

TrustPower Limited  
Patea hydroelectric scheme, below dam  
lower river monitoring programme  
Annual Report 2009-2010

Technical Report 2010-87

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## Executive summary

TrustPower Limited (the Company) operates a hydroelectric power scheme located on the Patea River, in the Patea catchment. This report for the period to 30 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 six resource consents, which include a total of 65 conditions setting out the requirements that the Company must satisfy. Two of these consents cover the diversion of water from Lake Rotorangi for hydroelectric power generation and spilling purposes, while four cover the placement of structures in the Patea River and river-channel maintenance and protection works.

The Council's compliance monitoring for the year under review included an assessment of dam discharge data, and maintenance of the hydrological recorder sites on the Patea River.

In 2009-2010, flows in the lower Patea River were below average. The median flow at McColl's Bridge was 14.4 cubic metres per second (cumecs) and the mean flow was 25.4 cumecs. During 2009-2010, there were no significant flood events. The highest flood-fresh event recorded during the 2009-2010 period was 185 cumecs at McColl's Bridge. This flood-fresh occurred in June 2010 and has a return period of approximately 1.3 years for the Patea River.

The Company achieved compliance with residual flow and daily mean flow consent conditions at all times in 2009-2010. All operational data provided by the Company during the period was of high quality. There were seven minor breaches of tailrace flow rise and recession rates.

No complaints or reports of river erosion were received during the year, and there were no unauthorised incidents relating to the Company's activities below the dam.

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

The consent holder lodged renewal applications in late 2007 and the renewal process continued throughout the 2009-2010 period. Following a hearing held commencing 3 June 2009, the Council granted renewals of the consents for the dam, but the Council's decision has been appealed by submitters. All consents that expired on 30 June 2008, are continuing to be used until the appeals are resolved and new consents are issued.

This report includes recommendations for the 2010-2011 monitoring year.



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# 1. Introduction

This report covers the results and findings of monitoring implemented by the Council in respect of the resource consents held by TrustPower Limited (the Company) that relate to the diversion of water from Lake Rotorangi for hydroelectric power generation and spilling purposes, the placement of structures in the Patea River, and river-channel maintenance and protection works, in the Patea catchment.

This is the thirteenth Annual Report to be prepared by the Taranaki Regional Council to cover the Company's activities and their effects in the Patea River, downstream of the dam.

## 1.1 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 approach to monitoring through annual programmes, the resource consents held by the Company for the Patea River below the dam, the nature of the monitoring programme in place for the period under review, and a description of the activities and operations conducted at the Company'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 2008-2009 monitoring year.

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

## 1.2 Compliance monitoring and the Resource Management Act (1991)

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 (e.g., recreational, cultural, or aesthetic);
- (e) risks to the neighbourhood or environment.

In drafting and reviewing conditions on water and land use permits, and in implementing monitoring programmes, the Taranaki Regional Council is recognising the comprehensive meaning of 'effects' inasmuch as is appropriate for the consented activities. 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, including 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 to move closer to achieving sustainable development of the region's resources.

### 1.2.1 Evaluation of environmental performance

Besides discussing the various details of the performance and extent of compliance by the Company 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 a verified unauthorised incident involving significant environmental impacts against the company, 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.

### 1.3 Process description

The Patea hydroelectric scheme is located on the Patea River, some 43 km upstream of the river mouth (Figure 1). The scheme was commissioned in 1984 by Egmont Electricity Ltd, who operated it until August 1997 before selling it to Powerco Ltd. In April 1999, the scheme was sold to Taranaki Generation, a wholly owned subsidiary of TrustPower Ltd.

Following the granting of consents in 1978 to construct a hydroelectric power station on the Patea River, work commenced on the 82 m high earth-filled dam. The dam impounds water in the Patea River to create the reservoir known as Lake Rotorangi.

Lake Rotorangi is over 46 km long, fairly narrow, and has a surface area of approximately 6 km<sup>2</sup>. The lake has storage of some 6,600 cumec-hours within the 4.5 m operational range, which is small by national standards. The scheme's 30 MW power station is the largest hydro-electric station in Taranaki.

The consents granted to Egmont Electricity Ltd for impoundment and use of the waters included special conditions which required that effects on the river environment were appropriately monitored, as it was recognised that the scheme could have significant adverse environmental effects, particularly on the river channels and banks below the dam.

River-channel monitoring commenced before 1984 and included the establishment and periodic surveying of eight river channel cross-sections. Around the same time hydrological data became available when the Council established a water level recorder at McColl's Bridge.

From the time the power scheme commenced operation in 1984, the Taranaki Regional Council received complaints of riverbank damage. Extensive river bank damage was reported by several downstream landowners following the large floods in 1990 and 1991. By 1990, compliance monitoring results were also showing evidence of localised river-channel changes.

Investigations into the nature and causes of river bank damage and channel instability identified high-energy flows from a commissioning test discharge and subsequent operational flows, as the cause (Torrance 1993).

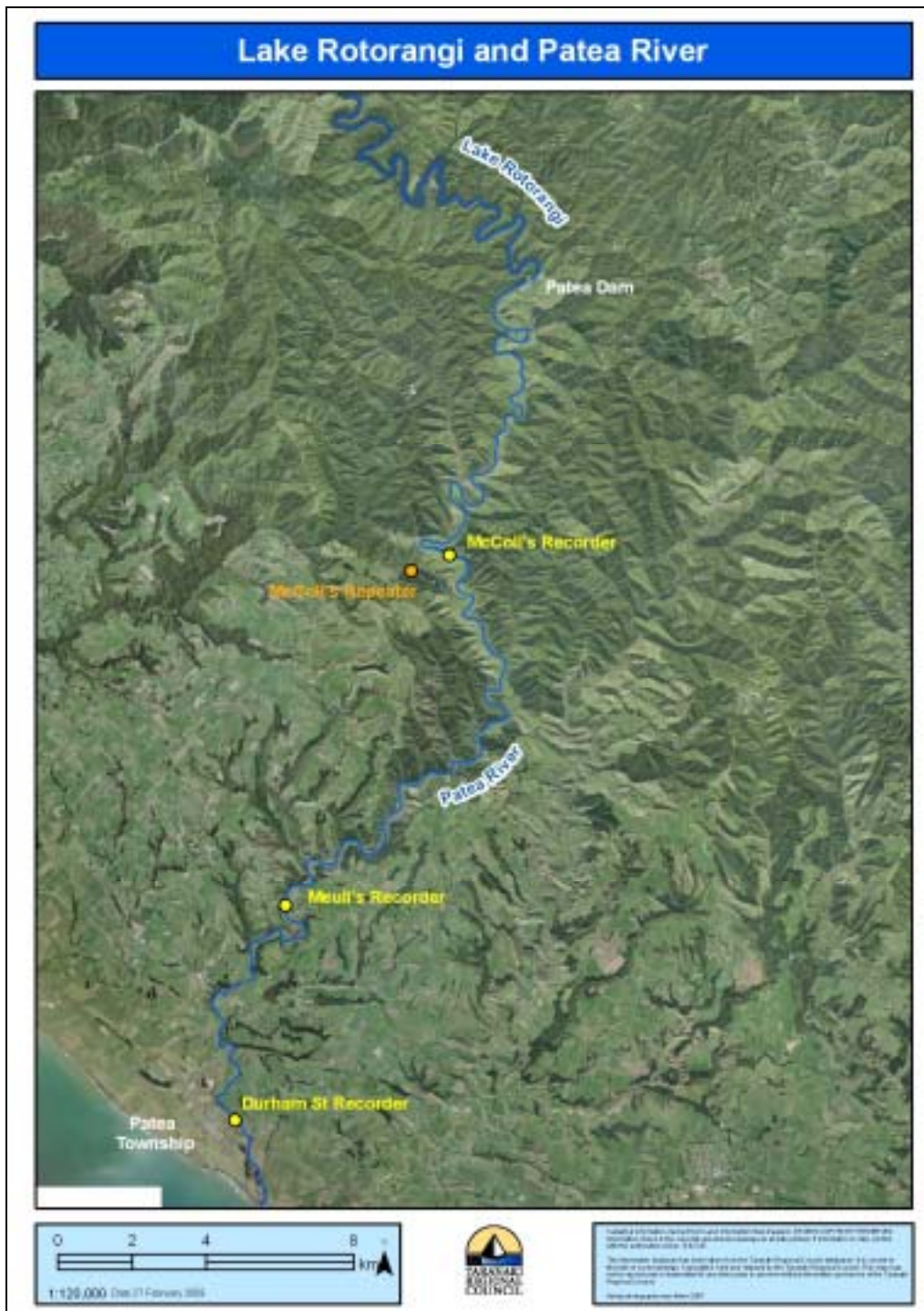
Recommendations from the investigations led to the 1994 consents review, which included new special conditions to limit the intensity of high-energy discharges (section 1.1). In conjunction with a substantial reduction of high-energy flows, tree planting on unstable river banks helped restore the natural resilience of the river channel.

During 1998, further damage to the river banks downstream of the dam occurred as a result of flood events. In response to this damage the consents were reviewed again in 2000. Events leading up to the review are discussed in more detail in the Taranaki Regional Council Technical Report 2003-87.

Following the 2000 consents review an automated control system was installed at the dam to regulate the discharges and since then, the natural channel resilience of the river below the dam has almost totally recovered.

Provided the natural boulder and timber weirs are not disturbed and the discharges adhere to consent conditions, future damage to the river channel and banks is expected to be a result of natural flow regimes only.

Photo 1 shows the location of the Patea Dam, Lake Rotorangi, and the Patea River.



**Photo 1** Lake Rotorangi, Patea River and the Patea Dam

## 1.4 Resource consents

The Company holds a total of six resource consents, which include a total of 65 conditions setting out the requirements that the Company must satisfy. The Company holds two consents that license the diversion of water from Lake Rotorangi for hydroelectric power generation and spilling purposes, and four land use consents that license the placement of structures in the Patea River and river-channel maintenance and protection works. The Company holds no other consents in relation to the Patea River below the dam.

All six consents were issued by the Taranaki Regional Council under Section 87(e) of the Resource Management Act 1991 (the Act). These consents are discussed in more detail below in sections 1.4.1 and 1.4.2. Copies of the consent certificates are attached to this report in Appendix I.

Applications for renewal of all consents were received on 19 November 2007. A Council hearing commenced for these consents on 3 June 2009, these were appealed on 17 July 2009. The old consents will continue to be in force until the issues are resolved.

### 1.4.1 Water 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.

The Company holds two water permits in relation to the Patea hydroelectric scheme below the dam (0489, 0490).

TrustPower Ltd holds water permit **0489-1** for the diversion of water from Lake Rotorangi to generate hydroelectric power. This permit was issued by the Taranaki Regional Council on 4 October 1978 under Section 87(d) of the Resource Management Act. It expired on 30 June 2008.

In 1994, the consent was reviewed and changes were made to the conditions to limit the intensity of high energy discharges below the dam. In June 2000, further changes were made to the conditions following a request by the consent holder for a consent review, pursuant to Section 127 of the Resource Management Act. One special condition was changed and one was deleted. The changed condition now requires discharges from the tailrace/stilling basin below the dam to reflect natural inflows to the lake above the dam to mitigate the effects of the discharges on river channel stability.

The Council did not review consent **0489** when last provided for in June 2002 on the basis that the consent conditions were adequate to deal with the environmental effects. There was no further provision for review before the expiry date.

Consent **0489** has a total of five special conditions as summarised below:

Special condition 1 is a review provision.

Special condition 2 sets the residual flow requirements in the river immediately below the dam.

Special condition 3 requires monitoring of discharges from the powerhouse to the river and instantaneous lake and tailrace water levels.

Special condition 4 requires the discharges from the dam to be managed to minimise downstream river damage, while special condition 5 relates to monitoring of the river below the dam.

TrustPower Ltd holds water permit **0490-1** for the diversion of excess water in Lake Rotorangi via the dam spillway. This consent was issued on 4 October 1978 and expired on 30 June 2008.

In 1994, the consent was reviewed and changes were made to the conditions to limit the intensity of high energy discharges below the dam. Further changes were made to the conditions in June 2000 following a request by the consent holder for a consent review, pursuant to Section 127 of the Resource Management Act. In total, six special conditions were changed to mitigate the adverse effects of the discharges on river channel stability.

The changed conditions now require the rise and recession rates of spillway discharges to reflect the natural rise and recession rates of lake inflows above the dam, and also require the frequency and magnitude of discharges to be contained within armoured segments of the downstream river channel.

The Council did not review this consent when last provided for in June 2002 on the basis that the consent conditions were adequate to deal with the environmental effects. There was no further provision for review before the expiry date.

Consent **0490** has a total of nine special conditions as summarised below:

Special condition 1 is a review provision.

Special conditions 2 to 4 set controls on spillway operating conditions, while special condition 9 relates to river channel monitoring downstream.

Special conditions 5 and 6 set limits on flow rise and recession rates into the lower Patea River by defining the relationship between flows in the river above the lake and dam outflows.

Special condition 7 requires the discharges to be managed to avoid or mitigate downstream river damage.

Special condition 8 defines the maintenance responsibilities for the hydrological monitoring stations at Skinner Road and Raupuha Road.

Special condition 9 requires monitoring of the river channel below the dam.

Copies of the water permits are attached to this report in Appendix I.

### 1.4.2 Land use permits

Section 13(1)(a) of the Resource Management Act 1991 stipulates that no person may, in relation to the bed of any lake or river, use, erect, reconstruct, place, alter, extend, remove or demolish any structure or part of any structure in, on, under, or over the bed unless the activity is expressly allowed for by a resource consent, or a rule in a regional plan, or meets the criteria set out in Section 14(3) of the Act.

The Company holds four land use consents in relation to the Patea hydroelectric scheme below the Patea dam (0488, 0669, 4835, and 4742).

TrustPower Ltd holds consent **0488-1** for the placement of a dam on the Patea River for hydroelectric power generation purposes. This consent was issued on 4 October 1978 and expired on 30 June 2008. In 1994, the consent was reviewed and changes were made to the conditions to limit the intensity of high energy spillway discharges.

In June 2000, further changes were made to the conditions following a request by the consent holder for a consent review, pursuant to Section 127 of the Resource Management Act. A total of five special conditions were changed, including one condition relating to the provision of spilling discharge records, one relating to compliance with the management plan, and three relating to fish passage.

The Council did not review consent **0488** when last provided for in June 2002 on the basis that the conditions were adequate to deal with the environmental effects, and there was no further provision for review before the expiry date.

Consent **0488** has a total of 27 special conditions, as summarised below:

Special conditions 1 to 4 and 21, 22 and 24 refer to controls on the exercise and monitoring of the consent.

Special conditions 5 and 12 do not guarantee access to water, or the quality and quantity of water.

Special condition 6 prohibits the discharge of unauthorised contaminants, while special conditions 7 and 9 to 11 relate to monitoring and record keeping.

Special condition 8 requires records for any discharges through the auxiliary or emergency spillway.

Special conditions 13 and 14 set lake levels to be maintained under specific operational and seasonal conditions.

Special conditions 15 to 20 relate to the stability, erosion and aesthetic values of the lake shoreline, including recreational uses and public safety.

Special conditions 25 to 27 relate to the passage of native fish past the dam.

TrustPower Ltd holds consent **0669-1** for excavation works in the channel of the Patea River for the purposes of maintaining river channel and power station efficiency. This consent was issued by the Taranaki Catchment Commission and

Regional Water Board as a right in respect of natural water under Section 21(3) of the Water and Soil Conservation Act 1967. The consent does not provide for an optional review.

Consent **0669** has a total of 13 special conditions as summarised below:

Special conditions 1 to 4, 6 to 9 and 11 refer to controls on the exercise and monitoring of the consent, including record keeping.

Special condition 5 prohibits the discharge of unspecified contaminants to water.

Special condition 10 states that the consent is not an authority to obtain access to or to discharge water.

Special conditions 12 and 13 refer to the control of bank erosion in the Patea River and its tributaries.

TrustPower Ltd holds consent **4742-1** for the construction and maintenance of training works on the Patea River for bank erosion control purposes. This consent was issued on 6 April 1995 and expired on 1 June 2010. The consent was not reviewed when last provided for in June 2004 on the basis that the conditions were adequate to deal with the environmental effects. There is no further provision for review before the expiry date.

The consent has a total of four special conditions as summarised below:

Special condition 1 requires contamination of the river to be minimised during the works, while special condition 2 requires disturbed areas to be reinstated.

Special condition 3 requires the consent holder to notify the Council prior to carrying out the works, while special condition 4 provides for consent review.

TrustPower Ltd holds consent **4835-1** for the placement and maintenance of remedial works on the true right bank of the Patea River for bank erosion control purposes. This consent was issued on 17 November 1995 and expired on 1 June 2010. The consent was not reviewed when last provided for in June 2004 on the basis that the conditions were adequate to deal with the environmental effects. There is no further provision for review before the expiry date.

The consent has a total of seven special conditions as summarised below:

Special conditions 1 to 3 relate to prior Council approval of the works.

Special conditions 4 to 6 require measures to be taken to minimise contamination of the Patea River, while special condition 7 is a review provision.

## 1.5 Monitoring programme

### 1.5.1 Introduction

Section 35 of the Resource Management Act sets out an obligation for 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.

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 Company's monitoring programme for the Patea River below the dam in 2009-2010, consisted of six primary components which are discussed below in sections 1.5.2 to 1.5.6.

### 1.5.2 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.

### 1.5.3 Site inspections

The 2009-2010 monitoring programmes provided for an annual visual inspection of the banks and channel of Patea River to be undertaken by the Council over the 43 km reach from the dam to the estuary. The inspection is normally carried out by helicopter, as a boat is unable to traverse the full length of the river safely. A photographic record is kept of any significant erosion or degradation features recognised during the inspection.

The lower than average flows in the Patea River during 2009-2010 meant there was a reduced likelihood of river bank damage caused by discharges from the dam. As a consequence, the river inspection was not considered necessary and no inspection was carried out during the year under review.

### 1.5.4 River cross section survey

Special condition 4 of consent 0489 states:

*"the discharges authorised by this consent shall be managed with the aim of avoiding or mitigating downstream river damage to the satisfaction of the Chief Executive, Taranaki Regional Council"*.

Special condition 5 of this consent states:

*"the consent holder shall, in conjunction with the Taranaki Regional Council, undertake such monitoring of the downstream river channel as deemed necessary by the Chief Executive, Taranaki Regional Council, subject to section 35(2)(d) and section 36 of the Resource Management Act 1991"*.

It is recognised that degradation of the river channel and erosion of the river banks can and has occurred as a result of high energy discharges from the dam.

In order to quantify rates of river bank degradation and erosion at key locations over time the Taranaki Regional Council initially established nine sites for river channel cross sections on the Patea River, between the dam and SH3.

Periodic surveys of these sections from 1984 to 1992 indicated that localised river channel degradation had occurred during that time (TRC 1995). No surveys of the sections were carried out from 1992 to 1996.

In 1997, Egmont Electricity Ltd requested that the Council undertake an extended river cross section survey for a dam break analysis and for this purpose, three new cross sections were established (9a, 9b and 13). Only sections 1 to 9, 9a, 9b, 12 and 13 were surveyed in 1997. The results indicated that from 1992 to 1997, the river channel had stabilised with no apparent degradation (TRC 1997).

In 1998, sections 1 to 9 were surveyed, and in 2000, only sections 10 and 11 were surveyed. These surveys continued to indicate that no significant further degradation of the river channel had occurred.

No river cross sections were surveyed from 2001 to 2005.

Since the establishment of the river cross sections in 1984 there have been discrepancies with location accuracy, nomenclature and survey precision. In view of these problems the consent holder agreed in 2004 to uptake the management and funding of all aspects of the cross section survey work, including data storage. Figures 1 to 3 show the locations of the original cross sections.

The first river cross section survey under the management of the consent holder was carried out in September 2006. This work was undertaken by BTW Surveyors Limited of New Plymouth. The location of each section was established to reproduce historical section information. For section 10 it was not possible to locate the bench mark for the original cross section, but in sections 1-9 and 11-13 a close approximation was achieved. Sections 11-13 could not be directly compared to historical survey data, due to the original sections lacking key information. However, the new and old data for sections 1 to 7 could be compared and indicated that over the intervening period there had been a general stability of the river banks and bed, there had been significant silting of the river bed and there had been some concentrated erosion above section 11 in the Whitehead Lane area.

This data collected in the 2006 survey has provided a sound basis for comparing future surveys at sections 1 to 9 and 11 to 13. The sections are to be re-surveyed at five-yearly intervals, with the next survey due in 2011-2012.

### **1.5.5 Recorder maintenance**

The Council routinely inspects the hydrological recording stations at McColl's Bridge (Figure 1), Raupuha Road and Skinner Road. Routine inspections are carried out on a monthly basis in order to maintain the quality of data produced from these sites, and

include flow gaugings and general maintenance. Recorder maintenance for 2009-2010 is discussed in section 2.3.

### **1.5.6 Discharge data assessment**

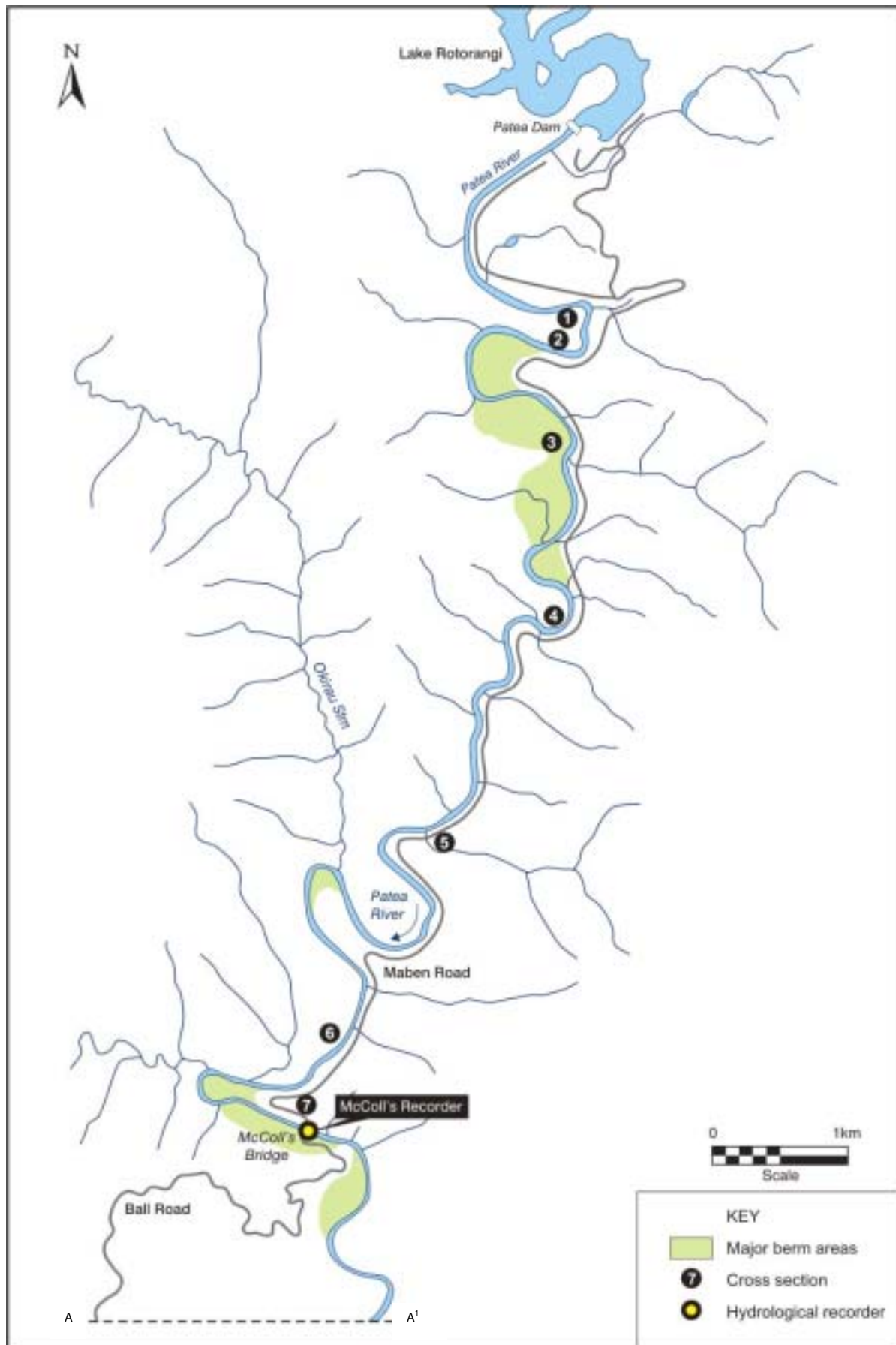
Discharges from the hydro station are managed by an automated control system which responds dynamically to lake inflow variations. The analysis of the discharge data is done by computer using an agreed data format. Analytical methodology is detailed in the Taranaki Regional Council technical report 2002-59 and is not repeated here.

It is recognised that surface waves in the tailrace can affect the accuracy of residual flow determinations by up to 5 %. In view of this, assessments of non-compliance with respect to residual flow requirements were made using a 5 % margin of error, unless the non-compliance is sustained for more than two and a half hours (i.e. 5 measurements at 30 minute intervals).

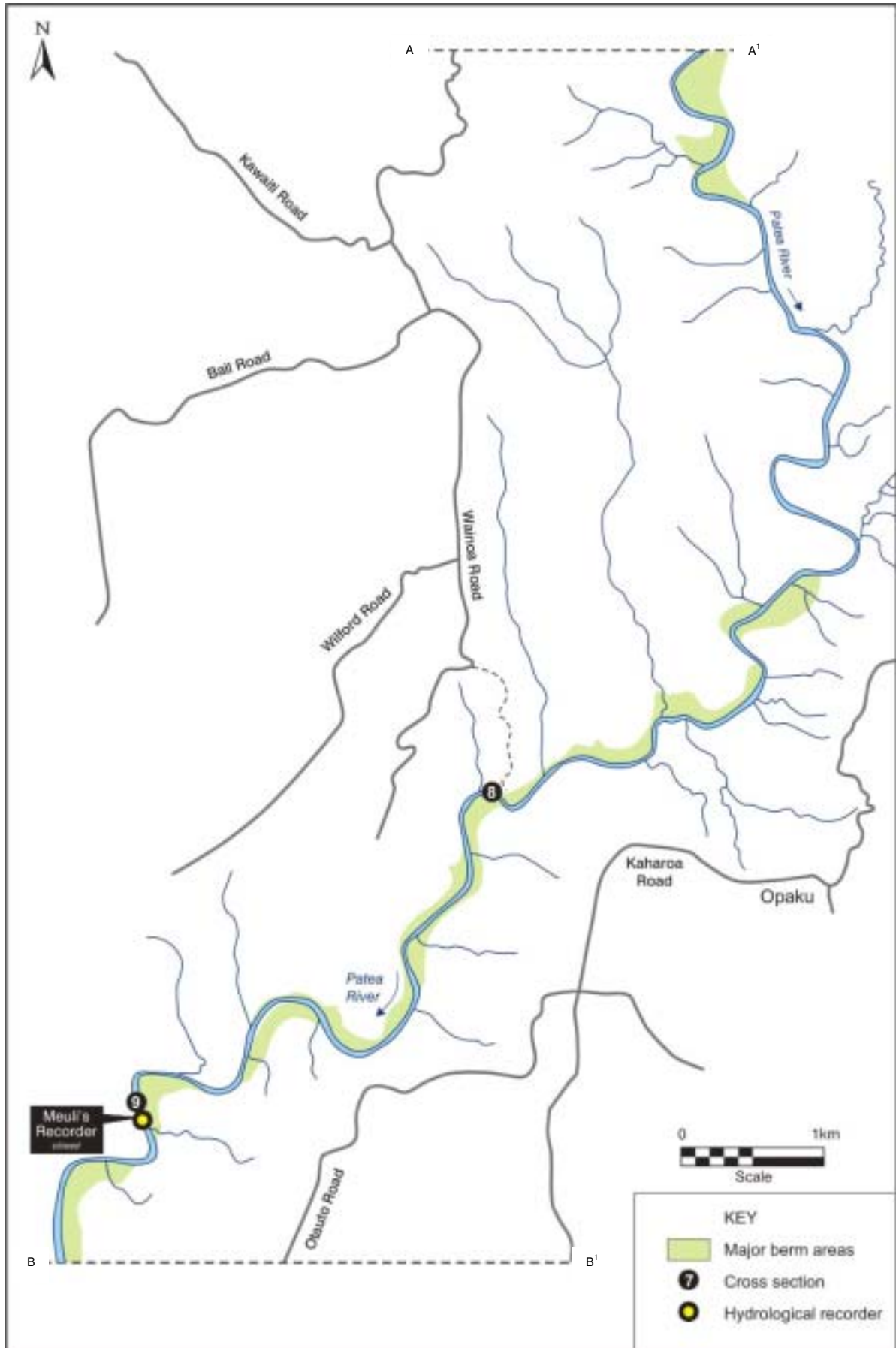
Non-compliance with residual flow requirements indicated by the one-hour stepping monitoring software must also be validated by the data from the corresponding 30 minute period.

When there is insufficient generation outflow and tailrace water levels decay towards 1.4 cumecs, the automated system either triggers the maintenance generator to start, or releases a small spillway discharge. The generation or spill is maintained long enough to recharge the tailrace/stilling basin storage and provides a means of satisfying both the residual flow and daily mean flow requirements.

The consent holder provides discharge data to the Council at monthly intervals, along with flow data from hydrological recorder stations at Skinner Road, Raupuha Road and McColl's Bridge. Discharge data are assessed for compliance with the relevant special conditions of consents 0488, 0498 and 0490. Discharge data for 2009-2010 are discussed in section 2.2 below.



**Figure 1** Location of key features on the Patea River below the dam (upper reach)



**Figure 2** Location of key features on the Patea River below the dam (middle reach)



**Figure 3** Location of key features on the Patea River below the dam (lower reach)

## **2. Results**

### **2.1 Water**

#### **2.1.1 Inspections**

No annual river inspections were undertaken by the Council in 2009-2010 (section 1.5.3).

The Council previously inspected and photographed the Patea River below the dam by helicopter on 15 March 2004.

The March 2004 inspection was carried out following the extreme rainfall events experienced during the previous month. A video recording was made of the river over the duration of the flight. A copy of the video tape was forwarded to the consent holder. No significant degradation of the channel or banks of the Patea River was recognised during the March 2004 inspection.

### **2.2 Discharge data assessment**

During the monitoring year under review, data provided by the consent holder was consistently of excellent quality and was provided in a timely manner. There were no significant gaps in the data provided.

#### **2.2.1 Annual tailrace zero confirmation**

Periodic checks of tailrace zero flow and low flow rating checks are necessary for calibration purposes. The methods for these checks are detailed in TRC 2002 and are not repeated here.

No confirmation was carried out in the 2009-2010 period, however in February 2009, the National Institute of Water and Atmospheric Research (NIWA), undertook some work in the river confirming the rating for the new residual flow recorder, Patea at McColls Quarry, which is located approximately two kilometres downstream of the dam. This is considered sufficient, as NIWA are regularly at this site carrying out flow gaugings to confirm the rating is stable.

#### **2.2.2 Flood and flood-fresh management**

Special condition 4 of consent 0489 and special condition 7 of consent 0490 require the consent holder to manage the discharges to avoid or mitigate downstream river damage. Fundamental to this requirement is effective management of flood and flood-fresh flows.

River flows in the Patea River during 2009-2010 were below average. During 2009-2010, the median flow for McColl's Bridge was 14.4 cumecs and the mean flow was 25.4 cumecs. These figures compare with the historical median of 15.9 cumecs and historical mean of 28.6 cumecs. The median and mean flows for McColl's Bridge in 2008-2009 were 25.2 cumecs and 35.8 cumecs respectively.

During 2009-2010, there were no significant flood events. In 2009-2010, the highest flood-fresh event recorded was 185 cumecs at McColl's Bridge. This flood-fresh occurred in June 2010 and has a return period of approximately 1.3 years for the Patea River. For comparative purposes, it can be noted that the highest recorded flow ever at McColl's Bridge is 968.993 cumecs recorded on 29 February 2004.

### 2.2.3 Tailrace rise and recession rates

Special condition 5 of consent 0490 sets the limits on flow rise and recession rates into the lower Patea River by defining the relationship between flows in the Patea River above the lake and dam outflows.

Special condition 7 of consent 0490 requires the consent holder to manage the discharge to avoid or mitigate downstream river damage.

During 2009-2010, there were no significant breaches and seven minor breaches of special condition 5 of consent 0490. These breaches are summarised in Table 1.

**Table 1** Summary of breaches of flow rise and recession rates in 2009-2010

Date	Time	Tailrace rise or recession rate m <sup>3</sup> /s/hr	Breach Significance
30 September 2009	2000-2100	56.8	Minor
5 February 2010	1600-1700	41.8	Minor
24 February 2010	0700-0800	41.4	Minor
	0800-0900	28.8	
	1800-1900	-40.2	Minor
	1900-2000	-18.6	
25 February 2010	1800-1900	96.6	Minor
	1900-2000	-40.3	
	2000-2100	-51.1	
	2100-2200	-30.6	
26 February 2010	0600-0700	37.4	Minor
	0700-0800	55.8	
1 March 2010	1500-1600	42.9	Minor
	1600-1700	46.8	
	1700-1800	-29.9	
	1800-1900	-32.6	

### 2.2.4 Residual flow compliance

The residual flow requirement below the dam is set in special condition 2 of consent 0489, which states that a residual flow of 1.4 cumecs with a mean 24-hour flow of at least 2 cumecs shall be maintained immediately downstream of the dam.

During 2009-2010, the lowest hourly flow recorded in the Patea River at McColl's Bridge was 1.773 cumecs, while the lowest daily mean flow was 2.038 cumecs.

Compliance was therefore achieved with the residual flow condition of consent 0489.

### **2.2.5 River channel cross sections**

Background information on the river cross sections is given in section 1.5.4 above. No cross sections were surveyed in the 2009-2010 monitoring year.

## **2.3 Recorder maintenance**

In 2009-2010, the Council's hydrological recorder sites at McColl's Bridge, Raupuha Road and Skinner Road were routinely inspected on 14 occasions each.

In 2003-2004 the original Raupuha Road site was undermined by the river causing the bank at this site to become unstable. In July 2005 the hydrological site was moved to the upstream side of the Raupuha Road Bridge and a radar water level sensor was installed on the upstream side of the Bridge. At June 2010, the original structure still remained at the site, and as such, presents a potential health and safety issue.

It is recommended that as soon as practicable in 2010-2011, the Council, in conjunction with the consent holder, remove the unsafe structure at Raupuha Road. A recommendation to this effect is made in section 4 below.

## **2.4 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 monitoring year, there were no incidents recorded by the Council that were associated with the Company's activities below the dam.

### 3. Discussion

#### 3.1 Discussion of plant performance

During 2009-2010, discharges from the Patea dam into the Patea River were observed to be within the limits specified on the resource consents on all but seven occasions, when minor breaches of the discharge rate consent condition occurred.

In all other respects, compliance with resource consents was achieved in 2008-2009.

The seven minor breaches were not considered to have had any adverse effects on bank and channel stability in the lower Patea River. There were no significant breaches of discharge rate consent conditions in the monitoring years.

#### 3.2 Environmental effects of exercise of consents

Potentially, the main environmental effect on rivers from discharges from hydroelectric schemes is the degradation of the river channel and erosion of the river banks downstream. While some environmental effects are inevitable from such discharges, it is high energy discharges in particular which can cause significant adverse effects through their unnaturally destructive hydraulic processes.

During 2009-2010 river flows were below average and potentially damaging high energy discharges did not occur. No reports of river bank damage were received.

#### 3.3 Evaluation of performance

During the year there were no unauthorised incidents or any breaches of consent conditions. There were seven minor breaches of consent conditions regarding tailrace rise and recession rates.

Overall in 2009-2010, the Company demonstrated a high level of environmental performance and compliance with the resource consents.

Consent holder compliance with the conditions of the six consents discussed in this report is summarised below in Table 2 to 7.

**Table 2** Summary of TrustPower consent 0488 compliance for 2009-2010

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Council prescribed management methods	N/A	N/A
2. Authority to exercise consent	N/A	N/A
3. Transfer of consent	N/A	N/A
4. Variation of consent conditions	N/A	N/A
5. Quality and quantity of water covered by permit	N/A	N/A

Condition requirement	Means of monitoring during period under review	Compliance achieved?
6. Provision of consent holder general water discharge records	Receipt of records	Yes
7. Provision of consent holder records for discharges via emergency spillway	N/A	N/A
8. Lake bed survey above dam	N/A	N/A
9. Ecological survey of lake above dam	N/A	N/A
10. Review of lake monitoring programme	N/A	N/A
11. Maintenance of minimum residual flow below dam	Receipt of records	Yes
12. Operational level of lake above dam	N/A	N/A
13. Dam operation management plan	N/A	N/A
14. Vegetation clearance around lake	N/A	N/A
15. Lake shoreline erosion mitigation	N/A	N/A
16. Maintenance of public access to lake	N/A	N/A
17. Maintenance of public recreation spaces	N/A	N/A
18. Health and safety warnings to public in river below dam	N/A	N/A
19. Provision of floating booms across intake to head race	N/A	N/A
20. Lapse clause	N/A	N/A
21. Right of Council access to inspect	N/A	N/A
22. Standard & design of maintenance works	N/A	N/A
23. Application for further consents for construction and operation	N/A	N/A
24. Design and operation of elver pass	N/A	N/A
25. Alternative means of fish passage	N/A	N/A
26. Report on alternatives for fish passage	N/A	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>

n/a = not applicable

**Table 3** Summary of TrustPower consent 0489 compliance for 2009-2010 – divert water

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Optional review provision	N/A	N/A
2. Maintenance of minimum residual flow	Assessment of discharge records & hydrology data	Yes
3. Consent holder monitoring of discharges and water levels	Assessment of discharge records & hydrology data	Yes
4. Mitigation of erosion from discharges	Assessment of river cross-sections & inspections where warranted	N/A
5. Monitoring of river channel below dam	Assessment of discharge records & hydrology data, river cross-sections, & inspections where warranted	Yes
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>

n/a = not applicable

**Table 4** Summary of TrustPower consent 0490 compliance for 2009-2010 – divert water

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Optional review provision	N/A	N/A
2. Operational range of service spillway	Assessment of discharge records & hydrology data	Yes
3. Provision of consent holder records for monitoring of spillway discharges	Receipt of satisfactory records	Yes
4. Spillway tests above 60 cumecs	N/A	N/A
5. Mean hourly rise and recession rate into lower river	Assessment of discharge records & hydrology data	Yes
6. Re-opening of spillway gates after sustained recessions	N/A	N/A
7. Mitigation of erosion from discharges	Assessment of river cross-sections & inspections where warranted	N/A
8. Cost-sharing of hydro recorder site maintenance	By arrangement between parties	Yes
9. Monitoring of river channel below dam	River channel cross-section surveys	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>

n/a = not applicable

**Table 5** Summary of TrustPower consent 4742 compliance for 2009-2010 – river training works

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Best practicable option exercised during construction of training works	N/A	N/A
2. Reinstatement of disturbed areas	N/A	N/A

Condition requirement	Means of monitoring during period under review	Compliance achieved?
3. Prior notification of maintenance	N/A	N/A
4. Optional review provision	N/A	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		N/A

n/a = not applicable

**Table 6** Summary of TrustPower consent 4835 compliance for 2009-2010 – remedial works

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Provision of plans prior to construction	N/A	N/A
2. Prior notification of maintenance	N/A	N/A
3. Construction in accordance with plans	N/A	N/A
4. Mitigation of sediment discharge during construction works	N/A	N/A
5. Discharge of cement products into river	N/A	N/A
6. Disposal of excavated material	N/A	N/A
7. Optional review provision	N/A	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		N/A

n/a = not applicable

**Table 7** Summary of TrustPower consent 0669 compliance for 2009-2010 – lower level of riverbed

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Council prescribed management methods	N/A	N/A
2. Authority to exercise consent	N/A	N/A
3. Transfer of consent	N/A	N/A
4. Variation of consent conditions	N/A	N/A
5. Quality and quantity of water covered by permit	N/A	N/A
6. Discharge of contaminants into water	N/A	Yes
7. Provision of consent holder records	Assessment of discharge records	Yes
8. Lapse clause	N/A	N/A
9. Cancellation of consent	N/A	N/A

Condition requirement	Means of monitoring during period under review	Compliance achieved?
10. Right of Council access to inspect	N/A	N/A
11. Standard of design and maintenance of works	N/A	N/A
12. Disposal of extracted materials	N/A	N/A
13. Mitigation of bank erosion during works	N/A	N/A
14. Installation and maintenance of erosion control structures	N/A	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>

n/a = not applicable

### 3.4 Recommendations from the 2008-2009 annual report

In the 2008-2009 annual report, it was recommended:

1. THAT the zero tailrace flow water level be confirmed jointly by the Council and TrustPower Taranaki Generation Ltd in 2009-2010, when flow conditions are sufficiently low to eliminate excessive backwater effects.
2. THAT the unsafe structure at the original Raupuha Road site be removed as soon as practicable in 2009-2010.
3. THAT the level of monitoring is unchanged from that programmed for 2008-2009 (subject to any renewal of the consents completed during the 2009-2010 period, and provisions arising).

In 2009-2010, recommendation 1 was not implemented by the Council and the consent holder. The consent holder has engaged NIWA to install and maintain a site downstream of the dam, to ensure compliance. It is recommended for future zero tailrace flow checks, that NIWA and the Council assess this together. Recommendation 2 was not implemented, and is included within the recommendations contained within this report. Recommendation 3 was implemented, as the level of monitoring remained unchanged.

### 3.5 Alterations to monitoring programme for 2010-2011

In designing and implementing the monitoring programmes for water discharges in the region, the Taranaki Regional Council has 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 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 Taranaki discharging to the environment.

It is proposed for 2010-2011, that the recommendations are to remain unchanged from that programmed for 2009-2010. This is subject to any particular provisions that may be incorporated into the consents upon their renewal (granted in the 2010-2011 period). A recommendation to this effect is made in section 4 of this report.

### **3.6 Exercise of optional review of consent**

There is no provision in any of the six resource consents held by the Company for the Patea River hydroelectric scheme below the dam for further optional review before their expiry dates. In late 2007, the consent holder applied for a renewal of their consents; as they were due to expire June 2008. The consenting process continued through the 2009-2010 period.

## 4. Recommendations

1. THAT the zero tailrace flow water level be confirmed jointly by the Council and TrustPower Ltd in 2010-2011, when flow conditions are sufficiently low to eliminate excessive backwater effects.
2. THAT the unsafe structure at the original Raupuha Road site be removed as soon as practicable in 2010-2011.
3. THAT the level of monitoring is unchanged from that programmed for 2010-2011 (subject to any renewal of the consents completed during the 2010-2011 period, and provisions arising).

## Glossary of common terms and abbreviations

The following abbreviations and terms are used within this report:

Biomonitoring	assessing the health of the environment using aquatic organisms
fresh	elevated flow in a stream, such as after heavy rainfall
l/s	litres per second
cumecs	cubic metres per second
resource consent	refer Section 87 of the RMA. Resource consents include land use consents (refer Sections 9 and 13 of the RMA), coastal permits (Sections 12, 14 and 15), water permits (Section 14) and discharge permits (Section 15)
RMA	Resource Management Act 1991 and subsequent amendments
Unauthorised Incident	an event recorded by the Council on the basis that it had potential or actual environmental consequences that may represent a breach of a consent or provision in a Regional Plan
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

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## **Appendix I**

### **Resource consents held by TrustPower Limited for the lower Patea River**





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

CHIEF EXECUTIVE  
PRIVATE BAG 713  
47 CLOTFN ROAD  
STRATFORD  
NEW ZEALAND  
PHONE: 06-765 7127  
FAX: 06-765 5097  
[www.trc.govt.nz](http://www.trc.govt.nz)

Please quote our file number  
on all correspondence

Name of  
Consent Holder: TrustPower Limited  
Private Bag 12023  
TAURANGA

Change To  
Conditions Date: 16 October 2000 [Granted: 4 October 1978]

**Conditions of Consent**

Consent Granted: To dam the Patea River with an earth dam for the purpose  
of hydroelectric power generation at or about  
2644806E-6183185N

Expiry Date: 30 June 2008

Review Date(s): June 2002

Site Location: Patea Hydroelectric Power Scheme, Maben Road,  
Hurleyville, Patea

Legal Description: Sec 7 Blk II Opaku Sec 7 Blk VI Opaku Crown Land

Catchment: Patea

Tributary: Lake Rotorangi

**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**

**special conditions 1 – 7 [unchanged]**

1. The Taranaki Catchment Commission may prescribe the method of management of this right including the limitation of periods during which the right may be fully exercised, if a water shortage or other abnormal circumstance occurs in the locality. The control of this condition is more fully specified in Section 24D and 24E of the Water and Soil Conservation Act 1967.
2. This right may be operated only by the Grantee holding the right or his agent and only for the purpose stated in the right.
3. The right may, with the consent of the Commission in writing, be transferred to a new operator of the hydro-electricity generation unit to which the right relates, but only on the same conditions as contained in the right.
4. The conditions relating to this right cannot be varied without the prior consent in writing of the Commission.
5. This right is not a guarantee that the quality and quantity of water specified will be available.
6. Unless specifically authorised by this right, the discharge of water or waste containing pollutants and/or sediment is not permitted.
7. The Grantee of the right shall keep such records as may be reasonably required by the Commission. All costs involved in monitoring, measuring, surveying or otherwise studying the effects of the lake on the environment, climate or any other investigative programme reasonably required by the Commission shall be borne by the Grantee and all results, findings and/or other relevant information shall be forwarded to the Commission as soon as practicable and within 28 days of becoming available to the Grantee.

**special condition 8 [changed]**

8. The Grantee shall provide monthly returns of the occasions when water is discharged through the auxiliary spillway and emergency spillway into Spillway Creek and an estimate of such discharges and their duration.

**special conditions 9 – 14 [unchanged]**

9. The lake shall be surveyed to assess the amount of siltation occurring. The method of measuring and the site shall be approved by the Commission and a survey shall take place before the lake is filled and thereafter once annually; the results to be forwarded to the Commission as soon as practicable and within 28 days of becoming available to the Grantee.
10. An annual ecological survey shall be carried out to determine the degree of eutrophication of the lake and the amount and species of aquatic weeds established in the lake, together with a plan showing the location and extent of weed beds.
11. At the request of either the Grantee or the Commission, the programme of monitoring, testing, surveying, measuring, investigating and recording specified in Clauses 7, 8, 9 and 10, may be reviewed from time to time and altered by agreement.
12. This right is not an authority to obtain access to a source of water or a point of discharge.
13. During the filling of the dam and at all times thereafter a minimum flow of 1.4 m<sup>3</sup>/sec with a mean 24-hour flow of at least 2 m<sup>3</sup>/sec shall be maintained in the Patea River immediately downstream of the dam to ensure continuity of supply of natural water to all lawful downstream users and to conserve and maintain fisheries and wildlife habitats.
14. The maximum operational level of the lake when the service spillway gates are in the fully open position shall not exceed 78.5 metres above sea level and the minimum level shall not be lower than 74 metres above mean sea level.

The Grantee shall take all reasonable steps to maintain lake levels within the following ranges, on an annual basis:

Above 78 m - only as required by flood flows about 0-5% of time.

76m to 78 m - maximum possible period of time.

75m to 76 m - only as required during low inflow times about 10-25% of time.

74m to 75m - only due to exceptionally low inflows less than about 10% of time, except in an emergency.

During the summer period (November - April) the Grantee shall take all reasonable steps to maintain the normal minimum control level at 76 metres above mean sea level and the normal maximum control level at 78 metres above mean sea level.

A lake level management plan and programme to be prepared and obtain the Commission's approval thereto. At the request of either the Grantee or the Commission, the plan and programme may be reviewed from time to time and may be altered by agreement.

The lake shall not be drawn down except for emergency situations, below 74 metres above mean sea level without prior notification in writing to the Commission.

**special condition 14 (a) [changed]**

14. a) The consent holder shall adhere to and comply with the procedures and requirements, specified in the management plan. In case of any contradiction between the management plan and the conditions of this resource consent, the conditions of this resource consent shall prevail.

**special conditions 15 – 24 [unchanged]**

15. The Grantee shall clear woody vegetation from the perimeter of the lake between the levels of 70 and 78 metres above mean sea level to the satisfaction of the Commission.

For the purposes of this condition the Grantee shall first prepare vegetation clearance proposals and submit such proposals to the Commission for approval at least six months before lake filling operations commence.

Such proposals shall have regard for considerations of visibility, slope and soil stability, vegetation type and tolerance to flooding and wetting and drying cycles, and future recreational usage. Woody vegetation in lakeside areas between the 70 metre and 78 metre contours may be zoned by the Commission for total or partial clearance having regard to these considerations and in achieving a reasonable balance between economic and aesthetic interests which may be in conflict.

16. The Grantee shall take all reasonable steps within its control to protect the shoreline against erosion as required by the Commission.
17. Recognising the strong interest shown by the public in the future recreational usage of the lake and in acknowledgement of favourable statements made by the Power Board in its Environmental Impact Report and before the Water Right Tribunal, the Grantee accepts the principle of public access to the lake for recreational usage and shall within the statutory limitations provide and maintain vehicular access to the lake and make such vehicular access available for recreational use by the public to such standards and conditions and at such point or points on the lakeside as may be agreed by the Grantee and the Commission.
18. The Grantee shall, where practicable, either by acquisition, lease, agreement or any other means, ensure land is available for the creation of a continuous lake foreshore reserve around the perimeter of the lake.

19. The Grantee shall erect and maintain notices and other warnings as may be required to the satisfaction of the Commission for adequate protection of public safety to warn the public using the river downstream of the dam of fluctuations in river flow and of the extent of those fluctuations.
20. The Grantee shall install floating booms across the intake to the head race and across the full length of the spillway of the dam to safeguard persons using the lake for recreation. The intake to the penstocks shall be fitted with screens with a gap no greater than 60 millimetres between bars.
21. This right may be cancelled by the Commission, or the Commission may take such other action as the Act provides, if the right is not exercised within eight years of its granting or such longer period as the Commission may approve.
22. This right is granted subject to the Commission or its servants or agents being permitted access at all reasonable times for the purpose of carrying out inspections and measurements.
23. The design and maintenance of any works relating to the right must be to a standard adequate to meet the conditions of the right so that neither the works nor the exercise of the right is likely to cause damage to any property or injury to any person.
24. The Grantee shall apply to the Taranaki Catchment Commission for any/all further rights which may be legally required for the construction and operation of a hydro-electricity generation unit.

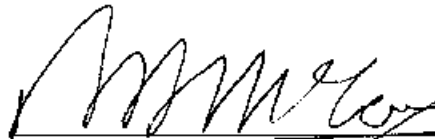
**special conditions 25-27 [changed]**

25. The consent holder shall design, install, maintain and monitor an elver pass facility to enable the passage of elvers over the dam. The monitoring information is to be forwarded to the Chief Executive, Taranaki Regional Council, at twelve monthly intervals.
  26. The consent holder shall investigate the alternative means available to facilitate the movement of adult eels, elvers and other native species over the dam. The investigations must be complete and a report outlining the results of the investigations forwarded to the Chief Executive, Taranaki Regional Council by 31 May 2002.
-

27. The Taranaki Regional Council, on receipt of the fish passage report required under condition 26, may serve notice of its intention to review conditions 25 and 26 of this consent in June 2002. The review shall be undertaken for the purpose of (i) determining whether means are available to facilitate the movement of adult eels, elvers and other native species over the dam; and (ii) requiring the implementation of the same should it be shown that practicable means exist.

Transferred at Stratford on 31 July 2007

For and on behalf of  
Taranaki Regional Council



Director-Resource Management



**Water Permit  
Pursuant to the Resource Management Act 1991  
a resource consent is hereby granted by the  
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](http://www.trc.govt.nz)

Please quote our file number  
on all correspondence

Name of Consent Holder: TrustPower Limited  
Private Bag 12023  
TAURANGA

Change To Conditions Date: 16 October 2000 [Granted: 4 October 1978]

**Conditions of Consent**

Consent Granted: To divert water from Lake Rotorangi for hydroelectric power generation purposes at or about 2645000E-6183200N

Expiry Date: 30 June 2008

Review Date(s): June 1996, June 2002

Site Location: Patea Hydroelectric Power Scheme, Maben Road, Hurleyville, Patea

Legal Description: Sec 7 Blk II Sec 7 Blk VI Opaku SD Crown Land

Catchment: Patea

Tributary: Lake Rotorangi

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

**General conditions**

- a) That 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) That 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) That 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**

**special conditions 1 – 2 [unchanged]**

1. That the Taranaki Regional Council may review any of all of the conditions of this consent by giving notice of review during June 1996 and/or June 2002, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects of the diversion on the in-stream environment.
2. That a residual flow of 1.4 cubic metres/second with a mean 24 hour flow of at least 2 cubic metres/second, shall be maintained in the Patea River immediately downstream of the dam.

**special condition 3 [changed]**

3. The consent holder shall monitor:
  - a) The total discharges from the powerhouse to the Patea River;
  - b) The instantaneous lake level at the dam; and
  - c) The instantaneous tailrace water level at the power station

at 30 minute intervals, and provide such data on a monthly basis to the satisfaction of the Chief Executive, Taranaki Regional Council.

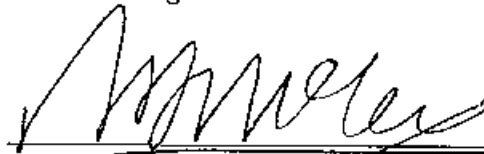
**existing special condition 4 deleted**

**existing special conditions 5 - 6 unchanged which now become special conditions 4 - 5**

4. That the discharges authorised by this consent shall be managed with the aim of avoiding or mitigating downstream river damage to the satisfaction of the Chief Executive, Taranaki Regional Council.
5. That the consent holder shall, in conjunction with the Taranaki Regional Council, undertake such monitoring of the downstream river channel as deemed necessary by the Chief Executive, Taranaki Regional Council, subject to section 35(2)(d) and section 36 of the Resource Management Act 1991.

Transferred at Stratford on 31 July 2007

For and on behalf of  
Taranaki Regional Council



Director-Resource Management



Expired  
30-6-08



CHIEF EXECUTIVE  
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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: TrustPower Limited  
Private Bag 12023  
TAURANGA

Change To  
Conditions Date: 16 October 2000 [Granted: 4 October 1978]

**Conditions of Consent**

Consent Granted: To divert water from Lake Rotorangi into either a service spillway or an emergency spillway ['Spillway Creek'] for the purpose of allowing excess water to pass the dam at or about 2645000E-6183200N

Expiry Date: 30 June 2008

Review Date(s): June 1996, June 2002

Site Location: Patea Hydroelectric Power Scheme, Maben Road,  
Hurleyville, Patea

Legal Description: Sec 7 Blk II Sec 7 Blk VI Opaku SD Crown Land

Catchment: Patea

Tributary: Lake Rotorangi

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

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Doc# 331275-v1

Expired

Consent 0490-1

### General conditions

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

### Special conditions

#### special condition 1 [unchanged]

1. That the Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during June 1996 and/or June 2002, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects of the diversion on the in-stream environment.

#### special conditions 2 – 6 [changed]

2. The consent holder shall install, maintain and operate a service spillway, controlled, by spillway gates, which, irrespective of any other operations, shall: operate when the reservoir level is greater than 78 metres above mean sea level; and at all time shall pass at least 800 cubic metres/second when the lake level is greater than 78.5 metres above mean sea level.
3. The consent holder shall monitor the spillway discharges at 30 minute intervals and shall provide, on a monthly basis, instantaneous flow data, to the satisfaction of the Chief Executive, Taranaki Regional Council.
4. Spillway tests of greater than 60 cubic metres/second shall only occur with the prior written approval of the Chief Executive, Taranaki Regional Council.
5. The mean hourly rise or recession rate for all flows greater than 95 cubic metres/second, into the Lower Patea River (being the reach of the Patea River immediately below the Patea Hydro Electric Power Scheme), from the tailrace/stilling basin (as determined from the tailrace/stilling basin data) shall:
  - i) for flows up to and including 135 cubic metres/second, not vary by more than 50%, plus or minus 20 cubic metres/second/hour, from the reference rate of change as defined in condition 5(ii); and

Expired

Consent 0490-1

- ii) for flows greater than 135 cubic metres/second, not vary by more than 50% from a reference rate of change defined as the sum of any two mean hourly flow rise or recession rates, one of the two rates as determined (at any time through the preceding 6 hours) from the Skinner Road hydrographic station data, and the other rate as determined (at any time through the preceding 6 hours) from the Raupuha hydrographic station data.
6. Whenever the spillway gate or spillway gates are re-opened during sustained recessions where the sum of the two mean hourly recession rates as determined in condition 5(ii) is continuously negative, the discharge from the spillway shall, irrespective of the current lake level, conclude with a continuous discharge of not more than 50 cubic metres/second for a period of not less than 6 hours or until, after 4 hours of the period, the mean lake-level has fallen below 78 metres above mean sea level and not less than 90 millimetres below the mean lake level at the time the spillway gates were opened.

**special condition 7 [unchanged]**

7. That the discharge authorised by this consent shall be managed with the aim of avoiding or mitigating downstream river damage to the satisfaction of the Chief Executive, Taranaki Regional Council.

**special condition 8 [changed]**

8. The cost of maintaining the hydrographic stations at Skinner Road and Raupuha Road shall be shared between the consent holder and the Taranaki Regional Council.

**special condition 9 [unchanged]**

9. That the consent holder shall, in conjunction with the Taranaki Regional Council, undertake such monitoring of the downstream river channel as deemed necessary by the Chief Executive, Taranaki Regional Council, subject to section 35(2)(d) and section 36 of the Resource Management Act 1991.

Transferred at Stratford on 31 July 2007

For and on behalf of  
Taranaki Regional Council



Director-Resource Management





**Land Use Consent**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**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](http://www.trc.govt.nz)

Please quote our file number  
on all correspondence

Name of  
Consent Holder: TrustPower Limited  
Private Bag 12023  
TAURANGA

Consent Granted  
Date: 11 June 1980

**Conditions of Consent**

Consent Granted: To lower the riverbed immediately downstream of the proposed hydro dam by 2.5m reducing to zero approximately 10 km downstream at or about 2644500E-6183000N

Expiry Date: 30 June 2008

Site Location: Approximately 2 km south of the Hawera/Patea County boundaries, Lake Rotorangi, Patea River, Hawera

Legal Description: Secs 1 & 2 So 12618 Sec 1 So 12962 & Pt Sec 6 Pts Sec 7 Blk VI Opaku SD

Catchment: Patea

**General conditions**

- a) The Commission may prescribe the method of management of this right, including the limitation of periods during which the right may be fully exercised, if a water shortage or other abnormal circumstance occurs in the locality.
- b) This right may be operated only by the person holding the right or his agent and only for the purposes stated in the right.
- c) The right may, with the consent of the Commission in writing, be transferred to a new owner or occupier of the property to which the right relates, but only on the same conditions as contained in this right.
- d) The conditions relating to the right cannot be varied without the prior consent in writing of the Commission.
- e) This right is not a guarantee that the quantity and quality of water specified will be available.
- f) Unless specifically authorised by this right the discharge of water or waste containing pollutants into the natural water is not permitted.
- g) The right is not an authority to obtain access to a source of water or point of discharge.
- h) The grantee of the right shall keep such records as may reasonably be required by the Commission and shall if so requested supply this information to the Commission.
- i) This right may be cancelled by the Commission, or Commission may take such other action as the Act provides, if the right is not exercised within 12 months of its granting or such longer time as the Commission may approve.
- j) This right may be cancelled by the Commission if in the opinion of the Commission it is not diligently and beneficially exercised.
- k) This right is granted subject to the Commission or its servants or agents being permitted access at all reasonable times for the purpose of carrying out inspections and measurements.
- l) The design and maintenance of any works relating to the right must be to a standard adequate to meet the conditions of the right so that neither the works nor the exercise of the right is likely to cause damage to any property or injury to any person.
- m) Should the grantee in the opinion of the Commission commit any breach of the right or its conditions the Commission may cancel the right.
- n) This right is granted, subject to the Commission retaining the right to review the terms and conditions attached hereto including the period of the right at intervals of not less than two (2) years.

- o) The cost of supervision of this right, including water sampling, deemed necessary by the Commission shall be carried by the grantee.

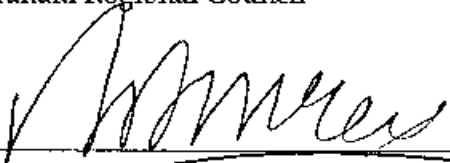
### Special conditions

1. The Taranaki Catchment Commission may prescribe the method of management of this right including the limitations of periods during which the right may be fully exercised, if a water shortage or other abnormal circumstance occurs in the locality. The control of this condition is more fully specified in Section 24D and 24E of the Water and Soil Conservation Act 1967.
2. This right may be operated only by the grantee holding the right or his agent and only for the purposes stated in the right.
3. The right may, with the consent of the Commission in writing, be transferred to a new operator of the hydro-electricity generation unit to which the right relates, but only on the same conditions as contained in the right.
4. The conditions relating to this right cannot be varied without the prior consent in writing of the Commission.
5. Unless specifically authorised by this right, the discharge of water or waste containing pollutants and/or sediment is not permitted.
6. The grantee of the right shall keep such records as may be reasonably required by the Commission, including monitoring of the work, the cost of such monitoring and records to be borne by the grantee, the findings shall be forwarded to the Taranaki Catchment Commission as soon as they are available.
7. The monitoring programme may be reviewed from time to time at the request of either the grantee or the Commission.
8. This right is subject to the Commission or its servants or agents being permitted at all reasonable times for the purpose of carrying out inspections and measurements.
9. This right may be cancelled by the Commission or the Commission may take such action as the Act provides, if the right is not exercised within eight years of its granting or such longer period as the Commission may approve.
10. This right is not an authority to obtain access to a source of water or a point of discharge.
11. The disposal of extraction debris shall be to the satisfaction of the Taranaki Catchment Commission; the grantee shall prepare a plan of work and submit the plan to the Commission for approval prior to commencement of operations.
12. The grantee shall, at its own cost, take all reasonable steps within its control to minimise lateral slumping and bank instability, associated with the works, causing debris to enter the water course.

13. That the grantee install and maintain, at its own cost, stream bed and stream bank erosion control works on tributaries entering the Patea River within 7 km downstream of the dam to the satisfaction of the Manager, Taranaki Catchment Commission.

Transferred at Stratford on 31 July 2007

For and on behalf of  
Taranaki Regional Council



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Director-Resource Management

Consent 4742-1

# EXPIRED

[ - 06 - 2010 ]



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

CHIEF EXECUTIVE  
PRIVATE BAG 713  
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[www.trc.govt.nz](http://www.trc.govt.nz)

Please quote our file number  
on all correspondence

Name of  
Consent Holder: TrustPower Limited  
Private Bag 12023  
TAURANGA

Consent Granted  
Date: 6 April 1995

### Conditions of Consent

Consent Granted: To construct and maintain training works on the Patea River to mitigate further stream bank erosion at or about 2644700E-6179500N

Expiry Date: 1 June 2010

Review Date(s): June 1998, June 2004

Site Location: Maben Road, Patea

Legal Description: Patea River Bed Blk X & Blk VI Patea Dist Opaku SD

Catchment: Patea

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

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# EXPIRED

## General conditions

- a) That 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) That 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) That 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;
  - (ii) charges for the carrying out of the Council's functions under section 35 in relation to this consent; and
  - (iii) charges authorised by regulations.

## Special conditions

- 1) That during the construction of the river training works, the consent holder must observe every practicable measure to prevent or minimise the disturbance of the channel and the placement of silt and/or organics, to the satisfaction of the Chief Executive, Taranaki Regional Council.
- 2) That all disturbed areas associated with the exercise of this consent shall be reinstated to the satisfaction of the Chief Executive, Taranaki Regional Council.
- 3) That the consent holder shall notify the Chief Executive, Taranaki Regional Council seven days prior to undertaking maintenance of the training works.
- 4) That the Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during June 1998 and/or June 2004 if the Chief Executive, Taranaki Regional Council, considers that it is necessary to do so for the purpose of ensuring that the conditions adequately deal with the environmental effects of the works.

Transferred at Stratford on 31 July 2007

For and on behalf of  
Taranaki Regional Council



Director-Resource Management

**EXPIRED**  
1-06-2010



**Land Use Consent**  
**Pursuant to the Resource Management Act 1991**  
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Please quote our file number  
on all correspondence

Name of  
Consent Holder: TrustPower Limited  
Private Bag 12023  
TAURANGA

Consent Granted  
Date: 17 November 1995

**Conditions of Consent**

Consent Granted: To place and maintain remedial works on the right bank of  
the Patea River downstream of the Patea Dam at or about  
2644600E-6183100N

Expiry Date: 1 June 2010

Review Date(s): June 1998, June 2004

Site Location: 150 metres downstream of the Patea Dam, Patea  
Hydroelectric Power, Maben Road, Patea

Legal Description: Pt Sec 7 Blk II Opaku SD

Catchment: Patea

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

## General conditions

- a) That 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) That 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) That 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 for the carrying out of the Council's functions under section 35 in relation to this consent; and
  - (iii) charges authorised by regulations.

## Special conditions

- 1) That prior to commencing construction the consent holder shall provide final plans and details of the remedial works and their construction, to the satisfaction of the General Manager, Taranaki Regional Council.
- 2) That the consent holder must notify the Taranaki Regional Council at least seven days before commencing construction or maintenance works.
- 3) That the remedial works shall be constructed and maintained in accordance with the plans and details provided under condition 1, to the satisfaction of the General Manager, Taranaki Regional Council.
- 4) That during and subsequent to construction works the consent holder must observe every practicable measure to minimise direct or indirect discharge of silt, organics, debris or cement products into the Patea River, and to avoid or remedy erosion and scour attributable to the works.
- 5) That, except for the pouring of concrete for the retaining wall within the area enclosed by sheetpiling, there shall be no direct discharge of cement or cement products into the Patea River.
- 6) That all excavated material shall be disposed of above the maximum water level of the spilling basin.

Consent 4835-1

# EXPIRED

- 7) That the Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during June 1998 and/or June 2004, 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.

Transferred at Stratford on 31 July 2007

For and on behalf of  
Taranaki Regional Council



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Director-Resource Management

