Contact Energy Limited
Stratford Power Station (TCCP & SPP)
Monitoring Programme
Annual Report
2009-2010

Technical Report 2010-93

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Executive summary

Contact Energy Limited operates the Stratford Power Station located on State Highway 43 near Stratford, in the Patea catchment. The Company holds resource consents to allow it to abstract water from the Patea River, to discharge to the Patea River and Kahouri Stream, and to land, to provide for several structures across streams, and to discharge emissions into the air. This report for the period July 2009-June 2010 describes the monitoring programme implemented by the Taranaki Regional Council to assess the Company's environmental performance during the period under review, and the results and environmental effects of the Company's activities.

The Company holds a total of 26 resource consents, which include a total of 220 conditions setting out the requirements that the Company must satisfy. These consents provide for three gas-fired plants, including the existing combined-cycle plant, a yet-to-be-built plant similar to the existing plant, and the smaller, open-cycle peaking plant that was under construction during the review period.

The Council's monitoring programme for the year under review included twelve inspections, nine water samples collected for physicochemical analysis, and two biomonitoring surveys of receiving waters. Water abstraction, wastewater discharge, and air emission monitoring results were provided by the Company to the Council.

The monitoring showed that the combined cycle plant continued to be well managed and any environmental impacts were negligible. There were some minor breaches of the nitrogen oxides air emission limit during start-ups, which were addressed satisfactorily. One unauthorised incident was registered, in relation to nitrogen oxides emission concentration during the burning of a new feed gas. There was ongoing consultation between the Council and Contact Energy Limited staff.

Construction of the new peaker plant, across the Kahouri Stream from the combined cycle plant, proceeded without incident.

During the year, the Company demonstrated a high level of environmental performance and compliance with the resource consents. The Company has achieved a high level of performance throughout its twelve years of operation.

This report includes recommendations for the 2010-2011 year.

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1.1 Compliance monitoring programme reports and the Resource Management Act 1991

1.1.1 Introduction

This report is the Annual Report for the period July 2009-June 2010 by the Taranaki Regional Council on the monitoring programme associated with resource consents held by Contact Energy Limited (Contact Energy) to provide for two gas-fired power plants, one operational and one under construction, situated on East Road (State Highway 43) near Stratford, in the Patea catchment.

This report covers the results and findings of the monitoring programme implemented by the Council in respect of the consents held by Contact Energy Limited that relate to abstractions and discharges of water within the Patea catchment, and the air discharge permits held by Contact Energy Limited to cover emissions to air from the site.

One of the intents of the Resource Management Act (1991) 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 Taranaki Regional Council generally implements integrated environmental monitoring programmes and reports the results of the programmes jointly. This report discusses the environmental effects of Contact Energy use of water, land, and air, and is the thirteenth combined annual report by the Taranaki Regional Council for the Company.

1.1.2 Structure of this report

Section 1 of this report is a background section. It sets out general information about compliance monitoring under the Resource Management Act and the Council's obligations and general approach to monitoring sites through annual programmes, the resource consents held by Contact Energy Limited in the Patea catchment, the nature of the monitoring programme in place for the period under review, and a description of the activities and operations conducted at Contact Energy Limited's site.

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

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

Section 4 presents recommendations to be implemented in the 2010-2011 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 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);
(e) risks to the neighbourhood or environment.

In drafting and reviewing conditions on discharge permits, and in implementing monitoring programmes, the Taranaki Regional Council is recognising the comprehensive meaning of `effects' in as much as is appropriate for each discharge source. Monitoring programmes are not only based on existing permit conditions, but also on the obligations of the Resource Management Act to assess the effects of the exercise of consents. In accordance with section 35 of the Resource Management Act 1991, the Council undertakes compliance monitoring for consents and rules in regional plans; and maintains an overview of performance of resource users against regional plans and consents. Compliance monitoring, (covering both activity and impact monitoring), also enables the Council to continuously assess its own performance in resource management as well as that of resource users particularly consent holders. It further 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 Contact Energy Limited in the Patea Catchment during the period under review, this report also assigns an overall rating. The categories used by the Council, and their interpretation, are as follows:

- a **high** level of environmental performance and compliance indicates that essentially there were no adverse environmental effects to be concerned about, and no, or trivial (such as data supplied after a deadline) non-compliance with conditions.
- a **good** level of environmental performance and compliance indicates that adverse environmental effects of activities during the year were negligible or minor at most, items of concern were resolved positively, co-operatively, and quickly, the Council did not record any verified unauthorised incidents involving significant environmental impacts and was not obliged to issue any abatement notices, there were perhaps some items noted on inspection notices for attention but these items were not urgent nor critical, and follow-up inspections showed they have been dealt with.

- **improvement desirable** indicates that the Council may have been obliged to record against the consent holder a verified unauthorised incident involving significant environmental impacts, and/or abatement notices may have been issued; there were adverse environmental effects arising from activities and intervention by Council staff was required, and there were matters that required urgent intervention, took some time to resolve, or remained unresolved at end of the period under review.
- **poor** performance is used when there were grounds for prosecution or infringement notice.

1.2 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 a 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 been improved to 383 MW at 56.7%. The firing system in the gas turbine is especially designed to minimise the production of nitrogen oxides in the exhaust.

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 steam 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 TAWN fields (Tariki, Ahuroa, Waihapa and Ngaere fields). The station uses approximately 1.4 million cubic metres of gas per day in generation.

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 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. 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 gas turbines employ a gas-fired open cycle generation process, with an intercooler, and are capable of going from cold to full power in 10 minutes. To improve efficiency, air passing from the low pressure compressor is cooled prior to 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 for the existing combined cycle plant described above, being a hybrid dry/wet mechanical draft cooling tower.

Water to supply the cooling tower is to be drawn from the Patea River via the existing abstraction and storage system for the combined cycle plant. Stand-alone water and wastewater treatment systems were being constructed. Wastewater is to be discharged to the Patea River via the existing effluent outfall for the combined cycle plant. Site stormwater was being discharged to the Kahouri Stream during plant construction and is to be transferred to the raw water holding pond at the combined cycle plant during operation. Domestic wastes were being treated at the existing plant for the adjacent switchgear yard during construction, and is to be discharged to a new land-based system during operation.

Construction of the peaker plant commenced in December 2008, following demolition of the old Stratford Gas Turbine plant. It was due to be completed in mid-2010, however commissioning was delayed until February 2011.

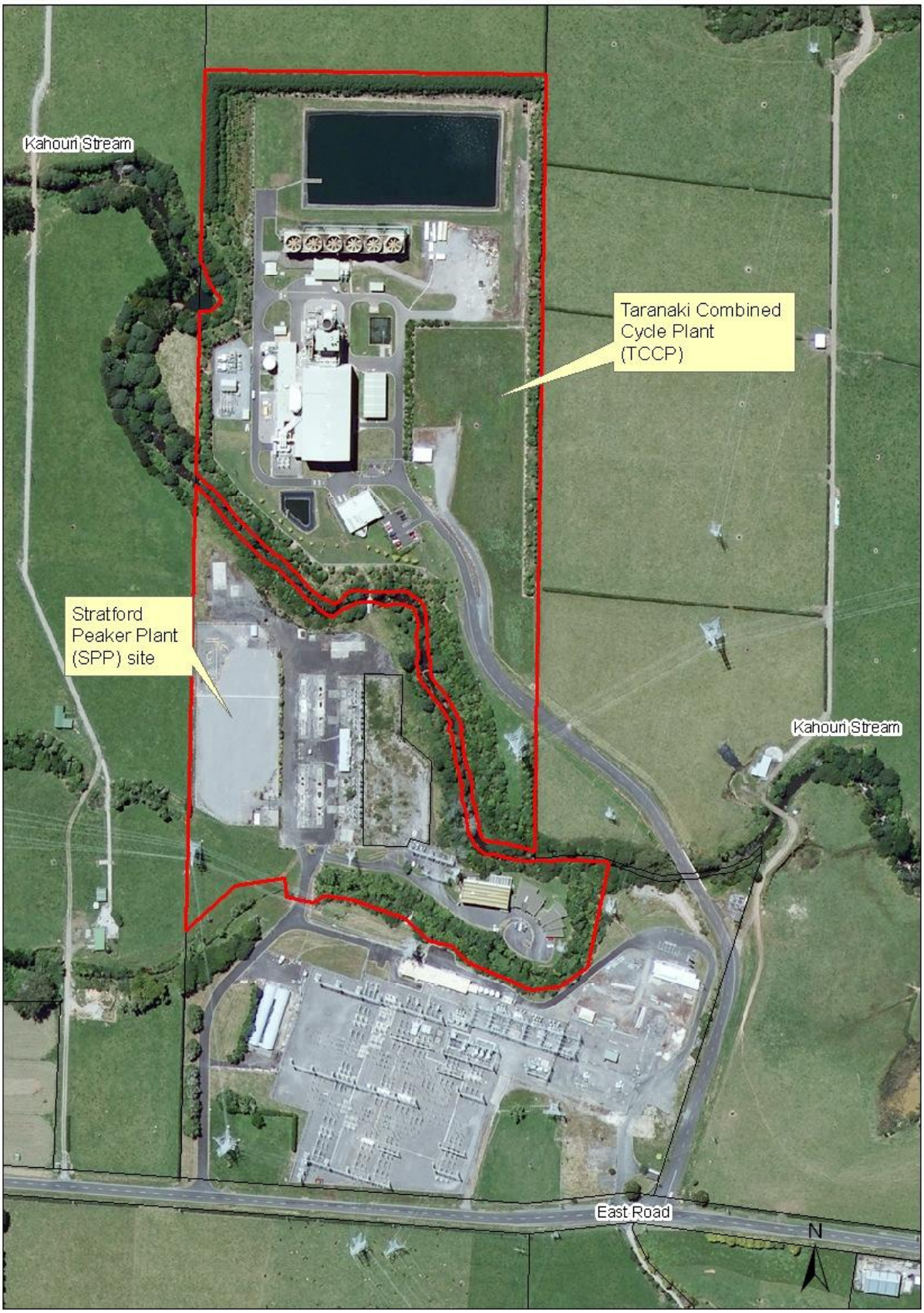

Photo 1 Aerial view of Stratford Power Station, early 2007

1.3 Resource consents

A summary of the consents held by Contact Energy Limited, formerly Stratford Power Limited, 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 held by Contact Energy Limited

Consent number	Purpose	Volume	Next review date	Expiry date
3939-2	Discharge stormwater	464 L/s	2010	2016
4022-2	Discharge emissions to air from combustion		2010	2022
4454-1	Discharge contaminants to air		2010	2029
4455-1	Take from Patea River below Toko confluence	19,440 m^3/day (225L/s)	2010	2028
4456-1	Intake structure on Patea River below Toko confluence		2010	2028
4458-1	Diffuser structure on Patea River		2010	2028
4459-1	Discharge stormwater to Kahouri/Piakau Streams	1,360 litres/second	2010	2028
4460-1	Stormwater discharge structures		2010	2028
4461-1	Utilities structures on Kahouri Stream		2010	2028
4462-1	Water transmission structures		2010	2028
4804-1	Bridge for electricity transmission over Kahouri Stream		2010	2028
5063-1	Discharge septic tank effluent to land	5 m^3/day	2010	2028
5633-1	Discharge sediment from water intake to Patea River		2010	2028
5846-1	Discharge contaminants to air		2010	2034
5847-1	Take from Patea River at Skinner Road	19,440 m^3/day (225L/s)	2010	2034
5848-1	Discharge used water to Patea River	6,740 m^3/day (78L/s)	2010	2034
5849-1	Gas pipeline structures on Kahouri Stream		2010	2034
5850-1	Intake structure on Patea River at Skinner Road		2010	2034
5851-1	Discharge sediment from water intake to Patea River		2010	2034
5852-1	Utilities structures on Kahouri Stream		2010	2034
7247-1	Discharge emissions to air from cooling tower		2010	2034
7248-1	Bridge for pedestrian access and utilities over Kahouri tributary		2010	2034
7249-1	Bridge for vehicle access over Kahouri Stream		2010	2034
7250-1	Bridge for pedestrian access and utilities over Kahouri Stream		2010	2034
7605-1	Stormwater discharge structure		2016	2028
7653-1	Stormwater discharge structure		2016	2028

Consents **4454** to **4462** and **4804** were granted in 1994 and 1995 to provide for the operation of the existing Taranaki Combined Cycle (TCC 1) 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 (TCC 2), in combination with the existing plant (TCC 1). 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 (SPP), 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).

1.3.1 Water abstraction permits

Section 14 of the Resource Management Act 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 Limited holds two consents for the abstraction and use of water.

Water Permit **4455-1** allows the take and use of 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 of power stations. This permit was originally issued by the Taranaki Regional Council on 25 May 1994 under Section 87(d) of the Resource Management Act, with a change to consent conditions on 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 the Company 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. This permit was issued by the Taranaki Regional Council on 27 November 2001 as a resource consent under Section 87 (d) of the Resource Management Act, with changes to consent conditions in 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 Limited proposes that when the TCC 2 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.

1.3.2 Water discharge permits

Section 15(1)(a) of the Resource Management Act 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

Stratford Power Limited previously held water discharge permit **4457-1** to cover the discharge of up to 2,770 m^3/day [32 litres/second] of used water, mainly blow down water from the cooling system, and up to 5 m^3/day [0.12 litres/second] of treated domestic effluent, into the Patea River. This permit was issued by the Taranaki Regional Council on 25 May 1994 under Section 87(e) of the Resource Management Act, 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 cubic metres/day [78 litres/second] of used water, mainly blowdown water from the cooling system of combined cycle power stations, into the Patea River. This permit was issued by the Taranaki Regional Council on 27 November 2001 under Section 87(e) of the Resource Management Act, 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 Limited holds two consents in relation to discharge of stormwater.

Water discharge permit **3939-2** covers the discharge of up to 454 litres/second 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 Taranaki Regional Council on 10 November 1997 under Section 87(e) of the Resource Management Act. It is due to expire on 1 June 2016.

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** covers the discharge of up to 1,360 litres/second of stormwater from a combined cycle power station site, including stormwater and sediment from construction activities associated with the proposed expansion of the 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 Taranaki Regional Council on 29 May 1994 under Section 87(e) of the Resource Management Act. It is due to expire on 1 June 2034.

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

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

Condition 3 requires a contingency plan in case of accidental discharge or spillage.

Condition 4 establishes a mixing zone, and controls effects of the discharge on the appearance, odour, water quality, and biology of the river.

Condition 5 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 Taranaki Regional Council on 24 May 2000 under Section 87(e) of the Resource Management Act. 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 Taranaki Regional Council on 7 December 2001 under Section 87(e) of the Resource Management Act, 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 applications.

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.

1.3.3 Air discharge permits

Section 15(1)(c) of the Resource Management Act 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 Limited holds four discharge permits in relation to discharges to air.

1.3.3.1 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 Resource Management Act. A variation was granted by Hearing Committee on 12 June 2003 to delete (original) conditions 4 to 10 relating to the mitigation of CO2 emissions. A change to condition 12 was granted on 9 February 2010 to increase the period when emission standards relating to start-up apply, from 30 minutes to 240 minutes. 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 Limited to provide reports within two years of, and then again at 4 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.

1.3.3.2 Taranaki Combined Cycle 2 (TCC 2 – yet to be constructed)

Air discharge permit **5846-1** covers the discharge of contaminants to air from combined cycle 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 second power station to be constructed adjacent to the existing one. 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 on 6 September 2002. The consent was issued on 6 September 2002. A variation to change the date of the lapse of the consent if the consent is not exercised from 6 years from the date of commencement to 6 December 2017 was granted on 22 February 2007. To date the consent has not been exercised. The consent expires on 1 June 2034.

Conditions 1, 2 and 3 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 4 requires consultation with Council before any significant changes on the site.

Condition 5 requires Contact Energy to provide reports within two years of, then again at 4 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 6 to 10 impose limits on significant potential contaminants in discharges.

Condition 11 sets a minimum height for discharges from turbines.

Condition 12 prohibits any direct significant adverse ecological effect.

Conditions 13 and 14 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.

1.3.3.3 Stratford Peaker Plant (SPP – under construction in 2009-2010)

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 Taranaki Regional Council on 14 December 1994 under Section 87(e) of the Resource Management Act, 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 Taranaki Regional Council on 6 March 2008 under Section 87(e) of the Resource Management Act. 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 cooing 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.

1.3.4 Discharges of waste to land

Sections 15(1)(b) and (d) of the Resource Management Act 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 cubic metre/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 Taranaki Regional Council on 6 December 1996 as a resource consent under Section 87(e) of the Resource Management Act, with changes to conditions on 6 September 2001. 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.

1.3.5 Land use consents

Section 13(1)(a) of the Resource Management Act 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 Limited holds 14 land use consents in relation to structures on streams.

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 Taranaki Regional Council on 25 May 1994 as a resource consent under Section 87(a) of the Resource Management Act, 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 f discharging used water from the combined cycle power stations, was issued by the Taranaki Regional Council on 25 May 1994 as a resource consent under Section 87(a) of the Resource Management Act, 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 the site of combined cycle power stations, was issued by Taranaki Regional Council on 25 May 1994 as a resource consent under section 87(a) of the Resource Management Act. 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 combined cycle power, was issued by the Taranaki Regional Council on 25 May 1994 as a resource consent under section 87(a) of the Resource Management Act. The consent expires on 1 June 2028.

Consent **4461** has essentially the same nine conditions as those imposed on consent **4458** (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 combined cycle power stations, was issued by the Taranaki Regional Council on 25 May 1994 as a resource consent under section 87(a) of the Resource Management Act. The consent expires on 1 June 2028.

Consent **4462** has essentially the same nine conditions as those imposed on consent **4458** (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 combined cycle power stations, was issued by the Taranaki Regional Council on 25 May 1994 as a resource consent under section 87(a) of the Resource Management Act. 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 Taranaki Regional Council on 27 November 2001 as a resource consent under section 87(a) of the Resource Management Act, with the consent conditions varied on 22 February 2007. 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 combined cycle power station purposes, was issued by Taranaki Regional Council on 27 November 2001 as a resource consent under section 87(a) of the Resource Management Act, 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 and associated utilities over the Kahouri Stream in the Patea catchment for combined cycle power station purposes, was issued by Taranaki Regional Council on 6 December 2001 as resource consent under section 87(a) of the Resource Management Act. 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 the Kahouri Stream for pedestrian access and carriage of water pipes, high voltage cables, control cables and associates utilities, was issued by Taranaki Regional Council on 6 March 2008 as resource consent under section 87(a) of the Resource Management Act. To date this consent has not been exercised. 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 Taranaki Regional Council on 6 March 2008 as a resource consent under section 87(a) of the Resource Management Act. To date this consent has not been exercised. The consent expires on 1 June 2034.

Consent **7249** has 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 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 Taranaki Regional Council on 6 March 2008 as a resource consent under section 87(a) of the Resource Management Act. 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 Taranaki Regional Council on 23 February 2010 as a resource consent under section 87(a) of the Resource Management Act. 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 Taranaki Regional Council on 21 June 2010 as a resource consent under section 87(a) of the Resource Management Act. 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.

1.4 Monitoring programme

1.4.1 Introduction

Section 35 of the Resource Management Act sets out an obligation upon the Taranaki Regional Council to gather information, monitor, and conduct research on the exercise of resource consents, and the effects arising, within the Taranaki region and report on these.

The Taranaki Regional 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 Contact Energy site, consisted of six primary components.

1.4.2 Programme liaison and management

There is generally a significant investment of time and resources by the Taranaki Regional Council in ongoing liaison with resource consent holders over consent conditions and their interpretation and application, in discussion over monitoring requirements, preparation for any reviews, renewals, or new consents, advice on the Council's environmental management strategies and the content of regional plans, and consultation on associated matters.

1.4.3 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.

The construction of the Peaker plant was inspected approximately monthly during the monitoring period. Inspections focused on potential or actual discharges to receiving watercourses, including contaminated stormwater, and to air, including dust.

1.4.4 HSNO Inspections

In addition to RMA compliance monitoring inspections, the Council carried out HSNO (Hazardous Substances and New Organisms Act) compliance inspections at

various sites during 2009-2010. The Peaker plant construction site was visited three times in relation to HSNO during the monitoring period.

1.4.5 Chemical sampling

The Taranaki Regional 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.

The cooling water discharge was sampled on three occasions, and the sample analysed for temperature, pH, suspended solids, oil and grease, free and total chlorine, ammonia, dissolved reactive phosphorus, turbidity and conductivity.

No samples of the stormwater discharge to the Kahouri Stream were taken during the year. Stormwater is reused on site and discharges are limited to extreme rainfall events or the infrequent times when overflowing is required to carryout planned plant maintenance.

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.

1.4.6 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 stream.

1.4.7 Review of data and reports

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

2. Results

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

2.1 Water

2.1.1 Inspections – Combined Cycle Plant operation

At the combined-cycle plant site, inspection is made of areas where wastewater is generated, treated and monitored, and where chemicals and fuel/oil are stored, transferred or 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 plant, the cooling water system, and the wastewater treatment system (pH neutralisation, oil separation, holding pond and monitoring station). 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.

Four inspections were carried out during the year. In general the site was found to be in tidy condition. 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.

2.1.2 Inspections – Peaker Plant construction

Inspections and/or meetings at SPP, involving staff of Contact Energy and Council, occurred approximately monthly over the review period, with more frequent communication during the periods of most intensive construction activity.

Photograph 1 Stratford Peaker Plant under construction, 1 July 2010

Photograph 1 shows the central construction area, with the Kahouri Stream and bridge to the TCC1 plant in the background, at the end of the review period.

In November 2009, the Company advised its decision that all SPP utilities were to be independent of the TCC1 plant. This affected both water supply and wastewater disposal. For water supply, the river pumps at Vicker's Quarry were upgraded, and a by-pass line with pump was installed around the TCC1 raw water pond. For wastewater disposal, a separate 1,700 m^3 "operations pit" was excavated at the SPP site, with duplication of the existing wastewater monitoring equipment at the (by-passed) TCC1 plant operations pit, and a more direct connection to the (joint) river outfall. At the end of the review period, the additional works were almost finished.

The effluent disposal management plan required under special condition 1 on consent **5848-1** was revised in December 2009 to cover the SPP effluent. The plan was satisfactory. A list of water treatment chemicals was provided, as required under special condition 3. The nine raw water and six cooling water treatment chemicals were all known to Council, and no change of consent **5848-1** was required to provide for their use as proposed. Three of the chemicals contain phosphorus, two being required for at least a year as part of a guarantee on equipment in the cooling system.

The Company is aware of its obligation under condition 1 (iii) to minimise phosphorus in plant effluent and is investigating alternative chemicals.

The new water supply pumps were commissioned on 16 April 2010. The excess water was discharged to the Kahouri Stream, via the TCC1 plant raw water and stormwater holding ponds, rather than through the Patea River effluent outfall, as the plant was down for planned maintenance. Council was consulted and inspected the Kahouri Stream, finding no significant effect.

Water from the cooling tower system was discharged to the Kahouri Stream on one occasion, in June 2010. At this time, the SPP operations pit had not been completed, nor had the stormwater connection to the TCC plant. A volume of less than 100 m^3, comprising Patea River water that had been used for fire prevention, and accumulated rain water without any added treatment chemicals, was flushed from the system pipework. The discharge occurred via the interceptor pit, after chemical testing and consultation with Council.

Particular attention was given during inspections to control of sediment in stormwater run-off and from dewatering of foundations and trenches, which was accomplished by several methods, including use of two existing on-site oil separators, placement of silt fences, hay bales and sand bags, and soakage to ground in areas with rubble substrate. A temporary truckwash was set up during concrete pouring, with an interceptor for solids separation and soakage of washwater to ground.

Portable toilets served the construction area, with disposal off site. Sewage from the administration buildings was directed to the sand-filter treatment plant that was designed for construction of the old station, and is now part of the adjacent switchyard site owned by Transpower Limited, and which discharges to Kahouri Stream under consent **1211-3**. A new sewage treatment and soakaway system was installed on the peaker plant site in June 2009 to provide for the plant during operation. (Certificate of compliance **7498-0**)

Overall, management of the construction activities to control environmental effects was found to be of a high standard.

2.1.3 Results of abstraction monitoring

Abstractions are regulated by consent **4455**. Contact Energy Limited also holds consent **5847** relating to water abstraction for the proposed power station. Contact Energy Limited 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. 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 litres/second (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 the year under review, the maximum intake flow recorded was 152.6 L/s, with an average flow rate of 37.5 L/s. The total volume abstracted was 1,176,052 m^3. This was a decrease of 15%, or 560 m^3/day, over the previous year's abstraction volume, which can be attributed to the plant running less than last year.

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. During the year in review the Patea River flow did not fall below 690 L/s.

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

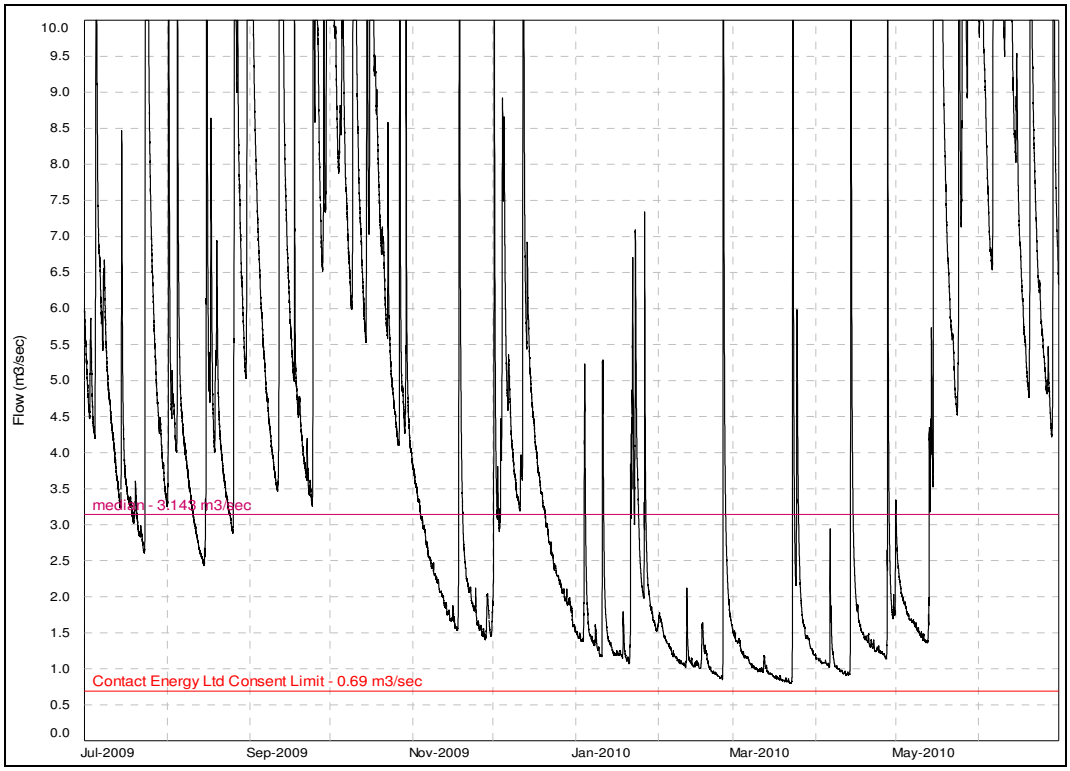

Figure 2 Patea River flow at Skinner Road (m^3/s), July 2009 – June 2010

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

Table 2 Monthly abstraction data July 2009 to June 2010

Month	Ave L/s	Max L/s
July-09	55	76
August-09	47	151
September-09	21	86
October-09	1.7	153
November-09	35	83
December-09	51	77
January-10	44	74
February-10	71	83
March-10	43	139
April-10	15	147
May-10	25	140
June-10	48	146

2.1.4 Results of discharge monitoring

Consent **5848** covers the discharge of process waters (mainly blowdown water from the cooling system) to the Patea River. The Company continuously monitors pH, chlorine, temperature (effluent and receiving water), and flow. 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 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. 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).

2.1.4.1 Results of monitoring by Contact Energy

The data in Table 3 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 by Contact Energy Limited July 2009 to June 2010

Month	Flow L/s			pH			Total Cl_2 g/m^3			Temp °C		
	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
Jul-09	0	15.4	8.3	6.8	7.7	7.1	0.00	0.06	0.00	11.7	25.6	18.4
Aug-09	0	20.4	7.2	6.7	8.5	6.8	0.00	0.05	0.00	15.1	22.5	19.0
Sep-09	0	22.1	4.0	6.1	8.9	7.0	0.00	0.05	0.00	12.8	21.7	18.4
Oct-09	0	25.3	2.1	6.6	8.4	7.0	0.00	0.87	0.00	11.6	20.8	15.4
Nov-09	0	26.6	5.2	6.3	8.6	7.0	0.00	1.03	0.00	15.1	25.2	21.1
Dec-09	0	15.2	7.4	6.7	8.2	7.0	0.00	0.12	0.01	19.6	26.7	23.6
Jan-10	0	21.1	6.9	6.2	9.0	7.1	0.00	0.23	0.01	19.1	27.1	23.2
Feb-10	0	21.6	12.1	6.3	8.9	7.0	0.00	0.17	0.01	21.9	27.9	25.1
Mar-10	0	27.2	7.3	5.8	8.2	7.0	0.00	0.79	0.01	17.5	26.5	23.3
Apr-10	0	26.8	0.7	5.4	9.6	7.1	0.00	1.03	0.03	14.6	20.5	16.7
May-10	0	31.9	5.0	6.4	8.5	7.0	0.00	0.08	0.00	11.3	20.1	15.5
Jun-10	0	17.4	7.3	6.1	8.8	7.2	0.00	0.91	0.00	15.3	20.9	18.0
Limit	**78**			**6.0**	**9.0**	**6.0-9.0**	**0.05**					

Flow

The discharge flow remained within the consent limit of 78 L/s for the year. The average discharge flow was 6.1 L/s, a decrease of 0.6 L/s from the previous year brought about by the plant running less often. The maximum recorded discharge flow was 31.9 L/s. The total volume of wastewater discharged for the year was 192,321 m^3.

pH

For the continuous pH analyser, the average value recorded during the year was 7.1. The minimum pH was 5.4, and the maximum 9.6. However, these extreme values were recorded when there was no or minimal discharge.

Each time the continuous pH monitor reading exceeds the consent range limit, the wastewater discharge valve automatically closes immediately (within one minute), ensuring discharge of off-specification wastewater to the river does not occur. The limits of when the discharge valve closes are set so that the valve activates outside the pH range 6.1 to 8.9. The pH excursions that were recorded were reported to relate to low sample flow, instrument maintenance or testing of the valve closure system, or to have occurred during the short period while the valve closes in response to a pH range excursion.

A total of 264 laboratory pH tests were made, all of which gave results that were within the consent range limit of 6.0 to 9.0. The average value was 7.2, with a minimum of 6.0 and a maximum of 8.1.

Chlorine

The average value for chlorine as tested (on 264 occasions) by the Contact Energy laboratory was 0.01 mg/kg. The maximum value was 0.12 mg/kg, on 26 April 2010, when the discharge valve was closed. In comparison, the continuous monitor reading often exceeded the total residual chlorine limit of 0.05 mg/kg, with a maximum of 1.03 mg/kg. This discrepancy is ascribed to periods of low sample level in the analyser, instrument calibrations, or actual high values. The wastewater discharge valve was shut whenever the limit was exceeded; therefore compliance with consent conditions was achieved.

Temperature

The river temperature during the year remained below 25˚C, allowing for continuous discharge. River temperature differentials remained within consent limits throughout the year. The maximum temperature differential recorded was 0.61˚C.

2.1.4.2 Results of Council monitoring

The results of Council monitoring are presented in Table 4. 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. No stormwater sampling took place owing to the infrequent nature of stormwater discharges to the Kahouri Stream.

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 good agreement on monitoring results.

Table 4 Results of effluent monitoring by Taranaki Regional Council, compared to Contact Energy Limited results for temperature, pH and chlorine

Date	Time NZST	Flow L/s	Temp ˚ C		pH			Free Cl g g/m³		Total Cl g g/m³			Condy mS/m	Turbidity NTU	SS g/m³	Oil g/m³	Amm g/m³	DRP g/m³
			TRC	TCC Meter	TRC	TCC Lab	TCC Meter	TRC	TCC Lab	TRC	TCC Lab	TCC Meter						
18-Dec-09	0925	7.3	22.5	23.3	6.9	6.9	6.9	<0.01	<0.01	<0.01	0.01	0.01	108	4.6	6	<0.5	0.072	0.097
24-Feb-10	0945	18.7	25.1	25.1	6.8	6.9	6.8	<0.01	<0.01	<0.01	0.03	0.05	83	4.6	4	<0.5	0.089	0.217
30-Jun-10	1020	8.8	18.7	18.1	6.8	6.9	6.8	<0.01	<0.01	<0.01	<0.01	<0.01	110	5.6	5	<0.5	*	*
Limit		**78**			**6.0 - 9.0**					**0.05**								

* No result

Free = free chlorine
DRP = dissolved reactive phosphorus
SS = suspended solids

Total Cl = total chlorine
Amm = ammonia
C = temperature

Cond = conductivity at 20C
Oil = oil and grease
Turb = turbidity

2.1.5 Results of receiving environment monitoring

2.1.5.1 Biomonitoring

Biomonitoring was conducted in the Patea River on 6 November 2009 and 2 February 2010. The full reports are given in Appendix II. These surveys relate to the exercise of consent **5848**. The consent allows the discharge of cooling water into the Patea River approximately 1km upstream of its confluence with the Kahouri Stream. The discharge may be elevated in temperature and may contain nutrients and other contaminants. Condition 7 (v) and (vi) of consent 5848 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 at five established sites to collect streambed macroinvertebrates from the Patea River. Three of the sites are in the immediate vicinity of the discharge point, the other two further downstream below the abstraction point. Samples were processed to provide number of taxa (richness), MCI and $SQMCI_s$ scores, and EPT taxa 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 $SQMCI_s$ takes into account taxa abundance as well as sensitivity to pollution, and may reveal more subtle changes in communities. It may be the more appropriate index if non-organic impacts are occurring.

Significant differences in either MCI or the $SQMCI_s$ between sites indicate the degree of adverse effects (if any) of the discharge being monitored.

The conclusions of the two surveys are presented below.

The spring macroinvertebrate survey was undertaken following a brief period of power station cooling water discharge, while the summer survey was undertaken during a period of discharge. Both surveys indicated that these discharges of treated cooling water from the Stratford Power Station site had not had any detrimental effect on the macroinvertebrate communities of the river. No significant changes in the macroinvertebrate communities were recorded between the upstream 'control' site and site immediately downstream of the discharge. Rather, changes were more subtle involving presence/absence of a few 'sensitive' taxa rarities.

The macroinvertebrate communities in the reach of the Patea River adjacent to the discharge contained moderate to high proportions of 'sensitive' taxa at all sites whereas the communities were generally dominated numerically by 'sensitive' taxa during the spring survey and 'tolerant' taxa during the summer survey showing some effect from the impact of the major point source discharge (Stratford oxidation ponds' system) some 3.5 km upstream. Taxonomic richness (number of taxa) tended to have decreased slightly in the spring survey compared to the previous summer 2009 survey, then increased during the summer survey.

MCI and $SQMCI_S$ scores during both spring and summer surveys indicated that the stream communities were of 'good' to 'fair' health. The spring survey values were slightly above the condition predicted for similar Taranaki ringplain rivers, and reflected the improved conditions following a period of cooler spring, higher flow conditions. While the summer results were slightly below the typical condition predicted for similar Taranaki ringplain rivers, and reflected some impacts of a lengthy period of low flow conditions.

Biomonitoring at three sites further downstream in the Patea River, for the establishment of baseline conditions in relation to consented power station expansion, found similar conditions to those monitored in the vicinity of the cooling water discharge with the exception of a small increase in the number of characteristic (dominant) 'tolerant' taxa in spring, and a small decrease in the proportion of characteristic (dominant) 'sensitive' taxa at the furthest downstream sites in summer. No significant changes in proportions of 'tolerant' taxa numbers were recorded in this reach, while MCI scores were near historical median values during both surveys.

Biannual biomonitoring surveys will continue to form a component of future monitoring programmes associated with consents granted to 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 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.

2.1.5.2 Physicochemical monitoring by Council

Council Officers collected water quality samples from the Patea River on three occasions during the year at sites above the discharge point for the cooling and process wastewaters and at the boundary of the mixing zone 75 metres downstream. 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.

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

The temperature increase measured in the river was between 0.1 and 0.3˚C, at times of normal effluent discharge rate.

Table 5 Patea River monitoring

Parameter	Units	Site	18-Dec-09	24-Feb-10	30-Jun-10
Time	NZST	U	1010	0955	1045
		D	1030	1010	1100
Flow	L/s	Skinner Rd	3666	876	6977
		Discharge	7.3	18.7	8.8
Temperature	˚C	U	13.8	17.2	9.5
		D	13.9	17.5	9.7
Conductivity at 20˚C	mS/m	U	9.6	10.3	8.6
		D	10.4	14.5	9.0
pH	pH	U	7.8	8.1	7.4
		D	7.7	7.9	7.4
Ammonia	g/m^3 N	U	0.092	0.031	*
		D	0.093	0.031	*
Unionised ammonia	g/m^3 NH_3	U	0.0017	0.0015	*
		D	0.0014	0.0010	*
Dissolved reactive phosphorus	g/m^3 P	U	0.073	0.152	*
		D	0.076	0.149	*
Suspended solids	g/m^3	U	3	<2	<2
		D	2	<2	3
Turbidity	NTU	U	2.1	2.6	1.5
		D	2.2	2.6	1.5

U = upstream of discharge point (Site Code PAT000356)
D = downstream of discharge point (Site Code PAT000357)

2.1.5.3 Temperature monitoring by Contact Energy

The river temperature remained below 25˚C throughout the year, allowing for continuous discharge. The maximum river temperature recorded for the downstream monitoring site was 20.9˚C at 1700 NZDT on 18 February 2010. The upstream temperature recorder recorded a maximum reading of 20.8˚C a few minutes earlier.

The average temperature increase caused by the plant discharge was 0.08˚C. The highest temperature differential was 0.61˚C, recorded on 19 March 2010. The average plant discharge rate was 6.1 l/s and the median flow rate of the Patea River at Skinner Road was 3,370 l/s.

2.2 Air

2.2.1 Inspections

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

Inspections took place on 7 October and 18 December 2009, and 24 February and 30 June 2010.

Compliance with condition 16 of consent **4454**, in respect of non-production of a visible plume from the evaporative cooling system except under certain meteorological conditions was complied with at the time of each inspection.

Staff of Contact Energy Limited 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.

2.2.2 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_x), oxygen (O_2), carbon monoxide (CO) and carbon dioxide (CO_2). The results are summarised in Table 6 below.

It is noted that the emissions monitor was found to be faulty in April 2009, leading to some false high values for NO_x and CO emissions during the period of May and June 2009. The meter was sent away for repair in Switzerland during June. However, on its return it was still faulty and had to be returned again in July 2009. Monitoring of emissions resumed from 9 September 2009.

Total emissions of CO_2 for the year were 620,875 tonnes, a decrease of 171,125 tonnes or 22% from the previous year.

The limit imposed by consent **4454-1** on NO_x mass discharge rate (430 kg/h) was complied with throughout the year.

The maximum period of 30 minutes allowed for NO_x concentration in stack emissions to be above 50 ppm (volumetric basis) during start-up or shut-down of the gas turbine was exceeded on several occasions before 9 February 2010, when the maximum period allowed during start-up was increased to 240 minutes by a change of consent. This change brought consent **4454-1** for TCC1 into line with the more recent consent **5846-1** for the yet-to-be-built TCC2. Compliance with the (new) time constraint on elevated NO_x concentration during turbine start-up was achieved for the remainder of the review period.

In December 2009 and January 2010, gas composition issues associated with supply from the new Kupe Production Station led to the plant being run intermittently at low load (≤20 MW), and consequent emissions of high NO_x content gas, above 50 ppm, for short periods. This is addressed further in section 2.3.

Table 6 Air monitoring results

Parameter	Unit	Average									Maximum									Annual total								
		01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10
NOx	ppm	8.7	9.3	7.7	7.5	9.3	7.5	7.4	6.1	7.4	80	80	80	80	80	80	80	80	81									
	kg/h	32	33	24	20	35	26	26	23	23	155	171	146	277	317	346	359	298	277									
	tonnes																			283	287	214	178	304	232	230	214*	204*
Oxygen	%	11	11	11	11	12	10	10	10	7.4	21	21	21	21	21	21		22	21									
Carbon dioxide	t/h	111	103	81	71	122	91	91	91	71	145	147	154		161	306	189	167	171									
	Mtonnes																			0.969	0.911	0.718	0.627	1.106	0.801	0.801	0.792	0.621
Carbon monoxide	ppm	12	22	50	88	4	20	32	56	51	412	403	403	403	401	412	402	401	401									
Consent limits for NOx	ppm kg/h										**50 430**																	

*NO_x mass discharge rate for May and June 2009 estimated on basis of CO_2 emission data, while emissions monitor faulty. NO_x data for August, and parts of July and September 2009 not collected, while monitor repaired.

2.2.3 Reviews and audits

Under condition 8 of consent **4454**, Contact Energy was required to provide the Council with a report within two years and four years of commissioning the plant and then at six yearly intervals that reviewed technological advances in reducing or mitigating plant emissions, providing a site emissions inventory, describing the energy efficiency of the plant and covering other matters relating to mitigation or emissions reduction.

The first report was received by the Council in the 1999-2000 monitoring year and the second in the 2001-2002 year. A summary of each report is provided in the annual monitoring report for each year.

The next such report was due by 1 February 2008, however this was not received until August 2009. The report is attached as Appendix IV. The main points of the report are summarised below.

Technological advances

The plant already incorporates many of the features of the latest technology, such as EV burners and sequential combustion. The most notable advances in the mitigation of carbon dioxide emissions relate to alternative electricity generation, however most of these are not economically competitive with current technology at the Stratford plant.

Energy efficiency improvements

Refurbishment of the main turbine and a compressor blade in early 2008 resulted in an output increase of 24MW and an efficiency improvement of 0.76%.

2.3 Register of incidents

The Taranaki Regional 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 Unauthorised Incident Register (UIR) includes events where the company concerned has itself notified the Council. The register contains details of any investigation and corrective action taken.

Incidents may be alleged to be associated with a particular site. If there is 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 2009-2010 year, there was one incident recorded by the Council that was associated with Contact Energy Limited.

On 25 January 2010, Contact Energy notified the Council of a breach of the NO_x concentration limit for emissions to air from the combined cycle plant under consent **4454-1**. The limit of 50 ppm (volumetric) was being breached (>80 ppm) because power generation had to be reduced drastically, and thus combustion efficiency decreased, in order to protect the burners while receiving off-specification (high C2+

content) supply gas from Kupe Production Station. The breaches occurred intermittently over one month, until 29 January 2010, for a total period of about 72 hours and a maximum continuous period of 20 hours. The NO_x mass discharge limit, of 430 kg/h, was not breached at any time. No adverse effect on the environment resulted.

Council was kept fully informed of the situation, and a detailed written report was provided by the Company. The problem resulted directly from the introduction of gas from the new Kupe Production Station to the distribution system, and from the New Zealand specification for reticulated natural gas being less stringent than that for the gas turbine. This was addressed initially by adjusting the Maui/Kupe gas mixture. Improvement occurred following the commissioning of further gas processing equipment at Kupe Production Station (CO_2 stripping and LPG separation). In the longer term, the Company commenced investigations with the turbine supplier about safely using higher C2+ level gas.

The report was accepted by Council and no further action taken.

On another occasion, a potential breach of condition was notified by the Company, in relation to the discharge of stormwater to Kahouri Stream under consent **4459-1**.

On 26 February 2010, Contact Energy advised the Council that the level of suspended solids measured in the stormwater pond prior to discharge to Kahouri Stream the previous day, at 128 g/m^3, may have caused the consent limit of 100 g/m^3 to have been breached. Silt from installation of raw water supply lines for the SPP had been flushed by heavy rain (59 mm in 6 hours at Stratford) into the pond, which subsequently overflowed to the stream. Given that the effect on the receiving water while in fresh would have been negligible, that the duration of discharge was short, and that the suspended solids measurement had not been made on the discharge itself, no further action was taken.

3. Discussion

3.1 Discussion of plant performance

In respect of the existing Taranaki Combined Cycle Plant, 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 by Contact Energy has demonstrated compliance with the air discharge permit, with the exception of nitrogen oxides concentration during plant start-up and for short periods when the plant was run at low rate because feed gas contained unexpectedly high C2+ levels. Otherwise, the monitoring showed a high level of performance in terms of low concentrations of various contaminants in the plant emissions.

A change of consent was granted in February 2010 to allow a longer period of elevated nitrogen oxides concentration during start-up, but no change in mass discharge rate. The issue of high C2+ feed gas is being addressed with both the gas supplier and the turbine manufacturer. There is a large financial incentive for Contact Energy to resolve this issue, in relation to protection of generator and to loss of revenue.

Continuous monitoring by Contact Energy of water abstraction from the Patea River shows compliance with consent conditions throughout the year.

Monitoring of plant effluent, comprising mainly cooling water, was carried out largely by the Contact Energy, with quarterly checks by the Council. There was high compliance with conditions on the discharge permit.

Contact Energy Limited produced an annual report to the Council on the twelfth year of operation of the power station (Appendix III). The report is satisfactory.

In respect of activities during construction of the new open-cycle Stratford Peaker Plant, on-site management was undertaken in a satisfactory manner. Continual liaison between Contact Energy and the Council has contributed to this performance.

The effluent disposal management plan was revised in December 2009 to cover the SPP effluent. The plan was satisfactory.

3.2 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 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 metres 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, turbidity, or nutrients. 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 was 0.61˚C, at a flow of 836 litres/second at Skinner Road.

Biological surveys carried out in the Patea River in November 2009 and February 2010 showed slightly lower MCI scores than expected, indicative of some water quality enrichment and/or poorer physical habitat in the mid-Patea River reaches, particularly below Skinner Rd. This is considered to be a result of factors such as low river flows and increased temperature, along with the effects of the municipal oxidation ponds system discharge to the river 3km upstream, rather than as a result of the discharge of power station effluent. The effluent diffuser on the riverbed has been designed to allow fish passage.

3.3 Environmental effects of exercise of air discharge permit

3.3.1 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 year 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, with the exception of elevated nitrogen oxides level at plant start-up for longer than allowed (minutes) and when generation rate was lowered drastically to cope with high C2+ feed gas (hours). Given the short duration of these periods no adverse effect would have occurred.

3.3.2 Global effects

Total emissions of carbon dioxide for the year were 620,875 tonnes. As described earlier, under alterations to consent **4454**, Contact Energy is no longer required to provide a yearly carbon dioxide emissions report.

3.4 Evaluation of performance

A tabular summary of the Company's compliance record for consents that were exercised during the year under review is set out in Table 7 to Table 22 below.

Table 7 Summary of performance for Consent 3939-2 - to discharge stormwater into the Kahouri Stream from Stratford Peaker Plant

Condition requirement	Means of monitoring during period under review	Compliance achieved?
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	Review option not exercised.	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**High**

Table 8 Summary of performance for Consent 4454-1 to discharge emissions to air

Condition requirement	Means of monitoring during period under review	Compliance achieved?
4. Adopt best practicable option (BPO)	Site inspections - checking that standard operating procedures to achieve compliance with conditions are followed	Yes
5. Outline BPO measures at time of commissioning	Report provided in 1998, as required	N/A
6. Option to review BPO measures	No review sought by Council	N/A
7. Consulting over significant proposed changes	Liaison during visits. No significant changes undertaken during year	N/A
8. Provision of reports on specific monitoring/investigations	Third report received August 2009	Yes
9. Limit on ambient carbon monoxide	Not monitored beyond boundary, as continuous CO emission monitoring by Contact Energy gave low results	N/A
10. 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
11. Limit on other emissions at boundary	Not monitored, as emissions monitoring by Contact Energy and dispersion modelling demonstrated no need	N/A
12. Limits on nitrogen oxides outside start-up or shut-down periods	Continuous monitoring by Contact Energy and monthly report to Council.	No. Concentration limit breached during start-ups until consent changed Feb 10, and when generation rate reduced to cope with high C2+ feed gas. Refer sections 2.2.2 and 2.3.No effect.
13. Limit on nitrogen oxides mass discharge rate	Continuous monitoring by Contact Energy and monthly report to Council	Yes
14. Stack height	Inspection by Council	Yes

Condition requirement	Means of monitoring during period under review	Compliance achieved?
15. Ecological effects	Inspection by Council and observation of vegetation	Yes
16. Visibility of cooling system plume	Inspection and observation by Council and Contact Energy	Yes
17. Cooling system drift	Inspection and observation by Council	Yes
18. Optional review of consent	Review option not exercised.	N/A
19. Lapse of consent	Consent was exercised	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**Improvement required**

N/A = not applicable

Table 9 Summary of performance for Consent 4455-1 - to take water from the Patea River

Condition requirement	Means of monitoring during period under review	Compliance achieved?
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	Review option not exercised.	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**High**

N/A = not applicable

Table 10 Summary of performance for Consent 4456-1 – intake structure

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Notification of works	No maintenance undertaken	N/A
2. Construction and maintenance in accordance with documentation		N/A
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

Condition requirement	Means of monitoring during period under review	Compliance achieved?
7. Optional review provision	Review option not exercised.	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**High**

N/A = not applicable

Table 11 Summary of performance for Consent 4458-1 – discharge structure

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Provision of design plans	Plans received by Council and approved in 1996	Yes
2. Construction and maintenance in accordance with documentation		N/A
3. Passage of fish not to be obstructed	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	Review option not exercised	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**High**

N/A = not applicable

Table 12 Summary of performance for Consent 4459-1 - to discharge stormwater

Condition requirement	Means of monitoring during period under review		Compliance achieved?
1. Provision of plans prior to completion of construction	Plans received by Council		Yes
2. Concentration limits upon potential contaminants in discharge	Not monitored by Council as infrequent. Monitored by Contact Energy.	One potential breach of suspended solids limit reported, no effect	
3. Provision of contingency plan	Plan received by Council and approved 1996. Most recent update 11 December 2008 approved by Council. No revision required		Yes
4. Controls on effect of discharge in receiving water	Inspection and biological monitoring by Council		Yes
5. Optional review provision re environmental effects	Review option not exercised		N/A
Overall assessment of consent compliance and environment performance in respect of this consent			**Good**

N/A = not applicable

Table 13 Summary of performance for Consent 4460-1 – stormwater structure

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Provision of plans	Plans received by Council and approved	Yes
2. Construction and maintenance in accordance with documentation	Site inspection by Council	Yes
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	Notification received	Yes
5. Timing of works	Inspections	Yes
6. Adopt best practicable option to prevent or minimise adverse effects	Inspections	Yes
7. Riverbed disturbance and reinstatement	Inspections	Yes
8. Removal of structure when no longer required		N/A
9. Optional review provision re environmental effects	Review option not exercised	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**High**

N/A = not applicable

Table 14 Summary of performance for Consent 4461-1 – utility structures

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Provision of plans	Plans received by Council and approved	Yes
2. Construction and maintenance in accordance with documentation	Site inspection by Council	Yes
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		N/A
5. Timing of works		N/A
6. Adopt best practicable option to prevent or minimise adverse effects		N/A
7. Riverbed disturbance and reinstatement		N/A
8. Removal of structure when no longer required		N/A
9. Optional review provision re environmental effects	Review option not exercised	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**High**

N/A = not applicable

Table 15 Summary of performance for Consent 4462-1 - structures for water transmission

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Provision of design plans	Plans received by Council and approved in 1996	N/A
2. Construction and maintenance in accordance with documentation	Site inspection by Council	Yes
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		N/A
5. Timing of works		N/A
6. Adopt best practicable option to prevent or minimise adverse effects		N/A
7. Riverbed disturbance and reinstatement		N/A
8. Removal of structure when no longer required		N/A
9. Optional review provision re environmental effects	Review option not exercised	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**High**

N/A = not applicable

Table 16 Summary of performance for Consent 4804-1 - electricity transmission structures

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Provision of design plans	Plans received by Council and approved in 1996	Yes
2. Construction and maintenance in accordance with documentation	Site inspection by Council	Yes
3. Notification prior to and after maintenance	No monitoring during review period, as design of structure satisfactory	N/A
4. Timing of works		N/A
5. Adopt best practicable option to prevent or minimise adverse effects		N/A
6. Riverbed disturbance and reinstatement		N/A
7. Removal of structure when no longer required		N/A
8. Optional review provision re environmental effects	Review option not exercised	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**High**

N/A = not applicable

Table 17 Summary of performance for Consent 5063-1 - to discharge septic tank effluent to land

Condition requirement	Means of monitoring during period under review	Compliance achieved?
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	Review option not exercised	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**High**

N/A = not applicable

Table 18 Summary of performance for Consent 5633-1 - to discharge sediment from water intake

Condition requirement	Means of monitoring during period under review	Compliance achieved?
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	Review option not exercised	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**High**

N/A = not applicable

Table 19 Summary of performance for Consent 5848-1 - to discharge used water

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Discharge in accordance with effluent disposal management plan	Inspection by Council, and provision of annual report by 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	Liaison with Contact Energy. Written notifications.	Yes
4. Provision of details on proposed new cleaning chemicals	Liaison with Contact Energy. Written notifications.	Yes
5. Optional review of consent on notification of new chemicals	No review required	N/A
6. Provision and maintenance of contingency plan	Plant received by Council and approved. Most recent update February 2010 approved by Council	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

Condition requirement	Means of monitoring during period under review	Compliance achieved?
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	Review option not exercised	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**High**

N/A = not applicable

Table 20 Summary of performance for Consent 7249-1 - to erect a bridge for vehicle access over the Kahouri Stream

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Exercise of consent in accordance with application	Site inspections	Yes
2. Provision of bridge plans prior to construction	Not received.	No
3. Notification prior to exercise of consent	Notification received 15 February 2010	Yes
4. Minimisation of sediment in stream	Site inspections	Yes
5. Area and volume of disturbance to be minimised	Site inspections	Yes
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	Not scheduled for consideration during year under review.	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**Good**

N/A = not applicable

Table 21 Summary of performance for Consent 7250-1 - to erect a bridge for utilities over the Kahouri Stream

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Exercise of consent in accordance with application	Site inspections	Yes
2. Provision of bridge plans prior to construction	Not received.	Yes

Condition requirement	Means of monitoring during period under review	Compliance achieved?
3. Notification prior to exercise of consent	Notification received 15 February 2010	Yes
4. Minimisation of sediment in stream	Site inspections	Yes
5. Area and volume of disturbance to be minimised	Site inspections	Yes
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	Review option not exercised	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**High**

N/A = not applicable

Table 22 Summary of performance for Consent 7605-1 – stormwater structure TCC1

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Exercise of consent in accordance with application	Site inspections	Yes
2. Notification prior to exercise of consent	Notification received 16 March 2010	Yes
3. Area and volume of disturbance to be minimised	Site inspections	Yes
4. Minimisation of sediment in stream	Site inspections	Yes
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	Not scheduled for consideration during year under review. Next consideration June 2016	N/A
Overall assessment of consent compliance and environment performance in respect of this consent		**High**

N/A = not applicable

Overall, during the year, the Company demonstrated a high level of environmental performance and compliance with the resource consents.

3.5 Recommendations from the 2008-2009 Annual Report

In the 2008-2009 Annual Report, it was recommended:

1. THAT monitoring of water abstraction and discharges in relation to the Stratford Power Station of Contact Energy Limited in the 2009-2010 year continues at the same level as in 2008-2009.

2. THAT monitoring of air emissions from the Stratford Power Station of Contact Energy Limited in the 2009-2010 year continues at the same level as in 2008-2009.

3. THAT the option for review of each or any of the 24 resource consents that provide for the operation of the Stratford Power Station of Contact Energy Limited in June 2010 not be exercised, on the grounds that current conditions are adequate to deal with any potential adverse effects.

These recommendations were implemented.

3.6 Alterations to monitoring programmes for 2010-2011

In designing and implementing the monitoring programmes for air/water discharges in the region, the Taranaki Regional Council had taken into account the extent of information made available by previous authorities, its relevance under the Resource Management Act, the obligations of the Act in terms of monitoring emissions/discharges and effects, and subsequently reporting to the regional community, the scope of assessments required at the time of renewal of permits, and the need to maintain a sound understanding of industrial processes within the Taranaki emitting to the atmosphere/discharging to the environment.

In the case of Contact Energy, the programme for 2009-2010 was essentially unchanged from that for 2008-2009, which itself had been adapted by increasing inspection frequency to allow more intensive monitoring during the construction and commissioning of Stratford Peaker Plant. The Peaker Plant was scheduled to be completed in mid-2010, however there were delays. It is proposed that for 2010-2011, the monitoring programme for the Stratford Power Station continue at the same level as in 2009-2010, with the additional monthly inspections of the Peaker Plant site, until the Peaker Plant Project is completed.

A recommendation to this effect is attached to this report.

4. Recommendations

1. THAT monitoring of water abstraction and discharges in relation to the Stratford Power Station of Contact Energy Limited in the 2010-2011 year continue at the same level as in 2009-2010.

2. THAT monitoring of air emissions from the Stratford Power Station of Contact Energy Limited in the 2010-2011 year continue at the same level as in 2009-2010.

3. THAT monitoring of the Stratford Peaker Plant construction and commissioning through additional monthly inspection continue in the 2010-2011 year until the project is completed.

Glossary of common terms and abbreviations

The following abbreviations and terms are used within the report:

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^3	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 foes not apply to gaseous mixtures
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_3	unionised ammonia, normally expressed in terms of the mass of nitrogen (N)
NTU	Nephelometric Turbudity 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
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
SPP	Stratford peaker plant, due to be brought on line in June 2010
SS	suspended solids
TCC 1	Taranaki combined cycle 1 power plant, commissioned in 1998

TCC 2	Taranaki combined cycle 2 power plant, not constructed
Temp	temperature, measure in ˚C (degrees Celsius)
Turb	turbidity, expressed in NTU
UI	Unauthorised Incident
UIR	Unauthorised 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

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

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Taranaki Regional Council (2008): 'Contact Energy Limited Stratford Power Station Monitoring Programme Annual Report 2007-2008' Technical Report 08-97

Taranaki Regional Council (2009): 'Contact Energy Limited Stratford Power Station Monitoring Programme Annual Report 2008-2009' Technical Report 09-98

Taranaki Regional Council (2010): 'Kahouri Catchment Monitoring Programme Annual Report 2009-2010' Technical Report 10-99

Appendix I

Resource consents held by Contact Energy Limited

Consent 3939-2

TARANAKI REGIONAL COUNCIL
CHIEF EXECUTIVE
PRIVATE BAG 713
47 CLOTEN ROAD
STRATFORD
NEW ZEALAND
PHONE: 06-765 7127
FAX: 06-765 5097
www.trc.govt.nz

Please quote our file number on all correspondence

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: 10 December 1997]

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

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

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^{-3}
Suspended solids	100 gm^{-3}

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

Director-Resource Management

Consent 4022-2

TARANAKI REGIONAL COUNCIL

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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: 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 2623900E-6207100N
Expiry Date:	1 June 2022
Review Date(s):	As per special condition 11
Site Location:	Stratford Peaker Power Station, State Highway 43 [East Road], Stratford
Legal Description:	Lot 1 DP 19365 & Lot 1 DP 17776 Blk II Ngaere SD

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

General conditions

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

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

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

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

Special conditions

1. That the consent holder shall adopt the best practicable option to prevent or minimise any actual or likely adverse effect on the environment associated with the discharge of contaminants into the environment from the site.

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

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

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

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

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

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

   e) detailing carbon dioxide emissions from the site.

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

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

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

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

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

7. That except in any period of 30 minutes following the initiation of start-up of a turbine or in any period of 30 minutes prior to the cessation of the generation of electricity from a turbine, in the event that the discharge of nitrogen oxides exceeds:
   a) a mass emission rate for the site of 175 g s^{-1}, or
   b) a mass emission rate per gas turbine stack of 25 g s^{-1}, or
   c) a concentration in any gas turbine stack equivalent to 100 mg m^{-3} at 450 degrees Celsius, or to 125 ppm [volumetric basis]

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

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

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

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

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

    a) dealing with any significant adverse effect on the environment arising from the exercise of the consent which was not foreseen at the time the application was considered and which it is appropriate to deal with at the time of the review or

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

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

Signed at Stratford on 6 March 2008

For and on behalf of
Taranaki Regional Council

Director-Resource Management

Consent 4454-1

TARANAKI REGIONAL COUNCIL

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Discharge Permit

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

Name of Consent Holder: Contact Energy Limited
P O Box 10742
WELLINGTON 6143

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

Conditions of Consent

Consent Granted: To discharge contaminants to air, subject to the following specified conditions, from a combined cycle power station and ancillary plant ['the station'] located adjacent to East Road approximately three kilometres East of the town of Stratford at or about (NZTM) 1713732E-5645766N

Expiry Date: 14 August 2029

Site Location: East Road, Stratford

Legal Description: Lot 2 of Subdiv of Lot 2 Lt 18343 Blk II Ngaere SD

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

General conditions

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

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

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

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

Special conditions

(note condition numbering intentionally begins at 4)

4) That the consent holder shall adopt the best practicable option to prevent or minimise any actual or likely adverse effect on the environment associated with the discharge of contaminants into the environment from the site.

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

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

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

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

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

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

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

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

e) detailing carbon dioxide emissions from the site.

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

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

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

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

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

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

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

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

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

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

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

15) That the discharges authorised by this consent shall not give rise to any direct significant adverse ecological effect on any ecosystems in the Taranaki region, including but not limited to habitats, plants, animals, microflora, and microfauna.

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

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

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

a) dealing with any significant adverse effect on the environment arising from the exercise of the consent which was not foreseen at the time the application was considered and which it is appropriate to deal with at the time of the review; or

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

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

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

Signed at Stratford on 9 February 2010

For and on behalf of
Taranaki Regional Council

Chief Executive

Consent 4455-1

TARANAKI REGIONAL COUNCIL

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Please quote our file number on all correspondence

Water Permit

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

Name of Consent Holder: Contact Energy Limited
P O Box 10742
WELLINGTON

Change To Conditions Date: 6 March 2008 [Granted: 25 May 1994]

Conditions of Consent

Consent Granted: To take up to 19,440 cubic metres/day [225 litres/second averaged over 15 minutes] of water on a continuous basis from the Patea River for use on Power Stations at East Road, Stratford at or about 2631900E-6204900N

Expiry Date: 1 June 2028

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

Site Location: Toko Road, Stratford

Legal Description: Patea Riverbed adjoining Pt Lot 2 DP 739 & Lot 1 DP 20723 Blk IV Ngaere SD

Catchment: Patea

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

General conditions

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

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

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

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

Special conditions

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

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

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

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

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

Signed at Stratford on 6 March 2008

For and on behalf of
Taranaki Regional Council

Director-Resource Management

Consent 4456-1

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Land Use Consent

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

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

Conditions of Consent

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

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

General conditions

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

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

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

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

Special conditions

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

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

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

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

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

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

7. That the Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during the month of June 2004 and/or June 2010 and/or June 2016 and/or June 2022, for the purpose of ensuring that the conditions adequately deal with the environmental effects arising from the exercise of this consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Transferred at Stratford on 4 July 2005

For and on behalf of
Taranaki Regional Council

Director-Resource Management

Consent 4458-1

TARANAKI REGIONAL COUNCIL

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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

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

General conditions

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

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

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

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

Special conditions

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

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

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

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

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

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

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

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

9. The Taranaki Regional Council may review any or all of the conditions of this consent, by giving notice of review during the month of June 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

Director-Resource Management

Consent 4459-1

TARANAKI REGIONAL COUNCIL
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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
Change To Conditions Date:	6 September 2001 [Granted: 25 May 1994]

Conditions of Consent

Consent Granted:	To discharge up to 1360 litres/second of stormwater from a combined cycle power station site, including stormwater and sediment from construction activities associated with the proposed expansion of the site, into an unnamed tributary of the Piakau Stream and into the Kahouri Stream, both tributaries of the Patea River at or about GR: Q20:238-075
Expiry Date:	1 June 2028
Review Date(s):	June 1998, June 2004, June 2010, June 2016, June 2022
Site Location:	Combined Cycle Power Station, East Road, Stratford
Legal Description:	Lot 2 DP 19365
Catchment:	Patea
Tributary:	Kahouri

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

General conditions

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

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

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

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

Special conditions

1. The consent holder shall forward plans of the upgraded stormwater catchment and treatment system within three months of completion of construction activities.

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

Component	Concentration
pH [range]	6 - 9
Oil and grease	15 gm^{-3}
Suspended solids	100 gm^{-3}

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.

3. 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.

4. 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;
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.

5. 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.

Transferred at Stratford on 4 July 2005

For and on behalf of
Taranaki Regional Council

Director-Resource Management

Consent 4460-1

TARANAKI REGIONAL COUNCIL
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Land Use Consent

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

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

Conditions of Consent

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

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

General conditions

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

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

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

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

Special conditions

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

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

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

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

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

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

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

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

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

Transferred at Stratford on 4 July 2005

For and on behalf of
Taranaki Regional Council

Director-Resource Management

Consent 4461-1

TARANAKI
REGIONAL
COUNCIL

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Land Use Consent

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

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

Conditions of Consent

Consent Granted:	To erect, place, use and maintain in, 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 combined cycle power stations at or about GR: Q20:240-072
Expiry Date:	1 June 2028
Review Date(s):	June 1998, June 2004, June 2010, June 2016, June 2022
Site Location:	Stratford Combined Cycle Power Station Site, East Road, Stratford
Legal Description:	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 conditions

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

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

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

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

Special conditions

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

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

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

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

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

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

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

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

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

Transferred at Stratford on 4 July 2005

For and on behalf of
Taranaki Regional Council

Director-Resource Management

Consent 4462-1

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Land Use Consent

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

Name of Consent Holder: Contact Energy Limited
P O Box 10742
WELLINGTON

Change To Conditions Date: 6 March 2008 [Granted: 25 May 1994]

Conditions of Consent

Consent Granted: To erect, place, use and maintain water pipelines and associated control cables above, through or below the beds of the Toko Stream and various small unnamed streams, for the purpose of water transmission from the Patea River to Power Stations at East Road, Stratford at or about 2631900E-6204900N

Expiry Date: 1 June 2028

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

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

Legal Description: Pt Secs 134 & 132, Secs 110, 111 & 130 Blk II Ngaere SD, Subdivision 2 of Sec 112 Ngaere SD, Lots 1 & 2 DP 363968, Lot 1 DP 16285, Lot 1 DP 141, Lot 1 DP 17136, Pt Lots 8 to 13 DP 141, Pt Secs 39 & 40 Blk III Ngaere SD, Lot 2 DP 1115, Pt Lots 1 & 2 DP 739, Lot 1 DP 20723

Catchment: Patea

Tributary: Toko

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

General conditions

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

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

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

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

Special conditions

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

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

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

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

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

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

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

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

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

Signed at Stratford on 6 March 2008

For and on behalf of
Taranaki Regional Council

Director-Resource Management

Consent 4804-1

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Land Use Consent

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

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

Conditions of Consent

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

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

General conditions

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

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

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

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

Special conditions

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

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

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

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

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

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

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

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

Transferred at Stratford on 4 July 2005

For and on behalf of
Taranaki Regional Council

Director-Resource Management

Consent 5063-1

TARANAKI REGIONAL COUNCIL
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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
Change To Conditions Date:	6 September 2001 [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 at or about GR: Q20:238-072
Expiry Date:	1 June 2028
Review Date(s):	June 1998, June 2004, June 2010, June 2016, June 2022
Site Location:	Combined Cycle Power Station, East Road, Stratford
Legal Description:	Lot 2 DP 19365
Catchment:	Patea
Tributary:	Kahouri

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

General conditions

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

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

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

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

Special conditions

1. 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.

Transferred at Stratford on 4 July 2005

For and on behalf of
Taranaki Regional Council

Director-Resource Management

Consent 5633-1

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Discharge Permit

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

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

Conditions of Consent

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

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

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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

Director-Resource Management

TARANAKI REGIONAL COUNCIL

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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: 6 September 2002]

Conditions of Consent

Consent Granted:	To discharge contaminants to air from combined cycle power station unit[s] and ancillary plant located adjacent to State Highway 43 [East Road] approximately three kilometres east of Stratford at or about GR: Q20:238-075
Expiry Date:	1 June 2034
Review Date(s):	June 2004, June 2010, June 2016, June 2022, June 2028
Site Location:	Combined Cycle Power Station, State Highway 43 [East Road], Stratford
Legal Description:	Lot 2 DP 19365 Blk II Ngaere SD
Catchment:	Patea

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

General conditions

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

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

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

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

Special conditions

Conditions 1 – 14 [unchanged]

1. The 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. 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.

3. The measures representing the best practicable option may be reviewed in accordance with the procedure provided for in conditions 16 and 17.

4. 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, Taranaki Regional Council, and shall obtain any necessary approvals under the Resource Management Act 1991 and any amendments.

5. 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 the cooling tower plume and of carbon dioxide, how these might be applicable and/or implemented at the power station, and the costs and benefits of these advances; and
b) detailing an inventory of emissions from the site of such contaminants as the Chief Executive may from time to time specify following consultation with the consent holder; and

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

6. 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^3 [eight-hour average exposure], or 30 mg/m^3 [one-hour average exposure] at or beyond the boundary of the site.

7. 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^3 [annual average exposure] or 200 ug/m^3 [one hour average] at or beyond the boundary of the site.

8. 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].

9. 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, 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 gas turbine stack of [63 divided by n] g/s [where n = number of gas turbine stacks], or

c) a concentration in any gas turbine stack equivalent to 50 mg/m3 at 100°Celsius, or to 50 ppm [volumetric basis].

10. For a maximum of 240 minutes from initiation of combustion until low NO_x operation is achieved or in any period of 30 minutes prior to the cessation of the generation of electricity from a turbine, the discharge of nitrogen oxides arising from the exercise of this consent shall not exceed 230 g/s.

11. The minimum height of discharge of products of combustion from the turbine(s) shall be 35 metres above ground level.

12. 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.

13. 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.

14. 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.

Condition 15 [changed]

15. 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.

Conditions 16 – 17 [unchanged]

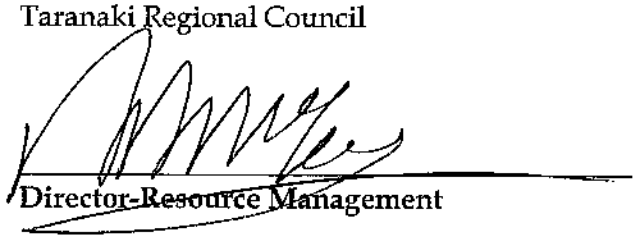
16. Subject to the provisions of this condition, within six months of receiving a report prepared by the consent holder pursuant to condition 5 of this consent, or during June 2004, and/or June 2010, and/or June 2016, and/or June 2022, and/or June 2028, the Taranaki Regional Council may review any or 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 Stratford combined cycle power station.

17. 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 16 would be achieved by a review and whether alternative means could be used to achieve those purposes.

Signed at Stratford on 22 February 2007

For and on behalf of
Taranaki Regional Council



Director-Resource Management

Consent 5847-1

TARANAKI REGIONAL COUNCIL

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Please quote our file number on all correspondence

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

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

General conditions

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

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

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

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

Special conditions

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

2. 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.

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

Director-Resource Management

Consent 5848-1

TARANAKI REGIONAL COUNCIL

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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

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

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.

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

9. The discharge shall not :

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

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

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

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

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

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

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

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

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

15. The Taranaki Regional Council may review any or all of the conditions of this consent, by giving notice of review during June 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

Director-Resource Management

TARANAKI REGIONAL COUNCIL

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Please quote our file number on all correspondence

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: 27 November 2001]

Conditions of Consent

Consent Granted:	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 at or about GR: Q20:237-075
Expiry Date:	1 June 2034
Review Date(s):	June 2004, June 2010, June 2016, June 2022, June 2028
Site Location:	Combined Cycle Power Station, State Highway 43 [East Road], Stratford
Legal Description:	Pt Lot 2 DP 7012 Blk II Ngaere SD
Catchment:	Patea
Tributary:	Kahouri

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

General conditions

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

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

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

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

Special conditions

Conditions 1 – 6 [unchanged]

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.

Condition 7 [changed]

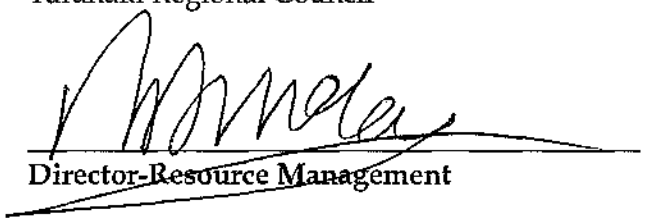
7. This consent shall lapse on 6 December 2017 unless the consent is given effect to before the end of that period, or the Taranaki Regional Council fixes a longer period pursuant to section 125 (b) of the Resource Management Act 1991.

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 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



Director-Resource Management

Consent 5850-1

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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

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 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.

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

Director-Resource Management

Consent 5851-1

TARANAKI REGIONAL COUNCIL

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Please quote our file number on all correspondence

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

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

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

Director-Resource Management

TARANAKI REGIONAL COUNCIL

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Please quote our file number on all correspondence

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, Straford Combined Cycle Power Station Site, State Highway 43 [East Road], Stratford

Legal Description: 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 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

Director-Resource Management

Consent 7247-1

TARANAKI REGIONAL COUNCIL

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Please quote our file number on all correspondence

Discharge Permit

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

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

Conditions of Consent

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

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

General conditions

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

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

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

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

Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.

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

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

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

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

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

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

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

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

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

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

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

Signed at Stratford on 6 March 2008

For and on behalf of
Taranaki Regional Council

Director-Resource Management

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Please quote our file number on all correspondence

Land Use Consent

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

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

Conditions of Consent

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

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

General conditions

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

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

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

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

Special conditions

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

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

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

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

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

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

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

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

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

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

Signed at Stratford on 6 March 2008

For and on behalf of
Taranaki Regional Council

Director-Resource Management

Consent 7249-1

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Please quote our file number on all correspondence

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 vehicle access purposes at or about 2624076E-6207480N
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:	Lots 1 & 2 DP 19365 Blk II Ngaere SD
Catchment:	Patea
Tributary:	Kahouri

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

General conditions

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

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

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

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

Special conditions

1. The exercise of this consent shall be undertaken substantially in accordance with the documentation submitted in support of application 4908. In the case of any contradiction between the documentation submitted in support of application 4908 and the conditions of this consent, the conditions of this consent shall prevail.

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

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

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

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

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

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

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

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

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

Signed at Stratford on 6 March 2008

For and on behalf of
Taranaki Regional Council

Director-Resource Management

Consent 7250-1

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Land Use Consent

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

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

Conditions of Consent

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

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

General conditions

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

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

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

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

Special conditions

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

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

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

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

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

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

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

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

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

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

Signed at Stratford on 6 March 2008

For and on behalf of
Taranaki Regional Council

Director-Resource Management

Consent 7605-1

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Land Use Consent

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

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

Conditions of Consent

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

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

General condition

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

Special conditions

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

2. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 48 hours prior to the commencement and upon completion of the initial installation and again at least 48 hours prior to and upon completion of any subsequent maintenance works which would involve disturbance of or deposition to the riverbed or discharges to water. Notification shall include the consent number and a brief description of the activity consented and be emailed to worknotification@trc.govt.nz. Notification by fax or post is acceptable only if the consent holder does not have access to email.

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

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

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

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

5. Except with the written agreement of the Chief Executive, Taranaki Regional Council, the structure[s] authorised by this consent shall be removed and the area reinstated, if and when the structure is no longer required. A further resource consent may be required to authorise the removal of the structure, and the consent holder is advised to seek advice from the Council on this matter.

6. This consent shall lapse on 31 March 2015, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

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

Signed at Stratford on 15 June 2010

For and on behalf of
Taranaki Regional Council

Director-Resource Management

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Please quote our file number on all correspondence

Land Use Consent

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

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

Conditions of Consent

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

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

General condition

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

Special conditions

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

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

3. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 48 hours prior to the commencement and upon completion of the initial installation and again at least 48 hours prior to and upon completion of any subsequent maintenance works which would involve disturbance of or deposition to the riverbed or discharges to water. Notification shall include the consent number and a brief description of the activity consented and be emailed to worknotification@trc.govt.nz.

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

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

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

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

6. Except with the written agreement of the Chief Executive, Taranaki Regional Council, the structure[s] authorised by this consent shall be removed and the area reinstated, if and when the structure is no longer required. A further resource consent may be required to authorise the removal of the structure, and the consent holder is advised to seek advice from the Council on this matter.

7. This consent shall lapse on 30 June 2015, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

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

Signed at Stratford on 21 June 2010

For and on behalf of
Taranaki Regional Council

Director-Resource Management

Appendix II

Biomonitoring reports

To	Job Manager, J Kitto
From	Scientific Officer, C R Fowles
Document	701064
Report No	CF492
Date	December 2009

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 power stations, November 2009

Introduction

Biomonitoring forms a component of the consents compliance monitoring programme implemented by the TRC following the construction of the Taranaki Combined Cycle [TCC1] power station in 1998. This particular biological monitoring survey (the first of two biannual surveys for the 2009-2010 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.

Three sites 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] have required the establishment and monitoring of two further 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 component of the Kahouri catchment monitoring programme and, together with biomonitoring of the Stratford municipal WWTP discharge to the Patea River, are reported separately. This present biomonitoring survey was performed on 6 November 2009 in conjunction with the spring component of the SEM programme.

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 on 6 November 2009. These sites were located as listed in Table 1 and illustrated in Figure 1.

Table 1 Location of sampling sites in the Patea River

Site No	Code	Map reference	Location	Altitude (m asl)	Distance from coast (km)	Distance from National Park (km)
1	PAT000356	Q20:246068	U/s of TCC1 cooling wastes discharge	250	131.8	17.2
2	PAT000357	Q20:247068	100 m d/s of TCC1 cooling wastes discharge	250	131.6	17.4
3	PAT000360	Q20:259064	Skinner Road	240	129.8	19.2
4	PAT000397	Q20:291053	Hungers Road	200	120.5	28.5
5	PAT000430	Q10:340028	Raupuha Road	160	106.9	42.1

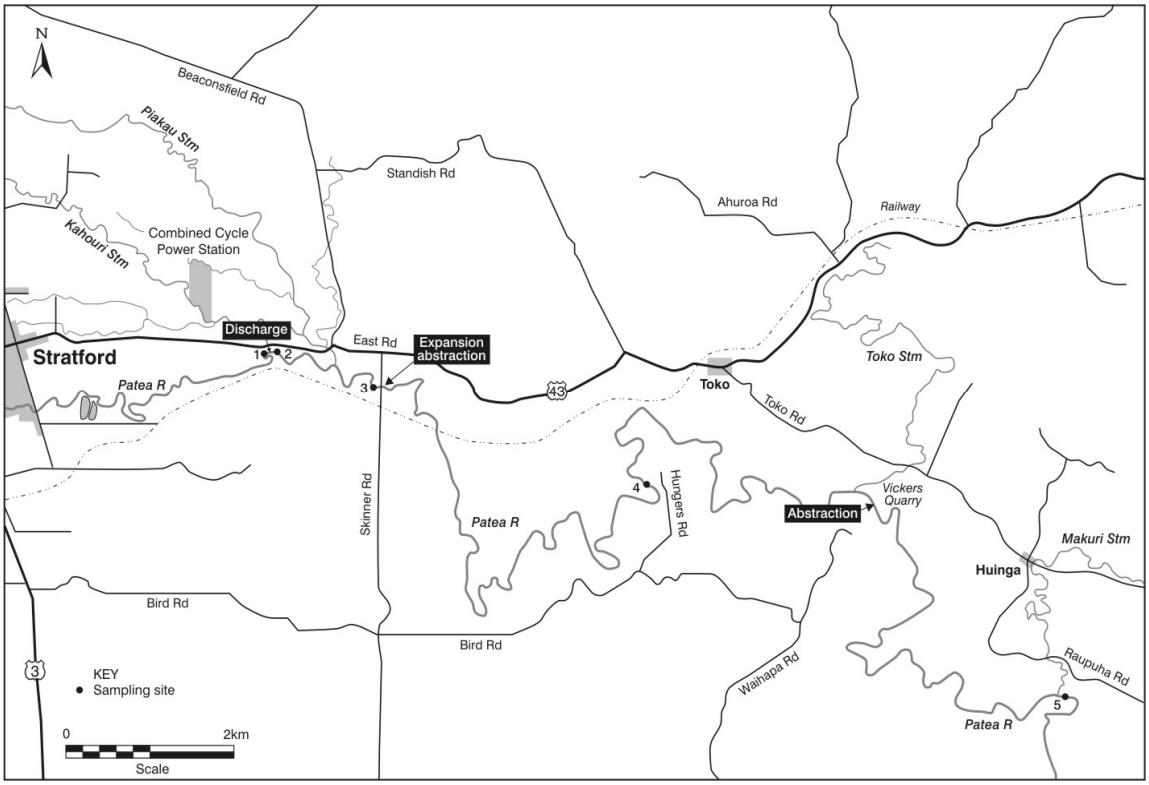


Figure 1 Location of biomonitoring sites in the Patea River in relation to the combined cycle power station, Stratford

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, $SQMCI_S$ (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 during a relatively low, spring, recession flow period, 8 days after a fresh in excess of 3x median flow and 10 days after a fresh in excess of 7x median flow and following a wet early spring period. River flow at Skinner Road was 2.75 m^3/sec representing a flow below the average monthly mean November flow (4.61 m^3/sec) and well above the minimum mean monthly flow for November (1.26 m^3/sec) recorded for the period 1978-2009.

Periphyton mats and filamentous algae were present at these five sites. Patchy moss was recorded at sites 1, 3, 4 and 5 from observations of the stony riffle substrates. River flow was clear and relatively low 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 13.0°C to 13.1°C during a period of power station cooling water discharge to the river (intermittently over two of the previous five days). River flow was slightly cloudy at sites 3, 4 and 5 further downstream from the Kahouri Stream confluence, and water temperatures ranged from 12.9°C to 15.2°C at these three sites (3, 4 and 5) at the time of this mid morning 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 July 1981 and March 2009

Site	No of surveys	Taxa no		MCI values		Survey of Nov 2009	
		Range	Median	Range	Median	Taxa No.	MCI
1	29	17-31	25	82-116	98	19	112
2	22	14-33	24	86-111	97	19	102
3	36	13-33	24	85-104	96	21	98
4	15	20-30	22	82-100	94	21	102
5	16	11-26	23	82-101	93	20	93

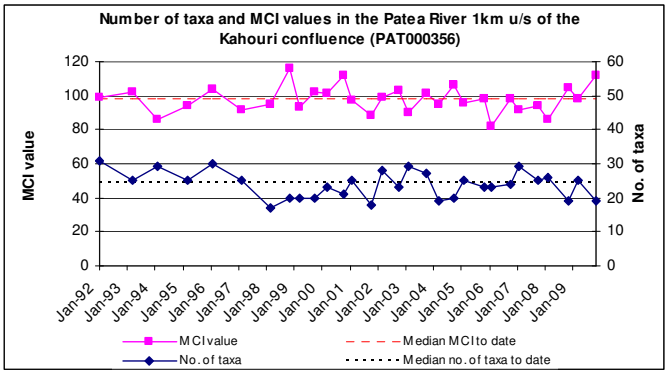
The macroinvertebrate fauna results from the present survey are presented in Table 3, with various survey results since 1992 illustrated in Figure 2.

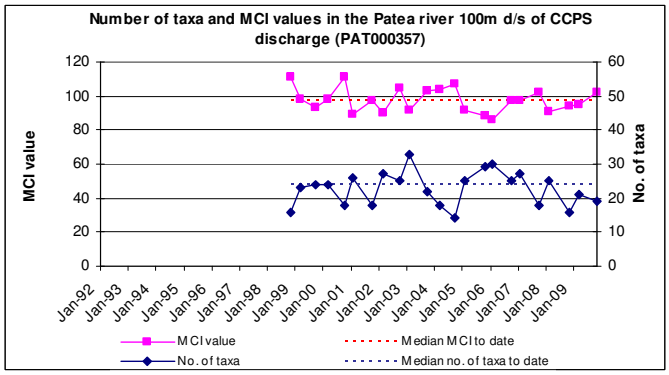
Table 3 Macroinvertebrate fauna of the Patea River in relation to Stratford Power Ltd sampled on 6 November 2009

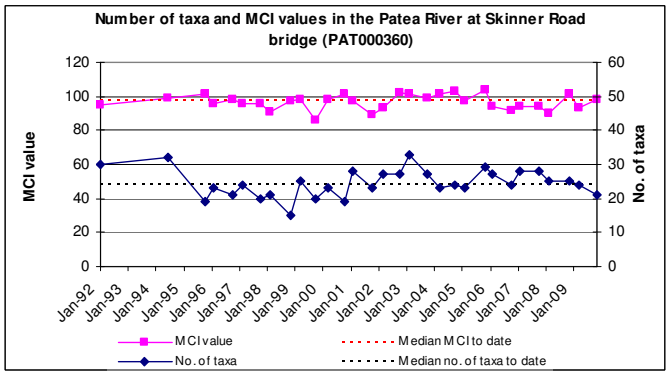
Taxa List	Site Number	MCI score	1	2	3	4	5
	Site Code		PAT000356	PAT000357	PAT000360	PAT000397	PAT000430
	Sample Number		FWB09308	FWB09309	FWB09310	FWB09311	FWB09312
NEMATODA	Nematoda	3	-	-	R	R	R
ANNELIDA (WORMS)	Oligochaeta	1	R	C	C	VA	R
	Lumbricidae	5	-	-	-	-	R
MOLLUSCA	*Latia*	5	-	-	-	R	-
	Potamopyrgus	4	R	R	C	XA	C
CRUSTACEA	*Paracalliope*	5	-	-	-	-	R
EPHEMEROPTERA (MAYFLIES)	*Austroclima*	7	R	R	-	R	R
	Coloburiscus	7	VA	VA	A	C	-
	Deleatidium	8	XA	XA	XA	XA	VA
	Nesameletus	9	C	C	-	R	-
	Zephlebia group	7	R	-	-	-	-
PLECOPTERA (STONEFLIES)	*Acroperla*	5	C	C	R	-	R
	Megaleptoperla	9	-	-	R	-	-
	Zelandobius	5	-	R	R	C	C
	Zelandoperla	8	R	-	-	-	-
COLEOPTERA (BEETLES)	Elmidae	6	C	C	A	VA	A
	Hydraenidae	8	R	-	-	-	-
MEGALOPTERA (DOBSONFLIES)	*Archichauliodes*	7	R	R	C	C	R
TRICHOPTERA (CADDISFLIES)	*Aoteapsyche*	4	R	R	A	A	A
	Costachorema	7	C	C	C	C	R
	Hydrobiosis	5	R	-	C	C	A
	Neurochorema	6	-	R	R	R	-
	Pycnocentrodes	5	-	-	C	VA	VA
DIPTERA (TRUE FLIES)	*Aphrophila*	5	A	A	VA	A	VA
	Eriopterini	5	-	R	R	-	-
	Maoridiamesa	3	VA	VA	VA	A	XA
	Orthocladiinae	2	A	VA	VA	VA	XA
	Tanypodinae	5	-	-	-	R	-
	Tanytarsini	3	R	R	R	C	A
	Austrosimulium	3	-	R	R	-	R
	No of taxa		19	19	21	21	20
	MCI		112	102	98	102	93
	SQMCIs		6.9	6.4	6.2	5.2	3.4
	EPT (taxa)		10	9	10	10	8
	%EPT (taxa)		53	47	48	48	40

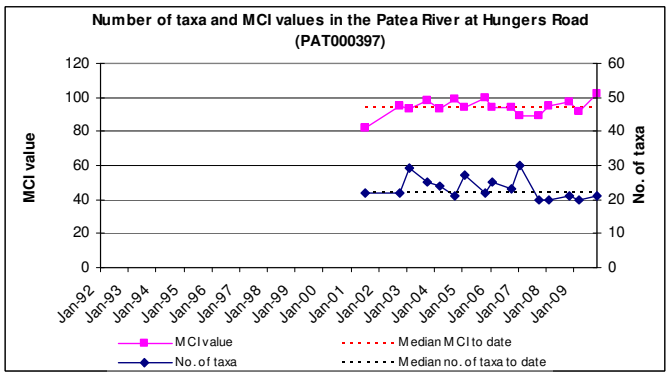
'Tolerant' taxa | 'Moderately sensitive' taxa | 'Highly sensitive' taxa

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


Number of taxa and MCI values in the Patea River 1km u/s of the Kahouri confluence (PAT000356)
MCI value
No. of taxa
MCI value
No. of taxa
Median MCI to date
Median no. of taxa to date


Number of taxa and MCI values in the Patea river 100m d/s of CCPS discharge (PAT000357)
MCI value
No. of taxa
MCI value
No. of taxa
Median MCI to date
Median no. of taxa to date


Number of taxa and MCI values in the Patea River at Skinner Road bridge (PAT000360)
MCI value
No. of taxa
MCI value
No. of taxa
Median MCI to date
Median no. of taxa to date


Number of taxa and MCI values in the Patea River at Hungers Road (PAT000397)
MCI value
No. of taxa
MCI value
No. of taxa
Median MCI to date
Median no. of taxa to date

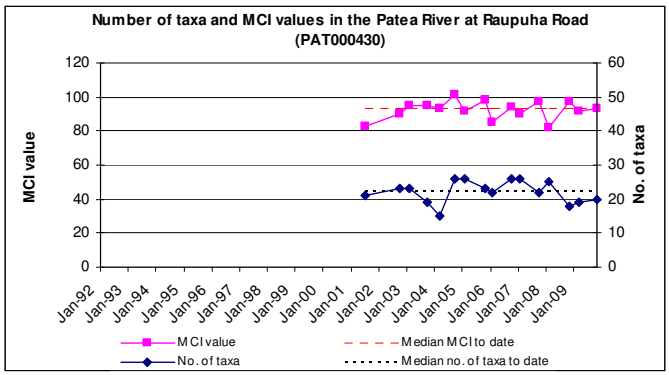


Figure 2 Taxa richness and MCI scores recorded to date at each of the five Patea River sites

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

The same taxa richness (19 taxa) was recorded at sites 1 and 2, upstream and downstream of the discharge. These taxa numbers were within ranges and lower than median richnesses previously surveyed at each site (Table 1 and Figure 2). These numbers were seven taxa less than the median (26) taxa richness previously recorded from 121 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, 1999 (updated, 2008)).

The characteristic taxa in this short reach of the river included one 'highly sensitive' taxon (extremely abundant mayfly (*Deleatidium*)); two 'moderately sensitive' taxa (mayfly (*Coloburiscus*) and cranefly (*Aphrophila*)); and two 'tolerant' taxa (midges (*Maoridiamesa* and orthoclads)). This dominance represented some subtle changes from the community dominance at the time of the previous summer survey when more 'tolerant' taxa were dominant numerically following a longer, lower flow recession period and more extensive periphyton substrate cover. No significant differences in individual taxon abundances were recorded between sites 1 and 2 and therefore the $SQMCI_s$ values were relatively similar at both sites (Table 3).

The presence of four 'highly sensitive' taxa, one of which was extremely abundant, in this reach of the Patea River was an indication of generally good physicochemical water quality conditions preceding the survey under moderately low flow conditions despite the presence of moderate periphyton substrate cover which could be expected to impact on physical habitat. However, improved treated wastewater quality (and greater dilution) of the upgraded Stratford municipal WWTP discharge, may have contributed to these conditions (CF486 and CF491).

MCI scores (Tables 2 and 3) reflected the relatively high proportion (63 to 68% of taxa richness) of 'sensitive' taxa in the communities at each site, with the scores recorded (112 and 102) between 5 and 14 units higher than the medians of scores previously recorded at both sites (Table 1). The decrease of 10 units between sites was not significant and reflected the relative similarity in community composition between sites as reflected by the 15 shared taxa (of 23 taxa) between sites. The downstream difference of 10 units was due to an absence of two 'highly sensitive' taxa, each of which was represented by one individual taxon at the upstream site, and therefore not a significant change in community composition between adjacent sites. Both of these scores categorised these sites as having 'good' river health (TRC, 2008) at the time of this summer survey. These scores were also 2 units higher and 8 units lower than the predicted MCI score for National Park-sourced ringplain sites at an altitude of 250m asl but ranging from a significant 13 units above to an insignificant 3 units below the predicted MCI score for these sites, 17.2 km and 17.4 km respectively downstream of the National Park boundary (Stark and Fowles, 2009).

Although these MCI scores at the two sites showed a larger than typical downstream decrease in scores, they were not indicative of recent impacts of any cooling water discharge on the macroinvertebrate fauna of the Patea River at the periphery of the permitted mixing zone, taking into account community composition at both sites.

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

Taxa richness at these three sites had a very narrow range from 20 to 21 taxa, moderate richnesses within 3 taxa of historical medians at these sites (Table 2), and similar to or slightly lower than median richnesses (21 and 23 taxa) previously recorded by 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, 1999 (updated 2008)).

The characteristic taxa within this 23 km reach of the Patea River included one 'highly sensitive' taxon (very to extremely abundant mayfly (*Deleatidium*)); up to five 'moderately sensitive taxa (mayfly (*Coloburiscus*), free-living caddisfly (*Hydrobiosis*), elmid beetles, stony-cased caddisfly (*Pycnocentrodes*), and cranefly (*Aphrophila*)); and up to six 'tolerant' taxa (oligochaete worms, snail (*Potamopyrgus*), extremely abundant net-building caddisfly (*Aoteapsyche*); and midges (*Maoridiamesa,* orthoclads, and tanytarsids)). There was some reduction in the abundances within several of the more 'sensitive' taxa (mayflies in particular) and some more localised increases in 'tolerant' taxa (worms, midges, and snails) in a downstream direction. A few significant differences in individual taxon abundances between sites were recorded along this river reach. Downstream increases in numbers of one 'sensitive' cased caddisfly taxon and two 'tolerant' taxa, were found at site 4 together with decreases in numbers of two 'tolerant' taxa and one 'sensitive' taxon, and increases in numbers of two 'tolerant' midge taxa were found in a downstream direction at site 5 which accounted for a moderate decrease in $SQMCI_S$ score.

Increased proportions of lower scoring 'tolerant' taxa (38 to 40%) in the communities at sites 3 to 5 were reflected in the MCI scores (93 to 102) recorded through this reach of the mid Patea River. These scores were an insignificant 0 to 8 units higher than the medians of scores previously recorded at all three sites (Table 1) and 1 to 10 units higher than those recorded by the previous summer survey which followed a much longer recession and lower flow period. The scores recorded at these three sites by this survey varied by 9 units through the reach of the river surveyed. The scores categorised these sites as having 'fair' to 'good' river health (TRC, 2008) at the time of this spring survey. They ranged from 1 unit higher to 11 units lower than the predicted MCI scores for National Park-sourced ringplain sites at altitudes of 160 to 240m asl but an insignificant 2 units lower to 6 units higher than the predicted MCI scores for these sites, 19.2 km to 42.1 km respectively downstream of the National Park boundary (Stark and Fowles, 2009).

However, the rate of downstream decrease between sites 3 and 5 (0.2 MCI units/km) was below 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). Observations in this reach of the river, and particularly below the Skinner Road site (site 3), indicated that riffles tended to be shorter and deeper than those typical of the upper reaches of the river (particularly upstream of the Kahouri Stream confluence), where the 'more sensitive' (particularly mayfly and stonefly) taxa are a more common component of the macroinvertebrate communities (TRC, 2001). A small increase in MCI score of 4 units was found between sites 3 and 4, with a decrease of 9 units between sites 4 and 5, resulting in an insignificant decrease of 5 MCI units found over this reach (23km) and an overall 19 unit decrease over the total reach (25km) of the river surveyed.

Conclusions

This twenty-first biomonitoring survey performed in relation to the discharge of cooling water from the power station indicated no impacts of any recent discharges upon the biological communities of the Patea River in the vicinity of the discharge outfall east of Stratford during a period of moderately low recession flow conditions in spring.

Macroinvertebrate community richness and MCI scores typical of habitats with moderate periphyton substrate cover were within ranges of results previously recorded and above

median scores coincident with improved habitat conditions under moderately low flow conditions after a wet early spring period. No statistically significant difference in MCI score was recorded at the periphery of the permitted discharge mixing zone in comparison with the upstream 'control' site following a recent brief period of discharge from the power station.

Biomonitoring performed at sites further downstream in the river was 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), but community composition showed a few (mainly subtle) changes from communities found at sites 1 and 2, upstream of the Kahouri Stream confluence . Of the total of 30 taxa found over the entire reach of the river surveyed, 21 taxa were present at one or more sites in both of the two reaches, above and below the Kahouri Stream confluence. Only 11 taxa were present at all five sites along the reach surveyed, of which one 'highly sensitive', three 'moderately sensitive', and three 'tolerant' taxa were abundant at a minimum of three of the sites. Two 'tolerant' taxa (midges (*Maoridiamesa* and orthoclads)), one 'moderately sensitive' taxon (cranefly (*Aphrophila*)), and one 'highly sensitive' taxon (mayfly (*Deleatidium*)), were abundant at all five sites; relatively typical of the number of taxa which have been uniformly characteristic of these sites' communities from time to time in past surveys although more coincident with better water quality and habitat conditions under moderately low flow, cooler spring conditions.

A relationship between MCI score and distance from the Park boundary 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 might be expected to range between 90 and 99 units. Therefore, the results of this survey found a slightly higher range of scores to that expected in the mid-Patea River reaches below Skinner Road, despite riffles tending to be shorter and deeper than those surveyed further upstream, but during a spring, shorter period of lower flow conditions and less widespread periphyton substrate cover (compared to summer low flow conditions).

The general trend of moderate MCI scores found throughout the reach of the river survey at the time of this spring survey, particularly in comparison with similar reaches of rivers elsewhere in Taranaki, also reflected minimal influence of the major point source municipal oxidation ponds system discharge to the river some 3 km upstream (see report CF486) and to a lesser extent this spring following the recent upgrading of the Stratford municipal WWTP system.

Biannual biomonitoring surveys will continue to 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 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 $SQMCI_S$ 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 $SQMCI_S$ 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 $SQMCI_S$ between sites indicate the degree of adverse effects (if any) of the discharges being monitored.

This spring macroinvertebrate survey undertaken following a brief period of power station discharge, indicated that these recent discharges of treated cooling water from the Contact Energy Ltd's site had not had any detrimental effect on the macroinvertebrate communities of the river. No significant changes in the macroinvertebrate communities were recorded between the upstream 'control' site and site immediately downstream of the discharge. Rather, changes were more subtle involving presence/absence of a few 'sensitive' taxa rarities.

The macroinvertebrate communities in the reach of the Patea River adjacent to the discharge contained relatively high proportions of 'sensitive' taxa at both sites where the communities were generally dominated by higher numbers of 'sensitive taxa, with less of an impact of the major point source discharge (upgraded Stratford WWTP system) some 3.5 km upstream than has been found by previous summer surveys under lower flow conditions. Taxonomic richness (number of taxa) tended to have decreased at the time of this summer survey compared to the previous summer 2008 survey.

MCI and $SQMCI_S$ scores indicate that the stream communities throughout the river reach were of 'good' to 'fair' health, and slightly above the condition predicted for similar Taranaki ringplain rivers, and reflected the improved conditions following a period of cooler spring, higher flow conditions.

Biomonitoring at three sites further downstream in the Patea River, for the establishment of baseline conditions in relation to consented power station expansion, found similar conditions to those monitored in the vicinity of the cooling water discharge with the exception of a small increase in the proportion of characteristic (dominant) 'tolerant' taxa. No significant changes in proportions of 'tolerant' taxa numbers were recorded within this reach, while these spring MCI scores were near or above historical median values and less typical than communities found during extensive summer periphyton substrate cover coincident with lower flow periods.

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To Job Manager, J Kitto
From Scientific Officer, C R Fowles
Document 760187
Report No CF502
Date May 2010

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 power stations, February 2010

Introduction

Biomonitoring forms a component of the consents compliance monitoring programme implemented by the TRC following the construction of the Taranaki Combined Cycle [TCC1] power station in 1998. This particular biological monitoring survey (the second of two biannual surveys for the 2009-2010 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.

Three sites 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 further 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 component of the Kahouri catchment monitoring programme and, together with biomonitoring of the Stratford municipal WWTP discharge to the Patea River, are reported separately. This present biomonitoring survey was performed on 2 February 2010 in conjunction with the Stratford WWTP survey and the summer component of the SEM programme.

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.

Table 1 Location of sampling sites in the Patea River

Site No	Code	Map reference	Location	Altitude (m asl)	Distance from coast (km)	Distance from National Park (km)
1	PAT000356	Q20:246068	U/s of TCC1 cooling wastes discharge	250	131.8	17.2
2	PAT000357	Q20:247068	100 m d/s of TCC1 cooling wastes discharge	250	131.6	17.4
3	PAT000360	Q20:259064	Skinner Road	240	129.8	19.2
4	PAT000397	Q20:291053	Hungers Road	200	120.5	28.5
5	PAT000430	Q10:340028	Raupuha Road	160	106.9	42.1

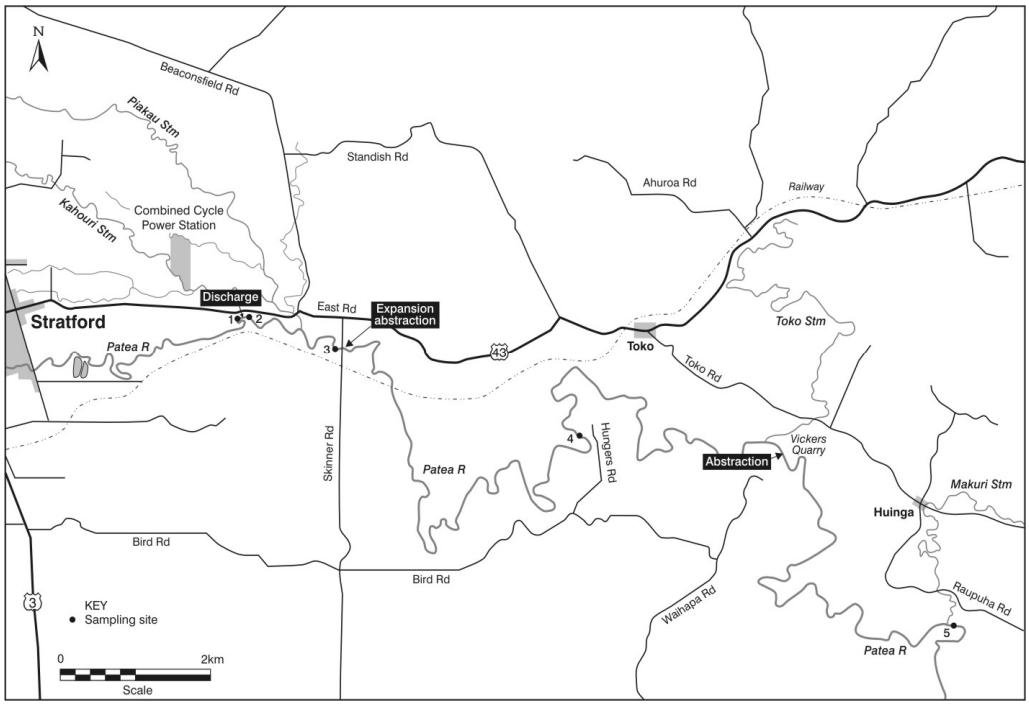

Figure 1 Location of biomonitoring sites in the Patea River in relation to the combined cycle power station, Stratford

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, $SQMCI_S$ (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 during a lengthy summer, low recession flow period, 52 days after a fresh in excess of 3x median flow and 76 days after a fresh in excess of 7x median flow. River flow at Skinner Road was gauged at 1.35 m^3/sec representing a flow well below the average monthly mean February flow (2.87 m^3/sec) but above the minimum mean monthly flow for February (0.64 m^3/sec) recorded for the period 1978-2009.

Periphyton mats were patchy to widespread at all sites and patchy filamentous algae were present at these five sites. Patchy moss was recorded at sites 1, 2, 3 and 5 from observations of the stony riffle substrates. River flow was clear and low 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 16.1°C to 16.3°C during a period of power station cooling water discharge to the river (almost continuously since mid November 2009).

River flow was slightly cloudy at sites 3, 4 and 5 further downstream from the Kahouri Stream confluence, where water temperatures ranged from 16.1°C to 20.4°C at these three sites (3, 4 and 5) at the time of this later morning 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 November 2009

Site	No of surveys	Taxa no		MCI values		Survey of Feb 2010	
		Range	Median	Range	Median	Taxa No.	MCI
1	30	17-31	25	82-116	98	26	102
2	23	14-33	24	86-111	97	22	102
3	31	15-33	24	86-104	97	22	105
4	16	20-30	22	82-102	94	25	99
5	16	15-26	23	82-101	93	21	91

The macroinvertebrate fauna results from the present survey are presented in Table 3, with various survey results since 1992 illustrated in Figure 2.

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

A relatively narrow range of taxa richness (22 to 26 taxa) was recorded at sites 1 and 2 upstream and downstream of the discharge. These taxa numbers were within ranges and similar to median richnesses previously surveyed at each site (Table 1 and Figure 2). These numbers were within five taxa of the median (26) taxa richness previously recorded from 128 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, 1999 (updated, 2009)).

The characteristic taxa in this short reach of the river included up to two 'highly sensitive' taxa (mayfly (*Deleatidium*) and hydraenid beetles); up to six 'moderately sensitive' taxa (mayfly (*Coloburiscus*), elmid beetles, dobsonfly (*Archichauliodes*), free-living caddisflies (*Hydrobiosis* and *Costachorema*), and cranefly (*Aphrophila*)); and five 'tolerant' taxa (extremely abundant net-building caddisfly (*Aoteapsyche*); midges (*Maoridiamesa*, orthoclads and tanytarsids) and oligochaete worms). This dominance represented some subtle changes from the community dominance at the time of the previous spring survey when fewer 'sensitive' taxa were dominant numerically following a lengthy flow recession period and more extensive periphyton substrate cover. Very few significant differences in individual taxon abundances were recorded between sites 1 and 2 and these did not affect the $SQMCI_s$ values which were within 0.3 unit at these sites (Table 3).

Table 3 Macroinvertebrate fauna of the Patea River in relation to Stratford Power Ltd sampled on 2 February 2010

Taxa List	Site Number	MCI score	1	2	3	4	5
	Site Code		PAT000356	PAT000357	PAT000360	PAT000397	PAT000430
	Sample Number		FWB10054	FWB10055	FWB10056	FWB10057	FWB10058
PLATYHELMINTHES (FLATWORMS)	*Cura*	3	-	-	-	R	R
NEMERTEA	Nemertea	3	-	-	-	R	R
NEMATODA	Nematoda	3	-	-	-	-	R
ANNELIDA (WORMS)	Oligochaeta	1	A	A	A	VA	A
	Lumbricidae	5	-	-	-	-	R
MOLLUSCA	*Physa*	3	R	-	-	-	-
	Potamopyrgus	4	R	R	A	VA	C
CRUSTACEA	*Paracalliope*	5	R	-	R	R	R
EPHEMEROPTERA (MAYFLIES)	*Austroclima*	7	-	R	R	C	A
	Coloburiscus	7	A	A	A	C	-
	Deleatidium	8	A	C	VA	VA	VA
	Nesameletus	9	R	-	R	C	-
	Zephlebia group	7	R	-	-	-	R
PLECOPTERA (STONEFLIES)	*Megaleptoperla*	9	-	-	-	R	-
	Zelandoperla	8	R	R	R	-	-
COLEOPTERA (BEETLES)	Elmidae	6	A	A	VA	VA	A
	Hydraenidae	8	A	R	C	R	-
	Staphylinidae	5	-	R	-	-	-
MEGALOPTERA (DOBSONFLIES)	*Archichauliodes*	7	A	C	A	C	C
TRICHOPTERA (CADDISFLIES)	*Aoteapsyche*	4	XA	XA	XA	XA	VA
	Costachorema	7	A	A	A	C	C
	Hydrobiosis	5	A	C	A	A	A
	Neurochorema	6	C	-	-	-	-
	Olinga	9	R	R	-	-	-
	Oxyethira	2	R	R	-	-	-
	Pycnocentrodes	5	-	-	C	VA	A
DIPTERA (TRUE FLIES)	*Aphrophila*	5	A	A	A	C	A
	Eriopterini	5	R	R	R	-	-
	Maoridiamesa	3	VA	VA	VA	VA	VA
	Orthocladiinae	2	A	A	A	VA	XA
	Polypedilum	3	-	-	-	R	-
	Tanytarsini	3	A	A	A	A	A
	Empididae	3	R	-	R	R	-
	Ephydridae	4	-	-	-	R	-
	Muscidae	3	R	C	C	R	R
	Austrosimulium	3	R	R	-	-	-
	No of taxa		26	22	22	25	21
	MCI		102	102	105	99	91
	SQMCIs		4.3	4.0	4.6	4.2	3.4
	EPT (taxa)		10	8	9	9	7
	%EPT (taxa)		38	36	41	36	33

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

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

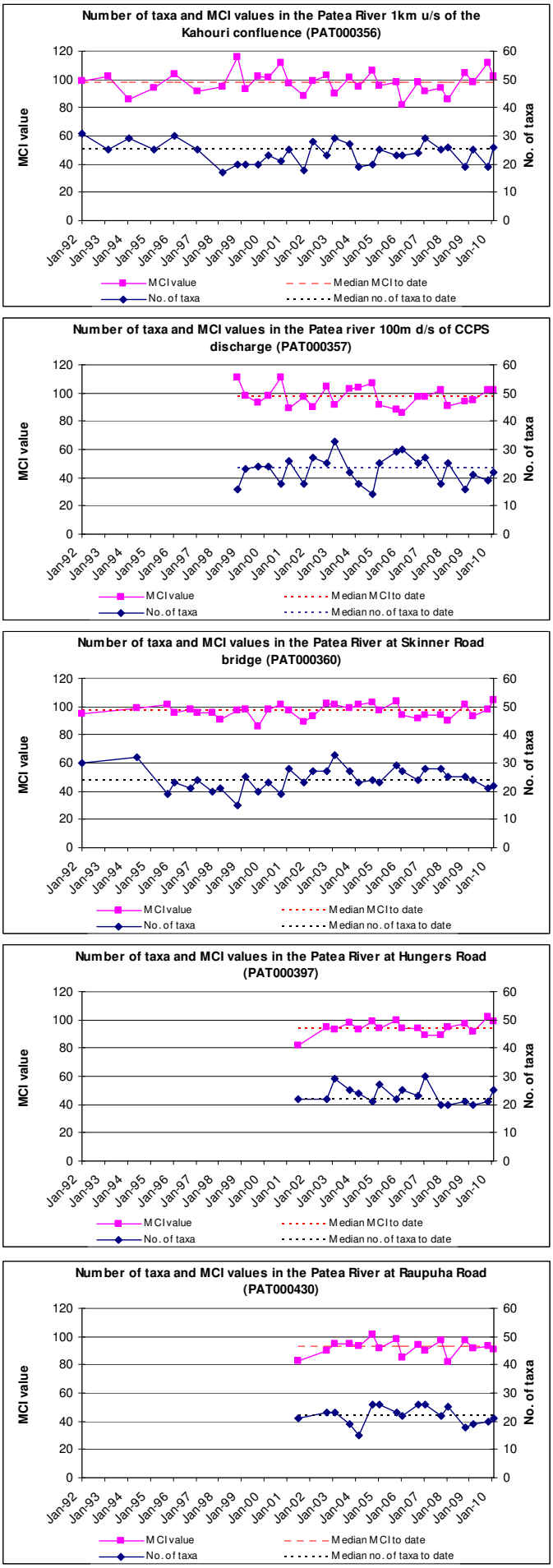

Figure 3 Taxa richness and MCI scores recorded to date a teach of the five Patea River Sites

The presence of five 'highly sensitive' taxa, up to two of which were abundant, in this reach of the Patea River, was an indication of generally good physicochemical water quality conditions preceding the survey under low flow conditions despite the presence of moderate periphyton substrate cover which could be expected to impact on physical habitat. However, improved treated wastewater quality (and greater dilution) of the upgraded Stratford municipal WWTP discharge, may have contributed to these conditions (see report CF501).

MCI scores (Tables 2 and 3) reflected the moderately high proportion (41 to 42% of taxa richness) of 'tolerant' taxa in the communities at each site, with the scores recorded (102), between 4 and 5 units higher than the medians of scores previously recorded at both sites (Table 1). The identical scores reflected the similarity in community composition between sites as reflected by the 20 shared taxa (of a total 28 taxa) between sites. These scores categorised both of these sites as having 'good' river health (TRC, 2009) at the time of this summer survey. They were also an insignificant 8 units lower than the predicted MCI score for National Park-sourced ringplain sites at an altitude of 250m asl and an insignificant 3 units above the predicted MCI score for these sites, 17.2 km and 17.4 km respectively downstream of the National Park boundary (Stark and Fowles, 2009).

The MCI scores at these two sites showed no downstream decrease in scores and were 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.

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

Taxa richness at these three sites had a relatively narrow range from 21 to 25 taxa, moderate richnesses within 3 taxa of historical medians at these sites (Table 2), and similar to or slightly higher than median richnesses (21 and 23 taxa) previously recorded by 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, 1999 (updated 2009)).

The characteristic taxa within this 23 km reach of the Patea River included one 'highly sensitive' taxon (mayfly (*Deleatidium*)); up to eight 'moderately sensitive taxa (mayflies (*Coloburiscus* and *Austroclima*), free-living caddisflies (*Hydrobiosis* and *Costachorema*), elmid beetles, dobsonfly (*Archichauliodes*), stony-cased caddisfly (*Pycnocentrodes*), and cranefly (*Aphrophila*)); and up to six 'tolerant' taxa (oligochaete worms, snail (*Potamopyrgus*), extremely abundant net-building caddisfly (*Aoteapsyche*); and midges (*Maoridiamesa,* orthoclads, and tanytarsids)). The patchy to widespread periphyton cover on the riverbed coincided with reductions in the abundances within several of the more 'sensitive' taxa (some mayflies in particular) in a downstream direction. A few significant differences in individual taxon abundances between sites were recorded along this river reach. A decrease in numbers of one 'tolerant' taxon and two 'moderately sensitive' taxa were found in a downstream direction at site 5 which accounted for the relatively small decrease of 0.8 unit in $SQMCI_S$ score.

The increasingly significant proportions of lower scoring 'tolerant' taxa (36, 48 and 48%) in the communities at sites 3, 4, and 5 were reflected in the MCI scores (105 to 91) recorded through this reach of the mid Patea River. These scores were an insignificant 5 to 8 units higher, to 2 units lower, than the medians of scores previously recorded at all three sites (Table 1) and within 2 to 7 units of those recorded by the previous spring survey which followed a much shorter recession flow period. The scores recorded at these three sites by

this survey decreased by 14 units through the reach of the river surveyed. These scores categorised these sites as having 'good' to 'fair' river health (TRC, 2009) at the time of this summer survey. They were 4 to 10 units lower than the predicted MCI scores for National Park-sourced ringplain sites at altitudes of 160 to 240m asl but an insignificant 6 units higher, to 3 units lower, than the predicted MCI scores for these sites, 19.2 km and 42.1 km respectively downstream of the National Park boundary (Stark and Fowles, 2009).

However, the rates of downstream decrease between sites 3 and 5 (0.6 MCI units/km) and sites 4 and 5 (0.6 MCI units/km) were slightly above 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). Observations in this reach of the river, and particularly below the Skinner Road site (site 3), indicated that riffles tended to be shorter and deeper than those typical of the upper reaches of the river (particularly upstream of the Kahouri Stream confluence), where the 'more sensitive' (particularly mayfly and stonefly) taxa are a more common component of the macroinvertebrate communities (TRC, 2001). A small decrease in MCI score of 6 units was found between sites 3 and 4, with a decrease of 8 units between sites 4 and 5, resulting in an overall decrease of 14 MCI units found over this reach (23km) and an 11 unit decrease over the total reach (25km) of the river surveyed.

Conclusions

This twenty-first biomonitoring survey performed in relation to the discharge of cooling water from the power station indicated no impacts of any recent discharges upon the biological communities of the Patea River in the vicinity of the discharge outfall east of Stratford during a lengthy period of low recession flow conditions in late summer.

Macroinvertebrate community richness and MCI scores typical of habitats with moderate to widespread periphyton substrate cover were within ranges of results previously recorded but generally slightly above median scores coincident with low flow conditions. No statistically significant difference in MCI score was 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 was 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 very few (mainly subtle) changes from communities found at sites 1 and 2, upstream of the Kahouri Stream confluence . Of the total of 36 taxa found over the entire reach of the river surveyed, 22 taxa were present at one or more sites in both of the two reaches, above and below the Kahouri Stream confluence. Only 13 taxa were present at all five sites along the reach surveyed, of which one 'highly sensitive', five 'moderately sensitive', and five 'tolerant' taxa were abundant at a minimum of three of the sites. Five 'tolerant' taxa (oligochaete worms, net-building caddisfly (*Aoteapsyche*), and midges (orthoclads, tanytarsids, and *Maoridiamesa*)) and one 'moderately sensitive' taxon (elmid beetles), and were abundant at all five sites; generally typical of the number of taxa which have been uniformly characteristic of these sites' communities from time to time in past surveys and coincident with warmer water temperatures and more extensive periphyton conditions under low flow summer conditions.

A relationship between MCI score and altitude 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 might be expected to range between 101 and 109 units. Therefore, the results of this survey found a slightly lower range of scores to that expected in the mid-Patea River reaches below Skinner Road, coincident with riffles tending to be shorter and deeper than those surveyed further upstream, but also during a very lengthy period of low flow conditions and relatively widespread periphyton substrate cover.

The general trend of lowered MCI scores found throughout the reach of the river survey at the time of this summer survey, particularly in comparison with similar reaches of rivers elsewhere in Taranaki, also reflected some influence of the major point source municipal oxidation ponds system discharge to the river some 3 km upstream (see report CF501) although to a lesser extent this summer following more recent upgrading of the Stratford municipal WWTP system.

Biannual biomonitoring surveys will continue to 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 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 $SQMCI_S$ 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 $SQMCI_S$ 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 $SQMCI_S$ between sites indicate the degree of adverse effects (if any) of the discharges being monitored.

This late summer macroinvertebrate survey undertaken during a period of power station discharge, indicated that recent discharges of treated cooling water from the Contact Energy Ltd's site had not had any detrimental effect on the macroinvertebrate communities of the river. No significant changes in the macroinvertebrate communities were recorded between the upstream 'control' site and site immediately downstream of the discharge. Rather, changes were more subtle involving presence/absence of a few taxa rarities.

The macroinvertebrate communities in the reach of the Patea River adjacent to the discharge contained moderate proportions of 'sensitive' taxa at all sites whereas the communities were generally dominated by an increase in numbers of 'tolerant' taxa, in part affected by impacts of the major point source discharge (Stratford WWTP system)

some 3.5 km upstream. Taxonomic richness (number of taxa) tended to have increased at the time of this summer survey compared to the previous spring 2009 survey.

MCI and $SQMCI_S$ scores indicate that the stream communities throughout the river reach were of 'good' to 'fair' health, and only slightly below the typical condition predicted for similar Taranaki ringplain rivers, and reflected some impacts of a lengthy period of low flow conditions.

Biomonitoring at three sites further downstream in the Patea River, for the establishment of baseline conditions in relation to consented power station expansion, found similar conditions to those monitored in the vicinity of the cooling water discharge but with a small decrease in the proportion of characteristic (dominant) 'sensitive' taxa at the furthest downstream sites. No significant changes in proportions of 'tolerant' taxa numbers were recorded within this reach, while MCI scores were near or slightly above historical median values and relatively typical of communities coincident with moderate summer periphyton substrate cover during a low flow period.

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Appendix III

Annual report for 2009-2010
by Contact Energy Limited

17 September 2010

The Chief Executive
Attn: James Kitto
Taranaki Regional Council
Private Bag 713
Stratford

Subject: TCC Annual Report for the period July 1st 2009 to June 30th 2010.

Dear Mr. Kitto

We are pleased to report that the 12th year of operation of the Taranaki Combined Cycle Power plant has maintained a high level of compliance with no reportable incidents. Minor reporting's involved low level chlorine metering, pH on the wastewater discharge and NOx values being greater than 50ppm for greater than 30 minutes on start ups or due to the C2+ issues.

Consent 4454-1 Discharge Permit Special Condition No. 12 was modified to allow for 240 minutes of NOx above 50ppm limit during start up in February 2010. This has resulted in TCCP being able to remain within the consent limits on start up. The plant however has experienced other issues due to C2+ gas supply exceeding the burners operating capability which has resulted in the plant operating at start up load for extended periods of time where the NOx concentration has exceeded the 50ppm NOx for greater than 240 minutes allowance. The first of these events occurred December 2009 then again in January 2010. The issue of C2+ gas supply is extremely serious to Contact Energy Ltd and remains a high priority to resolve in the coming year.

Four TRC inspections were carried out during the year. The TRC inspection results have been favorable with no infringement or abatement notices being issued.

Contact Energy Limited

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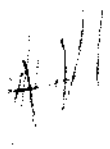
During 3 of the 4 TRC inspections, samples of the wastewater discharge and Patea River water were taken and analysed by the TRC Laboratory. The tested sample results indicated that consent conditions for the plant discharges were being met. Correlation of test results for wastewater analyses between the TCCP and TRC Laboratory has been good for all parameters tested.

Please find below a list of highlights for the past year of plant operation with regards to consent monitoring. Yearly summary reports are attached for wastewater discharge, raw water abstraction, stack emissions and inter laboratory testing.

We look forward to any feedback from the TRC on improvements or further reporting definitions with regard to the TCCP report for Period July 2009 to June 2010.

Yours faithfully



Sam Floriani
Site Manager
Taranaki Combined Cycle Plant

Consent Monitoring Highlights from 1st July 2009 – 30th June 2010

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

Constituents monitored for wastewater discharged during the year remained within consent requirements.

River Temperature:
The river temperature during the year remained below 25 °C allowing for continuous site discharge.
The maximum upstream temperature recorded for the river during the year was 20.8 °C recorded on the 18th of February 2010 at 16:55 hrs. The maximum downstream river temperature during the year was 20.9 °C recorded on the 18th of February 2010 at 17:00 hrs.

The temperature differentials remained within the consent limit of 1.5°C & 2.0°C (5% of time) for the entire year.
Average differential temperatures between upstream & downstream temperature probes in the river were recorded at 0.08 °C for the year. This was well within the allowable 2.0 °C temperature limit.
The maximum river temperature differential recorded for the year was 0.61 °C this occurred the 19th of March 2010 at 19:09 hrs. Other values recorded during that time were:

- upstream temperature probe 14.32°C
- downstream temperature probe 14.91°C
- Wastewater flow to the river 21.56 l/s
- Patea river flow 836 l/s.

River temperature probes were calibrated during the year at three monthly intervals.

Discharge Flow:
The discharge flow remained within the consent limit of 78 l/s the entire year.
The average discharge flow was 6.1 l/s for the year. The maximum recorded discharge flow for the year was 31.94 l/s which is well within the discharge consent limit of 78 l/s.
The total volume of wastewater discharged for the year from site was 192321 m3. This equates to approx. 16% of the water abstracted for plant use during the year. Most water discharged from site is in the form of evaporated cooling water.

Discharge flow volume decreased from the previous year by approx. 52m3 per day. This is because the plant operated less often than last year.

pH:
Summarised values for pH monitored or tested for the year at TCC were:

Tested By:	Average Value	Maximum	Minimum	No. of Tests
pH Analyser	7.06	**9.59**	**5.40**	Continuous
Laboratory pH	7.21	**8.14**	**6.00**	264

The pH value recorded by the monitor exceeded the consent pH range of 6.00 to 9.00 in March and April 2010. Each time the limit was exceeded the wastewater discharge valve shut automatically ensuring discharge to the Patea River had not occurred.

Calibrations and service of the wastewater pH meter were carried out as required throughout the year.

Chlorine:

Summarized values for Total Chlorine monitored or tested for the year at TCC were:

Tested By:	Average Value	Maximum	No. of Tests
Chlorine Analyser	0.00	**1.03**	Continuous
Laboratory Total Chlorine	0.01	**0.05**	264

High Chlorine values above the consent limit of 0.05ppm Total Chlorine were recorded by the on-line monitor in July, October, November, December 2009, January, February, March, April May & June 2010. High maximum measurements were due to values being recorded as the flow valve was closing. The high values occurred due to low sample volume to the analyzer which happens when the circulation pump stops due to low pit level (mostly), instrument calibrations/maintenance or actual high chlorine (sometimes involving potable water).

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

The storm water discharge remained within consent conditions for the entire year however in February 2010 the Total Suspended Solids exceeded the Consent limit of 100mg/L while discharging into the Kahouri Stream. The rainfall was extremely heavy during that time and a lot of silt from construction activities (Stratford Peaker Site raw water supply lines) had been flushed into the pond. Event 7982 was raised to investigate the issue. A dispensation for solids discharge during the construction phase of the peaker was requested from the TRC in case similar events may occur.
Most Storm water was returned to the raw water pond during the year and reused by the plant. The storm water pond overflowed into the neighboring river on eight occasions during the year due to the unusually high rainfall occurrences these occurred in July, August 2009, February, May and June 2010. The Stormwater overflow in April 2010 was due to raw water being overflowed as part of the commissioning process for the upgraded Raw Water pumps stationed at the intake.

Consent 4455-1 Take and use water from Patea River:

Raw water abstraction did not exceed the consent limit during the year.

The Patea River flow dropped below 690l/s in December 2009 however raw water abstraction take was well below the allowable 150l/s at that time.

The lowest river flow of 609l/s was recorded in December 2009.

The average abstraction rate for the year was 37.5.0 l/s, which is well below the maximum allowable take of 150 l/s at the lowest river flow of 690l/s. The maximum abstraction flow recorded for the year was 152.6 l/s.

The total river flow abstraction for the year was 1176052 m3. River flow abstracted was approx. 204308 m3 less per day compared to last year's abstraction figures. This can be attributed to the plant running less than last year.

Consent 4454-1 Discharge to air:

Total Carbon Dioxide stack emissions were recorded at 0.621 M tons for the year.
The total Nitrous Oxide emissions from the plant were recorded at 203.6 tons for the year.

The average Nitrous Oxide discharge rate from the plant for the year was 23.4 kg/hr, well below the limit of 430kg/hr. The discharge concentration limit of 50ppm Nitrous Oxide was exceeded during plant start-ups and shutdowns and during C2+ concentration issues.
The average concentration of Nitrous Oxide emissions for the year was 7.4 ppm. This is well below the consent limit of 50 ppm. This data may be slightly incorrect since no monitoring of NOx was available from the 27th July to 9th September 2009.

The NOx analyser data was unavailable from the 27th July to 9th September 2009 as the analyser was returned to Switzerland again for repair.

The Air discharge consent was modified in February 2010 to allow for NOx emissions to be > 50ppm for 240 minutes instead of 30 minutes on start up.

NOx issues due to C2+ concentration began on the 29th December 2009 and continued in January 2010. Event 7858 was raised to investigate however the issues are difficult to solve at this point.

The cooling tower plume was visible at certain times throughout the year, generally in the morning and at night during the winter months.

Inter Laboratory Comparisons and site inspections:

During the year the site was inspected four times and three sets of inter laboratory comparisons were carried out. Results reported between the TCCP site Laboratory, TCCP on line analysers and the TRC Laboratory were good for all parameters being measured. See attached table.

General Remarks:

Plant Operation:

The plant was shut down during the following periods for maintenance and commercial reasons:

- 10th September 2009 to 25th September 2009 for approx. 15 days
- 1st October 2009 to 4th November 2009 for approx. 35 days
- 6th November 2009 to 10th November 2009 for approx. 4 days
- 4th January to 7th January 2010 for approx. 3 days
- 19th March 2010 to 26th April 2010 for approx. 38 days
- 28th April 2010 to 19th May 2010 for approx. 21 days
- 28th May 2010 to 30th May 2010 for approx. 2 days
- 4th January 2010 to 7th January 2010 for approx. 3 days

Chemicals:

There were no major changes to dosing chemicals during the year.
The following chemical changes were made:
Stabrex ST70 replaced NALSPERSE 7348 Biodispersant
NALCO 71D5 Plus Antifoam is no longer necessary to use in the waste water for foam control during biodispersant cleans of the Cooling Tower. This chemical is still used for the waste contained during GT water wash occurrences.

ISO Programs:

TCC continued to maintain registration for certification in ISO14001 and ISO9001. The site internal audit was carried out from the 28th to 30th of July 2009 with the external audit completed in 16th November 2009.

Environmental Management:

The TCC Environmental Focus Group met four times during the year to discuss and progress environmental issues.

TCCP site was compliant to HSNO during the year. Tank certificates, handler certificates and the site location certificate were all current.

The environmental impacts and aspects register was reviewed and updated in July 2010.

Environmental training for staff was carried out as follows:

- Fire Training was given to site staff in October 2009.
- HSNO handler training was given to new Operators in September 2009.
- Legionella training was given to staff in November 2009.

Environmental Maintenance was carried out as follows:

- Air Emissions equipment checked during GT combustion tuning in August 2009.
- Waste water pit solids were analysed for heavy metals in view of dumping solids on the vacant land in February 2010. Solids were not dumped in the outage in March 2010.
- An observation of the backwash sequence at the Raw Water intake was carried out by K Baker and the TRC in March 2010.The impact of backwash on the Patea River appeared very minimal.

Environmental Improvements were made to the plant operations as follows:

- Combustion tuning on the GT was carried out in August 2009. This resulted in the NOx values reducing slightly. During that time the NOx values were checked by an external contractor.
- Barbara Hammond from the TRC carried out a site inspection/review of the TCC site lay down area and procedures in December 2009.
- A site cleanup of the lay down area was carried out in January 2010.
- The Stabrex trial carried out in March 2010 on the Cooling Tower was successful in that the discharge into the Patea River resulted in minimal foaming. The Stabrex is replacing the biodispersant as the secondary biocide required for meeting the legionella best practice regime. The need to dose antifoam to the discharge is no longer an issue for the TCC plant.
- During the upgrade of the Raw Water pumps the system for adding Skinner Road Pate River flow data was lost. A new system which allows for all Skinner Road flow data to be entered into the DCS was created in May 2010.

Environmental challenges for TCCP during the year included:

- Failure of the air emissions equipment again in July 2009 required the unit to be sent back to Switzerland for further repairs. Unit was reinstalled September 2009 and has worked well since.
- High C2+ in the gas supply resulted in the unit not being able to run up within the allowable NOx consent limit in December 2009 & January 2010.
- A dispensation for having solids > 100mg/l. in the stormwater overflow was sort from the TRC in March 2010. The construction work for the Stratford Peaker site has left large areas of land as dirt only which during high rainfall can result in solids in the stormwater pond being higher than the consent limit.

Table 1: Results of Laboratory testing completed by TRC Lab, TCCP Lab and TCCP monitors on Waste Water Discharge.

Date	Time	Sample	Test	Units	TRC Lab	TCC Lab	Difference TRC-TCC Lab	TCC Monitor	Difference TRC-TCC Monitor
18/12/2009	**09:25**	Waste Water Discharge	Free Chorine	g/m3	< 0.01	< 0.01	0	-	-
			Total Chlorine	g/m3	< 0.01	0.01	0.01	0.009	-0.009
			Conductivity	mS/m	108	119.6	-11.6	-	-
			PH		6.9	6.94	-0.04	6.88	0.02
			Temperature	°C	22.5	-	-	23.3	-0.8
			Turbidity	NTU	4.6	5.27	-0.67	-	-
			Ammonical Nitrogen	g/m3	0.072	-	-	-	-
			Suspended Solids	g/m3	6	-	-	-	-
			Oil & Grease	g/m3	< 0.5	-	-	-	-
			Dissolved Phosphate	g/m3	0.097	-	-	-	-
			Flow	l/s	-	-	-	7.3	-
24/02/2010	**09:45**	Waste Water Discharge	Free Chorine	g/m3	< 0.01	< 0.01	0	-	-
			Total Chlorine	g/m3	< 0.01	0.03	0.03	0.046	-0.046
			Conductivity	mS/m	82.5	114.0	-31.5	-	-
			PH		6.8	6.89	-0.09	6.80	0
			Temperature	°C	25.1	-	-	25.1	0
			Turbidity	NTU	4.6	5.80	-1.2	-	-
			Ammonical Nitrogen	g/m3	0.089	-	-	-	-
			Suspended Solids	g/m3	4	-	-	-	-
			Oil & Grease	g/m3	< 0.5	-	-	-	-
			Dissolved Phosphate	g/m3	0.217	-	-	-	-
			Flow	l/s	-	-	-	18.7	-
30/06/2010	**1040**	Waste Water Discharge	Free Chorine	g/m3	< 0.01	< 0.01	0	-	-
			Total Chlorine	g/m3	< 0.01	< 0.01	0	-0.001	0
			Conductivity	mS/m	110	121.2		-	-
			PH		6.8	6.90	0.1	6.83	0.03
			Temperature	°C	18.7	-	-	18.1	0.6
			Turbidity	NTU	5.6	5.80	0.2	-	-
			Ammonical Nitrogen	g/m3	-	-	-	-	-
			Suspended Solids	g/m3	5	-	-	-	-
			Oil & Grease	g/m3	< 0.05	-	-	-	-
			Dissolved Phosphate	g/m3	-	-	-	-	-
			Flow	l/s	-	-	-	8.8	-

Notes: Conductivity results need to be tested and reported at the same temperature. The difference in values is due to the 5°C difference in reporting.

Table 2: Results of Laboratory testing completed by TRC Lab on Upstream & Downstream Patea River samples.

Date	Time	Test	Units	Up stream Patea River	Down stream Patea River	Difference Down stream – Up stream	% Change
18/12/09	10:10	Conductivity	mS/m	9.6	10.4	0.8	8
		PH		7.8	7.7	-0.1	-1
		Temperature	°C	13.8	13.9	0.1	0.7
		Turbidity	NTU	2.1	2.2	0.1	5
		Ammonical Nitrogen	g/m3	0.092	0.093	0.001	1
		Suspended Solids	g/m3	3	2	-1	-33
		Dissolved Phosphate	g/m3	0.073	0.076	0.003	4
		Un-ionised Ammonia	g/m3	0.00173	0.00140	-0.00033	-19
24/02/10	09:45	Conductivity	mS/m	10.3	14.5	4.2	41
		PH		8.1	7.9	-0.2	2.5
		Temperature	°C	17.2	17.5	0.3	1.7
		Turbidity	NTU	2.6	2.6	0	0
		Ammonical Nitrogen	g/m3	0.031	0.031	0	0
		Suspended Solids	g/m3	< 2	< 2	0	0
		Dissolved Phosphate	g/m3	0.152	0.149	-0.003	-2
		Un-ionised Ammonia	g/m3	0.00146	0.00095	-0.00051	-35
30/06/10		Conductivity	mS/m	8.6	9.0	0.4	5
		PH		7.4	7.4	0	0
		Temperature	°C	9.5	9.7	0.2	2
		Turbidity	NTU	1.5	1.5	0	0
		Ammonical Nitrogen	g/m3	-	-	-	-
		Dissolved Phosphate	g/m3	0.152	0.149	-0.003	-2
		Suspended Solids	g/m3	< 2	3	3	?
		Dissolved Phosphate	g/m3	-	-	-	-
		Un-ionised Ammonia	g/m3	-	-	-	-

Notes:

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.

Raw Water Abstraction Report for year [illegible] 30th June 2010

Month	Patea River Flow (l/s)			Raw Water Intake Flow (l/s)			Raw Water Reservoir Flow (l/s)			Average Extraction	Total Volume extracted
	Average	Max	Min	Average	Max	Min	Average	Max	Min	l/s	m3
Jul-09	4523.3	8807.0	2692.0	54.5	76.0	0.0	55.4	74.8	0.0	54.9	147095
Aug-09	5173.0	32767.0	2500.0	47.3	83.0	0.0	47.6	150.5	0.0	47.5	127101
Sep-09	6159.4	13273.0	3277.0	21.3	82.0	0.0	21.8	85.9	0.0	21.6	55945
Oct-09	9545.3	31753.0	4151.0	1.7	82.0	0.0	1.6	152.6	0.0	1.7	4463
Nov-09	2345.2	4151.0	1411.0	34.7	83.0	0.0	35.8	73.1	0.0	35.3	91391
Dec-09	3211.9	6068.0	609.0	50.1	77.0	0.0	51.4	73.4	0.0	50.7	135922
Jan-10	1773.5	4802.0	1073.0	44.0	74.0	0.0	45.1	69.6	0.0	44.5	119270
Feb-10	1159.7	1972.0	876.0	70.8	83.0	0.0	70.4	76.1	0.0	70.6	170761
Mar-10	991.9	1972.0	836.0	42.8	82.0	0.0	42.6	139.5	0.0	42.7	114345
Apr-10	836.0	836.0	836.0	0.0	0.0	0.0	14.7	147.1	0.0	7.3	19023
May-10	11293.7	47218.0	1381.0	30.9	140.1	0.0	18.9	92.0	0.0	24.9	66771
Jun-10	10975.4	116834.0	4240.0	47.9	146.0	0.0	47.7	145.8	0.0	47.8	123965
Yearly Average	**4832**			37.2			**37.8**			**37.5**	
Yearly Max/Min		**116834**	**609**		**146.0**	**0.0**		**152.6**	**0.0**		
Yearly Sum m3											**1176052**
Consent Limit	**>600**			**< 140**			**< 140**				

Wastewater Discharge Report for Year 1st July 2009 to 30th June 2010

Month	Upstream Temperature Patea River (℃)			Downstream Temperature Patea River (℃)			Temperature Differential Patea River (℃)			Flow Wastewater Discharge (l/s)			(m3)	pH Wastewater Discharge			Total Residual Chlorine Waste water Discharge (mg/kg)			Temperature Wastewater Discharge (℃)			Lab TCL2 (mg/kg)	
	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Monthly Sum	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max
Jul-09	7.9	10.4	5.0	8.0	10.5	5.2	0.09	0.26	0.0	8.3	15.4	0.0	22323	7.28	7.74	6.83	0.01	0.06	0.00	18.4	25.6	11.7	0.01	0.05
Aug-09	9.2	11.9	6.7	9.3	12.0	6.8	0.09	0.19	0.0	7.2	20.4	0.0	19331	7.12	8.52	6.70	0.00	0.05	0.00	19.0	22.5	15.1	0.01	0.02
Sep-09	9.9	12.2	6.6	9.9	12.2	6.6	0.04	0.13	0.0	4.0	22.1	0.0	10285	6.95	8.90	6.05	0.00	0.05	0.00	18.4	21.7	12.8	0.01	0.02
Oct-09	10.3	12.6	6.8	10.3	12.6	6.8	0.03	0.11	0.0	2.1	25.3	0.0	5513	7.28	8.43	6.55	0.00	0.87	0.00	15.4	20.8	11.6	0.01	0.02
Nov-09	13.3	18.0	9.8	13.3	18.2	9.9	0.10	0.36	0.0	5.2	26.6	0.0	13370	7.06	8.59	6.27	0.00	1.03	0.00	21.1	25.2	15.1	0.00	0.01
Dec-09	14.7	19.9	11.1	14.8	20.0	11.2	0.10	0.29	0.0	7.4	15.2	0.0	19804	7.24	8.24	6.69	0.01	0.12	0.00	23.6	26.7	19.6	0.01	0.05
Jan-10	15.6	20.1	11.9	15.7	20.3	12.1	0.11	0.38	0.0	6.9	21.1	0.0	18420	7.10	8.97	6.17	0.01	0.23	0.00	23.2	27.1	19.1	0.01	0.04
Feb-10	17.2	20.8	14.4	17.4	20.9	14.6	0.19	0.54	0.0	12.1	21.6	0.0	29337	7.07	8.93	6.33	0.01	0.17	0.00	25.1	27.9	21.9	0.01	0.03
Mar-10	14.7	18.1	10.4	14.9	18.3	10.7	0.17	0.61	0.0	7.3	27.2	0.0	19614	6.75	8.22	5.84	0.01	0.79	0.00	23.3	26.5	17.5	0.01	0.05
Apr-10	12.1	14.8	0.0	12.2	14.8	0.0	0.03	0.26	0.0	0.7	26.8	0.0	1752	6.64	9.59	5.40	0.03	1.03	0.00	16.7	20.5	14.6	0.02	0.12
May-10	10.8	14.1	7.3	10.8	14.1	7.3	0.02	0.18	0.0	5.0	31.9	0.0	13526	7.34	8.54	6.44	0.00	0.08	0.00	15.5	20.1	11.3	0.01	0.04
Jun-10	10.0	12.2	7.9	9.9	12.1	7.9	0.00	0.08	0.0	7.3	17.4	0.0	19047	6.86	8.84	6.06	0.00	0.91	0.00	18.0	20.9	15.3	0.00	0.02
Yearly Average							0.08			6.1				7.06			0.01			19.8			0.01	
Yearly Sum m3													192321											
Yearly Max/Min		20.8	0.0		20.9	0.0		0.61	0.00		31.94	0.00			9.59	5.40		1.03	0.00		27.9	11.3		0.12
Consent Limits							1.5 ℃ - 95% or 2.0 ℃ - 5%			78 l/s				6.0-9.0			0.05 mg/kg						0.05 mg/kg	

Maximum Diff Temp for Year	@ Waste Water Flow	@ River Flow	@ Upstream Temperature	@ Downstream Temperature
19/03/10 0.61 ℃ 19:09:11	21.56 l/s	836 l/s	14.32 ℃	14.91 ℃

Maximum Upstream River Temperature ► 20.8 ℃ 18/Feb 10 16:55:41
Maximum Downstream River Temperature ► 20.9 ℃ 18/Feb 10 17:00:06

Emissions Discharge Report for year 1st July 2009 to 30th June 2010

Month	NOx Flue Gas (ppm)			Oxygen Flue Gas (%)			Nox Flue Gas (kg/h)				CO Flue Gas (ppm)			CO2 Flue Gas (t/h)			
	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Monthly Sum (tons)	Avg	Max	Min	Avg	Max	Min	Monthly Sum (tons)
Jul-09	14.5	80.0	0.0	10.9	20.8	0.0	53.2	207.8	0.0	39.6	17.8	399.4	0.0	120.8	156.7	0.0	89889.2
Aug-09	0.0	13.3	0.0	0.1	13.6	0.0	0.1	41.5	0.0	0.1	0.0	1.0	0.0	100.6	155.5	66.3	74824.7
Sep-09	2.5	80.0	0.0	3.0	20.8	0.0	6.9	233.6	0.0	4.9	40.0	399.8	0.0	49.2	160.3	0.0	35391.6
Oct-09	0.3	80.0	0.0	0.4	18.4	0.0	0.7	88.4	0.0	0.5	8.3	399.4	0.0	2.4	139.7	0.0	1817.3
Nov-09	7.8	80.3	0.0	10.4	21.3	0.0	20.8	270.4	0.0	15.0	150.3	399.9	0.0	65.3	146.9	0.0	46987.1
Dec-09	11.2	80.0	0.0	12.5	20.8	0.0	31.6	274.5	0.0	23.5	105.2	399.6	0.0	87.1	156.9	0.0	64838.5
Jan-10	14.9	80.5	0.0	12.0	20.9	0.0	32.2	276.8	0.0	23.9	128.0	399.8	0.0	77.1	149.3	0.0	57340.7
Feb-10	15.1	80.0	0.0	12.6	16.9	0.0	57.1	141.8	0.0	38.4	1.7	399.3	0.0	130.0	170.3	32.8	87366.5
Mar-10	9.8	80.0	0.0	7.8	18.1	0.0	37.5	89.8	0.0	27.9	1.6	399.5	0.0	79.8	147.9	0.0	59353.8
Apr-10	0.6	80.0	0.0	1.0	20.9	0.0	1.1	262.8	0.0	0.8	16.4	399.5	0.0	5.0	134.5	0.0	3619.3
May-10	2.4	80.0	0.0	4.9	21.2	0.0	7.2	266.6	0.0	5.3	70.8	399.6	0.0	31.3	141.7	0.0	23292.7
Jun-10	10.1	17.6	0.0	13.0	15.6	0.0	32.8	74.3	0.0	23.6	69.6	400.5	0.0	105.8	171.0	0.0	76153.2
Yearly Average	**7.4**			**7.4**			**23.4**				**50.8**			**71.2**			
Yearly Sum										**203.6**							**620875**
Yearly Max/Min		**80.5**	**0.0**		**21.3**	**0.0**		**276.8**	**0.0**			**400.5**	**0.0**		**171.0**	**0.0**	
Consent Limits	**50**						**430**										**1500000**

Tonnes of CO2 discharged for year 2009/2010 620875

Tonnes of NOx discharged for Year 2009/2010 203.6

Appendix IV

Air emissions report
by Contact Energy Limited

Pursuant to condition 8 on consent 4454-1

Taranaki Combined Cycle Power Station

Consent 4454-1

Compliance Report Pursuant to Condition 8 of Consent 4454-1 - to discharge contaminates to air from the Taranaki Combined Cycle Power Station.

August 2009

1. Introduction

Condition 8 requires:

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 the commencement of commissioning of the Station and every 6 years thereafter, a written report:

a. reviewing any technological advances in 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 contaminates as the General manager may from time to time specify following consultation with the consent holder; and

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

d. addressing any other issue relevant to the minimization or mitigation of emissions from the site that the General manager considers should be included; and

e. detailing carbon dioxide emissions from the site.

2. Reporting Time-frames

The Station was commissioned in 1998, thus Condition 8 requires reports in 2000, 2002 and every 6 years thereafter. The two and four year from commissioning reports have been forwarded to the Taranaki Regional Council (TRC).

This report is the first six year report (2008).

3. Technological Advances

Technological advances to plant such as the Taranaki combined cycle to reduce or mitigate carbon dioxide emissions are limited to detail developments as this plant already incorporates many of the features of the latest technology, such as EV burners and sequential combustion. The detail changes would generally result in small improvements in efficiency and output. Improvements to efficiency directly reduce carbon dioxide emissions whilst improvements to output improve the electricity sector's carbon dioxide emissions by displacing emissions from plant that has a higher emission factor.

The technology relating to the mitigation of carbon dioxide is continually developing with the most notable advances being related to alternative electricity generating plant, although there are other developments that result in making heat available directly from renewable sources in a useful form. However, most of the alternative electricity generating forms are still not economically competitive with the current TCC CCGT technology. Contact is pursuing the development of so called renewable electricity generating technologies such as geothermal and wind plant and these will be brought into the market when consents have been gained and the projects are economically viable.

Any technological advances intended to be implemented at the existing station would need to be sanctioned by the manufacturer so that plant guarantees would be retained.

The most recent developments have been related to compressor improvements.

Cooling towers such as used at TCC have gone through improvements to enhance operation. These improvements have been to seal up any air passages that would allow the air to bypass the plume coils and improve efficiency or to reduce the size and increase the number of droplets and thus the exposed droplet surface area so as to increase the heat rejection.

4. Inventory of Emissions

The General Manager has not detailed any contaminates from the site of which he needs an inventory of emissions.

5. Energy Efficiency Improvements.

During an outage in early 2008 the TCC main turbine refurbishment and compressor blade upgrade resulted in an output increase of 24MW and efficiency improvement of 0.76%.

The cooling tower at TCC has gone through improvements to enhance its operation. These improvements have been to seal up any air passages that would allow the air to bypass the plume coils and improve efficiency.

6. Other issues as requested by General Manager

The General Manager has not advised of any other issue relevant to the minimisation or mitigation of emissions from the site that he considers should be included in this report.

However, as Contact noted in the 2007 report for Condition 5 of Consent 5846-1, the following other aspects of Contact's operations impact upon its overall efficiency in the production of electricity.

Contact Energy has a policy of continuous assessment of means to improve the thermodynamic performance of all thermal stations it owns, since this makes economic sense and is consistent with the RMA precept of sustainable use of resources. These are generally small and can be difficult to quantify but do result in a reduction in Contact's greenhouse gas emissions. These have included:

- ***Otahuhu A Gas Turbines:*** These units are no longer used for emergency generation but a contract has been signed with Transpower to provide for the use of the Otahuhu A units 1 and 2 for synchronous compensation. Synchronous compensation results in improved power factor in long transmission lines and that results in fewer losses. The magnitude of this loss reduction and the consequent reduction in greenhouse gas emissions is difficult to quantify.

- ***Wairakei Binary Plant***: Contact has commissioned a 14MW Binary Plant at Wairakei. This plant displaces up to 66,200 tonnes of CO_2 per year.

- ***Ohaaki Geothermal Plant***: Three new production wells have been commissioned. The extra electricity able to be generated from these wells will have the potential to displace electricity generated at thermal stations that could save up to 58,000 tonnes of CO_2 per year. However, this is negated to a large extent by the high greenhouse gas content of the steam from the new wells.

- ***Te Rapa Co-generation Plant***: An upgrade of the components in the gas turbine hot gas flow path has improved the output resulting in the displacement of around 11,000 tCO_2 per year.

- ***Otahuhu B***: As well as the work noted in the 2007 report for Condition 5 of Consent 5846-1 Contact carried out a major inspection and overhaul of this CCGT plant in November/December 2008. As well as the normal maintenance work, the work included:
    - Firing Temperature Increase Upgrade - this included changing the burners to Reduced Swirl types and the combustion chamber tile holders were changed to impingement cooled types. The changes to the combustion tiles reduced cooling air requirements and both changes had the overall effect of reducing CO and NOx emissions.

- Hydraulic clearance optimisation (HCO) that alters compressor blade tip clearances to minimise leakage flows.
- Whilst not tested rigorously a performance test showed that due to the upgrades, the output increased by 10.25 MW and the LHV efficiency improved by 0.61%.

7. Carbon Dioxide Emissions.

In October 2002, since the last Condition 8 report, the Government gave approval for the TRC to proceed with the process of removing the original condition that required mitigation for greenhouse gases emitted greater than would have been emitted had the power station not been built and operated. Consequent to an application from the then Consent holder, Stratford Power Limited, the conditions concerned were removed. Since then Contact has not had an obligation in its consent to annually report carbon dioxide emissions.

However, a report including details of carbon dioxide gas emissions has been submitted annually to the TRC. In summary, these reports have noted:

Year ending 30 June	**CO2 Emissions Mtonne**	**Year ending 30 June**	**CO2 Emissions Mtonne**
2002	0.969	2006	1.066
2003	0.911	2007	0.801
2004	0.718	2008	0.802
2005	0.627	2009[1]	0.809[2]

[1] 2009 figures not yet reported to TRC.

[2] This is calculated from fuel flows and includes estimates of N_2O and CH_4 discharges all as obtained from tables 4.6 & 4.7 of http://www.med.govt.nz/upload/68779/Energy%20Greenhouse%20Gas%20Emissions%202009.pdf using the gross CV