

Trustpower Ltd
Motukawa HEP Scheme
Monitoring Programme
Annual Report
2018-2019

Technical Report 2019-66

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Executive summary

Trustpower Ltd (the Company) operates the Motukawa hydroelectric power (HEP) scheme in the Manganui River and Waitara River catchments. The Company draws water from behind a weir on the Manganui River near Tariki and diverts this water through a race to Lake Ratapiko and then through penstocks to the Motukawa Power Station. The power station discharges into the Makara Stream, a tributary of the Waitara River. Consents for the Motukawa HEP scheme allow the Company to maintain structures, to take, divert and discharge water, and to disturb the bed of Lake Ratapiko. This report for the period July 2018-June 2019 describes the monitoring programme implemented by the Taranaki Regional Council (the Council) to assess the Company's environmental performance during the period under review, and the results and environmental effects of their activities.

The Company holds a total of 23 resource consents, which include a total of 186 conditions setting out the requirements that they must satisfy. The Company holds five consents to allow it to take and use water, five consents to discharge water or sediment into the Makara, Mangaotea and Mako streams, one consent to discharge wastes to land around Lake Ratapiko and four land use permits for bed disturbance and structures in the Manganui River, Mangaotea Stream and Lake Ratapiko. Seven additional consents allow the Company to abstract water, and construct and maintain structures in the Mangaotea Stream.

During the period under review, the Company demonstrated a high level of environmental performance at the Motukawa power scheme.

The Council's monitoring for the period under review included seven inspections of fish passage and residual flow facilities, continuous water temperature monitoring at two sites between November and April, and a biomonitoring survey. In addition, all monitoring data provided by the Company was reviewed. The range of information provided by the Company included abstraction and discharge data, lake and race water level information and fish transfer data (elver and adult eel).

The monitoring showed that during the period under review, the management of abstraction rates, race and lake water levels was generally good. With regard to the management and recording of flows within the race, performance has improved significantly compared to previous monitoring years. There was good compliance with set flows and water levels, with no incidents occurring that warranted enforcement action while two incidents occurred, that were the result of unforeseen software issues. These issues were mechanical failures, beyond the control of the consent holder, and unforeseeable, therefore no further action was required or could be undertaken as they would be statutorily defensible under the RMA. Nonetheless, the Company proactively notified the Council of these issues as well as undertook steps to best resolve the issues.

Compliance with flushing flow requirements was good with regards to the Manganui River. Monitoring in the previous monitoring period showed that some improvement is necessary in the control systems managing the provision of flushing flows to the Mangaotea Stream. This was formally communicated to Company in the last monitoring period. No abstraction from the Mangaotea Stream occurred during this monitoring period.

Following the establishment of the 400 L/s residual flow limit in 2002, the difference in water temperature between natural flows in the Manganui River and those in the residual flow reach (downstream of the weir) appear to have reduced. In line with this observed pattern, the average temperature difference recorded between sites upstream and downstream of the weir during the reported period were smaller than those recorded historically. As a result of the hot and dry spring weather conditions experienced in Taranaki during the period being reported, water temperatures in the residual flow reach exceeded 25°C on 14 days, with a maximum temperature of 27.7°C recorded. However, relative to previous years, the upstream monitoring site also experienced a much greater degree of warming, with temperatures exceeding 25°C on five days and a new record high of 26.4°C being recorded.

Macroinvertebrate monitoring indicates improvement at some sites since the increased residual flow was implemented. In terms of the current report, it is considered that the communities of the residual flow reach represent what would be considered typical of a low flow community.

The current and previous surveys have found a general trend of decreasing MCI scores in a downstream direction which was more likely related to the natural changes in habitat downstream, than due to the reduced flow downstream of the weir. The current survey recorded only limited (and not statistically significant) deterioration at all sites with the exception of site 6 which showed a significant difference, although, within historical range. This is a positive indication that the impacts of the diversion were not as severe throughout the entire residual flow as expected during this noticeably hot summer with a lack of significant flushing flows.

The results indicate that all MCI scores at sites within the residual flow reach were similar to respective median scores with the exception of site 6 which was significantly lower, while SQMCI_s scores were significantly below (or near to for site 5) median scores. All sites for both variables were within historical range. Although this does not appear to be an encouraging result, this year experienced particularly high water temperatures in the residual flow reach with no significant natural flushing events in the months prior to the sampling occurring, therefore, it is expected to see some reduced scores under these conditions. The control site showed variable results, with a marginally lower MCI and a near significantly higher SQMCI_s score indicating that there is a pattern of catchment wide improvement. Overall, these results, along with previous monitoring results indicate that the invertebrate community supported by a residual flow of 400 L/s, with regards to presence/absence of taxa, and their respective abundances, is not in general significantly different to that supported by natural flows, although under more sustained extreme drier weather conditions any differences become more prominent. For most years the principal difference between the two flows is that there is a greater amount of invertebrate habitat available under natural flow conditions due to the increased amount of wetted riverbed width.

A significant result of fish monitoring undertaken to date in previous monitoring periods in relation to this scheme is the presence of key indicator species upstream of the weir. These species include redfin bully, shortjaw kokopu and inanga. Another significant result was recorded in the previous reported period, with juvenile lamprey recorded in the fish pass for the first time. Inanga and shortjaw kokopu were again recorded in the fish pass, with torrentfish recorded 300 m downstream.

Migrating trout were netted and tagged during the 2015-2016 monitoring period, but no angler catch returns have been received to date. This information would provide some information about the movement of these fish in the Manganui River catchment and Motukawa scheme. Interim results found in previous monitoring periods indicated that trout were able to negotiate the fish pass and flow control valve.

Eel and elver passage requirements were generally fulfilled with the elver transfer system at the power station working well. The total weight of elvers transferred in the reporting period was just over half that of the previous year's result but in general follows on from the promising results recorded in the three previous monitoring periods. It appears that the number of elvers arriving at the trap is highly variable. Electric fields have been installed at the power station intake and forebay and testing indicates that these are successful in deterring fish from these areas. Transfer of adult eels has been attempted during each migration season, with 26 longfin eel and 27 shortfin eel transferred in the most recent season.

Overall, it is considered that the Company was able to demonstrate a high level of environmental and administrative performance and compliance with the resource consents during the reported period. Although there were a small number of occasions where consent conditions were not strictly complied with, any incidents were minor and were managed appropriately to ensure no adverse environmental impacts occurred. There were no incidents that warranted enforcement action. The Company have been proactive in implementing improvements to their internal systems and monitoring of this highly complex scheme and continue to maintain a good level of communication with the Council regarding compliance matters.

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

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

This report includes recommendations for the 2019-2020 year.

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1 Introduction

1.1 Compliance monitoring programme reports and the Resource Management Act 1991

1.1.1 Introduction

This report is for the period July 2018 to June 2019 by the Taranaki Regional Council (the Council) describing the monitoring programme associated with resource consents held by Trustpower Ltd (the Company) for the Motukawa hydroelectric power (HEP) scheme. This scheme diverts water from the Manganui River and Mangaotea Stream to Lake Ratapiko and then onto the Motukawa Power Station on Motukawa Road.

This report covers the results and findings of the monitoring programme implemented by the Council in respect of the consents held by the Company that relate to abstractions and discharges of water in the Waitara catchment, and associated instream structures. This is the 24th report to be prepared by the Council to cover the Motukawa HEP scheme activities and their effects.

1.1.2 Structure of this report

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

- consent compliance monitoring under the *Resource Management Act 1991* (RMA) and the Council's obligations;
- the Council's approach to monitoring sites through annual programmes;
- the resource consents held by the Company in the Manganui and Waitara River catchments;
- the nature of the monitoring programme in place for the period under review; and
- a description of the activities and operations conducted in the Company's site/catchment.

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

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

Section 4 presents recommendations to be implemented in the 2019-2020 monitoring year.

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

1.1.3 The Resource Management Act 1991 and monitoring

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

- a. the neighbourhood or the wider community around an activity, and may include cultural and social-economic effects;
- b. physical effects on the locality, including landscape, amenity and visual effects;
- c. ecosystems, including effects on plants, animals, or habitats, whether aquatic or terrestrial;
- d. natural and physical resources having special significance (for example recreational, cultural, or aesthetic); and
- e. risks to the neighbourhood or environment.

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

1.1.4 Evaluation of environmental and administrative performance

Besides discussing the various details of the performance and extent of compliance by the consent holders, this report also assigns a rating as to each Company's environmental and administrative performance during the period under review.

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

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

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

Environmental Performance

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

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

For example:

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

Improvement required: Likely or actual adverse effects of activities on the receiving environment were more than minor, but not substantial. There were some issues noted during monitoring, from self reports, or during investigations of incidents reported to the Council by a third party. Cumulative

adverse effects of a persistent minor non-compliant activity could elevate a minor issue to this level. Abatement notices and infringement notices may have been issued in respect of effects.

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

Administrative performance

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

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

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

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

For reference, in the 2018-2019 year, consent holders were found to achieve a high level of environmental performance and compliance for 83% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 13% of the consents, a good level of environmental performance and compliance was achieved.¹

1.2 Process description

The Motukawa HEP scheme first generated electricity in January 1927 and has been modified over the years to improve efficiency. Previous monitoring reports provide additional detail on the scheme's history. The Company currently owns and operates the scheme, which was formerly operated by Powerco Ltd and also by Taranaki Energy. The main elements of the scheme are shown in Figure 1.

The Company draws water from behind a weir (referred to as the Tariki weir) on the Manganui River near Tariki and diverts this water through a settling pond (Ayling's Pond) and then via a water race into Lake Ratapiko, an artificial storage lake resulting from the damming of the Mako Stream. About half way along, the race crosses the Mangaotea Stream. At this location, water has in the past been pumped from the Mangaotea Stream, and discharged to the water race to supplement the Manganui River take. However, this has been temporarily ceased by the Company for various reasons which are discussed in previous reports. From Lake Ratapiko the water is piped through penstocks to the Motukawa Power Station, used to generate electricity, and discharged into the Makara Stream, a tributary of the Waitara River.

¹ The Council has used these compliance grading criteria for 15 years. They align closely with the 4 compliance grades in the MfE Best Practice Guidelines for Compliance, Monitoring and Enforcement, 2018

The Company have also installed an in-race generator. By constructing a small dam in the Motukawa Race and diverting water through a generator, it allowed the Company to utilise the natural head in the race at this point. A 200 KW generator now produces about 0.9 gigawatt/hours of electricity per year.

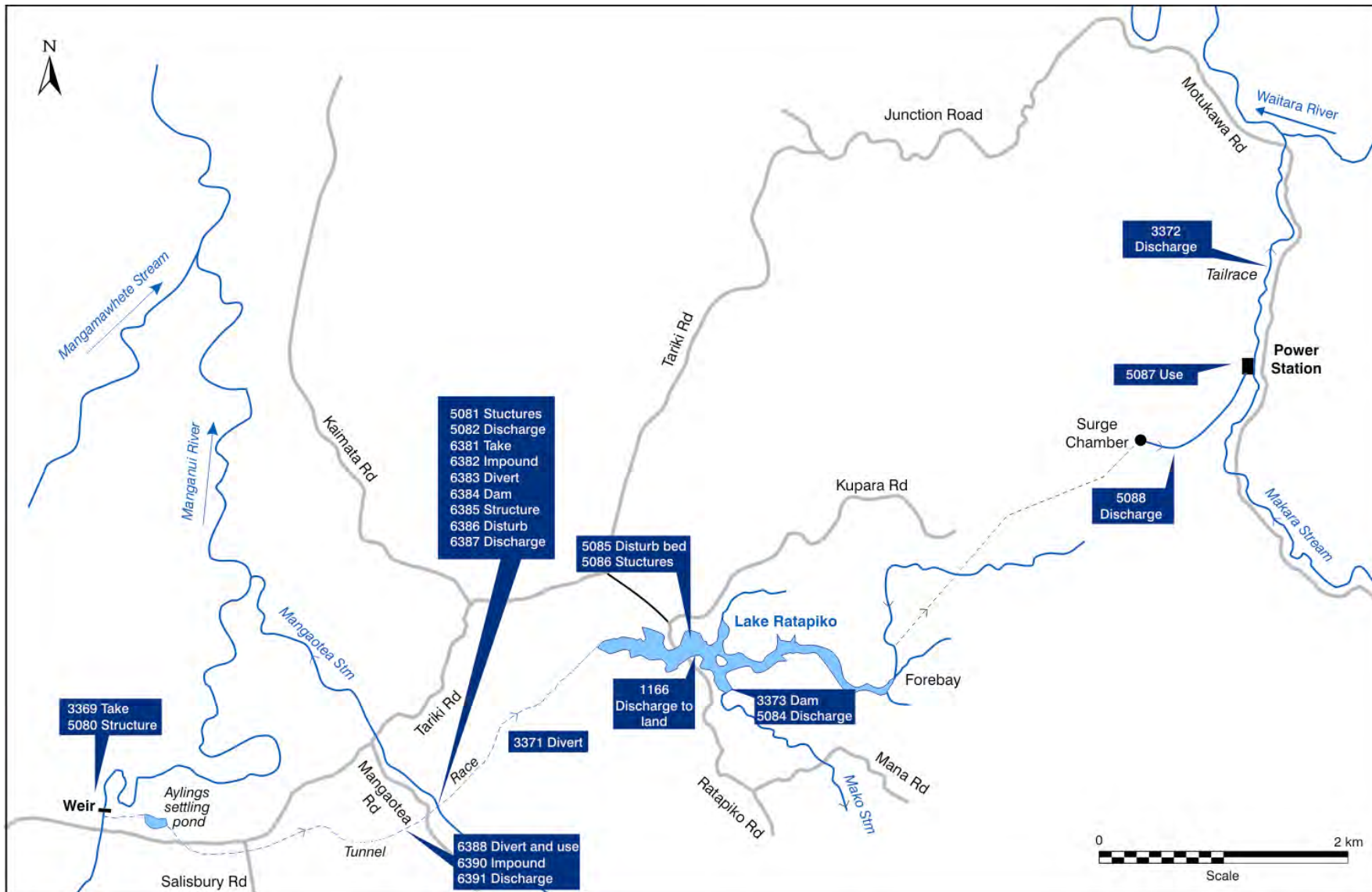


Figure 1 Main features of the Motukawa HEP Scheme including relevant consents

The Manganui River downstream of the weir carries a residual flow of at least 400 litres per second (L/s) for five kilometres between the weir and the confluence with the Mangaotea Stream with, more flow if the Tariki weir is overtopping. The confluence with the next major tributary, the Mangamawhete Stream, is a further eight km downstream. This residual flow was implemented following the renewal of consent 3369, and the construction of a new fish pass on the true right bank, which carries approximately 300 L/s of the residual flow past the weir (constructed in 2002). The remaining residual flow passes through an old (and mostly ineffective) fish pass on the true left bank of the weir.

Much of the scheme is monitored and operated remotely by the Company. Through an automated water level sensor system, the Company can monitor the residual flows in the Manganui River and Mangaotea Stream, water levels in the race and lake and how much rain is falling locally. This has allowed the Company to manage race flows to minimise flooding, and has greatly improved the Company's compliance with residual flow requirements.

1.3 Resource consents

The Company holds 23 resource consents, the details of which are summarised in the table below. Summaries of the conditions attached to each permit are set out in Section 3 of this report.

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

Table 1 Summary of consents held by the Company for the Motukawa HEP scheme

Consent number	Purpose	Granted	Review	Expires
<i>Water abstraction permits</i>				
3369-2	To take and use up to 5200 L/s of water from the Manganui River in the Waitara catchment for hydroelectric power generation purposes	19 September 2001	-	1 June 2022
3371-2.1	To divert and use up to 8000 L/s of stormwater run-off and the entire flow of various unnamed watercourses draining into the race and into Lake Ratapiko in the Waitara catchment for hydroelectric power supply purposes	19 September 2001 Varied 4 July 2016	At any time if there is flooding attributable to the scheme	1 June 2022
5087-1	To take and use up to 7787 L/s of water from Lake Ratapiko in the Waitara catchment for hydroelectric power generation purposes	19 September 2001	-	1 June 2022
6381-1	To take and use water from the Mangaotea Stream, a tributary of the Manganui River in the Waitara catchment, for hydroelectric power generation purposes	7 December 2007	-	1 June 2022
6382-1	To impound water behind a temporary dam within the Mangaotea Stream a tributary of the Manganui River in the Waitara catchment, for the purposes of constructing a water intake structure for hydroelectric power generation purposes	7 December 2005	-	1 June 2022

Consent number	Purpose	Granted	Review	Expires
6383-1	To divert water around a temporary dam within the Mangaotea Stream, a tributary of the Manganui River in the Waitara catchment, for the purposes of constructing a water intake structure for hydroelectric power generation purposes	7 December 2005	-	1 June 2022
6388-1	To divert and use water in the Motukawa Race for hydroelectric power generation purposes	27 July 2004	-	1 June 2022
6388-1	To divert and use water in the Motukawa Race for hydroelectric power generation purposes at or about GR: Q19:228-200	27 July 2004	-	1 June 2022
6390-1	To impound water behind a dam on the Motukawa Race for hydroelectric power generation purposes	27 July 2004 Varied 23 June 2006	-	1 June 2022
<i>Water discharge permits</i>				
1166-3	To discharge up to 4000 cubic metres/day [10,000 cubic metres/year] of dredgings from maintenance of Lake Rataipiko in the Waitara catchment onto land above the one-metre mark around the lake margin	19 September 2001	-	1 June 2022
5082-1	To discharge, under emergency conditions, up to 2000 L/s of overflow water from the Mangaotea Aqueduct into the Mangaotea Stream a tributary of the Manganui River in the Waitara catchment	19 August 1999	-	1 June 2022
5084-1	To discharge up to 55,000 L/s of hydroelectric power generation water, during adverse weather conditions, via spillways and lake drainage valves from Lake Rataipiko into the Mako Stream a tributary of the Makino Stream in the Waitara catchment	19 September 2001	-	1 June 2022
5088-1	To discharge up to 2000 L/s of water from the surge chamber of the Motukawa hydroelectric power station during maintenance periods into an unnamed tributary of the Makara Stream in the Waitara catchment	19 September 2001	-	1 June 2022
6387-1	To discharge sediments from earthworks into the Mangaotea Stream, a tributary of the Manganui River in the Waitara catchment, associated with the construction of an intake structure, for hydroelectric power generation purposes	7 December 2005	-	1 June 2022
6391-1	To discharge sediment during earthworks associated with the construction of a generator structure into the Motukawa Race at or about GR: Q19:228-200	27 July 2004	-	1 June 2022
<i>Land use permits</i>				
3373-2	To dam the Mako Stream a tributary of the Makino Stream in the Waitara catchment to form Lake Rataipiko for hydroelectric power generation purposes, including the spillway structure	19 September 2001 Varied 4 November 2002	-	1 June 2022

Consent number	Purpose	Granted	Review	Expires
5080-1	To erect, place, use and maintain the weir and various structures associated with hydroelectric power generation activities in the Manganui River in the Waitara catchment	19 September 2001	-	1 June 2022
5081-1	To erect, place, use and maintain the Mangaotea Aqueduct associated with hydroelectric power generation activities in and above the Mangaotea Stream a tributary of the Manganui River in the Waitara catchment	19 August 1999	-	1 June 2022
5085-1	To disturb the bed of Lake Ratapiko in the Waitara catchment for maintenance and repairs associated with hydroelectric power generation purposes	19 September 2001	-	1 June 2022
5086-1	To erect, place, use and maintain various structures in, on and over the bed of Lake Ratapiko in the Waitara catchment for hydroelectric power generation purposes	19 September 2001	-	1 June 2022
6384-1	To erect, place and maintain a temporary dam within the Mangaotea Stream, a tributary of the Manganui River in the Waitara catchment, for the purposes of constructing a water intake structure for hydroelectric power generation purposes	7 December 2007	-	1 June 2022
6385-1	To erect, place and maintain an intake structure including pumps in the bed of the Mangaotea Stream for the purposes of abstracting water for hydroelectric power generation purposes	7 December 2005 Varied 9 February 2007	-	1 June 2022
6386-1	To disturb and modify the bed and banks of the Mangaotea Stream, a tributary of the Manganui River in the Waitara catchment, associated with the construction of an intake structure for hydroelectric power generation purposes	7 December 2005	-	1 June 2022

1.4 Monitoring programme

1.4.1 Introduction

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

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

The monitoring programme for the Motukawa HEP scheme consisted of six primary components.

1.4.2 Programme liaison and management

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

- ongoing liaison with resource consent holders over consent conditions and their interpretation and application;

- discussion over monitoring requirements;
- preparation for any consent reviews, renewals or new consent applications;
- advice on the Council's environmental management strategies and content of regional plans; and
- consultation on associated matters.

1.4.3 Site inspections

The scheme was visited seven times during the reported period, including three hydrological inspections and four site inspections. With regard to consents for the abstraction of water, the main points of interest were:

- whether or not the old fish pass was free of blockages and to assess the flow over the old pass;
- to assess the flow and condition of the new fish pass;
- to assess residual flow compliance;
- to document whether the weir was overtopping;
- to assess water levels in the race and lake; and
- to monitor maintenance work where appropriate.

Sources of data being collected by the Company were identified and accessed, so that performance in respect of operation, internal monitoring, and supervision could be reviewed by the Council.

1.4.4 Water temperature monitoring

Water temperature was identified in past monitoring years as the water quality parameter of most concern in the residual flow reach (consent 3369), other than the obvious lack of submerged habitat below the weir.

The impact of the diversion of water at the weir upon water temperatures in the Manganui River was assessed using continuous monitoring over the summer period (November to May) of the monitoring year. Two temperature recorders were used, one being located immediately upstream of the Tariki weir (T1) and the second recorder located 2.3 km downstream of the Tariki weir (T2). A third location (T3), located downstream of the confluence with the Mangaotea Stream, was monitored for summer water temperatures from 2007 and 2013. The locations of the recorders are illustrated in Figure 2.

1.4.5 Data audit

The Company provided the Council with data on water abstraction from numerous locations, including the Manganui River and Mangaotea Stream (not required due to the temporary cessation of the water take). Data for race and lake water levels, river flows (including residual flows) and discharge rates to the Makara Stream were also provided. The Council assessed the abstraction and discharge data to determine whether or not the abstraction/discharge rates exceeded the consented rates. The lake level data were assessed to determine whether or not the range in water levels in Lake Ratapiko was within the range specified in the consent conditions. The fish pass flows and Mangaotea Stream (not required due to the temporary cessation of the water take) flows were compared with required residual flow requirements, while race water levels were also assessed to determine whether water levels exceeded maximum levels specified in consents. The locations of these water level monitoring sites are shown in Figure 3.

1.4.6 Biomonitoring surveys

Riverbed macroinvertebrate communities provide useful information relating to habitat quality because they are relatively sessile (attached to the bed), they can be easily sampled, and they form distinctive community structures that reflect certain physical and chemical conditions. There is also considerable past data for the Manganui River catchment for comparison with new results.

During the discussed period, one biological survey was performed in the Manganui River to determine whether or not residual flows below the Tariki weir were sufficient to maintain healthy water quality and macroinvertebrate communities in the river. Four sites were sampled and their locations are shown in Figure 4.

1.4.7 Fish monitoring

The Council has been monitoring fish species distribution in the Manganui River catchment since 1990. Electric fishing techniques and spotlighting at night have been used for this purpose. Following on from recommendations in previous monitoring reports, trout were captured at the head of the true right bank fish pass during the autumn and early winter of 2016 and tagged. The trapping was reported in the 2015-2016 monitoring report (TRC, 2016), while any tag returns, where fisherman report catching tagged fish, will be documented in subsequent reports.

No fish surveys were undertaken in the 2018-2019 monitoring period, with the last survey completed in the 2017-2018 monitoring period, with a six site electric fishing survey undertaken in the Manganui River.

The elver trap and transfer system continued to operate over the reported period. Results of the transfers are reviewed in the current report (consents 3372, 3373).



Figure 2 Continuous water temperature monitoring sites in the Manganui River in relation to the Motukawa HEP scheme



Figure 3 Location of water abstraction, discharge and water level monitoring sites for the Motukawa HEP scheme (limits in brackets)



Figure 4 Macroinvertebrate monitoring sites in the Manganui River in relation to the Motukawa HEP

2 Results

2.1 Water

2.1.1 Inspections

Each inspection undertaken of the Motukawa HEP Scheme essentially followed the same format, including checking water levels, fish passage, and making notes of general observations. Usually six inspections are undertaken during the monitoring period, however, due to a change in programme manager two of these inspections were not undertaken, and one was undertaken following a different format. The inspection with the alternate format was during a comprehensive scheme walkover that was run by the Company to help with the upcoming re-consenting process. A full inspection record is available on request.

No major issues were identified during inspections in the year under review. Overall, site management was found to be good throughout the monitoring period. Based on the inspections that were undertaken, the site remained in compliance with the relevant monitored consent conditions.

2.1.2 Hydrological inspections

Special condition 1 of consent 3368-1 sets the residual flow that the operator needs to comply with in the Manganui River as follows:

1. The abstraction shall be managed to ensure that a residual flow of not less than 400 L/s is maintained at all times in the Manganui River below the weir.

The Company provides this residual flow by passing flow through the new fish pass, located on the true right bank of the weir, and supplementing the flow through the old fish pass, located on the true left of the weir. When this residual flow is assessed for compliance purposes, a gauging is undertaken at each fish pass, with the total flow compared against the required amount of 400 L/s. Gaugings are only undertaken when there is no more than an insignificant amount of water spilling over the Tariki Weir.

Table 2 shows that three hydrological inspections were undertaken in relation to the Manganui River residual flow. These inspections found that the residual flow was being provided as required during each inspection.

Table 2 Gauging results for gaugings undertaken in relation to the Manganui River residual flow

Date	Weir spilling?	New fish pass flow (L/s)	Old fish pass flow (L/s)	Total residual flow (L/s)	Compliant ?
06/11/2018	No	315	145	460	Yes
24/01/2019	No	341	140	481	Yes
09/05/2019	No	335	130	465	Yes

Special condition 4 and 5 of consent 6381-1 set out the residual flow requirements of the Mangaotea Pumps intake, in the Mangaotea Stream. These conditions state the following:

1. For the first two years following the exercise of this consent the abstraction authorised by this consent shall cease when the flow in the Mangaotea Stream immediately downstream of the confluence with the Little Mangaotea Stream located at Q19: 227-201 (GPS E2622779 N6220149) is equal to or less than 94 L/s. If at this site flows are greater than 94 L/s, the abstraction shall cease when the flow in the Mangaotea Stream immediately downstream of the abstraction point (GPS E2622836 N6220071) is equal to or less than 35 L/s.

2. Two years after the exercise of this consent, and following assessment of monitoring conducted as per special conditions 8, if a review of the residual flows detailed in special condition 4 is required (as per condition 9), residual flows shall be based on 55% of the median flow immediately downstream of the confluence with the Little Mangaotea Stream, and at the point of abstraction shall be 35 L/s or mean annual low flow whichever is higher.

This assessment of monitoring was completed in 2012 and it was concluded that no review was warranted, and therefore the residual flows in the Mangaotea Stream are as follows:

- 35 L/s immediately downstream of the abstraction point; and
- 94 L/s immediately downstream of the confluence with the Little Mangaotea Stream.

The Council was informed by the Company that abstraction at the Mangaotea Stream would cease temporarily as outlined in the previous annual compliance report. The Mangaotea Stream pumps were visited on one occasion during the reported period on the 6th November 2018 for confirmation that there was no requirement for gauging. On this occasion, no water was being abstracted from the Mangaotea Stream, and therefore no gauging was completed. Abstraction was not observed at any other time by Council staff during the monitoring period.

2.1.3 Results of abstraction and discharge data audit

The Company holds several consents which, through various special conditions, require them to record abstraction rates, discharge rates and water levels, and provide these records to the Council on a three-monthly basis. The Company is currently providing this data monthly. The details of these consent requirements are shown in Table 3. Locations of the water level monitoring stations are shown in Figure 3. Once these records are submitted, they are audited so as to assess compliance with the relevant consent conditions.

There are two aspects of compliance assessed here, being the actual recording of data, and also staying within particular limits set by consents. These will be dealt with separately.

Previous reports for this scheme have reported the number of occasions where data was either lost or not recorded. Only notable periods were included, being greater than 24 hours for one site, or greater than 12 hours for two or more sites. Over the last nine years, the Company has made significant efforts to improve this scheme's equipment and systems used for measuring and recording the required data. As a result, there had been no notable gaps in the data since the 2014-2015 monitoring period. However, in the 2017-2018 monitoring period the scheme suffered a communications failure affecting all of the data recorders, with the suspected cause relating to an electrical storm. The Company immediately initiated investigating the cause and potential fix, although this proved problematic, and as a result eight recorded parameters experienced a loss of data for between 12 and 60 days. The Company relied on a backup system over this time, which utilised satellite communication. This system was only available for a smaller number of recorded parameters (race flow, lake level, and residual flow data,) but together they allowed the Company to operate the scheme within consent conditions. This was confirmed through site inspections, completed by both the Company and the Council. The Company also made several improvements to the system while resolving this issue, which means the system is now more robust, reducing the likelihood of a similar event occurring again in the future.

When assessing the data to determine whether the consent holder stayed within consent limits, it is important to apply an acceptable error to the data. This acknowledges that the recording equipment has an accepted accuracy (degree of closeness of a measurement to the actual value). If a flow is calculated using water level, then it is also important to consider the accuracy of the rating curve. In addition, when recorded data is compared with that measured in the field, and checked for accuracy, it is important to also consider the error associated with the field measuring technique. In this case the measured data

(when taking into account error in technique) must still comply with the limit specified in the consent. It is the responsibility of the consent holder to ensure the limit is complied with, and as such they must have adequate regard for the error in their monitoring methods.

Prior to the 2015-2016 monitoring period, a standard margin of error of 5% was applied to the data value provided, regardless of whether it was flow or water level data. This was not necessarily consistent with the National Environmental Standards for water level recording (2013b). It was therefore considered necessary to define what the acceptable error is for each relevant consent condition.

This discussion between the Council and the Company is ongoing, and it may be determined that it is better to define this error through the consent renewal process, which is anticipated to begin in 2021.

In the 2017-2018 period there was only one occasion where such limits were breached. This occurred on 27 July 2017 during a severe weather event. Significant rainfall occurred in the Mangaotea area, causing an increase in flow in the race. As a result, water levels in the race exceeded the limit at three locations, for up to 1.5 hours. This was not treated as a non-compliance event, due to the minor nature of the breach and the fact it was a result of a natural event.

In the 2018-2019 period there were two consent limits breached, both of which were the result of a programmed logic controller (PLC) issue, which has subsequently been fixed. This first occurred on the 17 September 2018, where the abstraction rate from the Manganui River exceeded the 5,200 L/s limit and the +5% logger error (5460 L/s) limit as per resource consent 3369-2. The take exceedance lasted for approximately four minutes, reaching a maximum take of 5546 L/s. The Company self notified the Council of this exceedance on the 28 September 2018. As a result of the exceedance being a non-compliance, what is commonly known as a 14 day letter was sent to the Company, so that they could provide an explanation for the incident. A part of the explanation provided by the Company included the following:

"River flow downstream at Tariki Road had not yet stabilised, and so in the automatic setting the gate opening increased which exceeded the trip point and caused them to close. An issue developed within the PLC system (which controls the gate opening) and prevented the gate automatically reopening, which required the operator to intervene. It was during this period that the flow in the Maunganui River went above the consented take (incl. 5% leeway) of 5460 l/s and recorded a maximum flow of 5546 l/s at 20:45."

The second consent limit breach was on the 16 February 2019, where insufficient flow below the 150 L/s limit was provided down the scheme's race as per resource consent 3369-2. The lack of flow lasted for approximately seven hours with the lowest flow provided being 94.1 L/s. The Company self notified the Council of this exceedance on the 28 February 2019. As a result of the exceedance being a non-compliance, a 14 day letter was sent to the Company. A part of the explanation provided by the Company included the following:

"Trustpower is required maintain 400 l/s at the fish pass under Condition 1 of RC 3369-2. We are also required to maintain a minimum race flow of 150 l/s during maintenance periods under Condition 7 of RC 3369-2. The investigation established that the PLC at our intake controls both of these flows. It was identified that during low flow conditions in Maunganui River the PLC has been programmed to apply a preference for providing water flow to the fish pass instead of the race flow requirement."

The Taranaki Region had been experiencing a prolonged dry period and in the days leading up to the incident, flows at the Waitara at Bertrand Road monitoring site were approximately 10 -15l/s above 5000 l/s. Due to the low flow in the Waitara River Trustpower decided to cease generation and pass water directly over the weir as per Condition 4 of 3369-2.

Flows within Maunganui River during this period were very low, to the point that there was insufficient flows to maintain both the residual flow below the weir and within the Race. This resulted in the PLC logic providing for our residual flow below the weir which caused flow in the race to go below 150 l/s from 03:31 to 10:16 on February 16th. The lowest recorded value during this period was 94.1 l/s at 09:45.

We note that in Condition 7 of RC 3369-2 that should it not be practicable to maintain 150l/s within the Race that a fish salvage should be undertaken. This incident was unplanned and not associated with maintenance. Site staff were unable to attend site between 03:00 and 10:00 to undertake a fish salvage. We can confirm that a visual walk-over was carried out in the days following which confirmed no fish mortalities.

In response to the incident, a site staff member remotely adjusted the gate set point to restore the race flow above 150 l/s on the day, and the gate has also been physically adjusted to allow extra flow to pass through - should a similar scenario present. Trustpower is satisfied these mitigating measures provide for the 150 l/s requirement, as similar low flows were present for extended periods following this incident and the race flow remained above 150 l/s. We believe the incident has occurred primarily due to exceptional prolonged low flows in the Maunganui River. "

The Company explained that both exceedances outlined above were a result of the PLC issues, and therefore they were uncontrollable and unforeseeable mechanical issues. Such mechanical issues have a statutory defence under the RMA, therefore, no further action could be undertaken. The Company was both proactive in self notifying the Council and providing solutions to fix the PLC issues. In general the Company's actions have been seen as a well-managed response to the non-compliant incidents.

There were no breaches of the residual flow in the Manganui River below the Tariki weir in the reported period. This represents an improvement from the previous period, when two periods of insufficient flow were reported.

Records of the discharge to the Makara Stream show that there were no occasions during the 2018-2019 monitoring period where the discharge rate exceeded the consent limit. Past compliance has been high with only one exceedance recorded since the beginning of the 2002-2003 monitoring year (May 2002).

The lower lake water level has not been breached since records began on 1 July 2002. The fact that so few limits were breached indicates very good management of the scheme.

There are certain operational requirements also set by consents, which require flushing flows of 400 L/s to be released down the residual flow reach once the Tariki Weir has not naturally overtopped for 30 days, and that once flows in the Waitara River at the Bertrand Road bridge drop below 5,000 L/s that either the abstracted water is passed continuously through the lake, or that abstraction cease (with regard to the 150 L/s residual flow in the race).

The Waitara River dropped below 5,000 L/s between the 15 and 22 February and the 3 and 8 March in the reported period, with the lowest recorded flows for each period being 4466 L/s (07/03/2019 7:05:00) and 4308 L/s (21/02/2019 5:05) respectively. On several occasions during the reporting period the Company was required to pass all abstracted water continuously through the lake, or to cease abstraction, due to the flow in the Waitara River dropping below 5,000 L/s. Perusal of the data throughout this period and communication with the Company during the period surrounding the low flows showed that the Company was proactively decreasing abstraction rates at the Manganui River as well as moderating generation flows in response to the low flows in the Waitara River. It should be noted that the consent states that Council need to inform the Company of the low Waitara River flow, and only then are the Company required to comply with the special condition.

Table 3 Details of consents and special conditions in relation to abstraction rates, discharge rates and water levels and the recording

Resource Consent	Special Condition	Detail	Limit/Requirement
3369-Abstraction from Manganui River	3	Measuring rate of abstraction	Measuring abstraction rate from the Manganui River (not to exceed 5,200 L/s \pm 5% (logger error))
	5	Flushing flows if weir has not overtopped for 30 days	Release 400 L/s for 3 hours daily
	4	If Waitara River drops below 5,000 L/s	Cease abstraction or pass water continuously through power station
	7	Residual flow in race	Retain a flow of at least 150 L/s, or a fish salvage is to be undertaken
3371-Diversion of water into race and Lake Ratapiko	2	Maximum race water levels	Race water level: Salisbury Rd: 205.20 m a.s.l Mangaotea: 199.30 m a.s.l Mangaotea Aqueduct: 199.25 m a.s.l Lower Mangaotea: 199.15 m a.s.l
	5	Recording of water levels and rainfall	Water levels at the above sites to be recorded, with the inclusion of rainfall at the Mangaotea Aqueduct
3372-Discharge to Makara Stream	2	Recording of discharge rate	Record the rate of water discharged to the Makara Stream (not to exceed 7,787 L/s)
3373-To dam the Mako Stream	5	Minimum lake level	Minimum level: 194 m a.s.l (except during maintenance)
	6	Maximum lake level	Maximum level: 198.7 m a.s.l
	8	Recording data	Record the lake level at the spillway
6381- Take water from Mangaotea Stream	3	Abstraction rate	Abstraction rate not to exceed 450 L/s
	4	Residual flows	94 L/s downstream of Little Mangaotea confluence If this is exceeded, then 35 L/s at point of take
	6	If a flushing flow (three-times median flow) has not occurred for 20 days	Cease abstraction for 8 hours
	7	Recording of flows	Abstraction rate, residual flow at point of take and flow downstream of Little Mangaotea Confluence all to be recorded

Table 4 Incidents where recorded flows/water levels did not meet consent requirements.

Includes only those incidents of one hour or longer that exceeded the 5% margin of error. Table includes the extent of non-compliance, and total duration in brackets

Date	Consent requirement												Detail	Deemed Non-compliant?	
	Manganui Abstraction		Salisbury Rd water level	Mangaotea water level	Mangaotea Aqueduct water level	Lower Mangaotea water	Makara Station d/c	Lake Level		Residual flow Manganui river	Mangaotea Abstraction				
	Min	Max	Max	Max	Max	Max	Max	Min	Max	Min	Min Residual flow	Max rate			
	150 L/s	5,200 L/s	205.2 masl	199.3 masl	199.25 masl	199.15 masl	7,787 L/s	194.0 masl	198.7 masl	400 L/s	35 L/s	94 L/s			450 L/s
17/09/2018	Complaint	Single incident	100% Compliant	Compliant	Compliant	Compliant	100% Compliant	100% Compliant	100% Compliant	100% Compliant	N/A (not take occurring)	N/A (not take occurring)	N/A (not take occurring)	Programming issue with gate controls	Yes, but with statutory defence. No further action undertaken
16/02/2019	Single incident	Compliant												Programming issue with gate controls	Yes, but with statutory defence. No further action undertaken

The data has also been assessed to determine when the Tariki Weir was not naturally overtopped for a period of 30 days in this time, requiring the release of flushing flows. This assessment identified no periods when flushing flows were required.

The abstraction from the Mangaotea Stream is also required to provide flushing flows, although the criteria that defines when is different to that for the Manganui River. Consent 6381-1 states the following:

6. If a flushing flow (defined as three times the median flow) has not occurred within a continuous period of 20 days, the consent holder shall cease abstraction for 8 hours during the next naturally occurring flushing flow, so as to enhance water quality downstream of the abstraction point.

The hydrological analysis undertaken in relation to condition 8 of this consent (discussed in the 2010-2014 report, Taranaki Regional Council, 2015a), determined that a flushing flow as per this definition was 366 L/s. The location at which this flushing flow applies is downstream of the abstraction, but upstream of the Little Mangaotea confluence. In analysing the data during the 2017-2018 monitoring period, there were three occasions where these flushing flows were required. On the first of these occasions, where the natural flushing flow occurred on 8 November 2017, no abstraction was occurring, so this flushing flow was provided as required. On the second and third occasions (5 January and 1 February 2018 respectively), abstraction ceased later than required, missing the peak of the flushing flow (Figure 5).

The Company investigated the lack of flushing flows and has been unable to determine a cause for the control system not providing these flushing flows as required. This investigation is ongoing.

In undertaking this analysis, it became apparent that there may be an issue with the Mangaotea abstraction data. It appears that the rate of abstraction is not always recorded accurately (Figure 6). However, this has not been confirmed through field measurements, and the Company ceased abstraction at the Mangaotea Pumps in April 2018, with no abstraction occurring until further notice, which has continued with no abstraction occurring during the 2018- 2019 monitoring period. Should abstraction recommence, it is expected that the Company undertakes an investigation into the accuracy of the abstraction data, and continues to investigate why flushing flows are not being provided as required.



Figure 5 Flow rate in the Mangaotea Stream immediately downstream of the intake, and the abstraction rate from the Mangaotea Stream at a time when abstraction ceased as required (top), when abstraction started when flushing was required, and when abstraction seemed to continue (albeit at a low rate) during the natural flushing flow (bottom)

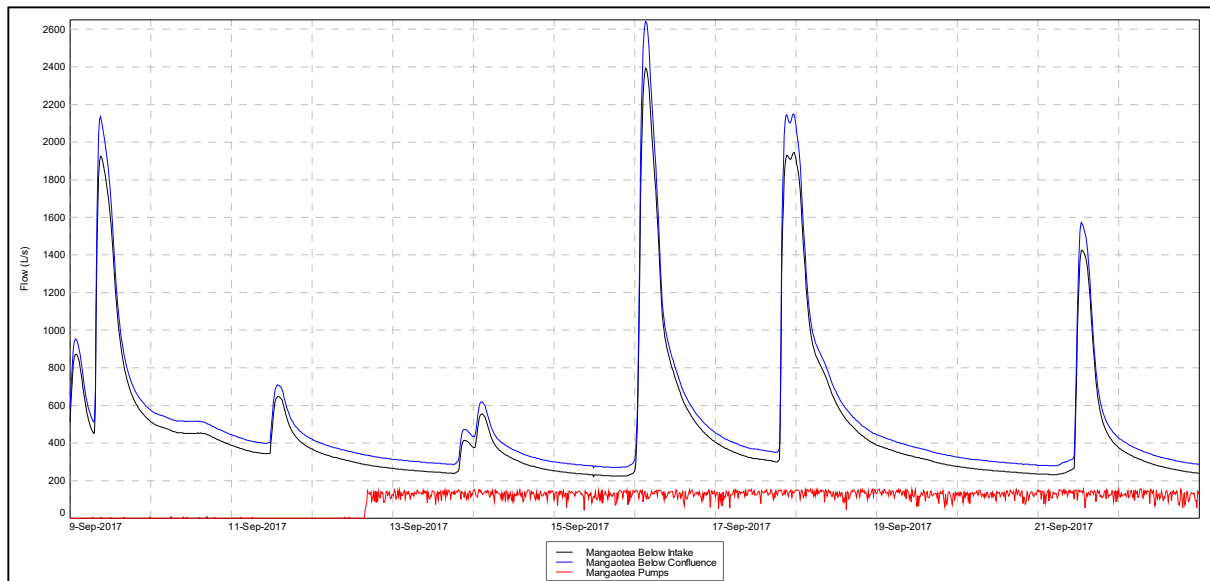


Figure 6 Flow rate in the Mangaotea Stream downstream of the abstraction, compared with recorded abstraction rate 9-23 September 2017

2.1.4 Other submitted data

Special condition 4 of consent 3371-2, which relates to the diversion of water into the race, requires that the consent holder undertakes a five yearly monitoring survey of the race. The objective of the survey is to identify any maintenance items required to maintain a race capacity of 8,000 L/s, for the purpose of avoiding flooding adjacent farmland. The condition also requires that any required maintenance occurs within 12 months of the completion of the survey. For this monitoring period (and the past five annual monitoring periods) it was agreed that an annual walk over survey of the race, as opposed to more intensive survey carried out on five yearly basis, was sufficient to comply with the consent condition. The Company also undertakes yearly inspections of the race as part of their asset management processes.

A review by the Council was undertaken this monitoring period to establish whether the current survey methodology is sufficiently comprehensive. It is considered that the more regular but less comprehensive annual surveys undertaken by the Company are seen to be sufficient in meeting the requirements of the consent, and that in general the undertaking of yearly observations is more likely to detect rising issues. However, it is also considered that the provision for a more comprehensive survey should remain should certain conditions be met. Conditions would include if an annual inspection finds that there has been a more than minor change to the race that could result in flooding, or if complaints or concerns are raised by the adjacent landowners (with the Company to actively maintain communications with landowners). Depending on the findings of these inspections or complaints the Company could then present a survey methodology to the Council directly catered to the specific issue(s).

Below is a summary provided by the Company on the annual inspection for the 2018-2019 monitoring period:

"The Motukawa race is inspected annually by site staff.

The method of monitoring includes a visual inspection of the race at half flow capacity (or less), to allow any areas needing maintenance to be more readily identified. Members of the Taranaki team walk the full length of the race at least once a year. Sites that raise concern have return visits to determine the type of works required and their urgency.

The race walk-over / survey was conducted in the week of February 4th 2019, and identified no new sites of interest.

The repairs stated below has been placed on hold at present and will be addressed as funding allows.

Description	Distance from intake (estimate)	Remedial Action
Minor slip	100m (downstream of MT2 generator)	Bank protection & re-contouring

To ensure the race capacity is at maximum, further maintenance works to reline the walls of the race are being undertaken between Mangotea Road and Farm bridge, a distance of approximately 400m. This project will take place over a 3 year maintenance cycles, with this year being the second year.

In addition, repairs to Tunnel 1 have also been identified. This will remove holes which have been eroded in the tunnel. The project date for this work is currently sitting with the Engineering team."

2.1.5 Results of receiving environment monitoring

2.1.5.1 Water temperature monitoring

Data loggers were used for continuous monitoring of river water temperatures at two sites (Figure 2). One logger was located immediately upstream of the weir at Tariki Road while the second logger was located 2.3 km downstream of the weir. These data have been collated and a monthly statistical summary presented in Table 5 together with data from the ten years (1992-2002) prior to the residual flow increase to 400 L/s, and the 16 years (July 2002 to June 2019) since the residual flow increase.

It should be noted that the loggers were deployed late, resulting in both sites missing about 5 days of data in November 2018. Any analysis using this data should be treated with caution. This is also the case for the November 2017 data where 10 days of data was also missed due to late deployment.

Also of note is that the temperature sensor units deployed at both sites for this reported period and the future monitored periods are a new upgraded model of unit by the same manufacturer. Throughout the Taranaki region during the 2018-2019 monitoring period old and new model units at various monitoring locations were deployed in parallel to test the suitability of a shift to a new model, essentially testing if there was any significant differences in the data collected. It was not expected that there would be major differences in the data collected, as the primary upgrades to the new units were mostly related to the unit's communication with other devices for data extraction (a shift to Bluetooth etc.). Movement to the new units in general was due to many of the old units reaching their end of life periods and because the new models have benefits in terms of usability. Although it was intended to deploy the old units used at the Motukawa scheme in parallel with the new units, it was found before deployment that the old units were no longer operating acceptably for redeployment, this resulted in a hard switch to the new units. Data quality checks between the old and new units deployed in parallel for other monitoring programmes in the region have found no significant differences in the data collected and therefore the hard switch to the new units at this scheme have been considered to be suitable.

During the 2018-2019 period, the highest monthly mean water temperature upstream of the weir was recorded in January, and this was also the case for the downstream site (Table 5). The lowest monthly mean was recorded in April for both the upstream and downstream sites. When comparing the sites, the downstream site had a higher mean monthly water temperature in all months monitored, when compared with that recorded upstream (0.15 to 1.38°C higher).

Maximum temperatures recorded upstream and downstream of the abstraction both occurred in January 2019. The maximum upstream temperature for the reporting period was 26.35°C, the highest recorded at this site since records began in 1992, and this follows on from the previous record setting January (25.94°C). This temperature was recorded on 29 January 2019, and was 0.41°C warmer than the previous maximum which was also recorded on 29 January in 2018. On the 31 January 2019, site T2 recorded a maximum

temperature of 27.1°C, which was the highest temperature recorded at this site during the monitored period. This was 1.2 degrees less than the highest temperature recorded at this site, which was recorded at a time when the required residual flow was lower than the current limit (28.3°C on the 21 January 1999). Overall, there appears to be a subtle warming trend in this data (Figure 7). Whether this is a reflection of climate change, or a change in upstream land use, or simply natural climatic cycles, is unclear, but it does reflect the value of continuing the water temperature monitoring component of the programme.

Table 5 Summary of summer Manganui River daily water temperatures (°C) prior to the increase in residual flow to 400 L/s (1992-2002) and for the years since, upstream and downstream of the Motukawa HEP weir

	Period	Month											
		November		December		January		February		March		April	
		Range	Mean	Range	Mean	Range	Mean	Range	Mean	Range	Mean	Range	Mean
Upstream (T1)	1992-2002 (pre 400 L/s)	7.9-20.2	13.9	10.4-22.8	16.2	11.1-24.6	17.8 ²	11.7 ² -23.7*	17.9* ²	9.4-21.7 ²	15.5 ²	8.3-17.0	13.0 ²
	2002-2017 (post 400 L/s)	7.8-23.5*	14.7* ²	9.7-23.1	16.4	10.7-25.4	17.9	11.3-25.6*	18.2*	9.6-22.3	16.0 ²	6.7-18.2	13.0
	2002-2018 (post 400 L/s)	7.8-23.5*	14.8*	9.7-24.3	16.0	10.7-25.9	18.0	11.3-25.6*	18.2*	9.6-22.3	16.0	6.7-18.2	13.0
	Previous Reported period 2017-2018	11.4-21.7*	16.1* ²	14.1-24.3	19.8	14.5-25.9	20.3	14.2 ² -23.4	18.0	13.0-20.3	16.2	9.9-17.1	13.3
	Current Reported Period (new sensor)	9.9-19.5	14.7 (-0.1)	12.2-22.3	17.0 (+1.0)	14-26.4	20.4 (+2.4)	12.8-25.1	19.3 (+1.1)	13.5-20.6	17.3 (+1.3)	10-17.5	12.8 (-0.2)
2.3 km Downstream (T2)	1992-2002 (pre 400 L/s)	8.4-22.7	15.3	11.0-24.6	17.6	12.0-28.3	19.4 ²	12.0-25.8*	19.5* ²	11.0-22.4	16.76 ²	9.3-20.4	13.9
	2002-2017 (post 400 L/s)	8.4-25.9	15.9 ²	10.6-25.4	17.6	10.5-28.2	19.1	11.8-27.8	19.2	10.3-24.1	16.7	7.8-19.0	13.6
	2002-2018 (post 400 L/s)	8.4-25.9	16.0	10.6-26.2	17.8	10.5-28.2	19.3	11.8-27.8	19.2	10.3-24.1	16.7	7.8-19.0	13.6
	Previous Reported period 2017-2018	12.3-23.7*	17.4* ²	15.1-26.2	20.8	15.2 ² -28.0	21.4	15.0-24.6	19.0	13.5-20.3	16.8	10.0-16.8	13.6
	Current Reported Period (new sensor)	11.0-21.9	16.0 (+0)	13.1-24.6	18.4 (+0.6)	14.5-27.7	21.6 (+2.3)	13.6-25.4	20 (+0.8)	13.8-21.3	17.9 (+1.2)	10.3-18.2	12.9 (-0.7)
<p>* These periods include periods of missing data that exceeded 240 hours, preventing a complete assessment for these periods. + and – values indicate mean difference in temperature between current 18-19 period and the 2002-2018 period long term mean (post 400 L/s)</p>													

² Updated values from errors identified in previous years reporting can be found in document number 2357629

The most extreme time period for water temperatures in the residual flow reach during the reported period occurred in January. The average daily water temperature in January was 21.6°C at site T2, 2.3°C higher than the long term (post 2002) average (Table 5). Furthermore, 14 days recorded a maximum water temperature in excess of 25°C, over the period 1 January 2019 to 1 February 2019, including 8 of the first 12 days at the start of January. Table 6 presents a summary of maximum daily water temperatures for the reported period from November to April. This table shows that the number of days that recorded a maximum temperature in excess of 20°C increased significantly at both site T1 and T2 when compared to the average. The increase at the upstream site was particularly significant (36.7% compared with average of 21.8%), reflecting just how extreme this period was. Site T2 still had a higher number of days that experienced a maximum daily temperature in excess of 20°C (86 compared with 65 days).

Temperatures over 25°C can significantly adversely affect trout and other freshwater fish communities, as well as being outside the tolerance range of some sensitive macroinvertebrate taxa. Prior to the 2005-2006 monitoring period, 25°C had only ever been exceeded in the residual flow reach (Figure 7). However, in February 2005 and January 2008, the maximum daily temperature at the upstream site exceeded 25°C, on a total of three days. During the 2018-2019 period, the upstream site exceeded 25°C on five days, and exceeded 20°C on 60 days (Table 6). In the 2017-2018 monitoring period there was a more than ten-fold increase on the number of days that the upstream water temperature exceeded 20°C in the 2016-2017 period (TRC, 2017). For this monitoring period, while there were three more days exceeding the 25°C than that in the 2017-2018 period, overall, there were five fewer days exceeding more than 20°C (TRC, 2018). The downstream site (site T2) exceeded 25°C on 14 days, and exceeded 20°C on 72 days, primarily in December and January (Figure 8) which was three days fewer and two days more respectively than that from the 2017-2018 monitoring period (TRC, 2018).

The 2018-2019 period monthly mean downstream and upstream water temperatures had some notable variations in water temperatures when compared to that of the monthly means recorded between 2002 and 2018 (Table 5). The downstream December, January, February, and March mean temperatures were all notably warmer, ranging between 0.6-2.3°C higher than the long term mean, the highest being in January. In contrast to this, the April temperature was notably colder by 0.7°C. The November temperature was equal to the long term mean. The upstream site was just as variable, with the months of December, January, February, and March mean temperatures again all notably warmer, ranging between 1.0-2.4°C higher than the long term mean, the highest again being in January. November and April were less variable, being -0.1 and -0.2°C different respectively. This indicates that the 2018-2019 period was warmer overall, being one of the warmest years recorded to date. This follows on from a warmer than overall 2017-2018 period, which was also one of the warmest years on record. In the 2017 and 2018 monitoring period between February to April 2018, water temperatures were relatively typical, with the downstream site during these months recording a mean temperature between -0.2 to +0.1 different to the monthly means recorded between 2002 and 2017 (Table 5). Upstream experienced a slightly warmer than usual water temperature in March and April, being 0.3°C higher than the long term means. The earlier months (November to January) were notably warmer than normal, with mean temperatures being between 1.2 and 3.4°C higher than normal at the upstream site and 0.4 and 3.2°C higher than normal at the downstream site.

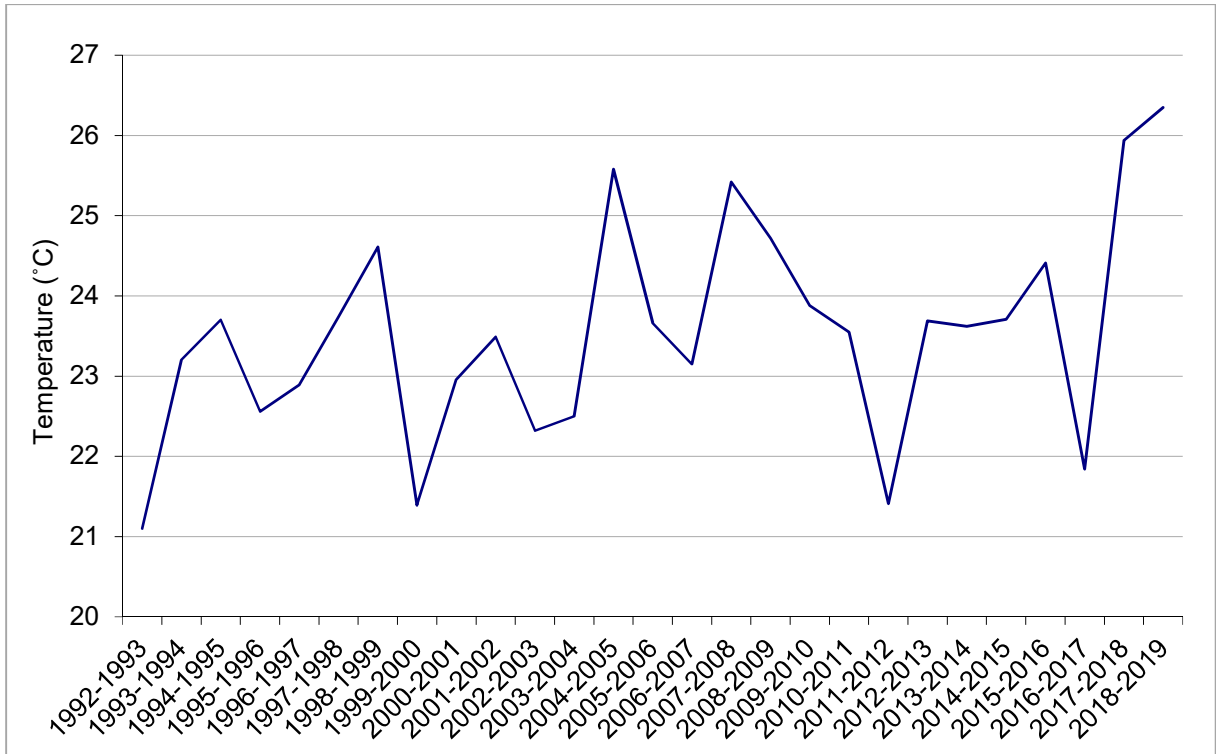


Figure 7 Maximum water temperatures in each monitoring year (November to April inclusive) recorded upstream of the abstraction (Site T1)

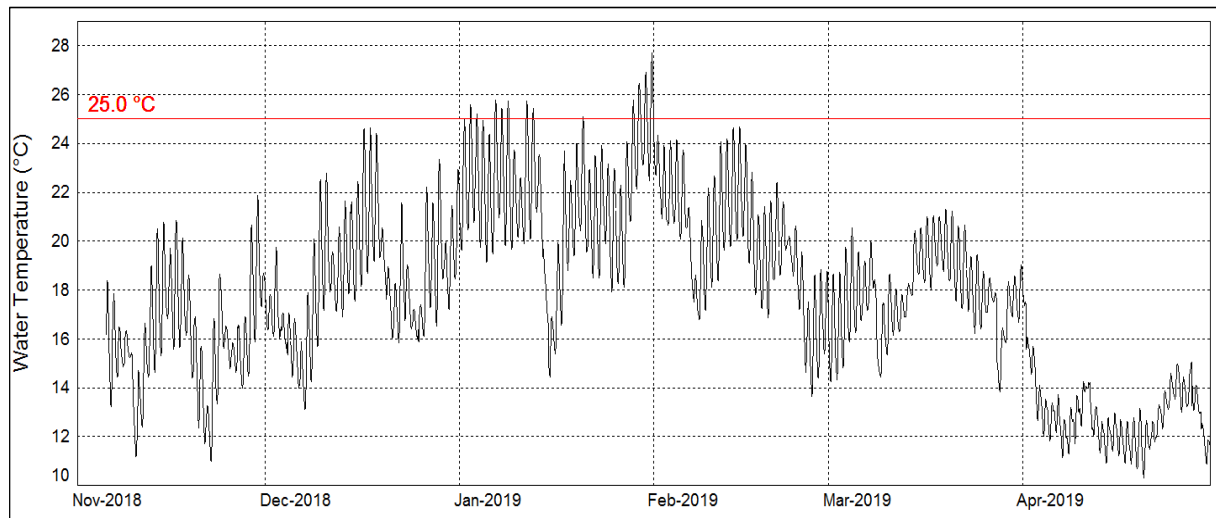


Figure 8 Water temperatures in the Manganui River, 2.3 km downstream of the Tariki Weir. 1 November 2018–1 May 2019

Table 6 Summary of maximum daily water temperatures in the Manganui River, upstream and downstream of the weir, between 1 November and 30 April inclusive

		No. days monitored	% of maximum temperatures in this range (no. of days)			
			10-15°C	15-20°C	20-25°C	25+°C
Upstream	1992- 2002 (pre 400 L/s residual flow)	1624	20.4	60.8	18.8	0.0
	2002-2018 (post 400 L/s residual flow)	2768	18.3	59.9	21.6	0.2
	2017-2018*	171	12.9 (22)	46.2 (79)	39.8 (68)	1.2 (2)
	2018-2019	177	17.5 (31)	45.8 (81)	33.9 (60)	2.8 (5)
Downstream	1992- 2002 (pre 400 L/s residual flow)	1677	11.7	49.0	37.6	1.6
	2002-2018 (post 400 L/s residual flow)	2817	11.8	47.1	37.9	3.2
	2017-2018*	172	11.6 (20)	37.8 (65)	40.7 (70)	9.9 (17)
	2018-2019	177	15.8 (28)	35.6 (63)	40.7 (72)	7.9 (14)
* Data record is missing approximately 10 days in November 2017.						

Most previous monitoring periods experienced at least one period of particularly extreme water temperatures and the 2018-2019 period was no exception. The highest average residual water temperature (21.6°C) was recorded in January 2019, and was 0.2°C warmer than the 2017-2018 January period average (21.4°C) which in itself was 2.5 degrees warmer than the highest average monthly water temperature recorded in the previous period (17.9), which occurred in February 2017. The most extreme time period for water temperatures in the residual flow reach during the reported period occurred in January. The average daily water temperature in January was 21.6°C at site T2, 2.3°C higher than the long term (post 2002) average (Table 5). Furthermore, 14 days recorded a maximum water temperature in excess of 25°C, over the period 1 January 2019 to 1 February 2019, including 8 of the first 12 days at the start of January. Table 6 presents a summary of maximum daily water temperatures for the reported period from November to April. This table shows that the number of days that recorded a maximum temperature in excess of 20°C increased significantly at both site T1 and T2 when compared to the average. The increase at the upstream site was particularly significant (36.7% compared with average of 21.8%), reflecting just how extreme this period was. Site T2 still had a higher number of days that experienced a maximum daily temperature in excess of 20°C (86 compared with 65 days).

When water temperatures above 20°C occur for long periods of time, conditions can become stressful for fish, therefore the duration of time that water temperatures exceed this temperature is also important. In the 2018-2019 reporting period, the percentage of time water temperatures exceeded 20°C downstream of the weir (site T2) was 1.55 times that recorded in the natural flow regime upstream of the weir (Table 7), which is less than that typically recorded since the 400 L/s residual flow was implemented. This is a reflection of how much time the upstream site exceeded 20°C, as, although the downstream reach experienced greater warming than normal, this warming was much more pronounced at the upstream site. This is illustrated by the fact that the downstream site exceeded 20°C for 28% of the time, over 1.5 times the average of 17%, while the upstream site exceeded 20°C for 18% of the time, over two times the average of 8%. Comparing

the percentage exceedance times for all data pre 400 L/s residual flow with all data post 400 L/s residual flow, it is clear that that temperatures greater than 20°C have still occurred more downstream (compared with upstream), but are marginally less frequent than occurred prior to the 400 L/s being released down the river (17% of time following the residual flow compared to 18% of the time prior). This compares well with the upstream temperatures, which have actually seen an increase in the percentage exceedance of 20°C, from 6% prior to, to 8% following the residual flow increase.

Table 7 Exceedance time (%) for Manganui River water temperatures recorded in the period prior to (1992-2002) and post residual flow increase (2002-2018) for comparison at both sites (1 November-30 April)

Site	Period	Temperature (°C)											
		4	6	8	10	12	14	16	18	20	22	24	26
T1-Upstream	1992-2002	100	100	99	99	93	73	47	21	6	<1	<1	0
	2002-2018	100	100	99	99	93	76	50	25	8	2	<1	0
	2017-2018	100	100	100	99	97	85	64	44	22	8	1	0
	2018-2019	100	100	100	99	93	79	61	37	18	7	1	<1
T2- 2.3Km Downstream	1992-2002	100	100	100	99	97	84	64	40	18	5	<1	<1
	2002-2018	100	100	99	99	96	83	62	37	17	6	1	<1
	2017-2018	100	100	100	99	98	89	72	53	32	15	5	2
	2018-2019	100	100	100	100	95	83	70	49	28	12	3	<1
* Data is missing for approximately 10 days in November 2017 for both the upstream and downstream sites.													

The key purpose of the water temperature monitoring is to assess whether the 400 L/s residual flow has reduced the mean and peak temperatures, and differences in water temperature, between the natural flow and residual flow reaches. Table 6 compares all data prior to the residual flow of 400 L/s (10 years of data) with all data following the residual flow implementation (16 years of data). Upstream of the weir under natural flows, pre and post residual flow water temperature data are comparable; although it appears that there may be a very subtle warming trend. Because of this slight warming trend it can be difficult to compare the raw temperature data, with that prior the 400 L/s residual flow.

A comparison of temperature differences can prove more useful. The temperature differences between the natural and residual flow reaches have changed markedly, since the 400 L/s has been implemented (Figure 9, Figure 10). Figure 9 presents the average difference in mean monthly temperatures between site T1 (upstream) and site T2 (downstream), separated into pre 400 L/s and post 400 L/s. It is clear from this data that the increased residual flow has led to a reduced average monthly temperature difference, with this effect being particularly noticeable during the months most critical for temperature (January to March). Figure 9 also shows that the temperature difference is greatest from November to December, which is most likely related to the upstream reach only beginning to warm in the latter half of the summer. Included in Figure 9 is data for the reported period. This shows that the average daily difference was highest in November and December, coincident with the headwaters receiving about three quarters and half of the normal rainfall for these months respectively³. The remaining months had average daily differences similar to or slightly less than that previously recorded since the residual flow was increased to 400 L/s. Of

³

note, January, which recorded above average temperatures due to an extremely dry period, did not see above average temperature differences. This suggests that the river at the upstream site had already warmed up so much that it couldn't get much warmer as it flowed downstream. It only gained an average 1.18 degree, compared to the more typical 1.27 degrees during these months.

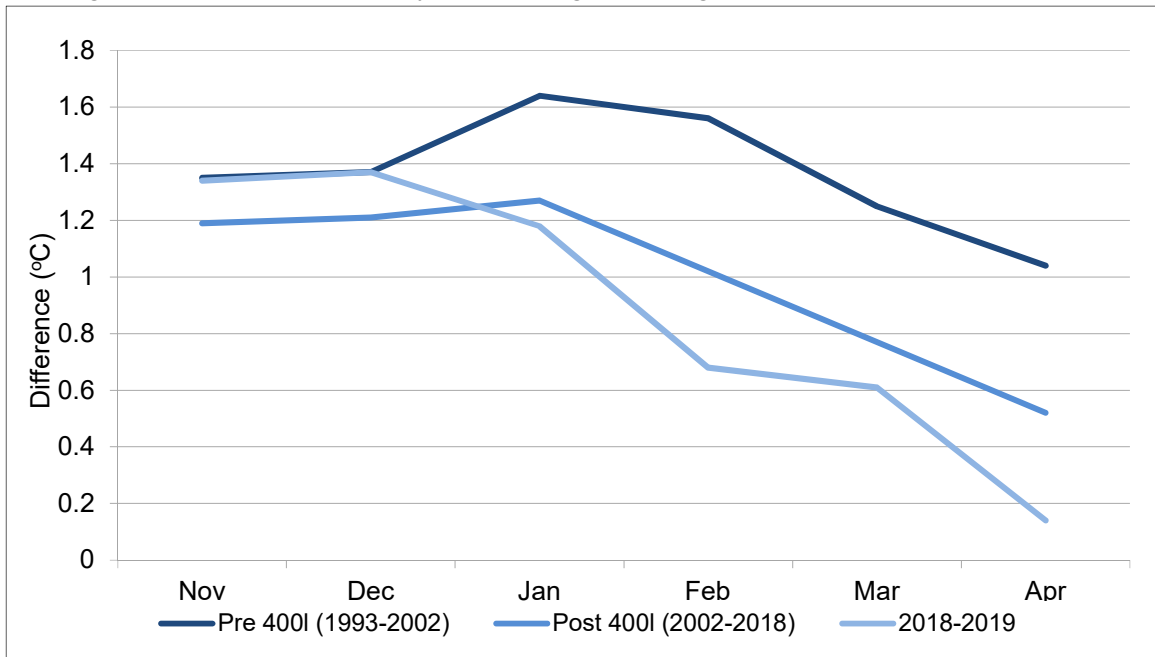


Figure 9 The average difference in mean monthly water temperatures between upstream and downstream, pre and post 400 L/s residual flow implementation, and during the reported period. Note that for the both sites, data is missing for approximately 5 days in November 2018

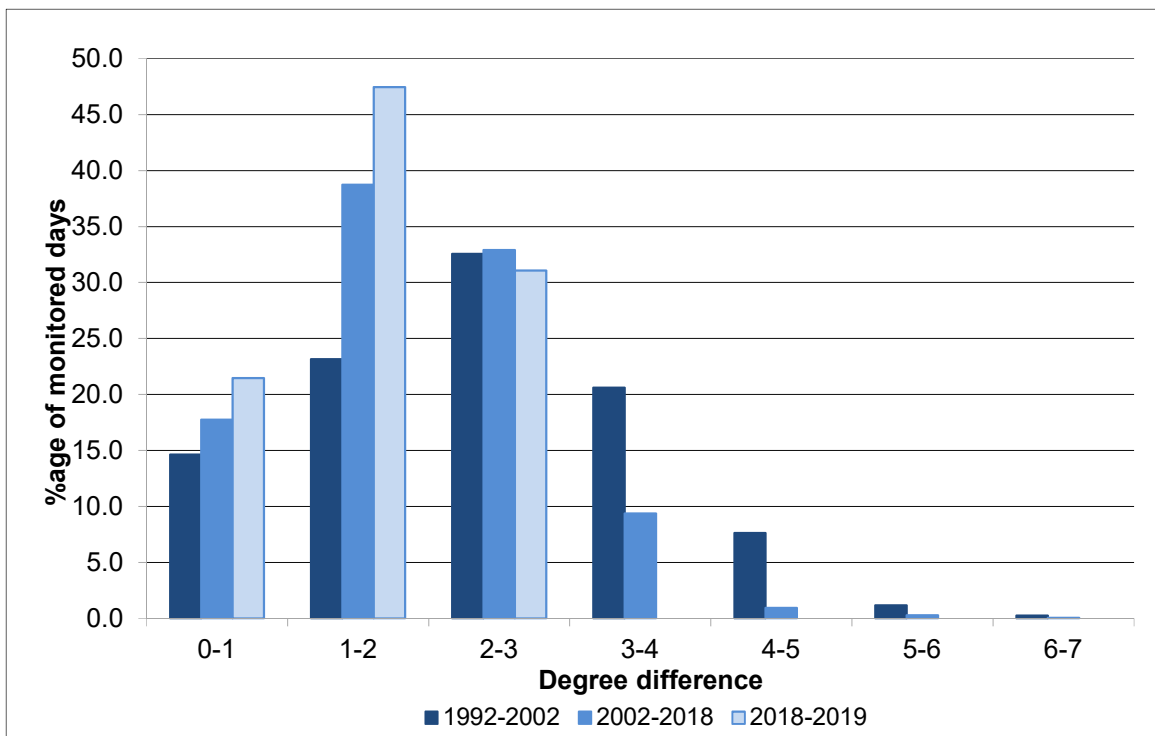


Figure 10 The distribution of maximum daily temperature differences (downstream minus upstream, November to April), displayed as a percentage of total days monitored. Data has been split into pre-400 L/s residual flow (1992-2002) and post 400 L/s residual flow (2002-2017), and current year

Prior to the 400 L/s, the most frequent maximum temperature difference was between 2-3 degrees, with almost 30% of the days experiencing a maximum difference of more than three degrees. In the sixteen years following the increased residual flow, the most frequent maximum daily temperature difference has reduced to 1-2°C, with the number of days experiencing a maximum daily difference of more than 3°C dropping to 10.6%, nearly a third of that recorded prior to the 400 L/s. When data from the reported period is compared with this historical summary (Figure 10), it can be seen that temperature differences reduced further. The proportion of time that maximum daily temperature differences were between 0-1°C increased from 17.8% in the 2002-2018 period to 21.5% over the reported period. In addition, the proportion of time that the maximum daily temperature difference exceeded 3°C dropped to 0%.

Instantaneous differences in river water temperatures between the two temperature monitoring sites are illustrated together with the flow record for the Manganui River at Everett Park in Figure 11, for a singular higher flow event that occurred in early November 2018. As in previous years, this figure illustrates that the greatest differences in water temperature occur between the two sites during recession flows. During large freshes, the differences in water temperature between the two sites are close to zero. Smaller freshes have less of an influence, as the scheme is able to absorb these flows, resulting in little change to the flow downstream of the weir.

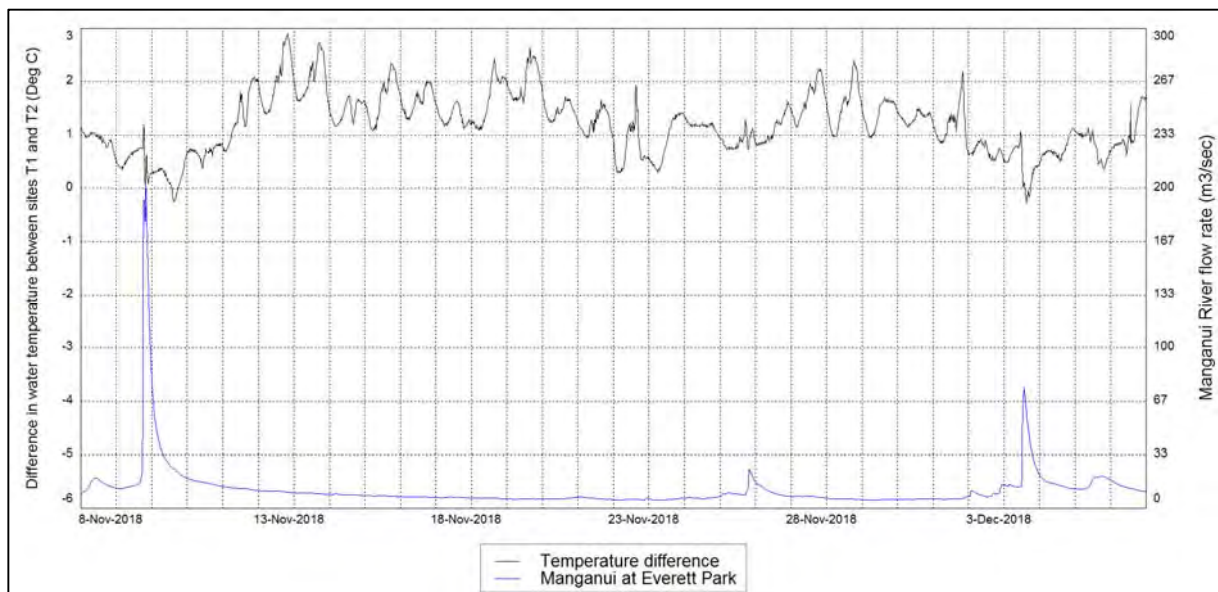


Figure 11 Manganui River water temperature differences between sites upstream and downstream of the Motukawa HEP weir compared with the flow in the Manganui River at Everett Park from 8 November to 8 December 2019

Schedule 3 of the RMA sets standards for water temperatures, for a range of waterways with specific values. It is acknowledged that the residual flow downstream of the weir is designed to primarily provide passage for trout, with some native fish habitat also provided. However, it follows that in order to provide passage; some aspects of habitat also need to be provided, such as a hospitable water temperature. Clauses 1 and 2 of schedule 3, which respectively relate to water being managed for ecosystem and fishery purposes, state that the natural temperature should not be changed by more than 3°C, while clause 2 also states that the natural temperature of the water should not exceed 25°C. It is clear from the results given above, that the increased residual flow has significantly improved water temperatures, with regard to the number of days that have a maximum temperature difference greater than 3°C. However, there is still a notable increase in the number of days where water temperatures downstream of the weir exceed 25°C (Table 6). It should be noted that it is rare to record little to no temperature increase in a downstream direction, as there will usually be warming attributable to the natural increase in water temperature with a reduction in altitude.

2.1.5.2 Biological monitoring

When the consents for the Motukawa HEP scheme were renewed in 2001, part of the basis for determining the residual flow was to ensure the management objective of maintaining reasonable water quality with the residual flow reach was achieved. The biological monitoring for this scheme is conducted to help assess whether this is being attained.

Biological monitoring was conducted in relation to the Motukawa HEP scheme on one occasion during the monitoring period under review, to assess if the residual flow below the weir had had any detectable adverse effects on the water quality and macroinvertebrate habitat. The Council's standard 'kick-sampling' technique was used at four established sites (Figure 4) to collect streambed macroinvertebrates from the Manganui River. Samples were processed to provide number of taxa (richness), MCI and SQMCI₅ 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 SQMCI₅ 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 the MCI or the SQMCI₅ between sites indicate the degree of adverse effects (if any) of the activity being monitored.

A survey was conducted on 18 February 2019. Flows had been stable in the two months prior, with the last three times median fresh occurring 55 days beforehand. The river had naturally overtopped the weir on a number of occasions in the two-month period preceding this survey, however, there had not been any major flow events.

This survey recorded taxonomic richness (number of taxa) slightly below the median numbers of taxa previously recorded at these sites with the exception of site 2, which recorded taxa richness equal to its respective median. All sites had MCI values below their respective medians, however, site 6 was the only site with a significantly lower score (Stark, 1998). Previous surveys generally found MCI values to steadily decrease in a downstream direction, which is attributed to changes in habitat downstream (including increased water temperatures and algal growth), associated with the reduction in flow downstream of the weir. Past surveys have recorded a decrease in MCI since the February 2017 survey at all sites. Because the decrease has also been recorded at the control site (site 2), this would indicate an upstream source or catchment conditions (such as rainfall) might be affecting macroinvertebrate populations in this reach, however, the sites below the weir show a larger, often significant decrease in MCI compared to site 2.

There were significant (Stark, 1998) decreases in SQMCI₅ scores between site 2 and all sites downstream of the weir. Previous surveys have noted some significant changes related to the slight increase in algal biomass observed downstream of the weir, which is consistent with the current survey. The current survey recorded warm temperatures (around 18-19°C, although this is just a snapshot of temperatures with much higher temperatures observed in the river as discussed earlier), and patchy growths of periphyton mats and filaments at all downstream sites with cyanobacteria present at site 5. The upstream sites also supported patchy growths, but they were not as extensive. Under the current residual flow regime, such prolific growths may not be flushed away by floods on a regular basis, that otherwise would occur under a more natural flow regime. Such growth can become particularly prolific under lengthy periods of stable low flow conditions and high temperatures, which reduces macroinvertebrate habitat quality. Such proliferations were not as apparent during the current survey even with the lack of significant flushing flows that occurred during the start of 2019.

In general, all sites were dominated by mostly similar taxa, despite the summer low flow conditions. Only subtle changes in abundance were noted, reflecting a change in periphyton biomass and site specific habitat conditions, with the exception of some of the EPT group of taxa where there was a notable difference in

abundance between site 2 and all of the downstream sites. As in most previous surveys, the SQMCI_s scores reduced gradually in a downstream direction with the exception of site 4 which was the lowest, scoring 2 points lower than the upstream site 2 which is a significant decrease (1 point represents a significant difference). This likely resulted from the lack of EPT taxa found at the site this year. In the previous monitoring period EPT abundance and richness was very similar to all other sites for site 4. As also found in most previous survey results, the survey found 'tolerant' taxa to be generally dominant. Overall, the SQMCI_s scores at these downstream sites were significantly below (or near to for site 5 at 0.7 points below) historical median scores recorded for these sites as well as all being significantly lower than the upstream site 2.

The presence of a number of 'highly sensitive' taxa at all sites indicated generally good preceding physicochemical water quality, although individual abundances within these taxa tended to vary across sites. *Deleatidium* mayflies, considered 'highly sensitive', were only well represented at site 2, whereas they were well represented at all sites in the previous monitoring period. Each site did have at least one 'highly sensitive' species present, although, in low abundances. MCI scores indicated that the stream communities were of good or fair 'health', while the SQMCI_s scores were representative of poor to very poor communities (Stark & Maxted, 2007). All MCI scores were similar to respective medians with the exception of site 6 which was significantly lower, while SQMCI_s were significantly below (or near to for site 5) with the exception of site 2 which was nearly significantly higher. Although this does not appear to be an encouraging result, this year experienced particularly high water temperatures in the residual flow reach with no significant flushing events in the months prior to the sampling occurring, therefore, it is expected to see some reduced scores under these conditions.

Since the new residual flow has been operating, some improvement in communities have been observed particularly at site 5, 1.7 km downstream of the weir, where MCI values have generally been above the historical median. The habitat at this site prior to the establishment of the new residual flow was generally poor due to smothering by iron oxide deposits, which has been significantly reduced since the new residual flow has been implemented. This result was not repeated in the current survey, with the MCI score at site 5 being a non-significant four units lower than the median and the SQMCI_s score a non-significant 0.7 units lower than the median. This may be a result of a noticeably hot summer with a lack of significant flushing flows. The general improvement in macroinvertebrate communities at this site in more recent times is likely to have been a direct result of the increased residual flow, although there also appears to be a general overall improvement in the catchment, as demonstrated at site 2, upstream of the affected reach. However, elevated water temperatures and denser periphyton cover have affected macroinvertebrate communities of the residual flow reach in more recent summer surveys.

When the results for each site are compared over time, it is clear that the control site (site 2) is more stable in both taxa number and MCI score than recorded at the three downstream sites. This reflects the 'buffering' effect of the higher flow upstream, which better protects the community from extremes such as elevated temperatures. The reduced flow downstream of the weir does not provide as great a buffer and therefore, there is more variation in the macroinvertebrate communities recorded at sites in the residual flow reach.

Overall, these results and previous monitoring results indicate that the invertebrate community supported by a residual flow of 400 L/s, with regards to presence/absence of taxa, and their respective abundances, is not significantly different to that supported by natural flows, although under more sustained extreme drier weather conditions any differences become more prominent. The principal difference between the two flows is that there is a greater amount of invertebrate habitat available under natural flow conditions due to the increased amount of wetted riverbed width.

2.1.5.3 Fish monitoring

2.1.5.3.1 Residual flow and fish pass

One of the most significant issues in relation to the water abstraction and associated weir on the Manganui River is the provision for fish habitat and fish passage through the residual flow reach and past the weir at Tariki Road. The new fish pass and residual flow of 400 L/s have been designed to provide:

- Passage for trout through the critical reach between the weir and the Mangamawhete Stream (8 km downstream); and
- Some native fish habitat and passage.

Improved fish diversity and abundance are key aspects for determining the success of the fish pass and residual flow with respect to the objectives above, however key native indicator species, including redfin bully and torrentfish, also provide important information on the successful passage through the residual flow reach and past the weir. Previous annual reports detail the results of numerous fish surveys undertaken in relation to the Motukawa HEP, and these are useful reference documents, providing a valuable historical perspective.

Recent surveys have recorded longfin eel, shortjaw kokopu, redfin bully and inanga upstream of the weir. However, torrentfish, which have been recorded at the bottom of the fish pass, have never been recorded upstream of the weir. This indicates that most fish species expected to be present at this altitude and distance inland are able to use the fish pass to continue upstream.

The aim of the 400 L/s residual flow (with regard to trout), is to provide adequate passage for adult trout to move up and spawn in the headwaters. Anecdotal evidence suggests trout populations upstream of the weir have improved (A. Stancliff, Fish and Game pers com), suggesting that passage through the residual flow reach and fish pass is being achieved. However, this has not been proven, and therefore previous reports suggested including monitoring specific to trout, being the capturing, tagging and releasing of adult trout within the residual flow reach and possibly further downstream. This was attempted in the 2015-2016 monitoring period, with two fyke nets set at the head of the fish pass but downstream of the flow control valve, at times when trout were anticipated to be moving upstream to spawn. The methodology and details of the tagged trout are included in the report for the 2015-2016 monitoring period (TRC, 2016).

This tagging work indicates that brown trout can easily move up the fish pass, and the fact that tagged fish were not repeatedly recaptured indicates that these fish are also able to negotiate the flow control valve at the top of the fish pass. However, no anglers have to date made contact with either Fish and Game or the Council to report having captured a tagged trout.

There is still potential for these fish to be captured in the future, and it is hoped that any anglers who capture a tagged fish will return the catch details. This will enable a better understanding of trout movement in the Manganui River catchment, and also has the potential to record the movement of trout down the race, with implications for management at the in-race generator. This tagging may be repeated in the future, in an effort to increase the number of trout tagged.

No fish surveys were completed during this reported period, with the last survey undertaken in and reported on during the 2017-2018 monitoring period. The next survey is planned for the 2019-2020 monitoring period.

2.1.5.3.2 Mangaotea Stream

Fish monitoring in the Mangaotea Stream was discontinued following the 2016-2017 monitoring period. This stream has been surveyed on a number of occasions. However, the stream is difficult to survey, due to the streambed comprising mainly soft sediment, and there being a large amount of cover. In

addition, the maturation of the riparian planting is making access more difficult with each survey. It was for these reasons that the surveys were discontinued.

Overall, this previous survey did not indicate any issue with fish passage at the intake, or with reduced flows downstream of the intake. The majority of fish recorded prefer slower flowing, deep water habitat. This habitat is less likely to be affected by the abstraction of water from the Mangaotea Stream.

2.1.5.3.3 Adult eel and elver transfers

Special conditions in consents 3372 (condition 3) and 3373 (condition 8) require the Company to provide for the passage of elvers (both consents) and adult eels (consent 3373). An elver pass using a trap and transfer system similar to that implemented successfully at the Patea Dam was installed at the power station (consent 3372) late in the 2001-2002 summer. Following modifications, this trap has operated successfully since the 2002-2003 elver migration period, with elvers transferred to either the Manganui River upstream of the weir or into Lake Ratapiko.



Photo 1 Elver trap at the base of the tail race at the power station, prior to upgrade

Photo 1 shows the elver trap prior to the upgrade that occurred in the 2016-2017 period. Elvers enter a pipe carrying the attractant flow, which leads to the trap. These elvers are then transferred to an area above the Manganui River head works.

The Company provided records in terms of weight of elvers and dates of transferral. These are presented for the 2018-2019 elver migration season (December to February) in Figure 12 and along with previous year's data in Table 8. Normally, elvers begin to appear at the tail race at the start of December and this was the case during the reported period (Figure 12).

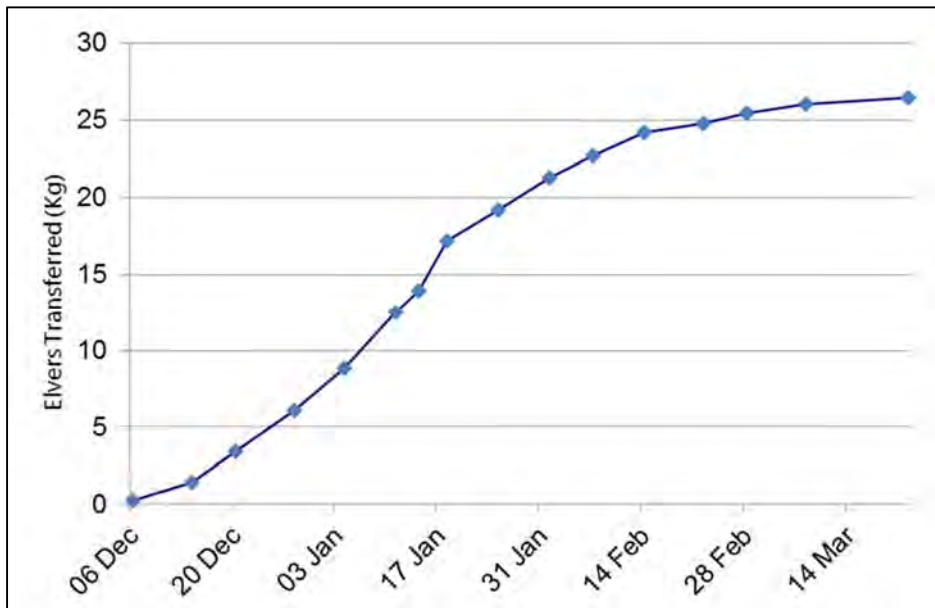


Figure 12 Cumulative weight of elvers transferred from the Motukawa Power Station during the 2018-2019 period

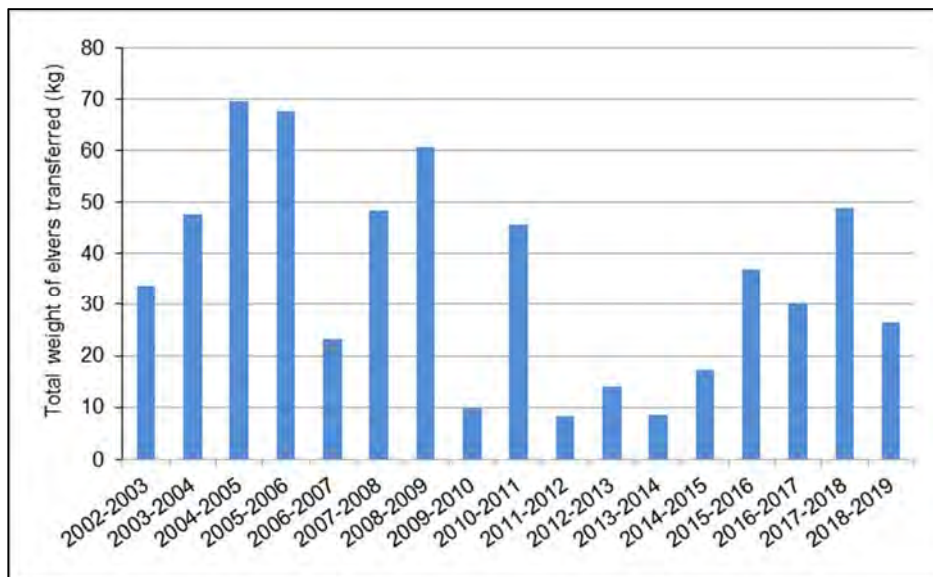


Figure 13 Elver transfer data for the monitoring years to date

The elver run in the 2018-2019 period started slightly earlier than normal, with the first transfer occurring on 6 December 2018. There were two peaks in the run during this period, with 3.68 kg transferred on 11 January 2019, and 3.27 kg transferred on 18 January 2019 (Figure 12). The last transfer was undertaken on 22 March 2019 (Figure 12), finishing earlier than the previous year, and around the time the elver run has typically finished. The total weight of elvers transferred during this period totalled 26.44 kg (Figure 13).

This result was over just over half that of the previous year's result but in general follows on from the promising results recorded in the three previous monitoring periods. It appears that the number of elvers arriving at the trap is highly variable.

With regard to the numbers of elvers transferred, it can be difficult to accurately calculate the total number, from the recorded weight, as the average weight of the individual elvers appears to vary between years. Subsamples of elvers from the Motukawa elver trap have been weighed and counted during two separate years, with one count finding 1,350 elvers per kg, and the other finding 950 elvers per kg. Table 8 shows

how many elvers were transferred during the reported period, using both weights, compared with previous years.

The elver trap was visited by Council staff on one occasion during the reported period. This inspection, completed on 28 November 2018 during the scheme site walkover, found that the elver trap was in operation and although this was at the very early extent of the historical migration there were a few individual elver within the trap.

Table 8 Elver transfer data collected since the 2002-2003 monitoring period

Monitoring year	Total weight of elvers transferred (kg)	Estimated number of elvers transferred (1 kg = 1,350 elvers (2003 count))	Estimated number of elvers transferred (1 kg = 950 elvers (2006 count))
2002-2003	33.7	45,495	-
2003-2004	47.7	64,395	-
2004-2005	69.5	93,825	-
2005-2006	67.5	91,125	64,125
2006-2007	23.18	31,293	22,021
2007-2008	48.55	65,542	46,122
2008-2009	60.65	81,878	57,618
2009-2010	9.71	13,109	9,225
2010-2011	45.57	61,520	43,291
2011-2012	8.35	11,273	7,932
2012-2013	14.15	19,103	13,442
2013-2014	8.61	11,624	8,179
2014-2015	17.23	23,261	16,368
2015-2016	37.01	49,957	35,154
2016-2017	30.21	40,784	28,699
2017-2018	48.99	66,141	46,543
2018-2019	26.44	35,694	25,118

During the 2005-2006 monitoring period, a number of sub samples of elvers were collected and identified, to assess what proportion of the elvers were longfin, and what proportion were shortfin eels. The results are summarised in Table 9. A relatively consistent ratio of longfin eels to shortfin eels was found on each occasion with the majority being shortfin eels.

Table 9 Proportion of elvers as longfin and shortfin eels for elvers trapped at Motukawa Power Station

Date	Number of longfin eels	Proportion of longfin eels	Number of shortfin eels	Proportion of shortfin eels
27-Jan-06	11	24%	35	76%
8-Feb-06	19	26%	55	74%
17-Feb-06	24	22%	85	78%

As per special condition 8 of consent 3373 an elver pass also needed to be installed at the spillway and dam on the Mako Stream (which forms Lake Ratapiko), within 6 months of the granting of this consent. The site operator at the time requested that this be delayed until March 2003, to allow works on the spillway to be completed during suitable weather in the summer of 2002-2003. This work was subsequently delayed, but was completed during the 2003-2004 monitoring period. Night spotting of the Mako Stream spillway has been conducted at times, although the most recent such visit was conducted in January 2006 and no elvers were observed accumulating at the dam, although there was no water flowing down the pass at the time of the monitoring. It is considered worthwhile to either try and trap at the head of this pass, or to conduct some monitoring later in the elver migration season (possibly late February or March) as this site is some distance inland from the coast (88.5 km).

Adult eels migrate down rivers to the sea in autumn and have been known to congregate at the Ratapiko Dam which dams the Mako Stream and at the penstocks leading to the power station. The facilitation of passage for adult eels over the Mako dam is required under special condition 8 of consent 3373. During the period under review, the Company's staff attempted to transfer adult eels from the lake. The results show that 26 longfin eel and 27 shortfin eel were transferred, much higher numbers than in the previous period which saw seven longfin eel and three shortfin eel transferred.

The Company now has a net in place each year at the start of the migrating season (autumn) and removed at the end of it. While the net is in place it is checked and emptied regularly and the eels transferred downstream. However, the configuration at the lake outlet makes this a difficult undertaking, and it is possible that a review of this process may see an improved methodology developed. It is understood that commercial eeling does occur within the lake which likely influences the number of migrating adult eels caught within the lake from year to year. Any specific details of this eeling is unknown at the time of writing this report, however, this information if available would be useful for the Company in terms of managing downstream migrations at the scheme.

Consent 5086 also has a special condition 1 relating to the penstock intake screens, maintaining the screens with spaces of no larger than 30 mm. Screens of this size were installed at the power station, complying with this condition. However, a monitoring inspection undertaken during the 2008-2010 reporting period did observe an eel that appeared to have passed through the turbines, so it is recommended that the required screen spaces be reconsidered at some stage.

Special conditions in consents 5080 (3) and 5086 (2) require the consent holder to install, maintain and operate a light barrier, within six months of the granting of these consents, for the purpose of diverting fish from the intake gate at the abstraction point from the Manganui River and the intake gate from the power station. During the 2001-2002 monitoring year, the Company purchased light sticks to comply with these consent conditions and requested that installation of the light sticks be delayed pending trials by Mr Jacques Boubee of NIWA. The Council agreed that this would be appropriate and acknowledged that installation would not be conducted within the six months specified in consent conditions. Research to date has found these lights to be ineffective, however, eels appeared to have a strong avoidance to 12 volt electrical fields. This option has been investigated, and electrical field devices had been installed at the

intake gates at the Tariki weir and at the penstocks in the forebay. These were removed for further testing, but have since been reinstalled and are operational.

2.2 Riparian planting

As per special condition 8 of consent 3369, the consent holder donates annually to the Taranaki Tree Trust (\$6,000) to mitigate the effects of the abstraction from the Manganui River. Funding on the Manganui catchment was initially targeted at Lake Ratapiko and the Rumkeg Creek. It was then expanded to include plantings on the wider Manganui catchment.

At the time of compiling this report, five landholders in the Manganui catchment had applied to be subsidised 50% of the cost of plants planted within the catchment for riparian protection in the 2018-2019 period, with just over \$8,500 available to them at the start of the period. It is expected that there will be approximately \$11,800 available for the 2019-2020 period following the next consent holder input.

2.3 Stakeholders' meeting

As a requirement under a special condition in all the Motukawa HEP scheme consents, an annual meeting of interested stakeholders is held to discuss any matters relating to the exercise of these consents, but particularly monitoring programme design, implementation and interpretation, in order to facilitate ongoing consultation.

Previously, stakeholders meetings have only been held when warranted i.e. when particular issues warranted a round table discussion. Due to insufficient interest, no meeting was held in the 2017-2018 period. No such issues were raised during the reported period, however, as a result of the upcoming consenting process for many of the consents that expire in 2021, it was agreed that a scheme walkover that was held in December 2018 was sufficient to meet the requirements of the stakeholder meeting. The Company invited various stakeholders, the Council, and various consultants to visit the scheme where the history and future of the scheme was discussed. The Company are in the early stages of investigating the renewal of the Motukawa HEP resource consents, most of which expire in 2022. The stakeholder meeting may be a good mechanism for the Company to engage with adjacent landowners and other interested parties in initiating the resource consent renewal process.

2.4 Incidents, investigations, and interventions

The monitoring programme for the year was based on what was considered to be an appropriate level of monitoring, review of data, and liaison with the Company. During the year matters may arise which require additional activity by the Council, for example provision of advice and information, or investigation of potential or actual causes of non-compliance or failure to maintain good practices. A pro-active approach, that in the first instance avoids issues occurring, is favoured.

For all significant compliance issues, as well as complaints from the public, the Council maintains a database record. The record includes events where the individual/organisation concerned has itself notified the Council. Details of any investigation and corrective action taken are recorded for non-compliant events.

Complaints may be alleged to be associated with a particular site. If there is potentially an issue of legal liability, the Council must be able to prove by investigation that the identified individual/organisation is indeed the source of the incident (or that the allegation cannot be proven).

Table 10 below sets out details of any incidents recorded, additional investigations, or interventions required by the Council in relation to the Company's activities during the 2018-2019 period. This table presents details of all events that required further investigation or intervention regardless of whether these were found to be compliant or not.

Table 10 Incidents, investigations, and interventions summary table

Date	Details	Compliant (Y/N)	Enforcement Action Taken?	Outcome
17/09/18	Water take exceeding consent limit during high flows	N	Fourteen Day Letter	Statutory Defence - It was explained that there was an unforeseen software issue that caused the problem. This issue was beyond the control of the consent holder and unforeseeable therefore no further action was required/ undertaken.
16/02/19	Drop in flow below consent limit within the Motukawa HEPS race	N	Company provided self notification and explanation	Statutory Defence - It was explained that there was an unforeseen software issue that caused the problem which was related to programmed preferences for maintaining one flow condition (residual flow) against another (race flows). This issue was beyond the control and unforeseeable due to low flows and programming, therefore no further action was required/ undertaken.

3 Discussion

3.1 Discussion of site performance

Several consents contain special conditions requiring the Company to monitor and forward abstraction, discharge and water level data to the Council at three monthly intervals. This data was forwarded as required during the monitoring year under review and checked for continuity of the data record, and compliance with their respective limits.

There was good compliance with set flows and water levels, with no incidents occurring that warranted enforcement action. Two incidents occurred, and were the result of unforeseen software issues. These issues were mechanical failures, beyond the control of the consent holder, and unforeseeable, therefore no further action was required or could be undertaken as they would be statutorily defensible under the RMA. Nonetheless, the Company proactively notified the Council of these issues as well as undertook steps to best resolve the issues. It should be noted that only incidents of one hour or longer are typically discussed for these requirements, provided the limit was breached by at least 5%, to allow for marginal errors associated with recording equipment.

Compliance with flows and water level requirements was also confirmed through inspections, including hydrological gaugings where appropriate. These inspections also confirmed compliance with other requirements such as the operation of an elver trap at the station and elver pass at the Mako Dam spillway.

During periods of stable flow, the station is required to either release flushing flows (Manganui River), or cease abstracting during the next naturally occurring flushing flow (Mangaotea Stream). During the previous reported period, the Company experienced a mechanical failure in the programmed logic controller, which resulted in a delay in providing flushing flows for the Manganui River. There were also three occasions when flushing flows were required for the Mangaotea Stream. Only one of these was provided, while it was provided late for the remaining two occasions. This is an area that the Company has struggled to historically meet full compliance for. However, no problems were observed during this monitoring period. In analysing the data in the previous monitoring period, it became apparent that there may be an issue with the accuracy of the Mangaotea abstraction data, although this is yet to be confirmed through gaugings, and there is currently no abstraction occurring from here.

Special condition 4 of consent 3371-2, which relates to the diversion of water into the race, requires that the consent holder undertakes a five yearly monitoring survey of the race. The objective of the survey is to identify any maintenance items required to maintain a race capacity of 8,000 L/s, for the purpose of avoiding flooding adjacent farmland. The condition also requires that any required maintenance occurs within 12 months of the completion of the survey. For this monitoring period (and the past five annual monitoring periods) it was agreed that an annual walk over survey of the race, as opposed to more intensive survey carried out on five yearly basis, was sufficient to comply with the consent condition. The Company also undertakes yearly inspections of the race as part of their asset management processes. A review by the Council was undertaken this monitoring period to establish whether the current survey methodology is sufficiently comprehensive. It is considered that the more regular but less comprehensive annual surveys undertaken by the Company are seen to be sufficient in meeting the requirements of the consent, and that in general the undertaking of yearly observations is more likely to detect rising issues. However, it is also considered that the provision for a more comprehensive survey should remain should certain conditions be met. Conditions would include if an annual inspection finds that there has been a more than minor change to the race that could result in flooding, or if complaints or concerns are raised by the adjacent landowners (with the Company to actively maintain communications with landowners). Depending on the findings of these inspections or complaints the Company could then present a survey methodology to the Council directly catered to the specific issue(s).

Consent 5082 allows the discharge of water into the Mangaotea Stream in emergency conditions. Special condition 4 of this consent requires the Company to put aside \$600 per year for flood management, and to make this available to landowners downstream of the race in the Mangaotea Stream catchment. This money continues to be made available each year (but is not accumulated from year to year).

A draft contingency plan had been received in 2002 to cover conditions in consents 5084 and 5088. This was to be reviewed by the operator of the scheme once work on the spillway and Ratapiko Road culvert has been completed in the 2002-2003 monitoring year. An Emergency Management Plan and Emergency Action Plan contact list has been provided to Council, up to date to December 2013.

Management of most aspects of the Motukawa HEP scheme over the period being reported has generally been excellent with the significant improvements undertaken in previous years contributing to this. It is clear that the Company takes compliance with consent conditions seriously, and this is reflected in their self notification of any breaches they become aware of, and their swift response in each case. Throughout the reported period, The Company and Council have continued to work closely with one another.

3.2 Environmental effects of exercise of consents

Continuous water temperature monitoring is performed in the Manganui River upstream and downstream of the Tariki Road weir from November to May in each monitoring year. Monitoring indicated that temperatures were warmer throughout this period than typically seen, with a number of significant extremes recorded. This primarily related to the long dry spring and summer that Taranaki experienced during the year under review, with the upstream site recording a new maximum water temperature (26.4°C). This upstream site continued to indicate that the catchment may be warming. Average monthly water temperatures were warmer by a degree or more for the months of December to March compared the long term average, while November and May were near the long term average. Furthermore, the number of days that experienced a maximum temperature in excess of 25°C was well above average, with the upstream and downstream sites experiencing a water temperature in excess of 25°C on five and 14 days respectively. The upstream site experienced the greatest degree of warming, with nearly 1.7 times as many days experiencing maximum temperatures over 20°C (36.7% of days) compared with the average (21.8% of days). Downstream this figure increased by 7.5%, to 40.7%. Temperatures over 25°C can significantly adversely affect trout and other freshwater fish communities as well as being outside the tolerance range of some sensitive macroinvertebrate taxa. Furthermore, temperatures over 20°C, for extended periods, can put stress on fish. No fish kills were reported in the residual flow reach of the Manganui River, although this is not actively monitored by any party.

A comparison of the water temperatures prior to the new residual flow of 400 L/s against those after it was implemented indicate that water temperature differences had generally decreased between the two water temperature monitoring sites some 2.3 km apart. The proportion of days that had a maximum temperature difference of 1-2°C since the 400 L/s is over double that recorded prior, with the difference coming from a reduction in the proportion of days that experienced a maximum temperature difference of more than 3°C. The temperature differences recorded in the 2018-2019 period were less than the average, with the exception of November and December 2018, when the downstream reach warmed similar to that recorded prior to the increased residual flow. This is related to November and December receiving below average rainfall, indicating finer weather and more heating. This result was not repeated in the subsequent months, as the upstream site had warmed much more than normal, resulting in less potential for further warming in the residual flow reach.

Because of an extended period of natural to near natural flows in the residual flow reach in early 2010, it was possible to assess what impact the main abstraction has on the water temperatures in this reach. This showed that even though the Manganui River was running slightly warmer at that time than was typical, the temperatures in the residual flow reach were reduced by this natural flow. It was also clear that

temperatures which can negatively affect stream biota ($>20^{\circ}\text{C}$) are less likely to occur under the more natural flow, and that their increased occurrence in the residual flow reach is directly related to the reduced flow.

The macroinvertebrate survey conducted in the reported period indicated that the residual flow from the Motukawa HEP scheme was maintaining reasonable water quality and some habitat for macroinvertebrate communities downstream of the diversion weir.

The current and previous surveys have found a general trend of decreasing MCI scores in a downstream direction which was more likely related to the natural changes in habitat downstream, than due to the reduced flow downstream of the weir. The current survey recorded only limited (and not statistically significant) deterioration at all sites with the exception of site 6 which showed a significant difference, although within historical range. This is a positive indication that the impacts of the diversion were not as severe throughout the entire residual flow as expected during this noticeably hot summer with a lack of significant flushing flows.

Since the new residual flow has been operating, some improvement in communities have been observed particularly at site 5, 1.7 km downstream of the weir, where MCI values have been above the historical median, since the new residual flow was implemented. This result was not repeated in the current survey, with the MCI and SQMCI₅ scores being non-significantly lower than the long term median. This may be a result of a noticeably hot summer with a lack of significant flushing flows. The general improvement in macroinvertebrate communities at this site in more recent times is likely to have been a direct result of the increased residual flow, although there also appears to be a general overall improvement in the catchment, as demonstrated at site 2, upstream of the affected reach. However, elevated water temperatures and denser periphyton cover have affected macroinvertebrate communities of the residual flow reach in more recent summer surveys.

Overall, these results and previous monitoring results indicate that the invertebrate community supported by a residual flow of 400 L/s, with regards to presence/absence of taxa, and their respective abundances, is not significantly different to that supported by natural flows, although under more sustained extreme drier weather conditions any differences become more prominent. The principal difference between the two flows is that there is a greater amount of invertebrate habitat available under natural flow conditions due to the increased amount of wetted riverbed width.

The macroinvertebrate monitoring continues to show that water quality in the residual flow reach is maintained, indicating that the objective of maintaining water quality (which was used to determine an appropriate residual flow of 400 L/s), is being achieved, and has improved physical macroinvertebrate habitat and physicochemical water quality conditions when compared to previous residual flows of less than 100 L/s.

Improved fish diversity and abundance are key aspects for determining the success of the fish pass and residual flow with respect to fish passage in the residual flow reach as well as providing some native fish habitat. Key native indicator species, including the redfin bully and torrentfish, also provide important information on the successful passage through the residual flow reach and past the weir.

Electric fishing surveys in the Manganui catchment prior to the installation of the new fish pass in 2002, and increased residual flow, indicated that redfin bullies and torrentfish did not swim to the base of the Motukawa diversion weir, at an altitude of 210 m (TRC, 1999a and 2000). The minimal residual flow downstream of the weir was insufficient to attract these fish up the river as far as the weir. Redfin bullies swim well above an altitude of 200 m in the Ngatoro-iti, Ngatoro-nui, Waitepuke and Mangamawhete streams, all tributaries of the Manganui River (which enter the Manganui River downstream of the Tariki weir).

Numerous fish surveys have been conducted in relation to the Motukawa scheme. More recent surveys have recorded improving populations of redfin bully and shortjaw kokopu upstream of the weir, and also recorded inanga upstream of the weir. This shows that fish are beginning to move through the residual flow reach and fish pass. Torrentfish however have only been recorded in the fish pass and sporadically in the residual flow reach, not upstream of the weir. This is likely to be related to the residual flow being insufficient to attract significant numbers of torrentfish, and those that do make it to the fish pass may not be able to negotiate the weirs in the fish pass.

Monitoring undertaken in the previous reported period again recorded inanga and shortjaw kokopu in the fish pass, and torrentfish 300 m downstream of the weir. The most significant result of this survey was the presence of juvenile lamprey in the fish pass, the first time this species has been recorded at this site. Considering the abundance of lamprey at this site, it is possible spawning occurred in the fish pass. The next survey will be undertaken in the 2019-2020 monitoring period.

In the 2015-2016 monitoring period, brown trout were caught in the fish pass and tagged, in an effort to confirm the anecdotal observations that they can negotiate the fish pass. Although only five trout were captured and tagged, the interim results indicate that this species can negotiate the pass, including the flow control valve. No anglers have yet reported catching these fish.

Overall, results indicate that with respect to the management objectives for which the residual flow was developed:

- reasonable water quality is being maintained;
- passage for trout is probably being achieved through the residual flow reach and past the weir;
- passage for some (but not all) native fish is being achieved in the residual flow reach and it would appear through the fish pass; and
- habitat of native fish has improved but fish diversity is similar to that recorded prior to the 400 L/s residual flow and may suggest that the objective of 'some native fish habitat' is not being achieved for torrentfish, although redfin bullies and inanga have been recorded in the residual flow reach.

3.3 Evaluation of performance

A tabular summary of the Company's compliance record for the year under review is set out in Table 11 to Table 30. Three consents are not included in this tabular summary (6382-1, 6383-1 & 6384-1), as these were for temporary activities associated with the installation of an intake structure, and these activities are no longer being undertaken.

Table 11 Summary of performance for Consent 3369-2

Purpose: To take and use up to 5,200 L/s of water from the Manganui River		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Maintenance of residual flow of 400 L/s	Inspections fish pass, including water levels in pass; gaugings	Yes
2. Residual flow passes through fish pass within 12 months of the granting of this consent	Inspection; Implemented in 2002	Yes

Purpose: To take and use up to 5,200 L/s of water from the Manganui River		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
3. Install and operate measuring device for monitoring abstraction rate and forward to Council	Receipt and review of Company data every three months	Yes
4. Cease abstraction if flow in Waitara is \leq 5000 L/s	Council to notify if Waitara flow is less than threshold	Yes
5. Pulse flows released if weir has not overtopped for 30 days	No such period of low flows occurred	Yes
6. (a) Install race water level control system to manage inflow from Manganui River (b) Avoid flooding of farmland (c) Emergency power source	Receipt and review of Company data every three months	Yes
7. Maintain 150 L/s in race during maintenance	Notification by Company	Yes
8. Donation to Taranaki Tree Trust	Confirmation with Council finance dept that donation received	Yes
9. Meeting with stakeholders annually	One meeting conducted	Yes
10. Optional change/cancellation of conditions by consent holder	Not exercised	N/A
12. Optional review provision re environmental effects	No review undertaken	N/A
Overall assessment of environmental performance and compliance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable

Table 12 Summary of performance for Consent 3371-2

Purpose: To divert and use up to 8,000 L/s of stormwater runoff and tributaries draining in to race and Lake Ratapiko		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. (a) Install race water level control system (b) Emergency power source	Installed in 1998	Yes
2. Management of maximum race water levels at 4 sites to avoid flooding of farmland	Receipt and review of Company data every three months	Yes

Purpose: To divert and use up to 8,000 L/s of stormwater runoff and tributaries draining in to race and Lake Ratapiko		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
3. Install and survey stage boards for visual check on race levels	Installed in 1995; Inspections of race	Yes
4. Five yearly survey of race to identify maintenance requirements	On agreement, yearly inspection and report provided to Council	Yes
5. Install and operate measuring device to measure water levels and forward to Council	Receipt and review of Company data every three months	Yes
6. Meeting with stakeholders annually	One meeting conducted	Yes
7. Bond required if flooding occurs between May 1999 and April 2000		N/A
8. Review of conditions if there is flooding of adjacent farmland	Not exercised	N/A
9. Optional change/cancellation of conditions by consent holder	Not exercised	N/A
10. Optional review provision re environmental effects	No review undertaken	N/A
Overall assessment of environmental performance and compliance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable

Table 13 Summary of performance for Consent 3372-2

Purpose: To discharge up to 7,787 L/s of water from the Motukawa HEP into the Makara Stream		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Cease abstraction if flow in Waitara is ≤ 5000 L/s	Council to notify if Waitara flow is less than threshold	Yes
2. Install and operate measuring device to measure discharge of water to Makara St and forward to Council	Receipt and review of Company data every three months	Yes
3. Install, maintain & monitor elver passage facility within 6 months of granting of consent	Installed in 2001-2002 monitoring year; Inspections; receipt and review of Company data	Yes
5. Meeting with stakeholders annually	One meeting conducted	Yes
6. Optional change/cancellation of conditions by consent holder	Not exercised	N/A

Purpose: To discharge up to 7,787 L/s of water from the Motukawa HEP into the Makara Stream		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
7. Optional review provision re environmental effects	No review undertaken	N/A
Overall assessment of environmental performance and compliance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable

Table 14 Summary of performance for Consent 3373-2

Purpose: To dam the Mako Stream to form Lake Ratapiko		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Within 6 months of granting consent, provide a SEED review	Received in 2002	Yes
2. Maintain & operate a safe dam		Yes
3. Place & maintain structure on top of lowered spillway crest to increase lake storage	Upgrade in 2003-2004 with spring tip flashboard	Yes
4. Manage structure in condition 4 and lake level so as to avoid flooding of farmland	Receipt and review of Company data every three months	Yes
5. Minimum lake water level of 194 m a.s.l. except during maintenance	Receipt and review of Company data every three months	Yes
6. Maximum lake water level of 198.7 m a.s.l.	Receipt and review of Company data every three months	Yes
7. Install, maintain & monitor elver /eel passage facility over spillway within 6 months of granting of consent	Inspections Installed in 2003-2004; Delays approved by Council	Yes
8. Install and operate measuring device to measure lake water level and forward to Council	Receipt and review of Company data every three months	Yes
9. Meeting with stakeholders annually	One meeting conducted	Yes
10. Optional change/cancellation of conditions by consent holder	Not exercised	N/A
11. Optional review provision re environmental effects	No review undertaken	N/A

Purpose: To dam the Mako Stream to form Lake Ratapiko		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
Overall assessment of environmental performance and compliance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable

Table 15 Summary of performance for Consent 1166-3

Purpose: To discharge up to 4,000 m³/day of dredgings from maintenance of Lake Ratapiko		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Notify Council at least 48 hours prior to commencement of discharge	No notification received. No maintenance undertaken	N/A
2. Adopt best practicable option		N/A
3. Meeting with stakeholders annually	One meeting conducted	Yes
4. Optional change/cancellation of conditions by consent holder	Not exercised	N/A
5. Optional review provision re environmental effects	No review undertaken	N/A
Overall assessment of environmental performance and compliance in respect of this consent		N/A
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable

Table 16 Summary of performance for Consent 5080-1

Purpose: To erect, place, use and maintain the weir and various structures in Manganui River		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Design, install, maintain & monitor structure at weir for fish passage	Inspections; biological monitoring	Yes
2. Fish pass to be constructed within 12 months	Completed in 2002	Yes
3. Install & operate a light barrier within 6 months to divert fish from intake	Research found light barrier to be ineffective. Electric fields have been reinstalled at intake and forebay in 2010-2014 period. Extension of time limit approved.	Yes
4. Meeting with stakeholders annually	One meeting conducted	Yes

Purpose: To erect, place, use and maintain the weir and various structures in Manganui River		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
5. Optional change/cancellation of conditions by consent holder	Not exercised	N/A
6. Optional review provision re environmental effects	No review undertaken	N/A
Overall assessment of environmental performance and compliance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable

Table 17 Summary of performance for Consent 5081-1

Purpose: To erect, place, use and maintain the Mangaotea Aqueduct in and above the Mangaotea Stream		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Install and survey a stage board for visual check on race levels	Installed in 1995; Inspections of race	Yes
2. Lower northern side of aqueduct by 300 mm to provide a flow of 2,000 L/s & install gate controlled by race water level control system	Conducted in 2000	Yes
3. Meeting with stakeholders annually	One meeting conducted	Yes
4. Optional change/cancellation of conditions by consent holder	Not exercised	N/A
5. Optional review provision re environmental effects	No review undertaken	N/A
Overall assessment of environmental performance and compliance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable

Table 18 Summary of performance for Consent 5082-1

Purpose: To discharge, under emergency conditions, up to 2,000 L/s of overflow water from the Mangaotea Aqueduct into the Mangaotea Stream		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. That the discharge shall occur after compliance with condition 2 of 5081 is achieved	No discharges in the monitoring period	N/A

Purpose: To discharge, under emergency conditions, up to 2,000 L/s of overflow water from the Mangaotea Aqueduct into the Mangaotea Stream		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
2. Definition of emergency conditions	When local stormwater runoff to the race is required to be discharged to Mangaotea Stream in order to avoid the race flooding adjoining land	N/A
3. Manage discharge to avoid or minimise flooding of farmland and roads below discharge	No discharges in the monitoring period	N/A
4. Set aside \$600 annually for maintenance of the flood capacity of the Mangaotea Stream below the discharge, and make funds available to landowners for works.	Money continues to be made available each year	Yes
5. Optional change/cancellation of conditions by consent holder	Not exercised	N/A
6. Meeting with stakeholders annually	One meeting conducted	Yes
7. Optional review provision re environmental effects	No review undertaken	N/A
Overall assessment of environmental performance and compliance in respect of this consent		N/A
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable

Table 19 Summary of performance for Consent 5084-1

Purpose: To discharge up to 55,000 L/s of HEP generation water, during adverse weather conditions, from Lake Rataipiko into the Mako Stream		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Prepare a contingency plan for managing discharge so as to avoid or minimise damage to property downstream	Reviewed contingency plan received in 2004-2005 monitoring year	Yes
2. Exercise consent in accordance with contingency plan		Yes
3. Meeting with stakeholders annually	One meeting conducted	Yes
4. Optional change/cancellation of conditions by consent holder	Not exercised	N/A

Purpose: To discharge up to 55,000 L/s of HEP generation water, during adverse weather conditions, from Lake Ratapiko into the Mako Stream		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
5. Optional review provision re environmental effects	No review undertaken	N/A
Overall assessment of environmental performance and compliance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable

Table 20 Summary of performance for Consent 5085-1

Purpose: To disturb the bed of Lake Ratapiko for maintenance and repairs associated with HEP generation		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Notify the Council 48 hours prior to commencement of disturbance activities	No notifications received. No disturbance undertaken	Yes
2. Best practicable option		N/A
3. Meeting with stakeholders annually	One meeting conducted	Yes
4. Optional change/cancellation of conditions by consent holder	Not exercised	N/A
5. Optional review provision re environmental effects	No review undertaken	N/A
Overall assessment of environmental performance and compliance in respect of this consent		N/A
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable

Table 21 Summary of performance for Consent 5086-1

Purpose: To erect, place, use and maintain various structures in, on and over the bed of Lake Ratapiko		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Maintain penstock intake screens with spaces no larger than 30 mm in order to minimise eel & fish entrapment	Inspections	Yes

Purpose: To erect, place, use and maintain various structures in, on and over the bed of Lake Ratapiko		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
2. Install & operate a light barrier within 6 months to divert fish from intake	Research found light barrier to be ineffective. Electric fields have been reinstalled at intake and forebay in 2010-2014 period. Extension of time limit approved	Yes
3. Install and survey a stage board for visual check on lake water levels	Installed in 1995; Inspections	Yes
4. Upgrade Ratapiko Road causeway	Completed in 2003	Yes
5. Optional change/cancellation of conditions by consent holder	Not exercised	N/A
6. Meeting with stakeholders annually	One meeting conducted	Yes
7. Optional review provision re environmental effects	No review undertaken	N/A
Overall assessment of environmental performance and compliance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable

Table 22 Summary of performance for Consent 5087-1

Purpose: To take and use up to 7,787 L/s of water from Lake Ratapiko		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Minimum lake water level of 194 m a.s.l.	Receipt and review of Company data every three months	Yes
2. For lake maintenance, the draw down of the level will occur gradually over 7 days & notify the Council and Fish and Game	No such works undertaken	N/A
3. Maximum lake water level under normal operating conditions does not exceed 198.7 m a.s.l.	Receipt and review of Company data every three months	Yes
4. Manage lake levels to avoid or minimise flooding of land		Yes
5. Meeting with stakeholders annually	One meeting conducted	Yes
6. Optional change/cancellation of conditions by consent holder	Not exercised	N/A

Purpose: To take and use up to 7,787 L/s of water from Lake Ratapiko		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
7. Optional review provision re environmental effects	No review undertaken	N/A
Overall assessment of environmental performance and compliance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable

Table 23 Summary of performance for Consent 5088-1

Purpose: To discharge up to 2,000 L/s of water from the surge chamber of the Motukawa power station during maintenance periods into an unnamed tributary of the Makara Stream		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Prepare contingency plan within 6 months	Reviewed contingency plan received in 2004-2005 monitoring year	Yes
2. Exercise consent in accordance with contingency plan		Yes
3. Notify the Council 48 hours prior to the discharge and adopt best practicable option	No notifications received	Yes
4. Meeting with stakeholders annually	One meeting conducted	Yes
5. Optional change/cancellation of conditions by consent holder	Not exercised	N/A
6. Optional review provision re environmental effects	No review undertaken	N/A
Overall assessment of environmental performance and compliance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable

Table 24 Summary of performance for Consent 6388-1

Purpose: To divert and use water in the Motukawa Race		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Best practicable option	Inspections	Yes

Purpose: To divert and use water in the Motukawa Race		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
2. Exercise of consent shall be undertaken generally in accordance with documentation submitted with application	Inspections	Yes
3. Notify the Council 7 days prior to the exercise of consent	Notification received 21 February 2006	Yes
4. Consent lapse period of 10 years	Consent has been exercised	N/A
5. Optional review provision re environmental effects	No review undertaken	N/A
Overall assessment of environmental performance and compliance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable

Table 25 Summary of performance for Consent 6390-1

Purpose: To impound water behind a dam on the Motukawa Race		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Best practicable option	Inspections	Yes
2. Exercise of consent shall be undertaken generally in accordance with documentation submitted with application	Inspections	Yes
3. Notify the Council 14 days prior to the construction of dam and turbine unit in the race	Notification received 13 October 2005	Yes
4. The intake is appropriately screened to avoid entrapment of freshwater fauna	Screens used found to be too narrow for operation. Change of consent conditions granted and new screens installed in July 2006	Yes
5. On 3 occasions between Nov and Feb, cease generation and open bypass valve for 12 hours to allow trout passage	It has been agreed by Council and Fish and Game that this is no longer required, as the bypass valve will be permanently running from November to February	N/A
6. Company must monitor effectiveness of bypass valve for first 6 bypass events and forward information to Council and Fish and Game.	It has been agreed by Council and Fish and Game that this is no longer required, as the bypass valve will be permanently running from November to February	Yes
7. Review conditions of consent if monitoring of bypass events show a significant trout accumulation	Not exercised	N/A

Purpose: To impound water behind a dam on the Motukawa Race		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
8. Management of race water level to avoid or minimise flooding of adjacent farmland	Receipt and review of Company data every three months	Yes
9. Consent lapse period of 10 years	Consent has been exercised	N/A
10. Optional review provision re environmental effects	No review undertaken	N/A
Overall assessment of environmental performance and compliance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable

Table 26 Summary of performance for Consent 6391-1

Purpose: To discharge sediment during earthworks associated with the construction of a generator structure into the Motukawa Race		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Best practicable option	Works completed	N/A
2. Exercise of consent shall be undertaken generally in accordance with documentation submitted with application	Works completed	N/A
3. Notify the Council 48 hours prior to the commencement and upon completion of the initial installation and again on any subsequent maintenance works	Notification to commence received 28 February 2005 and subsequently for each stage of works. No subsequent maintenance works undertaken as yet	N/A
4. Site erosion and sediment control management plan	Received 28 February 2005	N/A
5. Discharge shall not give rise to adverse effects on surface water body after reasonable mixing	Works completed	N/A
6. All earthworks shall be stabilised vegetatively or otherwise as soon as practicable following completion of activities	Works completed	N/A
7. Consent lapse period of 10 years	Consent has been exercised	N/A
8. Optional review provision re environmental effects	No review undertaken	N/A

Purpose: To discharge sediment during earthworks associated with the construction of a generator structure into the Motukawa Race		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
Overall assessment of environmental performance and compliance in respect of this consent		N/A
Overall assessment of administrative performance in respect of this consent		N/A

N/A = not applicable

Table 27 Summary of performance for Consent 6381-1

Purpose: To take and use water from the Mangaotea Stream, for HEP generation purposes		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Exercise of consent shall be undertaken generally in accordance with documentation submitted with application	Inspections, data review – Take not occurring	Yes
2. Notify the Council 48 hours prior to the exercise of this consent	Notification received	Yes
3. Restriction of abstraction rate and daily volume	Data review - Take not occurring	Yes
4. Maintenance of residual flows within the Mangaotea Stream	Data review, gaugings - Take not occurring	Yes
5. Specifies aspects of the review, should one be required as per special condition 9	Review not considered necessary	N/A
6. Flushing flow requirement	Data review, inspections - Take not occurring	Yes
7. Requires the recording of abstraction rate, residual flow downstream of abstraction and flow downstream of Little Mangaotea Stream confluence	Data review - Take not occurring	Yes
8. Consent holder to undertake a two year monitoring programme of hydrological and ecological effects in the Mangaotea Stream and Manganui River	Monitoring completed in 2012	Yes
9. Review provision should the residual flow and/or flow regime be considered not appropriate	Review not considered necessary	N/A
10. Meeting with stakeholders annually	One meeting conducted	Yes
11. Consent lapse period of 10 years	Consent has been exercised	N/A

Purpose: To take and use water from the Mangaotea Stream, for HEP generation purposes		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
12. Optional review provision re environmental effects	No review undertaken	N/A
Overall assessment of environmental performance and compliance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable

Table 28 Summary of performance for Consent 6385-1

Purpose: To erect, place and maintain an intake structure including pumps in the bed of the Mangaotea Stream, for the purposes of abstracting water for HEP generation		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Best practicable option	No maintenance works undertaken	N/A
2. Exercise of consent shall be undertaken generally in accordance with documentation submitted with application	No maintenance works undertaken	N/A
3. Notify the Council 48 hours prior to the commencement and upon completion of the initial installation and again on any subsequent maintenance works	No notifications received	N/A
4. Timing of works restricted to 1 November-30 April , unless waived by Council	No maintenance works undertaken	N/A
5. Must ensure that the area and volume of streambed disturbance is minimised so far as practicable	No maintenance works undertaken	N/A
6. The diversion and impoundment shall not obstruct fish passage	No maintenance works undertaken	Yes
7. The intake shall be appropriately screened to prevent entrapment of freshwater fauna	Inspections	Yes
8. The structure shall be removed and area reinstated should it no longer be required	Structure still required	N/A
9. Consent lapse period of 10 years	Consent has been exercised	N/A

Purpose: To erect, place and maintain an intake structure including pumps in the bed of the Mangaotea Stream, for the purposes of abstracting water for HEP generation		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
10. Optional review provision re environmental effects	No review undertaken	N/A
Overall assessment of environmental performance and compliance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable

Table 29 Summary of performance for Consent 6386-1

Purpose: To disturb and modify the bed and banks of the Mangaotea Stream, associated with the construction of an intake structure for hydroelectric generation purposes		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Best practicable option	No maintenance works undertaken	N/A
2. Exercise of consent shall be undertaken generally in accordance with documentation submitted with application	No maintenance works undertaken	N/A
3. Notify the Council 48 hours prior to the commencement and upon completion of the initial installation and again on any subsequent maintenance works	No notifications received	N/A
4. Timing of works restricted to 1 November-30 April , unless waived by Council	No maintenance works undertaken	N/A
5. Must ensure that the area and volume of streambed disturbance is minimised so far as practicable	No maintenance works undertaken	N/A
6. The diversion and impoundment shall not obstruct fish passage	Inspections	Yes
7. Consent lapse period of 10 years	Consent has been exercised	N/A
8. Optional review provision re environmental effects	No review undertaken	N/A
Overall assessment of environmental performance and compliance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable

Table 30 Summary of performance for Consent 6387-1

Purpose: To discharge sediments from earthworks into the Mangaotea Stream, associated with the construction of an intake structure, for HEP generation purposes		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Best practicable option	No maintenance works undertaken	N/A
2. Exercise of consent shall be undertaken generally in accordance with documentation submitted with application	No maintenance works undertaken	N/A
3. Notify the Council 48 hours prior to the commencement and upon completion of the initial installation and again on any subsequent maintenance works	No notifications received	N/A
4. Site erosion and sediment control management plan	Received March 2007	N/A
5. Timing of works restricted to 1 November-30 April , unless waived by Council	No maintenance works undertaken	N/A
6. Discharge shall not give rise to adverse effects on surface water body after reasonable mixing	No maintenance works undertaken	N/A
7. All earthworks shall be stabilised vegetatively or otherwise as soon as practicable following completion of activities	No maintenance works undertaken	N/A
8. Consent lapse period of 10 years	Consent has been exercised	N/A
9. Optional review provision re environmental effects	No review undertaken	N/A
Overall assessment of environmental performance and compliance in respect of this consent		High
Overall assessment of administrative performance in respect of this consent		High

N/A = not applicable

Table 31 Evaluation of overall environmental performance over time

Year	High	Good	Improvement req	Poor
2010 – 2014 (combined report)	-	1	-	-
2015	-	1	-	-
2016	1	-	-	-
2017	1	-	-	-

Year	High	Good	Improvement req	Poor
2018	1	-	-	-
2019	1	-	-	-
Totals	4	2	0	0

During the year, the Company demonstrated a high level of environmental and high level of administrative performance with the resource consents as defined in section 1.1.4. There were no incidents that warranted enforcement action, and although there were a small number of occasions where consent conditions weren't strictly complied with, the issues were either minor, managed in a way that ensured no other conditions were breached, or were unlikely to have resulted in any adverse environmental effects.

Overall the high level of environmental and consent compliance performance is a reflection of their improved systems and thorough monitoring of a highly complex scheme. The Company has maintained a good level of communication with the Council, including notifying Council of any potential breach of consent, no matter how minor.

3.4 Recommendations from the 2017-2018 Annual Report

In the 2017-2018 Annual Report, it was recommended:

1. THAT in the first instance, monitoring of the Motukawa HEP Scheme in the 2018-2019 year continue at the same level as in 2017-2018.
2. THAT should there be issues with environmental or administrative performance in 2018-2019, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.
3. THAT the scope of the monitoring surveys required under condition 4 of consent 3371-2 be reviewed during the 2018-2019 monitoring period and an ongoing survey methodology be agreed upon.
4. THAT the Company apply to change the conditions of consent 6390-1, so that the specified locations are consistent with consent 3371-2.

Recommendation 1 was implemented in the 2018-2019 monitoring year and recommendation 2 was not required to be implemented. Recommendation 3 was implemented in part, but further discussions are required to form a final position on monitoring requirements. There remained no progress in implementing recommendation 4. This matter will be addressed during the re-consenting process in 2022.

3.5 Alterations to monitoring programmes for 2019-2020

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

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

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

It is proposed that for 2019-2020 monitoring remains at the same level as that undertaken in the 2018-2019 year.

It should be noted that the proposed programme represents a reasonable and risk-based level of monitoring for the site(s) in question. The Council reserves the right to subsequently adjust the programme from that initially prepared, should the need arise if potential or actual non-compliance is determined at any time during 2019-2020.

3.6 Exercise of optional review of consent

Resource consent 3371-2.1 provides for an optional review of the consent at any time should there be flooding of areas adjoining the Motukawa Power Scheme attributable to the activities of the consent holder. No circumstances arose that warranted the implementation of this provision.

No other consents included a provision for an option for review in June 2019.

4 Recommendations

1. THAT in the first instance, monitoring of the Motukawa HEP Scheme in the 2019-2020 year continue at the same level as in 2018-2019.
2. THAT should there be issues with environmental or administrative performance in 2019-2020, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.
3. THAT the scope of the monitoring surveys required under condition 4 of consent 3371-2 be further discussed during the 2019-2020 monitoring period and a final position on the ongoing survey methodology be agreed upon.
4. THAT the Company apply to change the conditions of consent 6390-1, so that the specified locations are consistent with consent 3371-2.

Glossary of common terms and abbreviations

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

Biomonitoring	Assessing the health of the environment using aquatic organisms.
Bund	A wall around a tank to contain its contents in the case of a leak.
Cumec	A volumetric measure of flow- 1 cubic metre per second (1 m ³ s ⁻¹).
DO	Dissolved oxygen.
EPT	EPT represents three insect orders as a collective, grouping Ephemeroptera (mayfly), Plecoptera (stonefly) and Trichoptera (caddisfly) which are macroinvertebrate taxa.
Fresh	Elevated flow in a stream, such as after heavy rainfall.
g/m ² /day	grams/metre ² /day.
g/m ³	Grams per cubic metre, and equivalent to milligrams per litre (mg/L). In water, this is also equivalent to parts per million (ppm), but the same does not apply to gaseous mixtures.
Incident	An event that is alleged or is found to have occurred that may have actual or potential environmental consequences or may involve non-compliance with a consent or rule in a regional plan. Registration of an incident by the Council does not automatically mean such an outcome had actually occurred.
Intervention	Action/s taken by Council to instruct or direct actions be taken to avoid or reduce the likelihood of an incident occurring.
Investigation	Action taken by Council to establish what were the circumstances/events surrounding an incident including any allegations of an incident.
Incident Register	The Incident Register contains a list of events recorded by the Council on the basis that they may have the potential or actual environmental consequences that may represent a breach of a consent or provision in a Regional Plan.
L/s	Litres per second.
m ²	Square Metres.
MCI	Macroinvertebrate community index; a numerical indication of the state of biological life in a stream that takes into account the sensitivity of the taxa present to organic pollution in stony habitats.
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.
NTU	Nephelometric Turbidity Unit, a measure of the turbidity of water.
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 87 of the RMA. Resource consents include land use consents (refer Sections 9 and 13 of the RMA), coastal permits (Sections 12, 14 and 15), water permits (Section 14) and discharge permits (Section 15).
RMA	<i>Resource Management Act 1991</i> and including all subsequent amendments.
SS	Suspended solids.
SQMCI _s	Semi quantitative macroinvertebrate community index.
Temp	Temperature, measured in °C (degrees Celsius).

Turb	Turbidity, expressed in NTU.
UI	Unauthorised Incident.

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

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Appendix I

Resource consents held by the Trustpower Ltd

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

Consent number	Purpose	Granted	Review	Expires
1166-3	To discharge up to 4000 cubic metres/day [10,000 cubic metres/year] of dredgings from maintenance of Lake Ratapiko in the Waitara catchment onto land above the one-metre mark around the lake margin	19 September 2001	-	1 June 2022
3369-2	To take and use up to 5200 L/s of water from the Manganui River in the Waitara catchment for hydroelectric power generation purposes	19 September 2001	-	1 June 2022
3371-2	To divert and use up to 8000 L/s of stormwater run-off and the entire flow of various unnamed watercourses draining into the race and into Lake Ratapiko in the Waitara catchment for hydroelectric power supply purposes	19 September 2001 Varied 4 July 2016	At any time if there is flooding attributable to the scheme	1 June 2022
3373-2	To dam the Mako Stream a tributary of the Makino Stream in the Waitara catchment to form Lake Ratapiko for hydroelectric power generation purposes, including the spillway structure	19 September 2001 Varied 4 November 2002	-	1 June 2022
5080-1	To erect, place, use and maintain the weir and various structures associated with hydroelectric power generation activities in the Manganui River in the Waitara catchment	19 September 2001	-	1 June 2022
5081-1	To erect, place, use and maintain the Mangaotea Aqueduct associated with hydroelectric power generation activities in and above the Mangaotea Stream a tributary of the Manganui River in the Waitara catchment	19 August 1999	-	1 June 2022
5082-1	To discharge, under emergency conditions, up to 2000 L/s of overflow water from the Mangaotea Aqueduct into the Mangaotea Stream a tributary of the Manganui River in the Waitara catchment	19 August 1999	-	1 June 2022
5084-1	To discharge up to 55,000 L/s of hydroelectric power generation water, during adverse weather conditions, via spillways and lake drainage valves from Lake Ratapiko into the Mako Stream a tributary of the Makino Stream in the Waitara catchment	19 September 2001	-	1 June 2022
5085-1	To disturb the bed of Lake Ratapiko in the Waitara catchment for maintenance and repairs associated with hydroelectric power generation purposes	19 September 2001	-	1 June 2022
5086-1	To erect, place, use and maintain various structures in, on and over the bed of Lake Ratapiko in the Waitara catchment for hydroelectric power generation purposes	19 September 2001	-	1 June 2022
5087-1	To take and use up to 7787 L/s of water from Lake Ratapiko in the Waitara catchment for hydroelectric power generation purposes	19 September 2001	-	1 June 2022

Consent number	Purpose	Granted	Review	Expires
5088-1	To discharge up to 2000 L/s of water from the surge chamber of the Motukawa hydroelectric power station during maintenance periods into an unnamed tributary of the Makara Stream in the Waitara catchment	19 September 2001	-	1 June 2022
6381-1	To take and use water from the Mangaotea Stream, a tributary of the Manganui River in the Waitara catchment, for hydroelectric power generation purposes	7 December 2007	-	1 June 2022
6382-1	To impound water behind a temporary dam within the Mangaotea Stream a tributary of the Manganui River in the Waitara catchment, for the purposes of constructing a water intake structure for hydroelectric power generation purposes	7 December 2005	-	1 June 2022
6383-1	To divert water around a temporary dam within the Mangaotea Stream, a tributary of the Manganui River in the Waitara catchment, for the purposes of constructing a water intake structure for hydroelectric power generation purposes	7 December 2005	-	1 June 2022
6384-1	To erect, place and maintain a temporary dam within the Mangaotea Stream, a tributary of the Manganui River in the Waitara catchment, for the purposes of constructing a water intake structure for hydroelectric power generation purposes	7 December 2007	-	1 June 2022
6385-1	To erect, place and maintain an intake structure including pumps in the bed of the Mangaotea Stream for the purposes of abstracting water for hydroelectric power generation purposes	7 December 2005 Varied 9 February 2007	-	1 June 2022
6386-1	To disturb and modify the bed and banks of the Mangaotea Stream, a tributary of the Manganui River in the Waitara catchment, associated with the construction of an intake structure for hydroelectric power generation purposes	7 December 2005	-	1 June 2022
6387-1	To discharge sediments from earthworks into the Mangaotea Stream, a tributary of the Manganui River in the Waitara catchment, associated with the construction of an intake structure, for hydroelectric power generation purposes	7 December 2005	-	1 June 2022
6388-1	To divert and use water in the Motukawa Race for hydroelectric power generation purposes	27 July 2004	-	1 June 2022
6388-1	To divert and use water in the Motukawa Race for hydroelectric power generation purposes at or about GR: Q19:228-200	27 July 2004	-	1 June 2022
6390-1	To impound water behind a dam on the Motukawa Race for hydroelectric power generation purposes	27 July 2004 Varied 23 June 2006	-	1 June 2022

Consent number	Purpose	Granted	Review	Expires
6391-1	To discharge sediment during earthworks associated with the construction of a generator structure into the Motukawa Race at or about GR: Q19:228-200	27 July 2004	-	1 June 2022

Water abstraction permits

Section 14 of the RMA stipulates that no person may take, use, dam or divert any water, unless the activity is expressly allowed for by a resource consent or a rule in a regional plan, or it falls within some particular categories set out in Section 14. Permits authorising the abstraction of water are issued by the Council under Section 87(d) of the RMA.

Water discharge permits

Section 15(1)(a) of the RMA stipulates that no person may discharge any contaminant into water, unless the activity is expressly allowed for by a resource consent or a rule in a regional plan, or by national regulations. Permits authorising discharges to water are issued by the Council under Section 87(e) of the RMA.

Air discharge permits

Section 15(1)(c) of the RMA stipulates that no person may discharge any contaminant from any industrial or trade premises into air, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Permits authorising discharges to air are issued by the Council under Section 87(e) of the RMA.

Discharges of wastes to land

Sections 15(1)(b) and (d) of the RMA stipulate that no person may discharge any contaminant onto land if it may then enter water, or from any industrial or trade premises onto land under any circumstances, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Permits authorising the discharge of wastes to land are issued by the Council under Section 87(e) of the RMA.

Land use permits

Section 13(1)(a) of the RMA stipulates that no person may in relation to the bed of any lake or river use, erect, reconstruct, place, alter, extend, remove, or demolish any structure or part of any structure in, on, under, or over the bed, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Land use permits are issued by the Council under Section 87(a) of the RMA.

Coastal permits

Section 12(1)(b) of the RMA stipulates that no person may erect, reconstruct, place, alter, extend, remove, or demolish any structure that is fixed in, on, under, or over any foreshore or seabed, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Coastal permits are issued by the Council under Section 87(c) of the RMA.

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

Name of
Consent Holder: Trustpower Limited
Private Bag 12023
Tauranga 3143

Decision Date: 19 September 2001

Commencement Date: 19 September 2001

Conditions of Consent

Consent Granted: To discharge up to 4000 cubic metres/day [10000 cubic metres/year] of dredgings from maintenance of Lake Ratapiko in the Waitara catchment onto land above the one-metre mark around the lake margin

Expiry Date: 1 June 2022

Site Location: Lake Ratapiko, Ratapiko Road, Ratapiko

Grid Reference (NZTM) 1715022E-5659765N

Catchment: Waitara

Tributary: Lake Ratapiko

*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

- 1. That the consent holder shall notify the Taranaki Regional Council at least 48 hours prior to the commencement of the discharge.
- 2. That the consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to avoid or minimise the discharge of silt or other contaminants onto land arising from the discharge.
- 3. That the consent holder and staff of the Taranaki Regional Council shall meet as appropriate, and at least once per year, with interested submitters to the consent, to discuss any matter relating to the exercise of this resource consent, particularly the monitoring programme design, implementation and interpretation, in order to facilitate ongoing consultation.
- 4. That the consent holder may apply to the Taranaki Regional Council for a change or cancellation of the conditions of their consent, in accordance with section 127(1)(a) of the Resource Management Act 1991, to take account of operational requirements or the results of the monitoring, provided that such application may not be made more than once in any twelve month period.

Consent 1166-3

5. That the Taranaki Regional Council may review any or all of the conditions of this consent, pursuant to section 128 of the Resource Management Act 1991, by giving notice of review during the month of June 2001, June 2003, June 2009, and/or June 2015, 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 or which it was not appropriate to deal with at the time.

Transferred at Stratford on 31 October 2016

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

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

Name of
Consent Holder: Trustpower Limited
Private Bag 12023
Tauranga 3143

Decision Date: 19 September 2001

Commencement Date: 19 September 2001

Conditions of Consent

Consent Granted: To take and use up to 5200 litres/second of water from the Manganui River in the Waitara catchment for hydroelectric power generation purposes

Expiry Date: 1 June 2022

Site Location: Manganui River, Downstream Of Tariki Road Bridge,
Ratapiko, Inglewood

Grid Reference (NZTM) 1710124E-5658362N

Catchment: Waitara

Tributary: Manganui

*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 abstraction shall be managed to ensure that a residual flow of not less than 400 litres/second is maintained, at all times in the Manganui River below the weir situated at grid reference 1710124E-5658362N.
2. That the residual flow shall be passed through the fish pass, within 12 months of the granting of this consent, subject to conditions 1 and 2 of consent 5080.
3. That the consent holder shall install and operate a measuring device capable of measuring, at a minimum of 15 minute intervals, the abstraction rate of water from the Manganui River and shall make records of such measurements available to the Chief Executive, at three monthly intervals.
4. That the abstraction shall be managed so as to ensure that when the flow in the Waitara River, as measured at the Bertrand Road hydrology gauging site, is less than or equal to 5000 litres/second, the flow in the upper Manganui River, above the weir will either:
 - (a) pass directly over the weir into the Manganui River; or
 - (b) pass continuously through Lake Ratapiko [with provision for the residual flow in the Manganui River] and the power station into the Makara Stream, and thence the lower Waitara River;

in order to mitigate the effects of low flows in the Waitara River. The Taranaki Regional Council shall notify the consent holder when flows at the Bertrand Road site are equal to 5000 litres/second.

5. That the consent holder shall pass 400 litres/second for three hours daily over the weir, if the weir licensed by consent 5080 is not naturally overtopped by flows in the Manganui River, of the same or larger volume, for a continuous period of 30 days.

Consent 3369-2

6. That the consent holder shall design, install, maintain and monitor a race water level control system to manage the inflow from the Manganui River, within 2 months of the granting of this consent. The purpose of the control system shall be to avoid flooding of farmland attributable to the activities of the consent holder, as a result of the abstraction and the diversion of stormwater under consent 3371. The control system shall have an emergency power source capable of monitoring the system for up to 48 hours and shutting the race intake gate.
7. That the consent holder shall, as far as is practicable, maintain a residual flow of 150 litres/second in the race during maintenance periods. During periods when it is not practicable, the consent holder shall arrange for a fish salvage operation to relocate stranded fish from the race.
8. That by the agreement of the consent holder, the consent holder shall mitigate the effects of the abstraction by donating annually to the Taranaki Tree Trust \$6000 [goods and services tax exclusive] for the purpose of providing riparian management in the Manganui River catchment.
9. That the consent holder and staff of the Taranaki Regional Council shall meet as appropriate, and at least once per year, with interested submitters to the consent, to discuss any matter relating to the exercise of this resource consent, particularly the monitoring programme design, implementation and interpretation, in order to facilitate ongoing consultation.
10. That the consent holder may apply to the Taranaki Regional Council for a change or cancellation of the conditions of this consent, in accordance with section 127(1)(a) of the Resource Management Act 1991, to take account of operational requirements or the results of monitoring, provided that such application may not be made more than once in any twelve month period.
11. That the Taranaki Regional Council may review any or all of the conditions of this consent, pursuant to section 128 of the Resource Management Act 1991, by giving notice of review during the month of June 2001, June 2003, June 2009 and/or June 2015, 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 or which it was not appropriate to deal with at the time.

Transferred at Stratford on 31 October 2016

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

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

Name of
Consent Holder: Trustpower Limited
Private Bag 12023
Tauranga 3143

Decision Date
(Change): 7 July 2016

Commencement Date
(Change): 7 July 2016 (Granted: 19 September 2001)

Conditions of Consent

Consent Granted: To divert and use up to 8000 litres/second of stormwater run-off and the entire flow of various unnamed watercourses draining into the race and into Lake Ratapiko in the Waitara catchment for hydroelectric power supply purposes

Expiry Date: 1 June 2022

Review: In accordance with special condition 8

Site Location: Motukawa Hydro Race & Lake Ratapiko, Tariki Road,
Ratapiko

Grid Reference (NZTM) 1710120E-5658360N

Catchment: Waitara

Tributary: Manganui

*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

1. That the consent holder shall design, install, maintain and monitor a race water level control system, within 2 months of the granting of this consent, for the purpose of achieving compliance with condition 2. The control system shall have an emergency power source capable of monitoring the system for up to 48 hours and shutting the race intake gate.
2. That the consent holder shall manage the water in the race so as to avoid or minimise the potential for flooding of adjacent farmland attributable to the activities of the consent holder by ensuring a maximum race water level (metres), above mean sea-level, of:
 - 205.20 at Salisbury Road (NZTM: 1711773E-5658233N);
 - 199.30 at Mangaotea (NZTM: 1712685E-5658307N);
 - 199.25 at the Mangaotea Aqueduct (NZTM: 1712760E-5658335N);
 - 199.15 at Lower Mangaotea (NZTM: 1713893E-5659542N).
3. That the consent holder shall, within 1 month of granting of this consent, install and survey stage boards at the sites noted in condition 2 for the purpose of providing a visual check of race water levels, to the satisfaction of the Chief Executive.
4. That a five-yearly monitoring survey of the race be completed by the consent holder to identify any maintenance requirements in order to maintain a race capacity of 8000 litres/second, for the purpose of avoiding flooding adjacent farmland, any required maintenance shall occur within 12 months of the completion of the survey.
5. That the consent holder shall install and operate measuring devices capable of measuring the water level, at a minimum of 15 minute intervals, in the race at the locations specified in condition 2, and shall make records of such measurements available to the Chief Executive at three monthly intervals. The records supplied are also to include the rainfall data at hourly intervals from the station established at the Mangaotea Road culvert.

Consent 3371-2.1

6. That the consent holder and staff of the Taranaki Regional Council shall meet as appropriate, and at least once per year, with interested submitters to the consent, to discuss any matter relating to the exercise of this resource consent particularly the monitoring programme design, implementation and interpretation, in order to facilitate ongoing consultation.
7. That:
 - a) In order to ensure compliance with conditions 1 to 2 of this consent or to remedy any adverse environmental effects caused by the acts or omissions of the consent holder in carrying out activities pursuant to these conditions, the Taranaki Regional Council requires the consent holder to enter into a bond with a financial institution of good repute to be provided as surety to the reasonable satisfaction of the Chief Executive;
 - b) The bond shall be in the sum of \$150,000;
 - c) The consent holder shall complete such work requested, in respect of which any bond is held, within the time period nominated by the Taranaki Regional Council's written request;
 - d) If the bond is raised and required pursuant to paragraph 7(b) it shall be held or remain in full force and effect throughout the term of the consent and until all requirements of the bond have been performed;
 - e) The form of the bond is to be prepared by the Taranaki Regional Council's solicitors and the consent holder is to pay the Taranaki Regional Council's costs on preparation and execution of the bond;
 - f) If the consent is transferred in part or whole to another party or person, the bond shall continue until any outstanding work at the date of transfer is completed to ensure compliance with the conditions of this consent, unless the Taranaki Regional Council is satisfied adequate provisions have been made to transfer the liability to the new consent holder;
 - g) In the event of any such transfer of the consent, the consent holder shall ensure that the transferee forthwith provides a replacement bond to the Taranaki Regional Council on the terms required by condition 7(a) to 7(f);

provided that this condition shall only take effect if flooding of land adjoining the race attributable to the activities of the consent holder occurs within the period 1 May 1999 to 30 April 2000. For the avoidance of doubt, the consent holder shall not be required to establish such a bond unless such flooding occurs within that period.

8. That the Taranaki Regional Council may review, under section 128 of the Resource Management Act 1991, the conditions of this consent if, at any time after the race water level control system is installed, there is flooding of adjoining of the Motukawa Power Scheme attributable to the activities of the consent holder.

Consent 3371-2.1

9. That the consent holder may apply to the Taranaki Regional Council for a change or cancellation of the conditions of this consent, in accordance with section 127(1)(a) of the Resource Management Act 1991, to take account to operational requirements or the results of monitoring provided that such an application may not be made more than once in any twelve month period.
10. That the Taranaki Regional Council may review any or all of the conditions of this consent, pursuant to section 128 of the Resource Management Act 1991, by giving notice of review during the month of June 2001, June 2003, June 2009 and/or June 2015, 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 or which it was not appropriate to deal with at the time.

Transferred at Stratford on 31 October 2016

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

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

Name of
Consent Holder: Trustpower Limited
Private Bag 12023
Tauranga 3143

Decision Date
(Change): 4 November 2002

Commencement Date
(Change): 4 November 2002 (Granted Date: 19 September 2001)

Conditions of Consent

Consent Granted: To dam the Mako Stream a tributary of the Makino Stream in the Waitara catchment to form Lake Ratapiko for hydroelectric power generation purposes, including the spillway structure

Expiry Date: 1 June 2022

Site Location: Motukawa Hydroelectric Power Scheme, Lake Ratapiko, Ratapiko Road, Ratapiko, Inglewood

Grid Reference (NZTM) 1715023E-5659165N

Catchment: Waitara

Tributary
Makino
Mako
Lake Ratapiko

*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, within 6 months of the granting of this consent, provide a SEED [Survey Evaluation of Existing Dams] review from a registered engineer, experienced in the design and safety of dams.
- 2. That it is the responsibility of the consent holder to maintain and operate a safe dam and the Taranaki Regional Council accepts no responsibility in this regard.
- 3. The consent holder may construct, place and maintain a structure on top of the spillway crest for the purpose of increasing lake storage.
- 4. That the consent holder shall manage the structure in condition 3 and the lake level so as to avoid flooding of land adjacent to the lake and race as may be attributable to the activities of the consent holder.
- 5. That the consent holder shall ensure that a minimum lake water level of 194 metres above mean sea level, is retained at all times, except during periods of maintenance, for the purpose of maintaining aquatic habitat.
- 6. That the consent holder shall ensure the maximum level, under normal operating conditions, of Lake Ratapiko does not exceed 198.7 metres above mean sea level.
- 7. That the consent holder shall design, install, maintain and monitor a facility to enable the passage of elvers and adult eels over the spillway within six months of the granting of this consent. The monitoring information is to be forwarded to the Chief Executive, Taranaki Regional Council, at twelve monthly intervals.
- 8. That the consent holder shall install and operate a measuring device capable of measuring the lake water level, at a minimum of 15 minute intervals, at the spillway, and shall make records of such measurements available to the Chief Executive, at three monthly intervals.

Consent 3373-2

9. That the consent holder and staff of the Taranaki Regional Council shall meet as appropriate, and at least once per year, with interested submitters to the consent, to discuss any matter relating to the exercise of this resource consent, particularly the monitoring programme design, implementation and interpretation, in order to facilitate ongoing consultation.
10. That the consent holder may apply to the Taranaki Regional Council for a change or cancellation of the conditions of their consent, in accordance with section 127(1)(a) of the Resource Management Act 1991, to take account of operational requirements or the results of the monitoring, provided that such application may not be made more than once in any twelve month period.
11. That the Taranaki Regional Council may review any or all of the conditions of this consent, pursuant to section 128 of the Resource Management Act 1991, by giving notice of review during the month of June 2001, June 2003, June 2009 and/or June 2015, 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 or which it was not appropriate to deal with at the time.

Transferred at Stratford on 31 October 2016

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

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

Name of
Consent Holder: Trustpower Limited
Private Bag 12023
Tauranga 3143

Decision Date: 19 September 2001

Commencement Date: 19 September 2001

Conditions of Consent

Consent Granted: To erect, place, use and maintain the weir and various structures associated with hydroelectric power generation activities in the Manganui River in the Waitara catchment

Expiry Date: 1 June 2022

Site Location: Manganui River, Tariki Road, Ratapiko, Inglewood

Grid Reference (NZTM) 1710124E-5658362N

Catchment: Waitara

Tributary: Manganui

*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 design, install, maintain and monitor a structure at the weir to enable the passage of eels, native fish, juvenile and adult trout.
2. That the fish pass structure, required by condition 1, shall be constructed within 12 months of the granting of this consent, according to sheets 1, 2 and 3 of drawing 4-1007-2-7804 supplied with the application. The consent holder shall notify the Taranaki Regional Council at least 48 hours prior to the commencement of fish pass construction.
3. That the consent holder shall install, maintain and operate a light barrier, within 6 months of the granting of this consent, for the purpose of diverting fish from the intake gate.
4. That the consent holder and staff of the Taranaki Regional Council shall meet as appropriate, and at least once per year, with interested submitters to the consent, to discuss any matter relating to the exercise of this resource consent, particularly the monitoring programme design, implementation and interpretation, in order to facilitate ongoing consultation.
5. That the consent holder may apply to the Taranaki Regional Council for a change or cancellation of the conditions of their consent, in accordance with section 127(1)(a) of the Resource Management Act 1991, to take account of operational requirements or the results of the monitoring, provided that such application may not be made more than once in any twelve month period.

Consent 5080-1

6. That the Taranaki Regional Council may review any or all of the conditions of this consent, pursuant to section 128 of the Resource Management Act 1991, by giving notice of review during the month of June 2001, June 2003, June 2009 and/or June 2015, 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 or which it was not appropriate to deal with at the time.

Transferred at Stratford on 31 October 2016

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

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

Name of
Consent Holder: Trustpower Limited
Private Bag 12023
Tauranga 3143

Decision Date: 19 August 1999

Commencement Date: 19 August 1999

Conditions of Consent

Consent Granted: To erect, place, use and maintain the Mangaotea Aqueduct associated with hydroelectric power generation activities in and above the Mangaotea Stream a tributary of the Manganui River in the Waitara catchment

Expiry Date: 1 June 2022

Site Location: Mangaotea Stream Aqueduct, Mangaotea Road, Ratapiko Inglewood

Grid Reference (NZTM) 1712724E-5658364N

Catchment: Waitara

Tributary: Manganui
Mangaotea

*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

1. That the consent holder shall, within 1 month of the granting of this consent, install and survey a stage board in the race at the Mangaotea Aqueduct, for the purpose of providing a visual check on race water levels, to the satisfaction of the Chief Executive.
2. That the consent holder shall, within 12 months of the granting of this consent, lower the northern side of the aqueduct by 300 mm to provide for a flow of 2 000 litres/second and shall install a gate in the lowered section which shall be controlled by the race water level control system.
3. That the consent holder and staff of the Taranaki Regional Council shall meet as appropriate, and at least once per year, with interested submitters to the consent, to discuss any matter relating to the exercise of this resource consent, particularly the monitoring programme design, implementation and interpretation, in order to facilitate ongoing consultation.
4. That the consent holder may apply to the Taranaki Regional Council for a change or cancellation of the conditions of their consent, in accordance with section 127(1)(a) of the Resource Management Act 1991, to take account of operational requirements or the results of the monitoring, provided that such application may not be made more than once in any twelve month period.

Consent 5081-1

5. That the Taranaki Regional Council may review any or all of the conditions of this consent, pursuant to section 128 of the Resource Management Act 1991, by giving notice of review during the month of June 2001, June 2003, June 2009 and/or June 2015, 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 or which it was not appropriate to deal with at the time.

Transferred at Stratford on 31 October 2016

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

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

Name of
Consent Holder: Trustpower Limited
Private Bag 12023
Tauranga 3143

Decision Date: 19 August 1999

Commencement Date: 19 August 1999

Conditions of Consent

Consent Granted: To discharge, under emergency conditions, up to 2000 litres/second of overflow water from the Mangaotea Aqueduct into the Mangaotea Stream a tributary of the Manganui River in the Waitara catchment

Expiry Date: 1 June 2022

Site Location: Mangaotea Aqueduct Mangaotea Road, Ratapiko Inglewood

Grid Reference (NZTM) 1712724E-5658364N

Catchment: Waitara

Tributary: Manganui
Mangaotea

*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

1. That the discharge shall occur after compliance with condition 2 of consent TRK995081 is achieved.
2. That emergency conditions constitute a period when local stormwater runoff to the race is required to be discharged to the Mangaotea Stream in order to avoid the race flooding adjoining land.
3. That the consent holder shall manage the discharge so as to avoid or minimise the flooding of farmland and roads below the discharge, as may be attributable to the activities of the consent holder.
4. That by the agreement of the consent holder, the consent holder shall set aside \$600 annually, [adjusted annually to reflect changes in the Cost Construction Index as published by the Department of Statistics or its succeeding organisation], for the maintenance of the flood capacity of the Mangaotea Stream below the discharge to mitigate the effects of the discharge and shall make the funds available to landowners for such works, to the reasonable satisfaction of the General Manager, Taranaki Regional Council, upon request.
5. That the consent holder may apply to the Taranaki Regional Council for a change or cancellation of the conditions of their consent, in accordance with section 127(1)(a) of the Resource Management Act 1991, to take account of operational requirements or the results of the monitoring, provided that such application may not be made more than once in any twelve month period.
6. That the consent holder and staff of the Taranaki Regional Council shall meet as appropriate, and at least once per year, with interested submitters to the consent, to discuss any matter relating to the exercise of this resource consent, particularly the monitoring programme design, implementation and interpretation, in order to facilitate ongoing consultation.

Consent 5082-1

7. That the Taranaki Regional Council may review any or all of the conditions of this consent, pursuant to section 128 of the Resource Management Act 1991, by giving notice of review during the month of June 2001, June 2003, June 2009 and/or June 2015, 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 or which it was not appropriate to deal with at the time.

Transferred at Stratford on 31 October 2016

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

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

Name of
Consent Holder: Trustpower Limited
Private Bag 12023
Tauranga 3143

Decision Date: 19 September 2001

Commencement Date: 19 September 2001

Conditions of Consent

Consent Granted: To discharge up to 55,000 litres/second of hydroelectric power generation water, during adverse weather conditions, via spillways and lake drainage valves from Lake Ratapiko into the Mako Stream a tributary of the Makino Stream in the Waitara catchment

Expiry Date: 1 June 2022

Site Location: Lake Ratapiko / Mako Stream, Ratapiko Road, Ratapiko, Inglewood

Grid Reference (NZTM) 1715023E-5659165N

Catchment: Waitara

Tributary: Makino
Mako

*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

1. That the consent holder shall, within 6 months of the granting of this consent, prepare a contingency plan for the purpose of managing the discharge so as to avoid or minimise damage to property downstream. The contingency plan shall include reporting the exercise of the consent.
2. That the consent holder shall exercise the consent in accordance with the contingency plan.
3. That the consent holder and staff of the Taranaki Regional Council shall meet as appropriate, and at least once per year, with interested submitters to the consent, to discuss any matter relating to the exercise of this resource consent, particularly the monitoring programme design, implementation and interpretation, in order to facilitate ongoing consultation.
4. That the consent holder may apply to the Taranaki Regional Council for a change or cancellation of the conditions of their consent, in accordance with section 127(1)(a) of the Resource Management Act 1991, to take account of operational requirements or the results of the monitoring, provided that such application may not be made more than once in any twelve month period.

Consent 5084-1

5. That the Taranaki Regional Council may review any or all of the conditions of this consent, pursuant to section 128 of the Resource Management Act 1991, by giving notice of review during the month of June 2001, June 2003, June 2009 and/or June 2015, 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 or which it was not appropriate to deal with at the time.

Transferred at Stratford on 31 October 2016

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

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

Name of
Consent Holder: Trustpower Limited
Private Bag 12023
Tauranga 3143

Decision Date: 19 September 2001

Commencement Date: 19 September 2001

Conditions of Consent

Consent Granted: To disturb the bed of Lake Ratapiko in the Waitara catchment for maintenance and repairs associated with hydroelectric power generation purposes

Expiry Date: 1 June 2022

Site Location: Lake Ratapiko, Ratapiko Road Ratapiko, Inglewood

Grid Reference (NZTM) 1714723E-5659565N

Catchment: Waitara

Tributary: Lake Ratapiko

*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

- 1. That the consent holder shall notify the Taranaki Regional Council at least 48 hours prior to the commencement of any disturbance activities.
- 2. That the consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or potential effect on the environment arising from any disturbance activities.
- 3. That the consent holder and staff of the Taranaki Regional Council shall meet as appropriate, and at least once per year, with interested submitters to the consent, to discuss any matter relating to the exercise of this resource consent, particularly the monitoring programme design, implementation and interpretation, in order to facilitate ongoing consultation.
- 4. That the consent holder may apply to the Taranaki Regional Council for a change or cancellation of the conditions of their consent, in accordance with section 127(1)(a) of the Resource Management Act 1991, to take account of operational requirements or the results of the monitoring, provided that such application may not be made more than once in any twelve month period.

Consent 5085-1

5. That the Taranaki Regional Council may review any or all of the conditions of this consent, pursuant to section 128 of the Resource Management Act 1991, by giving notice of review during the month of June 2001, June 2003, June 2009 and/or June 2015, 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 or which it was not appropriate to deal with at the time.

Transferred at Stratford on 31 October 2016

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

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

Name of
Consent Holder: Trustpower Limited
Private Bag 12023
Tauranga 3143

Decision Date: 19 September 2001

Commencement Date: 19 September 2001

Conditions of Consent

Consent Granted: To erect, place, use and maintain various structures in, on and over the bed of Lake Ratapiko in the Waitara catchment for hydroelectric power generation purposes

Expiry Date: 1 June 2022

Site Location: Lake Ratapiko, Ratapiko Road, Ratapiko, Inglewood

Grid Reference (NZTM) 1714723E-5659565N

Catchment: Waitara

Tributary: Lake Ratapiko

*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

1. That the consent holder shall maintain the penstock intake screens with spaces no larger than 30 mm in order to minimise eel and fish entrapment.
2. That the consent holder shall install, maintain and operate a light barrier, within 6 months of the granting of this consent, for the purpose of diverting fish from the penstock intake screens.
3. That the consent holder shall, within 1 month of the granting of this consent, install and survey a stage board in the lake, for the purpose of providing a visual check on lake water levels, to the satisfaction of the Chief Executive.
4. That the consent holder shall, within 13 months of the granting of this consent, upgrade the Ratapiko Road causeway, so as not to restrict the flow of water between the two parts of Lake Ratapiko, for the purpose of avoiding flooding land adjoining the race.
5. That the consent holder may apply to the Taranaki Regional Council for a change or cancellation of the conditions of this consent in accordance with section 127(1)(a) of the Resource Management Act 1991, to take account of operational requirements, or the results of monitoring, or to assess the appropriateness of condition 4, provided that such application may not be made more than once in any twelve month period.
6. That the consent holder and staff of the Taranaki Regional Council shall meet as appropriate, and at least once per year, with interested submitters to the consent, to discuss any matter relating to the exercise of this resource consent, particularly the monitoring programme design, implementation and interpretation, in order to facilitate ongoing consultation.

Consent 5086-1

7. That the Taranaki Regional Council may review any or all of the conditions of this consent, pursuant to section 128 of the Resource Management Act 1991, by giving notice of review during the month of June 2001, June 2003, June 2009 and/or June 2015, 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 or which it was not appropriate to deal with at the time.

Transferred at Stratford on 31 October 2016

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

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

Name of
Consent Holder: Trustpower Limited
Private Bag 12023
Tauranga 3143

Decision Date: 19 September 2001

Commencement Date: 19 September 2001

Conditions of Consent

Consent Granted: To take and use up to 7787 litres/second of water from Lake Ratapiko in the Waitara catchment for hydroelectric power generation purposes

Expiry Date: 1 June 2022

Site Location: Lake Ratapiko, Ratapiko Road, Ratapiko, Inglewood

Grid Reference (NZTM) 1716522E-5659566N

Catchment: Waitara

Tributary: Lake Ratapiko

*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

1. That the consent holder shall ensure that a minimum lake water level of 194 metres above mean sea level is retained at all times, except during periods of maintenance, for the purpose of maintaining aquatic habitat.
2. That the consent holder shall, for lake maintenance purposes, draw the level of Lake Ratapiko down gradually, over a 7-day period, in order to avoid or minimise fish stranding, and shall notify the Taranaki Regional Council and Fish and Game New Zealand at the commencement of the draw down period.
3. That the consent holder shall ensure that the maximum level, under normal operating conditions, of Lake Ratapiko does not exceed 198.7 metres above mean sea level.
4. That the consent holder shall manage lake levels so as to avoid or minimise the potential for the flooding of land adjoining the lake and race attributable to the activities of the consent holder.
5. That the consent holder and staff of the Taranaki Regional Council shall meet as appropriate, and at least once per year, with interested submitters to the consent, to discuss any matter relating to the exercise of this resource consent, particularly the monitoring programme design, implementation and interpretation, in order to facilitate ongoing consultation.
6. That the consent holder may apply to the Taranaki Regional Council for a change or cancellation of the conditions of their consent, in accordance with section 127(1)(a) of the Resource Management Act 1991, to take account of operational requirements or the results of the monitoring, provided that such application may not be made more than once in any twelve month period.

Consent 5087-1

7. That the Taranaki Regional Council may review any or all of the conditions of this consent, pursuant to section 128 of the Resource Management Act 1991, by giving notice of review during the month of June 2001, June 2003, June 2009 and/or June 2015, 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 or which it was not appropriate to deal with at the time.

Transferred at Stratford on 31 October 2016

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

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

Name of
Consent Holder: Trustpower Limited
Private Bag 12023
Tauranga 3143

Decision Date: 19 September 2001

Commencement Date: 19 September 2001

Conditions of Consent

Consent Granted: To discharge up to 2000 litres/second of water from the surge chamber of the Motukawa hydroelectric power station during maintenance periods into an unnamed tributary of the Makara Stream in the Waitara catchment

Expiry Date: 1 June 2022

Site Location: Motukawa HEP Station, Motukawa Road, Ratapiko, Inglewood

Grid Reference (NZTM) 1718421E-5661167N

Catchment: Waitara

Tributary: Makara

*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

1. That the consent holder shall, within 6 months of the granting of this consent, prepare a contingency plan for the purpose of managing the discharge so as to avoid or minimise the potential for damage to property downstream.
2. The consent holder shall exercise the consent in accordance with the contingency plan.
3. That the consent holder shall notify the Taranaki Regional Council at least 48 hours prior to the discharge and shall adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or likely effect on the environment arising from the discharge.
4. That the consent holder and staff of the Taranaki Regional Council shall meet as appropriate, and at least once per year, with interested submitters to the consent, to discuss any matter relating to the exercise of this resource consent, particularly the monitoring programme design, implementation and interpretation, in order to facilitate ongoing consultation.
5. That the consent holder may apply to the Taranaki Regional Council for a change or cancellation of the conditions of their consent, in accordance with section 127(1)(a) of the Resource Management Act 1991, to take account of operational requirements or the results of the monitoring, provided that such application may not be made more than once in any twelve month period.

Consent 5088-1

6. That the Taranaki Regional Council may review any or all of the conditions of this consent, pursuant to section 128 of the Resource Management Act 1991, by giving notice of review during the month of June 2001, June 2003, June 2009 and/or June 2015, 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 or which it was not appropriate to deal with at the time.

Transferred at Stratford on 31 October 2016

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

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

Name of
Consent Holder: Trustpower Limited
Private Bag 12023
Tauranga 3143

Decision Date: 7 December 2005

Commencement Date: 7 December 2005

Conditions of Consent

Consent Granted: To take and use water from the Mangaotea Stream, a tributary of the Manganui River in the Waitara catchment, for hydroelectric power generation purposes

Expiry Date: 1 June 2022

Site Location: Downstream of Mangaotea Aquaduct, Mangaotea Road,
Ratapiko,

Grid Reference (NZTM) 1712760E-5658335N

Catchment: Waitara

Tributary: Manganui
Mangaotea

*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 generally in accordance with the documentation submitted in support of application 3051. In the case of any contradiction between the documentation submitted in support of application 3051 and the conditions of this consent, the conditions of this consent shall prevail.
2. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least seven days prior to the exercise of this consent.
3. The volume of water abstracted shall not exceed 38,880 cubic metres per day at a rate not exceeding 450 litres per second.
4. For the first two years following the exercise of this consent the abstraction authorised by this consent shall cease when the flow in the Mangaotea Stream immediately downstream of the confluence with the Little Mangaotea Stream located at Q19: 227-201 (GPS E2622779 N6220149) is equal to or less than 94 litres per second. If at this site flows are greater than 94 litres per second, the abstraction shall cease when the flow in the Mangaotea Stream immediately downstream of the abstraction point (GPS E2622836 N6220071) is equal to or less than 35 L/s.
5. Two years after the exercise of this consent, and following assessment of monitoring conducted as per special conditions 8, if a review of the residual flows detailed in special condition 4 is required (as per condition 9), residual flows shall be based on 55% of the median flow immediately downstream of the confluence with the Little Mangaotea Stream, and at the point of abstraction shall be 35 L/s or mean annual low flow whichever is higher.

Consent 6381-1

6. That if a flushing flow (defined as three times the median flow) has not occurred within a continuous period of 20 days, the consent holder shall cease abstraction for 8 hours during the next naturally occurring flushing flow, so as to enhance water quality downstream of the abstraction point.
7. Prior to the operation of this consent, the consent holder shall install and operate measuring devices capable of measuring, at a minimum of 15 minute intervals the:
 - abstraction rate of water from the Mangaotea Stream;
 - residual flow in the Mangaotea Stream immediately downstream of the abstraction point; and
 - flow downstream of the confluence with the Little Mangaotea Stream;

and shall make records of such measurements available to the Chief Executive, Taranaki Regional Council, at three monthly intervals.

8. In the first two years following the exercise of this consent, a monitoring programme designed in consultation with submitters and the Taranaki Regional Council, shall be commissioned and implemented by the consent holder to determine hydrological and ecological effects on the Mangaotea Stream and Manganui River downstream of the Mangaotea Stream confluence, and whether the residual flow is appropriate. Following the completion of monitoring, the consent holder shall forward the report(s) of these investigations to the Taranaki Regional Council and submitters within 6 weeks.
9. In accordance with section 128 of the Resource Management Act 1991, the Taranaki Regional Council may review the conditions of this consent if, after the completion of the residual flow monitoring and ecological assessments, two years following the exercise of this consent, and in consultation with submitters, it is found that the residual flow and/or flow regime is not appropriate.
10. That the consent holder and staff of the Taranaki Regional Council shall meet as appropriate and at least once per year, with interested submitters to the consent, to discuss any matter relating to the exercise of this resource consent, particularly the monitoring programme design, implementation and interpretation, in order to facilitate ongoing consultation.
11. This consent shall lapse on the expiry of ten 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.

Consent 6381-1

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 2007 and/or June 2009 and/or June 2015, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Transferred at Stratford on 31 October 2016

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

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

Name of
Consent Holder: Trustpower Limited
Private Bag 12023
Tauranga 3143

Decision Date: 7 December 2005

Commencement Date: 7 December 2005

Conditions of Consent

Consent Granted: To impound water behind a temporary dam within the Mangaotea Stream a tributary of the Manganui River in the Waitara catchment, for the purposes of constructing a water intake structure for hydroelectric power generation purposes

Expiry Date: 1 June 2022

Site Location: Downstream of Mangaotea Aquaduct, Mangaotea Road,
Ratapiko

Grid Reference (NZTM) 1712760E-5658335N

Catchment: Waitara

Tributary: Manganui
Mangaotea

*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 generally in accordance with the documentation submitted in support of application 3052. In the case of any contradiction between the documentation submitted in support of application 3052 and the conditions of this consent, the conditions of this consent shall prevail.
2. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 14 days prior to the exercise of this consent and then 48 hours upon completion of the activity.
3. The instream works authorised by this consent shall take place only between 1 November and 30 April inclusive, except where this requirement is waived in writing by the Chief Executive, Taranaki Regional Council.
4. The consent holder shall ensure that the area and volume of streambed disturbance shall, so far as practicable, be minimised and any areas which are disturbed shall, so far as practicable, be reinstated.
5. The diversion and impoundment which is the subject of this consent shall not obstruct fish passage.
6. This consent shall lapse on the expiry of ten 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.

Consent 6382-1

7. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2007 and/or June 2009 and/or June 2015, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Transferred at Stratford on 31 October 2016

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

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

Name of
Consent Holder: Trustpower Limited
Private Bag 12023
Tauranga 3143

Decision Date: 7 December 2005

Commencement Date: 7 December 2005

Conditions of Consent

Consent Granted: To divert water around a temporary dam within the Mangaotea Stream, a tributary of the Manganui River in the Waitara catchment, for the purposes of constructing a water intake structure for hydroelectric power generation purposes

Expiry Date: 1 June 2022

Site Location: Downstream of Mangaotea Aquaduct, Mangaotea Road,
Ratapiko

Grid Reference (NZTM) 1712760E-5658335N

Catchment: Waitara

Tributary: Manganui
Mangaotea

*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 generally in accordance with the documentation submitted in support of application 3053. In the case of any contradiction between the documentation submitted in support of application 3053 and the conditions of this consent, the conditions of this consent shall prevail.
2. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 14 days prior to the exercise of this consent and then 48 hours upon completion of the activity.
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 activity 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 instream works authorised by this consent shall take place only 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 ensure that the area and volume of streambed disturbance shall, so far as practicable, be minimised and any areas which are disturbed shall, so far as practicable, be reinstated.
6. The diversion and impoundment which is the subject of this consent shall not obstruct fish passage.
7. This consent shall lapse on the expiry of ten 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.

Consent 6383-1

8. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2007 and/or June 2009 and/or June 2015, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Transferred at Stratford on 31 October 2016

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

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

Name of
Consent Holder: Trustpower Limited
Private Bag 12023
Tauranga 3143

Decision Date: 7 December 2005

Commencement Date: 7 December 2005

Conditions of Consent

Consent Granted: To erect, place and maintain a temporary dam within the Mangaotea Stream, a tributary of the Manganui River in the Waitara catchment, for the purposes of constructing a water intake structure for hydroelectric power generation purposes

Expiry Date: 1 June 2022

Site Location: Downstream of Mangaotea Aquaduct, Mangaotea Road,
Ratapiko

Grid Reference (NZTM) 1712760E-5658335N

Catchment: Waitara

Tributary: Manganui
Mangaotea

*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 resource consent.
2. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 3054. In the case of any contradiction between the documentation submitted in support of application 3054 and the conditions of this consent, the conditions of this consent shall prevail.
3. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 14 days prior to the exercise of this consent and then 48 hours upon completion of the initial activity, 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 instream works authorised by this consent shall take place only 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 ensure that the area and volume of streambed disturbance shall, so far as practicable, be minimised and any areas which are disturbed shall, so far as practicable, be reinstated.
6. The diversion and impoundment which is the subject of this consent shall not obstruct fish passage.
7. This consent shall lapse on the expiry of ten 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.

Consent 6384-1

8. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2007 and/or June 2009 and/or June 2015, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Transferred at Stratford on 31 October 2016

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

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

Name of
Consent Holder: Trustpower Limited
Private Bag 12023
Tauranga 3143

Decision Date
(Change): 9 February 2007

Commencement Date
(Change): 9 February 2007 (Granted Date: 7 December 2005)

Conditions of Consent

Consent Granted: To erect, place and maintain an intake structure including pumps in the bed of the Mangaotea Stream for the purposes of abstracting water for hydroelectric power generation purposes

Expiry Date: 1 June 2022

Site Location: Downstream of Mangaotea Aqueduct, Mangaotea Road, Ratapiko

Grid Reference (NZTM) 1712760E-5658335N

Catchment: Waitara

Tributary Manganui
Mangotea

*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

Condition 1 – unchanged

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 resource consent.

Condition 2 - changed

2. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of applications 3055 & 4338. In the case of any contradiction between the documentation submitted in support of applications 3055 & 4338 and the conditions of this consent, the conditions of this consent shall prevail.

Conditions 3 – 10 – unchanged

3. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 14 days prior to the exercise of this consent and then 48 hours upon completion of the initial activity, 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 streambed or discharges to water.
4. The instream works authorised by this consent shall take place only 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 ensure that the area and volume of streambed disturbance shall, so far as practicable, be minimised and any areas which are disturbed shall, so far as practicable, be reinstated.
6. The structure which is the subject of this consent shall not obstruct fish passage.
7. The consent holder shall ensure that the intake is appropriately screened to avoid the entrapment of freshwater fauna.

Consent 6385-1

8. The structure[s] authorised by this consent shall be removed and the area reinstated, if and when the structure[s] are no longer required. The consent holder shall notify the Taranaki Regional Council at least 48 hours prior to structure[s] removal and reinstatement.
9. This consent shall lapse on the expiry of ten 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.
10. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2007 and/or June 2009 and/or June 2015, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Transferred at Stratford on 31 October 2016

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

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

Name of
Consent Holder: Trustpower Limited
Private Bag 12023
Tauranga 3143

Decision Date: 7 December 2005

Commencement Date: 7 December 2005

Conditions of Consent

Consent Granted: To disturb and modify the bed and banks of the Mangaotea Stream, a tributary of the Manganui River in the Waitara catchment, associated with the construction of an intake structure for hydroelectric power generation purposes

Expiry Date: 1 June 2022

Site Location: Downstream of Mangaotea Aquaduct, Mangaotea Road,
Ratapiko

Grid Reference (NZTM) 1712760E-5658335N

Catchment: Waitara

Tributary: Manganui
Mangaotea

*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 resource consent.
2. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 3056. In the case of any contradiction between the documentation submitted in support of application 3056 and the conditions of this consent, the conditions of this consent shall prevail.
3. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 14 days prior to the exercise of this consent and then 48 hours upon completion of the initial activity, 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 instream works authorised by this consent shall take place only 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 ensure that the area and volume of riverbed disturbance shall, so far as practicable, be minimised and any areas which are disturbed shall, so far as practicable, be reinstated.
6. The streambed works which are the subject of this consent shall not obstruct fish passage.
7. This consent shall lapse on the expiry of ten 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.

Consent 6386-1

8. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2007 and/or June 2009 and/or June 2015, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Transferred at Stratford on 31 October 2016

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

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

Name of
Consent Holder: Trustpower Limited
Private Bag 12023
Tauranga 3143

Decision Date: 7 December 2005

Commencement Date: 7 December 2005

Conditions of Consent

Consent Granted: To discharge sediments from earthworks into the Mangaotea Stream, a tributary of the Manganui River in the Waitara catchment, associated with the construction of an intake structure, for hydroelectric power generation purposes

Expiry Date: 1 June 2022

Site Location: Downstream of Mangaotea Aquaduct, Mangaotea Road, Ratapiko

Grid Reference (NZTM) 1712760E-5658335N

Catchment: Waitara

Tributary: Manganui
Mangaotea

*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 resource consent.
2. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 3057. In the case of any contradiction between the documentation submitted in support of application 3057 and the conditions of this consent, the conditions of this consent shall prevail.
3. The consent holder shall notify the Chief Executive, Taranaki Regional Council in writing at least 14 days 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 streambed or discharges to water.
4. Prior to the exercise of this consent, the consent holder shall provide for the written approval of the Chief Executive, Taranaki Regional Council, a site erosion and sediment control management plan.
5. The instream works authorised by this consent shall take place only between 1 November and 30 April inclusive, except where this requirement is waived in writing by the Chief Executive, Taranaki Regional Council.
6. After allowing for reasonable mixing, being a mixing zone extending seven times the width of the stream at the point of discharge, the discharge shall not give rise to any of the following effects in the stream:
 - a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
 - b) any conspicuous change in the colour or visual clarity;
 - c) any emission of objectionable odour;
 - d) the rendering of fresh water unsuitable for consumption by farm animals;
 - e) any significant adverse effects on aquatic life.

Consent 6387-1

7. All earthwork areas shall be stabilised vegetatively or otherwise as soon as is practicable immediately following completion of soil disturbance activities, and all areas disturbed shall be reinstated, to the satisfaction of the Chief Executive, Taranaki Regional Council.
8. This consent shall lapse on the expiry of ten 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.
9. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2007 and/or June 2009 and/or June 2015, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Transferred at Stratford on 31 October 2016

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

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

Name of
Consent Holder: TrustPower Limited
Private Bag 12023
TAURANGA

Consent Granted
Date: 27 July 2004

Conditions of Consent

Consent Granted: To divert and use water in the Motukawa Race for hydroelectric power generation purposes at or about GR: Q19:228-200

Expiry Date: 1 June 2022

Review Date(s): June 2009, June 2015

Site Location: Motukawa Race, Mangaotea Road, Ratapiko

Legal Description: Subdivision 2-3 Sec 2 Blk V Huiroa SD, Subdivision 1-2 Section 25 Blk VI Huiroa SD, and Subdivision 2-3 Section 27 Blk VI Huiroa SD

Catchment: Waitara

Tributary: Manganui
Lake Ratapiko
Motukawa Race

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 resource consent.
2. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 3058. In the case of any contradiction between the documentation submitted in support of application 3058 and the conditions of this consent, the conditions of this consent shall prevail.
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.
4. This consent shall lapse on the expiry of ten 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.
5. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2009 and/or June 2015, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 27 July 2004

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

Name of
Consent Holder: Trustpower Limited
Private Bag 12023
Tauranga 3143

Decision Date: 27 July 2004

Commencement Date: 27 July 2004

Conditions of Consent

Consent Granted: To divert and use water in the Motukawa Race for hydroelectric power generation purposes

Expiry Date: 1 June 2022

Site Location: Motukawa Race, Mangaotea Road, Ratapiko, Inglewood

Grid Reference (NZTM) 1712726E-5658316N

Catchment: Waitara

Tributary: Manganui
Lake Ratapiko
Motukawa Race

*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 resource consent.
2. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 3058. In the case of any contradiction between the documentation submitted in support of application 3058 and the conditions of this consent, the conditions of this consent shall prevail.
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.
4. This consent shall lapse on the expiry of ten 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.

Consent 6388-1

5. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2009 and/or June 2015, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Transferred at Stratford on 31 October 2016

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

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

Name of
Consent Holder: Trustpower Limited
Private Bag 12023
Tauranga 3143

Decision Date
(Change): 23 June 2006

Commencement Date
(Change): 23 June 2006 (Granted Date: 27 July 2004)

Conditions of Consent

Consent Granted: To impound water behind a dam on the Motukawa Race
for hydroelectric power generation purposes

Expiry Date: 1 June 2022

Site Location: Motukawa Race, Mangaotea Road, Ratapiko, Inglewood

Grid Reference (NZTM) 1712726E-5658316N

Catchment: Waitara

Tributary: Manganui
Lake Ratapiko
Motukawa Race

*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

Condition 1 – unchanged

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 resource consent.

Condition 2 – changed

2. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 3060 and 4257. In the case of any contradiction between the documentation submitted in support of application 3060, 4257, and the conditions of this consent, the conditions of this consent shall prevail.

Conditions 3 to 6 – unchanged

3. The consent holder shall notify the Chief Executive, Taranaki Regional Council, and Fish and Game New Zealand [Taranaki Region], in writing at least 14 days prior to the construction of the dam and turbine unit in the Motukawa Race.
4. The consent holder shall ensure that the intake is appropriately screened to avoid the entrapment of freshwater fauna.

Consent 6390-1

5. The consent holder shall, on three occasions during November to February each year, cease generation from the turbine unit and open the bypass valve for 12 hours in order to enable trout to pass through the dam.
6. The consent holder shall monitor the effectiveness of the bypass valve as a fish passage device for the first six [6] bypass events, and shall provide monitoring data to the Chief Executive, Taranaki Regional Council, and Fish and Game New Zealand [Taranaki Region], as soon as practicable after the sixth monitoring event. Monitoring shall include:
 - (a) A visual inspection of the section of the Motukawa Race from the outlet of Coxhead Tunnel to the dam site prior to the first six [6] bypass events in order to determine whether trout are accumulating in the head pond; and
 - (b) A survey of trout in the 100 metre section of the Motukawa Race downstream of the dam, prior to and immediately following the completion of each of the first six [6] bypass events.

Condition 7 – changed

7. In accordance with section 128 of the Resource Management Act 1991, the Taranaki Regional Council may review the conditions of this consent if, after the completion of the first six [6] bypass events, the monitoring shows that a significant number of trout accumulate in the generator head pond and are not being passed by the bypass valve, or there are a significant number of trout mortalities caused by passage through the turbine.

Conditions 8 to 10 – unchanged

8. The consent holder shall manage the water in the race so as to avoid or minimise the potential for flooding of adjacent farmland attributable to the activities of the consent holder by ensuring a maximum race water level [metres], above mean sea-level of:
 - 205.20 at Coxhead's Bridge [GR Q20:219 198];
 - 199.30 upstream of Mangaotea Road culvert [GR Q19:227 201];
 - 199.25 at the Mangaotea Aqueduct [GR Q19:228 201]; and
 - 199.15 at Berryman's Bridge [GR Q9:239-213].
9. This consent shall lapse on the expiry of ten 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.

Consent 6390-1

10. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2009 and/or June 2015, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Transferred at Stratford on 31 October 2016

For and on behalf of
Taranaki Regional Council

A D McLay
Director - Resource Management

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

Name of
Consent Holder: TrustPower Limited
Private Bag 12023
TAURANGA

Consent Granted
Date: 27 July 2004

Conditions of Consent

Consent Granted: To discharge sediment during earthworks associated with the construction of a generator structure into the Motukawa Race at or about GR: Q19:228-200

Expiry Date: 1 June 2022

Review Date(s): June 2009, June 2015

Site Location: Motukawa Race, Mangaotea Road, Ratapiko

Legal Description: Subdivision 2-3 Sec 2 Blk V Huiroa SD, Subdivision 1-2 Section 25 Blk VI Huiroa SD, and Subdivision 2-3 Section 27 Blk VI Huiroa SD

Catchment: Waitara

Tributary: Manganui
Lake Ratapiko
Motukawa Race

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 resource consent.
2. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 3061. In the case of any contradiction between the documentation submitted in support of application 3061 and the conditions of this consent, the conditions of this consent shall prevail.
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 river bed or discharges to water.
4. Prior to the exercise of this consent, the consent holder shall provide for the written approval of the Chief Executive, Taranaki Regional Council, a site erosion and sediment control management plan.
5. After allowing for reasonable mixing, being a mixing zone extending seven times the width of the surface water body at the point of discharge, the discharge shall not give rise to any of the following effects in any surface water body:
 - 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.
6. All earthwork areas shall be stabilised vegetatively or otherwise as soon as is practicable immediately following completion of soil disturbance activities to the satisfaction of the Chief Executive, Taranaki Regional Council.
7. This consent shall lapse on the expiry of ten 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.

Consent 6391-1

8. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2009 and/or June 2015, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 27 July 2004

For and on behalf of
Taranaki Regional Council

Director-Resource Management

