IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of The Proposed Land and Water Regional Plan

STATEMENT OF EVIDENCE OF TRACEY ELAINE HICKMAN

04 February 2013
1. INTRODUCTION

1.1 I am the General Manager: Generation Assets of Genesis Power Limited (trading as “Genesis Energy”).

1.2 As the GM Generation Assets, I am responsible for the company’s generation assets which include the Huntly Thermal Power Station, the Tongariro, Waikaremoana and Tekapo Hydro Power Stations and the Hau Nui Wind Farm. My role includes health and safety, asset management (including strategy, planning and plant performance), maintenance and operations and environmental and stakeholder management at each of these generation sites.

1.3 From October 2004 to March 2012, I was the Renewable Energy Manager, responsible for the operation, maintenance, environmental management and long term strategy development for Genesis Energy’s Renewable Energy assets, namely the Tongariro, Waikaremoana and Tekapo Hydro Schemes and the Hau Nui Wind Farm.

1.4 From April 1999 to October 2004, I was the Environmental Manager for Renewable Energy at Genesis Energy, responsible for the environmental management of all renewable energy assets.

1.5 Prior to joining Genesis Energy, I worked for the Electricity Corporation of New Zealand (“ECNZ”). For two and a half years I was the Tongariro Power Development Resource Consents Project Manager and before this I was an Environmental Advisor for ECNZ.

1.6 During the past 19 years, I have been involved in environmental management matters at various hydro, thermal and wind sites. This has included management of resource consents renewal projects for both the Waikaremoana and Tongariro Power Schemes, and the acquisition, implementation and management of a large number of resource consents at other generation sites.
1.7 I hold the degree of Master of Arts in geography and resource management from Auckland University.

2. SCOPE OF EVIDENCE

2.1 In my evidence I will cover the following matters:

a. Background to Genesis Energy;

b. Describe the Tekapo Power Scheme;

c. Describe the operation of the Tekapo Power Scheme;

d. Investment in the Tekapo Power Scheme; and

e. Implications of the proposed LWRP on the operation of the Tekapo Power Scheme.

3. GENESIS ENERGY

3.1 Genesis Energy has the largest share of the New Zealand retail electricity market at 27%\(^1\) and we continue to grow our market presence in the South Island.

3.2 Genesis Energy generates electricity for sale to the wholesale market and to meet the needs of our retail customers. We have a diverse portfolio of renewable and thermal electricity generation assets with a combined nominal generation capacity of approximately 2,160MW. Our generation assets are:

- the 1448MW Huntly Power Station in the Waikato District;

- the 380MW Tongariro Hydro Power Scheme in the central North Island;

- the 138MW Waikaremoana Power Scheme in Hawke's Bay;

\(^1\)Electricity Authority Percentage market share by energised ICP (December 2012)
• the 9MW Hau Nui Wind Farm in South Wairarapa; and

• the 185MW Tekapo Power Scheme.

3.3 We continue to pursue new generation development prospects across the Country. In particular, we are investigating the Slopedown Wind Farm Project in Southland as a further generation option to support our expanding South Island customer base. We have also recently obtained consents (under appeal) for the Castle Hill Wind Farm project in the northern Wairarapa, and hold resource consents for the Rodney thermal generation project near Helensville, north of Auckland.

3.4 Genesis Energy seeks to make the best use of the resources available to it for the benefit of the Company’s shareholder and of New Zealand. This is reflected in our Company objectives to manage impacts on communities in which we operate, to engage meaningfully with key stakeholders, and to manage responsibly our environmental impact while growing our business.

3.5 Genesis Energy aims to partner with the communities within which we operate. This includes localised community sponsorships and initiatives. We also actively participate in a range of broad based community initiatives such as the Tekapo Community Fund, Genesis Oncology Trust, Schoolgen and the Curtain Bank in Huntly, Christchurch, West Auckland and Wellington. We also have a significant partnership with the Department of Conservation on the Genesis Energy National Whio (Blue Duck) Recovery Programme, an initiative that has been underway for more than a decade in various guises.

4. THE TEKAPO POWER SCHEME

4.1 The Tekapo Power Scheme has been a part of the Canterbury environment since construction began on Tekapo A in 1938, and was finally completed in 1951.

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4.2 Genesis Energy purchased the Tekapo Power Scheme on 1 June 2011 for $821 million dollars from Meridian Energy Limited. The Tekapo Power Scheme is an important part of our generation portfolio. The scheme provides more balance to our diverse generation portfolio, which was previously predominantly thermal as well as exclusively in the North Island. Ownership of the Tekapo Power Scheme enables us to make more competitive offers to South Island customers. Meridian Energy continues to operate the balance of the Waitaki Power Scheme.

4.3 Since our purchase of the Tekapo scheme we have begun work to remedy geotechnical issues with the Tekapo Canal and to upgrade the Canal to ensure adherence with recent dam design standards and increased focus nationally on seismicity issues. This work will ensure the scheme retains its generation capacity and remains a key generation asset for New Zealand.

4.4 As shown in the evidence of Mr Wilson, the Tekapo Power Scheme is a significant part of New Zealand’s electricity generation market. Mr Wilson’s analysis is that the Tekapo Power Scheme has the highest energy potential of all the generation stations in the South Island.

4.5 This is due to the fact that the Tekapo Power Scheme is located at the head of the Waitaki Valley in the Mackenzie District. The scheme sits at the top of the Waitaki Power Scheme, a series of eight power stations that includes the Waitaki Power Stations owned and operated by Meridian Energy Limited. Attached and marked “Appendix 1” is a diagram showing the Tekapo Power Scheme.

4.6 The Tekapo Power Scheme comprises:

a. Lake Tekapo Control Structure (Gate 16);

b. The Lake Tekapo Intake Structure

c. The Tekapo A power station;
d. The Tekapo B power station;

e. The Tekapo canal; and

f. Lake George Scott, the George Scott Weir and Gate 17

each of which I will briefly describe.

Lake Tekapo Control Structure

4.7 Lake Tekapo is the main source of water for the entire Waitaki Power Scheme, including the Tekapo Power Scheme. The lake is dammed by the Lake Tekapo Control Structure (Gate 16) at the head of the Tekapo River which also forms the bridge over the river at State Highway 8.

Tekapo A power station

4.8 Construction of Tekapo A began in 1938. The station was finally commissioned in 1951.

4.9 Tekapo A Power Station has a rated capacity of 25 MW and generates, on average, 160 GWh of electricity per year from water diverted from Lake Tekapo via an intake structure and a 1.4 kilometre intake tunnel.

Tekapo B power station

4.10 Commissioned in 1977, Tekapo B is the only power station in New Zealand completely surrounded by water. Sitting in Lake Pukaki, essentially as an island, the station is connected to land via a 74 metre long bridge.

4.11 Constructed on huge concrete raft foundations, Tekapo B is 46 metres high. However, nearly two thirds of the power station is below the waterline. The station is powered by water from the Tekapo Canal with outflows entering Lake Pukaki. This same water then passes through a further six power stations within the Waitaki Catchment.
4.12 Tekapo B has a capacity of 160 MW and generates an average of 840 GWh of electricity per year.

_Tekapo Canal_

4.13 In 1970 a 25.5 kilometre canal was constructed to take outflows from Tekapo A Power Station to Tekapo B Power Station. The Tekapo Canal has a maximum capacity of 130 cubic metres per second.

4.14 The Tekapo Canal has had longstanding leakage issues. The previous owners, Meridian Energy, had initiated a range of works and monitoring to better understand how best to address the leakage problem and when Genesis Energy took ownership of the assets it continued this assessment, including detailed options studies leading finally to detailed designs. Genesis Energy has now begun a comprehensive remediation programme, which I discuss in more detail later in this statement.

_Lake George Scott, Lake George Scott Weir and Gate 17_

4.15 Water in Lake Tekapo can bypass Tekapo A Power Station via water releases through the Lake Tekapo Control Structure (Gate 16 - State Highway 8 bridge at Tekapo). When the control gates are open water flows down the upper Tekapo River to Lake George Scott. Water can then be released into the Tekapo Canal via control gate 17 that impounds Lake George Scott. Lake George Scott is also impounded by a weir structure. In high flow or spill events, flows may enter the Tekapo River over this weir.

5. **INVESTMENT IN THE TEKAPO POWER SCHEME**

_Purchase of the Tekapo Power Scheme_

5.1 On 1 June 2011, Genesis Energy made the very significant $821 million purchase of the Tekapo Power Scheme. This has been a significant investment for Genesis Energy and Tekapo is an important addition to our generation asset portfolio.
5.2 Genesis Energy continues to seek opportunities for scheme improvement to gain greater efficiencies in our operation of the Tekapo Power Scheme.

Remote Control of the Tekapo Power Scheme

5.3 Genesis Energy has a long established Renewable Energy Control Centre ("RECC") located at Tokaanu, at the Southern end of Lake Taupo, for all Genesis Energy owned and operated hydro generation assets. With the purchase of the Tekapo Power Scheme, Genesis Energy facilitated an upgrade of the existing Tekapo Communications infrastructure to ensure the plant could be remotely controlled from this RECC. The RECC is manned 24 hours/7 days a week and additional support can also be provided locally at the Tekapo Power Scheme should the scheme be required to run locally. If needed, the Tekapo scheme can be operated from either Tekapo A or Tekapo B power stations. The Tekapo Power Scheme is maintained locally (and can be operated locally) by a team of 6 staff who specialise in operations, control and instrumentation and maintenance.

Fibre Optic Cable Installation

5.4 With the purchase of the Tekapo Power Scheme, communications between Meridian Energy and the Tekapo Power Scheme required separation. Genesis Energy managed this by the installation of new fibre optic cable around the Tekapo Power Scheme, creating a dual redundancy network.

Tekapo Canal remediation

5.5 In September 2012, Genesis Energy commenced a re-lining and repair works project along sections of the Tekapo Canal, as well as associated bridge-strengthening and culvert works at certain locations of the canal.

5.6 Internal canal works, such as the re-lining, is planned for two seasons, with the first having commenced in January 2013, and a second
construction phase is planned for next year. Each construction period will require up to a 14 weeks outage of the canal. Outside of the internal canal works seasons, additional external works such as culvert repairs and seismic bridge strengthening will take place (including farm access bridges that cross the canal, and the State Highway 8 bridge). The remediation project is scheduled to be complete by no later than July 2015.

6. OPERATION OF THE TEKAPO POWER SCHEME

Resource consents

6.1 On 1 June 2011, with Genesis Energy’s purchase of the Tekapo Power Scheme, the Waitaki Power Scheme resource consents (which expire in 2025) were split or transferred between Genesis Energy for the Tekapo Power Scheme and Meridian Energy for the remaining Waitaki Power Stations. The split or transfer of consents was directed under the Electricity Industry Act 2010 and authorised by Environment Canterbury and the Mackenzie District Council.

6.2 At the same time Meridian Energy’s stakeholder agreements, relating to the Tekapo Power Scheme, were split or transferred between the two companies, and in some cases Genesis Energy was made party to the relevant agreement.

6.3 The key resource consents for the Tekapo Power Scheme are attached as Appendix 2 to the evidence of Dr Mitchell. Key aspects of the implementation of these consents include:

a. Authority to dam the Tekapo River and to control and operate Lake Tekapo.

i. Controls on the management of water levels in Lake Tekapo, with specific Maximum Control Levels applying for each month of the year. More specifically, Lake Tekapo is required to be maintained between 701.80 and 710.90 masl between 1 April and 30 September, and from 1 October to 31 March there is a
higher minimum lake level of 704.1 masl. During the October to March period, the minimum operating level for Lake Tekapo is allowed to decrease below 704.1 masl if the Electricity Commission (or any like statutory body) determines:

(i) that reserve generation capacity is required to generate electricity; or

(ii) the national or South Island minzones (or their future equivalents) have been breached.

b. Requirements to release periodic “recreational flows” into the Tekapo River at specified times of the year.

i. An agreement between the New Zealand Recreational Canoeing Association and Genesis Energy allows for flow releases from Lake Tekapo to the Tekapo River, above Lake George Scott Weir. This water is used either for kayaking opportunity in the upper Tekapo River or for the operation of a kayak slalom course located at the head of Lake George Scott. All water released for recreational opportunities is returned to the Tekapo Canal.

c. Requirements restricting the rate of water take and discharge.

i. The rate water can be taken from Lake Tekapo into the Tekapo A Power Station and/or from the Tekapo River at Lake George Scott into the Tekapo Canal is restricted to 130 cubic metres per second, respectively.

ii. The rate water can be discharged from the Tekapo B Power Station into Lake Pukaki is restricted to 130 cubic metres per second.

d. Controls on the management of spill to the Tekapo River (defined in the Tekapo Power Scheme Operating Rules).
i. The rules detail the lake level management regime, including minimum and maximum control levels and the procedures of instigating and ending spill from the Lake George Scott Weir. Discharges from Lake Tekapo when lake levels are above the maximum control level are also defined.

6.4 There is no requirement to release a permanent residual flow into the Tekapo River from the Tekapo Power Scheme.

Water Management Agreement

6.5 Water from the Tekapo Power Scheme passes to the Meridian Energy owned Waitaki Power Stations via the Tekapo Canal and Tekapo B Power Station, or via the Tekapo River to Lake Benmore. As part of the sale and purchase agreement for the Tekapo Power Scheme, Genesis Energy and Meridian Energy have entered into a Water Management Agreement (or “WMA”) that describes joint processes and specific obligations for managing high flow events in the Waitaki Catchment in an integrated manner, given the control options available to each Company, and sets out procedures to protect and minimise adverse effects on people, the environment and plant and structures. The WMA also requires Genesis Energy to pass a certain volume of water down the Tekapo Canal to Lake Pukaki on a monthly basis, unless certain outages of the Tekapo assets prohibit this from happening, in which case certain notification requirements to Meridian are also in place.

Mackenzie Irrigation Company Limited (MIC) Agreement

6.6 The MIC agreement is a legal agreement between Genesis Energy, Meridian and the Mackenzie Irrigation Company Limited and provides for the efficient utilisation of water in the Upper Waitaki Catchment for the irrigation of land.

6.7 Under the MIC Agreement, 150 million cubic metres of water per annum is made available (in tranches over time and space) for MIC shareholders throughout the Waitaki Chain. Genesis Energy will
supply water from Lake Tekapo and the Tekapo Canal only, and Meridian will supply water from the remainder of the chain.

6.8 All water to be taken under the MIC Agreement is subject to resource consent consideration by ECAN. To date, no water has been ‘used’ under the auspices of the MIC Agreement as all applications made by MIC shareholders to take water are currently before the Environment Court.

6.9 Water takes exercised under the MIC Agreement will ultimately result in the loss of generation potential over time. It is therefore fundamental to our continuing operations that provisions in the LWRP, and subsequently the Waitaki Allocation Plan, do not further derogate our access to water.

7. IMPLICATIONS OF THE PROPOSED LWRP ON THE TEKAPO SCHEME

7.1 As detailed in sections 6.11 and 6.12 of Mr Wilson’s evidence, the Tekapo Power Scheme has some of the highest efficiencies of all hydro generation schemes in New Zealand. This has been confirmed by our operational experience since acquiring the Tekapo Power Scheme.

7.2 The Tekapo Power Scheme’s significance is further enhanced when considered as part of the wider Waitaki Power Stations. The water from Lake Tekapo goes through a further six power stations before reaching the end of the Waitaki Power Stations. Any reduction in water availability will affect not only the generation at the Tekapo Power Scheme, but also the generation from other Power Stations downstream.

7.3 A key part of our due diligence before acquiring the scheme was the consideration of actual and potential environmental effects generated by the scheme. In that regard, we satisfied ourselves that the

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3 The applications have either been declined by Environment Canterbury or Appealed by the Applicant or third party interest groups.
combination of the flow regimes dictated by existing resource consents, and the initiatives covered by the various stakeholder agreements that are in place, were such that the environmental effects of the scheme were appropriate and generally consistent with our experiences elsewhere.

7.4 Given the above, Genesis Energy wishes to ensure that the Proposed Land and Water Regional Plan recognises the importance of the Tekapo Power Scheme, and in so doing:

a. Ensures that water levels in Lake Tekapo continue to be managed for electricity generation purposes, as specified in the existing consent conditions;

b. Enables the continued and efficient operation of the Tekapo Power Scheme (comprising Tekapo A and B power stations);

c. Ensures other existing and new generation and water infrastructure within the Canterbury region is adequately provided for;

d. Promotes hydro-electrical generation as a first priority use given its recognised (including by the Courts) national importance; the emphasis from central government for Councils to recognise and provide for electricity generation infrastructure in the Renewables NPS; and the long term investment that has been made in hydro-electrical infrastructure within the Canterbury region;

e. Ensures the provisions of the Waitaki Catchment Water Allocation Regional Plan prevail in relation to the operation of the Tekapo Power Scheme until such time as its provisions are reviewed and incorporated in the LWRP via a separate Schedule 1 process; and

f. Does not unduly constrain, or pre-empt the consideration of future renewable energy initiatives in Canterbury.
7.4 I consider the plan as notified does not achieve these matters for the reasons detailed in the evidence of Dr Mitchell. Hence, the need for the changes contained in his evidence which Genesis Energy strongly supports.

T Hickman
For Genesis Energy

4 February 2013
Appendix 1: Diagram of Tekapo Power Station