BEFORE A PANEL APPOINTED BY THE MINISTER
FOR THE ENVIRONMENT

UNDER

IN THE MATTER

The Resource Management Act 1991 (RMA)
of a draft national policy statement for
freshwater management and proposed
national environmental standards for
freshwater

AFFIDAVIT OF Personal details removed

FOR

MERIDIAN ENERGY LIMITED

31 OCTOBER 2019

Solicitor acting:

Personal details
In-house counsel

Counsel acting:

Personal details
Project Barrister

Personal details removed

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QUALIFICATIONS AND EXPERIENCE

1. My name is [Personal details removed]. I hold the position of Head of Environment at Meridian Energy Limited (Meridian).

2. I have been employed by Meridian since 2004 in a range of roles either currently or formerly responsible for:
   
i. Provision of legal advice and the development of strategy for planning and consenting processes that are necessary to secure approval for new wind and hydroelectric facilities in New Zealand;
   
   ii. Provision of legal advice regarding resource management and other environmental legislation related to Meridian’s existing hydro and windfarm operations in New Zealand;

   iii. Overall responsibility for:

      a. resource management processes (consenting and planning),

      b. environmental stakeholder relations, and

      c. operational compliance with legislation, consents, other statutory authorisations and mitigation agreements,

      for Meridian’s hydro and wind electricity generation in New Zealand;

   iv. Participation in sectoral and multi-sector collaborative processes regarding development of environmental policy and the implementation of environmental policy; for example, I was Meridian’s representative on the Land & Water Forum Small Group for nearly a decade and I was a Community Representative on the Canterbury Water Management Strategy - Regional Committee for 6 years;

   v. Previously responsible for Meridian’s sustainability functions including greenhouse gas management and inventory and Meridian’s successful listing on the Dow Jones Sustainability Index.

3. I hold the qualification of Bachelor of Laws. I was admitted as a Barrister & Solicitor of the High Court in New Zealand in 1996.
SCOPE OF STATEMENT

4 My evidence covers the following topics:

a. A description of Meridian’s hydro-electricity generation activities;

b. An explanation of the nature of the authorisations that apply to those activities;

c. The mitigation arrangements that apply to those activities; including
   stakeholder agreements;

d. A description of fish passage issues that apply to Meridian’s hydro operations;

e. A summary of the state of the environment in the two catchments where
   Meridian operates;

f. Observations and experience of the approach to freshwater planning in the
   Waitaki catchment and particularly the Waiau catchment;

g. Meridian’s approach to mitigation of environmental effects and the impacts of
   others;

h. Issues relating to proposed National Environmental Standards regarding to
   earth disturbance and water take activities that affect wetlands and infilling.

WAITAKI POWER SCHEME OPERATIONS AND MITIGATIONS

5 In this section of my evidence I discuss the Waitaki Power Scheme (WPS).

6 Exhibit A is a brief description of the WPS prepared for me by members of my
   team.

7 In short, the most succinct summary of the WPS is that (moving downstream from
   the highest hydro structures in the catchment):

a. It is first a series of three canal-based diversions from Lakes Tekapo, Pūkaki
   and Ōhau;

b. In the canal-based parts of the schemes electricity is generated in two Tekapo
   power stations that are owned and operated by Genesis Energy and three
   canal-based stations at Ōhau A, B and C that are owned and operated by
   Meridian;

c. These canals divert water that would otherwise flow down the Tekapo, Pūkaki
   and upper and lower Ōhau rivers and result in flows through (the human made)
Lake Ruataniwha and the canals until the flows are discharged in to the head of the Haldon Arm of Lake Benmore;

d. Lake Pūkaki has a large storage range with a maximum lake level of 532.5 metres above sea level (masl) and an ordinary minimum lake level of 518 masl – a 14.5 metre range. The absolute minimum lake level that is permissible to draw down to in the event of a significant hydro storage shortage is 513 masl.

e. Below the canal system are three mainstem dams that have created three human made lakes - Benmore, Aviemore and Waitaki. Each of the three dams includes a corresponding power station. The Ahuriri River is an unregulated or undammed river that flows in to the head of the Ahuriri Arm of Lake Benmore.

8 The management of water to enable the WPS to operate is currently authorised by a suite of resource consents (water and discharge permits). The core consents came into effect on 1 February 1991 and expire on 30 April 2025. The consents were granted following a very significant working group process so that the consents, conditions and mitigation agreements were jointly developed and agreed together with the 12 major stakeholder groups interested in the WPS and/or water management in the catchment. The agreed outcomes were summarised in a Head Agreement jointly signed by Electricity Corporation of New Zealand (ECNZ, now Meridian) and all twelve parties:

a. Her Majesty and Queen acting by and through the Minister of Conservation

b. South Canterbury Fish & Game Council

c. Ngāi Tahu Trust Board

d. Benmore Irrigation Company

e. The New Zealand Canoeing Association Incorporated

f. Mackenzie District Council

g. Lower Waitaki Irrigation Company

h. Maerewhenua District Water Resources Company Limited

i. Morven Glenavy Ikawai Irrigation Company

j. Transit New Zealand

k. South Canterbury Branch of Royal Forest and Bird Society of New Zealand Incorporated
I. New Zealand Salmon Anglers Association Incorporated.

9 A copy of the Waitaki Head Agreement is attached as Exhibit B

10 These resource consents establish the parameters that Meridian must operate within. These include:

a. Maximum and minimum operational lake levels for all of the mentioned lakes;

b. Environment flows that must be provided into the Upper Ōhau and Lower Waitaki Rivers; and

c. The management of flood flows caused by high inflows.

11 The consents authorise Meridian to undertake the storage, diversion into canals and use for electricity generation purposes of the flows that would otherwise discharge to the Pūkaki and upper and lower Ōhau Rivers.

12 The Waitaki Catchment Water Allocation Regional Plan (WAP) was prepared by the Waitaki Water Allocation Board and following submissions and hearings was made operative in 2005. In 2016 the WAP was changed by Plan Change 3 (WAP PC3) which established an amended environmental flow and allocation regime for the Lower Waitaki River to better achieve that Plan’s objectives. Meridian supported that change and has since amended its consents and operational practices to conform to the new regime.

13 Meridian operates the WPS in accordance with all the environmental flows, levels and allocation regimes established in the operative WAP.

14 Meridian recognises that the WPS caused major alterations to the pre-scheme hydrology of the catchment and has a number of consequences or effects, both positive and negative. To recognise these effects and in accordance with the Waitaki Head Agreement ECNZ (now Meridian) entered into important bilateral mitigation agreements with affected parties which require the company to reduce or compensate for potential adverse effects and to ensure various positive benefits. The initial Head Agreement and the bilateral mitigation agreements have also been added to over time. In summary, working from the top to the bottom of the catchment, these include:

a. Upper Catchment braided river biodiversity – the funding of Department of Conservation’s delivery of Project River Recovery. In the 2018/19 year Project River Recovery:
i. Undertook over 3,400 hours of targeted ground based spraying of weeds over eight Upper Catchment braided river beds,

ii. Jointly with the Department’s kākāi management programme, delivered the Tasman River Predator-Control Project, which supports braided river birds nesting on the Tasman River (above Lake Pūkaki),

iii. Undertook intensive predator trapping around the black fronted tern colony in the Upper Ōhau River,

iv. Enhanced galaxiid (native fish) habitat, including trout removal, in three streams,

v. Undertook wetland management in two wetland complexes,

vi. Conducted braided river bird, invertebrate, and native fish monitoring,

vii. Supported one PhD student researching the use of aerial photographs to identify weeds,

viii. Contributed to the Department’s new kākāi brooder facility;

b. Lakeshore erosion management – the protection from lakeshore erosion of New Zealand Transport Agency and Mackenzie District Council (both at Lake Pūkaki) and Waimate District Council (at Lake Aviemore) roading assets;

c. Recreation in the Pūkaki River – the provision of recreational flows in the Pūkaki River of up to 1120 cumec/hours per annum;

d. Upper Waitaki river fairways – the funding of 50% of Environment Canterbury’s annual river works;

e. Upper Catchment Irrigation – the provision of water for Upper Catchment irrigation that otherwise would be available for electricity generation, including providing reliable flows to the intake of the Benmore Irrigation Scheme;

f. Ngāi Tahu rock art – the sponsorship of Te Ana Rock Art Trust curator of rock art;

g. Tuna (eel) – passage passed Meridian’s Dams. Originally in the form of native fish passes and now by more effective trap and transfer programmes which are delivered with oversight by the Ngāi Tahu Native Fish Committee for the catchment;
h. Lower Waitaki River fairway maintenance – the funding of 40% of Environment Canterbury’s annual river works in the Lower Waitaki River;

i. Sports fishery management – the funding of Central South Island Fish and Game Council in relation to Lower Waitaki salmon fishery management, the ongoing operation of the spawning race at Aviemore dam, and the provision of practical access to the privately owned Upper Waitaki canals for sport fishery purposes;

j. Lower Waitaki River flushing flows – the provision of seven flushing flows per annum of not less than 450 cumecs. The purpose of these flushing flows is to maintain river morphology, clear accumulated periphyton and macrophytes and aid sediment transport;

k. Lower Waitaki River allocation flows – the provision of reliable river flows into the Lower Waitaki River for irrigation allocation and mahinga kai enhancement purposes;

l. Lower Waitaki Irrigators intakes – the funding of in-river works to support intake reliability for irrigation intakes below Waitaki Dam;

15 In addition, but outside the resource management framework, Meridian actively supports the in-catchment community, including through a contestable annual fund (PowerUp).

16 Meridian also recognises that the environment created by the WPS, including the artificial lakes such as Ruataniwha, Benmore, Aviemore and Waitaki; the canals; and the major dam structures, are now deeply embedded in the local environment, and are important recreational and landscape features that contribute greatly to the social wellbeing and vibrancy of the area.

17 Meridian has also recognised and sought to appropriately balance the provision of opportunities for tourism, primary production (through stock-water supply and irrigation access) and aquaculture (through the lease of canal space) in the catchment.

MANAPOURI POWER SCHEME OPERATIONS & MITIGATIONS

18 In this section of my evidence I discuss the Manapouri Power Scheme (MPS). The MPS has been operating for 50 years and since 1996 has operated in accordance with resource consents that include minimum flow requirements in
the Lower Waiau River. There have always been strong controls on the lake level management of Lakes Manapouri and Te Anau.

19 **Exhibit C** is a brief description of the MPS prepared by members of my team.

20 The MPS contains one very large power station at West Arm in Lake Manapouri that operates via a diversion of water into Deep Cove in Doubtful Sound, that would otherwise flow down the Lower Waiau River, from Lake Manapouri. Lake Te Anau is upstream of Lake Manapouri and the lakes are naturally connected by the Upper Waiau River. Lake levels of Lakes Te Anau and Manapouri and outflows are regulated by the Te Anau and Manapouri Lake Control structures.

21 Storage capacity and therefore operating flexibility in Lakes Te Anau and Manapouri is more limited than the very large lake ranges that apply in the WPS and in Lake Pūkaki in particular, as I explain below. Also, the inflows in the Te Anau/Manapouri catchment (in the form of rain and snowfall) have less seasonal variation than in the Waitaki. This means that the MPS operates with closer attention paid to intra and inter-day variability and flexibility in generation output to match shifts in demand and generation output from other generation sources.

22 The Lakes and powerstation are located within the Fiordland National Park. The MPS was built and is authorised to operate under its own enabling legislation, the Manapouri Te Anau Development Act 1963 (MTADA). MTADA also establishes detailed operating guidelines (Guidelines) for the management of the levels of Lakes Manapouri and Te Anau with which Meridian must comply. The dual purpose of the Guidelines is to protect natural and recreational values of the lakes while optimising electricity production.

23 Oversight of Meridian’s compliance with the Guidelines is undertaken by the Guardians of Lakes Manapouri, Monowai and Te Anau (Guardians). The Guardians specific statutory purpose is set out in section 6X of the Conservation Act 1987. Any departure from the Guidelines is required to be reported by Meridian to the Minister of Energy and Minister of Conservation at the time of occurrence. In turn this is required to be reported in the Annual Report of the Department of Conservation as the Department responsible for the administration of MTADA.

24 The MPS is also required to be operated in accordance with a suite of resource consents relating to takes, diversions and discharges of freshwater under the Resource Management Act. These were issued in 1996 (and amended in 2010.
when the peak tailrace discharge was increased from 510 cumecs to 550 cumecs). These consents expire in 2031.

25 The MPS, like the WPS, was subject to an extensive consultation and consenting process that lead to a number of agreed outcomes relating to river flow management and agreements regarding effects mitigation. I summarise these below. Before setting these measures out for the Panel it is important that I also note that these measures were agreed by all key stakeholders in the Waiau catchment as part of the 1996 resource consent process as being appropriate to manage adverse effects having regard to the national importance of the MPS and the state of the environment and accepted as part of the 2010 consenting of the Manapouri Tailrace Amended Discharge to 550 cumecs.

26 Exhibit D is a copy of the Heads of Agreement recording the fact that ECNZ (now Meridian) and the various stakeholders in the Waiau catchment were agreed on the range of measures that needed to be put in place to address effects of the operation of the MPS. The significance of this for Meridian is that I understand that the effects of the operation of the MPS remain largely as anticipated when the Heads of Agreement was signed and the current consents were implemented. The signatories to the Waiau Heads of Agreement in addition to ECNZ are:

a. Minister of Conservation
b. Director General of Conservation
c. Federated Farmers Southland Incorporated
d. Fiordland Promotion Association
e. Guardians of Lakes Manapouri Monowai and Te Anau
f. New Zealand Jet Boating Association
g. Te Runanaga o Ngāi Tahu
h. Secretary of the Environment
i. Royal Forest and Bird Protection Society Incorporated
j. Southland Conservation Board
k. Southland Electric Power Supply
l. Southland Fish and Game Council
m. Southland Resource Monitor Group
n. Southland District Council

o. Te Anau Rod and Gun Club

p. Tuatapere and District Promotions Incorporated

q. Waiau River Action Group

27 The mitigation measures agreed with stakeholders via the respective consenting processes that apply to the operation of the MPS are summarised as:

a. A range of minimum flows between 12 and 16 cumecs to the Lower Waiau River for river health purposes. The amount of minimum flow relates to specific times of the year;

b. Extensive monitoring programmes to identify potential unintended adverse effects associated with the operation of the MPS on the coastal marine environment at Doubtful Sound, the Lake Te Anau and Lake Manapouri environments and both the Upper and Lower Waiau River;

c. Lower Waiau River recreational flows of 35 cumecs for 24 hours for each last Sunday of the month between October and April;

d. Lower Waiau River flows of 150 cumecs for 24 hours in the event migratory fish passage becomes restricted as a result of the Waiau River Mouth flow becoming impeded;

e. The establishment and implementation of a trap and transfer programme for longfin eel and migrant eels in the Waiau Catchment;

f. An ongoing role for the Waiau Working Party (a consultative body established ECNZ) under the 1996 consents to make recommendations to the Southland Regional Council to review consent conditions under section 128 of the Resource Management Act where any unexpected or unforeseen adverse effects were identified from the exercising of the primary consents relating to the MPS;

g. The establishment and ongoing operation of the Te Waiau Mahika Kai Trust to mitigate effects on Ngāi Tahu cultural values;

h. The establishment and ongoing operation of the Tuatapere Amenities Trust to address effects on recreational and amenity values of the township of Tuatapere and its immediate surrounds;
i. The establishment and ongoing operation of the Waiau Fisheries and Wildlife Habitat Enhancement Trust to mitigate the effects on sports and native fish;

j. The provision of funding to assist with upgrading the Tuatapere town water supply;

k. The provision of an annual funding to the Southland Regional Council via an agreement with the Southland Branch of Federated Farmers to manage the maintenance of the Lower Waiau River fairway for flood management and erosion control. For the financial year ending the 30 June 2019 this annual funding equated to 86% of the income of the Lower Waiau Rating District, exclusive of income from interest received on the capital reserve that has been built up by the capitalisation of past contributions.

l. Significantly, since 2010 when Meridian was granted resource consent to increase the peak discharge of freshwater at Deep Cove up to 550 cumecs of freshwater, the consent conditions for the increase include a requirement to operate in accordance with a flushing flow protocol for the Lower Waiau River. This was a significant obligation that Meridian accepted to try and help address the impacts of periphyton that were beginning to have an adverse impact on Lower Waiau River health. This change in periphyton prevalence and river health is consistent with the introduction of didymo to the catchment and increased land use intensification that occurred over the intervening period since 1996. This is a topic I discuss further below.

28 As in the Waitaki catchment, outside both the resource management framework and formal agreements with stakeholders, Meridian actively supports in-catchment community initiatives through a contestable annual fund (PowerUp).

Fish passage

29 The scale and design of the large dams and control structures forming integral parts of these large hydro schemes is such that the inclusion of physical upstream fish passage is not always practical or even possible. Meridian has direct experience of this from the retrofitting of upstream native fish passes at the Waitaki and Aviemore Dams in the 1990s, which ultimately were unsuccessful, switched off, and alternative means of passage (trap and transfer) implemented. Similarly, screening and bypassing downstream migrating fish so they do not enter the turbines where they may be damaged or killed is also not practical.
Where ensuring upstream and/or downstream fish passage is an important fishery management objective, Meridian has developed, as required by resource consent conditions and agreements with stakeholders, alternative methods for ensuring fish are safely moved past the structures. Methods such as trap and transfer are able to target key species (such as longfin eels) as they migrate at different times of the year; intercept them; and safely transfer them into other parts of the river systems where they can then complete their breeding and life cycles.

It is important that the NPS-FM recognises that these further methods, and not just provision of physical fish passage past dam structures, can be effective in managing the effects of large structures on fish migration.

Water Quality Trends

In my 15 years working at Meridian across both the Waitaki and Waiau catchments it is evident that land use activities have intensified in both catchments and the consequences of this are particularly apparent in the Waiau catchment.

The introduction of didymo has also had a significant impact on aquatic health in both catchments where Meridian operates, during the same time frame that the impacts of land use change has been occurring.

In the Waitaki catchment there has been considerable maturity and mutual commitment by the regional council, farmers and stakeholders to develop and then comply with water quality standards that allow for viable primary production while managing adverse impacts on water quality.

Robust data about land use has not been routinely collected and reported, however the most relevant representation of land use intensification in Southland can be seen in the maps below sourced from a Southland Regional Council Report1. The blue dots on the maps represent dairy farming operations in Southland. The map on the left covers the season 1999-2000, the map on the right represents 2010-2011 – an 11 year time difference. The Waiau catchment is generally the western-most land area coloured light green, it is immediately to

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the right of Fiordland National Park indigenous forest area. While other catchments in Southland have undergone more widespread dairy conversion, the lower half of the lower Waiau river has seen a considerable rate of dairy conversions. I also understand that winter grazing across the catchment has significantly increased over time in response to the above.

36 Having read Dr [Person] evidence and listened to the evidence of many of the water quality scientists at the Proposed Southland Water & Land Plan (PW&LP) Environment Court appeal hearings it is evident to me that water quality in the Waiau Catchment is deteriorating both in the Mararoa River and the Lower Waiau River and its tributaries.

37 At a scientific level it is recognised that this deterioration in water quality is strongly related to land use change and intensification within the catchment. It is my understanding generally, and my experience in the Waitaki catchment, that water quality can be protected by focusing on the sources of contaminant load, setting water quality standards and regulating land use appropriately via planning processes. I believe that management in that way and internalisation of effects would be an appropriate response, given that a potential alternative is increasing
the assimilative capacity of the flow of the Lower Waiau River at the expense of hydro generation.

38 The Southland Regional Council is understandably in a challenging position it. It has elected representatives with a clear political mandate and imperative to represent and advance local and regional interests, yet it is also responsible for developing policy and regulation for nationally significant infrastructure.

39 When it comes to the plan rules that will govern the reconsenting of the MPS the council has recently acted in a way that does not demonstrate genuine conviction or confidence to manage the national significance of the MPS in the national interest.

a. As part of the process for developing the PW&LP the council's duly appointed hearing panel (which was independently chaired and included an independent and expert Ngāi Tahu member), after hearing all the evidence recommended to the council that reconsenting of the MPS should be a controlled activity under the RMA.

b. Importantly the controlled activity rule included reservations of control ensuring appropriate mitigation conditions would be able to be imposed, requiring that the re-consenting application was for like-for-like activities, that it must also comply with the flow and allocation regime to be developed in the next phase of the PW&LP, and that public notification and participation be required.

c. The council adopted all of the panel’s recommendations in respect of the PW&LP and resolved to support all of those recommendations in the Environment Court appeal; except that it resolved in a public excluded meeting to not support or defend the panel decision regarding the MPS reconsenting rule.

40 Rationally, Meridian understands that local communities may wish to prioritise local interests over national interests; and that a regional council will feel a strong sense of responsibility to prioritise what it sees as its community’s interests. However, in my opinion what I think this demonstrates is why national direction must be very clear and describe what is expected to happen (the expected outcome) and that when councils have discretions or judgements to exercise they should be required to do so within clear national policy parameters. Particularly relevant in the current instance are the priorities and objectives in the national interest to address climate change.
Meridian’s Approach to Mitigation and Impacts of Others

41 At all levels within Meridian there is a clear commitment to ensuring that the company acts responsibly in addressing any unavoidable adverse effects caused by the operation of its hydro schemes. However, I wish to put that commitment in context as follows:

a. There is extensive and ongoing mitigation in place to address the actual and potential effects of the operation of Meridian’s hydro schemes, much of it has been mutually agreed with stakeholders;

b. It is recognised in the relevant plan approaches that Meridian has advanced in both Canterbury and Southland that additional mitigation may be appropriate in the future and that can still be required in the context of controlled activity rules for re-consenting, but that mitigation should not be for the effects of others and should not at the expense of renewable generation output, storage and flexibility;

c. Meridian takes action on the basis of demonstrable scientific evidence as to a causal relationship between its activities and potential adverse effects on the environment;

d. I understand that the effects caused by the operation of the WPS and MPS in 2019 are consistent with what was anticipated at the time the resource consents were granted in 1991 and 1996 (and again in 2010) respectively. Where changes have occurred, the evidence indicates that this has been in response to other causes or factors;

e. The importance of protecting the generation flexibility, storage and output of the WPS and MPS is crucial as set out in Mr Personal evidence. The consents Meridian holds are subject to a range of conditions. This includes an ability pursuant to the RMA and those conditions to undertake a review if it is established that the operation of the Schemes was having some new or different adverse effect from that which was expected when they were granted. No such review has been instigated in this context since the schemes were consented.

Wetlands, Land Disturbance and Infilling

42 As a result of the dams, diversions and discharges that form integral parts of the WPS and MPS there have been a number of changes to the pre-scheme
environment in regard to wetlands, streams and related vegetation. Those changes are essentially permanent as they are a direct consequence of the physical presence of the scheme structures and of the way water moves through the schemes.

43 It is important that the proposed NES rules not apply to the existing large hydro schemes. If the rules were to apply this could undermine some of the benefit afforded by the provision for large hydro at 3.22 of the draft NPS and would also undermine the controlled activity status rules that apply to scheme reconsenting.

Affirmed at Christchurch on 31 October 2019 before me

A Solicitor of the High Court of New Zealand