Before Hearing Panel – Proposed Natural Resources Plan for the Wellington Region

Under The Resource Management Act 1991 (the Act)

In the matter of Proposed Natural Resources Plan for the Wellington Region – Hearing Stream Six
Coast, Natural Hazards, & Significant historic heritage values, Contaminated land, and Hazardous substances

Between Greater Wellington Regional Council

Local Authority

And Transpower New Zealand Limited

Submitter S165 and Further Submitter FS22

Statement of evidence of Andrew Charles Renton

Dated 18 May 2018
Qualifications and Experience

1. My full name is Andrew Charles Renton

2. I am employed by Transpower New Zealand Limited (Transpower) as the Senior Principal Engineer.

3. I have a New Zealand Certificate of Engineering and Bachelor of Engineering (Electrical). I have over 28 years’ experience in transmission engineering work. I currently work in the Grid Development Division of Transpower. My role involves investigating and providing holistic, pragmatic and strategic advice to developers and infrastructure divisions of councils, on suitable and cost effective transmission solutions as well as new developments and technologies. My previous roles at Transpower have included the Asset Development Engineering Manager responsible for all substation and transmission line engineering development work.

4. I confirm I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2014. As I am employed by Transpower, I acknowledge I am not independent, however I have sought to comply with the Code of Conduct. In particular, unless I state otherwise, this evidence is within my sphere of expertise and I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

Scope of Evidence

5. In his evidence lodged for Hearing Stream One, Dougall Campbell, Transpower’s Environment Policy and Planning Manager prepared evidence discussing Transpower’s role and its assets in the Wellington Region. I appeared before the Panel at Hearing Stream One in lieu of Mr Campbell, adopting the evidence of Mr Campbell. I will refer to Mr Campbell’s evidence statement in my evidence for Hearing Stream Six.

6. My evidence will focus on Transpower’s assets at Oteranga Bay and in the Cook Strait. I will provide a brief summary of Transpower’s role and the function and importance of its assets at Oteranga Bay.

Transpower NZ Ltd

7. As Mr Campbell stated in his evidence for Hearing Stream One, Transpower
owns and operates the National Grid, which transmits electricity throughout New Zealand. Transpower’s infrastructure transports energy from where it is generated to distribution networks and direct-connect customers. Transpower is not a wholesaler, generator or retailer of electricity.

8 Transpower’s main role is to ensure the delivery of a reliable and secure supply of electricity to New Zealand. It has a fundamental role in the industry and in New Zealand’s economy. Transpower is required to deliver and operate a National Grid that meets the needs of users now and into the future.

9 Prudent investment in the Grid, long term transmission planning strategies, and developing technologies are crucial to ensure the most can be made of existing infrastructure. Deferring the need for new infrastructure limits the cost and environmental footprint of the Grid for future generations.

10 Transmission lines and cables can last virtually indefinitely provided they are properly maintained.

11 Maintaining transmission assets requires regular inspections of their component parts so that their condition can be monitored and assessed.

**Transpower’s assets at Oteranga Bay and in the Cook Strait**

12 As Mr Campbell has already outlined in his Hearing One evidence, Transpower owns and operates the Cook Strait Cables, which transmit electricity between the North and South Islands.

13 The Cables consist of:

   (a) Three 350kV High Voltage Direct Current (HVDC) cables that have the capability of transmitting up to 1470 MW of power between Benmore in the South Island and Haywards in the Hutt Valley in the North Island.

   (b) Two fibre optic cables that carry telecommunication across Cook Strait. These fibre optic cables are owned by Transpower and used for telecommunications network and control and protection of the HVDC link. These fibre cables are also used by New Zealand’s main telecommunications companies for domestic and commercial traffic.

14 The Cook Strait cables ‘emerge’ on the foreshore at Oteranga Bay in Wellington and Fighting Bay in the Marlborough Sounds. The cables are vital to New Zealand’s electricity and communication systems. In a typical year, the
HVDC link provides approximately 15% of the North Island electricity supply, but at certain times these cables can provide up to approximately 40% of the North Island load or an even greater portion of South Island load during periods when South Island lake levels are low.

15 The fibre optic cables are a main inter-island telecommunication link.

16 The original gas-filled cables, installed in the 1960s, were replaced (though left in situ) in 1991 when three new power and two communication cables were laid, and a further two communications cables were laid in 2002. They lie for the most part unburied on the seabed across Cook Strait, within the Cook Strait Cable Protection Zone (CPZ). The CPZ is a protected area regulated by the Submarine Cables and Pipelines Protection Act 1966. Anchoring, fishing and other activities are prohibited in this area as they present a risk to the cables.

17 The Cook Strait power cables are approximately 125 mm in diameter and the fibre optic cables are approximately 40 mm in diameter over most of their length.

18 The power cables themselves are laid on the surface of the seabed in the Cook Strait as topography and geology of the seabed in the CPZ prevent burial over the full length of the cables.

19 The cables are buried under the foreshore at a target depth of 0.8 m for a distance of 20 m from mean high water, and at a minimum depth of 0.6 m for a further distance of 180 m. Beyond this point burial is prevented by the topography and geology of the seabed.

20 The fibre optic cables laid in 1991 were buried to a minimum depth of 0.8 metres for 20 metres seaward of mean high water springs level, and at a minimum depth of 0.6 metres for a further 180 metres.

21 The cables are not visible within the foreshore although they are buried at a relatively shallow depth. This allows them to be accessed easily. They move from the foreshore into the intertidal zone and then lead via the cable transition building to a double circuit steel tower. From here, a 350kV line extends overhead to the Oteranga Bay substation (see the aerial image below).

22 Attached to my evidence is a more detailed image of the CPZ (Attachment
Aerial photo of CPZ and Cables

Maintenance and upgrade work on the Cook Strait Power and Fibre Optic Cables

23 The Cook Strait cables, which have a copper core surrounded by solid insulation and steel wire armour, were manufactured with materials which are immune to marine growth, and only discharge a small amount of heat associated with their operation. (Refer photos in Attachment B).

24 Typical maintenance activities include unobtrusive annual inspections and monitoring using divers and a remotely operated underwater vehicle (ROV) from a surface support ship. Urgent maintenance may be required from time to time to ensure the cables’ safe and efficient operation.

25 Any maintenance work would be temporary in nature and, as the cables rest on top of the sea floor, it is likely that only minor movement of seafloor material directly beneath the cables would be required.

26 The effects of installing new submarine cables would also be limited, in this case to temporary disturbance of the seabed, temporary disruption to...
navigation in the Cook Strait, and temporary adverse visual effects (i.e. the activity of actually laying the cable – as mentioned above, once in place the cables are not visible).

27 Because of the critical importance of the cables to New Zealand’s electricity system, and the significant expense associated with replacement and/or repair of the cables (around $90 million for a new power cable, $35 million for a power cable repair, and $7 million for a fibre cable repair), Transpower puts considerable effort into ensuring the cables are protected.

28 Damage and repair works have included replacement of a section of the fibre cable as a result of fishing activities, and a cable failure from an unknown source.

29 The cables are protected by burial where possible, and the use of split cast iron pipe where they cross the beach and are subjected to wave action. Additional protection is provided by the Cable Protection Zone and our 24-hour-a-day, 365-day-per-year patrol vessel and helicopter call out operations.

30 As I noted earlier the original 1960s set of cables is not operational and remain redundant on the sea floor. The decommissioned cables have a benign presence in the marine environment. They are inert and do not leach any matter or decompose. Removing the cables would not achieve any particular benefit and could actually damage the marine environment which has developed under and around the cables (see photos in Attachment C).

31 Only Transpower’s infrastructure is located within the CPZ. Both Telecom
(now Chorus) and Vodafone have cables across Cook Strait but not near Transpower’s cables.

32 Co-locating cables can cause technical and operational issues (for example mutual heating and derating). At depth (up to 280m) cables located too closely may interfere with each other when being accessed from the surface. It is important that these issues are carefully considered before cable assets are located in proximity to each other.

33 The cables are vulnerable on the foreshore and it is important they are appropriately protected from third party and natural activities (eg wave action).

34 As the smaller lighter weight communications fibre cables degrade/age/wear at a faster rate than the power cables Transpower has plans to install a new fibre optics telecommunication cable across the Cook Strait within the next 2 years. This new cable will replace the existing fibre cable (which will remain in situ). The new cable will require some construction work at both Oteranga Bay and Fighting Bay stations. Heavy machinery will need to temporarily access the beach areas. The work should take approximately 4-5 days and any effects will be temporary. The laying of the actual cable will also take a few days and involves a cable laying ship similar to the one used to repair the broken fibre. Any effects will be temporary. The cable will be benign once it is laid and operational.
35 This replacement cable will provide the existing protection and communications services that are presently provided.

36 I understand from reading the evidence of Ms Whitney that the Oteranga Bay area and the area of the Cook Strait within Wellington Region, are protected environments. I fully understand that but do want to emphasise the crucial role of the Cook Strait cables (the HVDC link and the fibre optics cables) in literally keeping the North Island’s electricity supply running. I also want to emphasise the benign nature of these assets and the fact that they have been operating for many decades without adverse environmental impacts.

37 I also wish to emphasise the importance in ensuring the existing cables are not compromised by third party activities, both within the CPZ and the adjoining area outside the CPZ but still within the CMA and that Transpower has the continued ability to operate, maintain and replace these assets as is required by good asset management practices. It is vital for reasons relating to security of supply to ensure Transpower is fully informed and involved in any decisions about third party activities that could compromise the National Grid network.
ATTACHMENT A - Cable Protection Zone
ATTACHMENT B - Power & Fibre Cable

HVDC Power Cable

Fibre Cable
ATTACHMENT C - Cable infrastructure on sea floor