

Stratford Power Station (TCC1 & SP1)  
Ahuroa Gas Storage  
Contact Energy Ltd  
Monitoring Programme  
Annual Report  
2015-2016

Technical Report 2016-115

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## Executive summary

Contact Energy operates the Stratford Power Station located on State Highway 43 near Stratford in the Patea catchment, and the associated underground Ahuroa Gas Storage facility located 7.5 km away in the Waitara catchment. The Contact Energy holds resource consents that provide for the power station, gas storage and connecting pipeline. The consents allow it to abstract water from the Patea River and Kahouri Stream, to discharge to the Patea River and the Kahouri and other streams, and onto and into land, to provide for several structures across streams, and to discharge emissions into the air.

This report describes the monitoring programme implemented by the Council to Contact Energy's environmental performance, and the results of the monitoring undertaken and assesses the environmental effects of Contact Energy's activities.

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

For the power station, the report covers the period July 2015-June 2016, the eighteenth year of its operation. For the gas storage and pipeline, this is the third monitoring report, covering the period July 2015 to June 2016.

In relation to Stratford Power Station, Contact Energy holds 27 resource consents, which include a total of 232 conditions setting out the requirements that the consent holder must satisfy. These consents provide for three gas-fired plants, including a combined-cycle plant, a smaller, open-cycle peaking plant, and a yet-to-be-built plant similar to either of the existing plants.

The Council's annual monitoring programme for the year under review included three site inspections, 12 water samples collected for physico-chemical analysis, and three bio-monitoring surveys of receiving waters. Water abstraction, wastewater discharge, and air emission monitoring results were provided by Contact Energy to the Council. There was ongoing consultation between the Council and Contact Energy staff.

The monitoring showed that the power station continued to be well managed and any environmental impacts were negligible.

During the year, Contact Energy demonstrated a high level of environmental performance and high level of administrative performance with the resource consents for the Stratford Power Station. The Company has achieved a high level of performance throughout the station's eighteen years of operation.

For Ahuroa Gas Storage, Contact Energy holds a total of 10 resource consents, which include a total of 135 conditions setting out the requirements that the Company must satisfy. For the pipeline, a total of 17 resource consents are held, with a total of 170 conditions.

The Council's annual monitoring programme included two inspections and two stormwater sample collected for physico-chemical analysis at the gas storage site. Data on gas injection and flaring volumes and an annual report were provided by Contact Energy to the Council.

During the year, Contact Energy demonstrated a high level of environmental performance and high level of administrative performance with the resource consents for the Ahuroa Gas Storage facility.

There was ongoing consultation between the Council and Contact Energy staff. For reference, in the 2015-2016 year, 71% of consent holders in Taranaki monitored through tailored compliance monitoring programmes achieved a high level of environmental performance and compliance with their consents, while another 24% demonstrated a good level of environmental performance and compliance with their consents.

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 2016-2017 year.

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# 1. Introduction

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

### 1.1.1 Introduction

This report is for the period July 2015 to June 2016 by the Taranaki Regional Council (the Council) on the monitoring programme associated with the resource consents held by Contact Energy Ltd (Contact Energy) to provide for two gas-fired power plants at Stratford Power Station, situated on East Road (State Highway 43) near Stratford, in the Patea catchment.

This report is also the annual report for July 2015 to June 2016 by the Council on the monitoring programme associated with resource consents held by Contact Energy to provide for an associated underground gas storage reservoir, situated on Barleymans Road at Ahuroa, in the Waitara catchment, and the pipeline that connects the storage and power station.

This report includes the results and findings of the monitoring programme implemented by the Council in respect of the consents held by Contact Energy that relate to abstractions and discharges of water within the Patea and Waitara catchments, and the air discharge permits held by Contact Energy to cover emissions to air from the power station and storage 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 Contact Energy's use of water, land, and air, and is the 18th annual report by the Council for the consent holder.

### 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, and the Council's approach to monitoring sites through annual programmes.

Section 2 covers the Stratford Power Station, while Section 3 covers Ahuroa Gas storage. Each section includes:

- the resource consents held by Contact Energy in the Patea and Waitara catchments;
- the nature of the monitoring programme in place for the period under review;
- a description of the activities and operations conducted at the two sites and in the Patea and Waitara catchments;
- the results of monitoring during the period under review, including scientific and technical data;

- a discussion of the results, their interpretations, and their significance for the environment; and
- recommendations to be implemented in the 2016-2017 monitoring year.

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

### 1.1.3 The Resource Management Act 1991 and monitoring

The *Resource Management Act 1991* (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 a discharger, and may include cultural and socio-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 (eg, 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 performance of resource users and consent holders. Compliance monitoring, including both activity and impact monitoring, enables the Council to continually re-evaluate its approach and that of consent holders to resource management and, ultimately, through the refinement of methods and considered responsible resource utilisation, to move closer to achieving sustainable development of the region's resources.

### 1.1.4 Evaluation of environmental performance

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

**Environmental performance** is concerned with actual or likely effects on the receiving environment from the activities during the monitoring year.

**Administrative performance** is concerned with the Contact Energy'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, the 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 significant 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 in response to unauthorised incident reports, 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 in response to unauthorised incident reports. 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 in response to unauthorised incident reports. 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 2015-2016 year, 71% of consent holders in Taranaki monitored through tailored compliance monitoring programmes achieved a high level of environmental performance and compliance with their consents, while another 24% demonstrated a good level of environmental performance and compliance with their consents.

## 2. Stratford Power Station

### 2.1 Process description

#### **Taranaki Combined Cycle Plant**

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 Gas Storage facility. The station uses approximately 1.4 million cubic metres of gas per day in generation at full production.

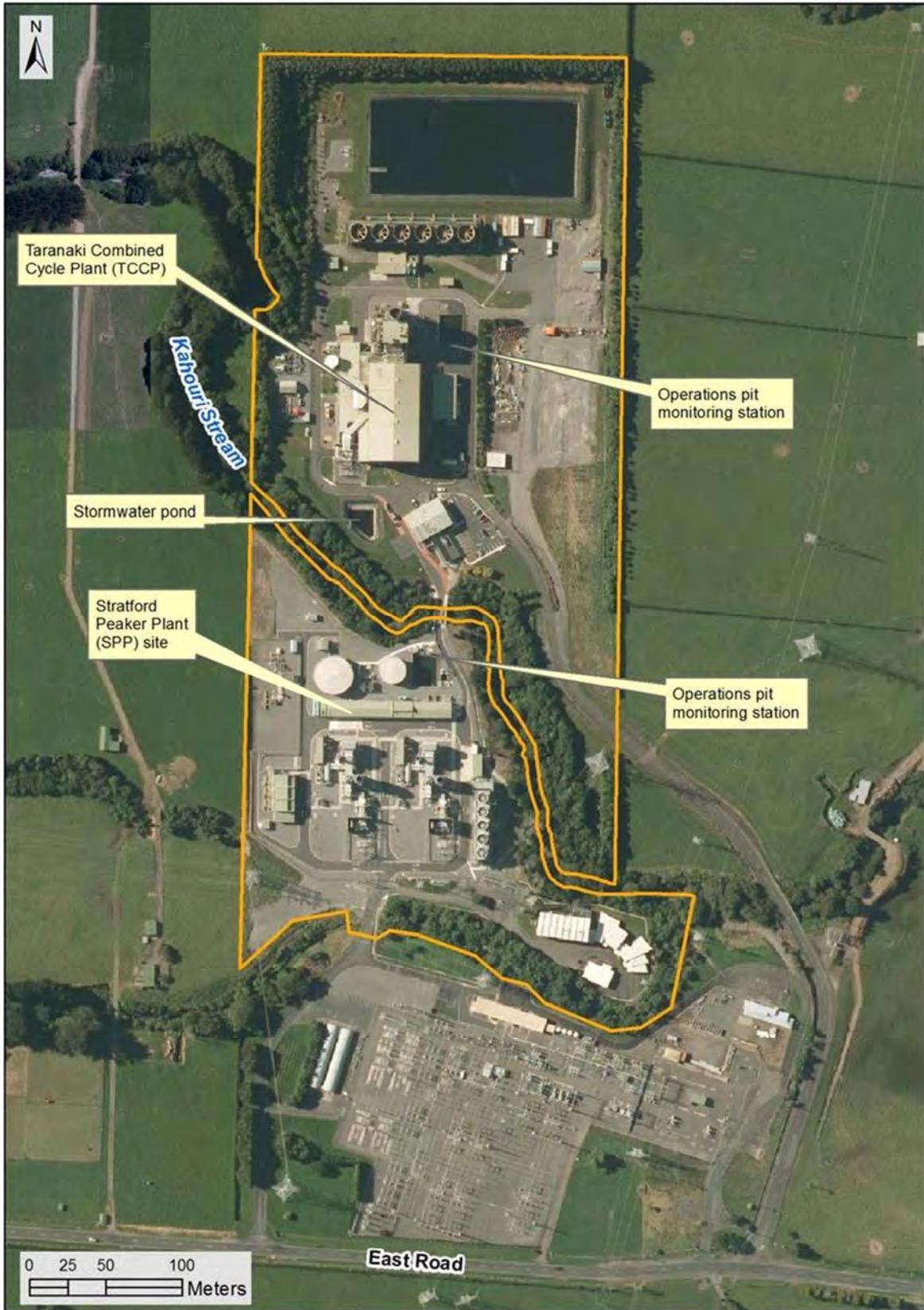
Water is abstracted from the Patea River to supply the cooling towers and for steam generation. The water discharges are from plant utilities and domestic effluent, boiler blowdown and site stormwater. Septic tank effluent is discharged to land.

#### **Stratford Peaker Plant**

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, and also to the Patea River after treatment on the adjacent switchyard site.



**Photo 1** Aerial view of Stratford Power Station, March 2012

## 2.2 Resource consents

A summary of the consents held by Contact Energy, formerly Stratford Power Ltd, in relation to activities at its Stratford Power Station site is given in Table 1 below. A copy of each of the consents can be found in Appendix I.

**Table 1** Summary of resource consents for Stratford Power Station

Consent number	Purpose	Volume	Next review date	Expiry date
3939-2	Discharge stormwater to Kahouri Stream/tributary	464 L/s	-	2016 <sup>^</sup>
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 <sup>3</sup> /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 <sup>3</sup> /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 <sup>3</sup> /day (225L/s)	2022	2034
5848-1	Discharge used water to Patea River	6,740 m <sup>3</sup> /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

\* Consents not yet exercised

<sup>^</sup> This consent expired on 1 June 2016 and will not be renewed. Changes to 4459 will be made to cover this activity.

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

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 that 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 6 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** and **4022** that 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 (SP2), 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.

### **2.2.1 Water abstraction permits**

Section 14 of the RMA stipulates that no person may take, use, dam or divert any water, unless the activity is expressly allowed for by a resource consent or a rule in a regional plan, or it falls within some particular categories set out in Section 14.

Contact Energy Ltd holds two consents for the abstraction and use of water in relation to SPS.

Water Permit **4455-1** allows the take and use of up to 19,440 cubic metres/day (225 L/s averaged over 15 minutes) of water on a continuous basis from the Patea River for use of power stations. This permit was originally issued by the Council on 25 May 1994 under Section 87(d) of the RMA, with change to consent conditions on 7 December 2001 and 6 March 2008. It is due to expire on 1 June 2028.

Condition 1 requires the consent holder to install and operate a recording device for water abstraction rates and to provide the records to the Council.

Conditions 2, 3 and 4 address abstraction during low flow conditions.

Condition 5 sets out review provisions.

Water permit **5847-1** allows Contact Energy to take and use up to 19,440 cubic m<sup>3</sup>/day (225 L/s averaged over 15 minutes) of water from a water intake structure in the Patea River for cooling and power station purposes. This permit was issued by the Council on 27 November 2001 as a resource consent under Section 87 (d) of the RMA, with changes to consent conditions on 6 March 2008. The consent expires on 1 June 2034. To date, this consent has not been exercised.

This permit applies to a different abstraction site from that which is covered by Permit **4455**. Contact Energy proposes that when the TCC2 or SP2 station is built, generally water would be drawn from the new site to service the demand of both stations. However, as flows in the Patea decrease, there would be both a reduction in the total draw-off allowed, and a gradual substitution of supply from the existing site over the new site.

Condition 1 requires a measuring device for recording rates of abstraction.

Conditions 2 and 3 set out the abstraction regime under various levels of flow in the Patea River.

Condition 4 sets out an agreed donation towards habitat enhancement within the Patea catchment.

Conditions 5 and 6 deal with lapse and review provisions.

## **2.2.2 Water discharge permits**

Section 15(1)(a) of the RMA stipulates that no person may discharge any contaminant into water, unless the activity is expressly allowed for by a resource consent or a rule in a regional plan, or by national regulations.

### **Used water, mainly cooling water**

For reference, Stratford Power Ltd previously held water discharge permit **4457-1** to cover the discharge of up to 2,770 m<sup>3</sup>/day (32 L/s) of used water, mainly blow down water from the cooling system, and up to 5 m<sup>3</sup>/day (0.12 L/s) of treated domestic effluent, into the Patea River. This permit was issued by the Council on 25 May 1994 under Section 87(e) of the RMA, and was due to expire on 1 June 2028.

This consent was surrendered on 21 October 2002.

Contact Energy holds water discharge permit **5848-1** to discharge up to 6,740 m<sup>3</sup>/day (78 L/s) of used water, mainly blowdown water from the cooling system of power stations, into the Patea River. This permit was issued by the Council on 27 November 2001 under Section 87(e) of the RMA, with changes to the consent granted on 6 March 2008. It is due to expire on 1 June 2034.

Conditions 1 and 2 detail requirements for an effluent disposal management plan, and address subsequent compliance with and revision of the plan.

Conditions 3, 4 and 5 deal with water treatment and cleaning chemicals.

Condition 6 requires a contingency plan in case of accidental discharge or spillage.

Condition 7 establishes a mixing zone beyond which a number of effects are prohibited, and condition 8 addresses fish passage within that zone.

Conditions 9, 10 and 11 relate to control and monitoring of temperature in the mixing zone.

Conditions 12 and 13 impose limits on concentrations of effluent components in the discharge and receiving water.

The last two conditions relate to lapse and review of the consent.

### **Stormwater**

Contact Energy holds two consents in relation to discharge of stormwater at Stratford Power Station.

Water discharge permit **3939-2** covers the discharge of up to 454 L/s of stormwater from the Stratford Power Station Peaking Plant into an unnamed tributary of the Kahouri Stream and into the Kahouri Stream in the Patea catchment. This permit was issued by the Council on 10 November 1997 under Section 87(e) of the RMA. It expired on 1 June 2016. Contact Energy has applied to Council to make changes to consent **4459-1** to include activities covered in **3939-2** so that **4459-1** will cover the stormwater from the entire site.

Condition 1 establishes a mixing zone and controls effects of the discharge on the appearance, odour, water quality and biology of the river.

Condition 2 imposes limits on significant potential contaminants in the discharge.

Condition 3 requires the consent to be exercised in accordance with documentation submitted.

Condition 4 is a review provision.

Water discharge permit **4459-1** covers the discharge of stormwater from a nine-hectare power station site into an unnamed tributary of the Piakau Stream and into the Kahouri Stream; both are tributaries of the Patea River. This permit was issued by the Council on 29 May 1994 under Section 87(e) of the RMA with changes to the consent granted on 6 September 2001 and 23 March 2012. It is due to expire on 1 June 2034.

Condition 1 relates to plans of the stormwater system when it is upgraded.

Condition 2, inserted in March 2012, restricts the stormwater catchment area.

Condition 3 imposes limits on significant potential contaminants in the discharge.

Condition 4 requires a contingency plan in case of accidental discharge or spillage.

Condition 5 establishes a mixing zone, and controls effects of the discharge on the appearance, odour, water quality, and biology of the river.

Condition 6 is a review provision.

### **Sediment at water intakes**

Contact Energy holds two consents in relation to the cleaning of water intake structures.

Water discharge permit **5633-1**, to discharge fine sediment and organic matter from water intake structure screens to the Patea River, was issued by the Council on 24 May 2000 under Section 87(e) of the RMA. It is due to expire on 1 June 2028.

Condition 1 requires that the discharge licensed by the consent takes place in accordance with the documentation provided with the application. The second condition sets out environmental performance requirements in terms of unacceptable effects upon the Patea River, while the third condition is a review condition.

Water discharge permit **5851-1**, to discharge fine sediment and organic matter from water intake structure screens to the Patea River, was issued by Council on 7 December 2001 under Section 87(e) of the RMA, with variations to conditions on 22 February 2007. To date this consent has not been exercised. The consent expires on 1 June 2034.

Condition 1 requires that the discharge licensed by the consent take place in accordance with the documentation provided with the application.

Condition 2 sets out environmental performance requirements in terms of unacceptable effects upon the Patea River.

Conditions 3 and 4 deal with lapse and review of the consent.

### **Construction contaminants**

Contact Energy holds water discharge permit **7785-1** to discharge stormwater, sediment, dewatering water and washdown water into an unnamed tributary of the Piakau Stream and the Kahouri Stream from earthworks associated with the construction activities of a power station. This permit was issued by the Council on 23 March 2012 under Section 87(e) of the RMA. The consent has not been exercised. It is due to expire on 1 June 2028.

Conditions 1 and 2 require the provision of and adherence to an erosion and sediment control plan. Condition 3 relates to notification of works.

Conditions 4 to 6 deal with sediment control measures and stabilisation of earthworks areas.

Condition 7 requires use of the best practicable option.

Condition 8 and 9 are lapse and review provisions.

### 2.2.3 Air discharge permits

Section 15(1)(c) of the RMA stipulates that no person may discharge any contaminant from any industrial or trade premises into air, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations.

Contact Energy holds five discharge permits in relation to discharges to air at SPS.

#### 2.2.3.1 Taranaki Combined Cycle 1 (TCC 1-operating)

Air discharge permit ~~4454~~-1 covers the discharge of contaminants to air 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.

The application relating to discharge to air was called in by the Minister for the Environment under Section 140 of the RMA, and the permit was issued by the Minister on 23 March 1995 (operative on 15 August 1995) as a resource consent under Section 87(e) of the RMA. A variation was granted by Hearing Committee on 12 June 2003 to delete (original) conditions 4 to 10 relating to the mitigation of CO<sub>2</sub> emissions. A change to condition 12 was granted on 9 February 2010 to increase the period when emission standards relating to start-up apply. The consent is due to expire on 14 August 2029.

Conditions 1, 2 and 3 are general, covering supply of information on exercise of consent, monitoring costs and administrative charges.

Conditions 4, 5 and 6 require the adoption of the best practicable option for controlling effects of discharges on the environment, and provide for the supply of relevant information on and for the review of measures representing the best practicable option.

Condition 7 requires consultation with Council before any significant changes on the site.

Condition 8 requires Contact Energy to provide reports within two years of, and then again at four years after, commencement of commissioning, and then at six-year intervals. The report(s) are to review technological advances in the reduction or mitigation of emissions, provide an inventory of emission contaminants, detail measures taken to improve energy efficiency, address issues relating to minimisation or mitigation of emissions, and detail carbon dioxide emissions.

Conditions 9 to 13 impose limits on significant potential contaminants in discharges.

Condition 14 sets a minimum height for discharges from turbines.

Condition 15 prohibits any direct significant adverse ecological effect.

Conditions 16 and 17 place controls on visible effects and droplet drift in relation to the evaporative cooling system.

The last two conditions relate to review and lapse of the consent.

### **2.2.3.2 Taranaki Combined Cycle 2 or Stratford Peaker 2 (TCC2 or SP2–yet to be constructed)**

Contact Energy holds two consents to discharge emissions to air in relation to a proposed new station adjacent to the existing combined cycle plant (TCC1), one for the development and construction phase, the other for the commissioning and operational phase.

#### **Construction**

Air discharge permit **7786-1** covers the discharge of contaminants (dust) to air from earthworks associated with the construction activities of a power station. This permit was issued by the Council on 23 March 2012 under Section 87(e) of the RMA. The consent has not been exercised. It is due to expire on 1 June 2028.

Condition 1 limits the earthworks area.

Conditions 2 and 3 require the provision of and adherence to a dust control management plan. Condition 4 relates to notification of works.

Condition 5 requires the adoption of the best practicable option.

Condition 6 controls levels of dust in air from the site beyond the property boundary.

Conditions 7 to 9 address complaints.

Conditions 10 and 11 deal with lapse and expiry of consent.

#### **Operation**

Air discharge permit **5846-1** covers the discharge of contaminants to air from power station unit(s) and ancillary plant located adjacent to State Highway 43 (East Road) approximately three kilometres east of Stratford.

This consent relates to a power station to be constructed adjacent to the existing TCC1 plant. The Council granted the permit after a hearing on 14 November 2001. The permit was subsequently appealed by two parties to the Environment Court. The appeal was subsequently dismissed by the Environment Court. The consent was issued on 6 September 2002 to provide for a second combined-cycle station (TCC2). A variation that broadened the purpose and conditions of the consent and allowed minor amendments, to provide for an alternative open-cycle (SP2) power plant, was granted on 23 March 2012. The consent has not been exercised. The consent expires on 1 June 2034.

Condition 1, inserted in March 2012, stipulates the use of gas fuel only.

Conditions 2, 3 and 4 require the adoption of the best practicable option for controlling effects of discharges on the environment, and provide for the supply of relevant information on and for the review of measures representing the best practicable option.

Condition 5 requires consultation with Council before any significant changes on the site.

Condition 6 requires Contact Energy to provide reports within two years of, then again at four years after, commencement of commissioning, and then at six-year intervals. The report(s) are to review technological advances in the reduction or mitigation of emissions, provide an inventory of emission contaminants, detail measures taken to improve energy efficiency, address issues relating to minimisation or mitigation of emissions, and detail carbon dioxide emissions.

Conditions 7 to 11 impose limits on significant potential contaminants in discharges.

Condition 12 sets a minimum height for discharges from turbines.

Condition 13 prohibits any direct significant adverse ecological effect.

Conditions 14 and 15 place controls on visible effects and droplet drift in relation to the evaporative cooling system.

The last three conditions relate to review and lapse of the consent.

### **2.2.3.3 Stratford Peaker Plant (SP1)**

Air discharge permit **4022-2** covers the discharge of emissions into the air from fuel combustion and other related activities associated with the operation of the Stratford Power Station and ancillary plant. This permit was originally issued by the Council on 14 December 1994 under Section 87(e) of the RMA, with changes to consent conditions on 6 March 2008 and 9 February 2010. It is due to expire on 1 June 2022.

Condition 1 requires the adoption of the best practicable option for controlling effects of discharges on the environment.

Condition 2 requires consultation with Council before any significant changes on the site.

Condition 3 requires Contact Energy to provide reports within two years of granting of the consent, and at six-year intervals thereafter. The report(s) are to review technological advances in the reduction or mitigation of emissions, provide an inventory of emission contaminants, detail measures taken to improve energy efficiency, address issues relating to minimisation or mitigation of emissions, and detail carbon dioxide emissions.

Conditions 4 to 18 impose limits on significant potential contaminants in discharges.

Condition 9 sets a minimum height for discharges from turbines.

Condition 10 prohibits any direct significant adverse ecological effect.

Condition 11 relates to review of the consent.

Air discharge permit **7247-1** covers the discharge of emissions to air from the operation of the cooling tower associated with the Stratford Peaker Power Plant. This permit was issued by the Council on 6 March 2008 under Section 87(e) of the RMA. It is due to expire on 1 June 2034.

Conditions 1 and 4 require the adoption of the best practicable option for controlling effects of discharges on the environment, and that processes be operated to minimise discharges.

Condition 2 requires that the cooling tower described in the consent application be installed.

Condition 3 deals with notification of works.

Conditions 5 and 6 address visible plumes and droplet drift.

Condition 7 requires consultation of significant changes in the plant.

Condition 8 deals with cooling water treatment.

Condition 9 prohibits the causing of offensive odour beyond the site boundary.

Condition 10 prohibits adverse ecological effects.

Conditions 11 and 12 relate to lapse and review of consent.

#### **2.2.4 Discharge of waste to land**

Sections 15(1)(b) and (d) of the RMA stipulate that no person may discharge any contaminant onto land if it may then enter water, or from any industrial or trade premises onto land under any circumstances, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations.

Contact Energy Limited holds land discharge permit **5063-1** to discharge up to 5 m<sup>3</sup>/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. This permit was issued by the Council on 6 December 1996 as a resource consent under Section 87(e) of the RMA, with changes to conditions on 6 September 2001 and 23 March 2012. The consent expires on 1 June 2028.

Condition 1 requires the septic tank and soakage system to be installed as described in the documentation provided with the application.

Condition 2 prohibits any direct discharge to a waterbody, while Condition 3 is a review condition.

### 2.2.5 Land use consents

Section 13(1)(a) of the RMA stipulates that no person may, in relation to the bed of any river, use, erect, reconstruct, place, alter, extend remove or demolish any structure or part of any structure in, on, over, or under the bed, unless the activity is expressly allowed for by a resource consent or a rule in a Regional Plan, or by national regulations.

Contact Energy holds 14 land use consents for structures on streams in relation to SPS.

Land use consent **4456-1**, to erect, place, use and maintain an intake structure in and on the bed of the Patea River, was issued by the Council on 25 May 1994 as a resource consent under Section 87(a) of the RMA, with a change to consent conditions on 20 January 2000. The consent expires on 1 June 2028.

Conditions 1 and 2 require the provisions of plans and details of the structure and that the consent holder constructs and maintains the structure according to the approved plan.

Condition 3 requires that the structure not obstruct fish passage.

Conditions 4 and 5 relate to notification and timing of maintenance works.

Condition 6 requires that the best practicable option be used to prevent adverse effects on water quality.

Condition 7 requires that the area of river bed disturbance be minimised.

Condition 8 relates to removal of the structure.

Condition 9 is a review condition.

Land use consent **4458-1**, 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, was issued by the Council on 25 May 1994 as a resource consent under Section 87(a) of the RMA, with a change to consent conditions on 28 November 2001. The consent expires on 1 June 2028.

Consent **4458** has essentially the same nine conditions as those imposed on consent **4456** (above).

Land use permit **4460-1** 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, was issued by Council on 25 May 1994 as a resource consent under Section 87(a) of the RMA with a change on 23 March 2012. The consent expires on 1 June 2028.

Consent **4460** has essentially the same nine conditions as those imposed on consent **4456** (above).

Land use consent **4461-1** 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, was issued by the Council on 25 May 1994 as a resource consent under Section 87(a) of the RMA. The consent expires on 1 June 2028.

Consent **4461** has essentially the same nine conditions as those imposed on consent **4456** (above).

Land use consent **4462-1** 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, was issued by the Council on 25 May 1994 as a resource consent under Section 87(a) of the RMA. The consent expires on 1 June 2028.

Consent **4462** has essentially the same nine conditions as those imposed on consent **4456** (above).

Land use consent **4804-1** 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 a power station site, was issued by the Council on 25 May 1994 as a resource consent under Section 87(a) of the RMA with a change on 23 March 2012. The consent expires on 1 June 2028.

Consent **4804** has essentially the same nine conditions as those imposed on consent **4458** (above), with the omission of the condition on fish passage.

Land use consent **5849-1** to erect, place use and maintain 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 combined cycle power station purposes, was issued by the Council on 27 November 2001 as a resource consent under section 87(a) of the RMA, with changes on 22 February 2007 and 23 March 2012. To date this consent has not been exercised. The consent expires on 1 June 2034.

Conditions 1 and 2 require the provision of plans and details of the structure and that the consent holder constructs and maintains the structure according to the approved plan.

Conditions 3, 4 and 5 control the construction of the structures, addressing effects on the watercourse, and notification and timing.

Condition 6 requires that the structure not obstruct the passage of fish.

Conditions 7 and 8 relate to lapse and review of the consent.

Land use consent **5850-1**, to erect, place use and maintain an intake structure and ancillary pipework and pumps in and on the bed, and including disturbance associated with construction of the bed, of the Patea River, for the purpose of taking water for power stations, was issued by Council on 27 November 2001 as a resource

consent under Section 87(a) of the RMA, with a change to conditions on 6 March 2008. To date this consent has not been exercised. The consent expires on 1 June 2034.

Consent **5850** has essentially the same eight conditions as those imposed on consent **5849** (above), with the omission of a condition on fish passage, and the addition of a condition dealing with removal and reinstatement.

Land use consent **5852-1** to erect, place use and maintain a bridge, cables including high voltage electricity cables and associated utilities over the Kahouri Stream in the Patea catchment for combined cycle power station purposes, was issued by the Council on 6 December 2001 as resource consent under Section 87(a) of the RMA with change on 23 March 2012. To date this consent has not been exercised. The consent expires on 1 June 2034.

Consent **5852** has essentially the same eight conditions as those imposed on consent **5850** (above).

Land use consent **7248-1**, 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 associates utilities, was issued by Council on 6 March 2008 as resource consent under Section 87(a) of the RMA. The consent expires on 1 June 2034.

Condition 1 requires exercise of consent in accordance with documentation supplied.

Condition 2 requires plans of the bridge.

Condition 3 relates to notification.

Conditions 4, 5 and 6 relate to control and mitigation of sediment, riverbed disturbance, removal of the structure and reinstatement.

Conditions 7 and 8 address lapse and review of consent.

Land use consent **7249-1**, to erect, place use and maintain a bridge over the Kahouri Stream for vehicle access purposes, was issued by Council on 6 March 2008 as a resource consent under Section 87(a) of the RMA. The consent was due to expire on 1 June 2034, but it was not exercised within five years and as per condition 7 it has lapsed.

Consent **7249** had essentially the same eight conditions as those imposed on consent **7248** (above).

Land use consent **7250-1**, 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 associates utilities, was issued by Council on 6 March 2008 as a resource consent under Section 87(a) of the RMA. The consent expires on 1 June 2034.

Consent **7250** has essentially the same eight conditions as those imposed on consent **7248** (above).

Land use consent **7605-1**, to construct, place and maintain a stormwater outlet structure in the Kahouri Stream was issued by Council on 23 February 2010 as a resource consent under Section 87(a) of the RMA. The consent expires on 1 June 2028.

Consent **7605** has seven conditions which are essentially the same as those imposed on consent **7248** (above), with the omission of a condition on provision of plans.

Land use consent **7653-1**, to construct, place and maintain a stormwater outlet structure in the Kahouri Stream was issued by Council on 21 June 2010 as a resource consent under Section 87(a) of the RMA. The consent expires on 1 June 2028.

Consent **7653** has eight conditions which are essentially the same as those imposed on consent **7605** with the addition of a condition dealing with timing of works.

## **2.3 Monitoring programme**

### **2.3.1 Introduction**

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

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

The monitoring programme for the Stratford Power Station site consisted of five primary components.

### **2.3.2 Programme liaison and management**

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

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

### **2.3.3 Site inspections**

The Contact Energy site was visited four times during the monitoring period. With regard to consents for the abstraction of or discharge to water, the main points of interest were plant processes with potential or actual discharges to receiving watercourses, including contaminated stormwater and process wastewaters. Air inspections focused on plant processes with associated actual and potential emission

sources and characteristics, including potential odour, dust, noxious or offensive emissions. Sources of data being collected by the consent holder 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.

#### **2.3.4 Chemical sampling**

The Council undertook sampling both of the discharges from the site and of the water quality upstream and downstream of the discharge point and mixing zone (Figure 1).

The used water discharge from both the TCCP and SPP was sampled on three occasions, and the samples analysed for temperature, pH, suspended solids, oil and grease, free and total chlorine, ammonia, dissolved reactive phosphorus, turbidity and conductivity.

Two sites on the Patea River were sampled on three occasions, and the samples analysed for temperature, pH, suspended solids, ammonia, dissolved reactive phosphorus, turbidity and conductivity.

#### **2.3.5 Biomonitoring surveys**

A biological survey was performed on two occasions 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 to assess the effect of stormwater discharges.

#### **2.3.6 Review of data and reports**

The consent holder submitted water discharge and emission data on a monthly basis to the Council for review.

## 2.4 Results - Water



Figure 1 Physico-chemical, biological sampling sites, discharge sites and abstraction site

### 2.4.1 Inspections – Combined Cycle Plant and Peaker Plant

At the combined-cycle plant and peaker plant 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 the control room are visited to view and discuss recent monitoring results.

At 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 plants, 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 (e.g. around chemical and oil storage/use, transformers, electrical batteries), and the stormwater drainage system, are given particular attention.

Three site visits were carried out during the 2015-2016 monitoring period. Routine inspections took place on 5 August and 24 November 2015 and 29 June 2016. In general, the site was found to be well kept with housekeeping evident across the facility. Staff of Contact Energy were found to have a good knowledge of the environmental aspects of running the plant, and to have proper training in dealing with contingency events that have potential for causing adverse environmental effects.

There is good communication between Contact Energy and the Council, which includes monthly reports as to the processes undertaken by the facility, which provides good transparency between both parties. The SPS Environmental Focus Group met on three occasions (November 2015, March and June 2016) to discuss and progress environmental opportunities for monitoring and management improvement.

#### **2.4.2 Results of abstraction monitoring**

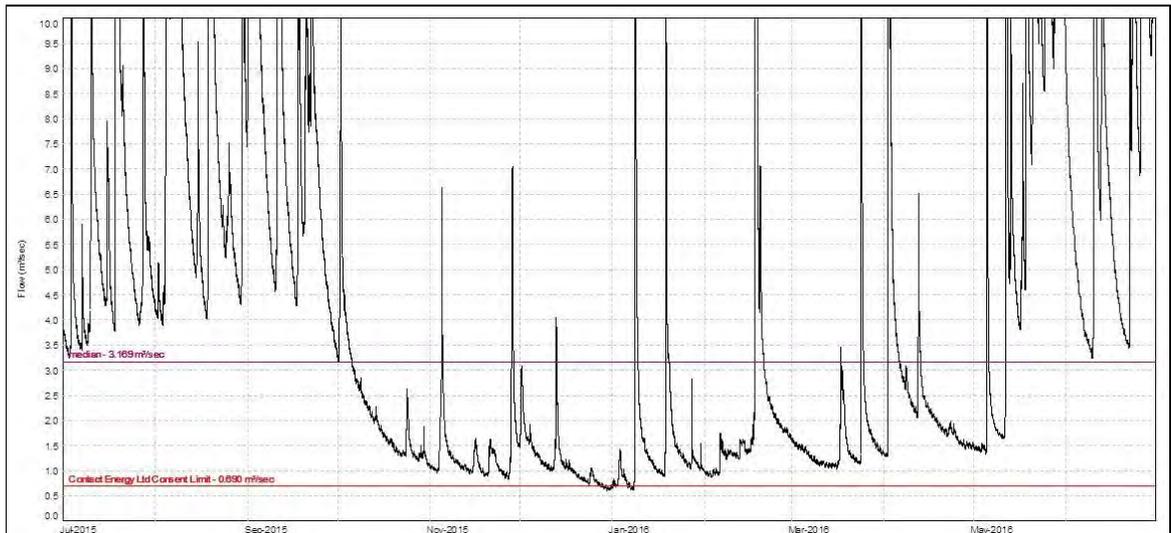
Abstractions are regulated by consent **4455**. Contact Energy also holds consent **5847** relating to water abstraction for the proposed power station. Contact Energy operates a continuous monitoring system to measure the abstraction rate at two points, at the river intake and at the inlet to the raw water pond that provides for both power plants. The record is based on 5-minute average flows, rather than instantaneous values, to avoid short-term 'spikes' that are caused when the pumps are reversed into backwash mode or are restarted, giving rise to transient water surges in the pipelines which may represent breaches of the abstraction consent. Data are forwarded to the Council on a monthly basis for audit.

The consent limit 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 abstraction pumps are governed so that they cannot exceed a rate of 225 L/s. During 2015-2016, the maximum intake flow recorded was 134 L/s, with an average flow rate of 31 L/s. The total volume abstracted was 966,013 m<sup>3</sup>. This was an increase of around 9%, or 214 m<sup>3</sup>/day, from the previous year's abstraction volume, and is a similar volume to that abstracted over the previous three years. Prior to the 2013-2014 period abstraction volumes were over 40% more, with the significant decrease attributed to the reduction in operation of the combined-cycle plant (52 days in 2015-2016).

The abstraction consent requires the plant to reduce its abstraction to less than 150 L/s when river flows drop below 690 L/s at Skinner Road. Abstraction rate did not exceed 150 L/s during the monitoring period. During the monitoring period, the Patea River flow dropped below 690 L/s on a total of nine days, from 28 December 2015 to 1 January 2016, and then again from 6 to 8 January 2016. The lowest instantaneous flow occurred on 30 December at 0815 NZST, with a value of 598 L/s.

Patea River flows measured at Skinner Road are shown in Figure 2.



**Figure 2** Patea River flow at Skinner Road ( $\text{m}^3/\text{s}$ ), July 2015–June 2016

The data in Table 2 below on abstraction rates are as presented by Contact Energy to the Council.

**Table 2** Monthly abstraction data July 2015 to June 2016

Month	Ave L/s	Max L/s
July	8	92
August	18	103
September	35	107
October	28	101
November	51	98
December	25	90
January	30	100
February	32	90
March	46	90
April	21	100
May	35	134
June	39	102

### 2.4.3 Results of discharge monitoring

Consent 5848 covers the discharge of used waters (mainly blowdown water from the cooling system of TCC1 and water treatment plant of SP1) to the Patea River. Contact Energy continuously monitors pH, chlorine, temperature (effluent and receiving

water), and flow of effluent from both plants. It also conducts twice-daily checking of the on-line monitoring devices, and daily sampling and analysis of 'grab' samples. The Council samples the discharge from both plants into the Patea River quarterly, splitting the samples with Contact Energy for inter-laboratory comparison. Sampling times are chosen by Council staff to cover the 'worst case' circumstances, relating to the daily dosing of cooling water with chlorine for biological control, and to flow of the receiving water. The Council analyses the samples to determine compliance with consent conditions on effluent composition (pH and chlorine) and nutrient minimisation (phosphorus), to assess the amount of ammonia discharged (in relation to the receiving water limit), and to monitor for any change in general effluent quality parameters (conductivity, turbidity and suspended solids).

Consent **4459** covers the discharge of stormwater to the Kahouri Stream from a holding pond that serves both plants. Before 2011, there were few discharges from the pond, as nearly all stormwater was transferred to the raw water pond. With enlargement of the catchment created by construction of the peaker plant, discharge frequency increased. Also, changes in Contact Energy's generation strategy, whereby TCC1 is shut down for longer periods, has led to a need to refresh the raw water pond at times, through overflow back to the Patea River via the stormwater pond and Kahouri Stream. The stormwater is monitored by Contact Energy for compliance with the limits on pH range, suspended solids and oil and grease.

#### 2.4.3.1 Results of monitoring by Contact Energy

The data in Table 3 and Table 4 are from the monthly summaries forwarded to the Council by Contact Energy relating to its monitoring of the Patea River discharge by continuous analysers and by testing of grab samples.

**Table 3** Monitoring of TCC1 plant effluent by Contact Energy Limited July 2015 to June 2016

Month	Flow L/s		pH		Total Cl <sub>2</sub> g/m <sup>3</sup>		Temp °C	
	Max	Avg	Min	Max	Max	Avg	Max	Avg
Jul-15	37.8	16.1	7.4	8.7	0.05	0.01	13.2	10.0
Aug-15	38.0	19.6	6.8	9.0	0.05	<0.01	11.4	10.1
Sep-15	40.6	19.8	6.1	9.4	0.09	<0.01	20.0	13.0
Oct-15	42.8	21.3	6.9	8.8	0.03	<0.01	21.5	16.2
Nov-15	41.8	23.7	6.9	8.2	0.04	0.01	26.4	18.7
Dec-15	49.2	20.5	7.5	8.9	0.39	0.01	24.3	20.4
Jan-16	47.6	23.9	7.2	8.6	0.68	<0.01	25.2	22.8
Feb-16	46.7	25.5	7.0	8.9	0.02	<0.01	25.8	24.1
Mar-16	44.4	20.7	6.0	9.0	0.09	<0.01	27.1	21.7
Apr-16	46.0	19.9	7.1	8.6	0.04	0.01	23.4	18.0
May-16	47.6	27.5	6.9	8.1	0.20	0.01	27.9	14.2
Jun-16	44.4	18.0	6.7	7.9	0.04	0.01	23.0	16.5
<b>Limit</b>	<b>78</b>		<b>6.0</b>	<b>9.0</b>	<b>0.05</b>			

**Table 4** Monitoring of SP1 effluent by Contact Energy Limited July 2015 to June 2016

Month	Flow L/s		pH		Total Cl <sub>2</sub> g/m <sup>3</sup>		Temp °C	
	Max	Avg	Min	Max	Max	Avg	Max	Avg
Jul-15	37.8	16.1	4.0	8.3	0.08	0.01	15.0	10.3
Aug-15	38.0	19.6	6.5	8.7	0.99	0.02	13.1	10.7
Sep-15	40.6	19.8	6.5	7.8	0.38	0.01	16.7	13.4
Oct-15	42.8	21.3	6.3	7.6	0.13	0.01	22.0	17.8
Nov-15	41.8	23.7	6.7	8.9	0.81	0.01	22.8	19.1
Dec-15	49.2	20.5	6.2	8.6	0.61	0.02	36.5	21.2
Jan-16	47.6	23.9	6.2	8.9	0.85	0.01	28.2	24.4
Feb-16	46.7	25.5	6.5	8.9	0.48	0.01	29.0	25.0
Mar-16	44.4	20.7	6.6	8.9	1.15	0.01	25.0	21.3
Apr-16	46.0	19.9	6.1	9.1	0.25	<0.01	21.4	18.1
May-16	47.6	27.5	6.8	8.9	0.70	0.01	23.4	17.4
Jun-16	44.4	18.0	6.9	8.8	0.06	0.01	17.9	13.9
<b>Limit</b>	<b>78</b>		<b>6.0</b>	<b>9.0</b>	<b>0.05</b>			

### Flow

The discharge flow remained within the consent limit of 78 L/s throughout the 2015-2016 period.

In 2015-2016, the combined average discharge flow for TCC1 and SP1 was 21.4 L/s and the maximum recorded discharge flow was 49.2 L/s. The total volume of wastewater discharged for the year was 576,361 m<sup>3</sup>, an increase of about 6% from the previous year which related to less evaporative cooling from operation of TCC1.

### pH

For TCC1, the minimum pH was 6.0, and the maximum 9.4. While for SP1, the minimum recorded pH was 4.0, and the maximum 9.1.

Each time the continuous pH monitor reading exceeds the consent range limit, the wastewater discharge valve at the relevant operations pit on the site automatically closes immediately (within one minute), ensuring discharge of off-specification wastewater to the river does not occur. The limits on when the discharge valve closes are set so that the valve activates outside the pH range 6.1 to 8.9 so that the discharge remained within the consent range of 6.0 to 9.0.

### Chlorine

The average value for chlorine at the combined-cycle plant was 0.01 mg/kg, and the maximum value was 0.68 mg/kg. The wastewater discharge valve was shut whenever the limit was exceeded; therefore compliance with consent conditions was achieved.

For the peaker plant, the average value for chlorine was 0.01 mg/kg, with a maximum of 1.15 mg/kg.

High chlorine values were recorded on several occasions while the wastewater discharge valves were closing. These high values occur due to low sample volume, which occurs when the circulation pump has been stopped as a result of a low water level in the wastewater 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 the discharge within consent limits.

### **Temperature**

The river temperature during the monitoring period remained below 25 °C, allowing for continuous discharge. River temperature differentials remained within consent limits throughout the monitoring period. The maximum temperature differential recorded was 1.6 °C.

### **Stormwater**

Contact Energy reported that discharges of stormwater to Kahouri Stream due to high rainfall occurred on 28 occasions. Full compliance with the limits on pH range (6-9), suspended solids (100 g/m<sup>3</sup>) and oil and grease (15 g/m<sup>3</sup>) was reported.

## **2.4.3.2 Results of Council monitoring**

The results of Council monitoring of effluent from the combined-cycle and peaker plants in 2015-2016 are presented in Table 5. Also presented are the corresponding results from continuous effluent monitoring by Contact Energy, and of grab samples taken by Contact Energy for inter-laboratory comparison.

### **Compliance monitoring**

Consent 5848 places limits on the pH range and the total residual chlorine concentration in the effluent. On the basis of laboratory test results, compliance with consent conditions on pH and total residual chlorine in the effluent was achieved.

### **Comparison exercises**

Comparisons are carried out between the Council and the Contact Energy laboratories on pH and free residual and total chlorine. The continuous temperature meter was checked with a field meter. Overall there was a reasonable agreement on monitoring results.

**Table 5** Results of effluent monitoring by Council, compared to Contact Energy results for temperature, pH and chlorine

	Time NZST	Flow L/s	Temp °C		pH		Free Cl <sub>2</sub> g/m <sup>3</sup>	Total Cl <sub>2</sub> g/m <sup>3</sup>		Condy @ 20 °C mS/m	Turbidity NTU	SS g/m <sup>3</sup>	Oil g/m <sup>3</sup>	NH <sub>3</sub> g/m <sup>3</sup>	DRP g/m <sup>3</sup>
			TRC	CE meter	TRC	CE meter	TRC	TRC	CE meter						
<b>TCC1</b>															
5-Aug-15	14:50	19.9	11.4	10.4	8.3	8.7	<0.01	0.04	<0.01	14.0	4.3	10	<0.5	<0.003	<0.003
26-Nov-15	10:54	14.2	25.4	24.9	7.1	7.3	0.01	0.02	<0.01	104	2.9	4	<0.5	0.070	0.176
9-Mar-16	9:20	21.1	24.5	25.2	7.4	7.7	<0.01	<0.01	<0.01	110	4.3	9	<0.5	0.184	0.126
<b>SP1</b>															
5-Aug-15	14:40	7.2	11.4	15.1	8.1	8.4	0.01	0.03	0.02	303	4.5	22	0.7	0.129	<0.003
26-Nov-15	10:17	16.6	20.3	21.8	6.9	7.4	<0.01	<0.01	0.01	46.7	1.4	14	<0.5	0.066	0.816
9-Mar-16	9:45	6.7	21.4	20.8	6.6	6.9	0.01	0.01	<0.01	39.2	2.4	13	<0.5	0.041	0.324
<b>Limit</b>		<b>78</b>			<b>6.0 - 9.0</b>			<b>0.05</b>							

CE meter = Contact Energy on-line meter

Free Cl<sub>2</sub> = free chlorine

Total Cl<sub>2</sub> = total chlorine

Cond = conductivity at 20 °C

DRP = dissolved reactive phosphorus

NH<sub>3</sub> = ammonia

Oil = oil and grease

SS = suspended solids

Temp = temperature

Turb = turbidity

## 2.4.4 Results of receiving environment monitoring

### 2.4.4.1 Biomonitoring

Biomonitoring was conducted in the Patea River on 12 October 2015, and 29 February 2016, and in the Kahouri Stream on 14 April 2016. The full reports are attached in Appendix IV. These surveys relate to the exercise of two consents.

Consent **5848-1** allows the discharge of cooling water into the Patea River approximately 1 km upstream of its confluence with the Kahouri Stream. The discharge may be elevated in temperature and may contain nutrients and other contaminants. Consent **4459-1** allows the discharge of stormwater into the Kahouri Stream, approximately 3 km upstream of its confluence with the Patea River. Condition 7 (v) and (vi) of consent **5848-1** and condition 4 (e) and (f) on consent **4459-1** specify that, beyond the mixing zone, the discharge shall not cause any significant adverse effects on aquatic life, habitats, or ecology nor any undesirable biological growths.

The Council's standard 'kick-sampling' technique was used to collect streambed macroinvertebrates from five sites in the Patea River, and two sites in the Kahouri Stream, to determine whether or not consented stormwater discharges from the Contact Energy site had had any recent detrimental effect upon the macroinvertebrate communities of the Patea River or Kahouri Stream. Samples were sorted and identified to provide the number of taxa (richness), MCI, and SQMCI<sub>s</sub> scores for each site.

The MCI is a measure of the overall sensitivity of the macroinvertebrate community to the effects of organic pollution in stony streams. It is based on the presence/absence of taxa with varying degrees of sensitivity to environmental conditions. It may be used in soft-bottomed streams to detect trends over time. The SQMCI<sub>s</sub> takes into account taxa abundance as well as sensitivity to pollution, and may reveal more subtle changes in communities, particularly if non-organic impacts such as elevated silt levels from stormwater discharges are occurring.

Significant differences in either MCI or SQMCI<sub>s</sub> between sites indicate the degree of adverse effects (if any) of discharges being monitored.

The conclusions of the three surveys in the two catchments are presented below.

#### 2.4.4.1.1 Patea River

MCI and SQMCI<sub>s</sub> scores indicated that the stream communities throughout the entire river reach were of 'fair' to 'good' generic health and generally in the condition predicted for similar sites in other Taranaki ringplain rivers.

Biomonitoring at three sites further downstream in the Patea River, for the establishment of baseline conditions in relation to consented power station expansion, found relatively similar community compositions to those monitored in the vicinity of the cooling water discharges with few significant changes in individual taxon abundances recorded (the summer survey noted an increase in 'tolerant' snails (*Potamopyrgus*) at sites 4 and 5). SQMCI<sub>s</sub> values were relatively similar between sites. MCI scores were higher than historical median values at all

sites in the spring survey, while in the summer survey MCI scores were lower than historical median values at sites 4 and 5. Overall MCI scores were typical of communities at these distances from the National Park.

Overall, the macroinvertebrate surveys indicated that discharges of treated cooling water from the Contact Energy site had not had any significant detrimental effect on the macroinvertebrate communities of the river. No significant changes in the macroinvertebrate community structures were recorded between the upstream 'control' site and site immediately downstream of the discharge.

#### **2.4.4.1.2 Kahouri Stream**

The taxa richness found at both sites on 14 April 2016 was moderately high. The macroinvertebrate communities of both sites were also in 'good' generic biological health and there were some abundant 'sensitive' taxa at both sites. There was an insignificant decrease in MCI score from site 1 to site 2 but site 2 had a significantly lower score than typical sites in ring plain streams that are sourced within the National Park. Site 2 also had a significantly lower SQMCIS score than site 1. These differences probably reflected nutrient enrichment from the discharge of effluent from oxidations ponds located 150 m upstream of site 2.

Overall, this early autumn macroinvertebrate survey indicated that the discharge of stormwater from the Contact Energy site had not had any significant detrimental effects on the macroinvertebrate communities of the Kahouri Stream.

#### **2.4.4.2 Physico-chemical monitoring by Council**

Council Officers collected water quality samples from the Patea River on three occasions during 2015-2016 at sites above the discharge point for the cooling and process wastewaters and at the boundary of the mixing zone 75 m downstream. The results are presented in Table 6. Flow in the river at the recording station downstream at Skinner Road is included for assessment of relative effects of the power station effluent. The Kahouri Stream, a major tributary, joins the river between the discharge point and the recorder station.

Sampling upstream and downstream of the discharge was undertaken in conjunction with inspections on 5 August and 26 November 2015, and 9 March 2016.

The discharge of power plant effluent had negligible effect on the river in terms of physical appearance, nutrient concentration, pH and temperature.

Turbidity and suspended solids levels remained relatively constant.

The concentration of nutrients, in terms of ammonia and dissolved reactive phosphorus (DRP), was governed largely by the discharge from Stratford oxidation ponds upstream. There was a measureable increase in DRP on one of the three monitoring occasions, when the peaker plant effluent contained a significant amount of DRP. However, there was no statistical increase in (flow-adjusted) level of DRP recorded for the Patea River at Skinner Road, 2.0 km downstream at the regional state of the environment monitoring site that is monitored monthly. In comparison to the previous monitoring period, there were two increases in concentrations of DRP

between monitoring locations, though there was no statistical increase at the Skinner Road recorder.

Ammonia concentration differed little between the two monitoring sites and was below concentration allowed by consent conditions.

The temperature difference measured in the river was between - 0.3 and + 0.7 °C.

**Table 6** Patea River monitoring

Parameter			5-Aug-15	26-Nov-15	9-Mar-16
Discharge	Units	Site	TCC+SP	TCC+SP	TCC+SP
Time	NZST	U	15:10	11:20	10:25
		D	15:20	11:40	10:15
Flow	L/s	Skinner Rd	10,882	939	1163
		Discharge	19.9+7.2	14.2+16.6	21.1+6.7
Temperature	°C	U	9.5	17.9	17.2
		D	9.5	18.6	16.9
Conductivity at 20 °C	mS/m	U	7.7	10.5	15.5
		D	8.6	14.8	10.2
pH	pH	U	7.6	8.0	8.2
		D	7.4	8.0	8.3
Ammonia	g/m <sup>3</sup> N	U	0.207	0.159	0.016
		D	0.199	0.167	0.011
Unionised ammonia	g/m <sup>3</sup> NH <sub>3</sub>	U	0.00179	0.00630	0.00094
		D	0.00109	0.00696	0.00079
Dissolved reactive phosphorus	g/m <sup>3</sup> P	U	0.041	0.149	0.063
		D	0.032	0.179	0.062
Suspended solids	g/m <sup>3</sup>	U	5	3	3
		D	<2	4	3
Turbidity	NTU	U	2.1	1.8	1.5
		D	2.2	2.0	1.5

U = upstream of discharge point (Site Code PAT000356)

D = downstream of discharge point (Site Code PAT000357)

#### 2.4.4.3 Temperature monitoring by Contact Energy

The river temperature remained below 25 °C throughout the monitoring period, allowing for continuous discharge.

During 2015-2016, the maximum river temperature recorded for the downstream monitoring site was 22.7 °C on 11 February 2016. The maximum temperature recorded for the upstream monitoring site was 22.4 °C on 3 February 2016.

The average temperature increase caused by the plant discharge was 0.11°C. The highest temperature differential was 1.6 °C, recorded on 12 November 2015. At this time the average plant discharge rate was 15.1 L/s and the flow rate of the Patea River at Skinner Road was 104 L/s.

## **2.5 Results - Air**

### **2.5.1 Inspections**

Inspections in relation to emissions to air comprise assessment of the visual effect of discharges from the power station site, particularly the cooling towers, and a visit to the control room to view and discuss air monitoring results. The equipment in the TCC1 air monitoring shed is also included.

Routine inspections took place on 5 August and 24 November 2015 and 29 June 2016.

Compliance with condition 16 of consent 4454 and condition 5 on consent 7247, in respect of non-production of a visible plume from the evaporative cooling systems except under certain meteorological conditions was achieved at the time of each inspection.

Staff of Contact Energy were found to have a good knowledge of the environmental aspects of running the plant, and to have proper training in dealing with contingency events that have potential for causing adverse environmental effects.

### **2.5.2 Results of discharge monitoring**

The station has provided to Council a monthly summary of its emissions monitoring data. The report covers the average, minimum and maximum concentrations of nitrogen oxides (NO<sub>x</sub>), oxygen (O<sub>2</sub>), carbon monoxide (CO) and carbon dioxide (CO<sub>2</sub>). The results are summarised in Appendix V.

Total emissions of CO<sub>2</sub> for the 2015-2016 year were 390,282 tonnes, comprising 135,562 tonnes from TCC1 and 254,720 tonnes (estimated) from SP1. This represented an increase of 17,817 tonnes, or 5 %, compared to 2014-2015, reflecting the increase in operational time in 2015-2016. For TCC1, this represented an increase of 3,488 tonnes or 3 % from the previous year. For SP1, this represented an increase of 14,329 tonnes or 6 % from the previous year.

The relative contribution from TCC1 and SP1 remained the same, with 35 % and 65 % respectively.

The limit imposed by consent 4454-1 on NO<sub>x</sub> mass discharge rate (430 kg/h) from TCC1 was complied with. Stack testing of the SP1 units under full load during commissioning in March 2011 had demonstrated compliance with NO<sub>x</sub> emission concentration and mass discharge limits on consent 4022-2. This was confirmed by testing the SP1 units under baseload in August 2014. (See section 2.5.3).

### **2.5.3 Emissions testing of Stratford Peaker Plant**

Consent 4022-2 places limits on the concentration and mass emission rate of nitrogen oxides (NO<sub>x</sub>) discharged to air from the two gas turbines at SP1. Limits are also imposed on maximum ground level concentration of carbon monoxide, nitrogen oxides and other contaminants derived from emissions to atmosphere from the site at or beyond the site boundary under ambient conditions, that is, accounting for emissions from all plants at the site.

The Council did not require Contact Energy to install continuous metering to monitor compliance with the NO<sub>x</sub> emission limits for SP1, as was done for TCC1, because of the NO<sub>x</sub> control technology employed and the relatively regular cycle of emissions for peaker plants of that design. Instead, Council required Contact Energy to demonstrate by stack testing during commissioning of SP1 that the discharge of contaminants would comply with the emission limits under worst case operating conditions, and that, on the basis of air dispersion modelling using the hard data from testing of SP1 and TCC1, compliance with ground level concentration limits would be achieved.

Stack testing of emissions from the two SP1 machines was undertaken on 25 and 26 March 2011. Officers of the Council attended the testing. The results are presented in Table 7. Both machines were run at full load of 108 MW. The duration of combustion gas sampling was 110 minutes for each machine. Volumetric flow rate, dry at STP, was 207–211 Nm<sup>3</sup>/s at 15 %O<sub>2</sub>.

**Table 7** Results from emission testing of Stratford Peaker Plant, March 2011

Constituent		Concentration			Mass rate, g/s		
		Unit 21	Unit 22	Limit	Unit 21	Unit 22	Limit
Oxides of Nitrogen(NO <sub>x</sub> ) as NO <sub>2</sub>	ppm	30	31	125	9.4	9.8	175
Oxides of Nitrogen(NO <sub>x</sub> ) as NO <sub>2</sub>	ppm @ 15 % O <sub>2</sub>	22	23				
Oxides of Nitrogen(NO <sub>x</sub> ) as NO <sub>2</sub>	mg/Nm <sup>3</sup>	61	63				
Carbon monoxide	ppm	17	18		3.2	3.4	NA
Carbon monoxide	ppm @ 15 % O <sub>2</sub>	13	13				
Carbon monoxide	mg/Nm <sup>3</sup>	21	22				
Carbon Dioxide	% v/v dry	5.2	5.3				
Oxygen	% v/v dry	13.0	12.9				
Moisture content	% v/v	12.3	11.4				

The results demonstrate compliance with the NO<sub>x</sub> consent limits at full load, emission concentration being about 25 % of the limit, and mass emission rate about 5 % of the limit.

The data from emission testing of SP1, used together with existing test data for TCC1, confirmed air dispersion modelling results that limits on NO<sub>x</sub> and carbon monoxide at ground level at and beyond the site boundary would be achieved.

Other emission testing, carried out during combustion tuning at commissioning, demonstrated that compliance with the consent limits on NO<sub>x</sub> was achieved during 'dry' operation, that is, without the water control system, throughout the range of generation conditions, albeit at higher values than under 'wet' operation.

In August 2012, Contact Energy reported the first of a series of problems with the NO<sub>x</sub> water control system in both peaker plants, which resulted in the cessation of all use of water for NO<sub>x</sub> control (deNO<sub>x</sub> water) in June 2013.

Additional emission testing, for NO<sub>x</sub> and other combustion products, to improve tuning of the plants for optimal power output versus efficiency without deNO<sub>x</sub>

water, was undertaken on 26 and 27 August 2014 (Photo 2). During the testing, monitoring was performed for a period of 30 minutes on each plant under normal baseload conditions (natural gas consumption of 21,000 Nm<sup>3</sup>/h, or 5.1 kg/s) to demonstrate that the conditions on consent 4022-2 are being met while the plants are operated without deNO<sub>x</sub> water. An officer of Council attended the testing.



**Photo 2** Stack testing at Stratford Peaker Plant GT21, 27 August 2014

The results are presented in Table 8.

**Table 8** Summary of NO<sub>x</sub> emission monitoring results for Stratford Peaker Plant, August 2014

Parameter	Units	Emission Limit	Average Emission
<b>Unit 21 Emissions at Baseload</b>			
Oxides of Nitrogen (NO <sub>x</sub> )	ppm	125	103.7
	mg/Nm <sup>3</sup>	265*	216 <sup>+</sup>
Mass emission rate for NO <sub>x</sub>	g/s (expressed as NO <sub>2</sub> )	175	33.1
<b>Unit 22 Emissions at Baseload</b>			
Oxides of Nitrogen (NO <sub>x</sub> )	ppm	125	103.2
	mg/Nm <sup>3</sup>	265*	217 <sup>+</sup>
Mass emission rate for NO <sub>x</sub>	g/s (expressed as NO <sub>2</sub> )	175	33.4
<b>Total mass emission rate Units 21 and 22 at Baseload</b>			
Mass emission rate for NO <sub>x</sub> <sup>#</sup>	kg/h (expressed as NO <sub>2</sub> )	830	239.3

\* Emission limit of 265 mg/Nm<sup>3</sup> (where Nm<sup>3</sup> refers to 0 °C, 1-atmosphere, dry gas basis) converted from limit of 100 mg m<sup>-3</sup> at 450 °C on consent 4022-2 condition 7c

<sup>+</sup> Expressed as mg/Nm<sup>3</sup> as NO<sub>2</sub>, (where Nm<sup>3</sup> refers to 0 °C, 1-atmosphere, dry gas basis)

<sup>#</sup> Mass emission rate for the entire site

The results demonstrate that, when run without deNO<sub>x</sub> water under normal baseload of 100 MW, the SP1 plants comply with the limits on concentration and mass emission rate of nitrogen oxides set on consent 4022-2. Nitrogen oxides concentration in the emissions was consistently about 83 % of the limit of 125 ppm (v/v). This compares with concentrations of about 24 % of the limit that were measured in March 2011 when the plants were tested while using deNO<sub>x</sub> water.

The mass emission rate of nitrogen oxides without use of deNO<sub>x</sub> water was about 19 % of the consent limit, compared to about 5.5 % of the limit when deNO<sub>x</sub> water was used.

Contact has undertaken to carry out biennial emission testing on SP1, with the next testing scheduled to be carried out in the 2016-2017 period.

#### 2.5.4 Reviews and audits

All three air discharge consents that cover emissions from fuel combustion at Stratford Power Station include a condition that requires Contact Energy to provide the Council with reports:

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

A summary of the most recent report(s) is provided in the annual monitoring report by Council.

In relation to TCC1, under condition 8 of consent 4454-1, Contact Energy was required to provide the Council with such a report within two years and four years of commissioning the plant and then at six-yearly intervals. The plant was

commissioned on 1 February 1998. The first report was received by Council in the 1999-2000 monitoring year and the second in the 2001-2002 year. The third report was received in the 2009-2010 year. The fourth report, due on 1 February 2014, was delayed, so that it could be presented together with the report for SP1 that was due 10 months later. This was received in December 2014.

In relation to SP1, under condition 3 of consent 4022-2, Contact Energy was required to provide the Council with such a report for the (old) Stratford Gas Turbine Plant within two years from the granting of the (replacement) consent in December 1994 and every six years thereafter. The last such report was considered to be the Assessment of Effects report that was produced in February 2008 in support of the application to change the purpose of consent 4022-2 to provide for operation of SP1. The next report was received in December 2014.

In relation to the as yet unbuilt third plant of either open or closed-cycle design, under condition 6 of consent 5846-1, Contact Energy was required to provide the Council with such a report within two years and four years of commissioning the plant and then at six-yearly intervals. The cooling tower plume was to be addressed specifically.

The most recent six-yearly report, which relates to both TCC1 and SP1, was received in December 2014. The main points of the report are summarised below.

### **Technological advances and energy efficiency improvements**

For TCC1, there have been no technological advances or efficiency improvements in the last six years. The plant already incorporates 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 having 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.

### **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.

## **2.6 Investigations, interventions, and incidents**

The monitoring programme for the period under review was based on what was considered to be an appropriate level of monitoring, review of data, and liaison with the consent holder. 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 courses 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 2015-2016 period, the Council was required to undertake significant additional investigations and interventions, or record incidents, in association with Contact Energy's conditions in resource consents or provisions in Regional Plans.

#### **24 July 2015**

A complaint was received regarding white foam in the Patea River downstream of the Skinner Road Bridge and subsequent investigation found that there was a significant amount of white foam present. During the inspection notification was received from Contact Energy that an inadvertent overdose of the dispersant Nalperse caused by injection mechanism breakdown had led to the excessive foam in the river. The product is non-toxic and not harmful to the environment. Contact Energy immediately took steps to mitigate the problem. Monitoring was undertaken over several days and the foaming diminished during that period. Investigation reports and emails of explanation were received from Contact Energy and a monitoring camera has subsequently been set up at the discharge point in to the Patea River. The camera feed is monitored from the Central Control Room and will hopefully prevent/minimise similar occurrences.

#### **4 August 2015**

Self-notification was received regarding a spill of approximately 5,000 litres of Polyaluminum Chloride (PAC) into the ops pit at the Stratford Power Station. The spill did not enter the receiving environment. Investigation found that the spill appeared to be a result of human error during the re-filling process of the PAC tank on site. The spill was captured in the concrete drains on site and directed to the ops pit where it was subsequently diluted in approximately 400 m<sup>3</sup> of plant water. None of the spilt material entered the receiving environment or areas of the site that drain into the stormwater system. The spill was identified once the ops pit was sampled and a change in pH was identified. Subsequently caustic soda was added to the ops pit to ensure that the pH was within range with regards to Consent 5848-1.

This material was then further tested and the resulting analysis allowed the ops pit to be cleaned out of PAC, with the material delivered to Stratford District Council effluent system of Esk Road.

## 26 May 2016

A complaint was received regarding an objectionable 'pepper' type odour allegedly discharging from the Stratford Power Station. Odour surveys conducted at the complainant's property failed to detect any odour and the complainant acknowledged the odour had dissipated since the complaint was made. An odour diary dating back to May 2014 was supplied to Council, the dates on which odour was recorded by the complainant correlated with wind direction data indicating the power station was the likely source. Council and Contact Energy staff has undertaken to investigate the matter further. The outcome of this incident will be discussed in the following monitoring period.

## 2.7 Discussion

### 2.7.1 Discussion of plant performance

Contact Energy provided regular documentation on plant performance. All documentation was reviewed by the Council and found to be satisfactory, meeting consent requirements.

Continuous emission monitoring of TCC1 by Contact Energy has demonstrated compliance with the air discharge permits. Emissions from SP1 were tested when the plant was commissioned, and again in August 2014 after use of deNO<sub>x</sub> water ceased. The monitoring showed a high level of performance in terms of concentrations of various contaminants in the plant emissions, though higher amounts of NO<sub>x</sub> discharged from SP1 after the water treatment was removed.

Continuous monitoring by Contact Energy of water abstraction from the Patea River showed compliance with consent conditions throughout the year. The volume abstracted, which had increased in June 2011 upon commissioning of SP1, reduced markedly (by 46 %) between 2012-2013 and 2013-2014, and there was a further reduction of around 5 % during 2014-2015. This was a result of less operation of TCC1. A similar volume was abstracted during the 2015-2016 period, with a slight increase of 9 %. The proportion of the volume abstracted that was discharged back to the Patea River (60 %) was similar to the 2014-2015 period (61 %), as the result of less evaporative cooling from operation of TCC1.

Monitoring of plant effluent, comprising mainly TCC1 cooling water and SP1 water treatment wastewater, was carried out largely by Contact Energy, with checks undertaken by the Council. There was compliance with conditions on the discharge permit.

Contact Energy provided an annual report to the Council on the 18th year of operation of the power station (Appendix VII). The report was satisfactory.

The effluent management plan was revised in December 2009 to cover the SP1 effluent. The plan was satisfactory. A new site emergency response plan, which covers fire, criminal actions, chemical/oil spill, earthquake, volcanic eruption and gas leak/explosion, among other things, was released in May 2016.

## 2.7.2 Environmental effects of exercise of water consents

The environmental effects in the Patea River system of discharges from the combined cycle power station were monitored through chemical analysis and biological survey of the Patea River, undertaken both above and below the plant effluent discharge point on East Road, and by biological survey of the Kahouri Stream above and below the stormwater discharge point beside the plant. Permanent temperature monitors are established in the Patea River immediately upstream of the effluent diffuser and at the mixing zone boundary 75 m downstream.

Chemical testing conducted on samples taken from the Patea River above and below the discharge point under relatively low flow conditions indicated that the discharge had little effect on receiving water quality. There was negligible change in pH, suspended solids, or turbidity. A slight increase in dissolved phosphorus concentration was noted on two out of three monitoring occasions. It is noted that the concentration of nutrients upstream is somewhat elevated as the result of the discharge from Stratford municipal oxidation ponds.

Temperature increase is usually the most important environmental effect associated with thermal power stations. The maximum temperature increase recorded by Contact Energy in 2015-2016 was 1.6 °C, at a flow of 1,040 L/s at Skinner Road.

Biological surveys carried out in the Patea River in October 2015 and February 2016, and in the Kahouri Stream in April 2016, showed no impacts of any recent discharges from SPS upon the biological communities in the vicinity of the discharges.

## 2.7.3 Environmental effects of exercise of air discharge permit

### 2.7.3.1 Neighbourhood effects

Monitoring in previous years around the station of dust, plume, and nitrogen oxide levels has confirmed there are no local issues arising from aerial emissions. The monitoring programme in the period under review reflected this, with the main emphasis being on ongoing inspections to confirm the status quo, and on auditing the Company's own emissions monitoring data.

All emissions complied with the resource consent conditions.

However, as an incident was raised in relation to an odour emanating from the peaker plant cooling towers (Section 2.6), an investigation was undertaken by Contact. The findings of this investigation will be discussed in more detail in the following monitoring, once the findings of the investigation have been put into effect and assessed.

### 2.7.3.2 Global effects

Total emissions of carbon dioxide for the year were 390,282 tonnes in 2015-2016, an increase of 5 % compared with 2014-2015. This reflected a slight increase in power generation during the 2015-2016 period. (There was a large decrease of 53 % from 2012-2013 to 2013-2014). As described earlier, under alterations to consent 4454, Contact Energy is no longer required to provide a yearly carbon dioxide emissions report.

## 2.8 Evaluation of performance

A tabular summary of Contact Energy's compliance record for consents that were exercised during the year under review is set out in Table 9 to Table 27 below.

**Table 9** Summary of performance for Consent 3939-2

<b>Purpose: To discharge 464 L/s of stormwater from the Stratford Power Station into an unnamed tributary of the Kahouri Stream and into the Kahouri Stream</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Effects not to be present below mixing zone	Site inspections	Yes
2. Limits on contaminant levels in discharge	Samples collected by Contact Energy	Yes
3. Discharge to be undertaken in accordance with application	Site inspections	Yes
4. Optional review of consent	Consent expired 1 June 2016	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

**Table 10** Summary of performance for Consent 4022-2

<b>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</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Adopt best practicable option (BPO)	Site inspections - checking that standard operating procedures to achieve compliance with conditions are followed	Yes
2. Consulting over significant proposed changes	Liaison during visits	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, as source monitoring at commissioning and modelling gave low results	N/A
5. Limit on ambient nitrogen oxides	Not monitored beyond boundary, as source monitoring at commissioning and modelling gave low results	N/A
6. Limit on other emissions at boundary	Not monitored beyond boundary, as source monitoring at commissioning and modelling gave low results	N/A
7. Limits on nitrogen oxides outside start-up or shut-down periods	Stack testing during commissioning of plants on 25 and 26 March 2011 and August 2014	Yes
8. Limit on nitrogen oxides mass discharge rate	Stack testing during commissioning of plants on 25 and 26 March 2011 and August 2014	Yes

<b>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</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
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
Overall assessment of consent compliance and environment performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

**Table 11** Summary of performance for Consent 4454-1

<b>Purpose: To discharge emissions to air from a combined cycle power station and ancillary plant</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Adopt best practicable option (BPO)	Site inspections - checking that standard operating procedures to achieve compliance with conditions are followed	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 Contact Energy 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 Contact Energy and dispersion modelling demonstrated no need	N/A
9. Limits on nitrogen oxides outside start-up or shut-down periods	Continuous monitoring by Contact Energy and monthly report to Council	Yes
10. Limit on nitrogen oxides mass discharge rate	Continuous monitoring by Contact Energy and monthly report to Council	Yes
11. Stack height	Inspection by Council	Yes
12. Ecological effects	Inspection by Council and observation of vegetation	Yes

<b>Purpose: To discharge emissions to air from a combined cycle power station and ancillary plant</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
13. Visibility of cooling system plume	Inspection and observation by Council and Contact Energy	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	N/A
16. Lapse of consent	Consent was exercised	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

Note: condition numbering intentionally begins at 4 as conditions 1 – 3 were deleted

**Table 12** Summary of performance for Consent 4455-1

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

N/A = not applicable

**Table 13** Summary of performance for Consent 4456-1

<b>Purpose: To erect, place, use and maintain an intake structure in and on the bed of the Patea River</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Notification of works	No maintenance undertaken	N/A
2. Construction and maintenance in accordance with documentation		N/A

<b>Purpose: To erect, place, use and maintain an intake structure in and on the bed of the Patea River</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
3. Adopt BPO to prevent or minimise adverse effects		N/A
4. Riverbed disturbance and reinstatement		N/A
5. Removal of structure when no longer required		N/A
6. Timing of works		N/A
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		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

**Table 14** Summary of performance for Consent 4458-1

<b>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</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
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	No monitoring during review period. Trout monitoring survey in January 2004 did not show any effect	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	Liaison with Contact Energy and inspection of diffuser	Yes
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		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

**Table 15** Summary of performance for Consent 4459-1

<b>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</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Provision of plans prior to completion of construction	Plans received by Council	Yes
2. Concentration limits upon potential contaminants in discharge	Monitored by Contact Energy	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		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

**Table 16** Summary of performance for Consent 4460-1

<b>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</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
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 17** Summary of performance for Consent 4461-1

<b>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</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
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 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 18** Summary of performance for Consent 4462-1

<b>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</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
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
5. Timing of works	No maintenance during period under review	N/A

<b>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</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
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		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

**Table 19** Summary of performance for Consent 4804-1

<b>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</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
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
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		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

**Table 20** Summary of performance for Consent 5063-1

<b>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</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Installation according to plan submitted	Installation inspected by Council	Yes
2. Prohibition on surface run-off	Inspection 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		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

**Table 21** Summary of performance for Consent 5633-1

<b>Purpose: To discharge fine sediment and organic matter from water intake structure tee screens to the Patea River</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Discharge according to documentation submitted	Inspection by Council	Yes
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		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

**Table 22** Summary of performance for Consent 5848-1

<b>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</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Discharge in accordance with effluent disposal management plan	Inspection by Council, and provision of annual report by Contact Energy	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	No changes during monitoring period	N/A
4. Provision of details on proposed new cleaning chemicals	No changes during monitoring period	N/A
5. Optional review of consent on notification of new chemicals	No review required	N/A

<b>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</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
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 and biological monitoring by Council	Yes
8. Passage of fish not to be obstructed	No monitoring during review period. Trout monitoring survey in January 2004 did not show any effect	Yes
9. Limit on river temperature increase	Continuous monitoring and monthly reporting by Contact Energy, and measurement checks by Council	Yes
10. Limit on maximum river temperature	Continuous monitoring and monthly reporting by Contact Energy, and measurement checks by Council	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	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		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

**Table 23** Summary of performance for Consent 7247-1

<b>Purpose: To discharge emissions into air from the operation of the cooling tower associated with the Stratford Peaker Power Plant</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
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
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 Contact Energy	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	Yes

<b>Purpose: To discharge emissions into air from the operation of the cooling tower associated with the Stratford Peaker Power Plant</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
8. Consulting over significant proposed changes	Liaison during visits. No significant changes undertaken during year	Yes
9. Offensive odour prohibited	Inspection by Council, pepper odour under investigation	For the most part
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		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

**Table 24** Summary of performance for Consent 7248-1

<b>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</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
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
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		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

**Table 25** Summary of performance for Consent 7250-1

<b>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</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
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
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		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

**Table 26** Summary of performance for Consent 7605-1

<b>Purpose: To ;construct, place and maintain a stormwater outlet structure in the Kahouri Stream</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
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

<b>Purpose: To ;construct, place and maintain a stormwater outlet structure in the Kahouri Stream</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
Overall assessment of consent compliance and environment performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

**Table 27** Summary of performance for Consent 7653-1

<b>Purpose: To construct, place and maintain a stormwater outlet structure in the Kahouri Stream</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
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
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		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

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

## **2.9 Recommendations from the 2014-2015 Annual Report**

In the 2014-2015 Annual Report, it was recommended:

1. THAT monitoring of water abstraction and discharges in relation to the Stratford Power Station of Contact Energy in the 2015-2016 year continue at the same level as in 2014-2015.
2. THAT monitoring of air emissions from the Stratford Power Station of Contact Energy in the 2015-2016 year continue at the same level as in 2014-2015.

3. THAT the Council notes that the option for review of consent 4022-2 (discharge emissions to air from SP1) within six months of receipt of a report prepared by the consent holder under condition 3 of the consent, as set out in condition 11, was not exercised on the grounds that current conditions are adequate to deal with any adverse effect on the environment caused by the discharge.
4. THAT the option for a review of resource consent 4454-1 (discharge contaminants to air) in June 2016, as set out in condition 18 of the consent not be exercised, on the grounds that current conditions are adequate to deal with any potential adverse effects.
5. THAT the option for a review of resource consent 4455-1 (water abstraction) in June 2016, as set out in condition 5 of the consent not be exercised, on the grounds that current conditions are adequate to deal with any potential adverse effects.
6. THAT the option for a review of resource consent 4456-1 (intake structure) in June 2016, as set out in condition 7 of the consent not be exercised, on the grounds that current conditions are adequate to deal with any potential adverse effects.
7. THAT the option for a review of resource consent 4458-1 (discharge structure) in June 2016, as set out in condition 9 of the consent not be exercised, on the grounds that current conditions are adequate to deal with any potential adverse effects.
8. THAT the option for a review of resource consent 4459-1 (discharge stormwater) in June 2016, as set out in condition 5 of the consent not be exercised, on the grounds that current conditions are adequate to deal with any potential adverse effects.
9. THAT the option for a review of resource consent 4460-1 (stormwater structure) in June 2016, as set out in condition 9 of the consent not be exercised, on the grounds that current conditions are adequate to deal with any potential adverse effects.
10. THAT the option for a review of resource consent 4461-1 (utility structures) in June 2016, as set out in condition 9 of the consent not be exercised, on the grounds that current conditions are adequate to deal with any potential adverse effects.
11. THAT the option for a review of resource consent 4462-1 (water transmission structures) in June 2016, as set out in condition 9 of the consent not be exercised, on the grounds that current conditions are adequate to deal with any potential adverse effects.
12. THAT the option for a review of resource consent 4804-1 (electricity transmission structures) in June 2016, as set out in condition 8 of the consent not be exercised, on the grounds that current conditions are adequate to deal with any potential adverse effects.
13. THAT the option for a review of resource consent 5063-1 (discharge septic tank effluent to land) in June 2016, as set out in condition 3 of the consent not be exercised, on the grounds that current conditions are adequate to deal with any potential adverse effects.

14. THAT the option for a review of resource consent 5633-1 (discharge sediment) in June 2016, as set out in condition 3 of the consent not be exercised, on the grounds that current conditions are adequate to deal with any potential adverse effects.
15. THAT the option for a review of resource consent 5846-1 (discharge emissions to air) in June 2016, as set out in condition 17 of the consent not be exercised, on the grounds that current conditions are adequate to deal with any potential adverse effects.
16. THAT the option for a review of resource consent 5847-1 (water take) in June 2016, as set out in condition 6 of the consent not be exercised, on the grounds that current conditions are adequate to deal with any potential adverse effects.
17. THAT the option for a review of resource consent 5848-1 (discharge used water) in June 2016, as set out in condition 15 of the consent not be exercised, on the grounds that current conditions are adequate to deal with any potential adverse effects.
18. THAT the option for a review of resource consent 5849-1 (gas pipeline structures) in June 2016, as set out in condition 8 of the consent not be exercised, on the grounds that current conditions are adequate to deal with any potential adverse effects.
19. THAT the option for a review of resource consent 5850-1 (intake structure) in June 2016, as set out in condition 8 of the consent not be exercised, on the grounds that current conditions are adequate to deal with any potential adverse effects.
20. THAT the option for a review of resource consent 5851-1 (discharge sediment) in June 2016, as set out in condition 4 of the consent not be exercised, on the grounds that current conditions are adequate to deal with any potential adverse effects.
21. THAT the option for a review of resource consent 5852-1 (erect bridge) in June 2016, as set out in condition 8 of the consent not be exercised, on the grounds that current conditions are adequate to deal with any potential adverse effects.
22. THAT the option for a review of resource consent 7247-1 (discharge emissions to air) in June 2016, as set out in condition 12 of the consent not be exercised, on the grounds that current conditions are adequate to deal with any potential adverse effects.
23. THAT the option for a review of resource consent 7248-1 (erect bridge) in June 2016, as set out in condition 8 of the consent not be exercised, on the grounds that current conditions are adequate to deal with any potential adverse effects.
24. THAT the option for a review of resource consent 7250-1 (erect bridge) in June 2016, as set out in condition 8 of the consent not be exercised, on the grounds that current conditions are adequate to deal with any potential adverse effects.
25. THAT the option for a review of resource consent 7605-1 (stormwater structure) in June 2016, as set out in condition 7 of the consent not be exercised, on the grounds that current conditions are adequate to deal with any potential adverse effects.

26. THAT the option for a review of resource consent 7653-1 (stormwater structure) in June 2016, as set out in condition 8 of the consent not be exercised, on the grounds that current conditions are adequate to deal with any potential adverse effects.
27. THAT the option for a review of resource consent 7785-1 (discharge stormwater) in June 2016, as set out in condition 9 of the consent not be exercised, on the grounds that current conditions are adequate to deal with any potential adverse effects.
28. THAT the option for a review of resource consent 7786-1 (discharge emissions to air) in June 2016, as set out in condition 11 of the consent not be exercised, on the grounds that current conditions are adequate to deal with any potential adverse effects.

These recommendations were all implemented.

## **2.10 Alterations to monitoring programmes for 2016-2017**

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

- the extent of information made available by previous authorities;
- its relevance under the RMA;
- its obligations to monitor emissions/discharges and effects under the RMA; and
- to report 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 emitting to the atmosphere/discharging to the environment.

It is proposed that for 2016-2017 the monitoring programme remains similar to that of 2015-2016. It is proposed that the frequency of Kahouri Stream biomonitoring is increased from annually in spring to biannually (spring and summer).

## **2.11 Recommendations**

1. THAT monitoring of water abstraction and discharges in relation to the Stratford Power Station of Contact Energy in the 2016-2017 year continue at a similar level as in 2015-2016, with the addition of an extra Kahouri Stream biomonitoring survey.
2. THAT monitoring of air emissions from the Stratford Power Station of Contact Energy in the 2016-2017 year continue at the same level as in 2015-2016.

## 3. Ahuroa Gas Storage

### 3.1 Process description

#### 3.1.1 Site overview

Contact Energy Ltd (Contact Energy) holds resource consents to store natural gas in a depleted hydrocarbon reservoir in the Tariki formation, using injection and extraction facilities located at the Ahuroa-B wellsite east of Midhirst (shown in Photo 3 and Figure 3). Ahuroa-B wellsite was established by Petroleum Corporation of New Zealand Ltd (Petrocorp) in 1986, following which four production wells were drilled by Petrocorp, Fletcher Challenge Energy New Zealand Ltd and Swift Energy New Zealand Ltd. From 2008, Contact Energy (under operatorship of Origin Energy Ltd) began to develop the Ahuroa underground gas storage (AGS) project.

Storage involves the injection of gas into a depleted sub-surface reservoir. Natural gas is typically injected during periods when the demand for gas supply is relatively low (e.g. in the summer months). As the demand for gas supply increases, the injected gas is withdrawn from the storage reservoir.



**Photo 3** Ahuroa-B site layout, facing north-west, May 2014

#### 3.1.2 Geological setting

At Ahuroa, gas is injected, using cased wells at a depth of approximately 2,300 metres, into the reservoir sandstone, known as the Tariki Sandstone Member. This member consists of interbedded sandstone, siltstone and mudstone deposited as submarine fans during the Oligocene (~30 million years ago) as part of the Otaraoa Formation. Periods of tectonic activity during the Oligocene and Early Miocene (~20 million years ago) subsequently modified the structural geology of the region, particularly in relation to tectonic stresses acting upon the Taranaki Fault and Tarata Thrust Fault.

The Tarata Thrust Fault is adjacent to the Ahuroa complex/system and aids in the effective trapping and storage of gas, in addition to the amalgamated sandstone deposits in the Tariki Sandstone Member which provide good reservoir quality and are overlain by alternating intervals of thin and thick siltstones predominantly the Otaraoa formation, which form a continuous top-seal.

The potential environmental risk associated with this gas storage activity relates to the possible unintentional release of natural gas into the receiving environment, particularly into groundwater aquifers. Appropriate reservoir selection and continual pressure monitoring are integral safeguards implemented to mitigate against this risk.

The nearest potable water aquifer to the reservoir is in the Matemateaonga Formation, the base of which is located approximately 950 metres below ground level, some 1,300 metres above the storage reservoir. There are also at least three known hydrocarbon reservoirs in the overlying formations, meaning that, in the highly unlikely event of any gas losses, any potential upward migration of gas would likely be intercepted by these reservoirs on the way toward the surface.

### **3.1.3 Gas injection/extraction**

At the Ahuroa-B site, the gas storage project has been developed in two stages. The initial storage utilised the existing Ahuroa 2A production well (identified in Figure 1) to inject gas. The secondary stage involved the drilling of an additional three injection wells (Ahuroa 3, 4 and 5ST-1, Figure 1), and the installation of additional compressors and surface processing equipment.

The site is configured so that the gas can run either through New Zealand Energy Corporation Ltd's (NZEC's) Waihapa production station (WPS) and then to Ahuroa through the original 8-inch gas line, or through the new 18-inch gas line from the First Gas transmission system via Contact Energy's Stratford power station. The system can be configured to either inject or extract through one or more injection wells at any time using the same surface equipment, but cannot extract through one well and inject through another simultaneously.

During injection, gas comes in through either the Waihapa or Contact Energy pipeline and into the compressor. The compressor raises the pressure to well and the reservoir pressure to make injection into the reservoir possible.

Extraction is a similar process to natural gas production. During extraction, relatively small quantities of produced water and gas condensate are brought to surface with the gas. These are separated out in the facilities on site. The produced water is piped to a 63 cubic metre storage tank on site, before being transported by road tanker to Waihapa production station for disposal by deep-well injected. The condensate is separated and piped directly to Waihapa. No condensate is stored on site.

Continual pressure monitoring is conducted using pressure sensors at surface and down-hole locations on the Ahuroa 3, 4 and 5ST-1 wells.



**Figure 3** Ahuroa B wellsite and gas storage facilities showing main components and discharge sampling site IND000146

### 3.1.4 Pressure monitoring

Pressure data is essential in understanding reservoir behaviour and response to injection and extraction, and in ensuring reservoir and pipeline integrity. Temperature and pressure data are monitored by operators at the Waihapa production station control room. High and low alarms are set on all the pressure transmitters to ensure any potential irregularities are quickly detected by site operators.

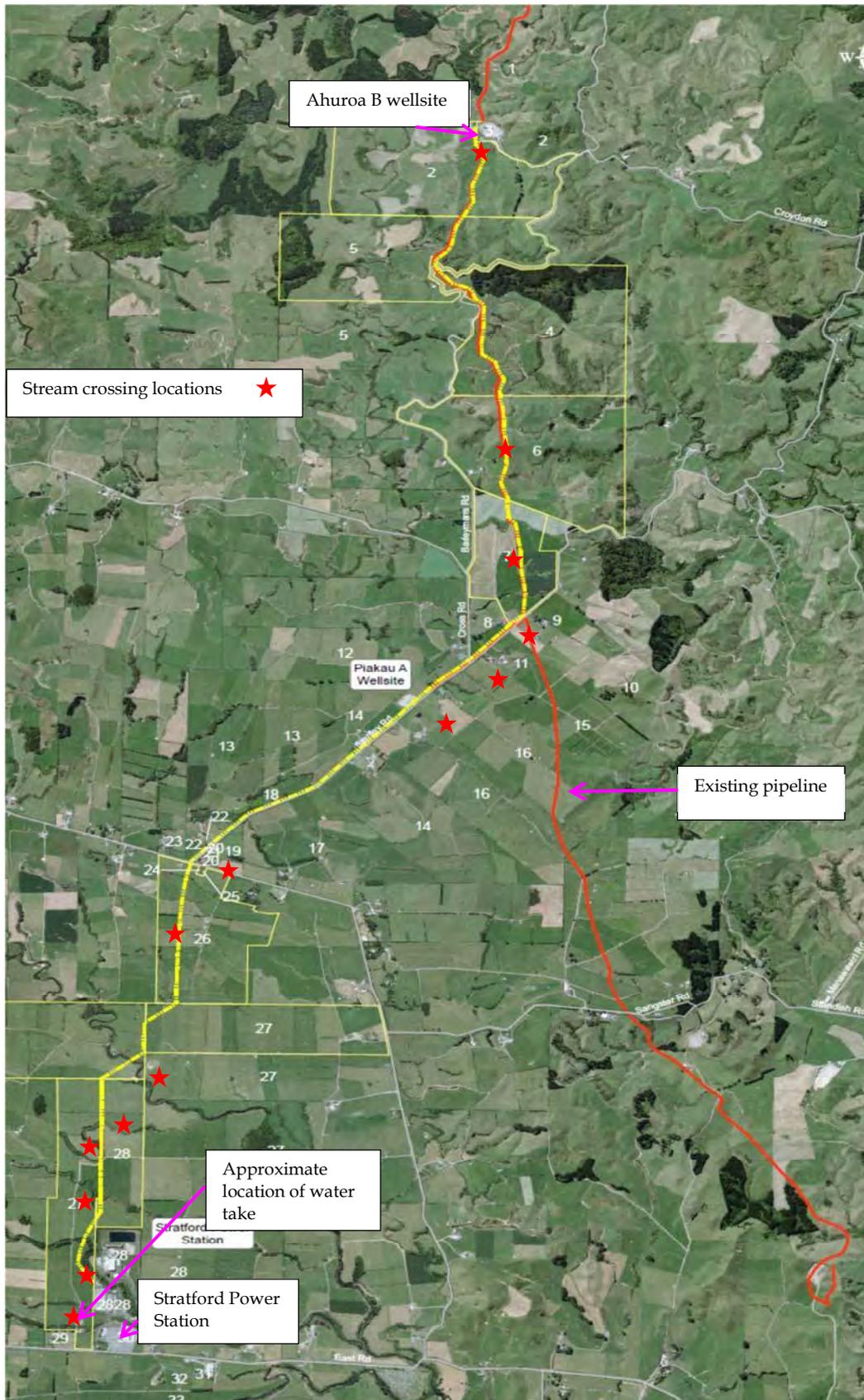
Both the pipeline and the reservoir pressure alarms are significantly lower than the design pressure (of the pipeline) or the known safe pressure (for the reservoir).

Hydraulic control valves are installed which can be used to shut the wells in, either remotely, or automatically, as required should there be a pressure anomaly during injection or extraction. In an extreme emergency, if none of the control valves are working, there is a subsurface safety valve on each well which will automatically close if the well is exposed to atmospheric pressures.

### 3.1.5 Pipeline to Stratford Power Station

An 18-inch pipeline, 8.5 km in length, was installed between AGS and SPS in 2013 for the bidirectional conveyance of gas associated with the AGS project. A fibre optic cable was installed in the same trench. The pipeline route crosses 14 waterways, comprising the Kahouri and Piakau Streams and unnamed tributaries of the Kahouri (2) and Piakau (4) Streams in the Patea catchment, and unnamed tributaries of the

Makara (5) and Ahuroa (1) Streams in the Waitara catchment. The pipeline route is shown in Figure 4.



**Figure 4** Pipeline route from Ahuroa Gas Storage to Stratford Power Station

### 3.2 Resource consents

A summary of the consents held by Contact Energy Limited in relation to Ahuroa Gas Storage facility and the gas pipeline connecting it to Stratford Power Station is given in Table 28 and Table 29. A copy of each of the consents for the storage and pipeline can be found in Appendix II and Appendix III, respectively.

**Table 28** Summary of resource consents for Ahuroa Production Station

Consent number	Purpose	Next review date	Expiry date
3681-2	Discharge stormwater, site water and uncontaminated production water to land and Makuri Stream tributary	2021	2033
5173-2*	Discharge solid drilling waste from hydrocarbon exploration operations at Ahuroa-B wellsite by mix-bury-covers	-	2021
7432-1	Discharge natural gas into land for purpose of gas storage	2021	2027
7621-1*	Discharge stormwater and sediment from Ahuroa-B site development earthworks to two Makara Stream tributaries	2021	2027
7622-1*	Culvert in Makara Stream tributary	2021	2027
7745-1*	Discharge emissions to air from flaring of hydrocarbons associated with well clean-up and well testing associated with exploration activities at Ahuroa-B wellsite	2022	2028
7746-1	Discharge emission to air during flaring from well workovers and in emergency situations associated with production activities at Ahuroa-B wellsite, together with miscellaneous emissions	2022	2028
7748-1*	Discharge stormwater and sediment to land from earthworks during extension of Ahuroa-B wellsite	2021	2027
7749-1*	Install pipe in bed of Makara Stream tributary	2021	2027
7750-1*	Access culvert in Makara Stream tributary	2021	2027

**Table 29** Summary of resource consents for the gas pipeline from AGS to SPS

Consent number	Purpose	Next review date	Expiry date
9307-1*	Discharge stormwater and sediment from pipeline construction between Ahuroa-B wellsite and SPS to land where may enter surface water	-	2017
9308-1*	Take from Kahouri Stream for pipeline testing	-	2017
9309-1 to 9322-1*	Install and use pipeline for conveying gaseous hydrocarbons under various streams between Ahuroa-B wellsite and SPS	2022	2028
9576-1*	Culvert to realign Makara Stream tributary	2021	2027

\* Consents not actively exercised during 2015-2016 monitoring period

Consents 3681 and 5173 were granted in 2003 to replace consents that provided for hydrocarbon exploration and production operations at Ahuroa-B wellsite. Consent 7432 was granted in December 2008 to provide for conversion of the depleted Ahuroa reservoir to a gas storage facility, and consents 7621 and 7622 enabled development of the site. Consents 7745 and 7746 were issued as a partial transfer to Contact Energy of consents that had allowed discharges to air at a number of sites. Consents 7748 to 7750 were granted in January 2011 to provide for expansion of the site. An extension to the lapse period of 7750 was granted on 16 March 2016. This

enables Contact Energy to exercise the consent (i.e build the proposed culvert) at any time up until 1 June 2027.

Consents 9307 to 9322 were granted in March 2012 to provide for the construction and operation of a gas pipeline between AGS and SPS. Consent 9576 was granted in June 2013 to allow access for pipeline testing and maintenance.

Of these 27 consents, as listed in Table 28 and Table 29, three of the ten held in relation to AGS were actively exercised in the 2015-2016 review period and these consents are described below. The pipeline was constructed during 2013, so although the pipeline consents have been exercised they were not actively used during the period under review.

### **3.2.1 Water discharge permit**

Section 15(1)(a) of the *Resource Management Act 1991* (RMA) stipulates that no person may discharge any contaminant into water, unless the activity is expressly allowed for by a resource consent or a rule in a regional plan, or by national regulations.

Water discharge permit 3681-2 covers the discharge of treated stormwater, uncontaminated treated site water, and uncontaminated treated production water from hydrocarbon exploration and production operations at the Ahuroa-B wellsite onto and into land and into an unnamed tributary of the Makara Stream in the Waitara catchment. This permit was issued to Swift Energy Ltd by the Council on 22 April 2003 under Section 87(e) of the RMA. It was transferred from Swift Energy to Origin Energy on 11 April 2008 and then partially transferred to Contact Energy Ltd on 23 November 2010 under Section 137(2). It is due to expire on 1 June 2033.

Condition 1 requires use of the best practicable option.

Condition 2 restricts the stormwater catchment area.

Condition 3 relates to notification of works.

Condition 4 relates to contingency planning.

Conditions 5 to 7 deal with stormwater treatment system design.

Condition 8 imposes limits on significant potential contaminants in the discharge.

Conditions 9 and 10 establish a mixing zone and set out allowable and unacceptable effects upon the receiving water.

Condition 11 addresses reinstatement of the site.

Condition 12 is a review provision.

### 3.2.2 Air discharge permit

Section 15(1)(c) of the RMA stipulates that no person may discharge any contaminant from any industrial or trade premises into air, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations.

Contact Energy Ltd holds air discharge permit 7746-1 to cover the discharge of emissions to air during flaring from well workovers and in emergency situations associated with production activities at the Ahuroa-B wellsite, together with miscellaneous emissions. This activity was formerly provided for by air discharge permit 7518-1, which was issued to Origin Energy Ltd by the Council to cover emissions at 11 wellsites, including Ahuroa-B, on 6 October 2009 under Section 87(e) of the RMA. On 23 November 2010, the part of the consent that relates to Ahuroa-B wellsite was transferred to Contact Energy under Section 137(2) of the RMA. Discharge permit 7746-1 was issued to cover the separated activity. It is due to expire on 1 June 2028.

Conditions 1 and 2 deal with notification of flaring.

Condition 3 requires consultation on changes in equipment or process.

Condition 4 relates to monitoring of wind conditions.

Conditions 5 to 7 address the separation of liquid and solids before gas flaring.

Condition 8 requires adoption of the best practicable option to minimise effects from emissions.

Condition 9 defines which substances can be combusted.

Conditions 10 and 12 control smoke and odour. Condition 11 requires vapour recovery systems on hydrocarbon storage vessels.

Conditions 13 to 15 set limits on ambient ground level concentrations of contaminants arising from flaring.

Conditions 16 to 19 relate to analysis of gas composition, recording of visible smoke emissions, flare event logs, and provision of an annual report.

Condition 20 is a review provision.

### 3.2.3 Discharges to land

Sections 15(1)(b) and (d) of the RMA stipulate that no person may discharge any contaminant onto land if it may then enter water, or from any industrial or trade premises onto land under any circumstances, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations.

Contact Energy Ltd holds discharge permit 7432-1 to cover the discharge of contaminants (natural gas) to land (sub-surface using deep well injection) for the purposes of storage. This permit was issued by the Council on 2 December 2008 under

Section 87(e) of the RMA. It was varied on 7 April 2011 to allow a reservoir pressure increase from 3,000 psia to 3,400 psia. It is due to expire on 1 June 2027.

Condition 1 requires adoption of the best practicable option to minimise effects on the environment.

Condition 2 requires discharged gas to meet a certain specification.

Condition 3 limits the maximum gas reservoir pressure, and condition 4 addresses monitoring of injection and reservoir pressures.

Conditions 5 and 6 are lapse and review provisions.

### **3.3 Monitoring programme**

#### **3.3.1 Introduction**

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

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

The monitoring programme for the Ahuroa-B site and pipeline consisted of four primary components.

#### **3.3.2 Programme liaison and management**

There is generally a significant investment of time and resources by the Council in ongoing liaison with resource consent holders over consent conditions and their interpretation and application:

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

#### **3.3.3 Site inspections**

The Ahuroa-B site was visited twice during the 2015-2016 review period. Inspections focussed on flaring activities and potential water discharge points including surface drainage networks and skimmer ponds. General site housekeeping was also assessed, and the neighbourhood was surveyed for environmental effects.

### **3.3.4 Chemical sampling**

The Council undertook sampling of skimmer pit discharges leaving the site twice during the review period. The samples were analysed for hydrocarbons, chloride, pH, conductivity, and suspended solids.

Contact Energy also undertakes regular sampling of this discharge to ascertain if it is within the consented concentrations to discharge.

### **3.3.5 Data review**

The consent holder is required to provide reservoir pressure and gas injection data routinely for Council review. Special conditions 3 and 4 of Consent 7432-1 stipulate the maximum allowable reservoir pressure, and require Contact Energy to record injection pressures and relate this to maximum reservoir pressure. A summary of flaring data is required annually by condition 18 of consent 7746-1.

## **3.4 Results – Water**

### **3.4.1 Inspections**

Two routine site inspections were undertaken during the 2015-2016 monitoring period, the observations are discussed below.

#### **19 February 2016**

The inspection was undertaken following heavy rainfall and the site stormwater system was found to be working well, with all stormwater being directed via ring drains for treatment to and through the skimmer pit. The contents of the skimmer pit were slightly opaque, this was expected due to the amount of rain. The receiving waters were very discoloured, and no effect caused by the discharge was noted on the unnamed tributary of the Makino Stream. No flaring was observed.

#### **28 June 2016**

The site inspection was undertaken during a period of heavy, squally rainfall. The stormwater discharge through the skimmer pit into the unnamed tributary was clear and no visual effects of the discharge were noted. There was no evidence of any recent flaring at the site.

### **3.4.2 Results of discharge monitoring**

A sample of skimmer pit discharge was collected from sampling site IND001046 during each inspection, identified in Figure 3, and shown in Photo 4 below.



**Photo 4** Ahuroa-B site looking towards skimmer pond (left) and final pond discharge point (right)

Discharge results are presented in Table 30.

**Table 30** 2015-2016 skimmer pond discharge results

Date	Chloride (g/m <sup>3</sup> )	Conductivity (mS/m@20C)	Hydrocarbons (g/m <sup>3</sup> )	pH	Suspended solids (g/m <sup>3</sup> )
19-Feb-16	4.2	3.1	<0.5	6.9	43
28-Jun-16	6.8	8.2	<0.5	6.8	6
<b>Consent limit</b>	<b>50</b>		<b>15</b>	<b>6.5-8.5</b>	<b>100</b>

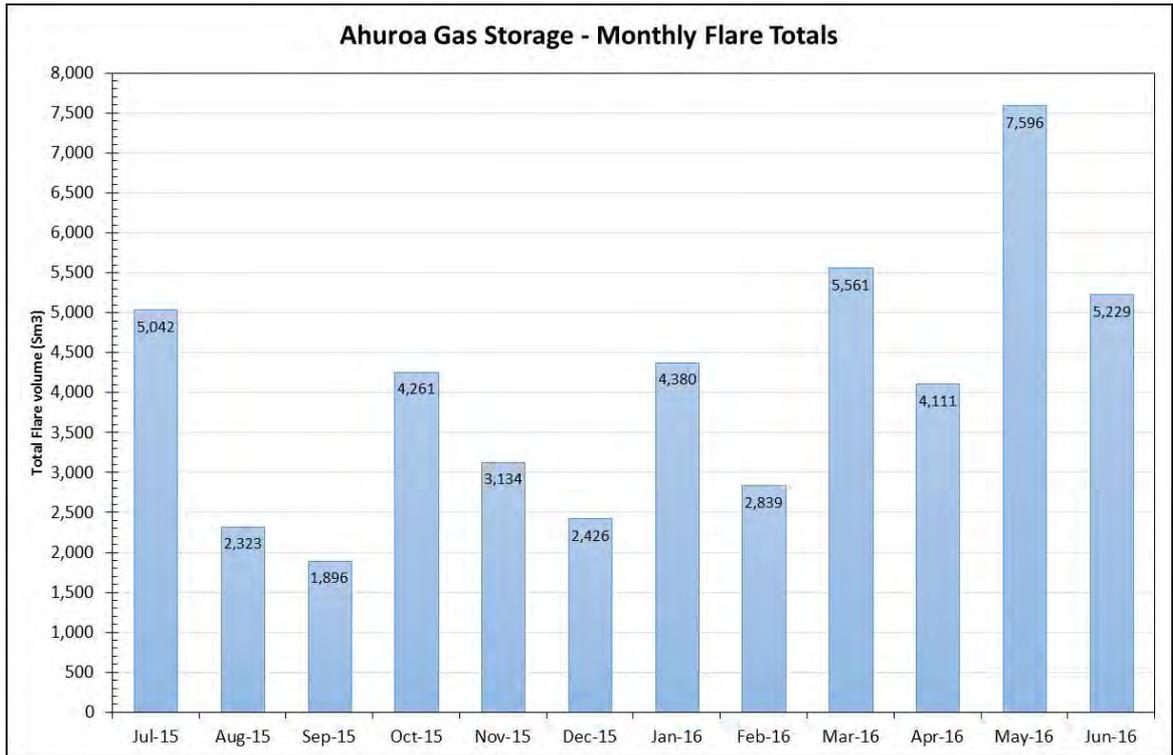
The results were well within consent limits, and discharge component concentrations would have been reduced further through dilution once the discharge eventually reached receiving waters. No hydrocarbons were detected, and the other water quality parameters were within typical surface water ranges.

## 3.5 Results - Air

### 3.5.1 Review of flaring data

During the 2015-2016 review period, short periods of flaring occurred at the Ahuroa-B wellsite. Flaring records were supplied to Council as required under condition 18 on consent 7746-1. The estimated total annual flared gas volume was 48,797 Sm<sup>3</sup>. Figure 5 presents the recorded monthly flaring volumes from 1 July 2015 to 30 June 2016.

The Council and neighbours are notified when flaring at high rate was expected. No complaints were received.

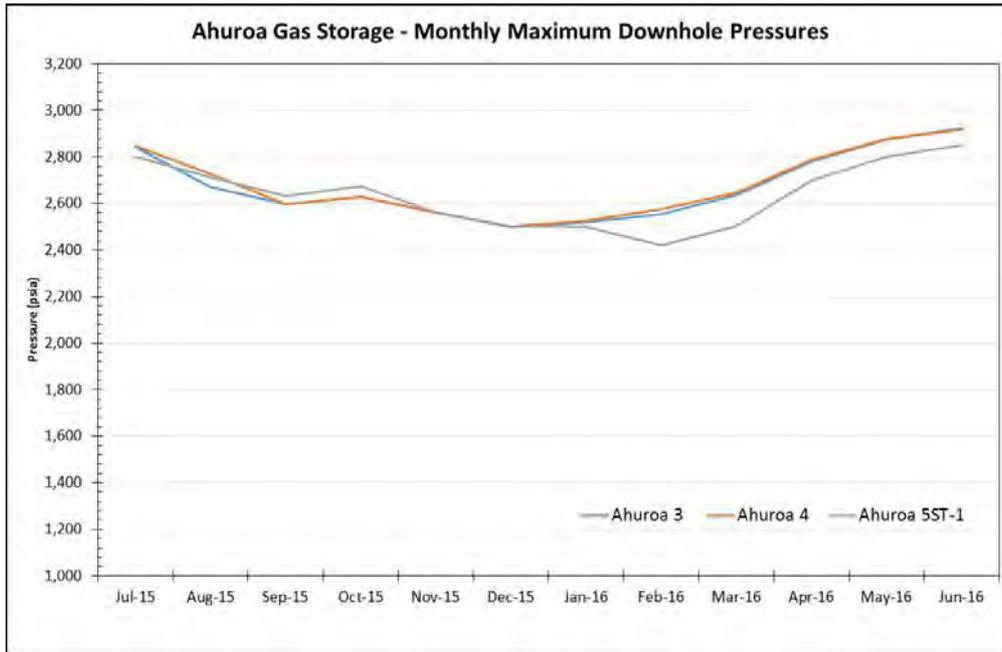


**Figure 5** Ahuroa flaring volumes (Sm<sup>3</sup>) by month for 2015-2016

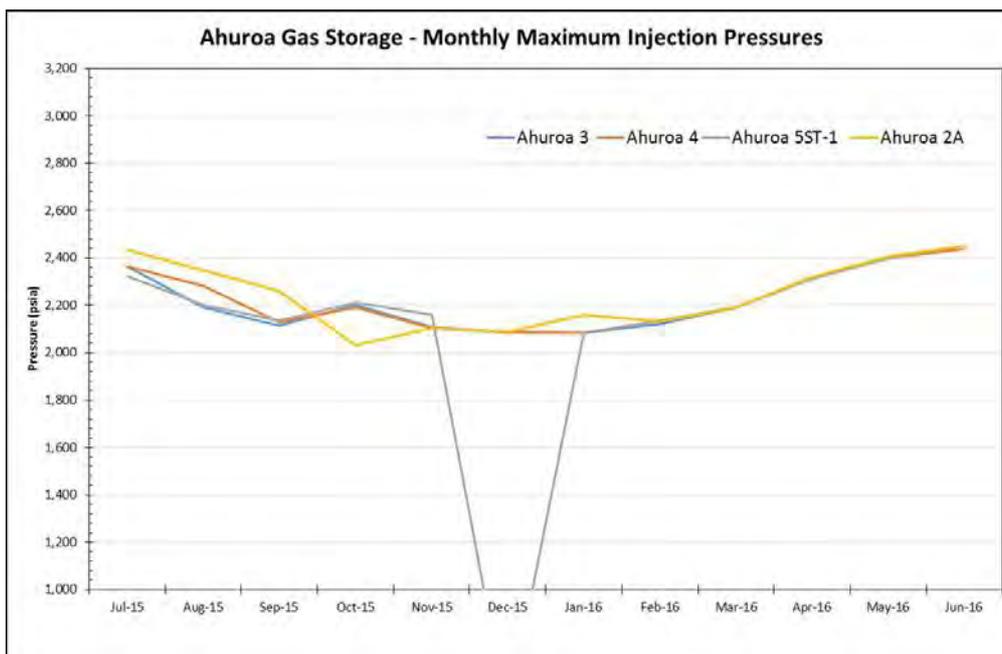
### 3.5.2 Reservoir pressure and injection pressure data review

Consent 7432-1 stipulates a maximum reservoir pressure of 3,400 psia. There is also a requirement for the consent holder to record injection pressures and relate these data to the maximum reservoir pressures.

The data supplied to the Council are hourly reservoir pressure values from down-hole pressure gauges in the Ahuroa 3, 4, and 5ST-1 wells, and hourly injection pressure values from surface gauges on the Ahuroa 2A, 3, 4 and 5ST-1 wells. Figure 6 and Figure 7 show monthly maximum readings for the down-hole and injection pressure gauges, respectively.



**Figure 6** Monthly maximum downhole pressures for Ahuroa wells 3, 4, and 5ST-1, 2015-2016



**Figure 7** Monthly maximum injection pressures for Ahuroa wells 2A, 3, 4 and 5ST-1, 2015-2016

Reservoir pressure and injection pressure monitoring data show compliance with the pressure limit of 3400 psi in condition 3 of consent **7432-1**.

Due to operational requirements well 5ST-1 was isolated from the process for all of December 2015, hence the gap in the injection pressure record.

### 3.6 Results – Pipeline

The gas pipeline between AGS and SPS was constructed and commissioned between January and October 2013. Various silt retention measures, including hay bales, silt

cloth, fluming, bunds and rip-rap, were used along the pipeline, and revegetation with grass and by riparian planting took place when soil moisture levels became suitable.

No significant effect on waterways was found during the construction, or since.

### **3.7 Annual report by Contact Energy**

Under condition 19 on consent 7746-1 to discharge emissions to air, Contact Energy is required to provide to Council during May each year a report:

- Detailing any energy efficiency measures implemented on the site;
- Detailing smoke emissions as required under conditions 17;
- Detailing any measures undertaken or proposed to reduced smoke emissions;
- Detailing any measures undertaken or proposed to reduce flaring
- Addressing any other issue relevant to the minimisation or mitigation of emissions from the flare;
- Reviewing all options and technological advances relevant to the reduction or mitigation of any discharge to air from the site, how these might be applicable and/or implemented at the site, and the benefits and costs of these advances.

This condition was imposed in relation to flaring from well workovers and emergency situations, and miscellaneous emissions, associated with a hydrocarbon production wellsite. Since 2010, the consent has provided for the operation of an underground gas storage facility with relatively small amounts of emissions.

The required report for the AGS site was received in May 2016 as required. The report is attached as Appendix VII.

No significant change occurred at the site during the review period. The potential for technological advances to reduce discharges to air is stated to be limited, given the intermittent nature of flaring events. However, Contact Energy has been working to minimise process upsets that lead to plant trips and hence flaring events. No visible emissions or complaints were recorded.

The report is satisfactory.

### **3.8 Investigations, interventions, and incidents**

The monitoring programme for the period under review was based on what was considered to be an appropriate level of monitoring, review of data, and liaison with the consent holder. 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 courses 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 (IR)

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 2015-2016 period, for the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with Contact Energy's conditions in resource consents or provisions in Regional Plans in relation to Ahuroa Gas Storage facility and the connecting pipeline to Stratford Power Station.

## **3.9 Discussion**

### **3.9.1 Discussion of performance**

Contact Energy performed well in respect to its consent conditions during the monitoring period. No incidents were recorded. Monitoring data were supplied promptly when requested and the data showed compliance with the resource consent conditions. Contact Energy staff were co-operative at all times and no other issues were identified during the monitoring period.

### **3.9.2 Environmental effects of exercise of consents**

No adverse environmental effects have been identified in the monitoring conducted during the 2015-2016 monitoring period in respect to any of the resource consents held by Contact Energy for activities at the Ahuroa Gas Storage facility.

Inspections and discharge monitoring have indicated that Ahuroa-B site surface drainage and stormwater treatment systems are well designed and working effectively, and that site management is generally good.

There are no indications that the injection/withdrawal processes have had any adverse environmental effects.

### 3.10 Evaluation of performance

A tabular summary of the consent holder's compliance record for the year under review is set out in Table 31 to Table 33.

**Table 31** Summary of performance for Consent 3681-2

<b>Purpose: To discharge treated stormwater and uncontaminated treated site water and uncontaminated treated production water from hydrocarbon exploration and production operations at the Ahuroa-B wellsite onto and into land and into and unnamed tributary of the Makara Stream in the Waitara catchment</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Adopt best practicable option to prevent or minimise adverse effects	Inspections	Yes
2. Catchment area limited	Inspections and records	Yes
3. Notification provided prior to commencement of site works or drilling	Not undertaken during period under review	N/A
4. Consent holder to provide site contingency plans for the site.	Most recent update May 2016	Yes
5. All stormwater and uncontaminated production water to be directed through a stormwater treatment system prior to discharge	Inspections, review of site plans	Yes
6. Stormwater system management and maintenance in accordance with consent application documentation	Inspection and liaison	Yes
7. Hazardous substance storage areas to be bunded and directed to sumps	Inspections	Yes
8. Limits on constituents in the discharge	Sampling	Yes
9. Discharge shall not result in increase in temp or BOD downstream of the mixing zone	Not sampled during monitoring period	N/A
10. Controls on effect of discharge in receiving water	Inspections	Yes
11. Consent holder to notify prior to site reinstatement	Site still in use	N/A
12. Optional review provision re environmental effects	Next option for review in June 2021	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

**Table 32** Summary of performance for Consent 7432-1

<b>Purpose: To discharge contaminants (natural gas) into land for the purpose of gas storage</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Consent holder to adopt best practicable option at all times	Inspections, consent holder liaison and data review	Yes
2. Gas discharged must meet into the ground must meet defined specifications	Not assessed	N/A
3. The pressure in the reservoir must not exceed 3400 psia	Data review	Yes
4. Consent holder to record injection pressure and reservoir pressure and supply to Council upon request	Data supplied and reviewed	Yes
5. Lapse condition	Consent exercised	N/A
6. Review provision	Next option for review in June 2021	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

**Table 33** Summary of performance data for Consent 7746-1

<b>Purpose: To discharge emissions to air during flaring from well workovers and in emergency situations associated with production activities at the Ahuroa-B wellsite, together with miscellaneous emissions</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Consent holder to notify of flaring events longer than 5 minutes in duration	Notifications received as required	Yes
2. Consent holder to notify nearby residents of flaring events longer than 5 minutes in duration	No complaints received from neighbours	Yes
3. No alteration of plant equipment or processes leading to changes in the quality of emissions	Company records and inspections	Yes
4. Consent holder to monitor wind conditions prior to flaring	Company records	Yes
5. Liquids and solids to be separated prior to flaring	Company records and inspections	Yes
6. Consent holder to notify if unable to comply with special condition 5 and to immediately work to re-establish separation process	No instances of non compliance with special condition 5	N/A

<b>Purpose: To discharge emissions to air during flaring from well workovers and in emergency situations associated with production activities at the Ahuroa-B wellsite, together with miscellaneous emissions</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
7. No liquids/solids to be combusted through the flare system unless during emergency		N/A
8. Consent holder to adopt BPO to minimise effects from emissions	Company records, inspections	Yes
9. Only treated substances from well stream to be combusted in flare pit	Company records, inspections	Yes
10. No objectionable odours or smoke beyond site boundary	Inspections, no complaints received	Yes
11. All hydrocarbon storage vessels shall be fitted with vapour recovery systems	Only produced hydrocarbon storage vessels on site so does not apply	N/A
12. Opacity of emissions to not exceed level 1 on Ringlemann scale for more than 4 minutes	Not assessed	N/A
13. The consent holder shall control carbon monoxide emissions to not exceed 10 mg/m <sup>3</sup> under ambient conditions	Not assessed	N/A
14. Consent holder to control nitrogen oxide emissions to not exceed 100 ug/m <sup>3</sup> under ambient conditions	Not assessed	N/A
15. Consent holder to ensure other contaminants from flaring do not exceed workplace exposure standards (DOL, 2002)	Not assessed	N/A
16. Consent holder to make an analysis of the gas/condensate stream available on request	Not requested during monitoring period	N/A
17. Visible smoke instances to be recorded and supplied to Council upon request	Not requested	N/A
18. Consent holder to record flaring events in a log and supply records to Council in an annual report	Inspections, records received	Yes
19. The consent holder to supply an annual report during May	Report received May 2016	Yes
20. Optional review provision re environmental effects	Next option for review in June 2022	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

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

### **3.11 Recommendations from the 2014-2015 Annual Report**

In the 2014-2015 Annual Report, it was recommended:

1. THAT monitoring of consented activities at Ahuroa gas storage (AGS) facilities and for the connecting pipeline to Stratford Power Station (SPS) in the 2015-2016 year continue at the same level as in 2014-2015.
2. THAT the option for a review of resource consent **7745-1** (discharge emissions to air) in June 2016, as set out in condition 20 of the consent not be exercised, on the ground that current conditions are adequate to deal with any potential adverse effects.
3. THAT the option for a review of resource consent **7746-1** (discharge emissions to air) in June 2016, as set out in condition 20 of the consent not be exercised, on the ground that current conditions are adequate to deal with any potential adverse effects.
4. THAT the option for a review of resource consents **9309-1 to 9322-1** (install pipeline under various streams) in June 2016, as set out in condition 10 of the consents not be exercised, on the ground that current conditions are adequate to deal with any potential adverse effects.

These recommendations were implemented.

### **3.12 Alterations to monitoring programmes for 2015-2016**

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

- the extent of information made available by previous authorities;
- its relevance under the RMA;
- its obligations to monitor emissions/ discharges and effects under the RMA; and
- to report 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 emitting to the atmosphere/ discharging to the environment.

It is proposed that for 2016-2017 the monitoring programme remains unchanged from that of 2015-2016.

### **3.13 Recommendations**

1. THAT monitoring of consented activities at Ahuroa gas storage (AGS) facilities and for the connecting pipeline to Stratford Power Station (SPS) in the 2016-2017 year continue at the same level as in 2015-2016.

## Glossary of common terms and abbreviations

The following abbreviations and terms are used within the report:

AGS	Ahuroa underground gas storage facility
Biomonitoring	Assessing the health of the environment using aquatic organisms
BPO	Best practicable option
Condy	Conductivity, an indication of the level of dissolved salts in a sample, usually measured at 20°C and expressed in mS/m
DRP	Dissolved reactive phosphorus
fresh	Elevated flow in a stream, such as after heavy rainfall
HHV	Higher heating value, the gross heat of combustion, expressed as kilojoules (of gas) per kilowatt-hour (of electricity)
g/m <sup>3</sup>	Grammes per cubic metre, and equivalent to milligrammes 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
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
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
LHV	Lower heating value, the net heat of combustion, expressed as kilojoules (of gas) per kilowatt-hour (of electricity)
L/s	Litres per second
MCI	Macroinvertebrate community index; a numerical indication of the state of biological life in a stream that takes into account the sensitivity of the taxa present to organic pollution in stony habitats
mS/m	MilliSiemens per metre
Mixing zone	The zone below a discharge point where the discharge is not fully mixed with the receiving environment. For a stream, conventionally taken as a length equivalent to 7 times the width of the stream at the discharge point
NH <sub>3</sub>	Un-ionised ammonia, 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)
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 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
psia	Pounds per square inch absolute. The pressure measured is relative to a vacuum rather than the ambient atmospheric pressure
resource consent	Refer Section 98 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 subsequent amendments
SGT	Stratford gas turbine plant, commissioned in 1976 and decommissioned in
Sm <sup>3</sup>	Standard cubic meter
SP1	Stratford peaker 1 plant, commissioned May 2011
SP2	Stratford peaker 2 plant, not constructed
SS	Suspended solids
TCC1	Taranaki combined cycle 1 power plant, commissioned in 1998
TCC2	Taranaki combined cycle 2 power plant, not constructed
Temp	Temperature, measure in °C (degrees Celsius)
Turb	turbidity, expressed in NTU
v/v	Volume for volume, as the ratio between gases in a mixture

For further information on analytical methods, contact the Council's laboratory

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## **Appendix I**

### **Resource consents for Stratford Power Station**

**(For a copy of the signed resource consent  
please contact the TRC consent department)**



**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

Change To                   6 March 2008    [Granted: 10 December 1997]  
Conditions Date:

**Conditions of Consent**

Consent Granted:        To discharge up to 464 litres/second of stormwater from  
                                  the Stratford Power Station Peaking Plant site into an  
                                  unnamed tributary of the Kahouri Stream and into the  
                                  Kahouri Stream in the Patea catchment at or about  
                                  2623900E-6207100N

Expiry Date:             1 June 2016

Review Date(s):         June 2010

Site Location:           Stratford Power Station site, State Highway 43 [East  
                                  Road], Stratford

Legal Description:       Lot 1 DP 19365 Blk II Ngaere SD

Catchment:               Patea

Tributary:                Kahouri

### 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

#### Conditions 1 - 2 [unchanged]

1. That after allowing for a mixing zone of 50 metres, the discharge shall not give rise to any of the following effects in the receiving waters of the Kahouri Stream:
  - 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 objectionable odour;
  - iv) the rendering of fresh water unsuitable for consumption by farm animals; and
  - v) any significant adverse effects on aquatic life.

2. That the components of the discharge shall not exceed the following concentrations:

pH (range)	6-9
Oil and grease (infrared spectroscope technique)	15 gm <sup>-3</sup>
Suspended solids	100 gm <sup>-3</sup>

#### Condition 3 - changed

3. That the discharge of stormwater as licensed by this consent shall be undertaken in accordance with the documentation submitted in support of applications 202 & 4899.

**Condition 4 – unchanged**

4. 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 2010, for the purpose of ensuring that the conditions adequately deal with the environmental effects arising from the exercise of this consent, which were not foreseen at the time the application was considered and which it was not appropriate to deal with at that time.

Signed at Stratford on 6 March 2008

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 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

### **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.

## Consent 4022-2

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  $10 \text{ mg m}^{-3}$  [eight-hour average exposure], or  $30 \text{ mg m}^{-3}$  [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  $20 \text{ ug m}^{-3}$  [twenty-four-hour average exposure], or  $60 \text{ ug m}^{-3}$  [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  $175 \text{ g s}^{-1}$ , or
  - b) *[cancelled]*
  - c) a concentration in any gas turbine stack equivalent to  $100 \text{ mg m}^{-3}$  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.

## Consent 4022-2

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

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**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                   9 February 2010    [Granted: 15 August 1995]  
Conditions Date:

**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

## Consent 4454-1

### 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

## Consent 4454-1

- 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<sup>3</sup> [eight-hour average exposure], or 30 mg/m<sup>3</sup> [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<sup>3</sup> [twenty-four hour average exposure], or 95 µg/m<sup>3</sup> [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<sup>3</sup> 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.

## Consent 4454-1

- 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

**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

### **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.

Consent 4456-1

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  
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 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 at or about 2624600E-6206700N

Expiry Date: 1 June 2028

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

Site Location: Patea River, Approximately 1 km east of the site above the confluence with the Kahouri Stream, State Highway 43 [East Road], Stratford

Legal Description: Patea Riverbed adjoining Pt Sec 121 Blk II Ngaere SD

Catchment: Patea

### **General conditions**

- a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
  - i) the administration, monitoring and supervision of this consent; and
  - ii) charges authorised by regulations.

### **Special conditions**

1. 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.

Consent 4458-1

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**



**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

Decision Date  
[change]: 23 March 2012

Commencement  
Date [change]: 23 March 2012 [Granted: 25 May 1994]

**Conditions of Consent**

Consent Granted: To discharge stormwater from the operation of a power station site at or about (NZTM) 1713810E-5645800N into an unnamed tributary of the Piakau Stream at or about (NZTM) 1713959E-5646039N and into the Kahouri Stream at or about (NZTM) 1713635E-5645679N, both tributaries of the Patea River

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 – TCC1, TCC2/SP2]  
Lot 2 DP 19365, Lot 3 DP 19365 and Sec 134 Blk II  
Ngaere SD  
[Discharge Points] Lot 2 DP 7012 – Kahouri Stream,  
Lot 3 DP 19365 – unnamed tributary of Piakau Stream

Catchment: Patea

Tributary: Kahouri  
Piakau

### 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 forward plans of the upgraded stormwater catchment and treatment system within three months of completion of construction activities.
2. The stormwater discharged shall be from a catchment area not exceeding nine (9) hectares.
3. The following concentrations shall not be exceeded in the discharge:

<b>Component</b>	<b>Concentration</b>
pH [range]	6 - 9
Oil and grease	15 gm <sup>-3</sup>
Suspended solids	100 gm <sup>-3</sup>

This condition shall apply prior to the entry of the stormwater into the receiving waters, at designated sampling points approved by the Chief Executive, Taranaki Regional Council.

4. The consent holder shall prepare and maintain a contingency plan, to the reasonable satisfaction of the Chief Executive, Taranaki Regional Council, for action to be taken in the event of accidental discharge or spillage of contaminants; the initial plan to be provided at least three months prior to the exercise of this consent.
5. After allowing for reasonable mixing in a 5-metre zone from any discharge point, the discharge must not give rise to any or all of the following effects in the receiving waters:
  - a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;

Consent 4459-1

- b) any conspicuous change in the colour or visual clarity;
  - c) any emission of an objectionable odour;
  - d) the rendering of freshwater unsuitable for consumption by farm animals;
  - e) any significant adverse effects on aquatic life, habitats, or ecology;
  - f) any undesirable biological growths.
6. 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, 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 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 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 and above the beds of an unnamed tributary of the Piakau Stream at or about (NZTM) 1713959E-5646039N and of the Kahouri Stream at or about (NZTM) 1713635E-5645679N, both tributaries of the Patea River, structures for the purpose of discharging stormwater from 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 – TCC1, TCC2/SP2]  
Lot 2 DP 19365, Lot 3 DP 19365 and Sec 134 Blk II  
Ngaere SD  
[Discharge Points] Lot 2 DP 7012 – Kahouri Stream,  
Lot 3 DP 19365 – unnamed tributary of Piakau Stream

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) 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.

Consent 4460-1

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 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.

Consent 4461-1

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.

Consent 4462-1

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  
P O Box 10742  
WELLINGTON 6143

Decision Date  
[change]: 23 March 2012

Commencement  
Date [change]: 23 March 2012 [Granted: 24 July 1995]

**Conditions of Consent**

Consent Granted: To erect, place, use and maintain in, over and under the bed of an unnamed tributary of the Kahouri Stream in the Patea catchment at or about (NZTM) 1713735E-5645420N, within the site and adjacent land immediately to the southeast a bridge structure to convey high voltage electricity cables, 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: [Stratford Power Station Site] Lot 1 DP 19365, Lot 2 DP 19365, Lot 3 DP 19365 and Sec 134 Blk II Ngaere SD, [Bridge structure] 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) 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.

Consent 4804-1

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.

Signed at Stratford on 23 March 2012

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 6143

Decision Date  
[change]: 23 March 2012

Commencement  
Date [change]: 23 March 2012 [Granted: 6 December 1996]

**Conditions of Consent**

Consent Granted: 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 at or about (NZTM) 1713753E-5645668N

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: Lot 2 DP 19365 [soakage field]

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. The septic tank and field soakage effluent treatment system shall be installed according to the plan submitted in support of application 96/264.
- 2. At no time shall the discharge directly enter a surface waterbody.
- 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 adequately deal with the environmental effects arising from the exercise of this consent, which were not foreseen at the time the application was considered and which it was not appropriate to deal with at the time.

Signed at Stratford on 23 March 2012

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

### **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  
                                      P O Box 10742  
                                      WELLINGTON 6143

Decision Date               23 March 2012  
[change]:

Commencement              23 March 2012 [Granted: 6 September 2002]  
Date [change]:

**Conditions of Consent**

Consent Granted:           To discharge contaminants to air from power station unit[s]  
                                      and ancillary plant located adjacent to State Highway 43  
                                      [East Road] approximately three kilometres east of  
                                      Stratford at or about (NZTM) 1713810E-5645800N

Expiry Date:                1 June 2034

Review Date(s):            June 2016, June 2022, June 2028

Site Location:              Stratford Power Station Site, State Highway 43 [ East  
                                      Road], Stratford

Legal Description:         [Part of Stratford Power Station Site – TCC2/SP2] Lot 2 DP  
                                      19365 and Sec 134 Blk II Ngaere SD

*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. The power station shall only operate using gas fuel.
2. 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 power station site.
3. 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.
4. The measures representing the best practicable option may be reviewed in accordance with the procedure provided for in conditions 17 and 18.
5. Prior to undertaking any alterations to the plant, processes or operations, as specified in the application and any variation, which may significantly change the nature or quantity of contaminants emitted from the site, the consent holder shall consult with the Chief Executive, Taranaki Regional Council, and shall obtain any necessary approvals under the Resource Management Act 1991 and any amendments.
6. The consent holder shall provide to the Council within two years from the first exercise of this consent and again at four years from the exercise of this consent 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 any cooling tower plume and of carbon dioxide, how these might be applicable and/or implemented at the power station site, and the costs and benefits of these advances; and

- b) detailing an inventory of emissions from the power station 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 power 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;

and should this consent not have been exercised within 4 years of it being granted, then in any case the consent holder shall provide a written report covering matters (a), (c), and (d) above.

7. 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 in conjunction with the exercise of any other consent for the site measured under ambient conditions does not exceed 10 mg/m<sup>3</sup> [eight-hour average exposure], or 30 mg/m<sup>3</sup> [one-hour average exposure] at or beyond the boundary of the site.
8. 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 in conjunction with the exercise of any other consent for the site measured under ambient conditions does not exceed 30 ug/m<sup>3</sup> [annual average exposure] or 200 ug/m<sup>3</sup> [one hour average] at or beyond the boundary of the site.
9. 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 in conjunction with the exercise of any other consent for the site measured at or beyond the boundary of the site is not increased above background levels:
  - a) by more than 1/30th of the relevant Workplace Exposure Standard-Time Weighted Average, or by more than the Workplace Exposure Standard-Short Term Exposure Limit at any time, [all terms as defined in Workplace Exposure Standards, 1994, 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, 1994, Department of Labour].
10. Except in any period of 240 minutes following the initiation of start-up of a generating unit or in any period of 30 minutes prior to the cessation of the generation of electricity, the discharge of nitrogen oxides arising from the exercise of this consent shall not exceed:
  - a) a mass emission rate for the plant of 63 g/s, or
  - b) a mass emission rate per generating unit exhaust stack of [63 divided by n] g/s [where n = number of stacks], or

- c) a concentration in any generating unit exhaust stack equivalent to 50 mg/m<sup>3</sup> at 100°Celsius, or to 50 ppm [volumetric basis].
11. For a maximum of 240 minutes from initiation of combustion of a generating unit until low NO<sub>x</sub> operation is achieved or in any period of 30 minutes prior to the cessation of the generation of electricity, the discharge of nitrogen oxides arising from the exercise of this consent shall not exceed 230 g/s.
12. The minimum height of discharge of products of combustion from a combined cycle plant shall be 35 metres above ground level.
13. 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.
14. 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.
15. 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.
16. This consent shall lapse on 6 December 2017 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.
17. Subject to the provisions of this condition, within six months of receiving a report prepared by the consent holder pursuant to condition 5 of this consent, or during June 2004, and/or June 2010, and/or June 2016, and/or June 2022, and/or June 2028, the Taranaki Regional Council may review any or all of the conditions of this consent, by giving 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.
  - c) altering, adding, or deleting limits on discharge, receiving environment or ambient concentrations of any contaminant or contaminants, for the purpose of dealing with any significant adverse ecological effect on any ecosystem; or
  - d) taking into account any Act of Parliament, regulation, national policy statement or national environmental standard which relates to limiting, recording, or mitigating emissions of carbon dioxide and/or nitrogen dioxide, and which is relevant to the air discharge from the power station.

Consent 5846-1

18. Prior to serving notice of its intention to review any condition, the Council shall allow at least 28 days for consultation with the holder as to whether the purposes in condition 17 would be achieved by a review and whether alternative means could be used to achieve those purposes.

Signed at Stratford on 23 March 2012

For and on behalf of  
Taranaki Regional Council

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**Director-Resource Management**



**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: 27 November 2001]

**Conditions of Consent**

Consent Granted: To take and use up to 19,440 cubic metres/day [225 litres/second averaged over 15 minutes] of water from a water intake structure in the Patea River for cooling and power station purposes at or about 2626000E-6206400N

Expiry Date: 1 June 2034

Review Date(s): June 2010, June 2016, June 2022, June 2028

Site Location: Skinner Road, Stratford

Legal Description: Patea Riverbed adjoining Pt Lot 8 DP 141 Blk III  
Ngaere SD

Catchment: Patea

### General conditions

- a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
  - i) the administration, monitoring and supervision of this consent; and
  - ii) charges authorised by regulations.

### Special conditions

1. The 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. The maximum rate of abstraction authorised by the exercise of this consent shall be managed so that:-
  - a) when the flow in the Patea River at the point of abstraction is more than 1040 litres per second, up to 225 litres per second may be abstracted;
  - b) when the flow in the Patea River at the point of abstraction is between 1040 litres per second and 887 litres per second, a residual flow of at least 812 litres per second shall be maintained at all times in the Patea River downstream of the abstraction point;
  - c) when the flow in the Patea River at the point of abstraction is between 887 litres per second and 695 litres per second, up to 75 litres per second may be abstracted;
  - d) when the flow in the Patea River at the point of abstraction is between 695 litres per second and 620 litres per second, a residual flow of at least 620 litres per second shall be maintained at all times in the Patea River downstream of the abstraction point; and
  - e) when the flow in the Patea River at the point of abstraction is less than 620 litres per second, no abstraction is permitted.

For (c) and (d) abstraction is permitted only if the maximum abstraction permitted under consent 4455 is already being extracted.

The residual flow below the abstraction point and at the point of abstraction will be as measured, or as implied from measurements, at the Taranaki Regional Council Skinner Road recorder [Q20:260-064].

3. The maximum rate of abstraction authorised by the exercise of this consent in combination with Water Permit 4455 shall not exceed 225 litres per second.

Consent 5847-1

4. By the agreement of the consent holder the consent holder shall provide a one off donation to the Taranaki Regional Council of \$100,000 [plus Goods and Services Tax], for the purposes of enhancing the habitat values of the Patea River and/or its tributaries, benefiting the ecological and/or recreational uses of the Patea catchment, or as otherwise agreed between the Manager, Stratford Power Station, and the Chief Executive, Taranaki Regional Council. The donation is payable at the start of the construction of the power station in respect of which this consent has been sought.
5. This consent shall lapse on 6 December 2017 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.
6. 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 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 6 March 2008

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

Change To  
Conditions Date: 6 March 2008 [Granted: 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 Power Stations at East Road, Stratford into the Patea River at or about 2624600E-6206800N

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: Patea Riverbed adjacent to Pt Sec 121 Blk II Ngaere SD

Catchment: Patea

### **General conditions**

- a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
  - i) the administration, monitoring and supervision of this consent; and
  - ii) charges authorised by regulations.

### **Special conditions**

#### **Conditions 1 - 2 [unchanged]**

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.

**Conditions 3 - 4 [changed]**

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 Power Stations, East Road, Stratford, 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 Power Stations, East Road, Stratford. 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.

**Conditions 5 - 15 [unchanged]**

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.

## Consent 5848-1

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:

<b>Component</b>	<b>Concentration</b>
pH [range]	6.0 – 9.0
Total Residual Chlorine	0.05 gm <sup>-3</sup>

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.

Consent 5848-1

15. 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 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 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

Decision Date  
[change]: 23 March 2012

Commencement  
Date [change]: 23 March 2012 [Granted: 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 at or about (NZTM) 1713810E-5645800N

Expiry Date: 1 June 2034

Review Date(s): June 2016, June 2022, June 2028

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  
[Pipeline] Pt Lot 2 DP 7012

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 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 2017 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.

Consent 5849-1

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 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: 27 November 2001]

**Conditions of Consent**

Consent Granted: To erect, place, use and maintain an intake structure and ancillary pipework and pumps in and on the bed, and including disturbance associated with construction of the bed of the Patea River, for the purpose of taking water for Power Stations at East Road, Stratford at or about 2626000E-6206400N

Expiry Date: 1 June 2034

Review Date(s): June 2010, June 2016, June 2022, June 2028

Site Location: Skinner Road, Stratford

Legal Description: Patea Riverbed adjoining Pt Lot 8 DP 141 Blk III  
Ngaere SD

Catchment: Patea

### **General conditions**

- a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
  - i) the administration, monitoring and supervision of this consent; and
  - ii) charges authorised by regulations.

### **Special conditions**

1. The consent holder shall notify the 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. 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. 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. 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. 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. 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. This consent shall lapse on 6 December 2017 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.

Consent 5850-1

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 2010 and/or June 2016 and/or June 2022 and/or June 2028, for the purpose of ensuring that the conditions adequately deal with the environmental effects 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**



**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

Change To  
Conditions Date: 22 February 2007 [Granted: 7 December 2001]

**Conditions of Consent**

Consent Granted: To discharge fine sediment and organic matter from water intake structure screens to the Patea River at or about GR: Q20:260-064

Expiry Date: 1 June 2034

Review Date(s): June 2004, June 2010, June 2016, June 2022, June 2028

Site Location: Skinner Road, Stratford

Legal Description: Patea Riverbed adjoining Pt Lot 8 DP 141 Blk III  
Ngaere SD

Catchment: Patea

### **General conditions**

- a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
  - i) the administration, monitoring and supervision of this consent; and
  - ii) charges authorised by regulations.

### **Special conditions**

#### **Conditions 1 – 2 [unchanged]**

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.

#### **Condition 3 [changed]**

3. This consent shall lapse on 6 December 2017 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.

**Condition 4 [unchanged]**

4. 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 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 22 February 2007

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: 22 February 2007 [Granted: 6 December 2001]

**Conditions of Consent**

Consent Granted: To erect, place, use and maintain a bridge, cables and associated utilities over the Kahouri Stream in the Patea catchment for combined cycle power station purposes at or about GR: Q20:239-071

Expiry Date: 1 June 2034

Review Date(s): June 2004, June 2010, June 2016, June 2022, June 2028

Site Location: Kahouri Stream, Stratford Combined Cycle Power Station Site, State Highway 43 [East Road], Stratford

Legal Description: Pt Sec 108 Blk II Ngaere SD

Catchment: Patea

Tributary: Kahouri

### **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**

#### **Conditions 1 – 6 [unchanged]**

1. Prior to commencing construction the consent holder shall provide final plans and details of the bridge, cables and associated utilities, to the reasonable satisfaction of the Chief Executive, Taranaki Regional Council.
2. The bridge, cables and associated utilities shall be constructed generally in accordance with the plans and details provided under condition 1, and shall be maintained to ensure the conditions of this consent are met.
3. The consent holder shall notify the Taranaki Regional Council in writing at least 48 hours prior to the commencement and upon completion of the initial construction and again at least 48 hours prior to and upon completion of any subsequent maintenance works which would involve disturbance of or deposition to the riverbed or discharges to water.
4. 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.
5. The consent holder shall ensure that the area and volume of riverbed and bank disturbance shall, so far as is practicable, be minimised and any areas which are disturbed shall, so far as is practicable, be reinstated.
6. The 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 the structure[s] removal and reinstatement.

**Condition 7 [changed]**

7. This consent shall lapse on 6 December 2017 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.

**Condition 8 [unchanged]**

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 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 22 February 2007

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

### 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](mailto: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.

## Consent 7247-1

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

### 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](mailto: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.

Consent 7248-1

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

### 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](mailto: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.

Consent 7250-1

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

Consent Granted  
Date: 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)  
1713710E-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

### 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-3538. 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](mailto: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.

Consent 7605-1

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 23 February 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           21 June 2010  
Date:

**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

### 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](mailto: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.

Consent 7653-1

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**



**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

Decision Date: 23 March 2012

Commencement  
Date: 23 March 2012

**Conditions of Consent**

Consent Granted: To discharge stormwater, sediment, dewatering water and washdown water into an unnamed tributary of the Piakau Stream at or about 1713959E-5646039N and into the Kahouri Stream at or about 1713635E-5645679N, from earthworks associated with the construction activities of a power station

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  
[Discharge Points] Pt Lot 2 DP 7012 – Kahouri Stream,  
Lot 3 DP 19365 – unnamed tributary of Piakau Stream

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 to section 36 of the Resource Management Act.

### Special conditions

1. At least 30 working days prior to the commencement of any earthworks, the consent holder shall prepare and submit to the Chief Executive, Taranaki Regional Council, an erosion and sediment control plan. The erosion and sediment control plan shall detail the methodology that will be used to ensure that erosion and sediment control works comply with the conditions of this consent.
2. The consent holder shall at all times adhere to the erosion and sediment control plan approved under condition 1 of this consent. Any changes to the plan approved shall be submitted for certification to the Chief Executive, Taranaki Regional Council prior to being implemented.
3. At least 7 working days prior to the commencement of works the consent holder shall notify the Taranaki Regional Council of the proposed start date for the work. Notification shall include the consent number and a brief description of the activity consented and shall be emailed to [worknotification@trc.govt.nz](mailto:worknotification@trc.govt.nz).
4. All runoff from any un-vegetated area shall pass through settlement ponds or sediment traps with a minimum total capacity of:
  - a) 100 cubic metres for every hectare of exposed soil between 1 November to 30 April; and
  - b) 200 cubic metres for every hectare of exposed soil between 1 May to 31 October; unless other sediment control measures that achieve an equivalent standard are agreed to by the Chief Executive of the Taranaki Regional Council.
5. The obligation described in condition 3 above shall cease to apply, and accordingly the erosion and sediment control measures can be removed, in respect of any particular site or area of any site, only when the site is stabilised.

*Note: For the purpose of conditions 4 and 5 "stabilised" in relation to any site or area means inherently resistant to erosion or rendered resistant, such as by using rock or by the application of basecourse, colluvium, grassing, mulch, or another method to the reasonable satisfaction of the Chief Executive, Taranaki Regional Council and as specified in the Taranaki Regional Council's Guidelines for Earthworks in the Taranaki Region, 2006. Where seeding or grassing is used on a surface that is not otherwise resistant to erosion, the surface is considered stabilised once, on reasonable visual inspection by an officer of the Taranaki Regional Council, an 80% vegetative cover has been established.*

Consent 7785-1

6. All earthworked areas shall be stabilised vegetatively or otherwise as soon as is practicable immediately following completion of soil disturbance activities.

*Note: For the purposes of this condition "stabilised" has the same definition as that set out in condition 4.*

7. 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 actual or likely adverse effect on the environment associated with the discharge of contaminants from the power station site.
8. This consent shall lapse on 6 December 2017, 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.
9. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 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 23 March 2012

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 6143

Decision Date: 23 March 2012

Commencement  
Date: 23 March 2012

**Conditions of Consent**

Consent Granted: To discharge contaminants [dust] to air from earthworks associated with the construction activities of a power station 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

*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 dust discharge shall result from earthworks not exceeding 13 hectares.
2. At least 30 working days prior to the commencement of any earthworks, the consent holder shall prepare and submit to the Chief Executive, Taranaki Regional Council, a dust control management plan. The dust management plan shall detail the methodology that will be used to ensure that discharges to air comply with the conditions of this consent, in particular, special conditions 5 and 6.
3. The consent holder shall at all times adhere to the dust control management plan approved under condition 2 of this consent. Any changes to the plan approved shall be submitted for certification to the Chief Executive, Taranaki Regional Council prior to being implemented.
4. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 48 hours prior to the commencement of earthworks associated with this consent . Notification shall include the consent number and a brief description of the activity consented and be emailed to [worknotification@trc.govt.nz](mailto:worknotification@trc.govt.nz).
5. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.
6. Any discharge to air from the site shall not give rise to any offensive, objectionable, noxious or toxic levels of dust at or beyond the boundary of the property, and in any case, suspended particulate matter shall not exceed 3 mg/ m<sup>3</sup> [measured under ambient conditions] beyond the boundary of the project site.
7. The consent holder shall maintain a permanent record of any complaints received alleging adverse effects from or related to the exercise of this consent. This record shall include the following, where practicable:
  - a. the name and address of the complainant, if supplied;
  - b. date, time and details of the alleged event;
  - c. weather conditions at the time of the alleged event (as far as practicable);
  - d. investigations undertaken by the consent holder in regards to the complaint and any measures adopted to remedy the effects of the incident/complaint; and
  - e. measures put in place to prevent occurrence of a similar incident.

## Consent 7786-1

8. The consent holder shall make the complaints record available to officers of Taranaki Regional Council, on request.
9. The consent holder shall notify the Chief Executive, Taranaki Regional Council of any complaints received, which relate to the exercise of this consent, within 24 hours of being received.
10. This consent shall lapse on 6 December 2017, 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.
11. 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 23 March 2012

For and on behalf of  
Taranaki Regional Council

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**Director-Resource Management**



## **Appendix II**

### **Resource consents for Ahuroa Gas Storage**



**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

Decision Date  
[Change]: 12 January 2011

Commencement  
Date [Change]: 12 January 2011 [Granted: 22 April 2003]

**Conditions of Consent**

Consent Granted: To discharge treated stormwater, uncontaminated treated site water, and uncontaminated treated production water from hydrocarbon exploration and production operations at the Ahuroa-B wellsite onto and into land and into an unnamed tributary of the Makara Stream in the Waitara catchment at or about (NZTM) 1715625E-5652966N

Expiry Date: 1 June 2033

Review Date(s): June 2015, June 2021, June 2027

Site Location: Ahuroa-B wellsite, 1278 Croydon Rd, Stratford  
[Property owner: G & K Bishop]

Legal Description: Lot 1 DP 16297 Blk X Huiroa SD [Discharge source & site]

Catchment: Waitara

Tributary: Makino  
Makara

*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 of the discharge on any water body.
2. The stormwater catchment area shall be no more than 40,000 m<sup>2</sup>.
3. The Chief Executive shall be advised in writing at least 7 days prior to any site works commencing, and again in writing at least 7 days prior to any well drilling operation commencing.
4. The consent holder shall provide and maintain for the written approval of the Chief Executive site specific details relating to contingency planning for the wellsite.
5. All site water and uncontaminated production water to be discharged under this permit shall be directed for treatment through the stormwater treatment system for discharge in accordance with the special conditions of this permit.
6. The design, management and maintenance of the stormwater system shall be generally undertaken in accordance with the information submitted in support of application 6634.
7. Any above ground hazardous substances storage areas shall be bunded with drainage to sumps, or other appropriate recovery systems, and not to the stormwater catchment.
8. The following concentrations shall not be exceeded in the discharge:

<b>Component</b>	<b>Concentration</b>
pH (range)	6.5 - 8.5
suspended solids	100 gm <sup>-3</sup>
total recoverable hydrocarbons [infrared spectroscopic technique]	15 gm <sup>-3</sup>
chloride	50 gm <sup>-3</sup>

This condition shall apply prior to the entry of the treated stormwater, site water and production water either onto and into land, or into surface water, at a designated sampling point approved by the Chief Executive.

9. After allowing for reasonable mixing, within a mixing zone extending downstream of the discharge point[s] to the confluence of the two unnamed tributaries at [NZTM] 1715531E-5653067N the discharge shall not give rise to any of the following effects in the receiving waters of the unnamed tributary:
  - a) an increase in temperature of more than 2 degrees Celsius;
  - b) an increase in biochemical oxygen demand of more than 2.00 gm<sup>-3</sup>.
10. After allowing for reasonable mixing, within a mixing zone extending downstream of the discharge point[s] to the confluence of the two unnamed tributaries at [NZTM] 1715531E-5653067N the discharge shall not give rise to any of the following effects in the receiving waters of the unnamed tributary:
  - 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.
11. The Chief Executive, Taranaki Regional Council, shall be advised in writing at least 48 hours prior to the reinstatement of the site and the reinstatement shall be carried out so as to minimise effects on stormwater quality.
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 2009 and/or June 2015 and/or June 2021 and/or June 2027, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 12 January 2011

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 6143

Decision Date: 16 July 2003

Commencement Date: 16 July 2003

**Conditions of Consent**

Consent Granted: To discharge solid drilling wastes from hydrocarbon exploration operations at the Ahuroa-B wellsite by mix-bury-cover at or about (NZTM) 1715527E-5652866N

Expiry Date: 1 June 2021

Review Date(s): June 2009, June 2015

Site Location: Ahuroa-B Wellsite, Croydon Road, Te Popo  
[Property owner: G & K Bishop]

Legal Description: Lot 1 DP 16297 Blk X Huiroa SD

Catchment: Waitara

Tributary: Makara

*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. This resource consent allows for the discharge of up to 1500 m<sup>3</sup> per well of solid drilling wastes [drill cuttings and residual fluids] by way of mix-bury-cover [MBC] into land on the Ahuroa-B Wellsite and surrounding land. MBC discharge areas for wastes from individual wells shall be kept separate and distinct.
2. Prior to the exercise of this consent for each separate mix-bury-cover [MBC] discharge the consent holder shall provide to the written satisfaction of the Chief Executive a report describing proposed MBC, including area, location, nature of material, means of compliance with conditions, etc, and the results of any relevant monitoring of existing MBC discharge sites under this consent. In any case additional MBC discharges shall not take place under this consent within 12 months of any previous MBC discharge, unless this requirement is waived in writing by the Chief Executive.
3. The resource consent holder shall notify the Taranaki Regional Council at least 48 hours prior to commencement, and upon completion of any discharge.
4. The resource consent holder shall ensure that the discharge, licensed by this resource consent, takes place in general accordance with the information submitted in support of application 2198. In particular but without limitation, any amendment to location of mix-bury-cover [MBC], pre-treatment of solids, changes to fluids/additives, method of MBC, or post burial site management, shall be advised to the Chief Executive, and shall not provide or result in any less environmental protection than that set out or provided for in the information submitted in support of application 2198.
5. The consent holder shall keep records of composition and volumes of the material to be discharged, including records of quantities and types of drilling fluids and additives used [materials and their composition], and shall forward the records to the Taranaki Regional Council prior to the discharge.
6. The edge of the mix-bury-cover zone shall be at least 30 metres from any surface water body, or any water supply bore.

## Consent 5173-2

7. All ponded water shall be removed from the sump prior to the recovery/mixing operation.
8. The impermeable liner shall be perforated, and where possible removed, so that it no longer encloses the solid drilling wastes.
9. The solid drilling wastes [drill cuttings and residual fluids] shall be incorporated with uncontaminated soils with a mixing ratio of 1 part solid drilling wastes [drill cuttings, additives and residual fluids] to a minimum of 1 part uncontaminated soil.
10. The placement of the solid drilling wastes [drill cuttings and residual fluids] shall as far as practicable be above the watertable.
11. The loading in the disposed solid drilling wastes for each distinct mix-bury-cover disposal area for wastes from an individual well must not exceed those listed in Table 3-1 of the Alberta Energy and Utilities Board, 1996, G-50 guidelines.
12. Post disposal chloride levels in the cover soil layer shall not exceed 2,000 mg kg<sup>-1</sup>.
13. The loading of chloride must not exceed 1,600 kg for each distinct mix-bury-cover disposal area for wastes from an individual well.
14. The loading of nitrogen must not exceed 400 kg for each distinct mix-bury-cover disposal area for wastes from an individual well.
15. The hydrocarbon content of the soil waste mix shall not exceed 0.1% [1000 mg/kg] on a dry weight basis.
16. The exercise of this consent shall not result in a level of total dissolved salts within any surface or groundwater of more than 2500 gm<sup>-3</sup>.
17. The disposal of solid drilling wastes shall comply with the heavy metal receiving environment concentration limits specified in Table C, Section 9, Public Guidelines for the Safe Use of Sewage Effluent and Sewage Sludge on Land, Ministry of Health, 1992.
18. The solid drilling wastes [drill cuttings and residual fluids] shall be covered by at least 0.5 m of uncontaminated soil, and shall be revegetated and thereafter maintained with pasture cover within 6 months of the completion of any mix-bury-cover operation.
19. The consent holder shall compact, contour, and maintain the cover layer of soil so as to ensure its integrity at all times to the satisfaction of the Chief Executive.
20. The consent holder shall adopt the best practicable option [as defined in the Resource Management Act 1991] to prevent or minimise any actual or potential effects on the environment arising from the discharge, including but not limited to any water body or soil.
21. The exercise of this resource consent, including the design, management and implementation of the mix-bury-cover discharge, shall not lead, or be liable to lead, to contaminants directly entering a surface water body from overland surface flows.

## Consent 5173-2

22. The exercise of the resource consent shall not result in any adverse impacts on groundwater as a result of leaching, or surface water including aquatic ecosystems, and/or result in a change to the suitability of use of the receiving water as determined by the Chief Executive.
23. At any time, the levels of hydrocarbons in the soil shall comply with the guideline values for the designated soil type in the surface layer [less than 0.5 metre depth] set out in Tables 4.12 and 4.15 of the Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand [Ministry for the Environment, 1999].
24. At any time, the upper [less than 0.5 metre depth] soil levels shall not exceed the following limits: conductivity, 290 mSm<sup>-1</sup>; total dissolved salts, 2500 gm<sup>-3</sup>; sodium 460 gm<sup>-3</sup>; and chloride 700 gm<sup>-3</sup>.
25. This resource consent shall lapse on the expiry of six years after the date of issue of this resource consent, unless the resource 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.
26. The consent holder may apply to the Taranaki Regional Council for a change or cancellation of any of the conditions of this resource consent in accordance with section 127(1)(a) of the Resource Management Act 1991 to take account of operational requirements or the results of monitoring.
27. The Taranaki Regional Council may review any or all of the conditions of this resource consent within two months of receiving data on the volume and composition of the material under condition 5, for the purpose of assessing the adequacy of monitoring and mitigation measures.
28. 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 2009 and/or June 2015, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Transferred at Stratford on 15 November 2013

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 6143

Decision Date  
[Change]: 7 April 2011

Commencement  
Date [Change]: 7 April 2011 [Granted: 2 December 2008]

**Conditions of Consent**

Consent Granted: To discharge contaminants [natural gas] into land for the  
purpose of gas storage at or about (NZTM)  
1715630E-5652960N

Expiry Date: 1 June 2027

Review Date(s): June 2015, June 2021

Site Location: Ahuroa-B wellsite, Barleymans Road, Tariki  
[Property owners: GN & KA Bishop]

Legal Description: Lot 1 DP 16297 Blk X Huiroa SD

Catchment: Waitara

Tributary: Makino  
Makara

*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. Notwithstanding any other condition of this consent, 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. Any gas discharged into the ground pursuant to this consent shall meet NZ5442 specifications.
- 3. The pressure within the gas reservoir shall not exceed 3400psia.
- 4. The consent holder shall continuously record the injection pressure, and establish and maintain a correlation between the injection pressure and pressure within the gas reservoir, so that the reservoir pressure can be monitored at all time to determine compliance with condition 3. The pressure records shall be made available to the Council on request.
- 5. This consent shall lapse on 31 December 2013, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

Consent 7432-1

6. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2015 and/or June 2021, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 7 April 2011

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 6143

Decision Date: 6 April 2010

Commencement Date: 6 April 2010

**Conditions of Consent**

Consent Granted: To discharge stormwater and sediment from earthworks into two unnamed tributaries of the Makara Stream, associated with site development at the Ahuroa-B wellsite at or about (NZTM) 1715699E-5652829N

Expiry Date: 1 June 2027

Review Date(s): June 2015, June 2021

Site Location: Ahuroa-B wellsite, 1278 Croydon Road, Stratford  
[Property owner: GS & KA Bishop]

Legal Description: Pt Lot 1 DP 2699 Blk X Huiroa SD

Catchment: Waitara

Tributary: Makino  
Makara

*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 6461. Specifically this includes Appendix B and plans NZ-2784-20-SK-0001/2 and NZ-2784-20-SK-0001/1. If there is any conflict between the documentation submitted in support of application 6461 and the conditions of this consent, the conditions of this consent shall prevail.
2. If any area of soil is exposed, all run off from that area shall pass through settlement ponds or sediment traps with a minimum total capacity of;
  - a) 100 cubic metres for every hectare of exposed soil between 1 November to 30 April; and
  - b) 200 cubic metres for every hectare of exposed soil between 1 May to 31 October;

unless other sediment control measures that achieve an equivalent standard are agreed to by the Chief Executive of the Taranaki Regional Council.

3. At least 7 working days prior to the commencement of works the consent holder shall notify the Taranaki Regional Council of the proposed start date for the work. Notification shall include the consent number and a brief description of the activity consented and shall be emailed to [worknotification@trc.govt.nz](mailto:worknotification@trc.govt.nz). Notification by fax or post is acceptable only if the consent holder does not have access to email.
4. All earthwork areas shall be stabilised vegetatively or otherwise as soon as is practicable immediately following completion of soil disturbance activities.
5. 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.

## Consent 7621-1

6. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2015 and/or June 2021, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 15 November 2013

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: 6 April 2010

Commencement Date: 6 April 2010

**Conditions of Consent**

Consent Granted: To install, use and maintain a culvert in an unnamed tributary of the Makara Stream in the Waitara catchment at or about (NZTM) 1715738E-5652776N

Expiry Date: 1 June 2027

Review Date(s): June 2015, June 2021

Site Location: Ahuroa-B wellsite, 1278 Croydon Road, Stratford  
[Property owner: GS & KA Bishop]

Legal Description: Lot 1 DP 16297 Blk X Huiroa SD

Catchment: Waitara

Tributary: Makino  
Makara

*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 culvert pipe shall have a diameter no less than 600 and be no longer than 22 metres.
2. The fill over the top of the culvert pipe shall be no deeper than 2.5 metres.
3. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 2 working days prior to the commencement and upon completion of the initial installation and again at least 2 working days to and upon completion of any subsequent maintenance works which would involve disturbance of or deposition to the river bed or discharges to water. Notification shall include the consent number and a brief description of the activity consented and be emailed to [worknotification@trc.govt.nz](mailto:worknotification@trc.govt.nz). Notification by fax or post is acceptable only if the consent holder does not have access to email.
4. The consent holder shall ensure that the area and volume of stream bed disturbance is, as far as practicable, minimised and any areas that are disturbed are, as far as practicable, reinstated.
5. The culvert shall not obstruct fish passage.
6. The invert of the culvert shall at all times be slightly lower than the level of the surrounding riverbed so that it fills with bed material and simulates the natural bed.
7. The gradient of the culvert shall be no steeper than the natural gradient of the stream bed at the site.
8. 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.

9. The works shall remain the responsibility of the consent holder and be maintained so that:
  - a) it does not become blocked and at all times allows the free flow of water through it;
  - b) any erosion, scour or instability of the stream bed or banks that is attributable to the works carried out as part of this consent is remedied by the consent holder.

Consent 7622-1

10. Except with the written agreement of the Chief Executive, Taranaki Regional Council, the culvert shall be removed and the area reinstated, if and when it 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.
11. 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.
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 2015 and/or June 2021, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 15 November 2013

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 6143

Decision Date: 06 October 2009

Commencement  
Date: 06 October 2009

**Conditions of Consent**

Consent Granted: To discharge emissions to air from flaring of hydrocarbons associated with well clean-up and well testing associated with exploration activities at the Ahuroa-B wellsite at or about (NZTM) 1715699E-5652954N

Expiry Date: 1 June 2028

Review Date(s): June 2016, June 2022

Site Location: Ahuroa-B wellsite, Barleymans Road, Stratford  
[Property owner: G & K Bishop]

Legal Description: Lot 1 DP 16297 Blk X Huiroa SD

*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**

#### **Exercise of consent**

1. Flaring shall not occur for more than 45 days, cumulatively, per zone for each well.

#### **Information and notification**

2. The consent holder shall notify the Chief Executive, Taranaki Regional Council, at least 24 hours before the initial flaring of any new zone being commenced. Notification shall include the consent number and a brief description of the activity consented and be emailed to [worknotification@trc.govt.nz](mailto:worknotification@trc.govt.nz).
3. At least 24 hours before any flaring, other than in emergencies, the consent holder shall provide notification to all residents within 1000 metres of the wellsite[s] of the commencement of flaring. The consent holder shall include in the notification a 24-hour contact telephone number for a representative of the consent holder, and shall keep and make available to the Chief Executive, Taranaki Regional Council, a record of all queries and complaints received in respect of any flaring activity.
4. No alteration shall be made to plant equipment or processes which may substantially alter the nature or quantity of flare emissions or other wellsite emissions, including but not limited to the recovery of produced gas, other than as authorised by this consent, without prior consultation with the Chief Executive, Taranaki Regional Council.

#### **Flaring**

5. Other than for the maintenance of a pilot flare flames, the consent holder shall have regard to the prevailing and predicted wind speed and direction at the time of initiation of, and throughout, any episode of flaring so as to minimise offsite effects.
6. All gas that is flared during well clean-up, drill stem testing, initial testing, well workovers, or production testing, or at any other time, must first be treated by effective liquid and solid separation and recovery, to ensure that smoke emission during flaring is minimised.
7. If separation required by condition 6 cannot be implemented or maintained at any time while there is a flow from the well, whether natural or induced, then the consent holder shall immediately advise the Compliance Manager, Taranaki Regional Council, and shall in any case re-establish liquid separation and recovery within three hours.

## Consent 7745-1

8. Subject to special condition 7, no liquid or solid hydrocarbons shall be combusted through the gas flare system.
9. The gas shall be combusted so that emissions of smoke are minimised.
10. The consent holder shall adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or potential effect on the environment arising from any emission to air from the flare or any other emissions to air from the wellsites authorised under this consent [including use of a separator during well clean-up].
11. Only substances originating from the well stream and treated as outlined by conditions 6, 7, 8, 9, and 10 shall be combusted within the flare pits.
12. There shall not be any objectionable or offensive odour or smoke at or beyond the boundaries of the properties where the wellsites are located.
13. The opacity of any smoke emissions shall not exceed a level of 1, as measured on the Ringelmann Scale, for more than 4 minutes cumulative duration in any 60 minute period.
14. The consent holder shall control all emissions of carbon monoxide to the atmosphere from the flares so that, whether alone or in conjunction with any other emissions from the wellsites, the maximum ground level concentration of carbon monoxide arising from the exercise of this consent measured under ambient conditions does not exceed 10 milligrams per cubic metre [ $\text{mg}/\text{m}^3$ ] [eight-hour average exposure], or 30  $\text{mg}/\text{m}^3$  one-hour average exposure] at or beyond the boundaries of the property where the wellsites are located.
15. The consent holder shall control all emissions of nitrogen oxides to the atmosphere from the flares, so that whether alone or in conjunction with any other emissions from the wellsites, the maximum ground level concentration of nitrogen dioxide arising from the exercise of this consent measured under ambient conditions does not exceed 100 micrograms per cubic metre [ $\mu\text{g}/\text{m}^3$ ] [24-hour average exposure], or 200  $\mu\text{g}/\text{m}^3$  [1-hour average exposure] at or beyond the boundaries of the properties where the wellsites are located.
16. The consent holder shall control emissions to the atmosphere from the wellsites and flares of contaminants other than carbon dioxide, carbon monoxide, and nitrogen oxides, so that whether alone or in conjunction with any emissions from the flare, the maximum ground level concentration for any particular contaminant arising from the exercise of this consent measured at or beyond the boundaries of the property where the wellsites are located, is not increased above background levels:
  - a) by more than 1/30<sup>th</sup> 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, 2002, 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, 2002, Department of Labour].

### **Recording and reporting information**

17. The consent holder shall make available to the Chief Executive, Taranaki Regional Council, upon request, an analysis of a typical gas and condensate stream from the field, covering sulphur compound content and the content of carbon compounds of structure C<sub>6</sub> or higher number of compounds.
18. Each time there is visible smoke as a result of the exercise of this consent, the consent holder shall record the time, duration and cause. The consent holder shall make the record available to the Chief Executive, Taranaki Regional Council, upon request.
19. The consent holder shall record and make available to the Chief Executive, Taranaki Regional Council, logs of all flaring, including time, duration, zone, and volumes of substances flared.

### **Review**

20. 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 any of the following purposes:
  - a) dealing with any significant adverse effect on the environment arising from the exercise of the consent which was not foreseen at the time the application was considered or which it was not appropriate to deal with at the time; and/or
  - b) requiring the consent holder to adopt the best practicable option to remove or reduce any adverse effect on the environment caused by the discharge; and/or
  - c) to alter, add or delete limits on mass discharge quantities or discharge or ambient concentrations of any contaminant.

Transferred at Stratford on 12 January 2011

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 6143

Decision Date: 06 October 2009

Commencement  
Date: 06 October 2009

**Conditions of Consent**

Consent Granted: To discharge emissions to air during flaring from well workovers and in emergency situations associated with production activities at the Ahuroa-B wellsite, together with miscellaneous emissions at or about (NZTM) 1715699E-5652954N

Expiry Date: 1 June 2028

Review Date(s): June 2016, June 2022

Site Location: Ahuroa-B wellsite, Barleymans Road, Stratford  
[Property owner: G & K Bishop]

Legal Description: Lot 1 DP 16297 Blk X Huiroa SD

*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**

#### **Information and notification**

1. Other than in emergencies, the consent holder shall notify the Chief Executive, Taranaki Regional Council, whenever the continuous flaring of hydrocarbons [other than purge gas] is expected to occur for more than five minutes in duration. Notification shall be no less than 24 hours before the flaring commences. Notification shall include the consent number and be emailed to [worknotification@trc.govt.nz](mailto:worknotification@trc.govt.nz).
2. At least 24 hours before any flaring, other than in emergencies, the consent holder shall provide notification to all residents within 1000 metres of the site[s] of the commencement of flaring. The consent holder shall include in the notification a 24-hour contact telephone number for a representative of the consent holder, and shall keep and make available to the Chief Executive, Taranaki Regional Council, a record of all queries and complaints received in respect of any flaring activity.
3. No alteration shall be made to plant equipment or processes which may substantially alter the nature or quantity of flare emissions or other site emissions, including but not limited to the recovery of produced gas, other than as authorised by this consent , without prior consultation with the Chief Executive, Taranaki Regional Council.

#### **Emissions from the site**

4. Other than for the maintenance of a pilot flare flame, the consent holder shall have regard to the prevailing and predicted wind speed and direction at the time of initiation of, and throughout, any episode of flaring so as to minimise offsite effects.
5. All gas that is flared must first be treated by effective liquid and solid separation and recovery to ensure that smoke emission during flaring is minimised.
6. If separation required by special condition 5 cannot be implemented or maintained at any time while there is a flow from the well, whether natural or induced, then the consent holder shall immediately advise the Compliance Manager, Taranaki Regional Council, and shall in any case re-establish liquid and solid separation and recovery within three hours.

## Consent 7746-1

7. Subject to special condition 6, no liquid or solid hydrocarbons shall be combusted through the gas flare system, other than in an emergency.
8. Notwithstanding any other condition of this consent the consent holder shall adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or potential effect on the environment arising from any emission to air from the flare or any other emissions to air from the wellsites authorised under this consent [including use of a separator during well clean-up].
9. Only substances originating from the well stream and treated as outlined by conditions 5, 6, 7, and 8 shall be combusted within the flare pit.
10. There shall not be any objectionable or offensive odour or smoke at or beyond the boundaries of the properties where the wellsites are located.
11. All hydrocarbon storage vessels shall be fitted with vapour recovery systems.
12. The opacity of any smoke emissions shall not exceed a level of 1, as measured on the Ringelmann Scale, for more than 4 minutes cumulative duration in any 60 minute period.
13. The consent holder shall control all emissions of carbon monoxide to the atmosphere from the flare so that, whether alone or in conjunction with any other emissions from the wellsite, the maximum ground level concentration of carbon monoxide arising from the exercise of this consent measured under ambient conditions does not exceed 10 milligrams per cubic metre [ $\text{mg}/\text{m}^3$ ] [eight-hour average exposure], or 30  $\text{mg}/\text{m}^3$  one-hour average exposure] at or beyond the boundaries of the properties where the wellsites are located.
14. The consent holder shall control all emissions of nitrogen oxides to the atmosphere from the flares so that, whether alone or in conjunction with any other emissions from the wellsites, the maximum ground level concentration of nitrogen dioxide arising from the exercise of this consent measured under ambient conditions does not exceed 100 micrograms per cubic metre [ $\mu\text{g}/\text{m}^3$ ] [24-hour average exposure], or 200  $\mu\text{g}/\text{m}^3$  [1-hour average exposure] at or beyond the boundaries of the of the properties where the wellsites are located.
15. The consent holder shall control emissions to the atmosphere from the wellsites and flare of contaminants other than carbon dioxide, carbon monoxide, and nitrogen oxides so that, whether alone or in conjunction with any emissions from the flares, the maximum ground level concentration for any particular contaminant arising from the exercise of this consent measured at or beyond the boundaries of the properties where the wellsites are located, is not increased above background levels:
  - a) by more than 1/30<sup>th</sup> 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, 2002, 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, 2002, Department of Labour].

### **Recording and reporting information**

- 16. The consent holder shall make available to the Chief Executive, Taranaki Regional Council, upon request, an analysis of a typical gas and condensate stream from the field, covering sulphur compound content and the content of carbon compounds of structure C<sub>6</sub> or higher number of compounds.
- 17. Each time there is visible smoke as a result of the exercise of this consent, the consent holder shall record the time, duration and cause. The consent holder shall make the record available to the Chief Executive, Taranaki Regional Council, upon request.
- 18. The consent holder shall record and maintain a log of all continuous flaring events longer than five minutes duration, and any intermittent flaring lasting for an aggregate of ten minutes or longer in any 120-minute period. The log shall contain the date, the start and finish times of the flaring event, the quantity and type of material flared, and the reason for flaring. The log shall be made available to the Chief Executive, Taranaki Regional Council, upon request, and summarised annually in the report required under condition 19.
- 19. The consent holder shall provide to the Taranaki Regional Council during May of each year, for the duration of this consent, a report:
  - i) detailing any energy efficiency measures implemented on the site;
  - ii) detailing smoke emissions as required under condition 17;
  - iii) detailing any measures undertaken or proposed to reduce smoke emissions;
  - iv) detailing any measures undertaken or proposed to reduce flaring;
  - v) addressing any other issue relevant to the minimisation or mitigation of emissions from the flare;
  - vi) detailing any complaints received and any measures undertaken to address complaints; and
  - vii) reviewing all options and technological advances relevant to the reduction or mitigation of any discharge to air from the site, how these might be applicable and/or implemented at the site, and the benefits and costs of these advances.

### **Review**

- 20. 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 any of the following purposes:
  - a) dealing with any significant adverse effect on the environment arising from the exercise of the consent which was not foreseen at the time the application was considered or which it was not appropriate to deal with at the time; and/or

Consent 7746-1

- b) requiring the consent holder to adopt the best practicable option to remove or reduce any adverse effect on the environment caused by the discharge; and/or
- c) to alter, add or delete limits on mass discharge quantities or discharge or ambient concentrations of any contaminant.

Transferred at Stratford on 12 January 2011

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 6143

Decision Date: 18 January 2011

Commencement  
Date: 18 January 2011

**Conditions of Consent**

Consent Granted: To discharge stormwater and sediment from earthworks during the construction of the extension of the Ahuroa-B wellsite onto and into land at or about (NZTM) 1715527E-5652866N

Expiry Date: 1 June 2027

Review Date(s): June 2015, June 2021

Site Location: Ahuroa-B wellsite, 1278 Croydon Rd, Stratford  
[Property owner: G & K Bishop]

Legal Description: Pt Lot 1 DP 2699 Blk X Huiroa SD  
[Discharge source & site]

Catchment: Waitara

Tributary: Makino  
Makara

*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 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 actual or likely adverse effect on the environment associated with the discharge of contaminants from the site.
2. If any area of soil is exposed, all run off from that area shall pass through settlement ponds or sediment traps with a minimum total capacity of;
  - a) 100 cubic metres for every hectare of exposed soil between 1 November to 30 April; and
  - b) 200 cubic metres for every hectare of exposed soil between 1 May to 31 October;unless other sediment control measures that achieve an equivalent standard are agreed to by the Chief Executive of the Taranaki Regional Council.
3. The obligation described in condition 2 above shall cease to apply, and accordingly the erosion and sediment control measures can be removed, in respect of any particular site or area of any site, only when the site is stabilised.

*Note: For the purpose of conditions 3 and 4 "stabilised" in relation to any site or area means inherently resistant to erosion or rendered resistant, such as by using rock or by the application of basecourse, colluvium, grassing, mulch, or another method to the reasonable satisfaction of the Chief Executive, Taranaki Regional Council and as specified in the Taranaki Regional Council's Guidelines for Earthworks in the Taranaki Region, 2006. Where seeding or grassing is used on a surface that is not otherwise resistant to erosion, the surface is considered stabilised once, on reasonable visual inspection by an officer of the Taranaki Regional Council, an 80% vegetative cover has been established.*

4. All earthworked areas shall be stabilised vegetatively or otherwise as soon as is practicable immediately following completion of soil disturbance activities.

*Note: For the purposes of this condition "stabilised" has the same definition as that set out in condition 3.*

5. At least 7 working days prior to the commencement of works the consent holder shall notify the Taranaki Regional Council of the proposed start date for the work. Notification shall include the consent number and a brief description of the activity consented and shall be emailed to [worknotification@trc.govt.nz](mailto:worknotification@trc.govt.nz).
6. This consent shall lapse on 31 March 2016, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

Consent 7748-1

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 2015 and/or June 2021 for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 18 January 2011

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: 18 January 2011

Commencement  
Date: 18 January 2011

**Conditions of Consent**

Consent Granted: To install and use a pipe in the bed of an unnamed tributary of the Makara Stream, including the associated reclamation, disturbance and deposition of material between (NZTM) 1715533E-5652692N and 1715550E-5652821N

Expiry Date: 1 June 2027

Review Date(s): June 2015, June 2021

Site Location: Ahuroa-B wellsite, 1278 Croydon Road, Stratford  
[Property owner: G & K Bishop]

Legal Description: Pt Lot 1 DP 2699 Blk X Huiroa SD [Site of structure]

Catchment: Waitara

Tributary: Makino  
Makara

*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. This consent authorises the laying pipe in 140 metres of stream bed and subsequently filling the piped reach between grid references [NZTM] 1715533E-5652692N and 1715550E-5652821N.
2. The pipe shall have a diameter of not less than 600 mm.
3. The piping shall be maintained to ensure it does not become blocked and at all times allows the free flow of water through it.
4. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 2 working days prior to the commencement and upon completion of the initial installation and again at least 2 working days to and upon completion of any subsequent maintenance works which would involve disturbance of or deposition to the river bed or discharges to water. Notification shall include the consent number and a brief description of the activity consented and be emailed to [worknotification@trc.govt.nz](mailto:worknotification@trc.govt.nz).
5. Any instream works shall take place only between 1 November and 30 April inclusive.
6. 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.

7. No vegetation shall be buried within 20 metres of the stream.
8. In the event that any archaeological remains are discovered as a result of works authorised by this consent, the works shall cease immediately at the affected site and tangata whenua and the Chief Executive, Taranaki Regional Council, shall be notified within one working day. Works may recommence at the affected area when advised to do so by the Chief Executive, Taranaki Regional Council. Such advice shall be given after the Chief Executive has considered: tangata whenua interest and values, the consent holder's interests, the interests of the public generally, and any archaeological or scientific evidence. The New Zealand Police, Coroner, and Historic Places Trust shall also be contacted as appropriate, and the work shall not recommence in the affected area until any necessary statutory authorisations or consents have been obtained.

Consent 7749-1

9. This consent shall lapse on 31 March 2016, 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.
10. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2015 and/or June 2021, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 18 January 2011

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 78  
Stratford 4352

Decision Date  
(Change): 16 March 2016

Commencement Date  
(Change): 16 March 2016 (Granted Date: 18 January 2011)

**Conditions of Consent**

Consent Granted: To place and use a culvert in an unnamed tributary of the  
Makara Stream for access purposes

Expiry Date: 1 June 2027

Review Date(s): June 2021

Site Location: Ahuroa-B wellsite, 1278 Croydon Road, Stratford

Grid Reference (NZTM) 1715558E-5652753N

Catchment: Waitara

Tributary Makino  
Makara

*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 culvert shall be constructed in accordance with the plan prepared by Transfield Worley Hawkins titled "Ahuroa Gas Storage Project Stage 2B/2C Sediment & Drainage Management" reference NZ-W820-15-EA-0001/2, provided to the Council with application 6637. In the case of any contradiction between the drawing[s] and the conditions of this consent, the conditions of this consent shall prevail.
2. The culvert pipe shall have a diameter no less than 600 mm and be no longer than 20 metres.
3. The fill over the top of the culvert pipe shall be no deeper than 4 metres.
4. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 2 working days prior to the commencement and upon completion of the initial installation. Notification shall include the consent number and a brief description of the activity consented and be emailed to [worknotification@trc.govt.nz](mailto:worknotification@trc.govt.nz).
5. Any instream works shall take place only between 1 November and 30 April inclusive.
6. The consent holder shall ensure that the area and volume of stream bed disturbance is, as far as practicable, minimised and any areas that are disturbed are, as far as practicable, reinstated.
7. The culvert shall not obstruct fish passage.
8. The invert of the culvert shall at all times be slightly lower than the level of the surrounding riverbed so that it fills with bed material and simulates the natural bed.
9. The gradient of the culvert shall be no steeper than the natural gradient of the stream bed at the site.
10. 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.

## Consent 7750-1.1

11. The works shall remain the responsibility of the consent holder and be maintained so that:
  - a. it does not become blocked and at all times allows the free flow of water through it;
  - b. any erosion, scour or instability of the stream bed or banks that is attributable to the works carried out as part of this consent is remedied by the consent holder.
12. Except with the written agreement of the Chief Executive, Taranaki Regional Council, the culvert shall be removed and the area reinstated, if and when it 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.
13. This consent shall lapse on 1 June 2027, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.
14. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2015 and/or June 2021, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 16 March 2016

For and on behalf of  
Taranaki Regional Council

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A D McLay  
**Director - Resource Management**



## **Appendix III**

### **Resource consents for AGS to SPS pipeline**



**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

Decision Date: 30 August 2012

Commencement  
Date: 30 August 2012

**Conditions of Consent**

Consent Granted: To discharge stormwater and sediment from earthworks associated with the construction and installation of a pipeline between the Ahuroa-B wellsite and Stratford Power Station onto and into land in circumstances where it may enter surface water between (NZTM) 1715545E-5652969N and 1713576E-5645663N

Expiry Date: 1 June 2017

Site Location: Pipeline route between Ahuroa-B wellsite and the Stratford Power Station

Legal Description: Various

Catchment: Patea  
Waitara

Tributary: Kahouri  
Makara  
Ahuroa  
Pikau

*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 with section 36 of the Resource Management Act.

### Special conditions

1. The discharge of stormwater and sediment authorised by this consent, shall only originate from works associated with the installation and construction of the pipeline in accordance with details submitted with application 7151.
2. At least 7 working days prior to the commencement of works the consent holder shall notify the Taranaki Regional Council of the proposed start date for the work. Notification shall include the consent number and a brief description of the activity consented and shall be emailed to [worknotification@trc.govt.nz](mailto:worknotification@trc.govt.nz).
3. All discharge which may enter surface water from any unvegetated area shall pass through settlement ponds or sediment traps with a minimum total capacity of:
  - a) 100 cubic metres for every hectare of exposed soil between 1 November to 30 April; and
  - b) 200 cubic metres for every hectare of exposed soil between 1 May to 31 October; unless other sediment control measures that achieve an equivalent standard are agreed to by the Chief Executive of the Taranaki Regional Council.
4. The obligation described in condition 3 above shall cease to apply, and accordingly the erosion and sediment control measures can be removed, in respect of any particular site or area of any site, only when the site is stabilised.
5. All earthworked areas shall be stabilised vegetatively or otherwise as soon as is practicable immediately following completion of soil disturbance activities.

*Note: For the purpose of conditions 4 and 5 "stabilised" in relation to any site or area means inherently resistant to erosion or rendered resistant, such as by using rock or by the application of basecourse, colluvium, grassing, mulch, or another method to the reasonable satisfaction of the Chief Executive, Taranaki Regional Council and as specified in the Taranaki Regional Council's Guidelines for Earthworks in the Taranaki Region, 2006. Where seeding or grassing is used on a surface that is not otherwise resistant to erosion, the surface is considered stabilised once, on reasonable visual inspection by an officer of the Taranaki Regional Council, an 80% vegetative cover has been established.*
6. 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 actual or likely adverse effect on the environment associated with the discharge of contaminants from the site.

Consent 9307-1

7. This consent shall lapse on 30 September 2017, 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.

Signed at Stratford on 30 August 2012

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 6143

Decision Date: 30 August 2012

Commencement  
Date: 30 August 2012

**Conditions of Consent**

Consent Granted: To take and use water from the Kahouri Stream for hydrostatic testing of pipelines at or about (NZTM) 1713550E-5645800N

Expiry Date: 1 June 2017

Site Location: East Road, Stratford [Property owner: Hwitan Tune Farm Trusts Partnership]

Legal Description: Lot 2 DP 20934 Blk II Ngaere SD [site of take]

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 with section 36 of the Resource Management Act.

**Special conditions**

1. The total volume of water taken shall not exceed 1500 cubic metres.
2. The consent holder shall maintain a record of the take including date, rate, pumping hours and volume abstracted and supply these records to the Chief Executive, Taranaki Regional Council, upon request.
3. At all times 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 abstraction of water, including, but not limited to, the efficient and conservative use of water.
4. The consent holder shall ensure that the intake is screened and designed to avoid fish entering the intake or being trapped against the screen.
5. This consent shall lapse on 30 September 2017, 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.

Signed at Stratford on 30 August 2012

For and on behalf of  
Taranaki Regional Council

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**Chief Executive**

Consents 9309-1, 9310-1, 9311-1, 9312-1, 9313-1, 9314-1, 9315-1  
9316-1, 9317-1, 9318-1, 9319-1, 9320-1, 9321-1, 9322-1

**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: 30 August 2012

Commencement  
Date: 30 August 2012

**Conditions of Consent**

Consent Granted: To install and use a pipeline for conveying gaseous hydrocarbons under the bed of the Kahouri and Piakau Streams, and 12 unnamed tributaries of the Makara, Ahuroa, Kahouri and Piakau Streams

Expiry Date: 1 June 2028

Review Date(s): June 2016 and June 2022

Site Location: Pipeline route between Ahuroa-B wellsite and the Stratford Power Station

Legal Description: Various

Catchment: Patea  
Waitara

Tributary: Kahouri  
Makara  
Ahuroa  
Pikau

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

Consents 9309-1, 9310-1, 9311-1, 9312-1, 9313-1, 9314-1, 9315-1  
9316-1, 9317-1, 9318-1, 9319-1, 9320-1, 9321-1, 9322-1

### 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 with section 36 of the Resource Management Act.

### Special conditions

1. These consents authorise the installation and use of a pipeline at or about the locations specified below:

Crossing No.	Consent No.	Location [Map Reference]	Stream
1	9309-1	1715550E-5652867N	Unnamed tributary – Makara Stream
2	9310-1	1715691E-5651133N	Unnamed tributary – Ahuroa Stream
3	9311-1	1715731E-5650473N	Unnamed tributary – Makara Stream
4	9312-1	1715781E-5650005N	Unnamed tributary – Makara Stream
5	9313-1	1715617E-5649687N	Unnamed tributary – Makara Stream
6	9314-1	1715374E-5649461N	Unnamed tributary – Makara Stream
7	9315-1	1714309E-5648554N	Unnamed tributary – Kahouri Stream
8	9316-1	1714065E-5648223N	Unnamed tributary – Kahouri Stream
9	9317-1	1713960E-5647439N	Unnamed tributary – Piakau Stream
10	9318-1	1713745E-5647083N	Piakau Stream
11	9319-1	1713646E-5646976N	Unnamed tributary – Piakau Stream
12	9320-1	1713627E-5646659N	Unnamed tributary – Piakau Stream
13	9321-1	1713619E-5646155N	Unnamed tributary – Piakau Stream
14	9322-1	1713547E-5645926N	Kahouri Stream

2. At least 48 hours prior to the commencement of works the consent holder shall provide the Taranaki Regional Council with a programme for the installation of the pipelines including: a schedule of proposed start dates and an estimation of the duration of the works, and details of the contractor including contact information for the project manager. Notification shall include the consent number and a brief description of the activity consented and be emailed to [worknotification@trc.govt.nz](mailto:worknotification@trc.govt.nz).
3. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise the discharge of sediment to any surface water body and to prevent or minimise any adverse effects of the disturbance activities on any surface water body.
4. All pipelines shall be buried to an initial burial depth not less than 2 metres below the bed of the streams.
5. Any work undertaken in the bed of the streams shall be undertaken only between 1 November and 31 May.
6. The consent holder shall ensure that the area and volume of river bed disturbance is restricted to a practicable minimum and that areas disturbed from the exercise of this consent are reinstated as near as practicable to pre-work condition.

Consents 9309-1, 9310-1, 9311-1, 9312-1, 9313-1, 9314-1, 9315-1  
9316-1, 9317-1, 9318-1, 9319-1, 9320-1, 9321-1, 9322-1

7. The consent holder shall take all reasonable steps to:
- minimise the amount of sediment discharged to the stream;
  - minimise the amount of sediment that becomes suspended in the stream; and
  - 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.

8. In the event that any archaeological remains are discovered as a result of works authorised by this consent, the works shall cease immediately at the affected site and tangata whenua and the Chief Executive, Taranaki Regional Council, shall be notified within one working day. Works may recommence at the affected area when advised to do so by the Chief Executive, Taranaki Regional Council. Such advice shall be given after the Chief Executive has considered: tangata whenua interest and values, the consent holder's interests, the interests of the public generally, and any archaeological or scientific evidence. The New Zealand Police, Coroner, and Historic Places Trust shall also be contacted as appropriate, and the work shall not recommence in the affected area until any necessary statutory authorisations or consents have been obtained.
9. This consent shall lapse on 30 September 2017, 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.
10. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 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 30 August 2012

For and on behalf of  
Taranaki Regional Council

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**Chief Executive**



**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:                      6 June 2013

Commencement Date:              6 June 2013

**Conditions of Consent**

Consent Granted:                      To install and use a culvert in an unnamed tributary of the  
   Makara Stream, including associated realignment,  
   streambed disturbance and reclamation

Expiry Date:                              1 June 2027

Review Date(s):                      June 2015, June 2021

Site Location:                              Ahuroa-B wellsite, 1278 Croydon Road, Stratford

Legal Description:                      Pt Lot 1 DP 2699 (Site of structure)

Grid Reference (NZTM)              1715566E-5652807N

Catchment:                                Waitara

Tributary:                                    Makino  
   Makara

*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.

### Special conditions

1. The culvert and stream realignment shall be constructed in accordance with the information provided in the application, including drawing NZ-W828-20-DD-31001-01, Revision A0 and dated March 2013. In the case of any contradiction between the information and the conditions of this consent, the conditions of this consent shall prevail.
2. The culvert shall be no longer than 22 metres.
3. The fill over the top of the culvert shall be no deeper than 3 metres.
4. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 2 working days prior to the commencement of the outstanding works. Notification shall include the consent number and a brief description of the activity consented and be emailed to [worknotification@trc.govt.nz](mailto:worknotification@trc.govt.nz).
5. The gradient of the culvert shall be no steeper than the natural gradient of the stream bed at the site.
6. The consent holder shall install headwalls and rock rip rap at the outlet and inlet of the culvert.
7. The grading of the rock rip rap is of the following specification:
  - a. 100% less than 450 mm diameter;
  - b. 50% greater than 350 mm diameter; and
  - c. 90% greater than 150 mm diameter.
8. That consent holder shall ensure that rock rip rap armouring is placed a minimum:
  - a. height and distance of 0.5 metres and 3 metres along the banks of the new channel and at the location where the new alignment deviates from the old alignment; and
  - b. distance of 3 metres across the full width of the bed of the new stream channel.
9. On completion of the realignment work:
  - a. the banks of the reconstructed channel shall have a slope no steeper than 1 horizontal to 1 vertical. Where the bank consists of fill, the slope will be no steeper than 2 horizontal to 1 vertical; and
  - b. the bed of the reconstructed channel shall be at an appropriate grade so as to provide for fish passage; and
10. The final slope of the channel banks above the culvert shall be no steeper than 1.5 horizontal to 1 vertical.

## Consent 9576-1

11. The invert of the culvert shall be set below the existing streambed by at least 20% of the culvert diameter so that it fills with bed material and simulates the natural bed.
12. The consent holder shall ensure that the area and volume of stream bed disturbance is, as far as practicable, minimised and any areas that are disturbed are, as far as practicable, reinstated.
13. 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.

14. All earthwork areas shall be stabilised as soon as is practicable immediately following the completion of soil disturbance activity.

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

15. The culvert structure and new stream channel shall remain the responsibility of the consent holder and be maintained so that:
  - a. the culvert does not become blocked and at all times allows the free flow of water through them; and
  - b. any erosion, scour or instability of the stream bed or banks that is attributable to the works carried out as part of this consent is remedied by the consent holder.
16. In the event that any archaeological remains are discovered as a result of works authorised by this consent, the works shall cease immediately at the affected site and tangata whenua and the Chief Executive, Taranaki Regional Council, shall be notified within one working day. Works may recommence at the affected area when advised to do so by the Chief Executive, Taranaki Regional Council. Such advice shall be given after the Chief Executive has considered: tangata whenua interest and values, the consent holder's interests, the interests of the public generally, and any archaeological or scientific evidence. The New Zealand Police, Coroner, and Historic Places Trust shall also be contacted as appropriate, and the work shall not recommence in the affected area until any necessary statutory authorisation, or consent, have been obtained.
17. This consent shall lapse on 30 June 2018, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

Consent 9576-1

18. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2015 and/or June 2021, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 6 June 2013

For and on behalf of  
Taranaki Regional Council

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**Director-Resource Management**

**Appendix IV**  
**Biomonitoring reports**



**To** Job Manager, N Crook  
**From** Scientific Officers, D Sutherland and B Thomas  
**Document** 1643230  
**Report No** BT050  
**Date** February 2016

## **Spring biomonitoring of the Patea River in relation to the discharge of cooling water and abstraction of water for Contact Energy Ltd's combined cycle and peaker power stations, October 2015**

### **Introduction**

Biomonitoring forms a component of the consents compliance monitoring programme implemented by the Taranaki Regional Council following the construction of the Taranaki Combined Cycle [TCC1] power station in 1998, and the addition of Stratford Peaker Plant [SPP] in 2011. This particular biological monitoring survey (the first of two biannual surveys for the 2015-2016 monitoring period) 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.

Five sites in total were surveyed in the Patea River (see Section 2), two in the immediate vicinity of the outfall, as required by Special Condition 7 of the consent (relating to the 'mixing zone'), and one (for reference purposes), at the Council's State of the Environment (SEM) long-term trend detection site at Skinner Road, approximately 1.5 km further downstream. 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 1) at Hungers Road (9 km downstream of Skinner Road) and a further 13 km downstream (adjacent to Raupuha Road, below the Makuri Stream confluence) which initially were sampled as a component of the environmental effects assessment for the power station expansion (Stark and Young, 2001 and CF251), continue to provide baseline information in anticipation of this expansion.

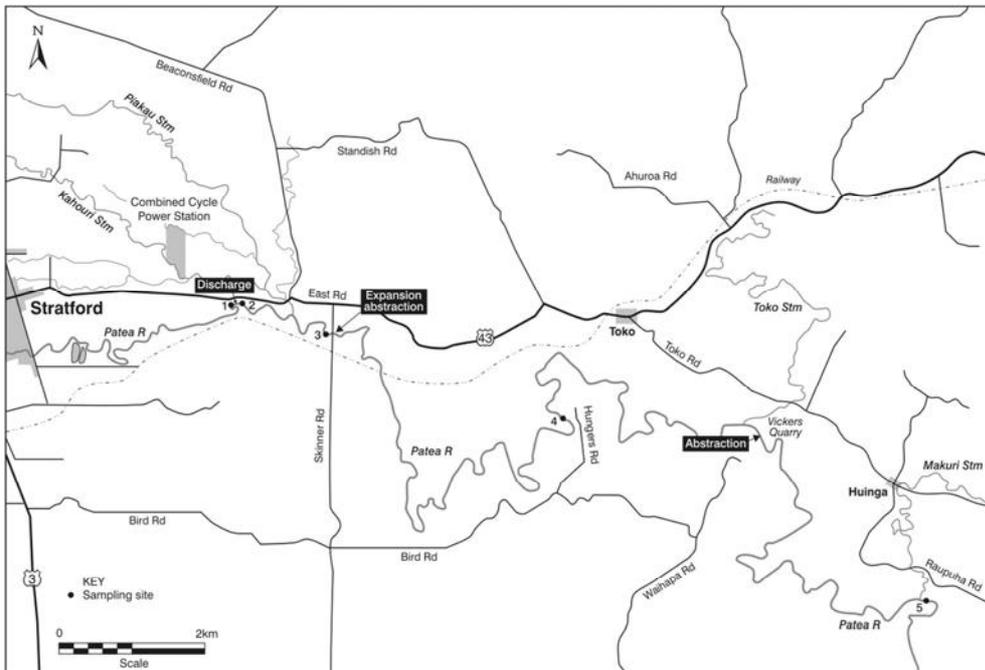
Biomonitoring of the TCC1 station stormwater discharges to the Kahouri Stream is also performed as a separate monitoring programme and this is reported separately. The present biomonitoring survey in the Patea River was performed on 12 October 2015 in conjunction with the spring component of the Regional Council's SEM programme and the consent monitoring programme for the Stratford Wastewater Treatment Plant.

### **Method**

The standard '400 ml kick sampling' technique was used to collect streambed (benthic) macroinvertebrates and algae from five riffle sites in the Patea River. These sites were located as listed in Table 1 and illustrated in Figure 1 and Figure 2.

**Table 1** Location of sampling sites in the Patea River

Site No	Code	GPS reference	Location	Altitude (m asl)	Distance from coast (km)	Distance from National Park (km)
1	PAT000356	E1714497 N5645112	U/s of TCC1 cooling wastes discharge	250	131.8	17.2
2	PAT000357	E1714662 N5645076	100 m d/s of TCC1 cooling wastes discharge	250	131.6	17.4
3	PAT000360	E1715919 N5644681	Skinner Road	240	129.8	19.2
4	PAT000397	E1718991 N5643531	Hungers Road	200	120.5	28.5
5	PAT000430	E1723952 N5641068	Raupuha Road	160	106.9	42.1



**Figure 1** Location of biomonitoring sites in the Patea River in relation to the combined cycle power station, Stratford



**Figure 2** Biomonitoring sites location in the Patea River

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 sorting and identification under a stereomicroscope according to Taranaki Regional Council methodology using protocol P1 of NZMWG protocols for sampling macroinvertebrates in wadeable streams (Stark et al, 2001). Macroinvertebrate taxa found in each sample were recorded as:

R (rare) = less than 5 individuals  
C (common) = 5-19 individuals  
A (abundant) = 20-99 individuals  
VA (very abundant) = 100-499 individuals  
XA (extremely abundant) = 500 or more individuals

Macroinvertebrate Community Index (MCI) values were calculated for taxa present at each site (Stark 1985) with certain taxa scores modified in accordance with Taranaki experience.

A semi-quantitative MCI value, SQMCIs (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).

## Results and discussion

This survey was performed on 12 October 2015 during a period of moderate and swift flow, 10 days after a fresh in excess of 3x median flow and 31 days after a fresh in excess of 7x median flow. It followed a wet spring period where five freshes were recorded over the preceding six week period. River flow at Skinner Road was 2.10 m<sup>3</sup>/sec representing a flow below the average monthly mean October flow (6.98 m<sup>3</sup>/sec) and slightly below the minimum mean monthly flow for October (2.39 m<sup>3</sup>/sec) recorded for the period 1978-2015.

Periphyton mats were patchy at site 4 and 5 but widespread at all other sites. Patchy filamentous algae was recorded at all sites excluding site 5, as determined from observations of the stony riffle substrates. River flow was clear, uncoloured and swift at the two sites (1 and 2) adjacent to the discharge site where water temperatures recorded (at the time of this mid morning survey) were 12.3 °C and 12.0°C respectively during a period when the peaker plant cooling water discharges to the river were occurring.

The (main) combined cycle plant had operated over a period of 12 days until 10 days before the survey, prior to which time it had not operated for over 10 months, since 24 November 2014, except for 2 days in December 2014. One or both peaker plants had been operated daily for more than a year, with occasional breaks of two to seven days.

River flow was swift, uncoloured, and clear at the three sites (3, 4, & 5) downstream from the Kahouri Stream confluence, and water temperatures ranged from 12.2 °C to 14.5°C at these three sites at the time of this midday survey.

## Macroinvertebrate communities

Prior to the establishment of the Contact Energy Ltd's 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 Contact Energy Ltd 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 2 (Note: The results of surveys at sites 4 and 5 performed by Cawthron are not included in this summary but are presented and discussed in TRC report CF251).

**Table 2** Summary of macroinvertebrate taxa numbers and MCI values for previous surveys performed between January 1992 and February 2015

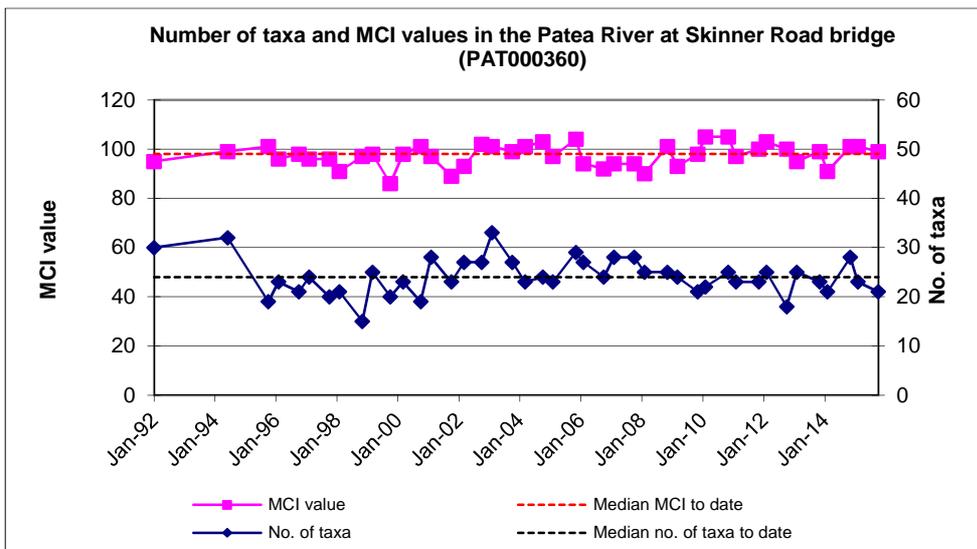
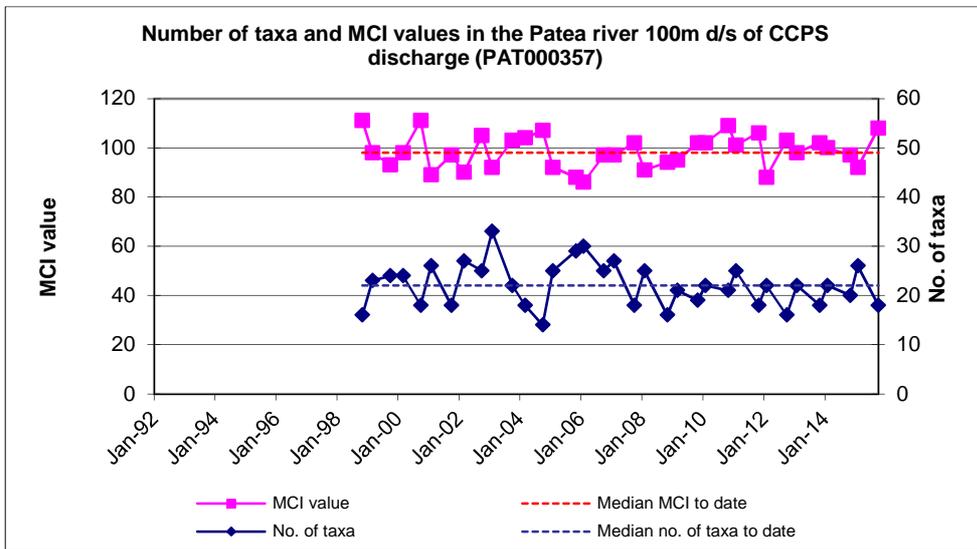
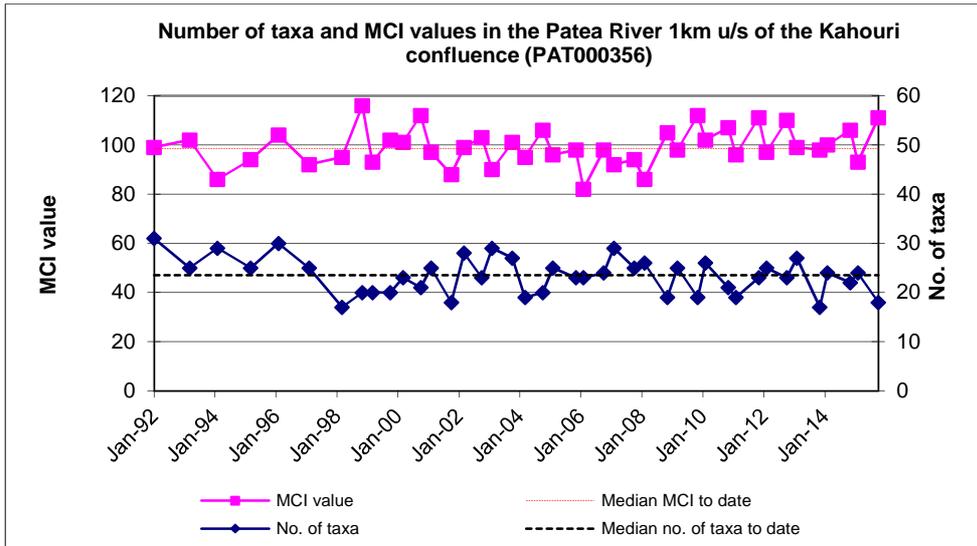
Site	No of surveys	Taxa no		MCI values		Survey of October 2015	
		Range	Median	Range	Median	Taxa No.	MCI
1	41	17-31	24	82-116	98	18	111
2	34	14-33	22	86-111	98	18	108
3	48	13-33	23	85-105	97	21	99
4	27	16-30	22	82-106	95	22	98
5	28	11-26	21	82-102	94	20	103

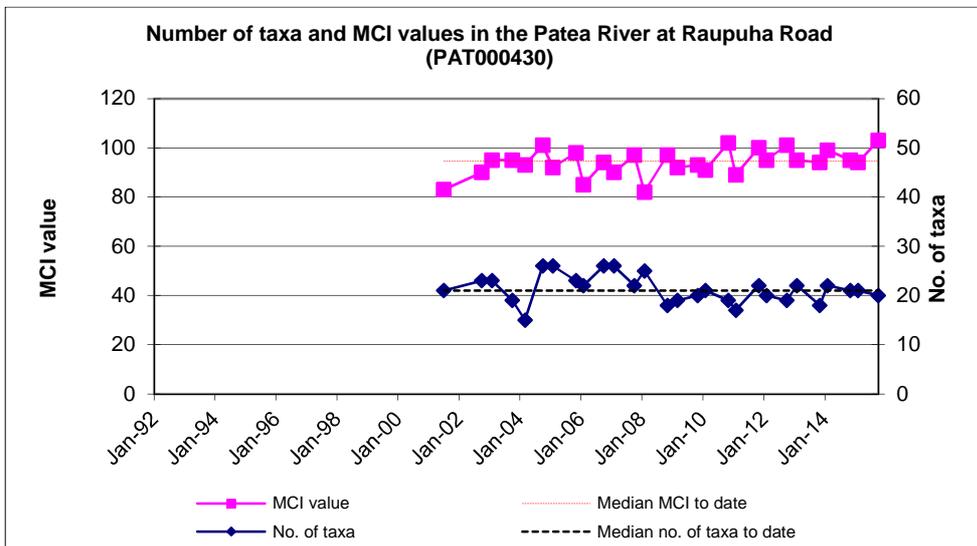
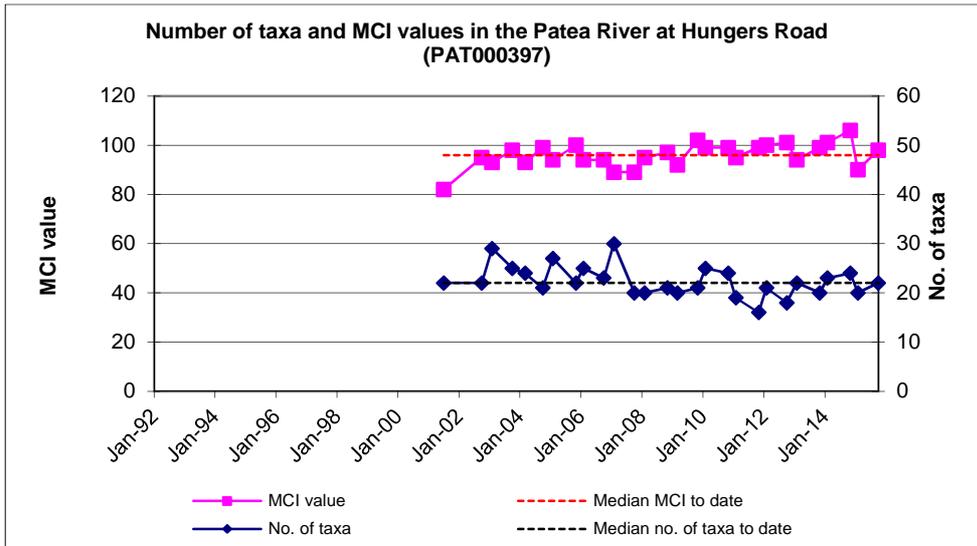
The macroinvertebrate fauna results from the present survey are presented in Table 3, and previous survey and current survey results are shown in figure 3.

**Table 3** Macroinvertebrate fauna of the Patea River in relation to Stratford Power Ltd sampled on 12 October 2015

Taxa List	Site Number	MCI score	1	2	3	4	5
	Site Code		PAT000356	PAT000357	PAT000360	PAT000397	PAT000430
	Sample Number		FWB15269	FWB15270	FWB15271	FWB15272	FWB15273
<b>ANNELIDA (WORMS)</b>	Oligochaeta	1	C	R	R	A	A
<b>MOLLUSCA</b>	<i>Latia</i>	5	-	-	-	R	-
	<i>Potamopyrgus</i>	4	-	-	C	XA	C
<b>CRUSTACEA</b>	Cladocera	5	R	R	-	-	-
	<i>Paracalliope</i>	5	-	-	-	R	-
<b>EPHEMEROPTERA (MAYFLIES)</b>	<i>Austroclima</i>	7	R	R	C	C	A
	<i>Coloburiscus</i>	7	VA	VA	A	A	R
	<i>Deleatidium</i>	8	VA	A	VA	XA	A
	<i>Nesameletus</i>	9	R	R	-	-	-
<b>PLECOPTERA (STONEFLIES)</b>	<i>Acroperla</i>	5	R	R	-	-	-
	<i>Zelandobius</i>	5	-	-	R	A	A
<b>COLEOPTERA (BEETLES)</b>	Elmidae	6	C	R	C	A	C
	Hydraenidae	8	C	R	-	R	-
<b>MEGALOPTERA (DOBSONFLIES)</b>	<i>Archichauliodes</i>	7	C	R	C	C	C
<b>TRICHOPTERA (CADDISFLIES)</b>	<i>Hydropsyche (Aoteapsyche)</i>	4	C	R	A	VA	C
	<i>Costachorema</i>	7	R	C	C	R	R
	<i>Hydrobiosis</i>	5	-	R	C	C	A
	<i>Neurochorema</i>	6	-	-	R	-	-
	<i>Beraeoptera</i>	8	R	-	R	-	-
	<i>Confluens</i>	5	-	-	C	-	-
	<i>Olinga</i>	9	-	-	-	-	R
	<i>Pycnocentria</i>	7	-	-	-	-	A
	<i>Pycnocentroides</i>	5	C	R	A	XA	VA
	<i>Triplectides</i>	5	-	-	-	R	-
<b>DIPTERA (TRUE FLIES)</b>	<i>Aphrophila</i>	5	C	A	VA	A	A
	<i>Maoridiamesa</i>	3	VA	VA	VA	C	A
	Orthoclaadiinae	2	VA	VA	A	R	A
	Tanytarsini	3	-	-	C	C	A
	Empididae	3	R	-	R	R	-
	<i>Austrosimulium</i>	3	-	R	R	-	R
	Tabanidae	3	-	-	-	R	-
<b>ACARINA (MITES)</b>	Acarina	5	-	-	-	-	R
<b>No of taxa</b>			18	18	21	22	20
<b>MCI</b>			111	108	99	98	103
<b>SQMCI</b>			5.0	4.4	5.2	5.5	4.8
<b>EPT (taxa)</b>			9	9	11	9	10
<b>%EPT (taxa)</b>			50	50	52	41	50
'Tolerant' taxa		'Moderately sensitive' taxa		'Highly sensitive' taxa			

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





**Figure 3** Taxa richness and MCI scores recorded to date at each of the five Patea River sites

## **Sites in the immediate vicinity of the power station outfall (sites 1 and 2)**

Eighteen taxa were recorded at both site 1 and site 2 immediately upstream and downstream of the discharge which was slightly lower than median richnesses previously surveyed at each site (Table 1 and Figure 2). This number was seven taxa less than the median (25) taxa richness previously recorded from 219 surveys of 'control' sites at similar altitudes (250 to 300 m asl) in Taranaki ring plain rivers and streams sourced within the National Park (TRC, 2015).

The characteristic taxa in this short reach of the river included one 'highly sensitive' taxon [mayfly (*Deleatidium*)]; up to two 'moderately sensitive' taxa [mayfly (*Coloburiscus*) and crane fly (*Aphrophila*)]; and two 'tolerant' taxa [orthoclad midges and midge (*Maoridiamesa*)]. This dominance represented a few changes from the community dominance at the time of the previous summer survey when six more taxa (three 'tolerant' and three 'moderately sensitive' taxa) were dominant numerically following a lower, warmer flow period. No significant differences in individual taxon abundances were recorded between sites 1 and 2, which together with some slight decreases in the numerical abundances within seven 'sensitive' taxa at site 2, accounted for the relatively similar SQMCI<sub>s</sub> values which decreased by 0.6 unit at site 2 (Table 3).

The presence of four 'highly sensitive' taxa, one of which was very abundant, in this short reach of the Patea River, was an indication of generally good physicochemical water quality conditions preceding the survey under moderate flow conditions following a wet spring period.

MCI scores (Table 3) reflected the greater proportions of 'sensitive' (72% of taxa richness) than 'tolerant' taxa in the communities at both sites, with the scores recorded (111 and 108 units) 13 and 10 units higher than the medians of scores previously recorded at each of these two sites (Table 1). The scores also reflected the relative similarity in community composition between sites as reflected by the very high proportion (16 shared taxa) of a total of 18 taxa between sites. These scores categorised these sites as having 'good' river health (TRC, 2015a) at the time of this spring survey. These scores were also similar to the predicted MCI score (113 units) for National Park-sourced ringplain sites at an altitude of 250m asl (TRC, 2015).

The MCI scores at these two sites showed an insignificant three unit downstream decrease in scores which was indicative of no recent impacts of any cooling water discharge on the macroinvertebrate fauna of the Patea River at the periphery of the permitted mixing zone. These MCI scores between adjacent sites reflected the very similar community compositions between sites.

## **Sites in the reach between Skinner Road and Raupuha Road (sites 3, 4 and 5)**

Taxa numbers at these three sites had a narrow range of richnesses (20 to 22 taxa), which were within one to two taxa of historical medians at these sites (Table 2). They were also very similar to median richnesses (21 and 23 taxa) previously recorded by more than 756 surveys of 'control' sites at similar altitudes (155 to 199 m asl and 200 to 249 m asl) in Taranaki ringplain rivers and streams sourced within the National Park (TRC, 2015).

The characteristic taxa within this 23 km mid-catchment reach of the Patea River included one 'highly sensitive' taxon [mayfly (*Deleatidium*)]; up to eight 'moderately sensitive' taxa [mayflies (*Coloburiscus* and *Austroclima*), elmids beetles, free-living caddisfly (*Hydrobiosis*), stony-cased caddisfly (*Pycnocentroides*), sandy-cased caddisfly (*Pycnocentria*) and stonefly (*Zelandobius*), crane fly (*Aphrophila*)]; and up to six 'tolerant' taxa [oligochaete worms, snail (*Potamopyrgus*), net-building caddisfly (*Aoteapsyche*), and midges (orthoclads, tanytarsids, and *Maoridiamesa*)]. Similar relatively widespread periphyton riverbed cover to that recorded upstream (at sites 1 & 2) together with some increase in abundances within a few of the more 'sensitive' taxa resulted in an increase of 0.8 SQMCI<sub>s</sub> units between sites 2 and 3. Only a few significant differences within individual taxon abundances between adjacent sites were recorded further downstream along this river reach which accounted for the variation in SQMCI<sub>s</sub> scores of 0.3 unit between sites 3 and 4, and 0.7 unit between sites 4 and 5. The improvement in SQMCI<sub>s</sub> score in a downstream direction between sites 2, 3 and 4 was due in particular to an increased abundance of 'sensitive' taxa, in particular stony-cased caddisfly and mayfly (*Deleatidium*).

In comparison with the upstream sites (1 and 2), an increase in the proportion of lower scoring 'tolerant' taxa in the communities at site 3, 4 and 5 (38%, 36% and 35% of total taxa respectively) were reflected in the MCI scores (99, 98, and 103 units) recorded through this reach of the mid Patea River. These scores were an insignificant two units higher (site 3), three units higher (site 4), and nine units higher (site 5) than the medians of scores previously recorded at each of the three sites (Table 1) and from two units lower to nine units higher than those recorded by the previous summer survey which was undertaken under lower, warmer flow conditions. The scores recorded at these three sites by this survey varied by five units through the reach of the river surveyed with an insignificant one unit decrease through the 9 km reach between sites 3 and 4. These scores categorised the sites as having 'good' to 'fair' river health (TRC, 2015a) at the time of this spring survey. The MCI scores were an insignificant two and three units lower (sites 3 and 4) than the predicted MCI scores for National Park-sourced ringplain sites at altitudes of 200 to 249m asl, and an insignificant 5 units lower (site 5) than the predicted MCI scores for National Park-sourced ringplain sites at altitudes of 155 to 199m asl.

The atypical increase in MCI scores between sites 3 and 5 and 4 and 5 were dissimilar to the predicted downstream MCI decrease (an average rate of 0.3 to 0.4 units per km) predicted for this reach of a Taranaki ringplain stream (Stark and Fowles, 2009). A slight decrease in MCI scores was found between sites 3 and 4 but an increase between sites 4 and 5 resulted in an overall increase of four units over this reach (23km) but an insignificant eight unit decrease over the total reach (25km) of the river surveyed.

## Conclusions

This biomonitoring survey performed in relation to the discharge of cooling water from the power station indicated no significant impacts of recent discharges upon the biological communities of the Patea River in the vicinity of the discharge outfall east of Stratford during a period of moderate flow conditions following a wet spring period. Macroinvertebrate community richness and MCI scores typical of habitats with moderately widespread periphyton substrate cover were within ranges of results previously recorded, similar to median richnesses, and similar to median MCI scores. There were very few subtle differences in community compositions between sites resulting in an insignificant (three

units) decrease in the MCI score recorded at the periphery of the permitted discharge mixing zone in comparison with the upstream 'control' site.

Biomonitoring performed at sites further downstream in the river has continued for the purpose of establishing baseline information in relation to the proposed expansion of the power station. Moderate community richnesses were found at the three sites in the 23 km reach between Skinner Road and Raupuha Road (where the principal effects of future water abstraction would be expected to occur), and community composition showed few changes from communities found at sites 1 and 2, upstream of the Kahouri Stream confluence. Of the total of 32 taxa found over the entire reach of the river surveyed, 12 taxa were present at all five sites, including one 'highly sensitive' taxon, three 'moderately sensitive' taxa, and two 'tolerant' taxa, all of which were abundant at a minimum of three of the sites. One 'moderately sensitive' taxon [mayfly (*Coloburiscus*)] and one 'highly sensitive' taxon [mayfly (*Deleatidium*)] were abundant at all five sites.

A relationship between MCI score and distance from the National Park established for National Park-sourced ringplain rivers and streams from Taranaki Regional Council data (Stark and Fowles, 2009) indicates that MCI values for the three sites (3, 4 and 5) in this reach of the mid-Patea River survey are expected to range between 90 and 99 units. Therefore, the results of this survey found a higher than expected score at site 5 but more typical scores for those expected at site 3 and site 4.

Biannual biomonitoring surveys will form a component of future monitoring programmes associated with consents granted to the Contact Energy Ltd'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.

## Summary

The Council's standard 'kick-sampling' technique was used at five established sites to collect streambed macroinvertebrates from the Patea River. Samples were sorted and identified to provide number of taxa (richness) and MCI and SQMCI<sub>5</sub> scores for each site.

The MCI is a measure of the overall sensitivity of the macroinvertebrate community to the effects of organic pollution in stony streams. It is based on the presence/absence of taxa with varying degrees of sensitivity to environmental conditions. The SQMCI<sub>5</sub> takes into account taxa abundance as well as sensitivity to pollution, and may reveal more subtle changes in communities, particularly if non-organic impacts are occurring.

Significant differences in either the MCI or the SQMCI<sub>5</sub> between sites indicate the degree of adverse effects (if any) of the discharges being monitored.

This spring macroinvertebrate survey undertaken following periods of power station peaker plant discharges, indicated that recent discharges of treated cooling water from the Contact Energy Ltd's site had not had any significant detrimental effect on the macroinvertebrate communities of the river. No significant changes in the macroinvertebrate community structures were recorded between the upstream 'control' site and site immediately downstream of the discharge

The macroinvertebrate communities in the reach of the Patea River adjacent to the discharge contained higher proportions of 'sensitive' than 'tolerant' taxa at both sites (more typical of spring flow conditions) as did the communities further downstream (below the Kahouri Stream confluence). Taxonomic richnesses (numbers of taxa) and MCI scores were similar to predicted values and historical medians (TRC, 2015).

Biomonitoring at three sites further downstream in the Patea River, for the establishment of baseline conditions in relation to consented power station expansion, found relatively similar community compositions to those monitored in the vicinity of the cooling water discharges with few significant changes in individual taxon abundances recorded. SQMCI<sub>s</sub> values were relatively similar between sites. MCI scores were higher than historical median values at all sites but typical of communities at these distances from the National Park.

MCI and SQMCI<sub>s</sub> scores indicated that the stream communities throughout the entire river reach were of 'fair' to 'good' generic health and generally in the condition predicted for similar sites in other Taranaki ringplain rivers, following a period of moderate flow conditions during a spring period.

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To Job Manager, Nathan Crook  
From Scientific Officers, Darin Sutherland  
Document 1670649  
Report No DS046  
Date April 2016

## **Summer biomonitoring of the Patea River in relation to the discharge of cooling water and abstraction of water for Contact Energy Ltd's combined cycle and peaker power stations, February 2016**

### **Introduction**

Biomonitoring forms a component of the consents compliance monitoring programme implemented by the Taranaki Regional Council following the construction of the Taranaki Combined Cycle [TCC1] power station in 1998, and the addition of Stratford Peaker Plant [SPP] in 2011. This particular biological monitoring survey (the second of two biannual surveys for the 2015-2016 monitoring period) 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.

Five sites in total were surveyed in the Patea River (see Section 2), two in the immediate vicinity of the outfall, as required by Special Condition 7 of the consent (relating to the 'mixing zone'), and one (for reference purposes), at the Council's State of the Environment (SEM) long-term trend detection site at Skinner Road, approximately 1.9 km downstream of the discharge. 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 1) at Hungers Road (9 km downstream of Skinner Road) and a further 13 km downstream (adjacent to Raupuha Road, below the Makuri Stream confluence) which initially were sampled as a component of the environmental effects assessment for the power station expansion (Stark and Young, 2001 and CF251), continue to provide baseline information in anticipation of this expansion.

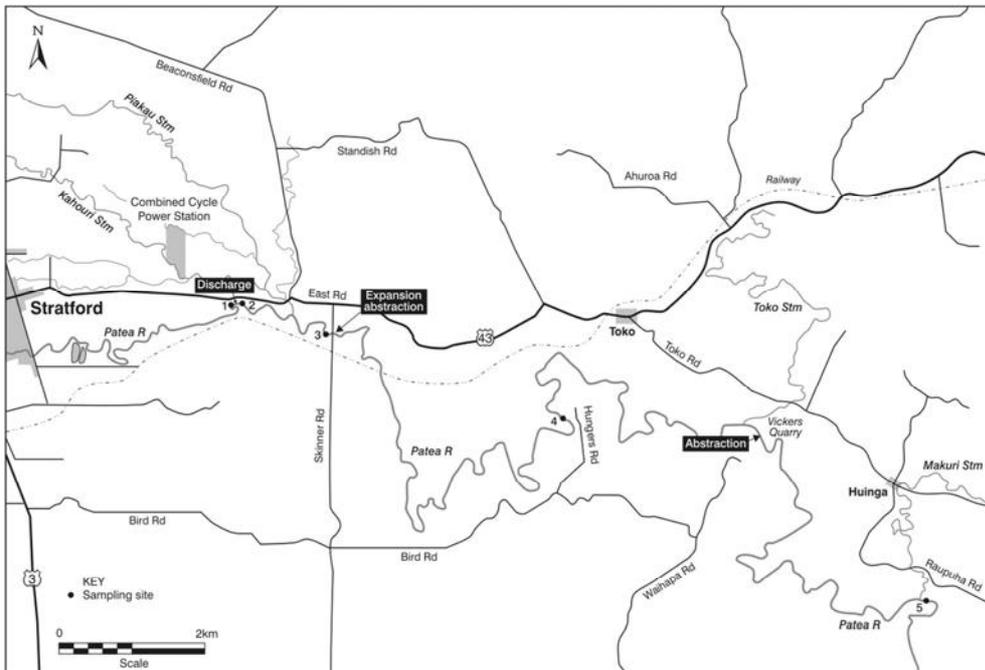
Biomonitoring of the TCC1 station stormwater discharges to the Kahouri Stream is also performed as a separate monitoring programme and this is reported separately. The present biomonitoring survey in the Patea River was performed on 29 February 2016 in conjunction with the summer component of the Regional Council's SEM programme and the consent monitoring programme for the Stratford Wastewater Treatment Plant.

### **Method**

The standard '400 ml kick sampling' technique was used to collect streambed (benthic) macroinvertebrates and algae from five riffle sites in the Patea River. These sites were located as listed in Table 1 and illustrated in Figure 1 and Figure 2.

**Table 1** Location of sampling sites in the Patea River

Site No	Code	GPS reference	Location	Altitude (m asl)	Distance from coast (km)	Distance from National Park (km)
1	PAT000356	E1714497 N5645112	U/s of TCC1 cooling wastes discharge	250	131.8	17.2
2	PAT000357	E1714662 N5645076	100 m d/s of TCC1 cooling wastes discharge	250	131.6	17.4
3	PAT000360	E1715919 N5644681	Skinner Road	240	129.8	19.2
4	PAT000397	E1718991 N5643531	Hungers Road	200	120.5	28.5
5	PAT000430	E1723952 N5641068	Raupuha Road	160	106.9	42.1



**Figure 1** Location of biomonitoring sites in the Patea River in relation to the combined cycle power station, Stratford



**Figure 2** Biomonitoring sites location in the Patea River

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 2.

**Table 2 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)	>499

**Table 3 Macroinvertebrate health based on MCI ranges which has been adapted for Taranaki streams and rivers (TRC, 2013) from Stark's classification (Stark, 1985 and Boothroyd and Stark, 2000)**

Grading	MCI
Excellent	>140
Very Good	120-140
Good	100-119
Fair	80-99
Poor	60-79
Very Poor	<60

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. A gradation of biological water quality conditions based upon MCI ranges which has been adapted for Taranaki streams and rivers (TRC, 2013) from Stark's classification (Stark, 1985 and Boothroyd and Stark, 2000) (Table 3). More 'sensitive' communities inhabit less polluted waterways. A difference of 11 units or more in MCI values is considered significantly different (Stark 1998).

A semi-quantitative MCI value, SQMCI<sub>s</sub> (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).

## Results

### Site habitat characteristics and hydrology

This summer survey was performed under moderately low flow conditions (approximately half median flow), 11 days after a fresh in excess of both 3 times and 7 times median flow in the Patea River (flow gauging site at the Patea River at Skinner Road). The survey followed a relatively dry period where only one extremely large fresh (31 times median flow) was recorded over the preceding month.

The water temperatures during the survey were in the range 18.8-22.4 °C. Water levels were low and water speed was swift. The water was uncoloured and clear. The substrate at all five sites comprised gravel/cobble/boulder.

Sites 1, 2 and 3 had patchy periphyton and widespread filamentous algae on the streambed. Sites 1 and 2 also had patchy moss and leaves while site 3 had patchy leaves only. Site 4 had widespread algal mats and patchy filamentous algae. Site 5 had slippery mats and no filamentous algae. There was patchy moss and leaves on the streambed.

### Macroinvertebrate communities

Prior to the establishment of the Contact Energy Ltd's 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 Contact Energy Ltd 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 2 (Note: The results of surveys at sites 4 and 5 performed by the Cawthron Institute are not included in this summary but are presented and discussed in TRC report CF251).

**Table 4** Summary of macroinvertebrate taxa numbers and MCI values for previous surveys performed between January 1992 and February 2016

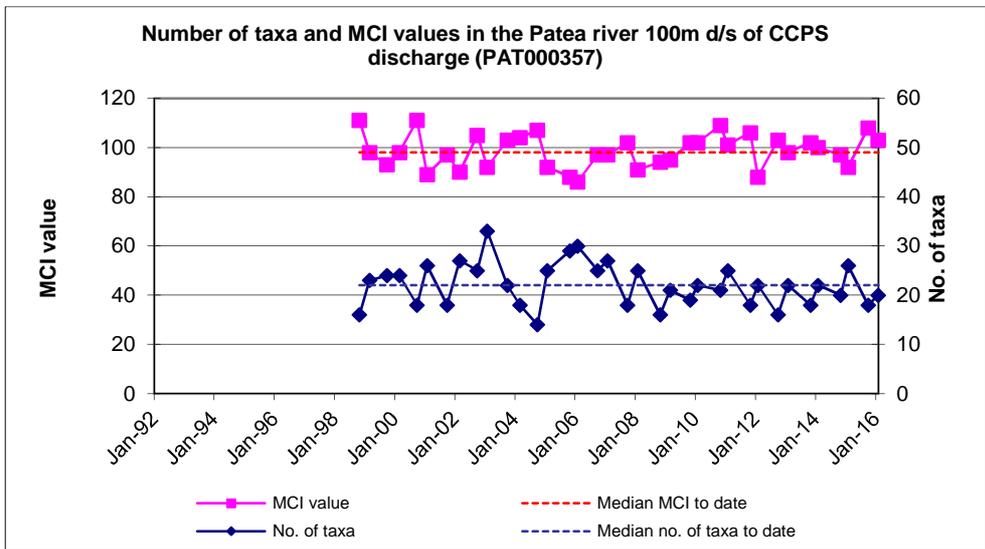
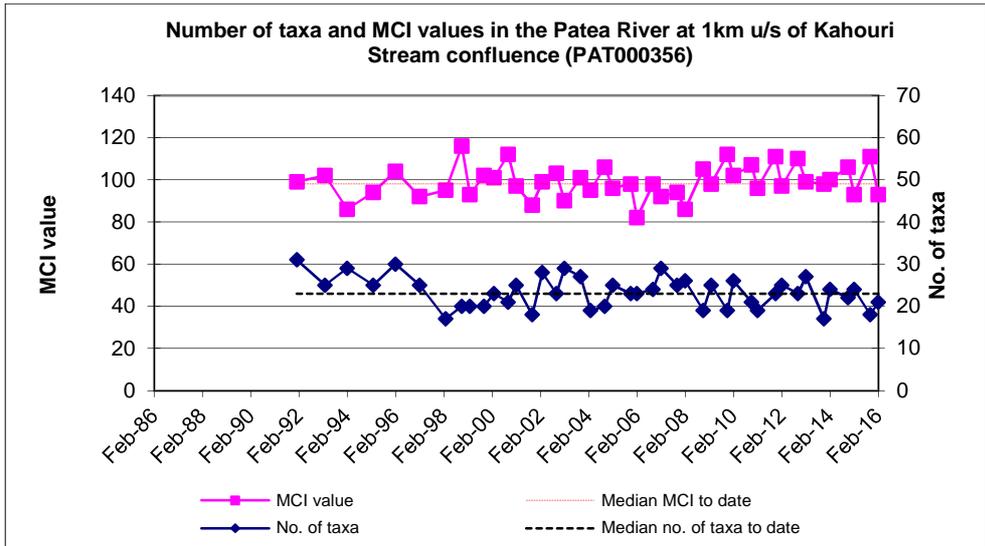
Site No.	N	No of taxa			MCI value			SQMCI <sub>s</sub> value		
		Median	Range	Feb 2016	Median	Range	Feb 2016	Median	Range	Feb 2016
1	42	24	17-31	21	99	82-116	93	4.1	2.3-7.2	3.3
2	35	22	14-33	20	98	86-111	103	3.9	2.0-6.8	3.6
3	49	23	13-33	20	97	85-105	96	3.8	2.1-7.3	4.5
4	28	22	16-30	16	96	82-106	84	4.8	3.1-6.4	3.5
5	29	21	11-26	21	94	82-103	83	4.3	3.1-7.1	4.0

The macroinvertebrate fauna results from the present survey are presented in Table 3, and previous survey and current survey results are shown in figure 3.

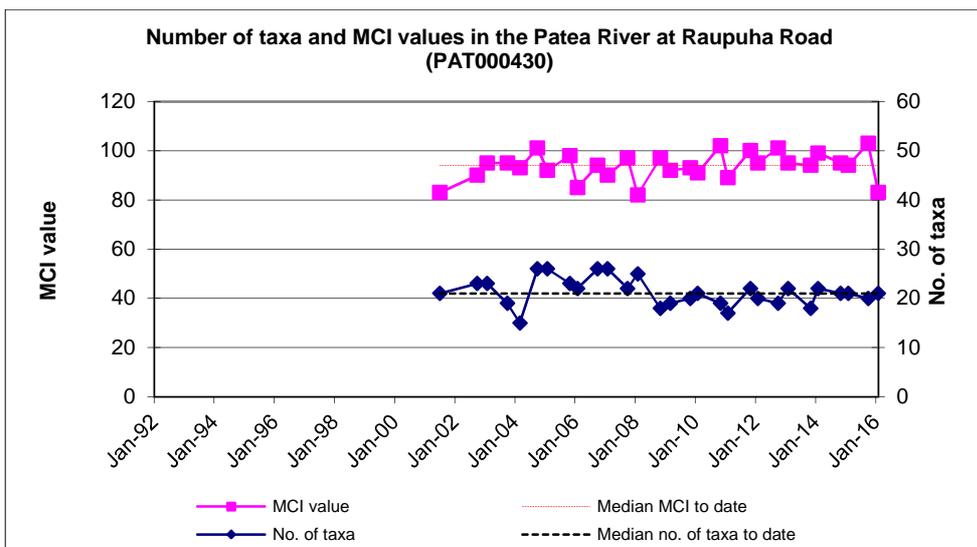
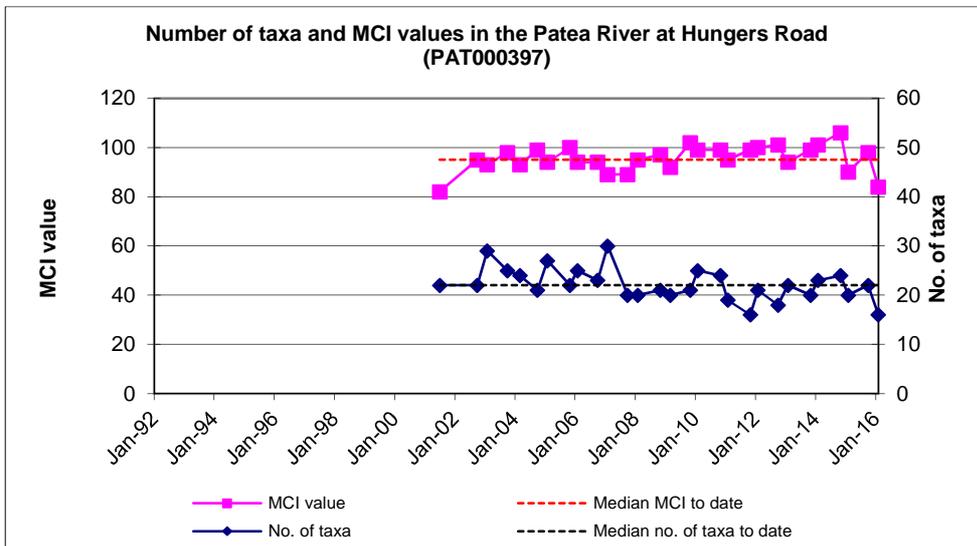
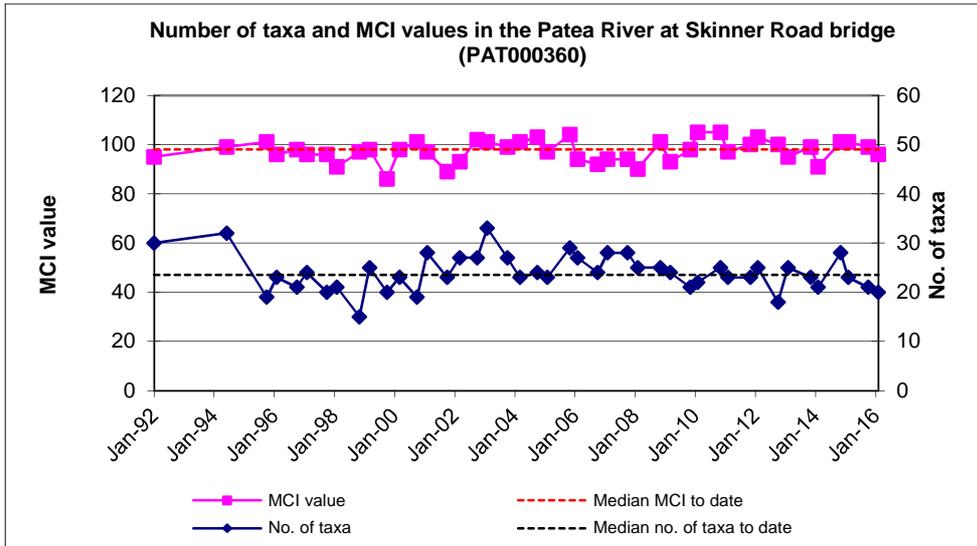
**Table 5** Macroinvertebrate fauna of the Patea River in relation to Stratford Power Ltd sampled on 29 February 2016

Taxa List	Site Number	MCI score	1	2	3	4	5	
	Site Code		PAT000356	PAT000357	PAT000360	PAT000397	PAT000430	
	Sample Number		FWB16104	FWB16105	FWB16106	FWB16107	FWB16108	
<b>NEMERTEA</b>	Nemertea	3	-	-	R	-	R	
<b>ANNELIDA (WORMS)</b>	Oligochaeta	1	C	-	A	A	C	
	Lumbricidae	5	R	-	-	-	-	
<b>MOLLUSCA</b>	<i>Latia</i>	5	-	-	-	-	C	
	<i>Physa</i>	3	-	-	-	-	C	
	<i>Potamopyrgus</i>	4	R	R	C	VA	XA	
<b>CRUSTACEA</b>	Ostracoda	1	-	-	-	-	R	
	<i>Paracalliope</i>	5	R	-	-	-	-	
<b>EPHEMEROPTERA (MAYFLIES)</b>	<i>Austroclima</i>	7	-	R	R	R	C	
	<i>Coloburiscus</i>	7	R	R	R	-	-	
	<i>Deleatidium</i>	8	A	A	VA	A	A	
	<i>Nesameletus</i>	9	-	R	-	-	-	
	<i>Zephlebia group</i>	7	-	-	-	-	R	
<b>COLEOPTERA (BEETLES)</b>	Elmidae	6	C	C	A	C	C	
	Hydraenidae	8	R	R	R	-	-	
<b>MEGALOPTERA (DOBSONFLIES)</b>	<i>Archichauliodes</i>	7	R	C	C	C	-	
<b>TRICHOPTERA (CADDISFLIES)</b>	<i>Hydropsyche (Aoteapsyche)</i>	4	A	A	VA	VA	VA	
	<i>Costachorema</i>	7	R	C	R	-	-	
	<i>Hydrobiosis</i>	5	R	R	C	C	C	
	<i>Confluens</i>	5	R	-	-	-	-	
	<i>Oxyethira</i>	2	R	-	-	C	R	
	<i>Pycnocentria</i>	7	-	-	-	-	R	
	<i>Pycnocentrodes</i>	5	-	-	C	A	VA	
	<b>DIPTERA (TRUE FLIES)</b>	<i>Aphrophila</i>	5	C	C	C	-	A
		<i>Maoridiamesa</i>	3	C	A	C	R	-
Orthoclaadiinae		2	VA	VA	VA	VA	VA	
<i>Polypedilum</i>		3	-	-	R	-	R	
Tanypodinae		5	-	-	R	-	-	
Tanytarsini		3	C	C	A	VA	A	
Empididae		3	C	R	-	R	R	
Ephydriidae		4	-	R	-	-	-	
Muscidae		3	-	R	-	-	-	
<i>Austrosimulium</i>		3	C	C	C	C	A	
Tanyderidae	4	-	-	-	R	-		
<b>ACARINA (MITES)</b>	Acarina	5	R	R	-	-	-	
<b>No of taxa</b>			21	20	20	16	21	
<b>MCI</b>			93	103	96	84	83	
<b>SQMCI</b>			3.3	3.6	4.5	3.5	4.0	
<b>EPT (taxa)</b>			6	7	7	5	7	
<b>%EPT (taxa)</b>			29	35	35	31	33	
'Tolerant' taxa		'Moderately sensitive' taxa		'Highly sensitive' taxa				

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



**Figure 3** Taxa richness and MCI scores recorded to date at sites in the vicinity of the outfall



**Figure 4** Taxa richness and MCI scores recorded to date at the reach between Skinner Road and Raupuha Road

## **Sites in the vicinity of the power station outfall (sites 1 and 2)**

### **Site 1 (upstream of discharge at East Road)**

A moderate macroinvertebrate community richness of 21 taxa was found at site 1 ('control' site) at the time of the survey (Table 4).

The MCI score of 93 units indicated a community of 'fair' biological health which was not significantly different (Stark, 1998) to the median MCI score of 99 units. The MCI score was significantly lower than the preceding survey on October 2015 (111 units). The predicted score for the site using the equation  $MCI=130.230 -1.411*D$  (D= distance from source) which was derived specifically for the Patea River within 45 km of its source (Stark and Fowles, 2009) was 106 units which was significantly higher than the observed result. The SQMCI<sub>s</sub> score of 3.3 units was lower than the median SQMCI<sub>s</sub> score of 4.1 units (Table 4).

The community was dominated by one 'very abundant' 'tolerant' taxon [midges (Orthocladiinae)] (Table 5).

### **Site 2 (100m d/s discharge East Road)**

A moderate macroinvertebrate community richness of 20 taxa was found at site 2 ('primary impact' site) at the time of the survey (Table 4).

The MCI score of 103 units indicated a community of 'good' biological health which was not significantly different (Stark, 1998) to the median MCI score of 98 units. The MCI score was not significantly lower than the preceding survey on October 2015 (108 units). The predicted score for the site was 106 units which was also not significantly different to the observed result. The SQMCI<sub>s</sub> score of 3.6 units was similar to the median SQMCI<sub>s</sub> score of 3.9 units (Table 4).

The community was dominated by one 'very abundant' 'tolerant' taxon [midges (Orthocladiinae)] (Table 5).

## **Sites in the reach between Skinner Road and Raupuha Road (sites 3, 4 and 5)**

### **Site 3 (Skinner Road)**

A moderate macroinvertebrate community richness of 20 taxa was found at site 3 at the time of the survey (Table 4).

The MCI score of 96 units indicated a community of 'fair' biological health which was not significantly different (Stark, 1998) to the median MCI score of 97 units. The MCI score was not significantly lower than the preceding survey on October 2015 (99 units). The predicted score for the site was 103 units which was also not significantly different to the observed result. The SQMCI<sub>s</sub> score of 4.5 units was higher than the median SQMCI<sub>s</sub> score of 3.8 units (Table 4).

The community was dominated by two 'very abundant' 'tolerant' taxa [net-building caddisfly (*Hydropsyche/Aoteapsyche*), chironomid midge (Orthocladiinae)] and one 'highly sensitive' taxon [mayfly (*Deleatidium*)] (Table 5).

#### **Site 4 (Hungers Road)**

A moderately low macroinvertebrate community richness of 16 taxa was found at site 4 at the time of the survey (Table 4).

The MCI score of 84 units indicated a community of 'fair' biological health which was significantly lower (Stark, 1998) than the median MCI score of 96 units. The MCI score was significantly lower than the preceding survey on October 2015 (98 units). The predicted score for the site was 90 units which was not significantly different to the observed result. The SQMCI<sub>s</sub> score of 3.5 units was lower than the median SQMCI<sub>s</sub> score of 4.8 units (Table 4).

The community was dominated by four 'very abundant' 'tolerant' taxa [snail (*Potamopyrgus*), net-building caddisfly (*Hydropsyche/Aoteapsyche*), chironomid midges (Orthocladiinae and Tanytarsini)] (Table 5).

#### **Site 5 (Raupuha Road)**

A moderate low macroinvertebrate community richness of 21 taxa was found at site 5 at the time of the survey (Table 4).

The MCI score of 83 units indicated a community of 'fair' biological health which was significantly lower (Stark, 1998) than the median MCI score of 94 units. The MCI score was significantly lower than the preceding survey on October 2015 (103 units). The predicted score for the site was 71 units which was significantly lower than the observed result though the reliability of the equation at sites further from the National Park was questionable (it should not be used for sites > 45 km away (Stark and Fowles, 2009) and perhaps this should be reduced to > 35 km). The SQMCI<sub>s</sub> score of 3.5 units was lower than the median SQMCI<sub>s</sub> score of 4.8 units (Table 4).

The community was dominated by three 'tolerant' taxa [snail (*Potamopyrgus*), net-building caddisfly (*Hydropsyche/Aoteapsyche*), chironomid midge (Orthocladiinae)] and one 'moderately sensitive' taxon [caddisfly (*Pycnocentroides*)] (Table 5).

## **Discussion and conclusions**

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 in case the anticipated expansion of the power scheme occurs and are unlikely to ever be affected by the discharge considering the considerable distance downstream they are from the outfall. Biannual biomonitoring surveys will form a component of future monitoring programmes associated with consents granted to the Contact Energy Ltd'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 richnesses at four of the sites were slightly lower than historical medians which may have been due to the very large fresh which occurred only 11 days prior to the

survey. Differences among sites were not large (maximum difference of five taxa) and there was only one taxon difference between site 1, the 'control' site, and site 2, the 'primary impact' site. Furthermore, site 2 had only two taxa less than the historical median for the site indicating that taxa richness was relatively normal with no evidence of any significant impacts.

The MCI scores categorised the majority of sites as having 'fair' generic river health except the 'primary impact' site which had 'good' health. There was a non significant increase in MCI score from the 'control' site to the 'primary impact' site of 10 units. Furthermore, at site 2 there were no significant differences between the current MCI score and the historical median and expected result for a site at that location on the Patea River indicating that there were no significant impacts from the outfall. The two bottom sites, sites 4 and 5, had significantly lower MCI scores than the historical norm which would be unrelated to the outfall discharge and may be partially a seasonal affect (summer median scores of 94 and 92 respectively were five units lower than spring median scores) and possibly increased eutrophication from surrounding farmland.

The SQMCI<sub>s</sub> score at site 2 was very similar to the historical median and the site 1 score which would be expected given the community composition between the two sites was very similar, dominated by 'very abundant' orthoclad midges at both sites. There were some substantial changes in individual taxon abundances recorded among sites with a large increase in 'tolerant' snails (*Potamopyrgus*) recorded at sites 4 and 5 and a slightly smaller increase in 'tolerant' chironomid midges (*Tanytarsini*) at sites 3, 4 and 5 suggesting increased nutrient enrichment. However, differences among SQMCI<sub>s</sub> scores were not particularly large and no discernible trend from upstream to downstream was evident.

This survey was relatively consistent with river health recorded by previous surveys except that the macroinvertebrate community at the two most downstream sites were in slightly poorer health than normal. Overall, this biomonitoring survey performed in relation to the discharge of cooling water from the power station indicated no significant impacts of recent discharges upon the biological communities of the Patea River in the vicinity of the discharge outfall east of Stratford.

## Summary

The Council's standard 'kick-sampling' technique was used at five established sites to collect streambed macroinvertebrates from the Patea River. Samples were sorted and identified to provide number of taxa (richness) and MCI and SQMCI<sub>s</sub> scores for each site.

The MCI is a measure of the overall sensitivity of the macroinvertebrate community to the effects of organic pollution in stony streams. It is based on the presence/absence of taxa with varying degrees of sensitivity to environmental conditions. The SQMCI<sub>s</sub> takes into account taxa abundance as well as sensitivity to pollution, and may reveal more subtle changes in communities, particularly if non-organic impacts are occurring.

Significant differences in either the MCI or the SQMCI<sub>s</sub> between sites indicate the degree of adverse effects (if any) of the discharges being monitored.

MCI and SQMCI<sub>s</sub> scores indicated that the stream communities throughout the entire river reach were of 'fair' to 'good' generic health and generally in the condition predicted for similar sites in other Taranaki ringplain rivers.

Biomonitoring at three sites further downstream in the Patea River, for the establishment of baseline conditions in relation to consented power station expansion, found relatively similar community compositions to those monitored in the vicinity of the cooling water discharges with few significant changes in individual taxon abundances recorded except for an increase in 'tolerant' snails (*Potamopyrgus*) at sites 4 and 5. SQMCI<sub>s</sub> values were relatively similar between sites. MCI scores were also lower than historical median values at sites 4 and 5.

Overall, this summer macroinvertebrate survey indicated that discharges of treated cooling water from the Contact Energy Ltd's site had not had any significant detrimental effect on the macroinvertebrate communities of the river. No significant changes in the macroinvertebrate community structures were recorded between the upstream 'control' site and site immediately downstream of the discharge.

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**To** Job Manager, Nathan Crook  
**From** Scientific Officer, Darin Sutherland  
**Doc No** 1699505  
**Report No** DS052  
**Date** June 2016

## **Biomonitoring of the Kahouri Stream in relation to the Contact Energy sites, East Road, April 2016**

### **Introduction**

This survey fulfilled one of two biological components of the 2015-2016 monitoring programme for the Contact Energy site located on East Road, Stratford. It was performed to determine whether or not consented stormwater discharges from the site had had any recent detrimental effect upon the macroinvertebrate communities of the Kahouri Stream. The monitoring related to the consents 3939-2 to discharge up to 464 litres/second of stormwater from the Stratford Power Station Peaking Plant site into an unnamed tributary of the Kahouri Stream and into the Kahouri Stream and 4459-1 to discharge stormwater from the operation of a power station site into an unnamed tributary of the Piakau Stream and into the Kahouri Stream, all tributaries of the Patea River. Both consents are currently held by Contact Energy Limited.

The results of biological surveys performed in the Kahouri Stream since 1996 are discussed in various reports referenced at the end of this report.

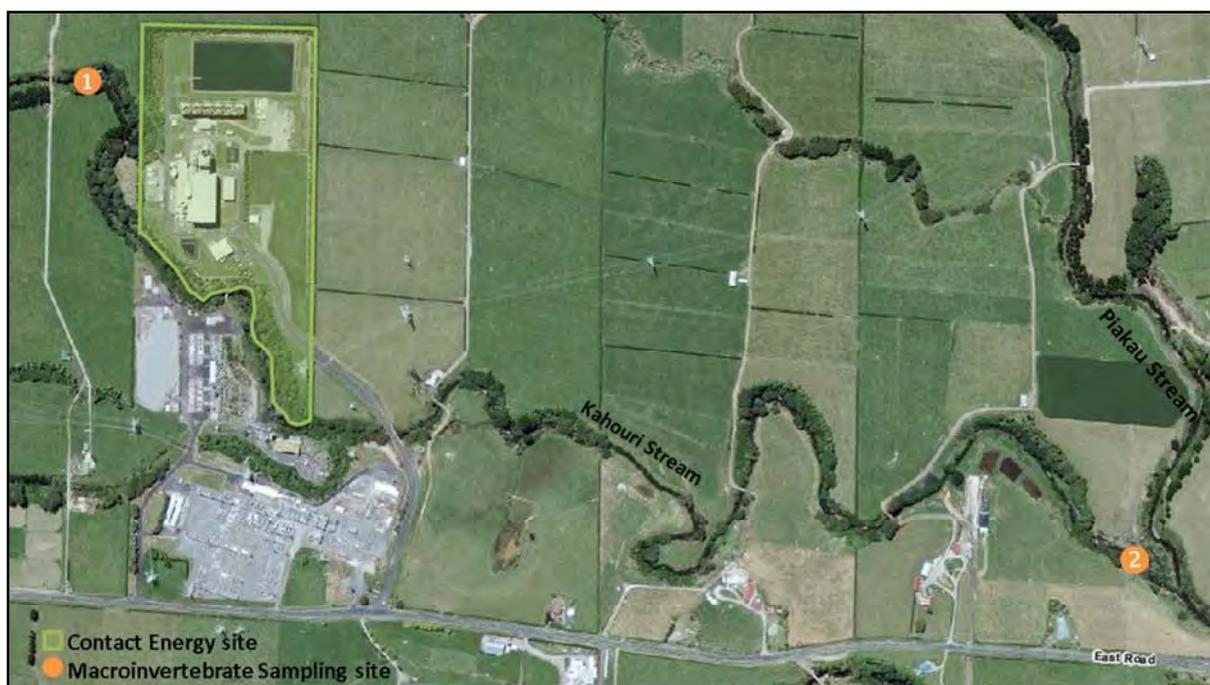
The other biological component of the monitoring programme, in relation to the abstraction of water from and the discharge of effluent to the Patea River, is reported on separately (see DS046).

### **Methods**

The standard '400 ml kick-sampling' technique was used to collect streambed macroinvertebrates from two established sites in the Kahouri Stream on 14 April 2016 ([Figure 1](#), [Table 1](#)).

**Table 1** Biomonitoring sites in the Kahouri Stream sampled in relation to the Contact Energy site

<b>Site No.</b>	<b>Site code</b>	<b>Location</b>	<b>GPS location</b>
1	KHI000457	Kahouri Stream, upstream of the Contact Energy site	E 1713512 N 5645931
2	KHI000480	Kahouri Stream, 20 m upstream of the Piakau Stream confluence	E 1714880 N 5645282



**Figure 1** Kahouri Stream Sites sampled for macroinvertebrates, in relation to the Contact Energy site

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 sorting and identification under a stereomicroscope according to Taranaki Regional Council methodology using protocol P1 of NZMWG protocols for sampling macroinvertebrates in wadeable streams (Stark et al. 2001). Macroinvertebrate taxa abundances scored based on the categories presented in Table 1.

**Table 2** Macroinvertebrate abundance categories

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

Stark (1985) developed a scoring system for macroinvertebrate taxa according to their sensitivity to organic pollution in stony New Zealand streams. Highly 'sensitive' taxa were assigned the highest scores of 9 or 10, while the most 'tolerant' 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. A gradation of biological water quality conditions based upon MCI ranges which has been adapted for Taranaki streams and rivers (TRC, 2013) from Stark's classification (Stark, 1985 and Boothroyd and Stark, 2000) (Table 2). More 'sensitive'

communities inhabit less polluted waterways. A difference of 10.83 units or more in MCI values is considered significantly different (Stark 1998).

**Table 3** Macroinvertebrate health based on MCI ranges which has been adapted for Taranaki streams and rivers (TRC, 2013) from Stark's classification (Stark, 1985 and Boothroyd and Stark, 2000)

Grading	MCI
Excellent	>140
Very Good	120-140
Good	100-119
Fair	80-99
Poor	60-79
Very Poor	<60

The MCI was designed as a measure of the overall sensitivity of macroinvertebrate communities to the effects of organic pollution. MCI results can also reflect the effects of warm temperatures, slow current speeds and low dissolved oxygen levels, because the taxa capable of tolerating these conditions generally have low sensitivity scores. Usually more 'sensitive' communities (with higher MCI values) inhabit less polluted waterways. The use of this index in non-stony streams is possible if results are related to physical habitat (good quality muddy/weedy sites tend to produce lower MCI values than good quality stony sites).

A semi-quantitative MCI value (SQMCI<sub>s</sub>) 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 products, and dividing by the sum of the loading factors (Stark 1998 and 1999). 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). Unlike the MCI, the SQMCI<sub>s</sub> is not multiplied by a scaling factor of 20, so that its corresponding range of values is 20x lower. A difference of 0.83 units or more in SQMCI<sub>s</sub> values is considered significantly different (Stark 1998).

## Results

### Site habitat characteristics and hydrology

This summer survey was performed under moderate flow conditions (approximately three quarters of median flow), 12 days after a fresh in excess of 3 times median flow and 13 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 survey followed a wet period where there was one very large fresh (approximately 24 times median flow) recorded over the preceding month and two small freshes, one in excess of 3 times median flow and the other approximately 2 times median flow which occurred only two days prior to sampling.

The stream at site 1 had slippery periphyton mats and no filamentous algae. There were macrophytes growing on the edge of the stream. There was partial bed shading from overhanging vegetation. Substrate was predominately cobbles (60%) with some boulder (10%), coarse gravel (10%), fine gravel (15%) and sand (5%). Site 2 had slippery mats and no filamentous algae. Moss and leaves were patchy on the streambed. There was partial bed shading from overhanging vegetation. Substrate was predominately cobbles (65%) with

some coarse gravel (15%). Boulder (10%), fine gravel (5%) and sand (5%) made up the remaining substrate.

## 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 4](#), together with current results, and the full results are reported in [Table 5](#).

**Table 4** Summary of the numbers of taxa and MCI values recorded previously in the Kahouri Stream in relation to the Contact Energy site since 1 January 1995, together with the results of the current survey

Site	Number of previous surveys	Numbers of taxa			MCI values			SQMCI <sub>s</sub> values (17 previous surveys)		
		Median	Range	Current Survey	Median	Range	Current Survey	Median	Range	Current Survey
1	22	23	18-31	23	103	87-112	110	5.5	2.3-7.6	6.9
2	23	24	17-34	29	97	82-110	101	4.9	3.8-7.5	5.9

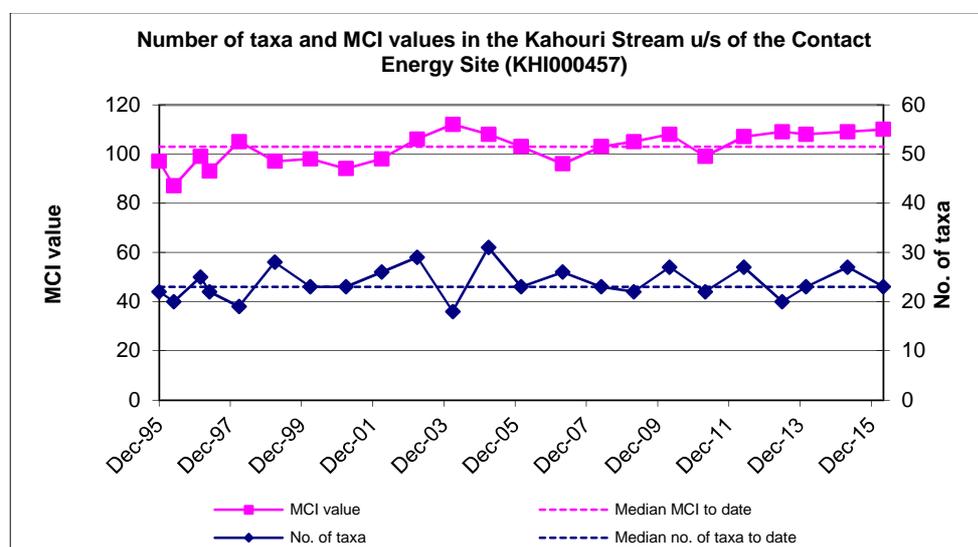
### Site 1: Kahouri Stream (KHI000457)

A moderately high macroinvertebrate community richness of 23 taxa was found at site 1 ('control' site) at the time of the summer survey. This was the same as the historical median for this site and two taxa lower than the previous survey on April 2015 ([Figure 2](#), [Table 4](#)).

The MCI score of 110 units indicated a community of 'good' biological health which was significantly higher (Stark, 1998) than the historical median MCI score of 103 units. The MCI score was not significantly different (Stark, 1998) to the preceding survey (109 units) and was close to the highest MCI score recorded at the site (112 units) ([Table 4](#)).

The SQMCI<sub>s</sub> score of 6.9 units was significantly higher (Stark, 1998) than the median SQMCI<sub>s</sub> score of 5.5 units but not significantly different to the preceding survey score (6.6 units) (Stark, 1998) ([Table 4](#)).

The community was characterised by one 'extremely abundant' 'highly sensitive' taxon [mayfly (*Deleatidium*)] and three 'very abundant' taxa ['tolerant' caddisfly (*Hydropsyche/Aoteapsyche*) and 'moderately sensitive' mayfly (*Coloburiscus*) and beetle (Elmidae)] ([Table 5](#)).



**Figure 2** Number of taxa and MCI values in the Kahouri Stream at site 1 (KHI000457)

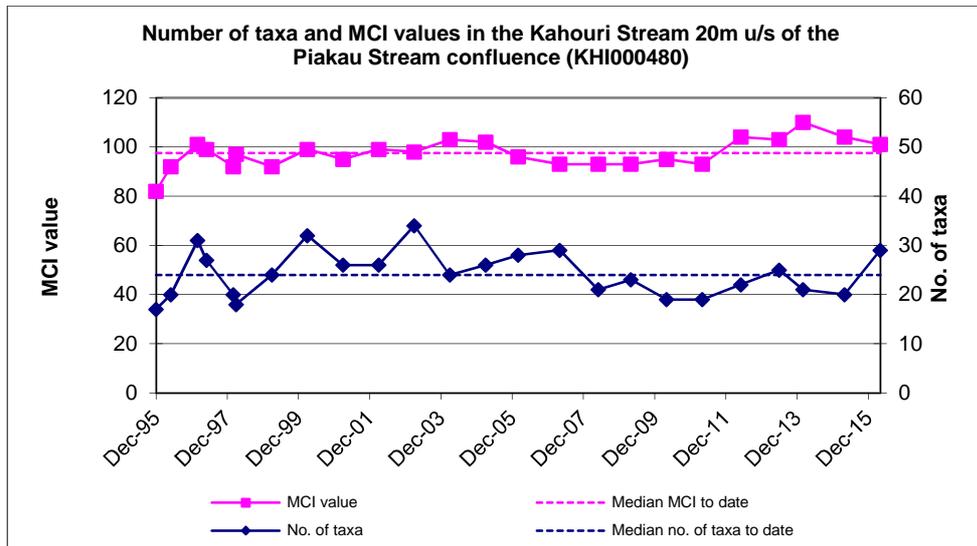
**Site 2: Kahouri Stream (KHI000480)**

A moderately high macroinvertebrate community richness of 29 taxa was found at site 2 ('impact' site) at the time of the summer survey. This was five taxa higher than the historical median for this site and nine taxa higher than the previous survey on April 2015 (Figure 3, Table 4).

The MCI score of 101 units indicated a community of 'good' biological health which was not significantly higher (Stark, 1998) than the historical median MCI score of 97 units. The MCI score was not significantly different (Stark, 1998) to the preceding survey (104 units) (Table 4).

The SQMCI<sub>s</sub> score of 5.9 units was not significantly higher (Stark, 1998) than the median SQMCI<sub>s</sub> score of 5.5 units and the same as the preceding survey score (5.9 units) (Stark, 1998) (Table 4).

The community was characterised by three 'very abundant' taxa ['tolerant' caddisfly (*Hydropsyche/Aoteapsyche*), 'moderately sensitive' mayfly (*Coloburiscus*), and 'highly sensitive' mayfly (*Deleatidium*)] (Table 5).



**Figure 3** Number of taxa and MCI values in the Kahouri Stream at site 2 (KHI000480)

**Table 5** Macroinvertebrate fauna of the Kahouri Stream (sites 1 & 2) in relation to Contact Energy, East Road during the survey of 14 April 2016

Taxa List	Site Number	MCI score	1	2
	Site Code		KHI000457	KHI000480
	Sample Number		FWB16194	FWB16195
ANNELIDA (WORMS)	Oligochaeta	1	A	A
MOLLUSCA	<i>Potamopyrgus</i>	4	R	C
CRUSTACEA	<i>Paracalliope</i>	5	-	R
EPHEMEROPTERA (MAYFLIES)	<i>Austroclima</i>	7	-	C
	<i>Coloburiscus</i>	7	VA	VA
	<i>Deleatidium</i>	8	XA	VA
	<i>Nesameletus</i>	9	C	-
	<i>Zephlebia group</i>	7	-	R
PLECOPTERA (STONEFLIES)	<i>Zelandobius</i>	5	-	R
	<i>Zelandoperla</i>	8	R	-
COLEOPTERA (BEETLES)	Elmidae	6	VA	A
	Hydraenidae	8	C	-
MEGALOPTERA (DOBSONFLIES)	<i>Archichauliodes</i>	7	A	A
TRICHOPTERA (CADDISFLIES)	<i>Hydropsyche (Aoteapsyche)</i>	4	VA	VA
	<i>Costachorema</i>	7	R	R
	<i>Hydrobiosis</i>	5	C	A
	<i>Neurochorema</i>	6	-	R
	<i>Psilochorema</i>	6	-	R
	<i>Beraeoptera</i>	8	C	A
	<i>Confluens</i>	5	R	C
	<i>Olinga</i>	9	R	-
	<i>Pycnocentria</i>	7	-	R
	<i>Pycnocentroides</i>	5	R	A
	<i>Tripletides</i>	5	-	R
DIPTERA (TRUE FLIES)	<i>Aphrophila</i>	5	A	C
	<i>Maoridiamesa</i>	3	-	R
	Orthocladinae	2	R	C
	Tanytarsini	3	R	C
	Empididae	3	-	R
	<i>Austrosimulium</i>	3	R	R
	Tabanidae	3	R	R
	Tanyderidae	4	R	R
ACARINA (MITES)	Acarina	5	R	R
No of taxa			23	29
MCI			110	101
SQMCIs			6.9	5.9
EPT (taxa)			11	15
%EPT (taxa)			48	52
'Tolerant' taxa		'Moderately sensitive' taxa	'Highly sensitive' taxa	

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

## Discussion and conclusions

This late summer 2016 biomonitoring survey of the Kahouri Stream that receives stormwater from the Contact Energy site on East Road was undertaken during a relatively wet period. Results indicated that the stormwater discharges had not had an impact on the macroinvertebrate communities of the stream.

Macroinvertebrate richness at the 'impact' site (site 2) was higher (six taxa higher) than the 'control' site (site 1) and to the historical median suggesting no effects of any toxic discharges. Taxa abundances were slightly higher at site 1 compared with site 2.

Site 1 had 'good' macroinvertebrate health that indicated that 'good' physicochemical water quality conditions preceded the survey at this site, located upstream of the Contact Energy site. The site 1 MCI score was an insignificant 9 MCI units higher than site 2 which also had 'good' macroinvertebrate health. However, the MCI score for site 2 was significantly lower than the 113 MCI units median score recorded for streams sourced within the National Park at sites with an altitude of 250 to 299 metres asl (TRC, 2015).

There was a significant downstream decrease in SQMCI<sub>s</sub> score of 1.0 units from site 1 to site 2 which suggested some nutrient enrichment at site 2. Differences in SQMCI<sub>s</sub> scores reflected differences in the community composition between sites, particularly differences in the more abundant taxa. Specifically, site 2 had a decrease in the 'highly sensitive' mayfly *Deleatidium* which was 'extremely abundant' at site 1 and the 'moderately sensitive' elmid beetles which were 'very abundant' at site 2.

The MCI and SQMCI<sub>s</sub> indexes are indicators of organic pollution but are also usually correlated with deposited sediment so that sites with high levels of silt tend to have lower MCI and SQMCI<sub>s</sub> scores which makes them useful for determining impacts of discharges that are predominately fine sediment such as stormwater discharges. However, macroinvertebrate sampling occurs in riffles which have high flow velocities compared with runs and pools and are therefore far less likely to accumulate deposited sediment. During the current survey only minor differences in deposited sediment were evident; the 'control' site had no silt and 5% sand while the 'impact' site had 5% silt and no sand. No silt coating was observed at either site nor any change in the turbidity of the water. Therefore, the most likely explanation for the decreases MCI and SQMCI<sub>s</sub> scores was the consented discharge of effluent from oxidation ponds situated 150 m upstream of the downstream 'impact' site.

Overall, there was no evidence that stormwater discharges from the Contact Energy site had any discernible impact on the macroinvertebrate community of the Kahouri Stream.

## Summary

The Council's standard 'kick-sampling' technique was used at two sites to collect streambed macroinvertebrates from the Kahouri Stream on 14 April 2016 to determine whether or not consented stormwater discharges from the Contact Energy site had had any recent detrimental effect upon the macroinvertebrate communities of the Kahouri stream. Samples were sorted and identified to provide the number of taxa (richness), MCI, and SQMCI<sub>s</sub> scores for each site.

The MCI is a measure of the overall sensitivity of the macroinvertebrate community to the effects of organic pollution in stony streams. It is based on the presence/absence of taxa with varying degrees of sensitivity to environmental conditions. It may be used in soft-bottomed streams to detect trends over time. The SQMCI<sub>s</sub> takes into account taxa abundance as well as sensitivity to pollution, and may reveal more subtle changes in communities, particularly if non-organic impacts such as elevated silt levels from stormwater discharges are occurring.

Significant differences in either MCI or SQMCI<sub>s</sub> between sites indicate the degree of adverse effects (if any) of discharges being monitored.

Taxa richness at both sites was moderately high. The macroinvertebrate communities of both sites were also in 'good' generic biological health and there were some abundant 'sensitive' taxa at both sites. There was an insignificant decrease in MCI score from site 1 to site 2 but site 2 had a significantly lower score than typical sites in ring plain streams that are sourced within the National Park. Site 2 also had a significantly lower SQMCI<sub>s</sub> score than site 1. These differences probably reflected a small level of nutrient enrichment from the discharge of effluent from oxidations ponds located 150 upstream of site 2.

Overall, this early autumn macroinvertebrate survey indicated that the discharge of stormwater from the Contact Energy site had not had any significant detrimental effects on the macroinvertebrate communities of the Kahouri Stream.

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## **Appendix V**

### **Air monitoring results for TCC1**



Parameter	Unit	Average															Consent limits for NOx
		01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	
NOx	ppm	8.7	9.3	7.7	7.5	9.3	7.5	7.4	6.1	7.4	6.4	12.0	10.9	2.9	1.6	1.7	
	kg/h	32	33	24	20	35	26	26	23	23	20						
Carbon dioxide	t/h	111	103	81	71	122	91	91	91	71	62	89	78	33	15	16	
Carbon monoxide	ppm	12	22	50	88	4	20	32	56	51	87	50	55	43	9	14	
		Maximum															
		01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	
NOx	ppm	80	80	80	80	80	80	80	80	81	80	80	80	80	80	81	<b>50</b>
	kg/h	155	171	146	277	317	346	359	298	277	332	137	126	105	134	97	<b>430</b>
Carbon dioxide	t/h	145	147	154		161	306	189	167	171	212	184	199	151	186	152	
Carbon monoxide	ppm	412	403	403	403	401	412	402	401	401	412	412	408	412	400	401	
		Annual total															
		01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	
NOx	tonnes	283	287	214	178	304	232	230	214*	204*	177	344	309	80	50	49	
Carbon dioxide	M tonnes	0.969	0.911	0.718	0.627	1.106	0.801	0.801	0.792	0.621	0.551	0.786	0.682	0.288	0.132	0.136	



**Appendix VI  
Annual report for 2015-2016  
by Contact Energy Limited**

**Pursuant to condition 19 of consent 7746-1**





09 August 2016  
The Chief Executive  
Taranaki Regional Council  
Private Bag 713  
Stratford

Attn: Kate Giles

**Subject: Stratford Power Station Annual Report for the period 1 July 2015 to 30 June 2016.**

Dear Miss Giles

We are pleased to report that the 18<sup>th</sup> year of Stratford Power Station (SPS) operation, we believe, has continued to maintain a high level of compliance. 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 2015 to 30 June 2016.

Please find included a summary of plant operation with regard to consent monitoring and relevant operational changes for the year in review. Summary reports reflecting the last years inter laboratory testing are also included for wastewater discharge, raw water abstraction and stack emissions.

We look forward to any feedback from the TRC on improvements or further reporting definitions with regard to the reporting period.

Yours faithfully

Paul Fougere  
Head of Generation - Taranaki



## **Consent Monitoring Highlights for the period 1 July 2015 – 30 June 2016**

### **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 966,013m<sup>3</sup> with an average abstraction rate of 31 l/s. The maximum abstraction rate for the year was 134 l/s on 13 May 2016 when the minimum river flow was 4723 l/s.

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

One non-compliance event occurred on 24 July 2015 when a member of the public lodged a complaint relating to foaming in 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 & 2.0°C (5% of time) for the entire year.
- River temperature probes were calibrated periodically during the year in accordance with the maintenance plan.

The maximum difference between upstream and downstream temperatures occurred on 12 November 2015 at 20:07hrs, with difference of 1.56°C. At this time the waste water flow from site was 15.1l/s, river flow at 1.04m<sup>3</sup>/s with upstream and downstream temperatures of 12.76°C and 14.3°C respectively.

#### Discharge Flow:

The maximum recorded combined discharge flow for the year was 49.17 l/s, this being within the discharge consent limit of 78 l/s.

The average combined discharge flow from the site was 21.38 l/s for the year.

The total volume of wastewater discharged for the year from site was 576,361m<sup>3</sup>. This equates to approximately 60% 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 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 occur due to low sample volume, which occurs 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 SPS within its consent limits.



## Consent 4459-1 & 3939-2 Discharge storm water to Piakau and Kahouri Streams:

### Stratford Power Station: -

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

The storm water pond overflowed into the neighbouring river on 28 occasions during the year due to high rainfall occurrences. These occurred in July, August, September, November 2015 and January, February, March, April, May and June 2016.

### Consent 4454-1 Discharge to air (TCC):

The maximum hourly Nitrogen Oxides discharge rate from the plant for the reporting year was 96.99 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 23.1 ppm on 17 June 2016. This is below the consent limit of 50 ppm.

During start up and shut down, the plant is permitted to exceed the 50 ppm limit for set periods as per the consent. The maximum emissions during these periods of start up and shutdown was 80.85 ppm on 20 June 2016.

Total Carbon Dioxide stack emissions were calculated to be 135562 tonnes for the year and the total Nitrogen Oxides emissions from the plant were recorded at 493 tonnes for the year.

The cooling tower plume was visible at certain times throughout the year, generally in the morning and at night during the winter months.

### Consent 4454-1 Discharge to air (SPP):

The cooling tower plume was visible at certain times during the year, generally in the morning and at night during winter months; the plume coincides with plant operation at low ambient temperatures.

### Inter Laboratory Comparisons and site inspections:

During the year, inter laboratory comparisons samples were taken on 3 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 the 5 August 2015, 26 November 2015, and 9 March 2016, see attached Tables.

### Site Inspections Notices

Inspection Notice	Inspection Type	Date Issued	Consent	Comments
H385652443	Compliance Monitoring	24/07/2015	5848-1	Report of Foaming in Patea River & Required Follow Up Actions Listed.
H386035072	Follow Up	28/07/2015	5848-1	Required Follow up Actions are being taken.
Z388251988	Other Inspection	18/08/2015	5848-1	Incident Follow Up, Complies.
B416856239	Incident investigation	26/05/2016	7247-1	Public Complaint regarding smell from site, no further action as site found to be compliant.

**General Remarks:**

Plant Operation:

**TCC Number of Operational Days July 2015 – June 2016**

July	August	September	October	November	December	January	February	March	April	May	June
0	0	10	0	11	0	0	0	13	5	0	13

**GT21 Number of Operational Days July 2015 – June 2016**

July	August	September	October	November	December	January	February	March	April	May	June
22	25	12	24	24	23	31	26	23	14	30	29

**GT22 Number of Operational Days July 2015 – June 2016**

July	August	September	October	November	December	January	February	March	April	May	June
25	23	27	31	27	18	25	18	19	8	21	25

ISO Programs:

Stratford Power Station continued to maintain ISO14001 and ISO9001 Certification. An internal audit was carried out on 11 and 12 November 2015 with no non-conformances.

One improvement recommendation was made in respect of improving community relations with local Iwi and in accordance with Contact Energy's Ngā Tikanga.

Environmental Management:

The SPS Environmental Focus Group met on three occasions (November 2015, March and June 2016) during the reporting year to discuss and progress environmental opportunities for monitoring and management improvement.



Table 1: Results of Laboratory testing completed by TRC Lab, SPS Lab and site monitors on Waste Water Discharge Consent 5848-1 Special Condition 12.

Date	Time	Sample	Consent Condition	Units	Consent Limit(s)	TRC Lab	SPS Lab	Plant Monitor
5/08/2015	14:40	SPP Waste Water Discharge	Total Chlorine	g/m3	0.05	0.03	0.00	0.016
			pH		6 - 9	8.1	8.21	8.42
5/08/2015	14:50	TCC Waste Water Discharge	Total Chlorine	g/m3	0.05	0.04	0.00	0.000
			pH		6 - 9	8.3	8.81	8.70
26/11/2015	10:17	SPP Waste Water Discharge	Total Chlorine	g/m3	0.05	<0.01	0.01	0.005
			pH		6 - 9	6.9	6.96	7.35
26/11/2015	10:54	TCC Waste Water Discharge	Total Chlorine	g/m3	0.05	0.02	0.02	0.00
			pH		6 - 9	7.1	7.23	7.27
9/03/2016	09:45	SPP Waste Water Discharge	Total Chlorine	g/m3	0.05	0.01	0.01	0.003
			pH		6 - 9	6.6	6.99	6.88
9/03/2016	09:20	TCC Waste Water Discharge	Total Chlorine	g/m3	0.05	<0.01	0.02	0.029
			pH		6 - 9	7.4	7.58	7.71

1. Wastewater discharge from TCC had a negligible effect on the Patea River. The water quality was improved for some parameters.
2. Conductivity had the most impact on the River.