at site MGE000970, 3 km below JRPP (taxa richness of 26) (Table 9). Overall there was no evidence of any recent acute toxic discharges, which could dramatically lower taxa richness.

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 differing sensitivity to organic pollution. MCI scores were not significantly different between the three sites surveyed, and were reflective of 'fair' macroinvertebrate community health at all three sites. In comparison to the median recorded at site MGE000970 and the median recorded by similar streams at comparable altitudes, all three sites recorded lower MCI scores (site 1 significantly). Overall, these results provided no evidence of significant effects from the Junction Road Power Plant discharges.

The SQMCI is similar to the MCI, but accounts for relative abundances of the taxa found, as well as sensitivity to pollution. As such, it provides additional insight to that provided by the MCI score but is also easily influenced by the 'patchiness' of invertebrates on the stream bed, and therefore must be considered in the context of all three metrics. The SQMCI scores of 4.1, 3.5 and 3.4 units were recorded at sites 1-3 respectively. There were no significant differences in SQMCI score between the three sites, however the SQMCI score recorded at site 1 was reflective of 'fair' macroinvertebrate health, while the SQMCI scores recorded at sites 2 and 3 were reflective of 'poor' macroinvertebrate health. All three sites recorded SQMCI scores lower than the median score for 'control' sites at similar altitudes (by 1.1, 1.7 and 1.8 units at sites 1-3 respectively). In addition, all three sites recorded SQMCI scores that were lower than the median score recorded downstream at site MGE000970 (sites 2 and 3 both significantly). These results are most likely a product of subtle habitat differences between the sites rather than any effects from the Junction Road Power Plant discharge.

Macroinvertebrate community composition was similar between the three sites surveyed, with 12 out of the 23 taxa recorded at all three sites and only one significant change to individual taxon abundance across the



three sites surveyed. Dominant taxa (recorded as 'abundant' or more) varied slightly between the three sites. The 'moderately sensitive' stonefly taxon (*Zelandobius*) was dominant at site 1, while the 'tolerant' chironomid midge (*Tanytarsini*) was dominant only at site 2. 'Tolerant' Orthoclad midges were dominant at sites 2 and 3, while the 'tolerant' chironomid midge taxon (*Maoridiamesa*) was 'abundant' at all three sites.

When considered in the context of all three metrics, the results of this survey indicate that the discharges from the JRPP have not caused any recent significant detrimental impacts on the macroinvertebrate communities of the Mangorei Stream. The results indicated that the macroinvertebrate communities of the Mangorei Stream were in 'fair' health at all three sites. Overall, there was no evidence that any discharges from the JRPP had caused any recent detrimental impacts on the macroinvertebrate communities of the Mangorei Stream.

## Biomonitoring of the Mangorei Stream in relation to Junction Road Power Plant February 2021

### Site habitat and hydrology

This summer survey was performed seven days after a fresh in excess of three times median flow and 14 days after a fresh in excess of seven times median flow at the Mangorei Stream (flow gauging site at the pipe-bridge on the Mangorei Stream). Environmental data is presented in Table 4.

Table 11 Summary of the environmental data recorded at three sites in relation to monitoring carried out for Junction Road Power Plant, 24 February 2021

Site number	Site 1	Site 2	Site 3
Site Code	MGE000850	MGE000852	MGE000854
Sample Number	FWB21169	FWB21170	FWB21171
Time	11:40	11:25	11:10
Temperature	18.8	19.3	19.8
Water colour	Uncoloured	Uncoloured	Uncoloured
Water clarity	Clear	Clear	Clear
Flow conditions	Low	Low	Low
Water speed	Steady	Steady	Steady
Sampling habitat	Riffle	Riffle	Riffle
Periphyton mats	Patchy	Patchy	Patchy
Periphyton filaments	Widespread	Widespread	Widespread
Moss	Patchy	Patchy	Patchy
Leaves	None	None	None
Wood	None	None	None
Macrophytes	None	None	None
Bank stability	Stable	Stable	Stable
Stock damage	None	None	None
Iron oxide or silt coating	Yes	Yes	Yes
Substrate embedded	No	No	No
Substrate disturbed	With Difficulty	With Difficulty	With Difficulty
Bed shaded	Partial	Partial	Partial
Undercut banks	No	No	No
Overhanging vegetation	No	No	No
Substrate composition	Silt	10	10
	Sand	5	5
	Fine gravel	5	5
	Coarse gravel	10	5
	Cobble	30	30
	Boulder	40	45
	Bedrock	0	0
Hard clay	0	0	

Site number	Site 1	Site 2	Site 3
Site Code	MGE000850	MGE000852	MGE000854
Sample Number	FWB21169	FWB21170	FWB21171
Wood/root	0	0	0
Concrete/gabion	0	0	0

Macroinvertebrate communities

A summary of the previous and current survey results is presented in Table 12. The current survey results are also presented in Figure 4 and Table 13.

Table 12 Summary of numbers of taxa, MCI values and SQMCI scores recorded for macroinvertebrate surveys undertaken in the 2020-2021 monitoring year

Site	No. of taxa		MCI value		SQMCI value	
	7 Oct 2020	24 Feb 2021	7 Oct 2020	24 Feb 2021	7 Oct 2020	24 Feb 2021
1	14	21	86	95	4.1	3.4
2	20	23	94	100	3.5	3.3
3	17	22	93	95	3.4	3.5

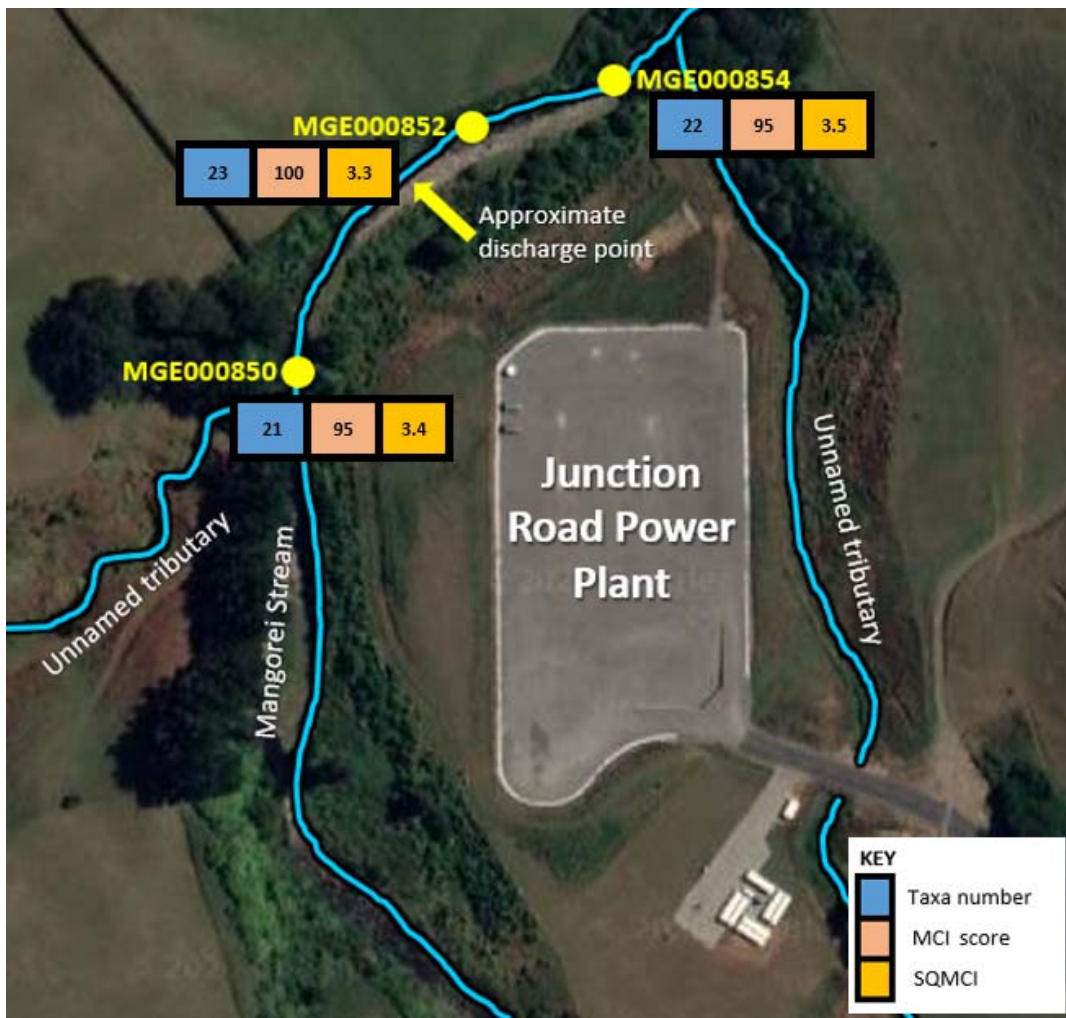


Figure 4 Biomonitoring sites in the Mangorei Stream sampled in relation to the Junction Road Power Plant with taxa number, MCI scores and SQMCI scores for each site

Table 13 Macroinvertebrate fauna of the Mangorei Stream in relation to Junction Road Power Plant sampled 24 February 2021

Taxa List	Site Number	Taranaki MCI score	Site 1	Site 2	Site 3
	Site Code		MGE000850	MGE000852	MGE000854
	Sample Number		FWB21169	FWB21170	FWB21171
PLATYHELMINTHES (FLATWORMS)	<i>Cura</i>	3	R	-	-
NEMERTEA	Nemertea	3	-	R	-
NEMATODA	Nematoda	3	-	-	R
ANNELIDA (WORMS)	Oligochaeta	1	R	-	R
MOLLUSCA	<i>Potamopyrgus</i>	4	A	C	A
EPHEMEROPTERA (MAYFLIES)	<i>Austroclima</i>	7	C	R	C
	<i>Coloburiscus</i>	7	R	-	R
	<i>Deleatidium</i>	8	R	R	C
	<i>Nesameletus</i>	9	R	R	R
PLECOPTERA (STONEFLIES)	<i>Zephlebia group</i>	7	C	R	-
	<i>Zelandobius</i>	5	-	R	-
	<i>Zelandoperla</i>	8	-	R	-
COLEOPTERA (BEETLES)	Elmidae	6	C	C	R
MEGALOPTERA (DOBSONFLIES)	<i>Archichauliodes</i>	7	R	R	R
TRICHOPTERA (CADDISFLIES)	<i>Hydropsyche (Aoteapsyche)</i>	4	C	A	A
	<i>Costachorema</i>	7	-	R	-
	<i>Hydrobiosis</i>	5	C	C	C
	<i>Neurochorema</i>	6	R	R	C
	<i>Beraeoptera</i>	8	-	-	R
	<i>Oxyethira</i>	2	C	C	C
	<i>Pycnocentroides</i>	5	-	R	R
	DIPTERA (TRUE FLIES)	<i>Aphrophila</i>	5	R	R
<i>Maoridiamesa</i>		3	C	C	C
Orthoclaadiinae		2	A	A	A
Tanytarsini		3	VA	VA	VA
Empididae		3	-	R	R
Muscidae		3	A	A	C
<i>Austrosimulium</i>		3	R	R	R
ACARINA (MITES)	Acarina	5	R	-	R
		No of taxa	21	23	22
		Taranaki MCI	95	100	95
		Taranaki SQMCI	3.4	3.3	3.5
		EPT (taxa)	8	11	9
		%EPT (taxa)	38	48	41
'Tolerant' taxa		'Moderately sensitive' taxa	'Highly sensitive' taxa		

R = Rare C = Common A = Abundant VA = Very Abundant XA = Extremely Abundant

## Discussion and conclusions

Taxa richness is the most robust metric when ascertaining whether a macroinvertebrate community has been exposed to toxic discharges. When exposed to toxic discharges, macroinvertebrates may die and be swept downstream or deliberately drift downstream as an avoidance mechanism (catastrophic drift). Taxa richness was 21, 23 and 22 taxa at sites 1 to 3 respectively. This was slightly higher than the median taxa richness recorded by 'control' sites at a similar altitude across the region (taxa richness of 17) (Table 8), although was slightly lower than the median richness recorded at site MGE000970, 3 km below JRPP (taxa richness of 26 (Table 9). Overall, there was no evidence of any recent acute toxic discharges, which could dramatically lower taxa richness.

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 differing sensitivity to organic pollution. MCI scores were not significantly different between the three sites surveyed and were reflective of 'fair' macroinvertebrate community health at sites 1 and 3 and 'good' health at site 2. In comparison to the median recorded at site MGE000970 and the median recorded by similar streams at comparable altitudes,

all three sites recorded lower MCI scores, although not significantly. Overall, these results provided no evidence of significant effects from the Junction Road Power Plant discharges.

The SQMCI is similar to the MCI, but accounts for relative abundances of the taxa found, as well as sensitivity to pollution. As such, it provides additional insight to that provided by the MCI score but is also easily influenced by the 'patchiness' of invertebrates on the stream bed, and therefore must be considered in the context of all three metrics. The SQMCI scores of 3.4, 3.3 and 3.5 units were recorded at sites 1-3 respectively. There were no significant differences in SQMCI score between the three sites, and all sites recorded SQMCI scores reflective of 'poor' macroinvertebrate community health. All three sites recorded SQMCI scores lower than the median score for 'control' sites at similar altitudes (by 1.8, 1.9 and 1.7 units at sites 1-3 respectively). In addition, all three sites recorded SQMCI scores that were significantly lower than the median score recorded downstream at site MGE0000970.

Macroinvertebrate community composition was similar between the three sites surveyed, with 15 out of the 29 taxa recorded at all three sites and only one significant change to individual taxon abundance across the three sites surveyed. Dominant taxa (recorded as 'abundant' or more) varied slightly between the three sites, with only two taxa recorded as 'abundant' or more at all three sites. These included the two 'tolerant' taxa, orthoclad midges and chironomid midge (*Tanytarsini*).

In comparison to the previous survey results, taxa richness was slightly higher at all three sites. MCI scores were also higher, although not significantly. SQMCI scores were lower than the previous survey scores at sites 1 and 2, while slightly higher at site 3 (albeit not significantly).

When considered in the context of all three metrics, the results of this survey indicate that the discharges from the Junction Road Power Plant have not caused any recent significant detrimental impacts on the macroinvertebrate communities of the Mangorei Stream. The MCI results indicated that the macroinvertebrate communities of the Mangorei Stream were in 'fair' to 'good' health at three sites surveyed.

## 2.2 Air

### 2.2.1 Results of receiving environment monitoring

#### 2.2.1.1 Ambient gas (PM10, CO and LEL) monitoring at JRPP during the 2020-2021 monitoring period

In July 2021, as part of the compliance monitoring programme for the JRPP. A survey of ambient air quality sampling was carried out by the Council, in the vicinity of the plant. The main objectives were to measure:

- The concentrations of PM10 using a portable data logging TSI 'DustTrak';
- And to measure carbon monoxide (CO) using a portable multi gas meter that provides instantaneous data throughout the monitoring period.

The findings of this study are presented, together with the locations of the monitoring sites which are provided in Figure 5.

#### Carbon monoxide (CO) and Lower explosive limit (LEL)

During the monitoring year, a multi-gas meter was deployed on one occasion in the vicinity of the plant. The deployment lasted approximately 76 hours, with the instrument placed in a down-wind position at the start of the deployment. Both power units operated daily, from 6 am until midnight. Monitoring consisted of continuous measurements of gas concentrations for the gases of interest (carbon monoxide and combustible gases).

Because of the nature of the activities on the site, it was considered that the primary information of interest in respect of gases potentially emitted from the site was the average downwind concentration, rather than any instantaneous peak value. That is, the long-term exposure levels, rather than short-term maxima, are of most interest. The gas meter was therefore set up to create a data set based on recording the average concentration measured during each minute as raw data.



Figure 5 Air monitoring site at JRPP 2020-2021

The details of the sample run are summarised in Table 14 and the data from the sample run are presented graphically in Figure 6.

The consents covering air discharges from the JRPP have specific limits related to particular gases. Special condition 3 of consent 9402-1 set limits on the carbon monoxide, nitrogen dioxide and fine particles [PM10] concentrations at or beyond the production station's boundary. The limit on the carbon monoxide is expressed as  $10 \text{ mg/m}^3$  for an eight hour average exposure. The maximum concentration of carbon monoxide found during the monitoring run was  $6.07^* \text{ mg/m}^3$  with average concentration for the entire dataset was only  $0.19^* \text{ mg/m}^3$  which comply with consent conditions.

Table 14 Results of carbon monoxide and LEL monitoring at JRPP

Period (from-to)		6/07/2021 6:26 to 9/07/2021 10:03
Max	CO(ppm)	5.30*
	LEL(%)	0.10
Mean	CO(ppm)	0.17*
	LEL(%)	0.00
Min	CO(ppm)	0.00*
	LEL(%)	0.00

Note: (1) the instrument records in units of ppm. At  $25^\circ\text{C}$ , 1 atm.

\*1ppm CO =  $1.145 \text{ mg/m}^3$

(2) See text for explanation of LEL. Because the LEL of methane is equivalent to a mixture of approximately 5% methane in air, then the actual concentration of methane in air can be obtained by dividing the percentage LEL by 20.

LEL gives the percentage of the lower explosive limit, expressed as methane that is detected in the air sampled. The sensor on the instrument reacts to gases and vapours such as acetone, benzene, butane, methane, propane, carbon monoxide, ethanol, and higher alkanes and alkenes, with varying degrees of

sensitivity. The Council's Regional Air Quality Plan has a typical requirement that no discharge shall result in dangerous levels of airborne contaminants, including any risk of explosion. At no time did the level of explosive gases downwind of the Junction Road Power Plant reach any more than a trivial level.

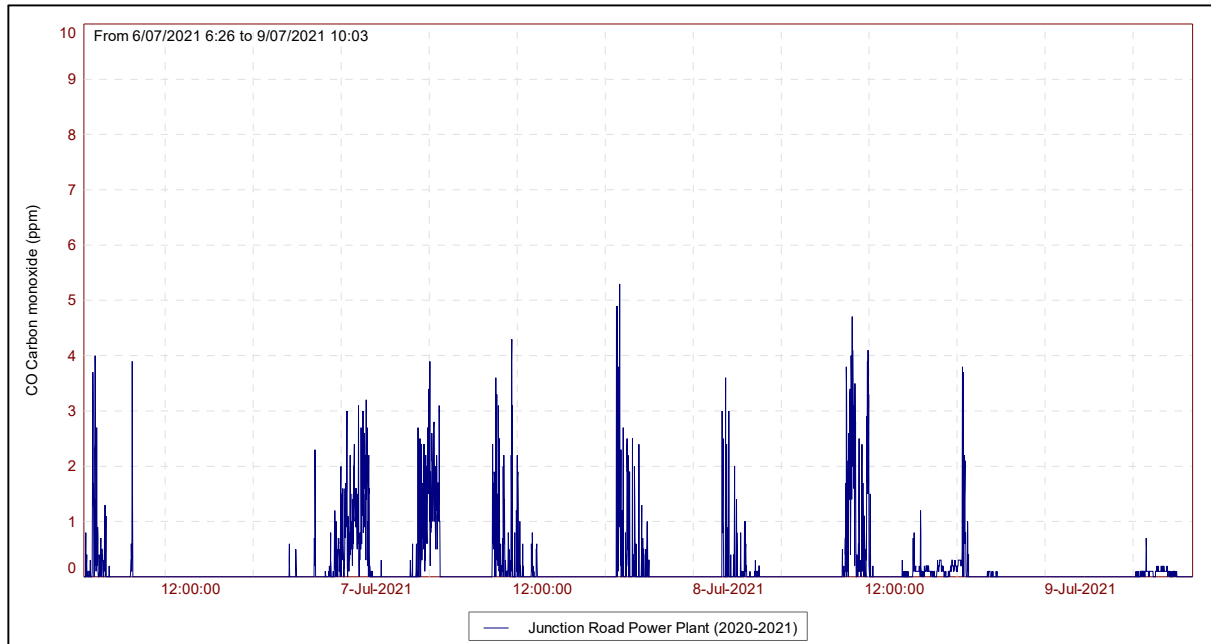


Figure 6 Graph of ambient CO levels in the vicinity of the Junction Road Power Plant (2020-2021)

#### PM10

In September 2004 the Ministry for the Environment made public National Environmental Standards (NESs) relating to certain air pollutants. The NES for PM10 is  $50 \mu\text{g}/\text{m}^3$  (24-hour average). The same limit is imposed on consent 9402-1.1, in condition 3 that provides for the discharge of emissions to air from JRPP.

Particulates can be derived from many sources, including motor vehicles (particularly diesel), solid and oil-burning processes for industry and power generation, incineration and waste burning, photochemical processes, and natural sources such as pollen, abrasion, and sea spray.

PM10 particles are linked to adverse health effects that arise primarily from the ability of particles of this size to penetrate the defences of the human body and enter deep into the lungs significantly reducing the exchange of gases across the lung walls. Health effects from inhaling PM10 include increased mortality and the aggravation of existing respiratory and cardiovascular conditions such as asthma and chronic pulmonary diseases.

During the reporting period, a "DustTrak" PM10 monitor was deployed on one occasion in the vicinity of the JRPP. The deployment lasted approximately 76 hours, with the instrument placed in a down-wind position at the start of the deployment. Both power units operated daily, from 6 am until midnight. Monitoring consisted of continual measurements of PM10 concentrations. The location of the "DustTrak" monitor during the sampling run is shown in Figure 5.

The details of the sample run are presented in Figure 7 and Table 15.



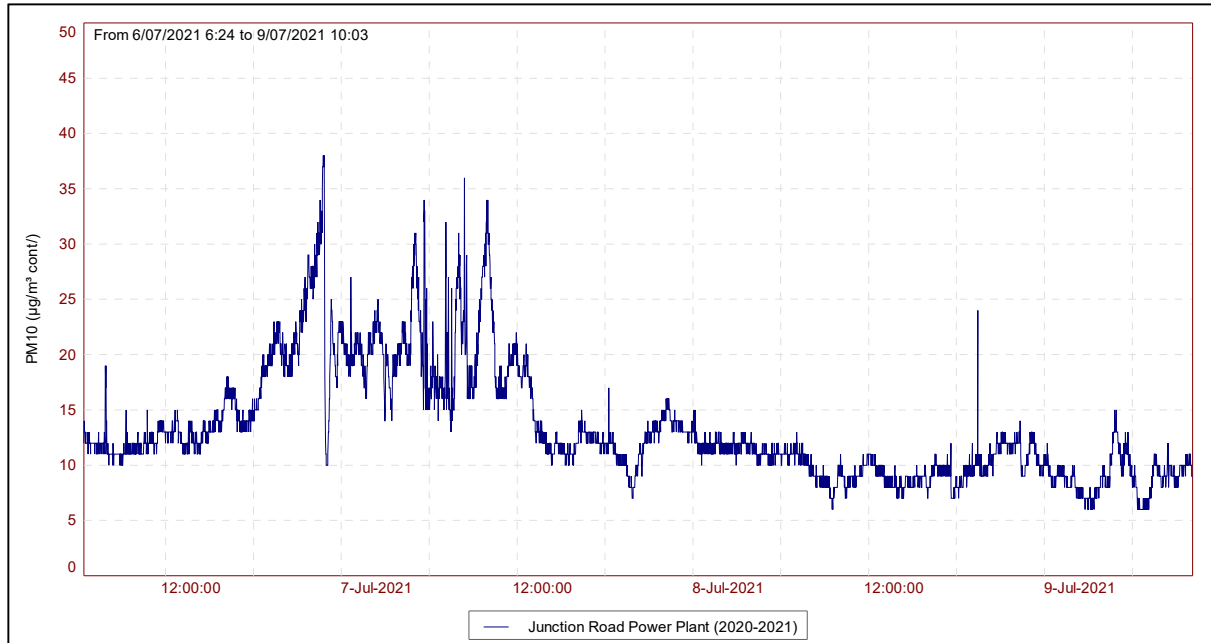


Figure 7 PM10 concentrations ( $\mu\text{g}/\text{m}^3$ ) at the Junction Road Power Plant (2020-2021)

Table 15 Daily mean of PM10 results at JRPP

	(76 hours total) (6-9/07/2021)		
	Day 1	Day 2	Day 3
Daily average	15.7 $\mu\text{g}/\text{m}^3$	16.7 $\mu\text{g}/\text{m}^3$	10.1 $\mu\text{g}/\text{m}^3$
NES	50 $\mu\text{g}/\text{m}^3$		

During the 76-hour run, from 6<sup>th</sup> to 9<sup>th</sup> of July 2021, the average recorded PM10 concentration for the first 24 hour period was 15.7  $\mu\text{g}/\text{m}^3$ , 16.7  $\mu\text{g}/\text{m}^3$  for the second and 10.1  $\mu\text{g}/\text{m}^3$  for the third 24 hour period. These daily means equate to 31%, 33% and 20% respectively, of the 50  $\mu\text{g}/\text{m}^3$  value that is set by the National Environmental Standard and consent 9402-1.

Background levels of PM10 in the region have been found to be typically around 11 $\mu\text{g}/\text{m}^3$ .

### 2.2.1.2 Emissions guarantee Test Report (NO<sub>x</sub>, CO and O<sub>2</sub>)

Emissions testing was undertaken by the supplier of the gas turbines, General Electric (GE), during the commissioning of the facility in March 2020. The primary objective of the testing was to measure the air emissions of the gas turbine-generator units in accordance with the purchase contract. The testing results were within specification Tables 16 and 17.

Table 16 GE commissioning test turbine U71 11 March 2020

U71 S/N 840263, Natural Gas, Sprint On, Water Injection On, Simple Cycle, Test Date: 11-Mar-2020				
Parameter	Units	Guarantee	100% Load	Compliant?
NO <sub>x</sub>	ppmvd	-	20.79	
	ppmvd @ 15% O <sub>2</sub>	25	20.67	Yes
CO	ppmvd	-	21.09	
	ppmvd @ 15% O <sub>2</sub>	25	20.97	Yes
O <sub>2</sub>	%	-	14.97	

Table 17 GE commissioning test turbine U72 11 March 2020

U72 S/N 840271, Natural Gas, Sprint On, Water Injection On, Simple Cycle, Test Date: 10-Mar-2020				
Parameter	Units	Guarantee	100% Load	Compliant?
NO <sub>x</sub>	ppmvd	-	22.88	
	ppmvd @ 15% O <sub>2</sub>	25	22.42	Yes
CO	ppmvd	-	20.19	
	ppmvd [mg/Nm <sup>3</sup> ] @ 15% O <sub>2</sub>	25	19.78	Yes
O <sub>2</sub>	%	-	14.88	

The testing demonstrates that the turbines were within scope at peak load. This is line with the Company's submitted application, within the assessment of environmental effects (AEE). The AEE undertook ambient air quality modelling of PM<sub>10</sub>, NO<sub>2</sub> and CO at peak load. The modelling outcomes were assessed against the National Environmental Standards on air quality (NES) and the Ambient Air Quality Guidelines (AAQG) and found to be well within guideline values for all parameters, Tables 18-20.

Table 18 Maximum predicted offsite NO<sub>2</sub> ground level concentrations from site discharges at peak load<sup>2</sup>

Averaging period	Predicted GLC (µg/m <sup>3</sup> )	Location	Assessment criteria
1-hour 99.9 <sup>th</sup> percentile (Modelled as 99.8 <sup>th</sup> percentile)	8	east of the site	200 µg/m <sup>3</sup> (NES, AAQG)
24-hour maximum	4	east of the site	100 µg/m <sup>3</sup> (AAQG)

Table 19 Maximum predicted offsite PM<sub>10</sub> ground level concentrations from site discharges at peak load<sup>3</sup>

Averaging period	Maximum off-site GLC (µg/m <sup>3</sup> )	Location	Assessment criteria
24-hour maximum	<1	Directly north and east of stacks	50 (NES, AAQG)
Annual	<0.1	Directly east of stacks	20 (AAQG)

<sup>2</sup> Table 3- Golder Associates. Technical assessment of discharges to the air – 100 MW Taranaki Power Plant September 2012

<sup>3</sup> Table 4- Golder Associates. Technical assessment of discharges to the air – 100 MW Taranaki Power Plant September 2012



Table 20 Maximum predicted offsite CO ground level concentrations from site discharges at peak load<sup>4</sup>

Averaging period	Predicted maximum off-site GLC (mg/m <sup>3</sup> )	Location	Assessment criteria
1-hour average	<0.1	east of the site	30 mg/m <sup>3</sup> (AAQG)
8-hour running mean	<0.1	east of the site	10 mg/m <sup>3</sup> (NES, AAQG)

## 2.3 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 the Company. 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 2020-2021 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with the Company's conditions in resource consents or provisions in Regional Plans.

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<sup>4</sup> Table 5- Golder Associates. Technical assessment of discharges to the air – 100 MW Taranaki Power Plant September 2012

## 3 Discussion

### 3.1 Discussion of site performance

2020-2021 marks the inaugural monitoring year JRPP. Operations commenced 15 May 2020, post the commissioning stage undertaken in March of the same year. Notifications and data required by consent were provided. The site appeared well managed, with good housekeeping prevalent during the inspection undertaken this period. This is similarly noted in subsequent inspections undertaken in the 2021-2022 monitoring period.

The facility is not required to run for a sustained period of time. As a peaking power plant it typically operates during periods of peak power usage, these are generally in the mornings and evenings. However, peaking may occur at any time. For example, during a dry period, when hydro dam levels are low, the facility may work for a sustained period of time. Likewise, during calm weather, the plant may be called upon, due to low electricity output from windfarms.

Overall, there were no issues from a performance perspective in relation to the Company in this monitoring period.

### 3.2 Environmental effects of exercise of consents

Minimal environmental effects were noted during the monitoring of the JRPP site in the 2021-2022 monitoring period. Discharge samples and Mangorei Stream samples have not been possible to collect, as the facility has not been observed to be discharging from the retention pond.

Process wastewater appear to discharge via land soakage and evaporation. It was not seen to discharge through the overflow discharge pipe, on to the rock rip wrap and into swale, prior to the Mangorei Stream. A sample will be taken if the discharge is found to be occurring in subsequent inspection rounds. This will likely occur during periods of sustained operation, and future communication with the Company will be able to target such events. It is noted that the singular wastewater sample analysed by the Company and provided to the Council was compliant with the consent.

From a biological monitoring perspective, two rounds were undertaken in the Mangorei Stream in this monitoring period.

The conclusion from the Council's biologist was as follows:

*Overall, there was no evidence that any discharges from the Junction Road Power Plant had caused any recent detrimental impacts on the macroinvertebrate communities of the Mangorei Stream.*

From an air quality perspective, the stack emissions from both turbine units were tested by General Electric during the commissioning stage of the plant, March 2020. The results, as previously discussed were within specification of the manufacturer's guarantee, when operated at full load. The resultant analysis indicated the ambient air modelling undertaken during the assessment of environmental effects, which was modelled on worst case, at base load, were within the guidelines values stipulated by the National Environmental Standards (NES) for air quality and the MfE Ambient Air Quality Guidelines (AAQGs).

Ambient air quality monitoring was undertaken by the Council for PM10, CO and LEL this monitoring period. In terms of CO and LEL, the Council's Regional Air Quality Plan has a typical requirement that no discharge shall result in dangerous levels of airborne contaminants, including any risk of explosion. At no time did the level of explosive gases downwind of the JRPP reach any more than a trivial level.

In terms of PM10, the monitoring indicated that the concentrations recorded were well below the NES one hour average. The limit on the carbon monoxide is expressed as 10 mg/m<sup>3</sup> for an eight hour average exposure. The maximum concentration of carbon monoxide found during the monitoring run was 6.07

mg/m<sup>3</sup> with average concentration for the entire dataset was only 0.19 mg/m<sup>3</sup> which comply with consent conditions.

In terms of LEL, the Council's Regional Air Quality Plan has a typical requirement that no discharge shall result in dangerous levels of airborne contaminants, including any risk of explosion. At no time did the level of explosive gases downwind of the Junction Road Power Plant reach any more than a trivial level.

Overall, the facility performed well from an environmental perspective in the 2021-2022 monitoring period.

### 3.3 Evaluation of performance

A tabular summary of the consent holder's compliance record for the year under review is set out in Tables 21-25.

Table 21 Summary of performance for consent 9383-1.1

<b>Purpose: To discharge treated stormwater and wastewater from the Junction Road Power Plant</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. The consent holder shall at all times adopt the best practicable option	Inspections	Yes
2. The stormwater discharged shall be from a catchment area not exceeding 2.5 hectares	Inspection and online calculation	Yes
3. All stormwater shall pass through a treatment system that includes a settlement pond with a capacity of no less than 250 m <sup>3</sup>	Inspections	Yes
4. Except as provided in the condition 5 contaminants in the discharge shall be in general accordance with the application	Inspections	Yes
5. Discharge constituents should not exceed: <ul style="list-style-type: none"> <li>• pH 6-9</li> <li>• Suspended solids</li> <li>• &lt;100 g/m<sup>3</sup></li> <li>• Recoverable hydrocarbons &lt;15 g/m<sup>3</sup></li> <li>• Free chlorine &lt;0.01 g/m<sup>3</sup></li> </ul>	Sampling of discharge provided by Company from wastewater pond	Yes

<b>Purpose: To discharge treated stormwater and wastewater from the Junction Road Power Plant</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
6. Post mixing zone of 25 m the following effects should not occur: <ul style="list-style-type: none"> <li>• Production of any conspicuous oil and grease or films, floatable or suspended material</li> <li>• Any conspicuous change in colour or visual clarity</li> <li>• Any emission objectionable odour</li> <li>• Freshwater unsuitable for consumption of animals</li> <li>• Significant adverse effects of aquatic life</li> </ul>	Sampling of discharge not possible as no discharge reached the stream in this monitoring period Targeted sampling in the upcoming monitoring period will aim to assess the discharge to surface water This will be dependent on future operations and weather	N/A
7. Prepare, maintain, adhere and provide a Contingency Plan to the Council	Plan received by Council 26 November 2020	Yes
8. Prepare, maintain, adhere and provide a stormwater management plan to the Council	Plan received by Council 19 November 2020	Yes
9. Notification of changes to plant processes		N/A
10. Undertake and maintain riparian fencing and planting	Inspections	Not assessed in the period under review
11. Riparian to be undertaken in accordance with the following programme	Inspections	Not assessed in the period under review
12. Lapse condition	Consent in effect	Yes
13. Review condition		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 22 Summary of performance for consent 9402-1.1

<b>Purpose: To discharge emission in to the air arising from combustion of natural gas and other activities associated with the operation of the Junction Road Power Plant</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. The consent holder shall at all times adopt the best practicable option	Inspections	Yes

<b>Purpose: To discharge emission in to the air arising from combustion of natural gas and other activities associated with the operation of the Junction Road Power Plant</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
2. Six yearly report requirement Technological advances Inventory of emissions Documentation demonstrating emission contaminants is the minimum which can be achieved Energy efficiency of the power plant	Report provided November 2020	Yes
3. Consent holder control CO, NO2, PM10 and SO2 so that maximum ground level does not exceed NES Air Quality	Inspection and monitoring undertaken for PM10. Stack testing at peak load during commissioning stage (March 2020) undertaken by General Electric This indicated the ambient air quality was in compliance with NES and AAQS guidelines as defined by modelling undertaken by Golder (September 2021)	Yes
4. The consent holder shall control all emissions to the atmosphere from the site of contaminants other than those expressly provided for under special condition 3	Inspections	Yes
5. The minimum height of discharge of the products of combustion from the turbines shall be 18 m above ground level	Inspections	Yes
6. The discharges authorised by this consent shall not give rise to any direct significant adverse ecological effect on any ecosystems effects of aquatic life	Inspections	Yes
7. Review condition	Review not required	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>

Table 23 Summary of performance for consent 9384-1.1

<b>Purpose: To install and use a stormwater outlet structure in the Mangorei Stream</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Structure to be constructed in general accordance with original plans submitted by BTW	Inspections	Yes
2. Consent holder to notify the Council 48 hours prior to exercise of consent and 48 hours prior to subsequent maintenance works	Report provided November 2020	Yes
3. The consent holder shall take all practicable steps to minimise sedimentation and increased turbidity of the stream during the construction, implementation and maintenance of the works, including <ol style="list-style-type: none"> <li>a) completing all works in the minimum time practicable;</li> <li>b) avoiding placement of excavated material in the flowing channel;</li> <li>c) keeping machinery out of the actively flowing channel, as far as practicable; and</li> <li>d) undertaking works during times of low flow</li> </ol>	Inspections and notifications	Yes
4. The discharge pipe shall have a diameter no less than 375 mm	Inspections	Yes
5. The lower 5 m (vertical) of the rock riprap shall have the following grading: <ul style="list-style-type: none"> <li>• 100% less than 1000 mm diameter;</li> <li>• 50% greater than 750 mm diameter; and</li> <li>• 90% greater than 450 mm diameter</li> </ul>	Inspections	Yes
6. The depth of the rock riprap shall be at least 1.2 m	Inspections	Yes

<b>Purpose: To install and use a stormwater outlet structure in the Mangorei Stream</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
7. The consent holder shall ensure that the area and volume of stream bed disturbance is, as far as practicable, minimised and any areas that are disturbed are, as far as practicable, reinstated	Inspections	Yes
8. Except with the written agreement of the Chief Executive, Taranaki Regional Council, the structure(s) authorised by this consent shall be removed and the area reinstated, if and when the structure is no longer required. A further resource consent may be required to authorise the removal of the structure, and the consent holder is advised to seek advice from the Taranaki Regional Council on this matter	Notification	N/A
9. In the event that any archaeological remains are discovered as a result of works authorised by this consent, the works shall cease immediately at the affected site and tangata whenua and the Chief Executive, Taranaki Regional Council, shall be notified within one working day	Notification	N/A
10. The works shall remain the responsibility of the consent holder and be maintained so that any erosion, scour or instability of the stream bed or banks that is attributable to the works carried out under this consent, is remedied by the consent holder	Inspections and notification	N/A
11. Lapse condition	In effect	N/A
12. Review condition	Review not required	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>

Table 24 Summary of performance for consent 9385-1

<b>Purpose: To realign an unnamed tributary of the Mangorei Stream</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. This consent authorises the permanent diversion of the full stream flow through a reconstructed channel, and reclamation of the existing stream channel between grid references	Inspections	Yes
2. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 48 hours prior to the exercise of this consent 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 river bed or discharges to water	Notification received	Yes
3. The consent holder shall take all practicable steps to minimise sedimentation and increased turbidity of the stream during the construction, implementation and maintenance of the works, including <ul style="list-style-type: none"> <li>a) completing all works in the minimum time practicable;</li> <li>b) avoiding placement of excavated material in the flowing channel;</li> <li>c) keeping machinery out of the actively flowing channel, as far as practicable; and</li> <li>d) undertaking works during times of low flow</li> </ul>	Inspections	Yes
4. As far as practicable, excavation of the reconstructed channel shall be completed prior to diverting the flow	Inspections	Yes



Purpose: <i>To realign an unnamed tributary of the Mangorei Stream</i>		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
5. Instream silt control measures (such as hay bales) shall be placed in the unnamed tributary directly downstream of the realignment. The silt control measures may only be removed once the rock rip rap has been placed in the new channel and the tributary has stabilised	Inspections	Yes
6. The consent holder shall ensure that the passage of fish is not impeded, as far as practicable, during the works. If any fish are stranded due to the works, the consent holder shall ensure that these are placed back in the active flowing part of the channel as soon as practicable	Inspections	Yes
7. The consent holder shall place rock rip rap armouring at both ends of the realignment (i.e. where the new channel meets the old channel). Rock rip rap shall be placed: <ul style="list-style-type: none"> <li>• on the banks of the channel, over a minimum length of 3 metres and a minimum height of 1 metre vertical; and</li> <li>• in the bed of the channel, across the full width of the channel (flush with bed level), and for a minimum length of 3 m.</li> </ul>	Inspections	Yes
8. Rock rip rap shall have the following grading: <ul style="list-style-type: none"> <li>• 100% less than 750 mm diameter;</li> <li>• 50% greater than 550 mm diameter; and</li> <li>• 90% greater than 300 mm diameter.</li> </ul>	Inspections	Yes

Purpose: <i>To realign an unnamed tributary of the Mangorei Stream</i>		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
<p>9. On completion of the realignment work:</p> <ul style="list-style-type: none"> <li>• the banks of the reconstructed channel shall have a slope no steeper than 1 metre horizontal to 1 metre vertical;</li> <li>• the bed of the reconstructed channel shall be no less than 1 metre wide and shall be at an appropriate grade so as to provide for fish passage;</li> <li>• the reconstructed channel shall, as far as practicable, replicate the existing stream features such as pools, riffle, and runs by the placement of cobbles and boulders in the bed; and</li> <li>• the reconstructed channel shall have a capacity to carry flood flows that is no less than the original stream channel</li> </ul>	Inspections	Yes
<p>10. Subject to the agreement of the landowner and in conjunction with other consents for the site, the consent holder shall undertake and maintain fencing and riparian planting in accordance with the Riparian Management Plan for the property, specifically:</p> <ul style="list-style-type: none"> <li>• along both sides of the unnamed tributary of the Mangorei Stream for the entire length of the section realigned; and</li> <li>• along 360 m of the true right bank of the Mangorei Stream, from immediately upstream of the confluence of the Mangorei Stream and the unnamed tributary</li> </ul>	Not assessed	N/A

Purpose: <i>To realign an unnamed tributary of the Mangorei Stream</i>		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
11. The fencing and riparian planting required under condition 10 above shall be carried out in accordance with the following programme <ul style="list-style-type: none"> <li>• Mangorei Stream completion date Oct 2014</li> <li>• Unnamed tributary of the Mangorei Stream</li> </ul>	Not assessed	N/A
12. In the event that any archaeological remains are discovered as a result of works authorised by this consent, the works shall cease immediately at the affected site and tangata whenua and the Chief Executive, Taranaki Regional Council, shall be notified within one working day	No notification in this monitoring period	N/A
13. All earthwork areas shall be stabilised as soon as is practicable immediately following completion of soil disturbance activities. <ul style="list-style-type: none"> <li>• Definition of stabilised provided</li> </ul>	Inspections	Yes
14. The works shall remain the responsibility of the consent holder and be maintained so that: <ul style="list-style-type: none"> <li>• any erosion, scour or instability of the stream bed or banks that is attributable to the works carried out as part of this consent is remedied by the consent holder; and</li> <li>• fish passage is not impeded</li> </ul>	Inspections	Yes
15. No vegetation shall be buried within 20 m of the stream.	Inspections	Yes
16. Lapse condition	In effect	N/A
17. Review condition	Review not required	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>

Table 25 Summary of performance for consent 10217-1.0

<b>Purpose: To install a culvert in an unnamed tributary of the Mangorei Stream, including associated bed disturbance</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. This consent authorises the installation of a culvert between approximate grid references reconstructed channel, and reclamation of the existing stream channel between grid references	Inspections	Yes
2. The culvert shall be designed to pass a flow of at least 6.9 m <sup>3</sup> /s.	Not assessed	N/A
3. The consent holder shall ensure that: <ul style="list-style-type: none"> <li>a) the erosion protection includes: <ul style="list-style-type: none"> <li>I. aprons at the culvert inlet and outlet of the culvert; and</li> <li>II. precast or rock rip rap headwalls on the banks surrounding the culvert inlet and outlet; and</li> </ul> </li> <li>b) the rock rip rap is placed on a slope no steeper than 1.5:1, with a thickness of no less than twice the D50 size of the rock</li> </ul>		Yes

<b>Purpose: To install a culvert in an unnamed tributary of the Mangorei Stream, including associated bed disturbance</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
<p>4. No less than 1 month prior to the commencement of works, the consent holder shall submit to the Chief Executive, Taranaki Regional Council, a detailed design for the proposed culvert in compliance with conditions 2 and 3 above. The information provided with the design shall include, as a minimum:</p> <ul style="list-style-type: none"> <li>a) the culvert location, in NZTM coordinates;</li> <li>b) the culvert diameter;</li> <li>c) the fill over the culvert;</li> <li>d) the erosion protection measures and their extents;</li> <li>e) at the inlet and outlet of the culvert; and</li> <li>f) in the bed and banks of the stream</li> </ul>	Provided in November 2016	Yes
<p>5. The culvert and associated structures shall be constructed in accordance with approved design provided to fulfil the requirements of condition 1 of this consent</p>	Inspections	Yes
<p>6. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 2 working days prior to the commencement of work</p>	Inspections	Yes
<p>7. Any concrete work carried out in the river bed shall be completely separated from running water, by a temporary coffer-dam and/or diversion using sand bags or some other form of contained of fill</p>	Not required currently	N/A
<p>8. The consent holder shall ensure that any concrete placed in the channel is not exposed to flowing water for a period of 48 hours after it has been placed</p>	Not assessed	N/A
<p>9. Between 1 May and 31 October no work shall be undertaken on any part of the stream bed that is covered by water</p>	Inspections, no work notification received in this period	N/A

<b>Purpose: To install a culvert in an unnamed tributary of the Mangorei Stream, including associated bed disturbance</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
10. The consent holder shall take all practicable steps to minimise stream bed disturbance, sedimentation and increased turbidity during installation of the culvert, including by: <ul style="list-style-type: none"> <li>a) completing all works in the minimum time practicable;</li> <li>b) avoiding placement of excavated material in the flowing channel;</li> <li>c) keeping machinery out of the actively flowing channel, as far as practicable; and</li> <li>d) reinstating any disturbed areas as far as practicable</li> </ul>	Inspections	Yes
11. The culvert shall not restrict fish passage	Inspections	Yes
12. The invert of the culvert shall be set below the existing streambed by at least 20% of the culvert diameter so that it fills with bed material and simulates the natural bed	Inspections	Yes
13. The gradient of the culvert shall be no steeper than the natural gradient of the stream bed at the site	Inspections	Yes
14. On completion of works, the banks of the channel upstream and downstream of the culvert shall be no steeper than the existing natural banks. Where the bank consists of fill, the fill must be well compacted with batter slopes no steeper than 2 horizontal to 1 vertical	Inspections	Yes

<b>Purpose: To install a culvert in an unnamed tributary of the Mangorei Stream, including associated bed disturbance</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
15. The culvert shall remain the responsibility of the consent holder and be maintained so that: a) it does not become blocked, and at all times allows the free flow of water through it; and b) the consent holder repairs any erosion, scour or instability of the stream bed or banks that the culvert causes	Inspections	Yes
16. In the event that any archaeological remains are discovered as a result of works authorised by this consent, the works shall cease immediately at the affected site and tangata whenua and the Chief Executive, Taranaki Regional Council, shall be notified within one working day	None communicated	N/A
17. Lapse condition	In effect	N/A
18. Review condition	Review not required	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>

During the year, the Company demonstrated a high level of environmental and high level of administrative performance with the resource consents as defined in Section 1.1.4.

### 3.4 Alterations to monitoring programmes for 2021-2022

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

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

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

Planned changes for 2021-2022 monitoring programme include the removal of the surface water monitoring from the Mangorei Stream as the facility does not discharge. The remainder of the monitoring programme will remain unchanged from that undertaken in the 2020-2021 monitoring period.

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



## 4 Recommendations

1. THAT in the first instance, monitoring of consented activities at Company facility in the 2021-2022 year continue at the same level as in 2020-2021 with the removal of the requirement for Mangorei Stream samples, on the premise the facility discharge does not reach the surface waters of the Stream.
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.

## Glossary of common terms and abbreviations

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

Al*	Aluminium.
As*	Arsenic.
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.
Bund	A wall around a tank to contain its contents in the case of a leak.
CBOD	Carbonaceous biochemical oxygen demand. A measure of the presence of degradable organic matter, excluding the biological conversion of ammonia to nitrate.
cfu	Colony forming units. A measure of the concentration of bacteria usually expressed as per 100 millilitre sample.
COD	Chemical oxygen demand. A measure of the oxygen required to oxidise all matter in a sample by chemical reaction.
Conductivity	Conductivity, an indication of the level of dissolved salts in a sample, usually measured at 25°C and expressed in $\mu\text{S}/\text{cm}$ .
Cu*	Copper.
Cumec	A volumetric measure of flow- 1 cubic metre per second ( $1 \text{ m}^3\text{s}^{-1}$ ).
DO	Dissolved oxygen.
DRP	Dissolved reactive phosphorus.
E.coli	Escherichia coli, an indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units per 100 millilitre sample.
Ent	Enterococci, an indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units per 100 millilitre of sample.
F	Fluoride.
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.
FNU	Formazin nephelometric units, a measure of the turbidity of water
Fresh	Elevated flow in a stream, such as after heavy rainfall.
$\text{g}/\text{m}^2/\text{day}$	grams/metre <sup>2</sup> /day.
$\text{g}/\text{m}^3$	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 <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.
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.
MPN	Most Probable Number. A method used to estimate the concentration of viable microorganisms in a sample.
µS/cm	Microsiemens per centimetre.
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).
NO <sub>3</sub>	Nitrate, normally expressed in terms of the mass of nitrogen (N).
NTU	Nephelometric Turbidity Unit, a measure of the turbidity of water.
O&G	Oil and grease, defined as anything that will dissolve into a particular organic solvent (e.g. hexane). May include both animal material (fats) and mineral matter (hydrocarbons).
Pb*	Lead.
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.
PM <sub>10</sub> , PM <sub>2.5</sub> , PM <sub>1.0</sub>	Relatively fine airborne particles (less than 10 or 2.5 or 1.0 micrometre diameter, respectively).
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 or FNU.
Zn*	Zinc.

\*an abbreviation for a metal or other analyte may be followed by the letters 'As', to denote the amount of metal recoverable in acidic conditions. This is taken as indicating the total amount of metal that might be solubilised under extreme environmental conditions. The abbreviation may alternatively be followed by the letter 'D', denoting the amount of the metal present in dissolved form rather than in particulate or solid form.

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

## Bibliography and references

General Electric Emissions Guarantee Acceptance Test Report. Todd Generation Taranaki Limited Junction Road, New Zealand April 2020.

Golder Associates. Bay of Plenty Energy Ltd. Technical assessment of the discharges to air- 100 MW Taranaki Power Plant. September 2012.

Ministry for the Environment. 2018. Best Practice Guidelines for Compliance, Monitoring and Enforcement under the Resource Management Act 1991. Wellington: Ministry for the Environment.

Tkachenko V. Taranaki Regional Council. Ambient Gas (PM10, CO and LEL) Monitoring at Junction Road Power Plant during the 2020-2021 monitoring year.



# Appendix I

## Resource consents held by Todd Generation Ltd

(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: Todd Generation Taranaki Limited  
Level 15  
The Todd Building  
95 Customhouse Quay  
Wellington 6011

Decision Date  
(Change): 12 September 2017

Commencement Date  
(Change): 12 September 2017 (Granted Date: 24 July 2013)

**Conditions of Consent**

Consent Granted: To discharge treated stormwater and wastewater from the  
Junction Road Power Plant into the Mangorei Stream

Expiry Date: 1 June 2033

Review Date(s): June 2020, June 2026 and in accordance with special  
condition 13

Site Location: Junction Road Power Plant  
688 Junction Road, New Plymouth

Grid Reference (NZTM) 1695340E-5669748N

Catchment: Waiwhakaiho

Tributary: Mangorei

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

### General condition

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

### Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.
2. The stormwater discharged shall be from a catchment area not exceeding 2.5 hectares.
3. All stormwater shall pass through a treatment system that includes a settlement pond with a capacity of no less than 250 m<sup>3</sup>.
4. Except as provided for in condition 5 below, the levels of contaminants in the discharge shall be in general accordance with those stated in the application for this consent.
5. Constituents of the discharge shall meet the standards shown in the following table.

<b>Constituent</b>	<b>Standard</b>
pH	Within the range 6.0 to 9.0
suspended solids	Concentration not greater than 100 gm <sup>-3</sup>
total recoverable hydrocarbons	Concentration not greater than 15 gm <sup>-3</sup>
free chlorine	Concentration not greater than 0.1 gm <sup>-3</sup>

This condition shall apply before entry of the combined stormwater and wastewater into the receiving waters at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

6. After allowing for reasonable mixing, within a mixing zone extending 25 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:
  - 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.

## Consent 9383-1.1

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 spill or emergency and shall, to the satisfaction of the Chief Executive, Taranaki Regional Council, detail measures and procedures to be undertaken to prevent spillage or accidental discharge of contaminants not authorised by this consent and measures to avoid, remedy or mitigate the environmental effects of such a spillage or discharge.
8. Within three months of the granting of this consent, the consent holder shall prepare and maintain a stormwater management plan. This plan shall be followed at all times, shall be certified by the Chief Executive, Taranaki Regional Council, and shall include but not necessarily be limited to:
  - a) details of the treatment system;
  - b) details of how the treatment system will be maintained; and
  - c) details of how the site will be managed to minimise the contaminants that become entrained in the stormwater.

*Note: The stormwater management plan may be combined to include other stormwater discharges from the site.*

9. The consent holder shall notify the Chief Executive, Taranaki Regional Council, prior to making any changes to the processes or operations undertaken at the site, or the chemicals used or stored on site, that could alter the nature of the discharge. Any such change shall then only occur following receipt of any necessary approval under the Resource Management Act. Notification shall include the consent number, a brief description of the activity consented and an assessment of the environmental effects of any changes, and be emailed to [consents@trc.govt.nz](mailto:consents@trc.govt.nz).
10. Subject to the agreement of the landowner and in conjunction with other consents for the site, the consent holder shall undertake and maintain fencing and riparian planting in accordance with the Riparian Management Plan for the property, specifically:
  - along both sides of the unnamed tributary of the Mangorei Stream for the entire length of the section realigned in accordance with consent 9385-1; and
  - along 360 metres of the true right bank of the Mangorei Stream, from immediately upstream of the confluence of the Mangorei Stream and the unnamed tributary.
11. The fencing and riparian planting required under condition 10 above shall be carried out in accordance with the following programme:

Stream bank to be fenced and planted	Completion date
Mangorei Stream	1 October 2014
Unnamed tributary of the Mangorei Stream	First planting season following completion of works

## Consent 9383-1.1

12. This consent shall lapse on 30 September 2023, 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.
13. 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 2020 and/or June 2026; and/or
  - b) within 3 months of receiving a notification under special condition 9 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.

Transferred at Stratford on 10 July 2018

For and on behalf of  
Taranaki Regional Council

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A D McLay  
**Director-Resource Management**

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

Name of Consent Holder: Todd Generation Taranaki Limited  
Level 15  
The Todd Building  
95 Customhouse Quay  
Wellington 6011

Decision Date (Change): 3 April 2017

Commencement Date (Change): 3 April 2017 (Granted Date: 23 July 2013)

**Conditions of Consent**

Consent Granted: To install and use a stormwater outlet structure in the Mangorei Stream

Expiry Date: 1 June 2033

Review Date(s): June 2020, June 2026

Site Location: Junction Road Power Plant  
688 Junction Road, New Plymouth

Grid Reference (NZTM) 1695340E-5669780N

Catchment: Waiwhakaiho

Tributary: Mangorei

*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 structure shall be constructed in general accordance with the plans prepared by BTW Company Limited titled "Nova Energy Limited SH3 Proposed Platform Stormwater Outlet", Drawing No. 280-31051-08, REV F. In the case of any contradiction between the drawing(s) and the conditions of this consent, the conditions of this consent shall prevail.
2. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 48 hours prior to the exercise of this consent 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 river bed or discharges to water. Notification shall include the consent number and a brief description of the activity consented and be emailed to [worknotification@trc.govt.nz](mailto:worknotification@trc.govt.nz).
3. The consent holder shall take all practicable steps to minimise sedimentation and increased turbidity of the stream during the construction, implementation and maintenance of the works, including:
  - a) completing all works in the minimum time practicable;
  - b) avoiding placement of excavated material in the flowing channel;
  - c) keeping machinery out of the actively flowing channel, as far as practicable; and
  - d) undertaking works during times of low flow.
4. The discharge pipe shall have a diameter no less than 375 mm.
5. The lower 5 metres (vertical) of the rock riprap shall have the following grading:
  - 100% less than 1000 mm diameter;
  - 50% greater than 750 mm diameter; and
  - 90% greater than 450 mm diameter.
6. The depth of the rock riprap shall be at least 1.2 metres.
7. The consent holder shall ensure that the area and volume of stream bed disturbance is, as far as practicable, minimised and any areas that are disturbed are, as far as practicable, reinstated.
8. Except with the written agreement of the Chief Executive, Taranaki Regional Council, the structure(s) authorised by this consent shall be removed and the area reinstated, if and when the structure is no longer required. A further resource consent may be required to authorise the removal of the structure, and the consent holder is advised to seek advice from the Taranaki Regional Council on this matter.

## Consent 9384-1.1

9. In the event that any archaeological remains are discovered as a result of works authorised by this consent, the works shall cease immediately at the affected site and tangata whenua and the Chief Executive, Taranaki Regional Council, shall be notified within one working day. Works may recommence at the affected area when advised to do so by the Chief Executive, Taranaki Regional Council. Such advice shall be given after the Chief Executive has considered: tangata whenua interest and values, the consent holder's interests, the interests of the public generally, and any archaeological or scientific evidence. The New Zealand Police, Coroner, and Historic Places Trust shall also be contacted as appropriate, and the work shall not recommence in the affected area until any necessary statutory authorisations or consents have been obtained.
10. The works shall remain the responsibility of the consent holder and be maintained so that any erosion, scour or instability of the stream bed or banks that is attributable to the works carried out under this consent, is remedied by the consent holder.
11. This consent shall lapse on 30 September 2018, 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 2020 and/or June 2026, 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.

Transferred at Stratford on 10 July 2018

For and on behalf of  
Taranaki Regional Council

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A D McLay  
**Director - Resource Management**





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

Name of Consent Holder: Todd Generation Taranaki Limited  
Level 15  
The Todd Building  
95 Customhouse Quay  
Wellington 6011

Decision Date: 23 July 2013

Commencement Date: 23 July 2013

**Conditions of Consent**

Consent Granted: To realign an unnamed tributary of the Mangorei Stream

Expiry Date: 1 June 2033

Review Date(s): June 2020, June 2026

Site Location: Junction Road Power Plant  
688 Junction Road, New Plymouth

Grid Reference (NZTM) Between 1695519E-5669613N & 1695491E-5669748N

Catchment: Waiwhakaiho

Tributary Mangorei

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

### General condition

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

### Special conditions

1. This consent authorises the permanent diversion of the full stream flow through a reconstructed channel, and reclamation of the existing stream channel between grid references (NZTM) 1695491E-5669748N and 1695519E-5669613N.
2. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 48 hours prior to the exercise of this consent 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 river bed or discharges to water. Notification shall include the consent number and a brief description of the activity consented and be emailed to [worknotification@trc.govt.nz](mailto:worknotification@trc.govt.nz).
3. The consent holder shall take all practicable steps to minimise sedimentation and increased turbidity of the stream during the construction, implementation and maintenance of the works, including:
  - a) completing all works in the minimum time practicable;
  - b) avoiding placement of excavated material in the flowing channel;
  - c) keeping machinery out of the actively flowing channel, as far as practicable; and
  - d) undertaking works during times of low flow.
4. As far as practicable, excavation of the reconstructed channel shall be completed prior to diverting the flow.
5. Instream silt control measures (such as hay bales) shall be placed in the unnamed tributary directly downstream of the realignment. The silt control measures may only be removed once the rock rip rap has been placed in the new channel and the tributary has stabilised.
6. The consent holder shall ensure that the passage of fish is not impeded, as far as practicable, during the works. If any fish are stranded due to the works, the consent holder shall ensure that these are placed back in the active flowing part of the channel as soon as practicable.
7. The consent holder shall place rock rip rap armouring at both ends of the realignment (i.e. where the new channel meets the old channel). Rock rip rap shall be placed:
  - on the banks of the channel, over a minimum length of 3 metres and a minimum height of 1 metre vertical; and
  - in the bed of the channel, across the full width of the channel (flush with bed level), and for a minimum length of 3 metres.

8. Rock rip rap shall have the following grading:
  - 100% less than 750 mm diameter;
  - 50% greater than 550 mm diameter; and
  - 90% greater than 300 mm diameter.
9. On completion of the realignment work:
  - the banks of the reconstructed channel shall have a slope no steeper than 1 metre horizontal to 1 metre vertical;
  - the bed of the reconstructed channel shall be no less than 1 metre wide and shall be at an appropriate grade so as to provide for fish passage;
  - the reconstructed channel shall, as far as practicable, replicate the existing stream features such as pools, riffle, and runs by the placement of cobbles and boulders in the bed; and
  - the reconstructed channel shall have a capacity to carry flood flows that is no less than the original stream channel.
10. Subject to the agreement of the landowner and in conjunction with other consents for the site, the consent holder shall undertake and maintain fencing and riparian planting in accordance with the Riparian Management Plan for the property, specifically:
  - along both sides of the unnamed tributary of the Mangorei Stream for the entire length of the section realigned; and
  - along 360 metres of the true right bank of the Mangorei Stream, from immediately upstream of the confluence of the Mangorei Stream and the unnamed tributary.
11. The fencing and riparian planting required under condition 10 above shall be carried out in accordance with the following programme:

Stream bank to be fenced and planted	Completion date
Mangorei Stream	1 October 2014
Unnamed tributary of the Mangorei Stream	First planting season following completion of works

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

## Consent 9385-1

13. All earthwork areas shall be stabilised as soon as is practicable immediately following completion of soil disturbance activities.

*Note: For the purpose of this condition "stabilised" in relation to any site or area means inherently resistant to erosion or rendered resistant, such as by using indurated rock or by the application of basecourse, colluvium, grassing, mulch, or another method to the reasonable satisfaction of the Chief Executive, Taranaki Regional Council and as specified in Taranaki Regional Council's Guidelines for Earthworks in the Taranaki Region, 2006. Where seeding or grassing is used on a surface that is not otherwise resistant to erosion, the surface is considered stabilised once, on reasonable visual inspection by an Investigating Officer, Taranaki Regional Council, an 80% vegetative cover has been established.*

14. The works shall remain the responsibility of the consent holder and be maintained so that:

- a) any erosion, scour or instability of the stream bed or banks that is attributable to the works carried out as part of this consent is remedied by the consent holder; and
- b) fish passage is not impeded.

15. No vegetation shall be buried within 20 metres of the stream.

16. This consent shall lapse on 30 September 2018, 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.

17. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2020 and/or June 2026 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.

Transferred at Stratford on 10 July 2018

For and on behalf of  
Taranaki Regional Council

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A D McLay  
**Director - Resource Management**

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

Name of  
Consent Holder: Todd Generation Taranaki Limited  
Level 15  
The Todd Building  
95 Customhouse Quay  
Wellington 6011

Decision Date  
(Change): 12 September 2017

Commencement Date  
(Change): 12 September 2017 (Granted Date: 24 July 2013)

**Conditions of Consent**

Consent Granted: To discharge emissions into the air arising from combustion of natural gas and other activities associated with the operation of the Junction Road Power Plant

Expiry Date: 1 June 2033

Review Date(s): June 2020, June 2026

Site Location: Junction Road Power Plant  
688 Junction Road, New Plymouth

Grid Reference (NZTM) 1695340E-5669780N

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

**General condition**

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

**Special conditions**

1. The consent holder shall adopt the best practicable option to prevent or minimise any actual or likely adverse effect on the environment associated with the discharge of contaminants into the environment from the property.
2. By 30 August 2015 and every six years thereafter, the consent holder shall provide to the Taranaki Regional Council a written report that demonstrates compliance with condition 1 above. The report shall include but not necessarily be limited to:
  - a) A review of any of technological advances in the reduction or mitigation of emissions, how these might be applicable and/or implemented at the power plant, and the costs and benefits of these advances; and
  - b) An inventory of emissions from the site of such contaminants as the Chief Executive, Taranaki Regional Council, may from time to time specify following consultation with the consent holder; and
  - c) Documentation showing that emissions of contaminants is the minimum that can be reasonably achieved; and
  - d) Details of any measures that have been taken by the consent holder to improve the energy efficiency of the power plant.
3. The consent holder shall control all emissions of carbon monoxide, nitrogen dioxide, fine particles (PM10) and sulphur dioxide to the atmosphere from the site, in order that the maximum ground level concentration of any of these contaminants arising from the exercise of this consent measured under ambient conditions does not exceed the relevant ambient air quality standard as set out in the Resource Management (National Environmental Standards for Air Quality Regulations, 2004) at or beyond the boundary of the property.
4. The consent holder shall control all emissions to the atmosphere from the site of contaminants other than those expressly provided for under special condition 3, in order that they do not individually or in combination with other contaminants cause a hazardous, noxious, dangerous, offensive or objectionable effect at or beyond the boundary of the property.
5. The minimum height of discharge of the products of combustion from the turbines shall be 18 metres above ground level.
6. The discharges authorised by this consent shall not give rise to any direct significant adverse ecological effect on any ecosystems in the Taranaki region, including but not limited to habitats, plants, animals, microflora and microfauna.

## Consent 9402-1.1

7. This consent shall lapse on 30 September 2023, 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.
8. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2020, and/or June 2026 for any of the following purposes:
  - a) dealing with any significant adverse effect on the environment arising from the exercise of the consent which was not foreseen at the time the application was considered or which it was not appropriate to deal with at the time; and/or
  - b) requiring the consent holder to adopt specific practices in order to achieve the best practicable option to remove or reduce any adverse effect on the environment caused by the discharge.

Transferred at Stratford on 10 July 2018

For and on behalf of  
Taranaki Regional Council

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A D McLay  
**Director - Resource Management**





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

Name of Consent Holder: Todd Generation Taranaki Limited  
Level 15  
The Todd Building  
95 Customhouse Quay  
Wellington 6011

Decision Date: 18 February 2016

Commencement Date: 18 February 2016

**Conditions of Consent**

Consent Granted: To install a culvert in an unnamed tributary of the Mangorei Stream, including the associated disturbance of the streambed

Expiry Date: 1 June 2032

Review Date(s): June 2020, June 2026

Site Location: 594 Junction Road, New Plymouth

Grid Reference (NZTM) Between 1695936E-5669602N & 1695981E-5669386N

Catchment: Waiwhakaiho

Tributary: Mangorei

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

### General condition

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

### Special conditions

1. This consent authorises the installation of a culvert between approximate grid references 1695936E-5669602N and 1695981E-5669386E.
2. The culvert shall be designed to pass a flow of at least 6.9 m<sup>3</sup>/s.
3. The consent holder shall ensure that:
  - a) the erosion protection includes:
    - i) aprons at the culvert inlet and outlet of the culvert; and
    - ii) precast or rock rip rap headwalls on the banks surrounding the culvert inlet and outlet; and
  - b) the rock rip rap is placed on a slope no steeper than 1.5:1, with a thickness of no less than twice the D50 size of the rock.
4. No less than 1 month prior to the commencement of works, the consent holder shall submit to the Chief Executive, Taranaki Regional Council, a detailed design for the proposed culvert in compliance with conditions 2 and 3 above. The information provided with the design shall include, as a minimum:
  - a) the culvert location, in NZTM coordinates;
  - b) the culvert diameter;
  - c) the fill over the culvert;
  - d) the erosion protection measures and their extents:
    - i) at the inlet and outlet of the culvert; and
    - ii) in the bed and banks of the stream.
5. The culvert and associated structures shall be constructed in accordance with approved design provided to fulfil the requirements of condition 1 of this consent. In the case of any contradiction between the approved design and the conditions of this consent, the conditions of this consent shall prevail.
6. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 2 working days prior to the commencement of work. Notification shall include the consent number and a brief description of the activity consented and be emailed to [worknotification@trc.govt.nz](mailto:worknotification@trc.govt.nz).
7. Any concrete work carried out in the river bed shall be completely separated from running water, by a temporary coffer-dam and/or diversion using sand bags or some other form of contained of fill.
8. The consent holder shall ensure that any concrete placed in the channel is not exposed to flowing water for a period of 48 hours after it has been placed.

## Consent 10217-1.0

9. Between 1 May and 31 October no work shall be undertaken on any part of the stream bed that is covered by water.
10. The consent holder shall take all practicable steps to minimise stream bed disturbance, sedimentation and increased turbidity during installation of the culvert, including by:
  - a) completing all works in the minimum time practicable;
  - b) avoiding placement of excavated material in the flowing channel;
  - c) keeping machinery out of the actively flowing channel, as far as practicable; and
  - d) reinstating any disturbed areas as far as practicable.
11. The culvert shall not restrict fish passage.
12. The invert of the culvert shall be set below the existing streambed by at least 20% of the culvert diameter so that it fills with bed material and simulates the natural bed.
13. The gradient of the culvert shall be no steeper than the natural gradient of the stream bed at the site.
14. On completion of works, the banks of the channel upstream and downstream of the culvert shall be no steeper than the existing natural banks. Where the bank consists of fill, the fill must be well compacted with batter slopes no steeper than 2 horizontal to 1 vertical.
15. The culvert shall remain the responsibility of the consent holder and be maintained so that:
  - a) it does not become blocked, and at all times allows the free flow of water through it; and
  - b) the consent holder repairs any erosion, scour or instability of the stream bed or banks that the culvert causes.
16. In the event that any archaeological remains are discovered as a result of works authorised by this consent, the works shall cease immediately at the affected site and tangata whenua and the Chief Executive, Taranaki Regional Council, shall be notified within one working day. Works may recommence at the affected area when advised to do so by the Chief Executive, Taranaki Regional Council. Such advice shall be given after the Chief Executive has considered: tangata whenua interest and values, the consent holder's interests, the interests of the public generally, and any archaeological or scientific evidence. The New Zealand Police, Coroner, and Historic Places Trust shall also be contacted as appropriate, and the work shall not recommence in the affected area until any necessary statutory authorisations or consents have been obtained.
17. This consent shall lapse on 31 March 2021, 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 10217-1.0

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 2020 and/or June 2026, 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.

Transferred at Stratford on 10 July 2018

For and on behalf of  
Taranaki Regional Council

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A D McLay  
**Director - Resource Management**