Contact Energy Ltd
Stratford Power Station
Monitoring Programme
Annual Report
2018-2019

Technical Report 2019-81

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Executive summary

Contact Energy Ltd (the Company) operates the Stratford Power Station (SPS) located on State Highway 43 near Stratford in the Patea catchment. The Company holds resource consents that provide for the power station. The consents allow the Company to abstract water from the Patea River, to discharge to the Patea River and the Kahouri Stream. They also provide for discharges onto and into land, as well as for several structures across streams, and to discharge emissions into the air. The Company also held consents which related to the Ahuroa B gas storage facility, and the associated connecting pipeline, however this was sold to GSNZ SPV 1 Ltd in October 2018.

This report for the period July 2018 to June 2019 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 activities.

The Company in relation to SPS hold 27 resource consents, which include a total of 232 conditions setting out the requirements that they must satisfy. The consents provide for three gas-fired plants. These are a combined cycle plant (TTC1), a smaller open cycle peaking plant (SP1), and a yet to be built facility which will comprise of a copy of either of the two existing facilities.

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

The Council's monitoring programme for the year under review included five inspections, 18 water samples collected for physicochemical analysis and three biomonitoring surveys of receiving waters. In addition, monthly emission results and abstraction records were provided to the Council which were reviewed.

The monitoring showed that the Stratford Power Station continued to be well managed with negligible environmental effects as a process of the exercise of their consents.

Surface water abstraction was compliant with daily rate and volume. Process water discharges were compliant with consent defined parameters. Surface water monitoring indicated negligible impacts from the discharge of process waters. The thermal tolerances within the receiving waters were not exceeded for the duration of the monitoring period.

Emissions monitoring results from the Taranaki Combined Cycle (TCC) were within consent defined specifications for the full duration of the monitoring period.

The Stratford Peaker Plants (SP1) were assessed by General Electric for nitrous oxide (NOx) remapping. This was proposed to extend the service life of both units. It also allowed for emission data to be provided, with supporting rationale, to the Council. The Company has also confirmed they will continue with biennial stack testing of both these units.

Odour issues associated with the cooling towers from SP1 have been mitigated by the Company.

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

For reference, in the 2018-2019 year, consent holders were found to achieve a high level of environmental performance and compliance for 83% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 13% of the consents, a good level of environmental performance and compliance was achieved.

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

This report includes recommendations for the 2019-2020 year.

Table of contents

List of tables

List of figures

List of photos

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 2018 to June 2019 by the Taranaki Regional Council (the Council) on the monitoring programme associated with resource consents held by Contact Energy Ltd (the Company). The Company operates two gas-fired power plants at Stratford Power Station (Taranaki Combine Cycle TCC1 and Stratford Peaker Plants SP1), situated on East Road (State Highway 43) near Stratford, in the Patea 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 Patea catchments, and the air discharge permit held by the Company to cover emissions to air from the sites.

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 21st 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 though annual programmes;
- the resource consents held by the Company in the Patea 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 site.

Section 2 presents the results of monitoring of Stratford Power Station (SPS) during the period under review, including scientific and technical data.

Section 3 discusses the results, their interpretations, and their significance for the environment including recommendations to be implemented in the 2018-2019 monitoring year for SPS.

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

1.1.3 The Resource Management Act 1991 and monitoring

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

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

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

e. risks to the neighbourhood or environment.

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

1.1.4 Evaluation of environmental and administrative performance

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 2018-2019 year, consent holders were found to achieve a high level of environmental performance and compliance for 83% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 13% of the consents, a good level of environmental performance and compliance was achieved.

1.2 Process description

Taranaki Combined Cycle Plant (TCC1)

The Taranaki Combined Cycle Power Plant (Photo 1) was the first large-scale combined-cycle power plant to be built in New Zealand. The plant was completed in 1998. It uses a gas turbine and a steam turbine in tandem to generate electricity at an efficiency greater than could be achieved by either system alone. The hot exhaust gases from the gas turbine are directed into a heat recovery boiler where most of the heat is used to produce high pressure steam that drives the steam turbine. The station was designed to produce up to 354 MW of electricity at an efficiency of about 56%, which has since been improved to 383 MW at 56.7%. The combustion system in the gas turbine is especially designed to minimise the production of nitrogen oxides in the gases.

The cooling system for the steam system is based on an evaporative process. The cooling towers have been designed to minimise the formation of a vapour plume, so that a plume is visible only under cool or humid conditions.

The gas supply for the plant comes mainly from the Kupe and Maui fields together with a smaller component from the underground Ahuroa B Gas Storage facility. The station uses approximately 1.4 million cubic metres of gas per day in generation at full production.

Water is abstracted from the Patea River to supply the cooling towers and for steam generation. The water discharges are from plant utilities and domestic effluent, boiler blowdown and site stormwater. Septic tank effluent is discharged to land.

Stratford Peaker Plants (SP1)

The Stratford Peaker Plant (Photo 1) is designed to provide fast start-up (peaking) capacity to support the increasing volumes of weather-dependent renewable electricity sources in New Zealand, such as wind generation. Commercial operation commenced in June 2011. The plant may be required to run for hours during low wind conditions, or for months during dry hydro years or times of major plant outages. The two separate 100 MW high-efficiency open cycle gas fired turbines are capable of going from cold to full power in 10 minutes. To improve efficiency, air from the low pressure compressor passes through an inter-cooler before entering the high pressure compressor, giving an LHV efficiency of about 46% at full load.

The cooling system for the intercooler is similar in type to that of the Taranaki Combined Cycle Plant described above, being a hybrid dry/wet mechanical draft cooling tower.

Water to supply the cooling tower is drawn from the Patea River via the existing abstraction and storage system for the combined cycle plant. Wastewater is discharged to the Patea River. Site stormwater is transferred to the raw water holding pond at the combined cycle plant during operation. Domestic wastes are discharged to a land-based system which was upgraded in September 2018.

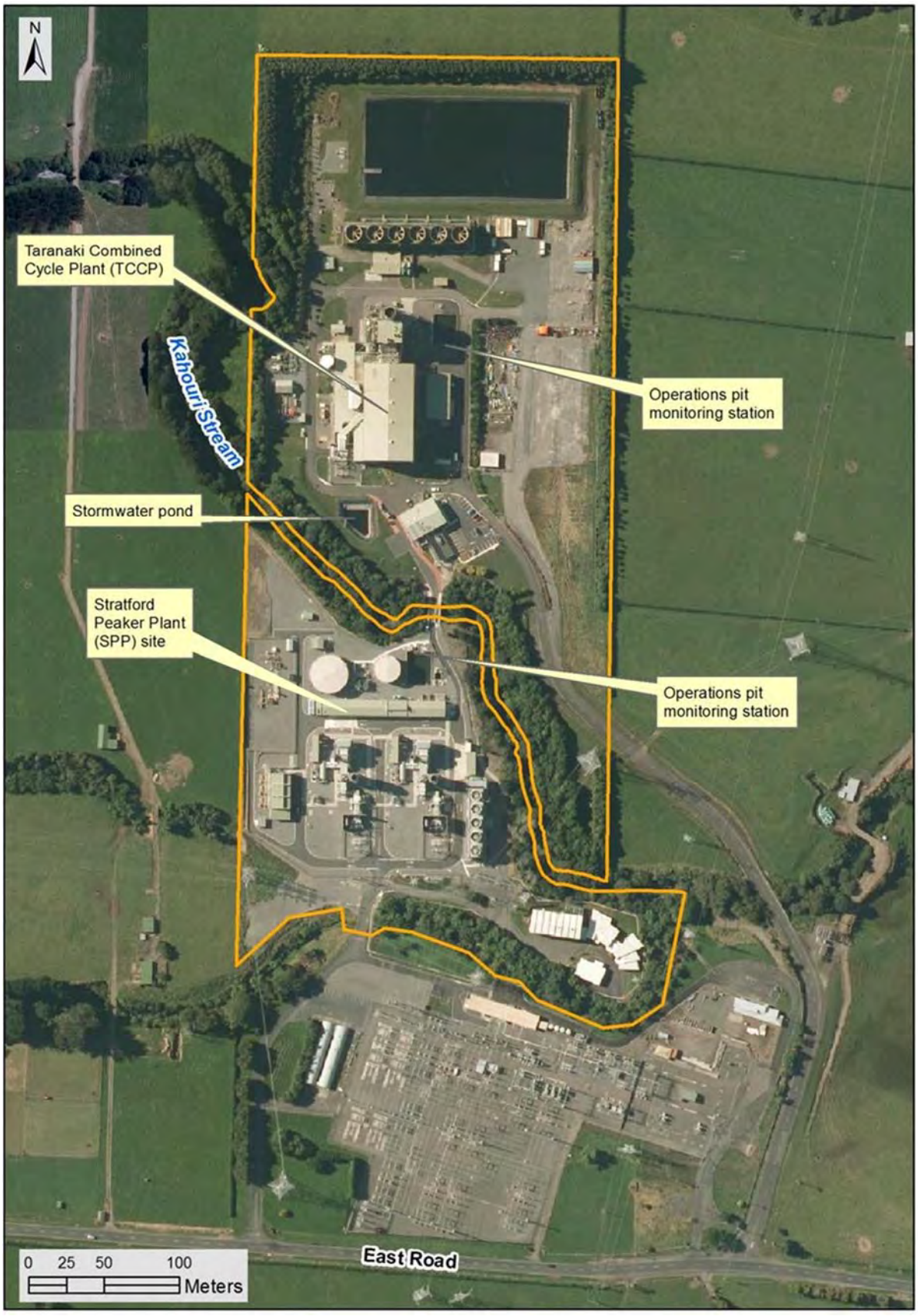

Photo 1 Aerial view of Stratford Power Station March 2012

1.3 Resource consents

A summary of consents held by the Company in relation to activities at its Stratford Power Station site are provided in Table 1 below. Summaries of the conditions are attached to each permit set out in section 3. A copy of each of the consents can be found in Appendix I.

Table 1 Summary of resource consents held by the Company

Consent Number	Purpose	Consent Granted/ Commencement Date	Change to Conditions Date	Next Review Date	Expiry Date
Discharge to Air Permits					
4022-2	Discharge emissions to air from fuel combustion	Dec 1994	Feb 2010	#	2022
4454-1	Discharge contaminants to air from power station & ancillary plant	Aug 1995	Feb 2010	#	2029
5846-1.3*	Discharge contaminants to air from power station & ancillary plant	Jan 2017	-	2022	2034
7247-1	Discharge emissions to air from cooling tower	Mar 2008	-	2022	2034
7786-1.1*	Discharge contaminants to air from construction	Jan 2017	-	2022	2028
Discharge to Water Permits					
5848-1	Discharge up to 78 L/s averaged over 15 minutes of used water to Patea River	Mar 2008	Mar 2008	2022	2034
4459-1.3	Discharge stormwater to Kahouri/Piakau Streams	Jul 2016	-	2022	2028
5633-1	Discharge sediment from water intake to Patea River	May 2000	-	2022	2028
5851-1.3*	Discharge sediment from water intake to Patea River	Jan 2017	-	2022	2034
7785-1.1*	Discharge construction contaminants to Piakau/Kahouri Streams	Jan 2017	-	2022	2028
Discharge to Land Permits					
5063-1	Discharge up to 5m^3 per day of septic tank effluent to land	Mar 2012	-	2022	2028
Water Use Permits					
4455-1	Take up to 225 L/s averaged over 15 minutes from Patea River below Toko confluence	May 1994	Mar 2008	2022	2028
5847-1.3*	Take up to 225 L/s averaged over 15 minutes from Patea River at Skinner Road	Jan 2017	-	2022	2034
Land Use Permits					
5849-1.3	Gas pipeline structures on Kahouri Stream	Jan 2017	-	2022	2034

Consent Number	Purpose	Consent Granted/ Commencement Date	Change to Conditions Date	Next Review Date	Expiry Date
5850-1*	Intake structure on Patea River at Skinner Road	Nov 2001	Mar 2008	2022	2034
4456-1	Intake structure on Patea River below Toko confluence	May 1994	Jan 2000	2022	2028
4458-1	Diffuser structure on Patea River	May 1994	Mar 2008	2022	2028
7248-1	Bridge for pedestrian access and utilities over Kahouri tributary	Mar 2008	-	2022	2034
7250-1	Bridge for pedestrian access and utilities over Kahouri Stream	Mar 2008	-	2022	2034
4804-1	Bridge for electricity transmission over unnamed tributary of Kahouri Stream	Mar 2012	-	2022	2028
4460-1	Stormwater discharge structures (above unnamed tributary of Piakau Stream)	May 2012	-	2022	2028
7605-1	Stormwater discharge structure in Kahouri Stream	Feb 2010	Jun 2010	2022	2028
7653-1	Stormwater discharge structure in Kahouri Stream	Jun 2010	-	2022	2028
4461-1	Utilities structures on Kahouri Stream	Mar 2012	-	2022	2028
5852-1.4*	Utilities structures on Kahouri Stream	Jan 2017	-	2022	2034
4462-1	Water transmission structures above Toko Stream/unnamed streams	May 1994	Mar 2008	2022	2028

*indicates consents not yet exercised

Optional review date is within 6 months of receipt of report required by consent conditions:

For consent 4022-2 the report was provided in December 2014 (next one due December 2020).
For consent 4454-1 the report was provided in 1998.

- Consents 4454 to 4462 and 4804 were granted in 1994 and 1995 to provide for the operation of the existing Taranaki Combined Cycle (TCC1) Power Plant, and consents 5063 and 5633 were issued after the plant was commissioned to provide for minor changes in its operation.
- Consents 5846 to 5852 were granted in 2001 to provide for the operation of a second, 500 MW combined-cycle power plant (TCC2), in combination with the existing plant (TCC1). The proposed second station has not been constructed. A variation to change the date of the lapse of the consents if the consents are not exercised, to 6th December 2017, was granted in February 2007. Consent 5848 is exercised, in relation to the existing plant.
- Consents 7247 to 7250 were granted in March 2008 to provide for the operation of two 100 MW high efficiency open-cycle gas turbine generators, together known as Stratford Peaker Plant (SP1), in combination with the existing plant. Consents 7605 and 7653 were issued in 2010 while the plant was being constructed to provide for minor changes in its design.
- Consents 3939 (now expired) and 4022 had provided for the disused original Stratford Gas Turbine Plant (SGT), and consents 4455, 4458, 4462, 5847, 5848 and 5850 were changed in March 2008 to provide for the Peaker Plant. (Construction of the Peaker Plant commenced in December 2008, following demolition of the old plant. It became fully operational in May 2011).

- Consents 4459, 4460, 4461, 4804, 5063, 5846, 5849 and 5852 were changed in March 2012 to provide for the development and operation of a second Peaker plant (SP1), with up to two 200 MW generators, as an alternative to a second combined cycle plant. Consents 7785 and 7786 were granted to provide for construction activities.

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 site consisted of five 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;
- in 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 Company site was visited five times during the monitoring period. These were conducted on the 19th July 2018, 6th September 2018, 4th December 2018, 7th March 2019 and the 10th June 2019.

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.

Inter-lab comparisons of inspection results were also conducted, and are displayed in section 2.2.1.

1.4.4 Chemical sampling

The Council undertook sampling of both the discharges from the site and the water quality upstream and downstream of the discharge point and mixing zone (Photo 2).

The used water discharge from both the TCCP and SP1 were sampled on four occasion. The discharges were analysed for the analytes provided in Table 2.

Two sites on the Patea River were also sampled on five occasions for the parameters provided in Table 2.

Table 2 SPS chemical sampling analytes

Location	Analytes	
Discharges IND002023 IND002038	Chlorine (Total) Conductivity Dissolved reactive phosphorus (DRP) Un-ionised Ammonia NH_3 Ammoniacal Nitrogen NH_4	Oil and Grease pH Suspended solids Temperature Turbidity
Patea River PAT000356 PAT000357	Conductivity Dissolved reactive phosphorus (DRP) Flow Un-ionised Ammonia NH_3 Ammoniacal Nitrogen NH_4	pH Suspended solids Temperature Turbidity

1.4.5 Biomonitoring surveys

A biological survey was performed on two occasions; 14th November 2018 and the 7th March 2019 in the Patea River to determine whether or not the discharge of used water, mainly cooling water, from the site has had a detrimental effect upon the communities of the streams. The Kahouri Stream was surveyed once; on the 25th March 2019, to assess the effect of stormwater discharges from the Company sites.

These surveys include establishing macroinvertebrate abundance, their corresponding 'health' based on MCI ranges, site habitat characteristics and hydrology and a summary of macroinvertebrate taxa present during the survey.

1.4.6 Provision of consent holder data

The Company submitted monitoring data to the Council on a monthly basis for review pertaining to the operations of the plant, including water abstraction, wastewater discharges and air emissions discharges. They also provided the Council with an annual report. The annual report is appended to this report.

2 Results

2.1 Water

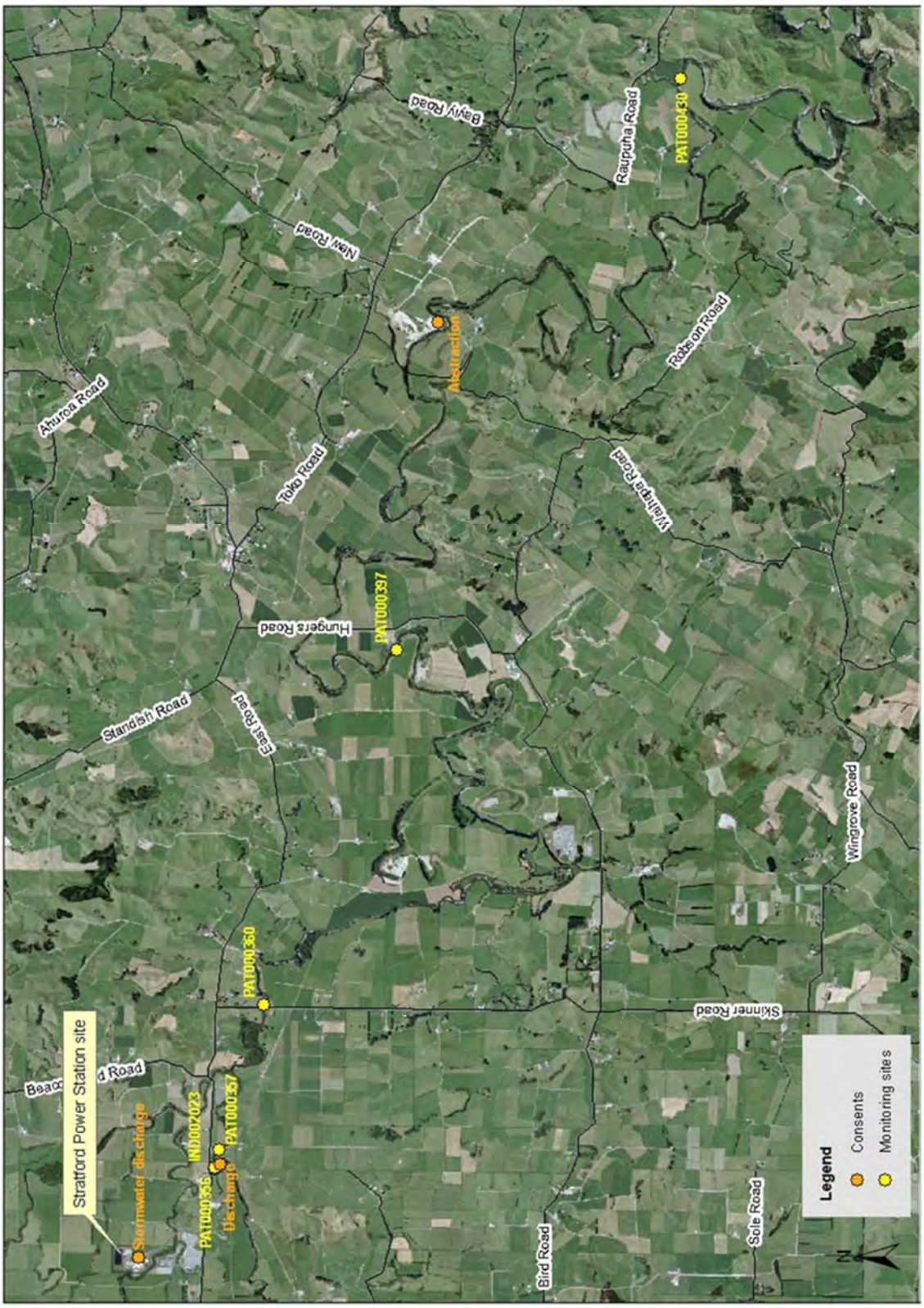

Photo 2 Physicochemical, biological sampling, discharge sites and abstraction site locations

2.1.1 Inspections

At the SPS combined cycle (TCC1) plant and peaker plant (SP1) site, inspection is made of areas where wastewater is generated, treated and monitored, and where chemicals and fuel/oil are stored, transferred and dispensed. The stormwater system is also included.

The laboratory and control room are also visited to view and discuss recent monitoring results. On the Patea River, the abstraction works at Vickers Quarry and the discharge structure beside East Road are inspected.

Inspections specifically address the operation of the water abstraction system, the raw water treatment plant, the cooling water systems, and the wastewater treatment systems (pH neutralisation, oil separation, holding ponds and monitoring stations). The maintenance of areas that are bunded to contain spillage (around chemical and oil storage/use, transformers, electrical batteries), and the stormwater drainage system, are given particular attention.

Five inspections were undertaken by the Council at Contact Energy's facility, Stratford Power Station (SPS), in the 2018-2019 monitoring period. These were undertaken on the following dates:

Inspection 1: 19th July 2018,

Inspection 2: 6th September 2018,

Inspection 3: 4th December 2018,

Inspection 4: 7th March 2019 and

Inspection 5: 10th June 2019.

During these inspections the following areas were also inspected;

- Peaker Plant Ops pits (IND002038),
- Combined cycle Ops pit (IND002023),
- Stormwater pit (STW002032) and
- The diffuser on the Patea River with respect to the process water diffuser.

2.1.1.1 Inspection results and notes

The Company site appeared to be compliant across all consent conditions. In general, the site was found to be well kept with good housekeeping evident across the facility. Staff of the Company were found to hold good knowledge of the environmental aspects of running the plant, and to have proper training in dealing with contingency events that have the potential for causing adverse environmental effects.

Across all consent aspects there appeared to be no visual environmental impacts at any of the discharge locations. There appeared to be even discharges via the diffuser with no foaming, but some jetting on the 7th March due to low river flow. Compliant water quality samples were collected, though some variation was noted in phosphate levels in the inter-lab comparisons, which will be worked on in the upcoming monitoring period. Previous issues concerning odour emitted from the cooling tower system have been rectified.

Temperature logger data was downloaded from all four monitoring sites during each inspection; except the Hungers Road logger on the 7th March 2019, as it had become obstructed. Early in the 2019-2020 monitoring period, wireless Bluetooth temperature loggers are proposed for instillation.

A new septic wastewater treatment facility was being constructed through majority of this monitoring period. The facility was completed for inspection by the 7th March 2019; but was not inspected until the 10th June 2019.

Overall, there is good communication between the Company and the Council. This includes the supply of monthly monitoring reports from the Company to the Council as to the processes undertaken by the facility, which provides good transparency between both parties.

2.1.2 Results of abstraction and discharge monitoring

Water abstractions are regulated under consent 4455. Monitoring of the abstraction system is undertaken at two locations. One is located at the Patea River intake, while the other is located at the inlet to the raw water pond. The raw water pond provides for both power plants (the combined cycle and the two smaller Peaker plants). The Company also hold consent 5847 which is also related to water abstraction, however this is for a future proposed facility.

The record for water abstraction (Figure 1) is based on 15 minute average flows, rather than instantaneous values. This is undertaken to prevent short term spikes within the data set as a consequence of when the pumps are reversed into backwash mode or restarted, as this may give rise to transient water surges in the pipelines which may otherwise represent breaches of the abstraction consent.

The analysis provided in Figure 1 indicated compliance with the consent defined maximum abstraction volume which is limited to 19,440 m^3/day. In addition, the analysis provided by Figure 2 indicated compliance with the maximum abstraction rate (<225 L/s), which was not exceeded for the duration of the monitoring period.

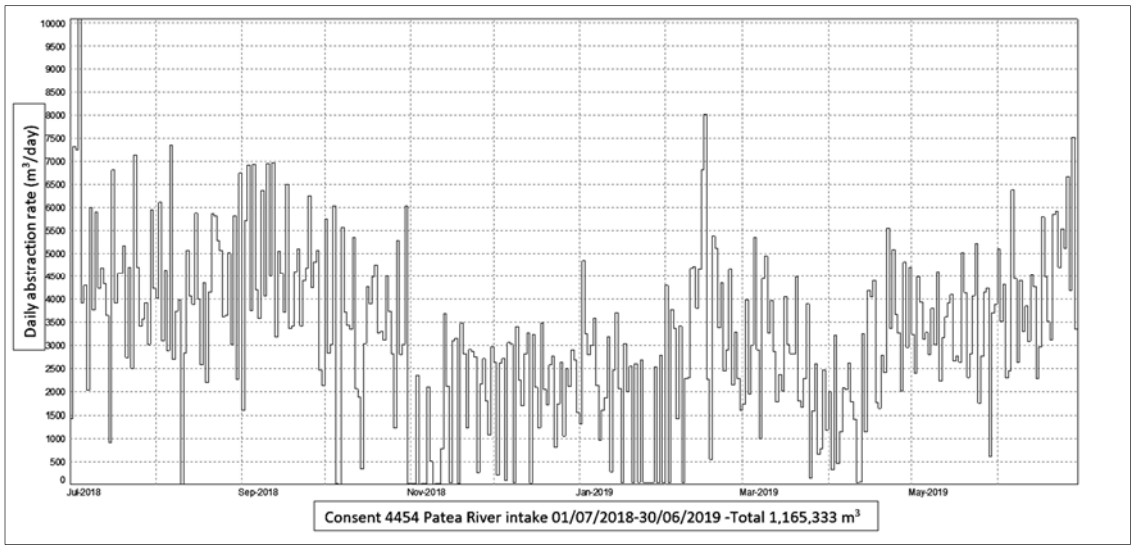

Figure 1 Consent 4454-1 daily abstraction from the Patea River SP1

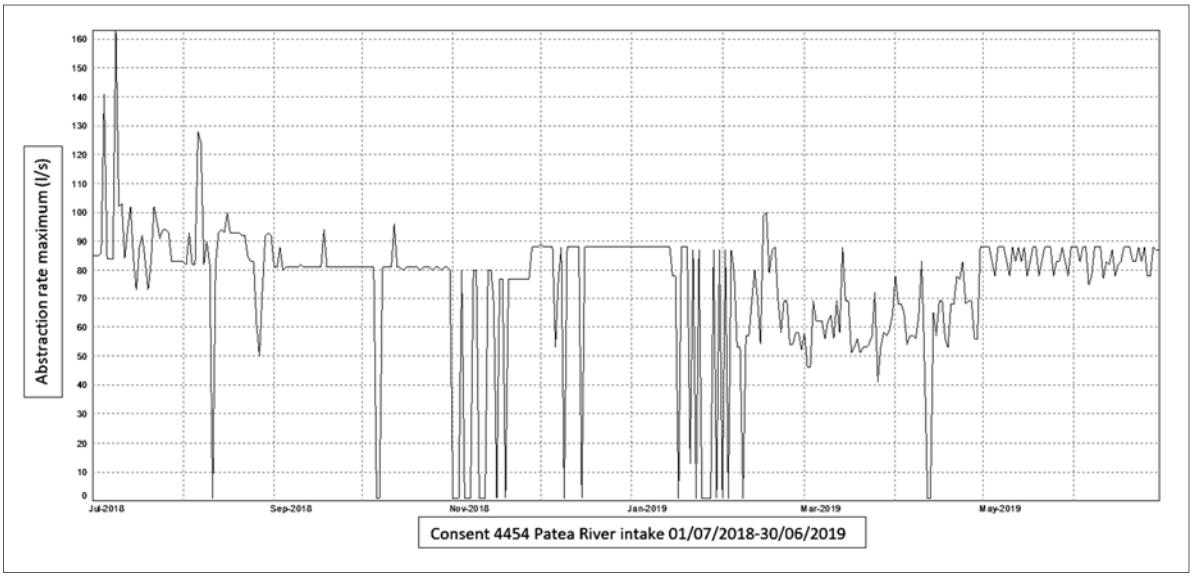

Figure 2 Abstraction rate maximum (L/s) Patea River SP1

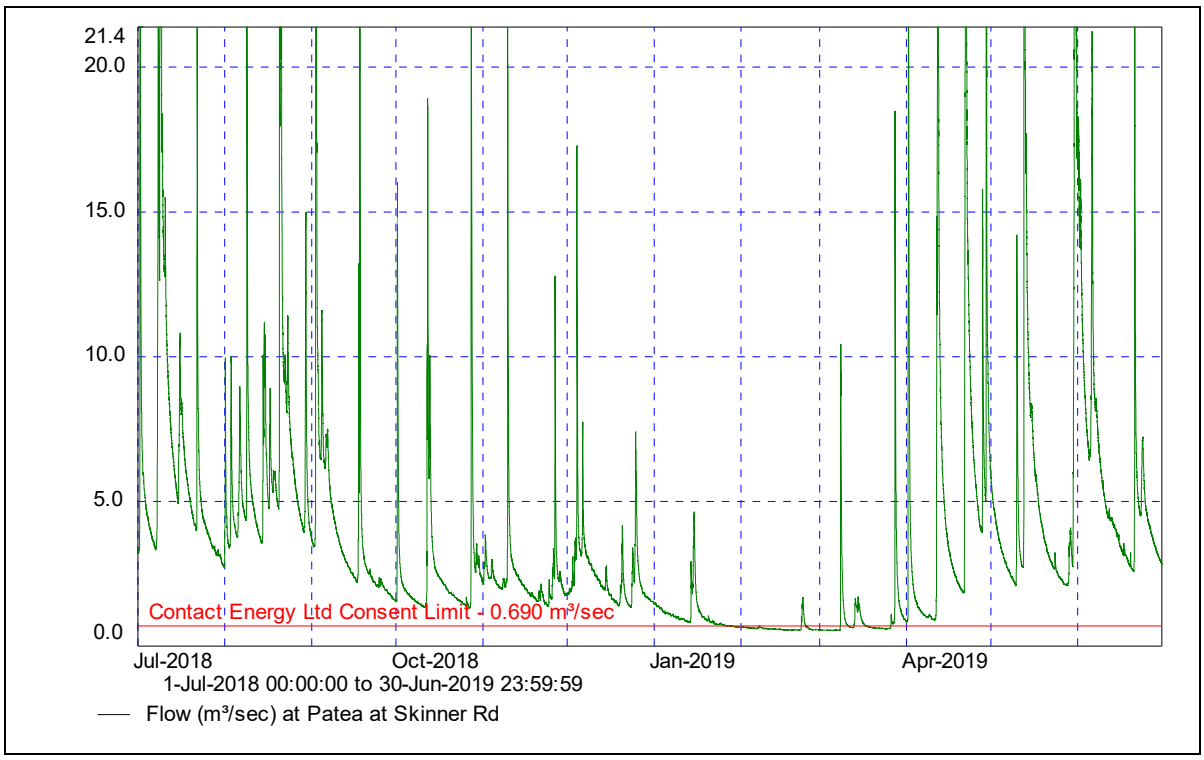

Figure 3 Patea River flow (m^3/sec) at Skinner Road

Flow monitoring

The consent limit (4455-1) is 225 L/s when river flows at Skinner Road are above 765 L/s, ramping down to 150 L/s when river flows at Skinner Road are at or below 690 L/s. The record of the abstraction rate, as provided in Figure 2, can be compared against the flow at Skinner Road (Figure 3). Specifically during January 2019 through to April 2019 the flow, as recorded at Skinner Road (Figure 3), reduced below the consented trigger level of 690 L/s. This required the Company to reduce their abstraction rate to ≤150 L/s, which was undertaken by the Company, as defined in Figure 2.

The abstraction is setup so it is not possible to exceed a pump rate of 225 L/s. Throughout the 2018-2019 monitoring period the maximum abstraction average intake flow was recorded was 163 L/s (July 2018) with

an average flow rate of 53 L/s (Table 3). The total volume abstracted throughout the monitoring period was 1,165,333 m^3.

This abstraction volume was a decrease of 11.05% compared to the previous monitoring period (2017-2018), where the total abstraction volume was 1,310,125 m^3. The TCC1 which was in operation for a total 195 days this monitoring period. For comparison, in the previous monitoring period the TCC1 was in operation for 176 days, but the average abstraction rate was 41.41 L/s, whereas in the 2018-2019 monitoring the average abstraction rate was only 36.91 L/s, with the plant operating for 195 days.

Table 3 Monthly abstraction data the Company 2018-2019

Month	Max. Abstraction L/s average	Ave. Abstraction L/s average
July	163	53
August	128	47
September	94	55
October	96	39
November	88	16
December	89	25
January	88	21
February	100	38
March	88	31
April	88	29
May	88	39
June	88	50

2.1.3 Results of discharge monitoring

Consent 5848 is held by Contact Energy. This covers the discharge of used waters (mainly blowdown water) from the cooling system of combined cycle (TCC1) and water treatment plant of the peaker facilities (SP1) to the Patea River (Photo 2).

The Company continuously monitors the following parameters:

- pH,
- Chlorine,
- Temperature (including the effluent of receiving waters), and
- Flow of the effluents from both plants (TCC1 and SP1).

The online monitoring sensors are checked twice daily. The Company also undertake sampling and analysis of grab samples from both operation pits (Photo 1) to assess the online sensor accuracy.

The Council samples the discharge from both plants. This is undertaken as close to quarterly as possible, although variations in the flow rate in the Patea River may lead to a slight augmentation in timing. Inter-laboratory comparison exercises are also undertaken between both parties of the same discharges through split samples.

The analysis undertaken by the Council in respect of the discharges includes the following:

- pH;
- Chlorine (free and total);
- Conductivity;
- Dissolved reactive phosphorus (DRP);
- Ammonia (NH_4)
- Oil and grease
- Suspended solids;
- Turbidity;
- Flow rate;
- Temperature; and
- Un-ionised ammonia (NH_3).

The Council analyses the samples to determine compliance with the specific consent conditions on effluent composition (pH and chlorine), it is also assessed for nutrients and nutrient minimisation (phosphorus). Ammonia is also assessed (in relation to the receiving water limit). General effluent parameters are also monitored for any significant change (conductivity, turbidity and suspended solids).

Consent 4459 covers the discharge of stormwater to the Kahorui Stream from the holding pond that serves both plants. Prior to 2011 there were minimal discharges from this pond as the majority of stormwater was recycled through the raw water pond. When the stormwater catchment area was increased as a process of redeveloping the site, the discharge from this source increased. This was also a reflection of the augmentation of the facilities power generation capabilities, whereby the combined cycle (TCC1) may be shut down for periods. This would result in a need to refresh the raw water pond at times through flow back into the Patea River, via the stormwater pond and Kahouri Stream. The stormwater prior to discharge is monitored by the Company and its compliance limits as defined by consent 4459 are as follows:

- pH (6-9),
- Suspended solids (100 g/m^3), and
- Oil and grease (15 g/m^3).

2.1.3.1 Results of monitoring by the Company

Tables 4 and 5 detail the monthly summaries provided to the Council from the Company. They relate to monitoring of the Patea River discharge by continuous analyser. The analyser record is also further checked for precision through the analysis of a grab sample from the associated operations pit.

Table 4 Monitoring of SP1 effluent by the Company July 2018-June 2019

Month	SP1 & TCC Max flowrate discharge	SP1 & TCC Ave flowrate discharge	SP1 Max Cl_2	SP1 Ave Cl_2	SP1 Max pH	SP1 min pH	SP1 Temp Max	SP1 Temp Ave
	L/s avg 15mins	L/s	ppm	ppm	pH	pH	°C	°C
July	35.270	10.067	0.699	0.009	7.75	6.99	11.53	9.97
August	51.195	9.434	0.608	0.007	8.89	6.18	14.74	11.40
September	27.126	9.462	0.187	0.009	7.67	6.19	14.93	11.86
October	26.615	7.952	0.433	0.011	8.45	7.02	17.83	14.83

Month	SP1 & TCC Max flowrate discharge	SP1 & TCC Ave flowrate discharge	SP1 Max Cl_2	SP1 Ave Cl_2	SP1 Max pH	SP1 min pH	SP1 Temp Max	SP1 Temp Ave
	L/s avg 15mins	L/s	ppm	ppm	pH	pH	°C	°C
November	45.389	14.832	0.680	0.012	8.89	6.80	20.79	16.95
December	38.891	21.099	0.629	0.016	8.02	6.25	25.15	20.20
January	36.946	17.079	0.776	0.012	8.19	6.71	26.81	23.06
February	45.038	24.210	0.138	0.008	7.82	6.99	32.04	22.45
March	41.648	25.159	1.170	0.011	7.91	0.00	25.26	21.75
April	32.173	13.361	0.305	0.014	7.69	6.65	19.76	15.81
May	36.562	7.346	0.123	0.012	7.99	7.37	15.05	13.58
June	39.608	8.629	0.134	0.007	8.21	7.09	12.06	10.86

Table 5 Monitoring of TCC1 plant effluent by the Company July 2018-June 2019

Month	SP1 & TCC Max flowrate discharge	SP1 & TCC Ave flowrate discharge	TCC Max Cl_2	TCC Ave Cl_2	TCC Max pH	TCC min pH	TCC Temp Max	TCC Temp Ave
	L/s avg 15mins	L/s	ppm	ppm	pH	pH	°C	°C
July	35.270	10.067	1.030	0.005	8.56	6.60	22.30	20.24
August	51.195	9.434	0.066	0.006	9.20	6.54	23.48	20.51
September	27.126	9.462	0.699	0.015	8.97	6.87	23.50	20.61
October	26.615	7.952	0.820	0.015	8.34	6.80	24.20	21.00
November	45.389	14.832	0.076	0.018	8.97	7.22	21.69	18.30
December	38.891	21.099	0.052	0.016	8.97	7.29	23.64	20.92
January	36.946	17.079	0.099	0.021	8.57	6.05	25.09	22.44
February	45.038	24.210	0.051	0.018	8.92	6.75	27.73	21.78
March	41.648	25.159	0.120	0.021	8.92	7.02	22.41	20.20
April	32.173	13.361	0.050	0.016	8.84	6.04	23.30	18.33
May	36.562	7.346	0.038	0.010	8.92	6.34	23.08	20.28
June	39.608	8.629	0.174	0.007	9.00	6.50	22.48	20.15

Flow

The discharges from the Company in the 2018-2019 monitoring period were compliant with the associated consent limit which stipulates a rate of <78 L/s.

In 2018-2019, the combined average discharge flow from both plants (TCC1 and SP1) was 14.05 L/s, the maximum recorded discharge flow was 51.195 L/s, recorded in August 2018. The total volume of wastewater

discharged for the year was 418,538 m^3. This was a 6.7% reduction when compared to the previous monitoring period.

Chlorine

The yearly average value for chlorine within the discharge from the TCC1 was recorded as 0.01 ppm. The corresponding max value for chlorine was 1.030 ppm, recorded only once during the July 2018 period of monitoring. When chlorine levels reach or exceed 0.05 ppm, as with the pH, the discharge ceases.

For SP1, the yearly average value was recorded as 0.01 ppm chlorine, while the maximum recorded chlorine was found to be 1.170 ppm. This was recorded during March 2019. The control system engages and ceases the discharge prior to elevated chlorine process water discharging.

pH

The discharge pH remained within the consent range limit of pH 6.0-9.0 throughout the monitoring period at both SP1 and TCC1, except in August 2018 at TCC; where the max pH recorded was 9.20.

For the TCC1 (Table 5), the minimum pH observed was pH 6.04, recorded in April 2019. The maximum observed was pH 9.20, recorded in August 2018. For the SP1 (Table 4), the minimum pH recorded was pH 6.18, recorded in August 2018. The highest recorded pH was pH 8.89, recorded on two occasions; in the August 2018 period and the November 2018 period.

When the continuous pH monitor indicate an exceedance with respect to the pH range limit, the wastewater discharge valve at relevant operations pit on the site automatically closes immediately (within one minute). This does not allow the non-compliant discharge to enter the river.

The limits on the discharge monitor with respect to pH range, activate when the corresponding pH range reaches either, pH 6.1 or 8.9.

Temperature

The river temperature during the monitoring period remained below the 25°C consented limit for the full duration (Figure 4), allowing for continuous discharge if required. River temperature differentials also remained within consent limits (Figure 5). A data handling error by the Council resulted in a loss of temperature data from the 6 May-1 July 2019.

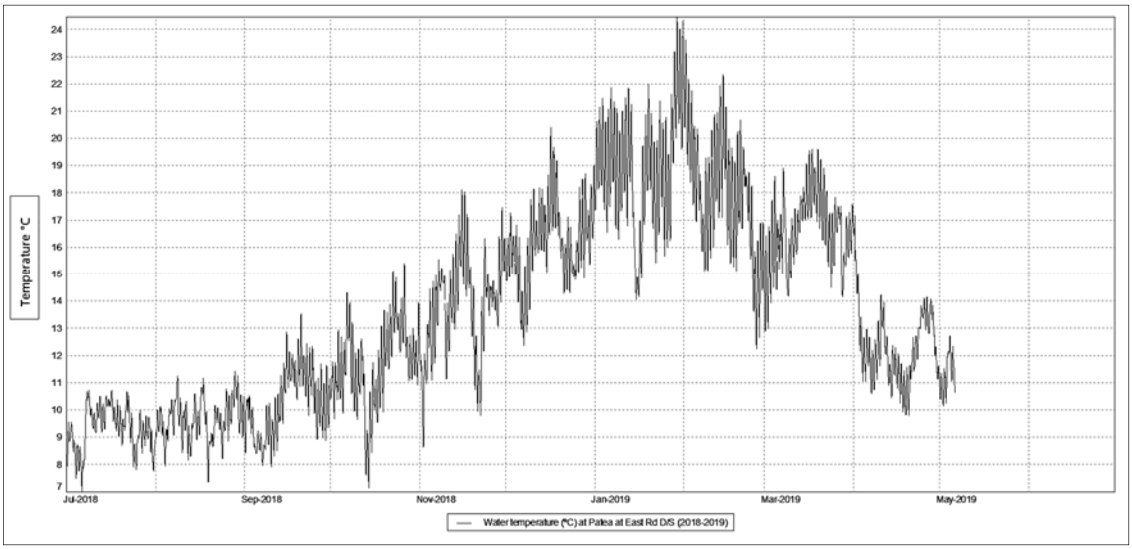

Figure 4 Patea River temperature 2018-2019 downstream of SP1 discharge

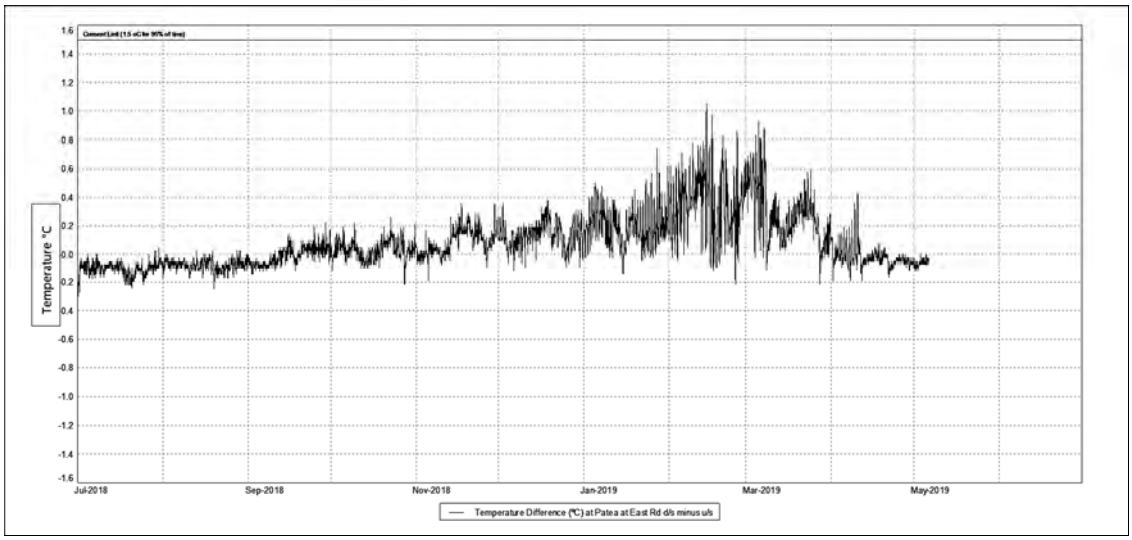

Figure 5 Patea River upstream minus downstream of discharge temperature variation 2018-2019

2.1.3.2 Discharges to the Kahouri Stream

The Company recorded 17 occasions where stormwater was discharged to the Kahouri Stream during the 2018-2019 monitoring period. This occurred during high rainfall events. Stormwater monitoring is undertaken by the Company.

2.2 Results of receiving environment monitoring

2.2.1 Inter-lab Comparisons

The results of the Council monitoring of the effluent from the TCC1 and SP1 in the 2018-2019 monitoring period are provided in Tables 6 and 7. Included in these tables are the corresponding concentrations of the continuous effluent monitoring provide by the Company for pH and chlorine and the associated grab samples, undertaken for validation of the continuous analysis.

Compliance monitoring

Specifically consent 5848 places limits on the pH range and the total residual chlorine concentrations within the effluent. As previously discussed, these limits are as follows:

The following concentration shall not be exceeded in the discharge effluent:

- pH range of discharge: pH 6.0-9.0;
- Total residual chlorine: 0.05 g/m^3.

This condition shall apply immediately prior to the entry of the effluent into the receiving water.

Comparison exercises

Inter-laboratory comparisons were undertaken between the Company and the Council on four occasions this period (Tables 6 and 7). The comparisons were undertaken across the following parameters:

- Total residual chlorine;
- Conductivity;
- pH;
- Dissolved reactive phosphorus; and
- Turbidity.

The analysis provided in Tables 6 and 7 indicated that the facility was operating within its consent conditions with respect to discharges to the Patea River under consent 5848-1 in terms of pH and total residual chlorine. Further, the inter-laboratory comparison exercises indicated reasonably good agreement across all parameters.

In a specific case, in respect of dissolved reactive phosphate (DRP) where there was variation noted between both parties, the Company were asked to the further work on that specific analysis. It was also noted that the concentrations were of low quantity, thus gaining accurate readings can be difficult to achieve.

Table 6 Inter-laboratory comparisons July and December 2018

19 Jul 2018	Site	IND002038 (Stratford Peaker Plant SP1)		IND002023 (Taranaki Combined Cycle TCC)	
	Units	Council	SP1	Council	TCC
Time	NZST/Actual	1340	1340	1400	1400
pH lab	pH	7.4	7.34	7.2	7.22
Total Cl2 (lab)	mg/L	-	0	-	0
Turbidity	NTU	0.82	0.59	2.5	2.36
Oil	g/m^3/0 or 1	<4	0	<4	0
Conductivity (lab)	uS/cm @ 25°C	258	254	945	955
Phosphate (DRP)	g/m^3	**0.199**	**0.79**	0.065	-
Discharge flow (meter)	L/s	-	9.8	-	13.72
pH (meter)	pH	-	7.47	-	7.08
Total CL2 (meter)	mg/L	-	0.002	-	0.001
Temperature (meter)	°C	11	14.5	21.6	20.9
Reagents		-	OK	-	OK
TSS	g/m^3	3	-	<3	-
Ammonia	g/m^3	0.021	-	<0.010	-
Un-ionised Ammonia	g/m^3	<0.010	-	<0.010	-
04 Dec 2018	Site	IND002038 (Stratford Peaker Plant SP1)		IND002023 (Taranaki Combined Cycle TCC)	
	Units	Council	SP1	Council	TCC
Time	NZST/Actual	0830	0830	0845	0845
pH lab	pH	7.4	7.42	7.7	7.75
Total Cl2 (lab)	mg/L	0.02	0	-	0
Turbidity	NTU	1.84	1.56	1.08	1.05
Oil	g/m^3 / 0 or 1	<4	0	6	0
Conductivity (lab)	uS/cm @25°C	406	386	141	133.5
Phosphate (DRP)	g/m^3	**0.49**	**1.57**	0.012	-
Discharge flow (meter)	L/s	-	-	-	-
pH (meter)	pH	-	7.68	-	8.22
Total CL2 (meter)	mg/L	-	0.013	-	0.026
Temperature (meter)	°C	18.6	18.6	19.4	19.6
Reagents	Ok	-	-	OK	-
TSS	g/m^3	6	-	<3	-
Ammonia	g/m^3	<0.010	-	0.039	-
Un-ionised Ammonia	g/m^3	<0.00010	-	0.00072	-

Table 7 Inter-laboratory comparisons March and June 2019

07 Mar 2019	Site	IND002038 (Stratford Peaker Plant SP1)		IND002023 (Taranaki Combined Cycle TCC)	
	Units	Council	SP1	Council	TCC
Time	NZST/Actual	0850	1100	0915	1015
pH lab	pH	7.2	7.15	8.1	8.36
Total Cl2 (lab)	mg/L	<0.07	0	<0.07	0
Turbidity	NTU	1.12	0.72	1.34	0.9
Oil	g/m^3	<4	NP	<4	NP
Conductivity (lab)	uS/cm	501	495	183	178.6
Phosphate (DRP)	g/m^3	**0.35**	**1.27**	0.009	-
Discharge flow (meter)	L/s	18	-	-	-
pH (meter)	pH	-	7.26	8.36	8.36
Total CL2 (meter)	mg/L	-	0.003	-	0.012
Temperature (meter)	°C	21.4	22.58	19.6	19.66
Reagents		-	-	-	-
TSS	g/m^3	10	-	<3	-
Ammonia	g/m^3	<0.010	-	0.041	-
Un-ionised Ammonia	g/m^3	<0.00008	-	0.002	-
10 Jun 2019	Site	IND002038 (Stratford Peaker Plant SP1)		IND002023 (Taranaki Combined Cycle TCC)	
	Units	Council	SP1	Council	TCC
Time	NZST/Actual	0945	0950	1000	1000
pH lab	pH	7.5	7.62	6.9	6.9
Total Cl2 (lab)	mg/L	<0.07	0	<0.07	0
Turbidity	NTU	0.9	0.57	3	2.71
Oil	g/m^3	<4	NP	<4	NP
Conductivity (lab)	uS/cm	247	245	1135	1127
Phosphate (DRP)	g/m^3	**0.182**	**0.64**	0.166	NP
Discharge flow (meter)	L/s	0.01572	-	0.0066	-
pH (meter)	pH	-	7.68	-	7.2
Total CL2 (meter)	mg/L	-	0.02	-	0.02
Temperature (meter)	°C	11	10.99	19.8	19.9
Reagents		-	-	-	-
TSS	g/m^3	4	NP	3	NP
Ammonia	g/m^3	<0.010	NP	0.046	NP
Un-ionised Ammonia	g/m^3	<0.00007	NP	0.00016	NP

The results of the two inter-laboratory comparisons undertaken in this monitoring period are provided in the above Tables 6 and 7. The results indicated the following:

- All results were within consent limits.
- pH variations were found to be relatively minor throughout the monitoring period, with the largest variation being 0.26 pH units, recorded at the TCC wastewater site on the 7th March 2019. In terms of consent 5848-1 which requires the pH of the discharge to remain within set standards (6-9 pH), the values recorded indicated compliance with this consent limit on the four occasions it was assessed.
- Total chlorine levels were monitored by Council through lab samples. In the early rounds in July 2018 and December 2018 the Council did not have the necessary equipment to monitor for chlorine as it was still undertaking validation testing of the proposed device necessary to test. The analysis conducted by the Council did not record a value above the limit of detection in both rounds it was undertaken.

- Temperature comparisons indicated fairly good agreement between laboratories across both exercises undertaken this monitoring period. The highest temperature variation was 0.7°C, recorded on the 19th July 2018 at the TCC wastewater discharge site.
- Throughout this monitoring period both ammonia and un-ionised ammonia levels were only monitored by the Council. The results indicated that levels of ammonia and un-ionised ammonia were all below, or close to, the limit of detection. The highest recording of ammonia was 0.046 g/m^3 recorded on the 10th June 2019 at the TCC wastewater discharge site, while the highest recording for un-ionised ammonia was 0.002 g/m^3 recorded on the 7th March 2019 again at the TCC wastewater site (IND002023).
- Turbidity comparisons showed slight variations between the two labs, with SP1's results being slightly lower throughout the monitoring period. The largest variation recorded was 0.44 NTU. This was recorded at the TCC wastewater site on the 7th March 2019, therefore it is recommended that the calibration of probes/meters is undertaken more regularly.
- Oil level was measured in g/m^3 by Council and on a scale from 0-1 by SP1. Comparisons of oil levels were conducted on the 19th July 2018 and the 4th December 2018. These comparisons indicated fairly good compliance, however it is difficult to judge with the two different units. The highest level recorded from Council was 6 g/m^3 recorded on the 4th December 2018 at the wastewater site while SP1 obtained a result of 0.
- Conductivity comparisons indicated slight variations between the two laboratories, with SP1's results being lower than Council's. The largest variation between the two laboratories was 20 uS/cm points recorded on the 4th December 2018 at the SP1 site; with Council obtaining a result of 406 uS/cm and SP1 386 uS/cm.
- Phosphate comparisons indicated some moderate variations in results. The largest variation between the two laboratories was 1.08 g/m^3, recorded on the 4th December 2018 at the SP1 site (IND002038), with Council obtaining a reading of 0.49 g/m^3 while SP1 indicated a result of 1.57 g/m^3. On every occasion at the SP1 monitoring site, phosphate levels had noticeable variations between the two laboratories. The Council has made the Company aware of this variation and the Company are working towards gaining better agreement in this analyte.
- TSS or Total Suspended Solids observations were only monitored by Council during this monitoring period. The highest reading of TSS occurred at the SP1 site on the 10th June 2019. The observed results was 10 g/m^3 of solids.

Overall, the inter-laboratory comparisons indicated good agreement between both parties. Subtle variations were noted, however the concentrations recorded were of a low value. Gaining identical results at low concentrations is difficult. There is some additional work required to bring in to line the variation noted on the phosphate and that will be further assessed in the upcoming monitoring period.

2.2.2 Physicochemical monitoring by the Council

On five occasions in the 2018-2019 monitoring period, water quality samples were collected from the Patea River. There are two sample sites (Photo 2) in respect of the discharge of monitored plant effluent from the Company. One site is located upstream (PAT000356), above the discharge, aimed at assessing the preceding water quality. The second site is located at the boundary of the 75 m mixing zone (PAT000357), post the discharge, downstream of the discharge, aimed at assessing the likely effect of the discharge.

The results of the five monitoring rounds on the Patea River are presented in Table 8 and 9.

Table 8 Surface water monitoring Patea River July - December 2018

Parameter	Discharge origin	TCC and SP1		TCC and SP1		TCC and SP1	
	Site	PAT000356	PAT000357	PAT000356	PAT000357	PAT000356	PAT000357
	Collected	19 Jul 2018	19 Jul 2018	06 Sep 2018	06 Sep 2018	04 Dec 2018	04 Dec 2018
	Time	14:45	15:05	10:35	10:55	09:00	09:15
	Unit/Location	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream
Dissolved Reactive Phosphorus	g/m^3	0.037	0.039	0.022	0.023	0.09	0.092
Electrical Conductivity (EC)	mS/m	10.7	11.5	8.6	9	9.8	10.1
Free Ammonia as N	g/m^3	< 0.010	< 0.010	0.00042	0.00037	0.0024	0.0021
pH	pH Units	7.7	7.4	7.3	7.3	7.5	7.5
Sample Temperature	°C	10.7	10.6	9.3	9.7	15	15.2
Total Ammoniacal-N	g/m^3	0.139	0.146	0.116	0.114	0.28	0.25
Total Suspended Solids	g/m^3	< 3	< 3	< 3	< 3	6	5
Turbidity	NTU	1.03	1.16	2.1	2.1	4.5	4.6

Table 9 Surface water monitoring Patea River March - June 2019

Parameter	Discharge origin	TCC and SP1		TCC and SP1	
	Site	PAT000356	PAT000357	PAT000356	PAT000357
	Collected	07 Mar 2019	07 Mar 2019	10 Jun 2019	10 Jun 2019
	Time	09:45	10:00	10:45	11:00
	Unit/Location	Upstream	Downstream	Upstream	Downstream
Dissolved Reactive Phosphorus	g/m^3	0.197	0.188	0.022	0.023
Electrical Conductivity (EC)	mS/m	13.5	15.9	10.6	11.1
Free Ammonia as N	g/m^3	0.0008	0.00045	0.00073	0.00064
pH	pH Units	7.9	7.8	7.4	7.4
Sample Temperature	°C	15.6	16.2	10.1	10.2
Total Ammoniacal-N	g/m^3	0.034	0.026	0.147	0.134
Total Suspended Solids	g/m^3	< 3	3	7	7
Turbidity	NTU	1.6	1.34	2.9	2.8

The analysis provided in Tables 8 and 9 indicated that the plant effluent from the two operation areas of SP1 and TCC were having a minimal effect on Patea River at the time of sampling.

The monitoring indicated the following:

- Dissolved reactive phosphorus (DRP) results recorded minimal increases between both sites. The largest increase between the two sites in this parameter was found during the July 2018 monitoring round with an increase of 0.002 g/m^3.
- Electrical conductivity (EC) values indicated slight increases between the two monitoring sites across the five monitoring rounds. The largest increase was found in the March 2019 monitoring round with an increase of 2.4 mS/m @ 25°C.
- Free ammonia (NH_3) was recorded in four of five monitoring rounds at very low concentrations. Monitoring round July 2018 did not record any NH_3 above the limit of detection for that analyte at either site. Of the four rounds (September, December 2018 and March, June 2019) which did record NH_3, the results ranged from 0.00037 g/m^3 - 0.0024 g/m^3. The requirement of consent 5848-1, condition 13, is for a concentration of NH_3 no greater than 0.025 g/m^3 at the low monitoring location of PAT000357. All values recorded were below this limit.
- pH results indicated values all above neutral pH (>7 pH). The range recorded was 7.3 pH-7.9 pH, with the lower readings recorded in the September 2018 monitoring round. The higher readings were recorded during the March 2019 monitoring round.
- Surface water temperatures ranged from 9.3°C through 16.2°C this monitoring period. The lower temperatures were observed in the September 2018 monitoring round, whilst the higher temperatures were recorded in the March 2019 monitoring round. Temperature monitoring is further assessed in the following section. The requirement bestowed by consent 5848-1, condition 10, is for the discharge to not increase the surface water temperature to greater than 25°C. The analysis provided in the above Tables 8 and 9 indicated that at the time of sampling this thermal limit was not exceeded.
- Total ammoniacal nitrogen as NH_4 was recorded in all samples collected this monitoring period. The range recorded 0.026 g/m^3 through to 0.28 g/m^3 indicated low concentrations for this analyte. The largest increase for this analyte, post the discharge, was recorded during the July 2018 monitoring round with an increase of 0.007 g/m^3. The other four monitoring rounds recorded a decrease in NH_4 below the discharge when compared to the preceding water conditions.
- Total suspended solids (TSS) results ranged from below the LOD (<3 g/m^3) on two monitoring occasions (July and September 2018) through to 7 g/m^3, recorded in the June 2019 monitoring. The largest increase in this analyte was found during the March 2019 monitoring round with an increase in 1 g/m^3.
- Turbidity as measured in NTU, recorded low values throughout the monitoring period, ranging from 1.03 NTU through to 4.6 NTU.

2.2.3 Biomonitoring 2018-2019

Biomonitoring forms a component of the consents compliance monitoring programme implemented by the Council following the construction of the Taranaki Combined Cycle [TCC1] power station in 1998, and the addition of Stratford Peaker Plant [SP1] in 2011. This particular biological monitoring survey related primarily to consent 5848, which permits the discharge of cooling water into the Patea River approximately 1 km upstream of the river's confluence with the Kahouri Stream, east of Stratford.

The Council collected streambed macroinvertebrates at five established sites to investigate the effects of the cooling water discharge and abstraction of water for the Company's combined cycle and Peaker Power

stations. Macroinvertebrates were identified, the number of different types of taxa counted (taxa richness), and MCI and SQMCI scores were calculated for each site.

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

Five sites in total were surveyed in the Patea River. Consents granted in 2001 (5847 and 5850) for the future expansion of the power station [TCC2] required the establishment and monitoring of two additional sites in the mid-reaches of the Patea River, between the site of the proposed additional water abstraction (Skinner Road) and the confluence with the Mangaehu River. These sites (Figure 6) at Hungers Road and a further 13 km downstream (adjacent to Raupuha Road, below the Makuri Stream confluence) were initially sampled as a component of the environmental effects assessment for the power station expansion (Stark and Young, 2001 and CF251). They continue to provide baseline information in anticipation of this expansion.

Biomonitoring of the TCC1 station storm water discharges to the Kahouri Stream is also performed as a separate monitoring programme and this is reported separately. The present biomonitoring surveys in the Patea River were performed on 7th November 2018, and the 4th March 2019.

Method

The standard '400 ml kick sampling' technique was used to collect streambed (benthic) macroinvertebrates from five riffle sites in the Patea River. These sites were located as listed in Table 10 and illustrated in Figure 6, and 7.

Table 10 Location of biomonitoring sampling sites in relation to the Patea River

Site No	Site code	Grid reference	Location	Altitude (m asl)
1	PAT000356	E1714497 N5645112	U/s of TCC1 cooling wastes discharge	250
2	PAT000357	E1714662 N5645076	100 m d/s of TCC1 cooling wastes discharge	250
3	PAT000360	E1715919 N5644681	Skinner Road	240
4	PAT000397	E1718991 N5643531	Hungers Road	200
5	PAT000430	E1723952 N5641068	Raupuha Road	160

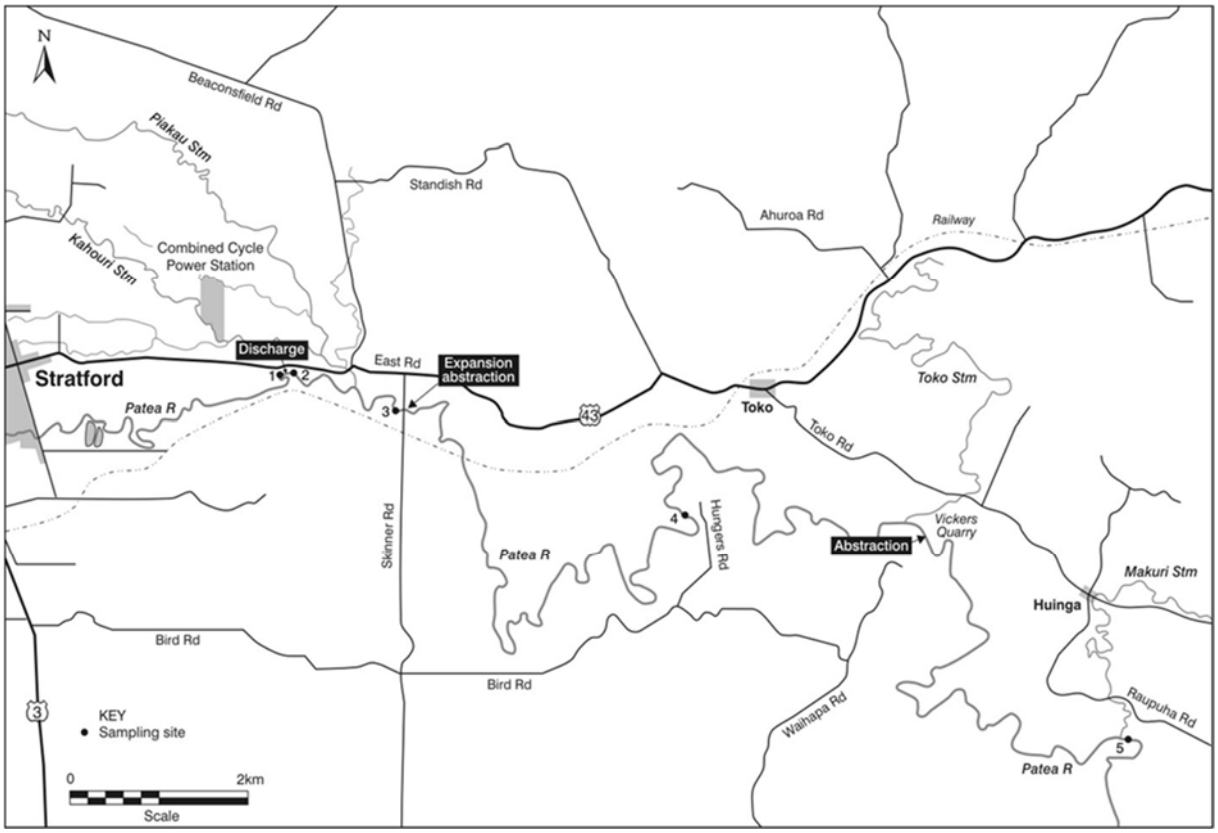

Figure 6 Location of biomonitoring sites in the Patea River in relation to Stratford Power Station

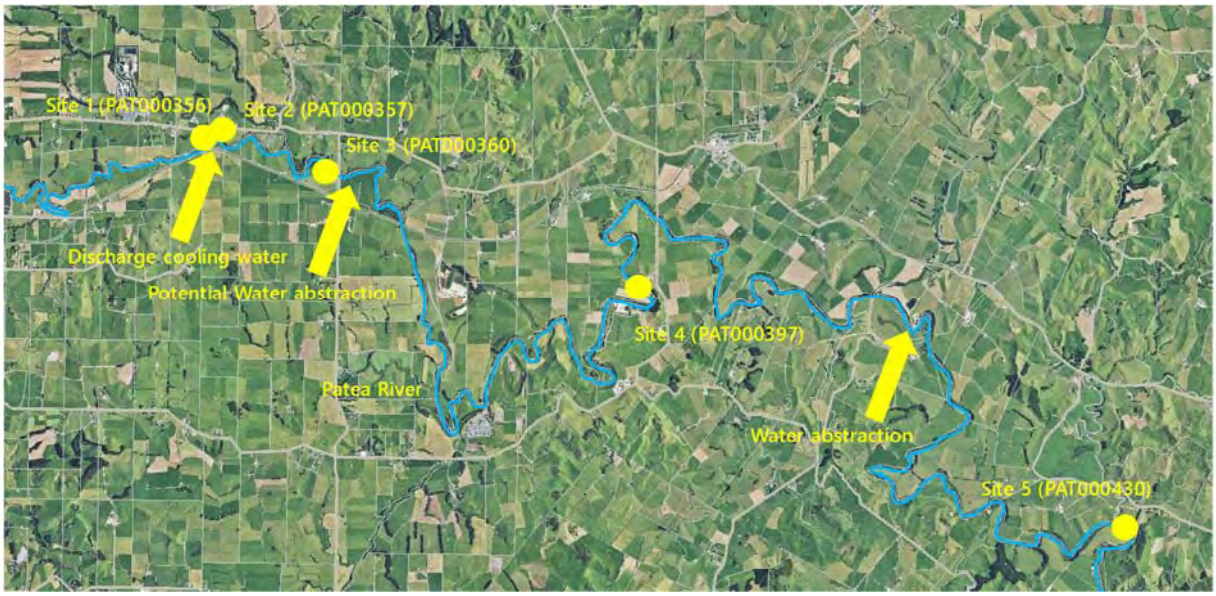

Figure 7 Location of biomonitoring sites in the Patea River in relation to the power station discharge of cooling water

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 Kahle's Fluid for later stereomicroscopic sorting and identification according to documented Taranaki Regional Council methodology and macroinvertebrate taxa abundances scored based on the categories in Table 11 and 12.

Table 11 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+

Table 12 Macroinvertebrate health based on MCI and SQMCI ranges

Council 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

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' forms 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 3). 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 Council experience is also significantly different between individual kick-samples and other values (medians, means, limits, expected values etc).

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

2.2.3.1 Biomonitoring results Patea River November 2018

Site habitat characteristics and hydrology

This spring survey was performed under moderate conditions, 10 days after a fresh in excess of 3 times median flow and 11 days after a fresh in excess of 7 times median flow in the Patea River (flow gauging site at the Patea River at Skinner Road). Environmental data recorded at the time of the survey is presented in Table 13.

Table 13 Summary of the environmental data recorded at four sites in relation to monitoring carried out for the Stratford WWTP, 7th November 2018

Site number		Site 1	Site 2	Site 3	Site 4	Site 5
Site Code		PAT000356	PAT000357	PAT000360	PAT000397	PAT000430
Sample Number		FWB18336	FWB18337	FWB18338	FWB18339	FWB18340
Time		11:45	11:25	12:15	12:55	13:50
Temperature		14.8	15.6	16.1	16.7	17.4
Water colour		Uncoloured	Uncoloured	Uncoloured	Uncoloured	Uncoloured
Water clarity		Clear	Clear	Clear	Clear	Clear
Flow conditions		Low	Low	Low	Low	Low
Water speed		Swift	Swift	Swift	Swift	Swift
Sampling habitat		Riffle	Riffle	Riffle	Riffle	Riffle
Periphyton mats		Patchy	Widespread	Widespread	Patchy	Patchy
Periphyton filaments		Patchy	Patchy	Patchy	Patchy	None
Moss		None	None	Patchy	Patchy	Patchy
Leaves		Patchy	Patchy	Patchy	None	Patchy
Wood		None	None	None	None	None
Macrophytes		None	None	None	None	None
Bank stability		Mostly Stable	Mostly Stable	Mostly Stable	Highly Unstable	Stable
Stock damage		None	None	Minor	Moderate	None
Iron oxide or silt coating		No	No	No	No	No
Substrate embedded		No	No	No	No	No
Substrate disturbed		Moderate Kicking	Moderate Kicking	Moderate Kicking	Moderate Kicking	Moderate Kicking
Bed shaded		Partial	No	No	No	No
Undercut banks		No	No	Yes	No	No
Overhanging vegetation		Yes	No	No	No	No
Substrate composition	Silt	0	0	0	5	0
	Sand	5	10	5	10	0
	Fine gravel	20	10	10	15	20
	Coarse gravel	25	10	10	25	20
	Cobble	35	40	50	35	40
	Boulder	15	30	25	10	20
	Bedrock	0	0	0	0	0
	Hard clay	0	0	0	0	0
	Wood/root	0	0	0	0	0
	Concrete/gabion	0	0	0	0	0

2.2.3.1.1 Macroinvertebrate communities

Prior to the establishment of the Company programme, biomonitoring surveys had been performed at site 1 (in association with other consents' monitoring programmes) and site 3 (SEM and investigation programmes). Site 2 was established specifically for the purpose of the Company consent monitoring programme and sampled initially in spring 1998. The two lower sites (sites 4 and 5) had been surveyed on fewer previous occasions, principally for environmental assessment purposes.

A summary of the results of these previous surveys and the existing programme's results are presented in Table 14 and current survey results are presented in Table 15. The location and scoring of the current survey are provided in Figure 8.

Table 14 Summary of macroinvertebrate taxa numbers MCI and SQMCI values for previous surveys performed between January 1992 and March 2018 and the current survey

Site No.	N	No of taxa				MCI value				SQMCI value			
		Median	Range	Previous survey	Current survey	Median	Range	Previous survey	Current survey	Median	Range	Previous survey	Current survey
1	47	23	15-31	19	21	99	82-116	85	96	4.1	2.3-7.2	3.8	4.9
2	40	22	14-33	26	19	100	86-111	86	108	4.0	2.0-6.8	3.2	5.8
3	48	23	15-33	24	19	98	86-112	99	98	4.2	1.9-7.3	3.2	4.8
4	33	22	15-30	17	16	96	82-108	94	99	4.8	3.1-7.2	4.1	6.5
5	33	21	15-26	17	17	95	82-103	89	96	4.2	3.1-7.1	2.6	5.0

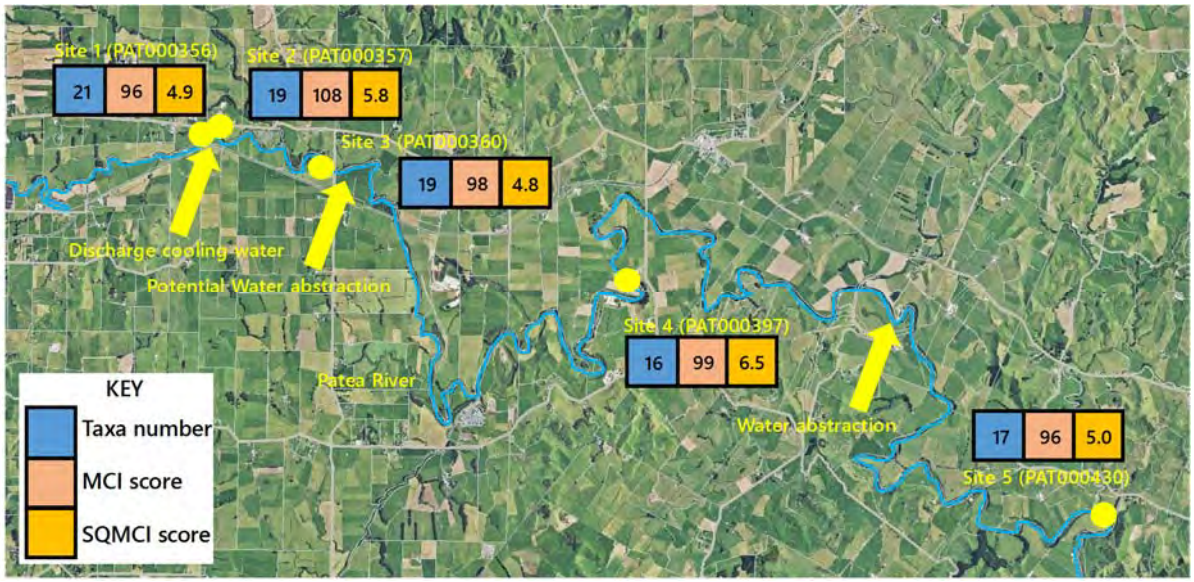

Figure 8 Location of biomonitoring sites in the Patea River in relation to the power station discharge of cooling water and water abstraction with taxa number, MCI scores and SQMCI scores for each site

Table 15 Macroinvertebrate fauna of the Patea River in relation to the Company sampled on 7 November 2018

Taxa List	Site Number	MCI score	1	2	3	4	5
	Site Code		PAT000356	PAT000357	PAT000360	PAT000397	PAT000430
	Sample Number		FWB18336	FWB18337	FWB18338	FWB18339	FWB18340
ANNELIDA (WORMS)	Oligochaeta	1	A	A	A	A	A
	Lumbricidae	5	-	-	-	-	C
MOLLUSCA	*Potamopyrgus*	4	-	R	C	VA	A
EPHEMEROPTERA (MAYFLIES)	*Austroclima*	7	-	-	-	-	R
	Coloburiscus	7	VA	VA	C	R	R
	Deleatidium	8	VA	VA	VA	XA	VA
	Nesameletus	9	-	R	-	R	-
PLECOPTERA (STONEFLIES)	*Austroperla*	9	-	R	-	-	-
	Megaleptoperla	9	-	-	R	-	-
COLEOPTERA (BEETLES)	Elmidae	6	C	A	A	VA	A
	Hydraenidae	8	R	R	-	-	-
MEGALOPTERA (DOBSONFLIES)	*Archichauliodes*	7	C	C	C	A	R
TRICHOPTERA (CADDISFLIES)	*Hydropsyche (Aoteapsyche)*	4	R	R	A	VA	VA
	Costachorema	7	A	VA	C	R	R
	Hydrobiosis	5	C	R	C	A	A
	Olinga	9	-	R	-	-	-
	Pycnocentria	7	R	-	R	-	-
	Pycnocentrodes	5	R	-	C	A	A
DIPTERA (TRUE FLIES)	*Aphrophila*	5	A	A	A	C	A
	Eriopterini	5	R	-	-	-	-
	Maoridiamesa	3	VA	VA	VA	C	A
	Orthocladiinae	2	VA	A	A	C	A
	Tanypodinae	5	R	-	-	-	-
	Tanytarsini	3	C	R	A	R	C
	Empididae	3	R	-	R	-	-
	Muscidae	3	R	R	C	-	-
	Austrosimulium	3	R	R	-	-	R
	Tabanidae	3	-	-	-	R	-
	Tanyderidae	4	R	-	R	-	-
	No of taxa		21	19	19	16	17
	MCI		96	108	98	99	96
	SQMCI		4.9	5.8	4.8	6.5	5.0
	EPT (taxa)		7	8	8	7	7
	%EPT (taxa)		33	42	42	44	41

'Tolerant' taxa | 'Moderately sensitive' taxa | 'Highly sensitive' taxa

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

2.2.3.2 Biomonitoring results Patea River March 2019

Site habitat characteristics and hydrology

The summer survey was performed under very low conditions, 90 days after a fresh in excess of 3 times median flow and 127 days after a fresh in excess of 7 times median flow in the Patea River (flow gauging site for the Patea River was at Skinner Road). Environmental data recorded at the time of the survey is presented in Table 16.

Table 16 Summary of the environmental data recorded at five sites in relation to monitoring carried out for the Company, 4th March 2019

Site number		Site 1	Site 2	Site 3	Site 4	Site 5
Site Code		PAT000356	PAT000357	PAT000360	PAT000397	PAT000430
Sample Number		FWB19150	FWB19151	FWB19152	FWB19153	FWB19154
Time		12:00	11:20	12:35	13:25	14:30
Temperature		16.9	17.1	16.5	19.6	
Water colour		Uncoloured	Uncoloured	Uncoloured	Uncoloured	Uncoloured
Water clarity		Clear	Clear	Clear	Clear	Clear
Flow conditions		Very Low	Very Low	Very Low	Very Low	Very Low
Water speed		Swift	Swift	Swift	Swift	Swift
Sampling habitat		Riffle	Riffle	Riffle	Riffle	Riffle
Periphyton mats		Patchy	Patchy	Widespread	Patchy	Widespread
Periphyton filaments		Patchy	Patchy	Widespread	Patchy	Widespread
Moss		None	None	Patchy	None	None
Leaves		Patchy	Patchy	Patchy	None	None
Wood		Patchy	Patchy	None	None	None
Macrophytes		None	None	None	On Bed Too	Edges Only
Bank stability		Mostly Stable	Stable	Mostly Stable	Highly Unstable	Stable
Stock damage		None	None	None	None	None
Iron oxide or silt coating		No	No	No	No	No
Substrate embedded		No	No	No	No	No
Substrate disturbed		Moderate Kicking	Moderate Kicking	Moderate Kicking	Moderate Kicking	Moderate Kicking
Bed shaded		Partial	Partial	No	No	No
Undercut banks		No	No	No	No	No
Overhanging vegetation		Yes	No	No	No	No
Substrate composition	Silt	5	5	5	5	5
	Sand	5	5	5	10	5
	Fine gravel	10	10	10	15	10
	Coarse gravel	10	10	10	15	20
	Cobble	35	35	40	25	50
	Boulder	35	35	30	30	10
	Bedrock	0	0	0	0	0
	Hard clay	0	0	0	0	0
	Wood/root	0	0	0	0	0
	Concrete/gabion	0	0	0	0	0

2.2.3.2.1 Macroinvertebrate communities

A summary of the results of the previous surveys and the existing programme's results are presented in Table 17 and current survey results are presented Table 18. The locations and scoring for the March 2019 survey are provided in Figure 9.

Table 17 Summary of macroinvertebrate taxa numbers, MCI and SQMCI values for previous surveys performed between January 1992 and the current survey

Site No.	N	No of taxa				MCI value				SQMCI value				
		Median	Range	Previous survey	Current survey	Median	Range	Previous survey	Current survey	N	Median	Range	Previous survey	Current survey
1	48	23	15-31	21	16	99	82-116	96	86	48	4.1	2.3-7.2	4.9	4.1
2	41	22	14-33	19	23	100	86-111	108	85	41	4.0	2.0-6.8	5.8	3.6
3	55	23	15-33	19	21	97	85-112	98	90	55	4.2	1.9-7.3	4.8	3.4
4	34	21	15-30	16	15	96	82-108	99	92	34	4.8	3.1-7.2	6.5	3.8
5	35	21	15-26	17	17	95	82-103	96	87	34	4.2	2.6-7.1	5.0	4.0

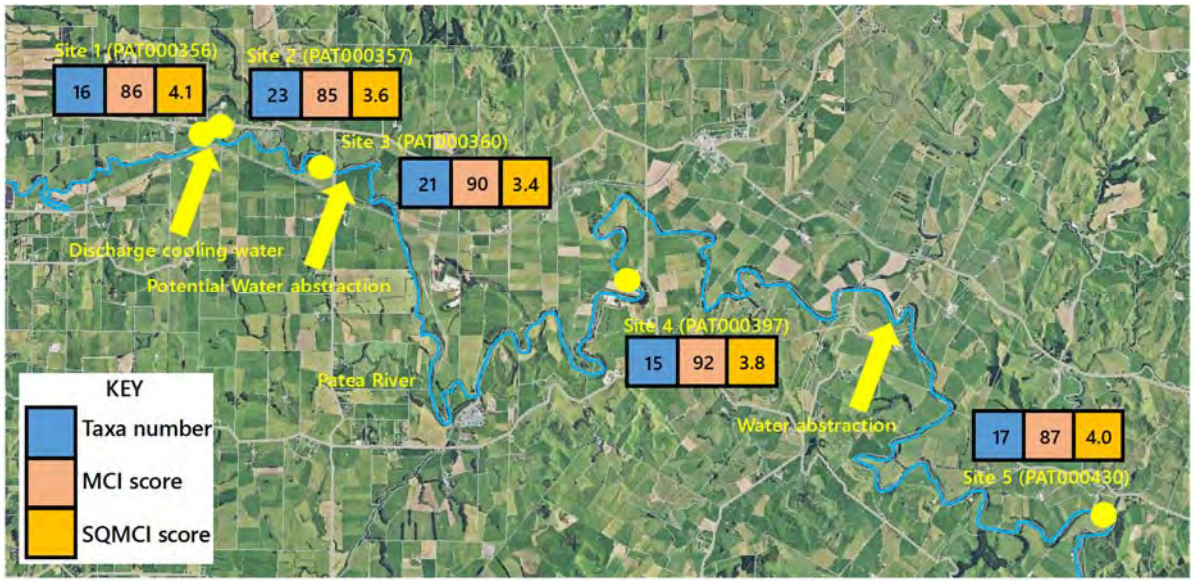

Figure 9 Location of biomonitoring sites in the Patea River in relation to the power station discharge of cooling water and water abstraction with taxa number, MCI scores and SQMCI scores for each site

Table 18 Macroinvertebrate fauna of the Patea River in relation to the Company sampled on 4th March 2019

Taxa List	Site Number	MCI score	1	2	3	4	5
	Site Code		PAT000356	PAT000357	PAT000360	PAT000397	PAT000430
	Sample Number		FWB19150	FWB19151	FWB19152	FWB19153	FWB19154
NEMERTEA	Nemertea	3	R	C	R	R	-
ANNELIDA (WORMS)	Oligochaeta	1	C	R	C	R	R
	Lumbricidae	5	-	-	R	-	-
MOLLUSCA	*Latia*	5	-	-	-	-	C
	Physa	3	-	R	-	-	-
	Potamopyrgus	4	-	R	C	VA	XA
CRUSTACEA	*Paracalliope*	5	-	-	R	-	-
EPHEMEROPTERA (MAYFLIES)	*Austroclima*	7	R	-	-	R	C
	Coloburiscus	7	-	R	R	-	-
	Deleatidium	8	-	R	R	C	R
COLEOPTERA (BEETLES)	Elmidae	6	C	A	C	A	A
	Hydraenidae	8	C	R	C	R	-
	Staphylinidae	5	-	R	-	-	-
MEGALOPTERA (DOBSONFLIES)	*Archichauliodes*	7	A	C	C	A	R
TRICHOPTERA (CADDISFLIES)	*Hydropsyche (Aoteapsyche)*	4	A	VA	A	VA	VA
	Costachorema	7	C	R	R	-	-
	Hydrobiosis	5	C	C	C	A	C
	Oxyethira	2	C	A	R	-	-
	Pycnocentrodes	5	-	R	-	C	A
DIPTERA (TRUE FLIES)	*Aphrophila*	5	R	C	C	-	R
	Chironomus	1	-	R	-	-	-
	Maoridiamesa	3	A	A	A	R	R
	Orthocladiinae	2	A	A	A	VA	A
	Polypedilum	3	-	-	-	-	R
	Tanytarsini	3	-	VA	VA	A	A
	Empididae	3	C	R	C	-	R
	Muscidae	3	C	C	C	R	A
	Austrosimulium	3	C	R	R	-	-
	No of taxa		16	23	21	15	17
	MCI		86	85	90	92	87
	SQMCI		4.1	3.6	3.4	3.8	4.0
	EPT (taxa)		4	6	5	5	5
	%EPT (taxa)		25	26	24	33	29

'Tolerant' taxa	'Moderately sensitive' taxa	'Highly sensitive' taxa

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

2.2.3.2.2 Taxa and MCI values in Patea River

The number of taxa and the macroinvertebrate community index results, by site, are provided in Figures 10-14. These tables include the data from both rounds (November 2018 and March 2019) of biomonitoring undertaken on the Patea River this monitoring period.

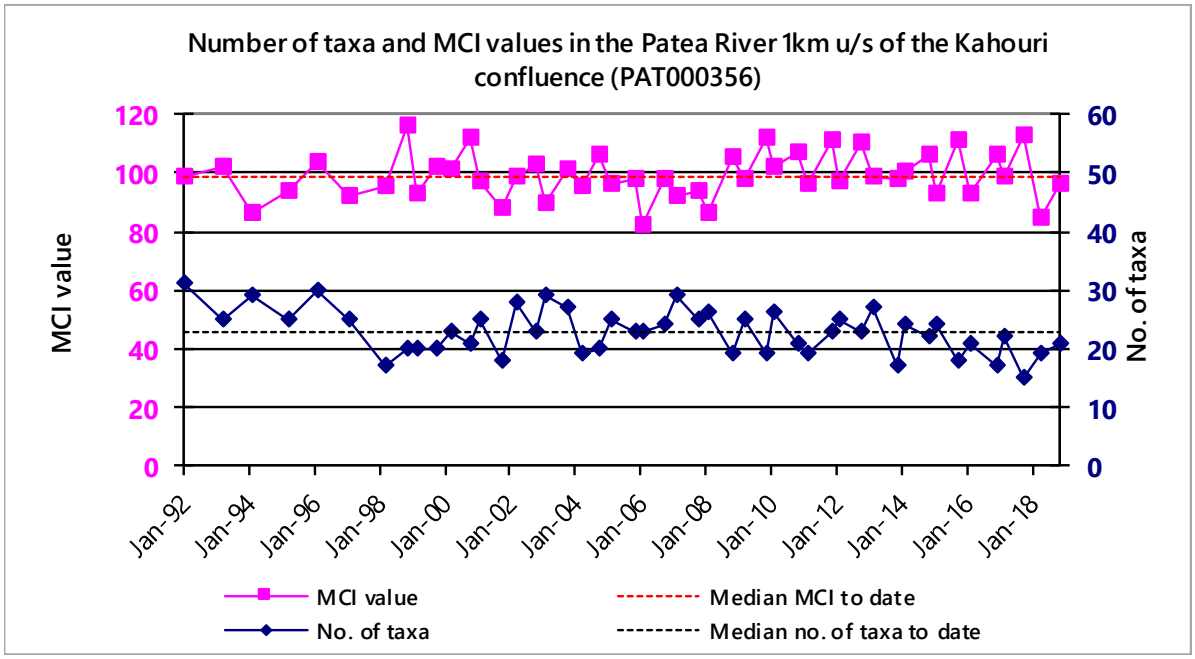

Figure 10 Taxa and MCI values in the Patea River PAT000356

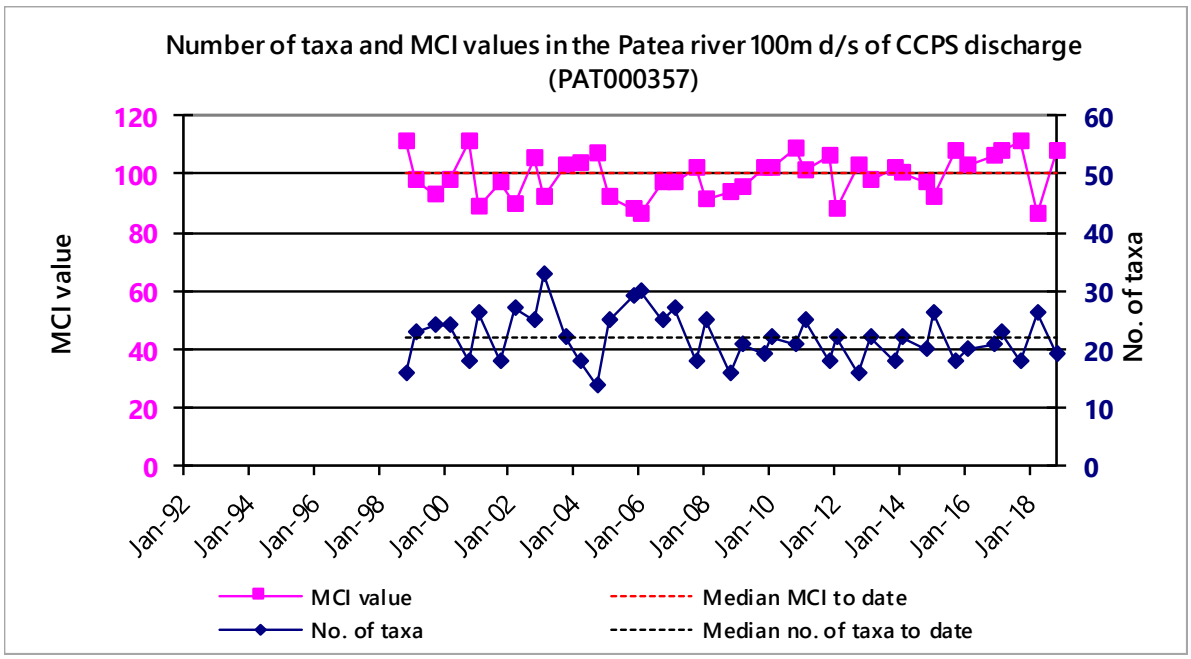

Figure 11 Taxa and MCI in the Patea River 100 m downstream of diffuser PAT00357

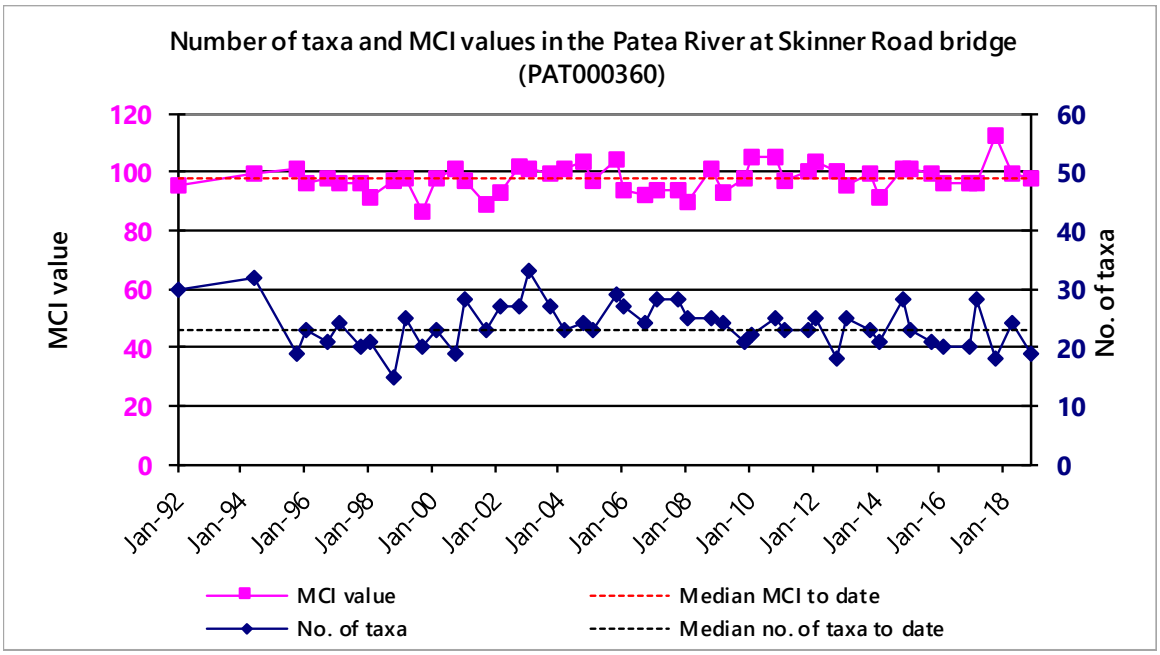

Figure 12 Taxa and MCI in the Patea River at the Skinner Road bridge PAT000360

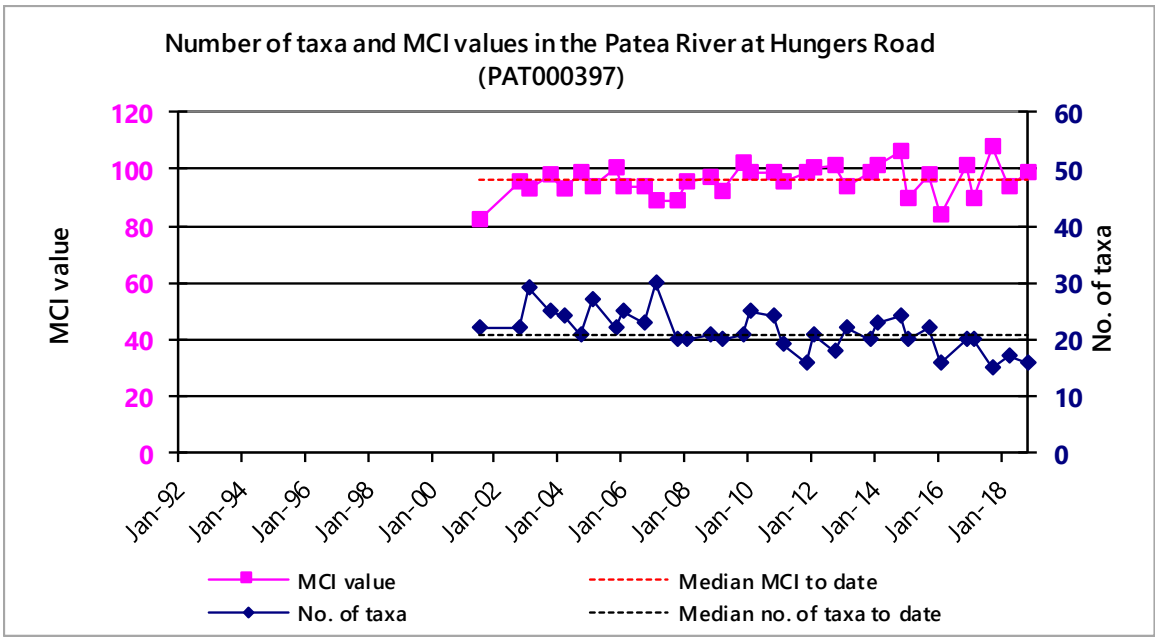

Figure 13 Taxa and MCI in the Patea River at Hungers Road PAT000397

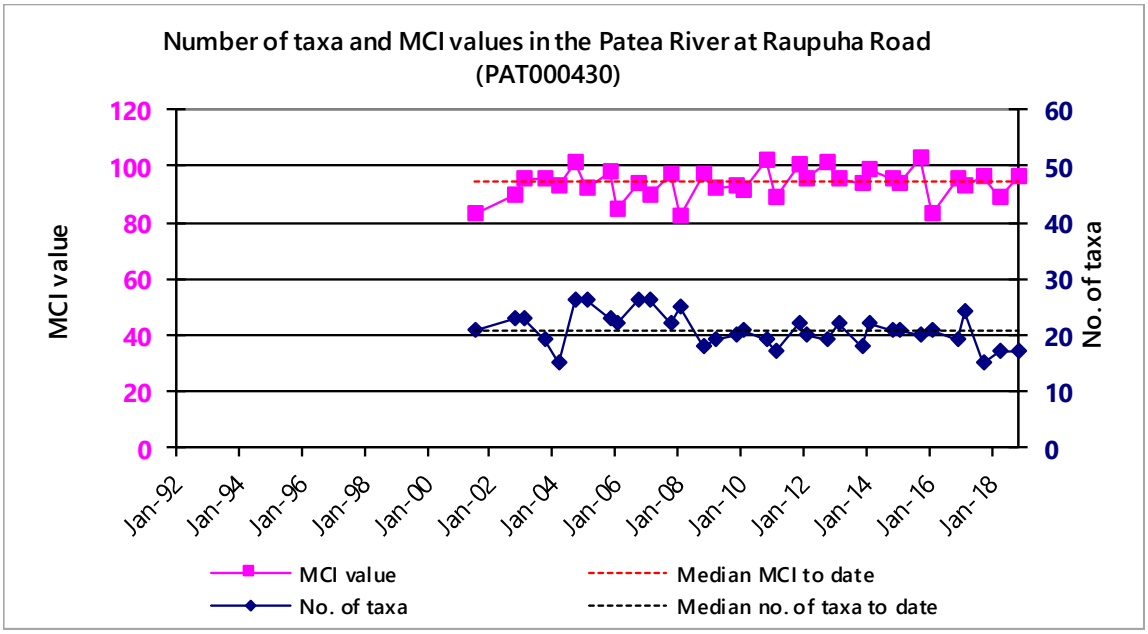

Figure 14 Taxa and MCI in the Patea River at Raupuha Road PAT000430

2.2.3.2.3 Discussion and Conclusions Patea River

The two sites immediately up and downstream of the discharge (sites 1 and 2) are useful in determining the effects of the outfall. The three most downstream sites provide background information for the anticipated expansion of the power scheme. The downstream sites are unlikely to ever be affected even by an increased discharge considering the distance downstream they are from the outfall. Biannual biomonitoring surveys will form a component of future monitoring programmes associated with consents granted to the Company's combined cycle power station, and will be integrated into other existing consents and state of the environment monitoring programmes. They will also continue to provide baseline information for the assessment of future effects of increased abstraction and cooling water discharge in the mid reaches of the Patea River with the consented expansion of the Stratford power station.

Macroinvertebrate richness was moderate at all sites on both occasions and was lower by two to six taxa from historical medians. There was a small decrease of only two taxa between site 1 and 2 suggesting no effect from the cooling water discharge and overall taxa richness decreased in a downstream direction but differences between sites were small (0-5 taxa). There was a small increase in taxa number by one taxon from site 4 to 5 indicating that water abstraction had had no effect on taxa richness.

The MCI scores categorised all sites as having 'fair' generic river health except for site 2, which had 'good' health. Sites 1 and 2 in November both had scores not significantly different to their historic medians, though site 2 had a significantly higher score than site 1, whilst in March Sites 1 and 2 both had scores significantly lower than their historical medians, though site 2 differed from site 1 by only 1 unit indicating no significant difference between the two sites. Both sites in November also had significantly higher scores than the preceding survey, whilst in March both sites also had scores lower than the preceding survey. This is likely caused by normal seasonal community fluctuations. The three lower sites on both occasions all had scores very similar to each other and to historical medians indicating that macroinvertebrate communities were in typical condition with little change between sites.

The SQMCI can be more sensitive than the MCI because, in addition to sensitivity scores, it also accounts for taxa abundance. The SQMCI scores for the November survey were all higher than historical medians, but were only significantly higher at sites 2 and 4. The scores indicated 'fair' health at sites 1 and 3, 'good' health at sites 2 and 5, and site 4 had 'very good' health. There was no significant difference in scores between sites 1 and 2, though site 2 had a higher score than site 1. However, there was a significant decline between sites

4 and 5 by 1.5 units. Comparison of historical medians indicates that site 4 has a higher median than site 5 by 0.6 units. This could be due to site 4 having better quality habitat than site 5, but equally, if the abstraction was having an effect for a long period of time it would also lower the median SQMCI score. The main difference between these sites was the change in the mayfly *Deleatidium* by only one abundance category, from extremely abundant to very abundant. If *Deleatidium* had been extremely abundant at site 5, then site 5 would have had a higher SQMCI score than site 4. Therefore, the MCI was probably a more reliable index that indicated no significant change. In the March survey the SQMCI scores were generally lower than historical medians, but were only significantly lower at site 4. The lower scores, congruent with the MCI scores, were probably the result of seasonal fluctuations with summer scores generally lower than spring scores

Overall, this biomonitoring survey performed in relation to the discharge from the power station indicated no significant impacts of recent discharges upon the biological communities of the Patea River near the discharge outfall east of Stratford. Generally, macroinvertebrate communities in the Patea River at the time of the surveys appeared to be in normal or better than normal health.

2.2.3.3 Biomonitoring of the Kahouri Stream

This summer survey (25 March 2019) was performed under moderate flow conditions (approximately three quarters of median flow), 18 days after a fresh in excess of 3 times median flow and 149 days after a fresh in excess of 7 times) median flow in the Patea River (flow gauging site at the Patea River at Skinner Road). The locations of the two monitoring locations on the Kahouri Stream are provided in Figure 15. Environmental data at the time of the survey is presented in Table 19.

Figure 15 Kahouri Stream biomonitoring site locations March 2019

Table 19 Summary of the environmental data recorded at two sites on the Kahouri Stream 25th March 2019

Site number		Site 1	Site 2
Site Code		KHI000457	KHI000480
Sample Number		FWB19225	FWB19226
Time		12:45	11:55
Temperature		16.2	16.6
Water colour		Uncoloured	Uncoloured
Water clarity		Clear	Clear
Flow conditions		Low	Very Low
Water speed		Swift	Steady
Sampling habitat		Riffle	Riffle
Periphyton mats		Patchy	Patchy
Periphyton filaments		Patchy	Patchy
Moss		Patchy	Patchy
Leaves		Patchy	Patchy
Wood		None	None
Macrophytes		None	None
Bank stability		Mostly Stable	Mostly Stable
Stock damage		None	None
Iron oxide or silt coating		No	No
Substrate embedded		No	No
Substrate disturbed		Moderate Kicking	Moderate Kicking
Bed shaded		No	Partial
Undercut banks		Yes	Yes
Overhanging vegetation		No	Yes
Substrate composition	Silt	5	5
	Sand	5	5
	Fine gravel	10	15
	Coarse gravel	20	25
	Cobble	40	45
	Boulder	20	5
	Bedrock	0	0
	Hard clay	0	0
	Wood/root	0	0
	Concrete/gabion	0	0

2.2.3.3.1 Macroinvertebrate communities

Previous surveys performed in the Kahouri Stream have indicated that the macroinvertebrate communities have generally been in good condition with relatively high numbers of taxa and MCI values. Results of previous surveys performed at sites 1 and 2 are summarised in Table 20 together with current results, and the full results reported in Table 6 and illustrated in Figures 16-18. Fauna identification is provided in Table 21.

Table 20 Summary of taxa, MCI and SQMCI values present and past results (since 1st January 1995)

Site	N	Numbers of taxa				MCI values				SQMCI values				
		Range	Median	Previous survey	Current	Range	Median	Previous survey	Current survey	N	Range	Median	Previous survey	Current survey
1	25	18-31	23	19	26	87-	103	103	110	20	2.3-	5.9	5.9	5.6
2	32	6-34	24	24	30	73-	97	108	109	20	3.8-	5.3	7.3	5.4

Figure 16 Location of biomonitoring sites in the Kahouri Stream in relation to the power station discharge of stormwater with taxa number, MCI scores and SQMCI scores for each site

2.2.3.3.2 Taxa and MCI values for the Kahouri Stream March 2019

The number of taxa and the macroinvertebrate community index results, by site, are provided in Figures 17 and 18. These include the biomonitoring undertaken on the Kahouri Stream this monitoring period. The actual macroinvertebrate results by fauna are provided in Table 21.

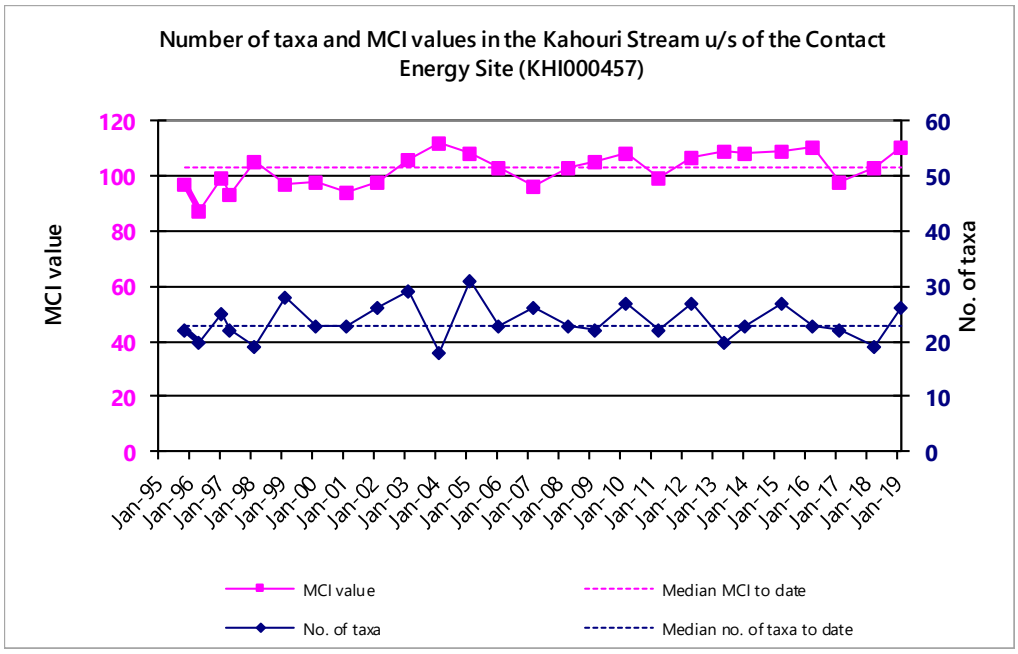

Figure 17 Taxa and MCI values for the Kahouri Stream March 2019 at site KHI000457

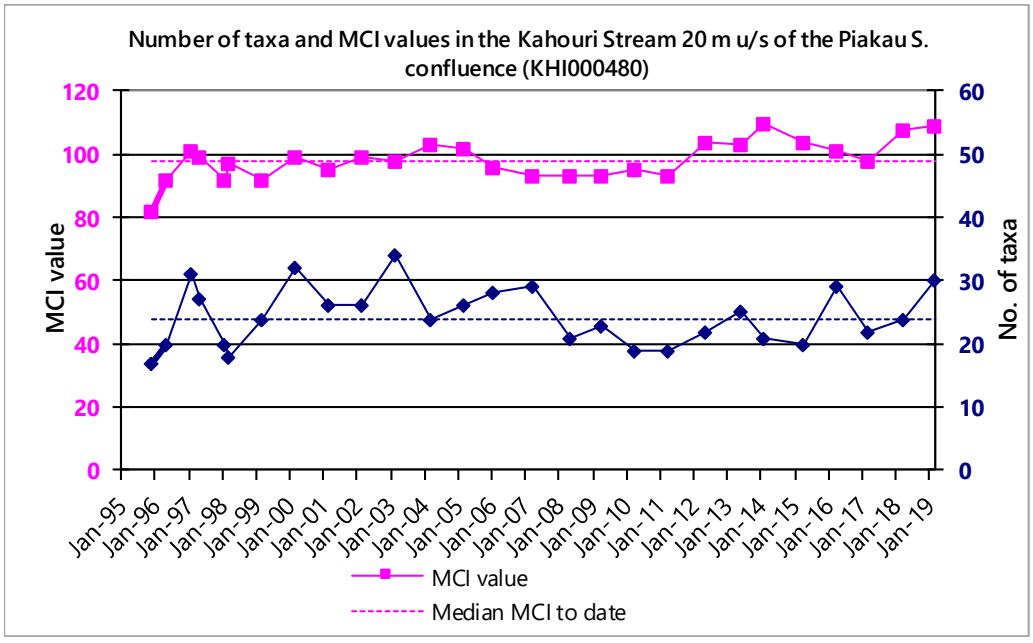

Figure 18 Taxa and MCI values for the Kahouri Stream March 2019 at site KHI000480

Table 21 Macroinvertebrate fauna of the Kahouri Stream at two sites sampled on 25th March 2019

Taxa List	Site Number	MCI score	1	2
	Site Code		KHI000457	KHI000480
	Sample Number		FWB19225	FWB19226
ANNELIDA (WORMS)	Oligochaeta	1	-	R
MOLLUSCA	*Potamopyrgus*	4	A	A
EPHEMEROPTERA (MAYFLIES)	*Ameletopsis*	10	-	R
	Austroclima	7	A	C
	Coloburiscus	7	VA	VA
	Deleatidium	8	A	VA
	Ichthybotus	8	R	-
	Nesameletus	9	C	-
	Zephlebia group	7	-	R
COLEOPTERA (BEETLES)	Elmidae	6	A	A
	Hydraenidae	8	C	R
	Ptilodactylidae	8	R	R
MEGALOPTERA (DOBSONFLIES)	*Archichauliodes*	7	A	A
TRICHOPTERA (CADDISFLIES)	*Hydropsyche (Aoteapsyche)*	4	VA	VA
	Costachorema	7	R	R
	Hydrobiosis	5	C	C
	Neurochorema	6	-	R
	Beraeoptera	8	A	C
	Confluens	5	A	C
	Olinga	9	-	R
	Oxyethira	2	C	-
	Pycnocentria	7	R	C
	Pycnocentrodes	5	C	XA
DIPTERA (TRUE FLIES)	*Aphrophila*	5	A	A
	Eriopterini	5	R	R
	Maoridiamesa	3	C	C
	Orthocladiinae	2	C	C
	Polypedilum	3	-	R
	Tanytarsini	3	A	A
	Culicidae	3	-	R
	Empididae	3	R	-
	Ephydridae	4	R	R
	Muscidae	3	R	-
	Austrosimulium	3	-	R
	Tanyderidae	4	-	R
		No of taxa	26	30
		MCI	110	109
		SQMCI	5.6	5.4
		EPT (taxa)	12	14
		%EPT (taxa)	46	47

'Tolerant' taxa | 'Moderately sensitive' taxa | 'Highly sensitive' taxa

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

2.2.3.3.3 Discussion and Conclusion

This summer 2019 biomonitoring survey of the Kahouri Stream that receives storm water from the Company site on East Road was undertaken during a relatively dry period. Results indicated that the storm water discharges had not had an impact on the macroinvertebrate communities of the stream. Macroinvertebrate richness were moderate for both sites and similar or the same as historical medians indicating no evidence for any toxic discharges.

Both sites had 'good' macroinvertebrate health with no significant difference in score between the two sites or between their respective historical medians suggesting typical results. This indicated that there were no significant impacts from discharges from the Contact Energy site. The SQMCI scores were largely congruent with the MCI scores. There was no significant difference in the SQMCI between the control site and the impacted site or their respective medians.

Overall, there was no evidence that storm water discharges from the Company site had any discernible impact on the macroinvertebrate community of the Kahouri Stream.

2.3 Air

2.3.1 Inspections

Inspections in relation to emissions to the air comprised assessment of the visual effect of discharges from the power station site, including odour surveys. The TCC is monitored continuously through the use of continuous emissions monitoring sensors, monthly reports are provided to Council. While for the SP1, the emissions are checked regularly with stack testing, with the most recent testing undertaken in September 2016.

2.3.2 Results of abstraction and discharge monitoring

The Company provides monthly reports to the Council which summarise its emissions monitoring data with respect to the TCC. The report includes the average, maximum and minimum concentrations of the following target gases:

- Nitrogen oxides (NOx);
- Oxygen (O_2);
- Carbon monoxide (CO); and
- Carbon dioxide (CO_2).

2.3.2.1 Taranaki Combined Cycle

In terms of the Taranaki Combined Cycle (TCC1), under normal operational circumstances, the maximum concentration of total nitrogen oxides (NOx) emissions for the year was 27.36 ppm. This was recorded in February 2019. There were three occasions during plant start up where the plant exceeded the 50 ppm limit which applies during steady-state operation. (Exceedance during start up is permitted for a brief period of time under consent 4454-1, condition 12). During these start-up or cessation operations the maximum value of 79.97 ppm was recorded on three occasions; on the 1st August 2018, 1st October 2018 and the 1st February 2019.

The maximum hourly NOx discharge rate reported to the Council was 98.5 kg/hr, which is in compliance with consent 4454-1, condition 13 which allows for a maximum of 430kg in any hour period. This was recorded in February 2019.

Total carbon dioxide (CO_2) emissions were calculated by the Company to comprise 425,335 tonnes CO_2 in the 2018-2019 monitoring period. This was a decrease of 57,105.1 tonnes CO_2 (11.8%) when compared to

the previous monitoring period. The TTC1 plant operation was in use for a total of 195 days this monitoring period. Of note, the TCC was in use 24 days longer than the previous monitoring period (2017-2018:171 days).

NOx emissions from the plant were recorded at 152 tonnes NOx in the 2018-2019 monitoring period. This is an increase in 21 tonnes NOx from the previous monitoring period (2017-2018:131 tonnes).

It can be noted that the Taranaki combined cycle is fitted with a continuous emissions monitoring system (CEMS). The CEMS continually monitors oxides of nitrogen (NOx), carbon monoxide (CO) and carbon dioxide (CO_2) emitted from the facility.

2.3.2.2 Emissions testing of the Stratford Peaker plants

Consent 4022 defines the limits on the concentration and mass emission rate for nitrogen oxides (NOx) discharged to air from the operation of the two peaker plant gas turbines (SP1). Limits are also imposed on maximum ground level concentration of carbon dioxide, carbon monoxide and nitrogen oxides, derived from emissions to the atmosphere from the site as or beyond the site boundary under ambient conditions.

No CEMS are fitted to the peaker plants in SP1. The peaker plants employ NOx control technology, coupled with a relatively regular cycle of emissions for peaker plants of that design. The Company undertakes regular assessments of their peaker plants. The most recent assessment of the emissions from both plants was undertaken on two separate dates. GT22 was tested by General Electric in May 2018, and GT21 was also tested by General Electric in October 2018. In both cases General Electric were requested by the Company to perform NOx water remapping. This was proposedly undertaken to significantly extend the service life on the combustor and hot section components. It also provided a secondary benefit by reducing the requirement for high purity water within the process which is utilised for NOx control.

As a process of this remapping undertaking, the Company were able to provide rationale to support the requirement of consent 4022-2 conditions 7 and 8. These stipulate the following:

7. *That except in any period of 30 minutes following the initiation of start-up of a turbine or in any period of 30 minutes prior to the cessation of the generation of electricity from a turbine, in the event that the discharge of nitrogen oxides exceeds:*

a) A mass emission rate for the site of 175 g/s^{-1}, or

b) [cancelled]

c) A concentration in any gas turbine stack equivalent to 100 mg/m^{-3} at 450 degrees Celsius, or to 125 ppm [volumetric basis].

Then the operator shall immediately initiate all reasonable steps to reduce the emissions to below these levels as soon as practicable.

8. *That the sum of all discharges of nitrogen oxides from the site of the power station is not to exceed 830 kg in any period of one hour.*

Table 22 Summary of emission data from General Electric peaker plant testing 2018

Source	Mass emission rate <175 g.s^{-1}	Concentration in any gas turbine stack ≤125 ppm	Combined NO_2 emissions	Maximum emission rate for NOx in one hour not to exceed <830 kg
GT21	16 g.s^{-1} NO_2	52 ppm	30 g.s^{-1} at 48 ppm	108 kg
GT22	14 g.s^{-1} NO_2	44 ppm		

2.3.3 Reviews and audits

The Company hold three air discharge consents, two of these (4454 & 4022) are currently in use for the TCC1 and SP1. The third (5846) relates to the currently un-built, though proposed future facility. Included in each of these three consents is a condition that requires the Company to provide the Council with reports which will include the following:

- reviewing technological advances in reducing or mitigating plant emissions;
- providing a site emissions inventory;
- describing the energy efficiency of the plant;
- covering other matter relating to mitigation or emissions reduction, and
- detailing carbon dioxide emissions from the site.

The most recent six yearly reports which relates to both the TCC1 and SP1 was received in December 2014, with the next set due in 2020. This report is provided in an earlier edition of the Council's annual report on the Company in the 2014-2015 monitoring period. This may be referenced from the bibliography and reference section of this report. The main points of the report are summarised below.

Technological advances and energy efficiency improvements

For TCC1, there had been no technological advances or efficiency improvements in the last six years. The plant already incorporated many of the features of the latest technology, such as EV burners and sequential combustion. Minor adjustments have been made, resulting in small improvements. The most notable advances relate to alternative electricity generating plant.

For SP1, the two new open cycle gas turbines commissioned in 2010 were the latest technology, only 51 units had been installed worldwide (as of June 2014). Technology advances implemented since then have related to increased component and hardware life and ability of the gas turbines to meet performance expectations. Annual emission testing was instituted in 2015 and undertaken in the 2016 monitoring period.

Changes in the electricity market

Following the significant investment that has been made in New Zealand's transmission and renewable generation capacity in the last three years, until such time as electricity demand increases, it is unlikely that the TCC1 will operate in a base loaded role outside of winter months. It is likely that there will be periods where the plant may be operated Monday to Friday only and shutdown in weekends when national electricity demand is lower. This type of operation results in reduced emissions and consumption of natural gas only when needed.

Officer's note

Changes to the electricity market synopsis were undertaken in 2014. The following monitoring period (2015-2016) observed the TCC1 in operation for a total of 52 days. In the 2016-2017 monitoring period the TCC1 was in operation for a total of 155 days. In the 2017-2018 monitoring period TCC1 was in operation for a total of 176 days, and in the monitoring period covered in this report; TCC1 was in operation for 195 days. This reflects the requirement for baseline power in New Zealand, which can vary annually.

Odour

Sporadic odour complaints had been received by the Council over the past couple of monitoring periods. This was in respect to an odour emanating from the cooling towers associated with the SP1 peaker plants.

The Company undertook an internal investigation into the odour and as result the use of a certain copper corrosion inhibitor was ceased, as it was determined that the odour was the result of such a products utilisation. This was ceased during January 2018, and since this cessation of copper corrosion inhibition the associated odour had not been observed.

However, noted by the Company was the ongoing concern with respect to copper corrosion within the cooling water system. To appease this concern with respect to copper corrosion, an alternative product was proposed by the Company.

The Company informed the Council throughout the trial of this new product and undertook extensive odour assessments throughout the trial. The trials of the proposed product were successful, with the Company communicating to the Council that the four stage trial was achieved without a discernible change in odour. The new product was prepared to be put into service.

2.4 Incidents, investigations, and interventions

The monitoring programme for the year was based on what was considered to be an appropriate level of monitoring, review of data, and liaison with the Contact Energy. 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.

The Council operates and maintains a register of all complaints or reported and discovered excursions from acceptable limits and practices, including non-compliance with consents, which may damage the environment. The incident register includes events where The Company concerned has itself notified the Council. The register contains details of any investigation and corrective action taken.

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 company is indeed the source of the incident (or that the allegation cannot be proven).

In the 2018-2019 period, there were no incidents, investigations or interventions conducted or reported by Contact Energy, or by public notice. Therefore there was no need for the Council to undertake significant additional investigations or interventions, in association with Contact Energy's conditions in resource consents or provisions in Regional Plans.

3 Discussion

3.1 Discussion of site performance

Site performance of the Company in the 2018-2019 monitoring period will be discussed by item.

Water abstraction

The daily surface water abstraction limit was not exceeded (19,440 m^3/day) throughout the monitoring period. The maximum daily abstraction was recorded as 8,000 m^3/day+/-. The daily surface water abstraction rate was not exceeded (<225 L/s). The maximum rate recorded was 160 L/s.

The abstraction rate is required to be limited by the Company during the period of low flow within the Patea River (<0.690 m^3/s). This was undertaken by the Company. The total volume of abstracted surface water during this monitoring period was 1,165,333 m^3. This is a decrease of 11.05% when compared to the previous monitoring period where 1,310,125 m^3 was abstracted. The average abstraction rate was lower (36.91 L/s) in this monitoring period than the previous monitoring period (41.41 L/s).

Discharge of process waters

The maximum discharge flow rate from the operations pits was 51.195 L/s, with the average combined flow recorded as 14.05 L/s. Total volume of wastewater discharged was 418,538 m^3. This was a 6.7% reduction when compared to the 2017-2018 monitoring period (448,789 m^3).

Chlorine analysis by the Company indicated compliance with the set requirement for not exceeding 0.05 g/m^3. Although on a couple of occasions elevated values above 0.05 g/m^3 were recorded, the automated shut off valve negated the discharge from entering surface water.

The discharge pH remained within the consent range limit of pH 6.0-9.0 throughout the monitoring period at both SP1 and TCC1, except in August 2018 at TCC; when the max pH recorded was pH 9.20.

When the continuous pH monitor indicated an exceedance with respect to the pH range limit, the wastewater discharge valve at relevant operations pit on the site automatically closes immediately (within one minute). This does not allow the non-compliant discharge to enter the river.

Temperature monitoring of receiving surface waters

The Patea River temperature during the monitoring period remained below the 25°C consented limit for the full duration, allowing for continuous discharge if required. River temperature differentials also remained within consent limits.

Kahouri stormwater

The stormwater over flow to the Kahouri Stream occurred on 17 occasions in this monitoring period. On a couple of occasions during the inspections it was communicated to Council that this water had been repurposed for use in the TCC raw water pond.

Inter-laboratory comparisons

Inter-laboratory comparisons were undertaken on four occasions this monitoring period. The results provided by the Company indicated fairly good agreement between both parties across the majority of parameters assessed. However, variation was noted on the analysis of dissolved reactive phosphorus (DRP) at the monitoring location IND002038 (SP1 waste water discharge) on all four occasions. The Company have been made aware of this variation through the inter-laboratory comparison process and will attempt to close the variation in the upcoming monitoring period.

Patea River physiochemical analysis

Physicochemical analysis of the Patea River was undertaken on five occasions this monitoring period. The aim was to assess the effects of the discharge from both or either operations pits when they are discharging to the Patea River. The results showed that the discharge of process waters were not causing an effect which was more than minor.

Emissions to air

The Taranaki Combined Cycle (TCC) was in operation for a total of 195 days this monitoring period. This is an increase of 24 days when compared to the previous monitoring period. During this period of operation the TCC discharged a total of 425,335 tonnes of CO_2. This was a decrease from the previous monitoring period (11% reduction) of 57,105 tonnes CO_2. Recorded discharged oxides of nitrogen (NOx) were reported as 152 tonnes of NOx this monitoring period, which is an increase of 21 tonnes NOx when compared to the previous monitoring period.

The maximum NOx concentration within the air discharge under normal operational circumstances was recorded at 27.36 ppm. On three occasions the Company exceeded the consent limit (50 ppm) for NOx concentration during steady-state operation. These three occasions were during start-up operations and no non-compliance was found. The Company are allowed a brief exceedance during start up or cessation activities with this specific area of plant.

The maximum hourly NOx discharge rate reported to the Council was 98.5 kg/hour. This is well within compliance standards which allows up to 430kg in any hour period.

It can be noted that the TCC1 is fitted with continuous emissions monitoring sensors (CEMS) which continually analyse for source exhaust gases.

Emissions from the Stratford Peaker Plants (SP1), in comparison to the TCC, do not have emission specific monitoring sensors. The peaker plants employ NOx control technology, coupled with a relatively regular cycle of emissions for peaker plants of that design. The Company undertakes regular assessments of their SP1 units. The Company have recently confirmed that will continue with the regularly biennial assessment of the SP1 emissions through stack testing.

During the 2018 year General Electric (GE), who constructed the peaker units were contracted to perform NOx remapping of both units. This process was proposed to significantly extend the service life of both units. This also allowed an assessment of the current NOx emissions from each of the units. The results of this remapping were provided with supporting rationale to confirm the units were within consent defined specification. The next stack testing round is planned for the 2020 year.

In terms of the air discharge consents held by the Company, the Company are required to submit a six yearly report with respect to the following:

- reviewing technological advances in reducing or mitigating plant emissions;
- providing a site emissions inventory;
- describing the energy efficiency of the plant;
- covering other matter relating to mitigation or emissions reduction, and
- detailing carbon dioxide emissions from the site.

The most recent report was provided in the 2014-2015 monitoring period (December 2014) with the next one due in 2020.

There were no incidents, investigations or interventions required with respect to the Company this monitoring period. Site inspections noted good housekeeping throughout the site with knowledgeable and appropriately trained staff throughout.

Overall, there is good communication between the Company and the Council. This includes the supply of monthly monitoring reports from the Company to the Council as to the processes undertaken by the facility, which provides good transparency between both parties.

3.2 Environmental effects of exercise of consents

Minimal environmental effects were noted during the period under review. In terms of emissions to air, carbon dioxide (CO_2) emissions from the TCC1 were reduced when compared to the previous monitoring period. Conversely however, nitrogen oxides (NOx) emissions increased when compared to the previous monitoring period.

In terms of odour, a trial of a new copper corrosion inhibitor was undertaken this monitoring period. This was proposed to replace a previous inhibitor which had produced sporadic odour impacts from the SP1 cooling towers in previous monitoring periods.

The trial was successful and throughout the process the Council were kept informed. The Company have since integrated this into the normal operational process.

Biological monitoring of the Patea River (two occasions) and the Kahouri Stream (one occasion) were undertaken this monitoring period.

In terms of the Patea River, the biologist noted the following:

Overall, this biomonitoring survey, performed in relation to the discharge from the power station indicated no significant impacts from the recent discharges upon the biological communities of the Patea River near the discharge outfall east of Stratford. Generally, macroinvertebrate communities in the Patea River at the time of the surveys appeared to be in normal or better than normal health.

In terms of the Kahouri Stream the biologist noted the following:

Overall, there was no evidence that storm water discharges from the Company site had any discernible impact on the macroinvertebrate community of the Kahouri Stream.

Inspections and monitoring of process waters did not indicate anything of an adverse nature. Temperature monitoring indicated compliance with consent defined criteria for both maximum thermal increase and total river temperature.

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 23-30.

Table 23 Summary of performance for consent 4022-2

Purpose: ***To discharge emissions to the air from fuel combustion and other related activities associated with the operation of the Stratford Power Station and ancillary plant***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Adopt best practicable option (BPO)	Site inspections - checking that standard operating procedures to achieve compliance with conditions are followed Proactive in dealing with sporadic odour complaints	Yes

Purpose: *To discharge emissions to the air from fuel combustion and other related activities associated with the operation of the Stratford Power Station and ancillary plant*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
2. Consulting over significant proposed changes	Liaison during visits and also consistent communication with Council via monthly reports, chemical changes and plant operations	Yes
3. Provision of reports on specific monitoring/investigations	Received December 2014 (next one due December 2020)	Yes
4. Limit on ambient carbon monoxide	Not monitored beyond boundary in this monitoring period Source monitoring at commissioning and modelling undertaken during the assessment of effects provided adequate results	N/A
5. Limit on ambient nitrogen oxides	Not monitored beyond boundary in this monitoring period Source monitoring at commissioning and modelling undertaken during the assessment of effects provided adequate results	N/A
6. Limit on other emissions at boundary	Not monitored beyond boundary in this monitoring period Source monitoring at commissioning and modelling undertaken during the assessment of effects provided adequate results	N/A
7. Limits on nitrogen oxides outside start-up or shut-down periods	NOx remapping undertaken by General Electric during May and October 2018. The results were supplied to the Council with supporting rationale Next stack testing proposed in the 2020-2021 monitoring period	Yes
8. Limit on nitrogen oxides mass discharge rate	NOx remapping undertaken by General Electric during May and October 2018. The results were supplied to the Council with supporting rationale Next stack testing proposed in the 2020-2021 monitoring period	Yes
9. Stack height	Inspection by Council	Yes
10. Ecological effects	Inspection by Council and observation of vegetation	Yes
11. Optional review of consent	Review available within six months of report being submitted in December 2020	N/A

Purpose: *To discharge emissions to the air from fuel combustion and other related activities associated with the operation of the Stratford Power Station and ancillary plant*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
Overall assessment of consent compliance and environment performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

N/A = not applicable

Table 24 Summary of performance for consent 4454-1

Purpose: *To discharge emissions to air from a combined cycle power station and ancillary plant*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Adopt best practicable option (BPO)	Site inspections-checked that standard operating procedures to achieve compliance with conditions are followed Outlined when equipment malfunctioned and also when equipment was brought back online	Yes
2. Outline BPO measures at time of commissioning	Report provided in 1998, as required	N/A
3. Option to review BPO measures	No review sought by Council	N/A
4. Consulting over significant proposed changes	Liaison during visits. No significant changes undertaken during year	N/A
5. Provision of reports on specific monitoring/investigations	Received December 2014 (next one due December 2020)	Yes
6. Limit on ambient carbon monoxide	Not monitored beyond boundary, as continuous CO emission monitoring by the Company gave low results	N/A
7. Limit on ambient nitrogen oxides	Not monitored, as emissions monitored continuously by Contact Energy, and previous ambient monitoring by Council, gave low results	N/A
8. Limit on other emissions at boundary	Not monitored, as emissions monitoring by the Company and dispersion modelling undertaken during AEE stage demonstrated no requirement	N/A
9. Limits on nitrogen oxides outside start-up or shut-down periods	Continuous monitoring by the Company and monthly report to Council	Yes
10. Limit on nitrogen oxides mass discharge rate	Continuous monitoring by the Company and monthly report to Council. Some technical issues with CEMS this period, however communicated to the Council at the time	Yes
11. Stack height	Inspection by Council	Yes

Purpose: *To discharge emissions to air from a combined cycle power station and ancillary plant*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
12. Ecological effects	Inspection by Council and observation of vegetation	Yes
13. Visibility of cooling system plume	Inspection and observation by Council and The Company	Yes
14. Cooling system drift	Inspection and observation by Council	Yes
15. Optional review of consent	Review available within 6 months of report being submitted as per condition 8. Report submitted 12 December 2014. No review required	N/A
16. Lapse of consent	Consent was exercised	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

N/A = not applicable

Table 25 Summary of performance for consent 4455-1

Purpose: *To take water up to 19,440 cubic metres/day [225 L/s averaged over 10 minutes] of water on a continuous basis from the Patea River for use on power stations on East Road, Stratford*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Measurement of abstraction rate	Continuous flow metering by the Company and monthly report	Yes
2. Limit on maximum abstraction rate	Continuous flow metering by the Company and monthly report to Council	Yes
3. Limit on abstraction rate during low river flows	Continuous flow metering by the Company and monthly report to Council	Yes
4. Limit on abstraction rate during very low river flows	Continuous flow metering by the Company and monthly report to Council	Yes
5. Optional review of consent	Next option for review in June 2022	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

N/A = not applicable

Table 26 Summary of performance for consent 4456-1

Purpose: *To erect, place, use and maintain an intake structure in and on the bed of the Patea River*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Notification of works	Maintenance communicated when required	Yes
2. Construction and maintenance in accordance with documentation	Maintenance communicated when required	Yes
3. Adopt BPO to prevent or minimise adverse effects	Communicated when required	Yes
4. Riverbed disturbance and reinstatement	Inspections	Yes
5. Removal of structure when no longer required		N/A
6. Timing of works	Communicated to the Council when required	Yes
7. Optional review provision	Next option for review in June 2022	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

N/A = not applicable

Table 27 Summary of performance for consent 4458-1

Purpose: *To erect, place, use and maintain a diffuser structure in and above the bed of the Patea River for the purpose of discharging used water from power stations at East Road, Stratford*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Provision of design plans	Plans received by Council and approved in 1996	Yes
2. Construction and maintenance in accordance with documentation		N/A
3. Passage of fish not to be obstructed	Not observed to be obstructing fish during period under review, assessed during surface water sample collection	Yes
4. Notification prior to and after maintenance		Yes
5. Timing of works	Works undertaken during low flows	Yes
6. Adopt best practicable option to prevent or minimise adverse effects	Liaison with the Company and inspection of diffuser	Yes

Purpose: *To erect, place, use and maintain a diffuser structure in and above the bed of the Patea River for the purpose of discharging used water from power stations at East Road, Stratford*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
7. Riverbed disturbance and reinstatement		N/A
8. Removal of structure when no longer required		N/A
9. Optional review provision re environmental effects	Next option for review in June 2022	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

N/A = not applicable

Table 28 Summary of performance for consent 4459-1.3

Purpose: *To discharge stormwater from the operation of a Power Station site into an unnamed tributary of the Piakau Stream and into the Kahouri Stream, both tributaries of the Patea River*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Provision of plans prior to completion of construction	Plans received by Council	Yes
2. Concentration limits upon potential contaminants in discharge	Monitored by the Company	Yes
3. Provision of contingency plan	Plan received by Council and approved 1996. Most recent update produced May 2016	Yes
4. Controls on effect of discharge in receiving water	Inspection and biological monitoring by Council	Yes
5. Optional review provision re environmental effects	Next option for review in June 2022	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

N/A = not applicable

Table 29 Summary of performance for consent 4460-1

Purpose: *To erect, place, use and maintain, in and above the beds of an unnamed tributary of the Piakau Stream and of the Kahouri Stream, both tributaries of the Patea River, structures for the purpose of discharging stormwater from a power station site*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Provision of plans	Plans received by Council and approved	Yes
2. Construction and maintenance in accordance with documentation	No maintenance during period under review	N/A
3. Passage of fish not to be obstructed	No monitoring during review period, as design of structure satisfactory	N/A
4. Notification prior to and after maintenance	No maintenance during period under review	N/A
5. Timing of works	No maintenance during period under review	N/A
6. Adopt best practicable option to prevent or minimise adverse effects	No maintenance during period under review	N/A
7. Riverbed disturbance and reinstatement	No maintenance during period under review	N/A
8. Removal of structure when no longer required		N/A
9. Optional review provision re environmental effects	Next option for review in June 2020	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

N/A = not applicable

Table 30 Summary of performance for consent 4461-1

Purpose: *To erect, place, use and maintain in, over and under the bed of the Kahouri Stream, a tributary of the Patea River, within the site and adjacent land immediately to the southeast ,a bridge, pipelines, cables and associated utilities for a power station site*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Provision of plans	Plans received by Council and approved	Yes
2. Construction and maintenance in accordance with documentation	No maintenance during period under review	N/A

Purpose: *To erect, place, use and maintain in, over and under the bed of the Kahouri Stream, a tributary of the Patea River, within the site and adjacent land immediately to the southeast ,a bridge, pipelines, cables and associated utilities for a power station site*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
3. Passage of fish not to be obstructed	No monitoring during review period, as design of structure satisfactory	N/A
4. Notification prior to and after maintenance	No maintenance during period under review	N/A
5. Timing of works	No maintenance during period under review	N/A
6. Adopt best practicable option to prevent or minimise adverse effects	No maintenance during period under review	N/A
7. Riverbed disturbance and reinstatement	No maintenance during period under review	N/A
8. Removal of structure when no longer required		N/A
9. Optional review provision re environmental effects	Next option for review in June 2022	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

N/A = not applicable

Table 31 Summary of performance for consent 4462-1

Purpose: *To erect, place, use and maintain water pipelines and associated control cables above, through or below the beds of the Toko Stream and various small unnamed streams, for the purpose of water transmission from the Patea River to power stations at East Road, Stratford*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Provision of design plans	Plans received by Council and approved in 1996	N/A
2. Construction and maintenance in accordance with documentation	No maintenance during period under review	N/A
3. Passage of fish not to be obstructed	No monitoring during review period, as design of structure satisfactory	N/A
4. Notification prior to and after maintenance	No maintenance during period under review	N/A

Purpose: *To erect, place, use and maintain water pipelines and associated control cables above, through or below the beds of the Toko Stream and various small unnamed streams, for the purpose of water transmission from the Patea River to power stations at East Road, Stratford*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
5. Timing of works	No maintenance during period under review	N/A
6. Adopt best practicable option to prevent or minimise adverse effects	No maintenance during period under review	N/A
7. Riverbed disturbance and reinstatement	No maintenance during period under review	N/A
8. Removal of structure when no longer required		N/A
9. Optional review provision re environmental effects	Next option for review in June 2022	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

N/A = not applicable

Table 32 Summary of performance for consent 4804-1

Purpose: *To erect, place, use and maintain over the bed of an unnamed tributary of the Kahouri Stream in the Patea catchment, within the site and adjacent land immediately to the southeast a bridge structure to convey high voltage electricity cables and associated communication cables for a power station site*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Provision of design plans	Plans received by Council and approved in 1996	Yes
2. Construction and maintenance in accordance with documentation	No maintenance during period under review	N/A
3. Notification prior to and after maintenance	No monitoring during review period, as design of structure satisfactory	N/A
4. Timing of works	No maintenance during period under review	N/A
5. Adopt best practicable option to prevent or minimise adverse effects	No maintenance during period under review	N/A
6. Riverbed disturbance and reinstatement	No maintenance during period under review	N/A
7. Removal of structure when no longer required		N/A

Purpose: *To erect, place, use and maintain over the bed of an unnamed tributary of the Kahouri Stream in the Patea catchment, within the site and adjacent land immediately to the southeast a bridge structure to convey high voltage electricity cables and associated communication cables for a power station site*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
8. Optional review provision re environmental effects	Next option for review in June 2022	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

N/A = not applicable

Table 33 Summary of performance for consent 5063-1

Purpose: *To discharge up to 5 cubic metres/day of domestic septic tank effluent through a soakage field onto and into land in the vicinity of the Kahouri Stream in the Patea catchment in association with the Stratford Power Station site*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Installation according to plan submitted	Installation inspected by Council, new plans recently submitted August 2018	Yes
2. Prohibition on surface run-off	Inspection by Council Note this consent will be surrendered in the upcoming monitoring period	Yes
3. Optional review provision re environmental effects	Next option for review in June 2022	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

N/A = not applicable

Table 34 Summary of performance for consent 5633-1

Purpose: *To discharge fine sediment and organic matter from water intake structure tee screens to the Patea River*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Discharge according to documentation submitted	Inspection by Council	Yes

Purpose: *To discharge fine sediment and organic matter from water intake structure tee screens to the Patea River*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
2. Controls on effect of discharge in receiving water	Inspection and biological monitoring by Council	Yes
3. Optional review provision re environmental effects	Next option for review in June 2022	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

N/A = not applicable

Table 35 Summary of performance for consent 5848-1

Purpose: *To discharge up to 6,740 cubic metres (78 L/s averaged over 15 minutes) of used water, mainly blowdown water from the cooling system from power stations at East Road, Stratford into the Patea River*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Discharge in accordance with effluent disposal management plan	Inspection by Council, and provision of annual report by The Company	Yes
2. Provision and revision of effluent disposal management plan	Plan received by Council and approved 1996. Most recent update received February 2010 approved by Council	Yes
3. Provision of details on proposed new water treatment chemicals	One change during monitoring period, cessation of copper corrosion inhibitor. New chemical to be reviewed and proposed in upcoming monitoring period	N/A
4. Provision of details on proposed new cleaning chemicals	No changes during monitoring period, though proposed in upcoming monitoring period	N/A
5. Optional review of consent on notification of new chemicals	No review required	N/A
6. Provision and maintenance of contingency plan	Plan received by Council and approved. Most recent update released May 2016	Yes
7. Controls on effect of discharge in receiving water	Inspection, sampling and biological monitoring by Council	Yes
8. Passage of fish not to be obstructed	Inspection of diffuser during compliance inspections did not indicate any fish barriers. Trout monitoring survey in January 2004 did not show any effect	Yes

Purpose: *To discharge up to 6,740 cubic metres (78 L/s averaged over 15 minutes) of used water, mainly blowdown water from the cooling system from power stations at East Road, Stratford into the Patea River*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
9. Limit on river temperature increase	Monitoring by Council indicated that this complaint for the full duration of the monitoring period. Noted Council data malfunction occurred May – July 2019.	Yes
10. Limit on maximum river temperature	Monitoring by the Council indicated that the maximum river temperature was not exceeded for the duration of the monitoring period. Noted Council data malfunction occurred May – July 2019.	Yes
11. Consent holder to continuously monitor temperature and provide records	Monthly reporting by Contact Energy	Yes
12. Concentration limits upon potential contaminants in discharge	Continuous monitoring and monthly reporting by Contact Energy, and measurement checks by Council through inter-laboratory analysis	Yes
13. Limit on ammonia in river	Monitoring by Council	Yes
14. Lapse of consent	Consent was exercised	N/A
15. Optional review provision re environmental effects	Next option for review in June 2022	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

N/A = not applicable

Table 36 Summary of performance for consent 7247-1

Purpose: *To discharge emissions into air from the operation of the cooling tower associated with the Stratford Peaker Power Plant*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Adopt best practicable option (BPO)	Site inspections - checking that standard operating procedures to achieve compliance with conditions are followed	Yes
2. Cooling tower design as described in application	Inspection by Council	Yes

Purpose: *To discharge emissions into air from the operation of the cooling tower associated with the Stratford Peaker Power Plant*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
3. Prior notification of exercise of consent	Notification received 10 November 2010	N/A
4. Minimisation of emissions	Inspection by Council	Yes
5. Visibility of cooling system plume	Inspection and observation by Council and the Company	Yes
6. Cooling system drift	Inspection and observation by Council	Yes
7. Description of water treatment regime to be provided	Description provided 10 November 2010, likely to be amended in the upcoming monitoring period	Yes
8. Consulting over significant proposed changes	Liaison during visits. No significant changes undertaken during year	Yes
9. Offensive odour prohibited	New corrosion inhibitor trialled successfully and to be implemented	Yes
10. Ecological effects	Inspection by Council and observation of vegetation	Yes
11. Lapse of consent	Consent was exercised	N/A
12. Optional review of consent	Next option for review in June 2022	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

N/A = not applicable

Table 37 Summary of performance for consent 7248-1

Purpose: *To erect, place, use and maintain a bridge over an unnamed tributary of the Kahouri Stream for pedestrian access and carriage of water pipes, high voltage cables, control cables and associated utilities*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Exercise of consent in accordance with application	Site inspections	Yes
2. Provision of bridge plans prior to construction	Not received	N/A

Purpose: *To erect, place, use and maintain a bridge over an unnamed tributary of the Kahouri Stream for pedestrian access and carriage of water pipes, high voltage cables, control cables and associated utilities*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
3. Notification prior to exercise of consent	Notification received 15 February 2010	N/A
4. Minimisation of sediment in stream	No maintenance during period under review	N/A
5. Area and volume of disturbance to be minimised	No maintenance during period under review	N/A
6. Structure removed and area reinstated if no longer required		N/A
7. Lapse of consent		N/A
8. Optional review provision re environmental effects	Next option for review in June 2022	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

N/A = not applicable

Table 38 Summary of performance for consent 7250-1

Purpose: *To erect, place, use and maintain a bridge over the Kahouri Stream for pedestrian access and carriage of water pipes, high voltage cables, control cables and associated utilities*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Exercise of consent in accordance with application	Site inspections	Yes
2. Provision of bridge plans prior to construction	Not received.	N/A
3. Notification prior to exercise of consent	Notification received 15 February 2010	N/A
4. Minimisation of sediment in stream	No maintenance during period under review	N/A
5. Area and volume of disturbance to be minimised	No maintenance during period under review	N/A
6. Structure removed and area reinstated if no longer required		N/A
7. Lapse of consent		N/A

Purpose: *To erect, place, use and maintain a bridge over the Kahouri Stream for pedestrian access and carriage of water pipes, high voltage cables, control cables and associated utilities*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
8. Optional review provision re environmental effects	Next option for review in June 2022	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

N/A = not applicable

Table 39 Summary of performance for consent 7605-1

Purpose: *To construct, place and maintain a stormwater outlet structure in the Kahouri Stream*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Exercise of consent in accordance with application	Site inspections	Yes
2. Notification prior to exercise of consent	Notification received 16 March 2010	N/A
3. Area and volume of disturbance to be minimised	No maintenance during period under review	N/A
4. Minimisation of sediment in stream	No maintenance during period under review	N/A
5. Structure removed and area reinstated if no longer required		N/A
6. Lapse of consent		N/A
7. Optional review provision re environmental effects	Next option for review in June 2022	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

N/A = not applicable

Table 40 Summary of performance for consent 7653-1

Purpose: *To construct, place and maintain a stormwater outlet structure in the Kahouri Stream*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Exercise of consent in accordance with application	Site inspections by Council	Yes
2. Timing of works	No maintenance during period under review	N/A

Purpose: *To construct, place and maintain a stormwater outlet structure in the Kahouri Stream*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
3. Notification prior to exercise of consent	Notification received 9 July 2010	N/A
4. Area and volume of disturbance to be minimised	No maintenance during period under review	N/A
5. Minimisation of sediment in stream	No maintenance during period under review	N/A
6. Structure removed and area reinstated if no longer required	Site inspections	N/A
7. Lapse of consent		N/A
8. Optional review provision re environmental effects	Next option for review in June 2022	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

N/A = not applicable

3.4 Recommendations from the 2017-2018 Annual Report

1. That in the first instance, monitoring of consented activities at the Company's Stratford Power Station (SPS) in the 2018-2019 year continue at the same level as in 2017-2018.
2. That should there be issues with environmental or administrative performance in the 2018-2019 monitoring period, the monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

Recommendation one was implemented. Recommendation two was not required.

3.5 Alterations to monitoring programmes for 2019-2020

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

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

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

It is proposed that for the 2019-2020 monitoring period in relation to the Company's Stratford Power Station (SPS), that the monitoring programme remain unchanged from that undertaken in the 2018-2019 monitoring period.

It should be noted that the proposed programme represents a reasonable and risk-based level of monitoring for the site in question. The Council reserves the right to subsequently adjust the programme from that initially prepared, should the need arise if potential or actual non-compliance is determined at any time during 2018-2019.

3.6 Recommendations

1. THAT in the first instance, monitoring of consented activities at the Company's Stratford Power Station (SPS) in the 2019-2020 year continue at the same level as in 2018-2019.
2. THAT should there be issues with environmental or administrative performance in 2019-2020, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

Glossary of common terms and abbreviations

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

Biomonitoring	Assessing the health of the environment using aquatic organisms.
BOD	Biochemical oxygen demand. A measure of the presence of degradable organic matter, taking into account the biological conversion of ammonia to nitrate.
BODF	Biochemical oxygen demand of a filtered sample.
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.
Conductivity	Conductivity, an indication of the level of dissolved salts in a sample, usually measured at 25°C and expressed in mS/m.
Cu*	Copper.
Cumec	A volumetric measure of flow- 1 cubic metre per second (1 m^3s^{-1}).
DO	Dissolved oxygen.
DRP	Dissolved reactive phosphorus.
Fresh	Elevated flow in a stream, such as after heavy rainfall.
$g/m^2/day$	grams/$metre^2$/day.
g/m^3	Grams per cubic metre, and equivalent to milligrams per litre (mg/L). In water, this is also equivalent to parts per million (ppm), but the same does not apply to gaseous mixtures.
Incident	An event that is alleged or is found to have occurred that may have actual or potential environmental consequences or may involve non-compliance with a consent or rule in a regional plan. Registration of an incident by the Council does not automatically mean such an outcome had actually occurred.
Intervention	Action/s taken by Council to instruct or direct actions be taken to avoid or reduce the likelihood of an incident occurring.
Investigation	Action taken by Council to establish what were the circumstances/events surrounding an incident including any allegations of an incident.
Incident register	The incident register contains a list of events recorded by the Council on the basis that they may have the potential or actual environmental consequences that may represent a breach of a consent or provision in a Regional Plan.
L/s	Litres per second.
m^2	Square Metres.
MCI	Macroinvertebrate community index; a numerical indication of the state of biological life in a stream that takes into account the sensitivity of the taxa present to organic pollution in stony habitats.
mS/m	Millisiemens per metre.
Mixing zone	The zone below a discharge point where the discharge is not fully mixed with the receiving environment. For a stream, conventionally taken as a length equivalent to 7 times the width of the stream at the discharge point.
NH_4	Ammonium, normally expressed in terms of the mass of nitrogen (N).
NH_3	Unionised ammonia, normally expressed in terms of the mass of nitrogen (N).

NO_3	Nitrate, normally expressed in terms of the mass of nitrogen (N).
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_{10}, $PM_{2.5}$, $PM_{1.0}$	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	*Resource Management Act 1991* 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.
UI	Unauthorised Incident.
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.

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Taranaki Regional Council (2017): *Stratford Power Station (TCC1 and SP1) Ahuroa Gas Storage Contact Energy Ltd Monitoring Programme Annual Report 2016-2017*. Technical Report 2017-12.

Taranaki Regional Council (2018): *Stratford Power Station (TCC1 and SP1) Ahuroa Gas Storage Contact Energy Ltd Monitoring Programme Annual Report 2017-2018* Technical Report 2018-50.

Appendix I

Resource consents held by the Company Ltd

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

Consent number	Purpose	Volume	Next review date	Expiry date
4022-2	Discharge emissions to air from combustion		#	2022
4454-1	Discharge contaminants to air		#	2029
4455-1	Take from Patea River below Toko confluence	19,440 m^3/day (225L/s)	2022	2028
4456-1	Intake structure on Patea River below Toko confluence		2022	2028
4458-1	Diffuser structure on Patea River		2022	2028
4459-1	Discharge stormwater to Kahouri/Piakau Streams	1,360 L/s	2022	2028
4460-1	Stormwater discharge structures		2022	2028
4461-1	Utilities structures on Kahouri Stream		2022	2028
4462-1	Water transmission structures		2022	2028
4804-1	Bridge for electricity transmission over Kahouri Stream		2022	2028
5063-1	Discharge septic tank effluent to land	5 m^3/day	2022	2028
5633-1	Discharge sediment from water intake to Patea River		2022	2028
5846-1*	Discharge contaminants to air		2022	2034
5847-1*	Take from Patea River at Skinner Road	19,440 m^3/day (225L/s)	2022	2034
5848-1	Discharge used water to Patea River	6,740 m^3/day (78L/s)	2022	2034
5849-1*	Gas pipeline structures on Kahouri Stream		2022	2034
5850-1*	Intake structure on Patea River at Skinner Road		2022	2034
5851-1*	Discharge sediment from water intake to Patea River		2022	2034
5852-1*	Utilities structures on Kahouri Stream		2022	2034
7247-1	Discharge emissions to air from cooling tower		2022	2034
7248-1	Bridge for pedestrian access and utilities over Kahouri tributary		2022	2034
7250-1	Bridge for pedestrian access and utilities over Kahouri Stream		2022	2034
7605-1	Stormwater discharge structure		2022	2028
7653-1	Stormwater discharge structure		2022	2028
7785-1*	Discharge construction contaminants to Piakau/Kahouri Streams		2022	2028
7786-1*	Discharge contaminants to air from construction		2022	2028

Discharge Permit

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

Name of Consent Holder:	Contact Energy Limited P O Box 10742 WELLINGTON 6143
Change To Conditions Date:	9 February 2010 [Granted: 14 December 1994]

Conditions of Consent

Consent Granted:	To discharge emissions into the air from fuel combustion and other related activities associated with the operation of the Stratford Power Station and ancillary plant at or about (NZTM) 1713825E-5645366N
Expiry Date:	1 June 2022
Review Date(s):	As per special condition 11
Site Location:	Stratford Peaker Power Station, State Highway 43 [East Road], Stratford
Legal Description:	Lot 1 DP 19365 & Lot 1 DP 17776 Blk II Ngaere SD

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

General conditions

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

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

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

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

Special conditions

1. That 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 site.

2. That prior to undertaking any alterations to the plant, processes or operations, as specified in the application which may significantly change the nature or quantity of contaminants emitted from the site, the consent holder shall consult with the Chief Executive and shall obtain any necessary approvals under the Resource Management Act.

3. That the consent holder shall provide to the Council within two years from the granting of this consent and every six years thereafter a written report:

a) reviewing any technological advances in the reduction or mitigation of emissions, how these might be applicable and/or implemented at the power station, and the costs and benefits of these advances; and

b) detailing 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) detailing any measures that have been taken by the consent holder to improve the energy efficiency of the power station; and

d) addressing any other issue relevant to the minimisation or mitigation of emissions from the site that the Chief Executive, Taranaki Regional Council, considers should be included; and

e) detailing carbon dioxide emissions from the site.

4. That the consent holder shall control all emissions of carbon monoxide to the atmosphere from the site, in order that the maximum ground level concentration of carbon monoxide arising from the exercise of this consent measured under ambient conditions does not exceed 10 mg m^{-3} [eight-hour average exposure], or 30 mg m^{-3} [one-hour average exposure] at or beyond the boundary of the site.

5. That the consent holder shall control all emissions of nitrogen oxides to the atmosphere from the site, in order that the maximum ground level concentration of nitrogen dioxide arising from the exercise of this consent measured under ambient conditions does not exceed 20 ug m^{-3} [twenty-four-hour average exposure], or 60 ug m^{-3} [four-hour average exposure] at or beyond the boundary of the site.

6. That the consent holder shall control all emissions to the atmosphere from the site of contaminants other than carbon dioxide, carbon monoxide, and nitrogen oxides, in order that the maximum ground level concentration for any particular contaminant arising from the exercise of this consent measured at or beyond the boundary of the site is not increased above background levels:

   a) by more than 1/30th of the relevant Occupational Threshold Value-Time Weighted Average, or by more than the Short Term Exposure Limit at any time, [all terms as defined in Workplace Exposure Standards and Biological Exposure indices for New Zealand, 1992, Department of Labour], or

   b) if no Short Term Exposure Limit is set, by more than three times the Time Weighted Average at any time, [all terms as defined in Workplace Exposure Standards and Biological Exposure Indices for New Zealand, 1992, Department of Labour].

7. That except in any period of 30 minutes following the initiation of start-up of a turbine or in any period of 30 minutes prior to the cessation of the generation of electricity from a turbine, in the event that the discharge of nitrogen oxides exceeds:

   a) a mass emission rate for the site of 175 g s^{-1}, or
   b) *[cancelled]*
   c) a concentration in any gas turbine stack equivalent to 100 mg m^{-3} at 450 degrees Celsius, or to 125 ppm [volumetric basis].

   then the operator shall immediately initiate all reasonable steps to reduce the emissions to below these levels as soon as practicable.

8. That the sum of all discharges of nitrogen oxides from the site of the power station is not to exceed 830 kg in any period of one hour.

9. That the minimum height of discharge of the products of combustion from the turbines shall be 15 metres above ground level.

10. That 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.

11. That subject to the provisions of this condition, the Taranaki Regional Council may within six months of receiving a report prepared by the consent holder pursuant to condition 3 of this consent, serve notice that it intends to review the conditions of this resource consent in accordance with Section 128(1)(a) of the Act for the purposes of:

    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 and which it is appropriate to deal with at the time of the review or

    b) requiring the holder to adopt the best practicable option to remove or reduce any adverse effect on the environment caused by the discharge; or

    c) taking into account any Act of Parliament, regulation, national policy statement, regional policy statement or regional rule which relates to limiting, recording, or mitigating carbon dioxide and which is relevant to emissions from the Stratford gas turbine power station.

Signed at Stratford on 9 February 2010

For and on behalf of
Taranaki Regional Council

_____

Chief Executive

Discharge Permit

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

Name of Consent Holder:	Contact Energy Limited P O Box 10742 WELLINGTON 6143
Change To Conditions Date:	9 February 2010 [Granted: 15 August 1995]

Conditions of Consent

Consent Granted:	To discharge contaminants to air, subject to the following specified conditions, from a combined cycle power station and ancillary plant ['the station'] located adjacent to East Road approximately three kilometres East of the town of Stratford at or about (NZTM) 1713732E-5645766N
Expiry Date:	14 August 2029
Site Location:	East Road, Stratford
Legal Description:	Lot 2 of Subdiv of Lot 2 Lt 18343 Blk II Ngaere SD

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

General conditions

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

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

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

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

Special conditions
(note condition numbering intentionally begins at 4)

4) That 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 site.

5) That a general outline of the methods, specifications, operating guidelines or other measures which represent the best practicable option at the time of commissioning will be supplied by the consent holder and thereafter attached to this consent as Schedule A.

6) That the measures representing the best practicable option may be reviewed in accordance with the procedure provided for in condition 18.

7) That prior to undertaking any alterations to the plant, processes or operations specified in the application, which alterations may significantly change the nature or quantity of contaminants emitted from the site, the consent holder shall consult with the Chief Executive and shall obtain any necessary approvals under the Resource Management Act.

8) That the consent holder shall provide to the Council within two years from the commencement of commissioning of the Station and again at four years from commencement of commissioning of the Station and every six years thereafter, a written report:

a) reviewing any technological advances in the reduction or mitigation of emissions, especially, but not exclusively in respect of the cooling tower plume and of carbon dioxide, how these might be applicable and/or implemented at the power station, and the costs and benefits of these advances; and

b) detailing an inventory of emissions from the site of such contaminants as the Chief Executive may from time to time specify following consultation with the consent holder; and

c) detailing any measures that have been taken by the consent holder to improve the energy efficiency of the Station; and

d) addressing any other issue relevant to the minimisation or mitigation of emissions from the site that the Chief Executive considers should be included; and

e) detailing carbon dioxide emissions from the site.

9) That the consent holder shall control all emissions of carbon monoxide to the atmosphere from the site, in order that the maximum ground level concentration of carbon monoxide arising from the exercise of this consent measured under ambient conditions does not exceed 10 mg/m^3 [eight-hour average exposure], or 30 mg/m^3 [one-hour average exposure] at or beyond the boundary of the site.

10) That the consent holder shall control all emissions of nitrogen oxides to the atmosphere from the site, in order that the maximum ground level concentration of nitrogen dioxide arising from the exercise of this consent measured under ambient conditions does not exceed 30 μ/m^3 [twenty-four hour average exposure], or 95 $\mu g/m^3$ [four-hour average exposure] at or beyond the boundary of the site.

11) That the consent holder shall control all emissions to the atmosphere from the site of contaminants other than carbon dioxide, carbon monoxide, and nitrogen oxides, in order that the maximum ground level concentration for any particular contaminant arising from the exercise of this consent measured at or beyond the boundary of the site is not increased above background levels:

a) by more than 1/30th of the relevant Occupational Threshold Value-Time Weighted Average, or by more than the Short Term Exposure Limit at any time, [all terms as defined in Workplace Exposure Standards and Biological Exposure Indices for New Zealand, 1992, Department of Labour], or

b) if no Short Term Exposure Limit is set, by more than three times the Time Weighted Average at any time, [all terms as defined in Workplace Exposure Standards and Biological Exposure Indices for New Zealand, 1992, Department of Labour].

12) That except in any period of 240 minutes following the initiation of start-up of a turbine or in any period of 30 minutes prior to the cessation of the generation of electricity from a turbine, in the event that the discharge of nitrogen oxides exceeds:-

a) a mass emission rate for the site of 70 g/s, or

b) a mass emission rate per gas turbine stack of [70 divided by n] g/s [where n = number of gas turbine stacks], or

c) a concentration in any gas turbine stack equivalent to 75 mg/m^3 at 84° Celsius, or to 50 ppm [volumetric basis] then the operator shall immediately initiate all reasonable steps to reduce the emissions to below these levels as soon as practicable.

13) That the sum of all discharges of nitrogen oxides from the site of the power station is not to exceed 430 kg in any period of one hour.

14) That the minimum height of discharge of the products of combustion from the turbines shall be 35 metres above ground level.

15) That 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.

16) That the evaporative cooling system to be used shall not produce a visible plume at any ambient condition further from saturation than 6° Celsius and 85% relative humidity.

17) That the evaporative cooling system shall be operated in order that the loss of cooling water as droplet drift to atmosphere does not exceed in aggregate 0.02% of the cooling water circulation rate at the time.

18) That subject to the provisions of this condition, the Council may within six months of receiving a report prepared by the consent holder pursuant to condition 8 of this consent, serve notice that it intends to review the conditions of this resource consent in accordance with Section 128(1)(a) of the Resource Management Act for the purpose of:

    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 and which it is appropriate to deal with at the time of the review; or

    b) requiring the holder to adopt the best practicable option to remove or reduce any adverse effect on the environment caused by the discharge; or

    c) taking into account any Act of Parliament, regulation, national policy statement, regional policy statement or regional rule which relates to limiting, recording, or mitigating carbon dioxide and which is relevant to emissions from the Station.

19) That this consent shall lapse on the expiry of six years after the date of commencement of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to Section 125(b) of the Resource Management Act 1991.

Signed at Stratford on 9 February 2010

For and on behalf of
Taranaki Regional Council

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Chief Executive

Water Permit

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

Name of Consent Holder:	Contact Energy Limited P O Box 10742 WELLINGTON
Change To Conditions Date:	6 March 2008 [Granted: 25 May 1994]

Conditions of Consent

Consent Granted:	To take up to 19,440 cubic metres/day [225 litres/second averaged over 15 minutes] of water on a continuous basis from the Patea River for use on Power Stations at East Road, Stratford at or about 2631900E-6204900N
Expiry Date:	1 June 2028
Review Date(s):	June 2010, June 2016, June 2022
Site Location:	Toko Road, Stratford
Legal Description:	Patea Riverbed adjoining Pt Lot 2 DP 739 & Lot 1 DP 20723 Blk IV Ngaere SD
Catchment:	Patea

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

General conditions

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

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

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

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

Special conditions

1. The resource consent holder shall install and operate a measuring device capable of recording instantaneous and daily rates of abstraction and shall make such records available to the Chief Executive, Taranaki Regional Council, upon request.

2. When the flow in the Patea River at the Taranaki Regional Council Skinner Road recorder [Q20:260-064] is more than 765 litres per second, up to 225 litres per second may be abstracted.

3. When the flow in the Patea River at the Taranaki Regional Council Skinner Road recorder [Q20:260-064] is between 765 litres per second and 690 litres per second abstraction may be up to a rate of the flow at the Skinner Road recorder less 540 litres per second.

4. When the flow in the Patea River at the Taranaki Regional Council Skinner Road recorder [Q20:260-064] is less than 690 litres per second, up to 150 litres per second may be abstracted.

5. The Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during June 2010, and/or June 2016, and/or June 2022, for the purpose of ensuring that the conditions are adequate to deal with any significant adverse effects on the environment arising from the exercise of this consent, which were either not foreseen at the time the application was considered and which it is appropriate to deal with at the time of review.

Signed at Stratford on 6 March 2008

For and on behalf of
Taranaki Regional Council

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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:	Contact Energy Limited (WELLINGTON) P O Box 10742 WELLINGTON
Change To Conditions Date:	20 January 2000 [Granted: 25 May 1994]

Conditions of Consent

Consent Granted:	To erect, place, use and maintain an intake structure in and on the bed of the Patea River at or about GR: Q20:319-049
Expiry Date:	1 June 2028
Review Date(s):	June 1998, June 2004, June 2010, June 2016, June 2022
Site Location:	Patea River, approximately 1 km downstream from the Toko Stream confluence, Toko Road, Toko, Stratford
Legal Description:	Pt Sec 2 DP 1041 Blk IV Ngaere SD
Catchment:	Patea

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

General conditions

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

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

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

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

Special conditions

1. That the consent holder shall notify the Taranaki Regional Council, at least 48 hours prior to the commencement and upon completion of the initial construction and again prior to and upon completion of any subsequent maintenance works which would involve disturbance of or deposition to the riverbed or discharges to water.

2. That the structure[s] authorised by this consent shall be constructed generally in accordance with the documentation submitted in support of the application and shall be maintained to ensure the conditions of this consent are met.

3. That the consent holder shall adopt the best practicable option to avoid or minimise the discharge of silt or other contaminants into water or onto the riverbed and to avoid or minimise the disturbance of the riverbed and any adverse effects on water quality.

4. That the consent holder shall ensure that the area and volume of riverbed disturbance shall, so far as is practicable, be minimised and any areas which are disturbed shall, so far as is practicable, be reinstated.

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

6. That any disturbance of parts of the riverbed covered by water and/or any works which may result in downstream discolouration of water shall be undertaken only between 1 November and 30 April, except where this requirement is waived in writing by the Chief Executive, Taranaki Regional Council.

7. That the Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during the month of June 2004 and/or June 2010 and/or June 2016 and/or June 2022, for the purpose of ensuring that the conditions adequately deal with the environmental effects arising from the exercise of this 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 4 July 2005

For and on behalf of
Taranaki Regional Council

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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:	Contact Energy Limited (WELLINGTON) P O Box 10742 WELLINGTON
Change To Conditions Date:	28 November 2001 [Granted: 25 May 1994]

Conditions of Consent

Consent Granted:	To erect, place, use and maintain a diffuser structure in and above the bed of the Patea River for the purpose of discharging used water from combined cycle power stations at or about GR: Q20:246-067
Expiry Date:	1 June 2028
Review Date(s):	June 1998, June 2004, June 2010, June 2016, June 2022
Site Location:	Patea River, Approximately 1 km east of the site above the confluence with the Kahouri Stream, East Road, Stratford
Legal Description:	Pt Sec 121 Blk II Ngaere SD
Catchment:	Patea

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

General conditions

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

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

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

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

Special conditions

1. Prior to commencing construction the consent holder shall provide plans and details of any modifications to the diffuser structure, to the reasonable satisfaction of the Chief Executive, Taranaki Regional Council. These plans and details shall be in accordance with 'option C', as outlined in the report 'Comments on Diffuser Design' [J C Rutherford, NIWA Ecosystems] provided with the application for this consent. Any modifications to the diffuser structure shall be in accordance with Section 3 of the report 'Stratford Power Station Expansion Project: Water Resources Engineering Summary Report [G Boyd, Meritec Limited, June 2001].

2. The diffuser structure shall be constructed and maintained in accordance with the plans and details provided under condition 1, to the reasonable satisfaction of the Chief Executive, Taranaki Regional Council.

3. The structure[s] that are the subject of this consent shall not result in the obstruction of fish passage.

4. The consent holder shall notify the Taranaki Regional Council prior to the commencement and upon completion of any subsequent maintenance works that would involve disturbance of or deposition to the riverbed or discharges to water.

5. Modification and any instream maintenance works [that would involve disturbance of or deposition to the riverbed or discharges to water] shall only take place between 1 November and 30 April inclusive, except where this requirement is waived in writing by the Chief Executive, Taranaki Regional Council.

6. The consent holder shall adopt the best practicable option to avoid or minimise the discharge of silt or other contaminants into water or onto the riverbed and to avoid or minimise the disturbance of the riverbed and any adverse effects on water quality.

7. The consent holder shall ensure that the area and volume of riverbed disturbance shall, so far as is practicable, be minimised and any areas which are disturbed shall, so far as is practicable, be reinstated.

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

9. The Taranaki Regional Council may review any or all of the conditions of this consent, by giving notice of review during the month of June 2004 and/or June 2010 and/or June 2016 and/or June 2022, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this consent which were not foreseen at the time the application was considered and which it is appropriate to deal with at the time of the review.

Transferred at Stratford on 4 July 2005

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Discharge Permit

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

Name of Consent Holder:	Contact Energy Limited PO Box 10742 Wellington 6143
Decision Date (Change):	8 July 2016
Commencement Date (Change):	8 July 2016 (Granted Date: 25 May 1994)

Conditions of Consent

Consent Granted:	To discharge stormwater from the operation of a power station site into the Kahouri Stream
Expiry Date:	1 June 2028
Review Date(s):	June 2022 and in accordance with special condition 10
Site Location:	Stratford Power Station, 167 East Road, Stratford
Grid Reference (NZTM)	1713640E-5645680N & 1713757E-5645561N
Catchment:	Patea
Tributary:	Kahouri Piakau

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 an area not exceeding 7.5 ha outlined in Appendix 1 (attached).

3. All stormwater shall be directed for treatment through the stormwater treatment system for discharge in accordance with the special conditions of this permit.

4. Constituents of the discharge shall meet the standards shown in the following table.

Constituent	Standard
pH	Within the range 6.0 to 9.0
suspended solids	Concentration not greater than 100 gm^{-3}
oil and grease	Concentration not greater than 15 gm^{-3}

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

5. The consent holder will notify the Taranaki Regional Council as soon as practicable if a direct discharge of stormwater from the SP1 pond to the Kahouri Stream is required or has been undertaken. The volume and duration of the discharge will be recorded and this information made available to the Council upon request.

6. After allowing for reasonable mixing, within a mixing zone extending 5 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.

7. The consent holder shall maintain and regularly update a 'Contingency Plan' that details measures and procedures that will be undertaken to prevent, and to avoid environmental effects from, a spillage or any discharge of contaminants not authorised by this consent. The plan shall be approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity.

8. The site shall be operated in accordance with a 'Management Plan' prepared by the consent holder and approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity. The plan shall detail how the site is to be managed to minimise the contaminants that become entrained in the stormwater and shall include as minimum:

   a) the loading and unloading of materials;
   b) maintenance of conveyance systems;
   c) general housekeeping; and
   d) management of the treatment system.

   Note: A Stormwater Management Plan template is available in the Environment section of the Taranaki Regional Council's web site www.trc.govt.nz.

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 1991. 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.

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

    a) during the month of June 2022 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.

Signed at Stratford on 8 July 2016

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Appendix 1

Stormwater catchment

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:	Contact Energy Limited (WELLINGTON) P O Box 10742 WELLINGTON
Change To Conditions Date:	30 October 2001 [Granted: 25 May 1994]

Conditions of Consent

Consent Granted:	To erect, place, use and maintain, in and above the beds of an unnamed tributary of the Piakau Stream and of the Kahouri Stream, both tributaries of the Patea River, structures for the purpose of discharging stormwater from the site of combined cycle power stations at or about GR: Q20:238-075
Expiry Date:	1 June 2028
Review Date(s):	June 1998, June 2004, June 2010, June 2016, June 2022
Site Location:	Stratford Combined Cycle Power Station Site, East Road, Stratford
Legal Description:	Lot 2 DP 19365
Catchment:	Patea
Tributary:	Kahouri

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

General conditions

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

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

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

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

Special conditions

1. Prior to commencing construction the consent holder shall provide plans and details of the stormwater discharge structure[s], to the reasonable satisfaction of the Chief Executive, Taranaki Regional Council.

2. The stormwater discharge structure[s] shall be constructed and maintained in accordance with the plans and details provided under condition 1, to the reasonable satisfaction of the Chief Executive, Taranaki Regional Council.

3. The structure[s] that are the subject of this consent shall not result in the obstruction of fish passage.

4. The consent holder shall notify the Taranaki Regional Council prior to the commencement and upon completion of any subsequent maintenance works that would involve disturbance of or deposition to the riverbed or discharges to water.

5. Any instream maintenance works [that would involve disturbance of or deposition to the riverbed or discharges to water] shall only take place between 1 November and 30 April inclusive, except where this requirement is waived in writing by the Chief Executive, Taranaki Regional Council.

6. The consent holder shall adopt the best practicable option to avoid or minimise the discharge of silt or other contaminants into water or onto the riverbed and to avoid or minimise the disturbance of the riverbed and any adverse effects on water quality.

7. The consent holder shall ensure that the area and volume of riverbed disturbance shall, so far as is practicable, be minimised and any areas which are disturbed shall, so far as is practicable, be reinstated.

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

9. The Taranaki Regional Council may review any or all of the conditions of this consent, by giving notice of review during the month of June 2004 and/or June 2010 and/or June 2016 and/or June 2022, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this consent which were not foreseen at the time the application was considered and which it is appropriate to deal with at the time of the review.

Transferred at Stratford on 4 July 2005

For and on behalf of
Taranaki Regional Council

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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:	Contact Energy Limited P O Box 10742 WELLINGTON 6143
Decision Date [change]:	23 March 2012
Commencement Date [change]:	23 March 2012 [Granted: 25 May 1994]

Conditions of Consent

Consent Granted:	To erect, place, use and maintain in, over and under the bed of the Kahouri Stream a tributary of the Patea River, within the site and adjacent land immediately to the southeast a bridge at or about (NZTM) 1713932E-5645443N, pipelines, cables and associated utilities for a power station site at or about (NZTM) 1713810E-5645800N
Expiry Date:	1 June 2028
Review Date(s):	June 2016, June 2022
Site Location:	Stratford Power Station Site, State Highway 43 [East Road], Stratford
Legal Description:	[Part of Stratford Power Station Site – TCC, TCC2/SP2] Lot 2 DP 19365, Lot 3 DP 19365 and Sec 134 Blk II Ngaere SD, [Bridge structure] Pt Sec 108 Blk II Ngaere SD
Catchment:	Patea
Tributary:	Kahouri

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

General condition

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

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

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

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

Special conditions

1. Prior to commencing construction the consent holder shall provide plans and details of the structure, to the reasonable satisfaction of the Chief Executive, Taranaki Regional Council.

2. The structure shall be constructed and maintained in accordance with the plans and details provided under condition 1, to the reasonable satisfaction of the Chief Executive, Taranaki Regional Council.

3. The structure that is the subject of this consent shall not result in the obstruction of fish passage.

4. The consent holder shall notify the Taranaki Regional Council prior to the commencement and upon completion of any subsequent maintenance works that would involve disturbance of or deposition to the riverbed or discharges to water.

5. Any instream maintenance works [that would involve disturbance of or deposition to the riverbed or discharges to water] shall only take place between 1 November and 30 April inclusive, except where this requirement is waived in writing by the Chief Executive, Taranaki Regional Council.

6. The consent holder shall adopt the best practicable option to avoid or minimise the discharge of silt or other contaminants into water or onto the riverbed and to avoid or minimise the disturbance of the riverbed and any adverse effects on water quality.

7. The consent holder shall ensure that the area and volume of riverbed disturbance shall, so far as is practicable, be minimised and any areas which are disturbed shall, so far as is practicable, be reinstated.

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

9. The Taranaki Regional Council may review any or all of the conditions of this consent, by giving notice of review during the month of June 2004 and/or June 2010 and/or June 2016 and/or June 2022, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this consent which were not foreseen at the time the application was considered and which it is appropriate to deal with at the time of the review.

Signed at Stratford on 23 March 2012

For and on behalf of
Taranaki Regional Council

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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:	Contact Energy Limited P O Box 10742 WELLINGTON
Change To Conditions Date:	6 March 2008 [Granted: 25 May 1994]

Conditions of Consent

Consent Granted:	To erect, place, use and maintain water pipelines and associated control cables above, through or below the beds of the Toko Stream and various small unnamed streams, for the purpose of water transmission from the Patea River to Power Stations at East Road, Stratford at or about 2631900E-6204900N
Expiry Date:	1 June 2028
Review Date(s):	June 2010, June 2016, June 2022
Site Location:	State Highway 43 [East Road], Stratford
Legal Description:	Pt Secs 134 & 132, Secs 110, 111 & 130 Blk II Ngaere SD, Subdivision 2 of Sec 112 Ngaere SD, Lots 1 & 2 DP 363968, Lot 1 DP 16285, Lot 1 DP 141, Lot 1 DP 17136, Pt Lots 8 to 13 DP 141, Pt Secs 39 & 40 Blk III Ngaere SD, Lot 2 DP 1115, Pt Lots 1 & 2 DP 739, Lot 1 DP 20723
Catchment:	Patea
Tributary:	Toko

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

General conditions

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

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

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

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

Special conditions

1. Prior to commencing construction the consent holder shall provide plans and details of the pipeline and associated structure[s], to the reasonable satisfaction of the Chief Executive, Taranaki Regional Council.

2. The pipelines and associated structure[s] shall be constructed and maintained in accordance with the plans and details provided under condition 1, to the reasonable satisfaction of the Chief Executive, Taranaki Regional Council.

3. The exercise of this consent shall not restrict the passage of fish.

4. The consent holder shall notify the Taranaki Regional Council prior to the commencement and upon completion of any subsequent maintenance works that would involve disturbance of or deposition to the riverbed or discharges to water.

5. Any instream maintenance works [that would involve disturbance of or deposition to the riverbed or discharges to water] shall only take place between 1 November and 30 April, except where this requirement is waived in writing by the Chief Executive, Taranaki Regional Council.

6. The consent holder shall adopt the best practicable option to avoid or minimise the discharge of silt or other contaminants into water or onto the riverbed and to avoid or minimise the disturbance of the riverbed and any adverse effects on water quality.

7. The consent holder shall ensure that the area and volume of riverbed disturbance shall, so far as is practicable, be minimised and any areas which are disturbed shall, so far as is practicable, be reinstated.

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

9. The Taranaki Regional Council may review any or all of the conditions of this consent, by giving notice of review during the month of June 2010 and/or June 2016 and/or June 2022, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this consent which were not foreseen at the time the application was considered and which it is appropriate to deal with at the time of the review.

Signed at Stratford on 6 March 2008

For and on behalf of
Taranaki Regional Council

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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:	Contact Energy Limited (WELLINGTON) P O Box 10742 WELLINGTON
Change To Conditions Date:	30 October 2001 [Granted: 24 July 1995]

Conditions of Consent

Consent Granted:	To erect, place, use and maintain over the bed of an unnamed tributary of the Kahouri Stream in the Patea catchment a bridge structure to convey high voltage electricity cables and associated communication cables for combined cycle power stations at or about GR: Q20:238-071
Expiry Date:	1 June 2028
Review Date(s):	June 1998, June 2004, June 2010, June 2016, June 2022
Site Location:	Stratford Combined Cycle Power Station Site, East Road, Stratford
Legal Description:	Lot 1 DP 19365
Catchment:	Patea
Tributary:	Kahouri

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

General conditions

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

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

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

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

Special conditions

1. Prior to commencing construction the consent holder shall provide plans and details of the structure, to the reasonable satisfaction of the Chief Executive, Taranaki Regional Council.

2. The structure shall be constructed and maintained in accordance with the plans and details provided under condition 1, to the reasonable satisfaction of the Chief Executive, Taranaki Regional Council.

3. The consent holder shall notify the Taranaki Regional Council prior to the commencement and upon completion of any subsequent maintenance works that would involve disturbance of or deposition to the riverbed or discharges to water.

4. Any instream maintenance works [that would involve disturbance of or deposition to the riverbed or discharges to water] shall only take place between 1 November and 30 April inclusive, except where this requirement is waived in writing by the Chief Executive, Taranaki Regional Council.

5. The consent holder shall adopt the best practicable option to avoid or minimise the discharge of silt or other contaminants into water or onto the riverbed and to avoid or minimise the disturbance of the riverbed and any adverse effects on water quality.

6. The consent holder shall ensure that the area and volume of riverbed disturbance shall, so far as is practicable, be minimised and any areas which are disturbed shall, so far as is practicable, be reinstated.

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

8. The Taranaki Regional Council may review any or all of the conditions of this consent, by giving notice of review during the month of June 2004 and/or June 2010 and/or June 2016 and/or June 2022, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this consent which were not foreseen at the time the application was considered and which it is appropriate to deal with at the time of the review.

Transferred at Stratford on 4 July 2005

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Discharge Permit

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

Name of Consent Holder:	Contact Energy Limited (WELLINGTON) P O Box 10742 WELLINGTON
Consent Granted Date:	24 May 2000

Conditions of Consent

Consent Granted:	To discharge fine sediment and organic matter from water intake structure tee screens to the Patea River at or about GR: Q20:319-049
Expiry Date:	1 June 2028
Review Date(s):	June 2004, June 2010, June 2016, June 2022
Site Location:	Patea River, approximately 500 m downstream from the Toko Stream confluence, Toko Road, Toko, Stratford
Legal Description:	Pt Sec 2 DP 1041 Blk IV Ngaere SD
Catchment:	Patea

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

General conditions

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

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

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

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

Special conditions

1. The discharge licensed by this consent shall be undertaken in accordance with the documentation submitted in support of the application to ensure the conditions of this consent are met.

2. After allowing for mixing within a mixing zone extending 25 metres downstream of the intake structure, the discharge shall not give rise to any of the following effects in the receiving waters of the Patea River:

   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.

3. The Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during the month of June 2004 and/or June 2010 and/or June 2016 and/or June 2022, for the purpose of ensuring that the conditions are adequate to deal with any significant adverse effects of the discharge on the environment arising from the exercise of this 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 4 July 2005

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Discharge Permit

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

Name of Consent Holder:	Contact Energy Limited (WELLINGTON) P O Box 10742 WELLINGTON
Consent Granted Date:	27 November 2001

Conditions of Consent

Consent Granted:	To discharge up to 6,740 cubic metres/day [78 litres/second averaged over 15 minutes] of used water mainly blowdown water from the cooling system from combined cycle power stations into the Patea River at or about GR: Q20:246-068
Expiry Date:	1 June 2034
Review Date(s):	June 2004, June 2010, June 2016, June 2022, June 2028
Site Location:	Combined Cycle Power Station, State Highway 43 [East Road], Stratford
Legal Description:	Pt Sec 121 Blk II Ngaere SD
Catchment:	Patea

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

General conditions

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

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

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

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

Special conditions

1. The consent shall be exercised in accordance with the procedures set out in an effluent disposal management plan [`the effluent disposal management plan'], which shall demonstrate ability to comply with consent conditions and shall address the following matters:

i) monitoring of discharge effluent;
ii) chemical, physicochemical, ecological and biological [including trout] monitoring of the Patea River;
iii) minimisation of ammonia and dissolved reactive phosphorus in the discharge effluent;
iv) mitigation of the effects of the discharge [including but not limited to, the options of riparian planting and other off-site mitigation measures]; and
v) reporting on the exercise of consent.

2. The effluent disposal management plan shall be submitted to the Chief Executive, Taranaki Regional Council, for approval not later than three months prior to the exercise of the consent, and such approval shall not be unreasonably withheld if the effluent disposal management plan demonstrates ability to comply with the conditions of this consent and addresses the matters set out in special condition 1 above. Thereafter the effluent disposal management plan shall be subject to revision upon three months' notice by either the consent holder or the Taranaki Regional Council.

3. No later than three months prior to exercise of the consent, the consent holder shall provide to the Chief Executive, Taranaki Regional Council, details of water treatment chemicals for use at the Stratford Combined Cycle Power Station, including raw water, boiler water and cooling water. Further, the consent holder shall provide to the Chief Executive, Taranaki Regional Council, details of any change in water treatment chemical, or increase in maximum concentration of any water treatment chemical used, no later than one month prior to the change.

4. No later than three months prior to exercise of the consent, the consent holder shall provide to the Chief Executive, Taranaki Regional Council, details of cleaning chemicals for use at the Stratford Combined Cycle Power Station. Further, the consent holder shall provide to the Chief Executive, Taranaki Regional Council, details of any change in cleaning chemical, or increase in maximum concentration of any cleaning chemical used, no later than one month prior to the change.

5. Pursuant to section 128(1)(a) of the Resource Management Act 1991, the Taranaki Regional Council may review special condition 12 of this consent, by giving notice of review within three months of the provision of information under special condition 3 or 4 involving the use of treatment or cleaning chemicals not already advised to the Council or at concentrations not already advised to the Council, for the purpose of including standards addressing water treatment chemicals, cleaning chemicals and their products.

6. The consent holder shall prepare and maintain a contingency plan, to the satisfaction of the Chief Executive, Taranaki Regional Council, for action to be taken in the event of accidental spillage or discharge of contaminants, the initial plan to be provided no later than three months prior to exercise of this consent.

7. That after allowing for reasonable mixing in a zone of 75 metres extending downstream of the discharge point [`the mixing zone'], the discharge shall not give rise to all or any of the following effects in the receiving water:

   i) the production of any conspicuous oil or grease films, scums or foams or floatable or suspended materials;
   ii) any conspicuous change in the colour or visual clarity;
   iii) any emission of an objectionable odour;
   iv) the rendering of freshwater unsuitable for consumption by farm animals;
   v) any significant adverse effects on aquatic life, habitats, or ecology;
   vi) any undesirable biological growths.

8. Within the mixing zone the discharge shall not give rise to a barrier preventing the movement of fish species.

9. The discharge shall not :

   (i) alter the ambient temperature of the receiving waters of the Patea River by more than 1.5 degrees Celsius for 95% of the time that the discharge is occurring on an annual basis; and
   (ii) alter the ambient temperature of the receiving waters of the Patea River by more than 2.0 degrees Celsius at any time

   when measured simultaneously immediately upstream and 75 metres downstream of the discharge site.

10. The discharge shall not raise the temperature of the receiving water above 25 degrees Celsius when measured 75 metres downstream of the discharge site.

11. The consent holder shall continuously monitor the temperature of the receiving waters so as to assess compliance with special conditions 9 and 10, and forward the results of this monitoring to the Chief Executive, Taranaki Regional Council, at monthly intervals.

12. The following concentrations shall not be exceeded in the discharge effluent:

Component	**Concentration**
pH [range]	6.0 – 9.0
Total Residual Chlorine	0.05 gm^{-3}

This condition shall apply immediately prior to the entry of the effluent into the receiving water.

13. The discharge shall not cause the concentration of un-ionised ammonia in the Patea River to exceed 0.025 grams per cubic metre when measured at a point 75 metres downstream of the discharge.

14. This consent shall lapse on the expiry of six years after the date of commencement of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(b) of the Resource Management Act 1991.

15. The Taranaki Regional Council may review any or all of the conditions of this consent, by giving notice of review during June 2004, and/or June 2010, and/or June 2016 and/or June 2022 and/or June 2028 for the purpose of ensuring that the conditions are adequate to deal with any significant adverse effects on the environment arising from the exercise of this consent which were not foreseen at the time the application was considered and which it is appropriate to deal with at the time of the review.

Transferred at Stratford on 4 July 2005

For and on behalf of
Taranaki Regional Council

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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:	Contact Energy Limited PO Box 10742 Wellington 6143	
Decision Date (Change):	19 January 2017	
Commencement Date (Change):	19 January 2017	(Granted Date: 27 November 2001)

Conditions of Consent

Consent Granted:	To erect, place, use and maintain at or about (NZTM) 1713596E-5645713N gas pipelines and associated utilities, under the bed, and including disturbance for installation by trenching of the bed, of the Kahouri Stream in the Patea catchment, for power station purposes
Expiry Date:	1 June 2034
Review Date(s):	June 2022, June 2028
Site Location:	Stratford Power Station Site, SH 43, East Road, Stratford
Grid Reference (NZTM)	1713596E-5645713N 1713810E-5645800N
Catchment:	Patea
Tributary	Kahouri

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

General conditions

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

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

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

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

Special conditions

1. Prior to commencing construction the consent holder shall provide plans and details of the structures, to the reasonable satisfaction of the Chief Executive, Taranaki Regional Council.

2. The structures shall be constructed and maintained in accordance with the plans and details provided under condition 1, to the reasonable satisfaction of the Chief Executive, Taranaki Regional Council.

3. During and subsequent to construction works the consent holder must observe every practicable measure to minimise the discharge or placement of silt and/or organics and/or debris into the watercourse, and to avoid or remedy erosion and scour attributable to the works.

4. The consent holder must notify the Taranaki Regional Council at least seven days before commencing construction.

5. Construction of the structures must be undertaken only between 1 November and 30 April inclusive. These dates may be altered only by the written approval of the Chief Executive, Taranaki Regional Council.

6. The exercise of this consent must not result in any barrier to the passage of fish species.

7. This consent shall lapse on 6 December 2024 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 (b) of the Resource Management Act 1991.

8. The Taranaki Regional Council may review any or all of the conditions of this consent, by giving notice of review during June 2004, and/or June 2010, and/or June 2016 and/or June 2022 and/or June 2028 for the purpose of ensuring that the conditions are adequate to deal with any significant adverse effects on the environment arising from the exercise of this consent which were not foreseen at the time the application was considered and which it is appropriate to deal with at the time of the review.

Signed at Stratford on 19 January 2017

For and on behalf of
Taranaki Regional Council

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Director - Resource Management

Discharge Permit

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

Name of Consent Holder:	Contact Energy Limited P O Box 10742 WELLINGTON
Consent Granted Date:	6 March 2008

Conditions of Consent

Consent Granted:	To discharge emissions into the air from the operation of the cooling tower associated with the Stratford Peaker Power Plant at or about 2623861E-6207168N
Expiry Date:	1 June 2034
Review Date(s):	June 2010, June 2016, June 2022, June 2028
Site Location:	State Highway 43 [East Road], Stratford
Legal Description:	Lot 1 DP 17776 & Lot 1 DP 19365 Blk II Ngaere SD

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

General conditions

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

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

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

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

Special conditions

1. 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. A hybrid dry/wet mechanical draft cooling tower, as described in section 3.3.4 of the assessment of environmental effects provided with the application, shall be installed.

3. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least seven days prior to the exercise of this consent. Notification shall include the consent number and a brief description of the activity consented and be emailed to worknotification@trc.govt.nz. Notification by fax or post is acceptable only if the consent holder does not have access to email.

4. The consent holder shall at all times operate, maintain, supervise, monitor and control all processes so that emissions authorised by this consent are maintained at the minimum practicable level.

5. The evaporative cooling system to be used shall not produce a visible plume at any ambient condition further from saturation than 6° Celsius and 85% relative humidity.

6. That the evaporative cooling system shall be operated in order that the loss of cooling water as droplet drift to atmosphere does not exceed in aggregate 0.02% of the cooling water circulation rate at the time.

7. Prior to undertaking any alterations to the plant, processes or operations which may significantly change the nature or quantity of contaminants emitted from the site and authorised by this consent, the consent holder shall consult with the Chief Executive, Taranaki Regional Council, and shall obtain any necessary approvals under the Resource Management Act.

8. The consent holder shall provide the Chief Executive, Taranaki Regional Council a description of the water treatment regime to be used in the cooling tower systems no later than 7 days prior to the first exercise of this consent. The consent holder shall thereafter advise the Chief Executive of the current water treatment regime.

9. The discharges authorised by this consent shall not give rise to an odour at or beyond the boundary of the site that is offensive or objectionable.

10. The discharges authorised by this consent shall not give rise to any significant adverse ecological effect on any ecosystems, including but not limited to habitats, plants, animals, microflora and microfauna.

11. This consent shall lapse on the expiry of five years after the date of issue of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

12. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2010 and/or June 2016 and/or June 2022 and/or June 2028, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 6 March 2008

For and on behalf of
Taranaki Regional Council

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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:	Contact Energy Limited P O Box 10742 WELLINGTON
Consent Granted Date:	6 March 2008

Conditions of Consent

Consent Granted:	To erect, place, use and maintain a bridge over an unnamed tributary of the Kahouri Stream for pedestrian access and carriage of water pipes, high voltage cables, control cables and associated utilities at or about 2623738E-6207157N
Expiry Date:	1 June 2034
Review Date(s):	June 2010, June 2016, June 2022, June 2028
Site Location:	State Highway 43 [East Road], Stratford
Legal Description:	Lot 1 DP 19365 & Lot 1 DP 18343 Blk II Ngaere SD
Catchment:	Patea
Tributary:	Kahouri

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

General conditions

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

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

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

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

Special conditions

1. The exercise of this consent shall be undertaken substantially in accordance with the documentation submitted in support of application 4907. In the case of any contradiction between the documentation submitted in support of application 4907 and the conditions of this consent, the conditions of this consent shall prevail.

2. Before beginning construction of the bridge the consent holder shall provide plans of the bridge to the Chief Executive, Taranaki Regional Council.

3. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least seven days prior to the exercise of this consent. Notification shall include the consent number and a brief description of the activity consented and be emailed to worknotification@trc.govt.nz. Notification by fax or post is acceptable only if the consent holder does not have access to email.

4. The consent holder shall take all reasonable steps to:

a) minimise the amount of sediment discharged to the stream;
b) minimise the amount of sediment that becomes suspended in the stream; and
c) mitigate the effects of any sediment in the stream.

Undertaking work in accordance with *Guidelines for Earthworks in the Taranaki region,* by the Taranaki Regional Council, will achieve compliance with this condition.

5. The consent holder shall ensure that the area and volume of riverbed disturbance shall, so far as is practicable, be minimised and any areas which are disturbed shall, so far as is practicable, be reinstated.

6. 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[s] are no longer required. The consent holder shall notify the Taranaki Regional Council at least 48 hours prior to structure[s] removal and reinstatement.

7. This consent shall lapse on the expiry of five years after the date of issue of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

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 2010 and/or June 2016 and/or June 2022 and/or June 2028, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 6 March 2008

For and on behalf of
Taranaki Regional Council

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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:	Contact Energy Limited P O Box 10742 WELLINGTON
Consent Granted Date:	6 March 2008

Conditions of Consent

Consent Granted:	To erect, place, use and maintain a bridge over the Kahouri Stream for pedestrian access and carriage of water pipes, high voltage cables, control cables and associated utilities at or about 2623777E-6207372N
Expiry Date:	1 June 2034
Review Date(s):	June 2010, June 2016, June 2022, June 2028
Site Location:	State Highway 43 [East Road], Stratford
Legal Description:	Lot 1 DP 17776 & Lots 1 & 2 DP 19365 Blk II Ngaere SD
Catchment:	Patea
Tributary:	Kahouri

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

General conditions

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

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

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

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

Special conditions

1. The exercise of this consent shall be undertaken substantially in accordance with the documentation submitted in support of application 4909. In the case of any contradiction between the documentation submitted in support of application 4909 and the conditions of this consent, the conditions of this consent shall prevail.

2. Before beginning construction of the bridge the consent holder shall provide plans of the bridge to the Chief Executive, Taranaki Regional Council.

3. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least seven days prior to the exercise of this consent. Notification shall include the consent number and a brief description of the activity consented and be emailed to worknotification@trc.govt.nz. Notification by fax or post is acceptable only if the consent holder does not have access to email.

4. The consent holder shall take all reasonable steps to:

a) minimise the amount of sediment discharged to the stream;
b) minimise the amount of sediment that becomes suspended in the stream; and
c) mitigate the effects of any sediment in the stream.

Undertaking work in accordance with *Guidelines for Earthworks in the Taranaki region,* by the Taranaki Regional Council, will achieve compliance with this condition.

5. The consent holder shall ensure that the area and volume of riverbed disturbance shall, so far as is practicable, be minimised and any areas which are disturbed shall, so far as is practicable, be reinstated.

6. 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[s] are no longer required. The consent holder shall notify the Taranaki Regional Council at least 48 hours prior to structure[s] removal and reinstatement.

7. This consent shall lapse on the expiry of five years after the date of issue of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

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 2010 and/or June 2016 and/or June 2022 and/or June 2028, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 6 March 2008

For and on behalf of
Taranaki Regional Council

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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:	Contact Energy Limited P O Box 10742 WELLINGTON 6143
Change To Conditions Date:	15 June 2010 [Granted: 23 February 2010]

Conditions of Consent

Consent Granted:	To construct, place and maintain a stormwater outlet structure in the Kahouri Stream at or about (NZTM) 1713704E-5645626N
Expiry Date:	1 June 2028
Review Date(s):	June 2016, June 2022
Site Location:	189 East Road, Stratford
Legal Description:	Lot 1 DP 19365
Catchment:	Patea
Tributary:	Kahouri

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 [Council] all the administration, monitoring and supervision costs of this consent, fixed in accordance to section 36 of the Resource Management Act.

Special conditions

1. The exercise of this consent shall be undertaken in accordance with the documentation submitted in support of application 6435, in particular, UGL drawing number 3200-0030-S-3609. In the event of a conflict between that material and this consent; the conditions of this consent shall take precedence.

2. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 48 hours prior to the commencement and upon completion of the initial installation and again at least 48 hours prior to and upon completion of any subsequent maintenance works which would involve disturbance of or deposition to the riverbed or 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. Notification by fax or post is acceptable only if the consent holder does not have access to email.

3. The consent holder shall ensure that the area and volume of streambed disturbance is, as far as practicable, minimised and any areas that are disturbed are, as far as practicable, reinstated.

4. The consent holder shall take all reasonable steps to:

   a. minimise the amount of sediment discharged to the stream;
   b. minimise the amount of sediment that becomes suspended in the stream; and
   c. mitigate the effects of any sediment in the stream.

   Undertaking work in accordance with *Guidelines for Earthworks in the Taranaki region,* by the Taranaki Regional Council, will achieve compliance with this condition.

5. 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 Council on this matter.

6. This consent shall lapse on 31 March 2015, 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.

7. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2016 and/or June 2022, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 15 June 2010

For and on behalf of
Taranaki Regional Council

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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:	Contact Energy Limited P O Box 10742 WELLINGTON 6143
Consent Granted Date:	21 June 2010

Conditions of Consent

Consent Granted:	To construct, place and maintain a stormwater outlet structure in the Kahouri Stream at or about (NZTM) 1713740E-5645575N
Expiry Date:	1 June 2028
Review Date(s):	June 2016, June 2022
Site Location:	189 East Road, Stratford
Legal Description:	Lot 1 DP 19365
Catchment:	Patea
Tributary:	Kahouri

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 [the Council] all the administration, monitoring and supervision costs of this consent, fixed in accordance to section 36 of the Resource Management Act.

Special conditions

1. The exercise of this consent shall be undertaken in accordance with the documentation submitted in support of application 6498. Specifically this includes United Group Infrastructure Plan 3200-0030-S-3608. If there is any conflict between the documentation submitted in support of application 6498 and the conditions of this consent, the conditions of this consent shall prevail.

2. Any disturbance of parts of the riverbed covered by water and/or any works which may result in downstream discolouration of water shall be undertaken only between 1 November and 30 April, except where this requirement is waived in writing by the Chief Executive, Taranaki Regional Council.

3. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 48 hours prior to the commencement and upon completion of the initial installation and again at least 48 hours prior to and upon completion of any subsequent maintenance works which would involve disturbance of or deposition to the riverbed or 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.

4. The consent holder shall ensure that the area and volume of streambed disturbance is, as far as practicable, minimised and any areas that are disturbed are, as far as practicable, reinstated.

5. The consent holder shall take all reasonable steps to:

   a. minimise the amount of sediment discharged to the stream;
   b. minimise the amount of sediment that becomes suspended in the stream; and
   c. mitigate the effects of any sediment in the stream.

   Undertaking work in accordance with *Guidelines for Earthworks in the Taranaki region,* by the Taranaki Regional Council, will achieve compliance with this condition.

6. 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 Council on this matter.

7. This consent shall lapse on 30 June 2015, 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 2016 and/or June 2022, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 21 June 2010

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Appendix II

–Company supplied annual report

Taranaki Regional Council
Private Bag 713
Stratford

Attn: Nathan Crook

5th September 2019

Dear Nathan

Subject: Stratford Power Station Annual Report for the period 1 July 2018 to 30 June 2019

This summary relates to compliance with Resource Consents held for the operation of Stratford Power Station and the Resource Management (Measurement and Reporting of Water Takes) Regulations for the period 1 July 2018 to 30 June 2019.

Please find included an overview of plant operation with regard to consent monitoring and relevant operational changes for the year in review. Summary reports reflecting the last year are included for wastewater discharge, raw water abstraction and stack emissions.

Yours faithfully

Mark Evans
Operations Supervisor - Taranaki

Contact Energy Limited. 191 East Road, Stratford. PO Box 78, Stratford 4352.
P: +64 6 765 8246 contactenergy.co.nz

Consent Monitoring Highlights for the period 1 July 2018 – 30 June 2019

Consent 4455-1 Water Take from the Patea River:

Abstraction from the Patea River was within the consent requirements throughout the year with the river flow results being supplied by TRC.

The total volume of water taken from the Patea River during the year was 1165436 m^3 with an average abstraction rate of 37 l/s. The maximum abstraction rate for the year was 163 l/s on 9th July 2018.

Consent 5848-1 Waste Water Discharge into the Patea River:

River Temperature:

- During the year the river temperature remained below 25°C allowing for continuous site discharge.
- Temperature differentials remained within the consent limit of 1.5°C for the entire year.
- River temperature probes were calibrated periodically during the year in accordance with the maintenance plan.

The maximum River water temperature and difference between upstream and downstream temperatures occurred in January with a river water temperature of 24.35°C and differential of 0.66°C.

Discharge Flow:

The maximum recorded combined discharge flow for the year was 51.2 l/s, this being within the discharge consent limit of 78 l/s.

The average combined discharge flow from the site was 14.05 l/s for the year.

The total volume of wastewater discharged for the year from site was 418538m3. This equates to approximately 35.91% of the water abstracted for plant use during the year.

Monitoring of both the TCC and SPP waste water discharges is by online analysers. Routine inter-comparison sampling is also performed to verify accuracy of testing in the laboratory. Calibration and servicing of the wastewater pH meters and chlorine meters was carried out as required throughout the year.

High chlorine values were recorded on several occasions while the waste water discharge valves were closing. These high values often occur due to low sample volume when the circulation pump has been stopped as a result of a low water level in the waste water pit. When the high chlorine values are recorded, the control system is in the process of closing the outlet valve to prohibit discharge, thus keeping outflows within consent limits.

Consent 4459-1 Discharge storm water to Piakau and Kahouri Streams: Stratford Power Station:

Storm water discharge remained within consent conditions for the entire year.

The TCC storm water pond overflowed into the neighbouring river on a number of occasions during the year due to high rainfall occurrences. These are included in monthly reporting statistics. The storm water recovery pump was replaced for maintenance reasons in August. During normal rainfall all storm water from both sites is collected and used within the process.

Consent 4454-1 Discharge to air (TCC):

The maximum hourly Nitrogen Oxides discharge rate from the plant for the reporting year was 98.5 kg/hr, which is below the consent limit of 430 kg/hr.

Under normal operation, the maximum concentration of Nitrogen Oxide emissions for the year was 27.36 ppm this is below the consent limit of 50 ppm.

Under start up and shut down operation, the plant is permitted to exceed the 50 ppm limit, the maximum emissions during these periods was 79.97 ppm.

Total Carbon Dioxide stack emissions were calculated to be 425335 tonnes for the year and the total Nitrogen Oxides emissions from the plant were recorded at 131 tonnes for the year.

The cooling tower plume was visible under low ambient conditions as allowed under consents.

Consent 4022-1 Discharge to air (SPP):

On 8th October 2018 Gas Turbine 21 exhaust emission testing and engine tuning was undertaken by General Electric. Results indicated the unit to be well within consented limits.

The cooling tower plume was visible under low ambient conditions as allowed under consents.

Ongoing issues regarding odour from the cooling tower have been addressed. Working with the suppliers, engineering and council representatives we are confident this issue has been resolved. Cooling water system corrosion is being monitored.

Inter Laboratory Comparisons and site inspections:

During the year, inter laboratory comparisons samples were taken on several occasions. Results reported between the site Laboratory, on line analysers and the TRC Laboratory were acceptable for all parameters being measured. Inter-comparison sampling occurred on 19th July 2018, 6th September 2018, 7th March 2019 and June 10th 2019.

Site Inspections Notices

Inspection Notice	Inspection Type	Date Issued	Consent	Comments
not generated	Ahuroa	2nd July 2018	R2/3681-2l	All Compliant
OBS-2018-49889	Stratford Compliance Monitoring	19th July 2018	All	All Compliant
OBS-2018-50963	Stratford Compliance Monitoring	6th September 2018	All	All Compliant
OBS-2018-53588	Stratford Compliance Monitoring	4th December 2018	All	All Compliant

In conjunction with inspection on the 19th July an on-site meeting was held with TRC representatives where the Contact Energy site organisational structure and responsibilities were overviewed.

Plant Improvements:
The installation and commissioning of the SPP water treatment plant performance improvement project has been undergoing initial proving runs. Key changes include on-line analysers and automation of the coagulant dosing to the Actiflo filtration units. Chemical requirements for this process are expected to be significantly reduced.

The Sites Sewer Upgrade works were successfully completed in September 2018 and a significant environmental risk of spill into the local stream (Kahouri) was removed by the decommissioning of the original waste water beds.

Plant Operation:

TCC Number of Operational Days July 2018 – June 2019											
July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May	June
31	29	30	24	0	0	0	7	0	13	31	30

GT21 Number of Operational Days July 2018 – June 2019											
July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May	June
18	25	15	17	13	24	26	27	11	0	0	0

GT22 Number of Operational Days July 2018 – June 2019											
July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May	June
0	0	0	7	8	13	17	9	25	14	3	21