

**Before the Proposed Te Tai o Poutini Plan – A Combined District Plan  
for the West Coast: Hearings Panel**

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Under the Resource Management Act 1991 (the Act)

In the matter of The Proposed Te Tai o Poutini Plan: A Combined  
District Plan for the West Coast – Hearing Topics 1 and  
2:

- **Introduction and General Provisions**
- **Strategic Directions**

Between **Te Tai o Poutini Plan Committee**  
Comprising the Buller, Grey and Westland District  
Councils

And **Transpower New Zealand Limited**  
Submitter 229 and Further Submitter FS110

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**Statement of evidence of Rebecca Mary Eng for Transpower New  
Zealand Limited**

Dated 29 September 2023

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## 1. Executive Summary

- 1.1. Transpower New Zealand Limited (“Transpower”) owns and operates the National Grid, which transmits electricity throughout New Zealand from energy generation sources to distribution networks and direct-connect customers. Transpower has a variety of assets within the West Coast region comprising 13 transmission lines, 10 substations and telecommunications assets.
- 1.2. While a resilient National Grid remains at the heart of New Zealand’s energy future, climate change has become a central issue for governments globally and hence for Transpower as a responsible owner and operator of the National Grid on behalf of New Zealanders. In this role Transpower will play a critical role for New Zealand in meeting its zero carbon aspirations, by both investing in its existing National Grid assets and enabling connections to new sources of renewable energy.
- 1.3. Transpower wishes to see appropriate planning provisions included in the Te Tai o Poutini Proposed District Plan (“TTPP”) to ensure that Transpower is able to develop, upgrade, operate, and maintain the National Grid to enable a sustainable, secure and reliable supply of electricity to the West Coast region and nationally.
- 1.4. **Ms Whitney**’s evidence addresses recommendations in the s42a reports for Hearing Topic 1 “Introduction and General Provisions” and Topic 2 “Strategic Direction”. **Ms Whitney** largely agrees with the s42a report conclusions and recommends some further amendments are necessary and the most appropriate (in terms of the requirements of section 32 of the Resource Management Act 1991 (“**RMA**”) to achieve consistency with, and give effect to (as appropriate), higher order provisions; to improve the efficiency, clarity and usability of the TTPP and achieve the purpose of the RMA. I concur with the amendments sought in Ms Whitney’s evidence.

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## 2. **Qualifications and Experience**

- 2.1. My full name is Rebecca Mary Eng. I am the Technical Lead - Policy at Transpower New Zealand Limited (“Transpower”), within the Environmental Regulatory Team. My team sits within Transpower’s Environmental Policy and Planning Group, whose responsibilities include:
- a) Strategic planning. This is achieved through the development and implementation of Transpower’s strategic resource management policy at national, regional, and local levels;
  - b) Ensuring that all necessary environmental approvals are obtained for Transpower’s physical works; and
  - c) Managing engagement with landowners and other parties who wish to undertake land use and development under or near the National Grid to ensure that Transpower’s assets can be operated, maintained, upgraded and developed.
- 2.2. I have been employed by Transpower for eight years. My role involves leading Transpower’s resource management policy workstream including to ensure planning documents give effect to the National Policy Statement on Electricity Transmission (“**NPSET**”).
- 2.3. I have a Master of Resource and Environmental Planning from Massey University. I have over 20 years’ experience working as an environmental planner in New Zealand and the United Kingdom, and I am a member (Intermediate) of the New Zealand Planning Institute. My relevant experience and qualifications are included in **Appendix A**.
- 2.4. I confirm that I am authorised to give this evidence on behalf of Transpower.
- 2.5. Although this matter is not before the Environment Court, I confirm that I have read the ‘Code of Conduct for Expert Witnesses’ contained in the Environment Court Consolidated Practice Note 2023. As I am employed by Transpower, I acknowledge I am not independent; however, I have sought to comply with the Code of Conduct when preparing my written statement of evidence and will do so when I give oral evidence before the Hearings Panel. 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.

### 3. **Scope of Evidence**

3.1. My evidence will address the following:

- a. Transpower and the National Grid;
- b. Transpower's assets and projects within the region;
- c. New Zealand's Paris Commitment and decarbonisation; and
- d. Conclusions

3.2. In subsequent hearings I will comment on Transpower's policy response to give effect to the NPSET. The focus of my evidence for this hearing is to provide contextual information on Transpower and the role and importance of the National Grid.

### 4. **Transpower and the National Grid**

4.1. Transpower is a State-Owned Enterprise that plans, builds, maintains, owns, and operates New Zealand's high voltage electricity transmission network – the National Grid (or "the Grid"). The Grid links generators to distribution companies and major industrial users. It extends from Kaikohe in the North Island to Tiwai in the South Island and carries electricity throughout New Zealand.

4.2. New Zealand has become increasingly dependent on electricity. It is an intrinsic part of living and working in the 21st century. Electricity now accounts for approximately 26% of all energy used in New Zealand.<sup>1</sup> Each year, \$6 billion worth of electricity is traded on the wholesale electricity market.<sup>2</sup> Transpower, whose main role is to ensure the delivery of a reliable and secure supply of electricity to New Zealand, has a fundamental role in the industry and in New Zealand's economy.

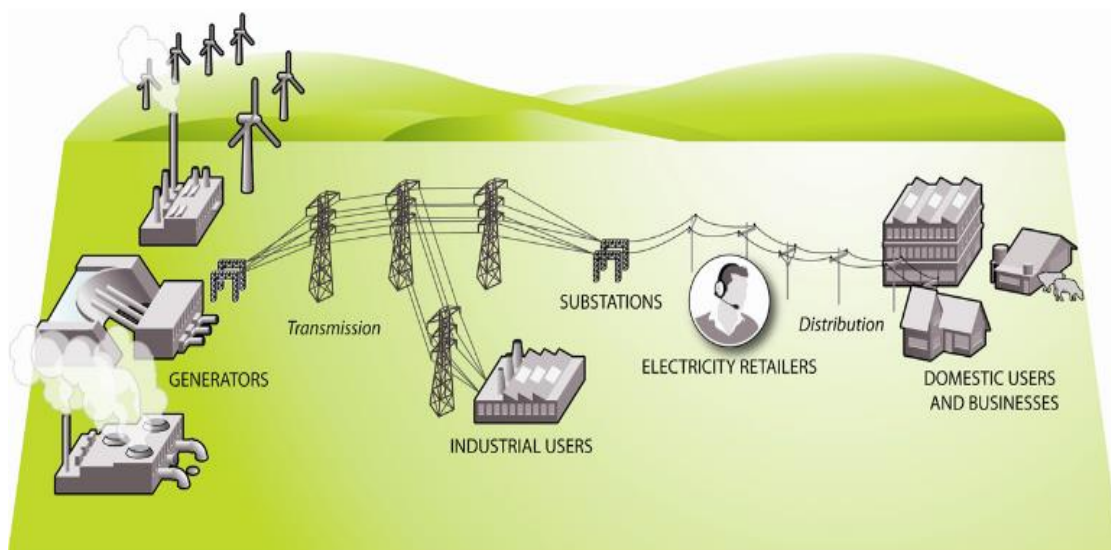
4.3. Transpower is not a generator of electricity and has no retail sales of electricity. It can be considered a 'freight company' for electricity, in that it carries bulk electrical energy from where it is generated by companies such as Contact Energy, Meridian and Genesis to the local lines distribution companies (e.g., Buller Electricity and Westpower) and some major users of electricity (e.g. Tiwai Point Aluminium Smelter and NZ Steel at Glenbrook).

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<sup>1</sup> [Energy statistics | Ministry of Business, Innovation & Employment \(mbie.govt.nz\)](https://www.mbie.govt.nz/energy-statistics)

<sup>2</sup> [Clearing manager | Electricity Authority](https://www.ea.govt.nz/clearing-manager)

- 4.4. Transpower also manages New Zealand's power system in real time. In its role as System Operator, Transpower operates the electricity market to ensure electricity transmitted through the National Grid is delivered whenever and wherever it is needed, 24 hours a day, seven days a week.
- 4.5. Transpower plays a significant part in New Zealand's economy, with all major industries, cities and communities being reliant on a secure and reliable supply of electricity.



*Figure 1. Electricity Industry in New Zealand. Source MBIE*

- 4.6. As a State-Owned Enterprise, Transpower's principal objective is to operate as a successful business. It must operate within certain legislative constraints and report regularly to its shareholding Ministers. Transpower is required to deliver and operate a National Grid that meets the needs of users now and into the future.
- 4.7. One of Transpower's key objectives therefore is to maintain and develop the National Grid, which contributes to New Zealand's economic and social aspirations.
- 4.8. Prudent investment in The Grid, long term transmission planning strategies, and developing technologies are crucial to ensure the most can be made from existing infrastructure. Proper maintenance and access to the Grid is essential to defer the need for new lines and substations and to create better options for when new build is required. This will, in turn, help to limit the cost and environmental footprint of the National Grid for future generations. This is more critical than ever in the context of the

Climate Change Response (Zero Carbon) Amendment Act 2019, which I expand on later in this evidence.

#### *The National Grid Network*

- 4.9. The National Grid comprises some 11,000 circuit km of transmission lines and approximately 170 substations across the country. This is supported by a network of some 300 telecommunication sites, which help link together and communicate with the components that make up the National Grid.
- 4.10. The Grid comprises a high voltage backbone which runs the length of the country and links major generation (such as the South Island hydro lakes and central North Island hydro and thermal generation sources) to major loads in the main cities (e.g., Christchurch, Wellington and Auckland). The bulk of the Grid backbone was built around 60 years ago and comprises most of the 220kV lines throughout New Zealand, along with the High Voltage Direct Current (HVDC) link between the North and South Islands.

### **5. Transpower's Assets and Projects within the Region**

#### *National Grid Assets in the West Coast region*

- 5.1. There are 13 National Grid transmission lines that traverse the region. These are listed on **page 3** of Transpower's original submission.
- 5.2. There are also 10 substations within the district and an underground fibreoptic cable.
- 5.3. A district map showing National Grid substations and transmission lines in the region is included in **Appendix 1** of Transpower's submission and a copy is attached to this evidence at **Appendix B**. National Grid transmission lines traverse more than 300km within the region.
- 5.4. The Grid is an interlinked network. Electricity flows along transmission lines via lines supported by towers (pylons), poles or pi poles and can vary in any instant, depending on actual generation at power stations and the demand for electricity across New Zealand. In operating the electricity market as System Operator, Transpower uses real-time information about electricity use by consumers and electricity generation available from generators to balance electricity demand and supply, ensuring optimum performance of the network.

5.5. The existing transmission network for the West Coast region is set out graphically in Figure 2 below.<sup>3</sup>



Figure 2: Central North Island region transmission. Source: Transpower Transmission Planning Report 2023)

5.6. For Transpower’s transmission planning purposes, the West Coast region network comprises 110kV and 66kV transmission circuits, with two 110/66kV interconnecting transformers at Dobson. Most of the West Coast load is supplied through the northern transmission circuits, with power flowing through the region on the 110kV circuits from Kikiwa to Dobson via Inangahua, and the 110kV spur from Inangahua to Robertson Street. The amount of generation in the West Coast and Nelson-Marlborough regions, combined, is much less than their combined demand. Significant inputs are required, most of which is supplied from remote generation in the Waitaki Valley, with significant load off take in the South Canterbury and Canterbury regions.

<sup>3</sup> Transpower Transmission Planning Report, 2023, page 289.



- 5.7. The West Coast regional peak electricity demand is forecast to grow by an average 5.0 per cent per annum over the next 15 years, from 55 megawatts (MW) in 2023 to 114 MW by 2038. This is greater than the national average growth rate of 2.0 per cent per annum.<sup>4</sup>
- 5.8. The National Grid provides connectivity between all sources of generation and consumers. Without the National Grid, consumers across New Zealand would be dependent on locally generated electricity which would be more expensive and less reliable. As such, the National Grid plays a significant role in the sustainable management of natural and physical resources.

*Transpower's Projects in the West Coast region*

- 5.9. There are several active projects currently taking place on the West Coast region assets. Waimangaroa Substation is being reconfigured and a section of the Inangahua-Westport B transmission line is being dismantled. On the Blackwater-Inangahua A line a number of poles are being replaced. Atarau Substation is being divested, and an Otira substation upgrade project is in the early design phase.
- 5.10. Other than these projects, Transpower is carrying out business as usual maintenance works on its assets within the region, such as pole replacements (primarily on the 66kV network), access track works, foundation strengthening, and flood protection works. An example of flood protection works is the Inangahua Substation stormwater management upgrade.
- 5.11. While Transpower has no specific plans for new transmission assets in the region at present, that could change at any stage. For example, where new National Grid transmission lines are required to connect new renewable energy generation sources to the network. This is discussed further below.

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<sup>4</sup> Transpower Transmission Planning Report, 2023, page 292

## 6. **New Zealand's Paris Commitment and decarbonisation**

### *Transmission Tomorrow (2016)*

- 6.1. Transpower's 2016 publication "Transmission Tomorrow" set out Transpower's strategy for the future development of The Grid for the next 30 years and beyond. Transmission Tomorrow documents Transpower's view that there is an enduring role for the National Grid. Transpower's lines and substations will be required for many years into the future to power the economy while enabling New Zealand's continued reliance on renewable forms of electricity generation, including from the South Island hydro lakes.

### *Te Mauri Hiko – Energy Futures (2018)*

- 6.2. Greenhouse gas emission reduction targets were agreed by New Zealand at the 2016 Paris Climate Accord and have been translated into domestic climate policy via the Climate Change Response (Zero Carbon) Amendment Act 2019. In early 2018 Transpower published its white paper "Te Mauri Hiko – Energy Futures" (Te Mauri Hiko). This project closely examined a range of electricity supply, demand and future technology scenarios and began exploring what will be required for New Zealand to maximise the potential of the energy opportunity it is facing, including meeting its Paris Climate Accord commitments.
- 6.3. Transmission Tomorrow was updated in 2018 and underlined the need to decarbonise New Zealand's economy. Transmission Tomorrow sets out how Transpower will go about planning and the developing the transmission system as demand for electricity increases following electrification of the transport and process heat sectors, and as new renewable generation is added to the system.

### *Whakamana I Te Mauri Hiko – Empowering our Energy Future (2020)*

- 6.4. Since then, Transpower has released a further document "Whakamana i Te Mauri Hiko – Empowering our Energy Future" (2020) which sets out a blueprint for how New Zealand might get to a zero-carbon future. It is consistent with the findings of both the Interim Climate Change Committee and the Productivity Commission that the greatest opportunities for emissions reductions outside of agriculture lie in the energy sector; specifically, around increasing the proportion of renewable electricity in the system and the electrification of emissions intensive transport and process heat sectors.

- 6.5. As the economy electrifies in pursuit of the most cost efficient and renewable sources, the Whakamana i Te Mauri Hiko base case predicts that electricity demand is likely to more than double by 2050. Whakamana i Te Mauri Hiko suggests that meeting this projected demand will require significant and frequent investment in New Zealand's electricity generation portfolio over the coming 30 years, including new sources of resilient and reliable grid connected renewable generation. In addition, new connections and capacity increases will be required across the transmission system to support demand growth driven by the electrification of transport and process heat. Transpower's current estimation is that around 70 new National Grid connections will be required in the next 15 years, with this trend continuing through to at least 2050. Simply put, New Zealand's electricity transmission system is the infrastructure on which our zero-carbon future will be built.
- 6.6. This work supports Transpower's view that there will be an enduring role for existing National Grid assets in the future, and the need to build new National Grid lines and substations to connect new, renewable generation sources to the electricity network.
- 6.7. In terms of a summary, the National Grid:
- a. transports electricity across the country (connecting generation to consumers);
  - b. supports New Zealand's national and regional economic growth;
  - c. plays an essential role in maintaining reliability and security of supply of energy;
  - d. provides a basis for investment decisions to be made by both suppliers and consumers of electricity;
  - e. enables competition among suppliers and retailers of electricity, thereby providing the basis for competitively priced electricity;
  - f. assists the development of new electricity generation technologies, including renewable energy, by providing access to markets;
  - g. enables the electrification of transport and process heat, without which there is no way in which our Paris Agreement and net-zero carbon economy commitments can be met; and
  - h. is predicted to play a key role in the decarbonisation of the economy.

## **7. Conclusions**

- 7.1. The National Grid is critical to the social and economic wellbeing of the West Coast region and our nation generally. It will also play a critical role in New Zealand's carbon zero commitment and mitigating the effects of climate change. This will necessitate the upgrade of existing, and construction of new, National Grid assets in the future. As an infrastructure asset of national significance, the NPSET requires that the National Grid be recognised and provided for in the TTPP.
- 7.2. Transpower's relief through the TTPP hearing process will ensure integrated management of activities through the District Plan to provide for sustainable development of both the National Grid infrastructure and other natural and physical resources, both of which are critical for the future development of the West Coast region and New Zealand.

**Rebecca Mary Eng**

29 September 2023

## **Appendix A: Statement of Experience**

### **Career Summary**

Technical Lead – Policy, Transpower New Zealand Ltd: January 2022 – present

Senior Environmental Planner, Transpower New Zealand Ltd: July 2015 – December 2021

Principal Policy Analyst, Parks & Recreation Policy - Central, Auckland Council: January 2014 – July 2015

Senior Planner, Barker & Associates, Auckland: February 2012 – January 2014

Associate, RPS Group plc, London, United Kingdom: September 2006 – May 2011

Planner, Beca, Wellington & Tauranga: December 2002 – June 2006

### **Qualifications**

Master of Resource & Environmental Planning, Massey University (2004)

Bachelor of Resource & Environmental Planning (First Class Hons) (Massey Scholar), Massey University (2002)

### **Affiliations**

Intermediate Member of the New Zealand Planning Institute

## **Appendix B: West Coast Region Assets**

### **Transmission Lines:**

The following National Grid transmission line assets are within the West Coast region.

- Arahura - Dobson A (AHA-DOB-A) 66kV Single Circuit line on Single and Pi Poles
- Arahura – Dobson A1 – CBL Section 66KV
- Arahura - Otira A (AHA-OTI-A) 66kV Double Circuit line on Single, Pi-Poles (Transpower own this from TMR (Three Mile Road) to OTI)
- Blackwater - Inangahua A (BWR-IGH-A) 110kV Single Circuit line on Pi Poles
- Coleridge - Otira A (COL-OTI-A) 66kV Double Circuit line on Single Poles, Pi Poles, Triple Poles and Steel Towers
- Dobson - Blackwater A (DOB-BWR-A) 110kV Single Circuit line on predominantly Single Poles
- Dobson - TEE A (DOB-TEE-A) 110kV Single Circuit line on Single and Pi Poles
- Greymouth - Kumara A (GYM-KMU-A) (Westpower owned, leased to Transpower)
- Inangahua - Kikiwa A (IGH-KIK-A) 110kV Single Circuit line on predominantly Steel Towers but with some Pi Poles
- Inangahua - Kikiwa B (IGH-KIK-B) 110kV operation voltage (220kV design voltage) Double Circuit line on Steel Towers
- Inangahua - Reefton A (IGH-RFN-A) 110kV Single Circuit line on Single Poles and Pi Poles)
- Inangahua - Waimangaroa A (IGH-WMG-A) 110kV Single Circuit line on Steel Towers
- Inangahua - Westport B (IGH-WPT-B) 110kV Double Circuit line on Steel Towers
- Kumara – Kawhaka Tee (Westpower Owned, leased to Transpower)
- Waimangaroa - Westport A (WMG-WPT-A) 110kV Single Circuit line on Pi Poles
- Robertson Street – Tee A (ROB-TEE-A) 110kV
- Robertson Street – Tee B (ROB-TEE-B) 110kV
- Orowaiti Tee (ORO)

### **Substations:**

There are six Transpower substations within the region:

- Atarau Substation
- Dobson Substation
- Inangahua Substation

- Otira Substation
- Inangahua Substation
- Waimangaroa Substation

Other substations include Kumara Substation (Westpower owned with Transpower having some equipment and operational control), Hokitika and Greymouth Substations (Westpower owned and operated), Reefton Substation (Westpower owned and operated), Robertson Street Substation (Buller Electricity owned and operated). The former Westport Substation has been dismantled.

A further asset is the Inangahua-Murchison underground fibreoptic cable.

There is one other leased line being the Hokitika-Two Mile River Tee A (owned by Westpower). There is also the Two Mile River Tee and Kawhaka Tee.



# Transpower Assets

West Coast Region

## Legend

### Region

Boundary

### NZ Roads

Highways

## Transpower Assets

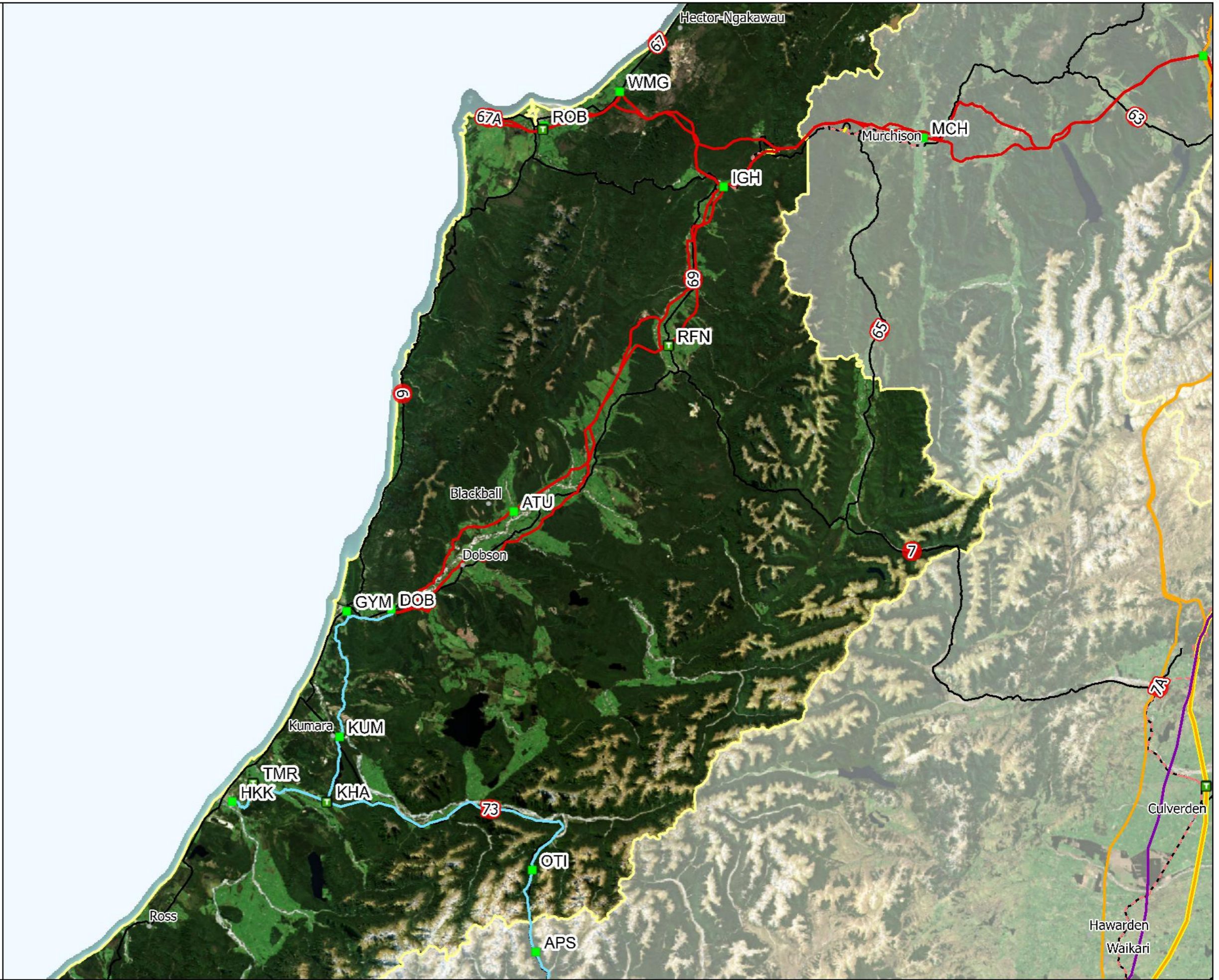
- Cable Protection Zone
- Overhead Fibre Cable
- - - Underground Fibre Cables

### Site

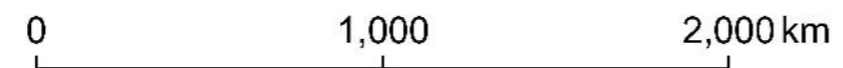
- ACSTN
- ▲ COMMS
- HVDC
- TEE

### Transmission Line

- 0kV Overhead
- 11, 66kV Underground
- 11, 33, 66 kV Overhead
- - - 110kV Underground
- 110 kV Overhead
- 220kV Underground
- 220 kV Overhead
- 350 kV Overhead
- - - 350kV Submarine
- 400kV Overhead



Projection: NZTM 2000 Scale: 1:600,000 Plan Size: A3L



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