Before the Far North Proposed District Plan: Hearings Panel

Under	the Resource Management Act 1991 (the Act)
In the matter of	The Proposed Far North District Plan: – Hearing 1 – Strategic Direction, Tangata Whenua and Part 1 / General / Miscellaneous
Between	**Far North District Council**
And	**Transpower New Zealand Limited** Submitter 454 and Further Submitter 078

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

Dated 13 May 2024

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 owns and operates one National Grid asset in the Far North District, which is the Kaikohe-Maungatepere A 110 kilovolt ("**kV**") double circuit transmission line on steel towers.

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 Proposed Far North District Plan ("**PDP**") 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 Far North District and nationally.

1.4. **Ms Dines'** evidence addresses recommendations in the s42a reports for Hearing 1 "Strategic Direction" and "Part 1 / General / Miscellaneous" topics. Ms Dines 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 PDP and achieve the purpose of the RMA. I concur with the amendments sought in Ms Dines' evidence.

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2. Qualifications and Experience

2.1. My full name is Rebecca Mary Eng. I am the Technical Lead – Environmental Policy at Transpower, within the Environment Group. The Environment Group's responsibilities include:

a. Delivering Transpower's strategic policy approach on environmental regulations, legislation, and council planning documents;

b. Developing and implementing Transpower's corridor management programme at a national and local level;

c. Ensuring that all necessary environmental approvals are obtained for Transpower works, and internal staff, consultants/service providers are aware of, and able to comply with, their environmental obligations; and

d. Internal external stakeholder engagement including with government officials, councils, iwi, industry stakeholders, developers and customers.

2.2. I have been employed by Transpower for over eight years. My role involves leading Transpower's environmental 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 within 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 Far North District;

c. The National Grid's role in Aotearoa New Zealand's energy future; 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.[1] Each year, $6 billion worth of electricity is traded on the wholesale electricity market.[2] 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., Top Energy, Northpower) and some major users of electricity (e.g. Tiwai Point Aluminium Smelter and NZ Steel at Glenbrook).

[1] Energy statistics | Ministry of Business, Innovation & Employment (mbie.govt.nz)

[2] Clearing manager | Electricity Authority

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.

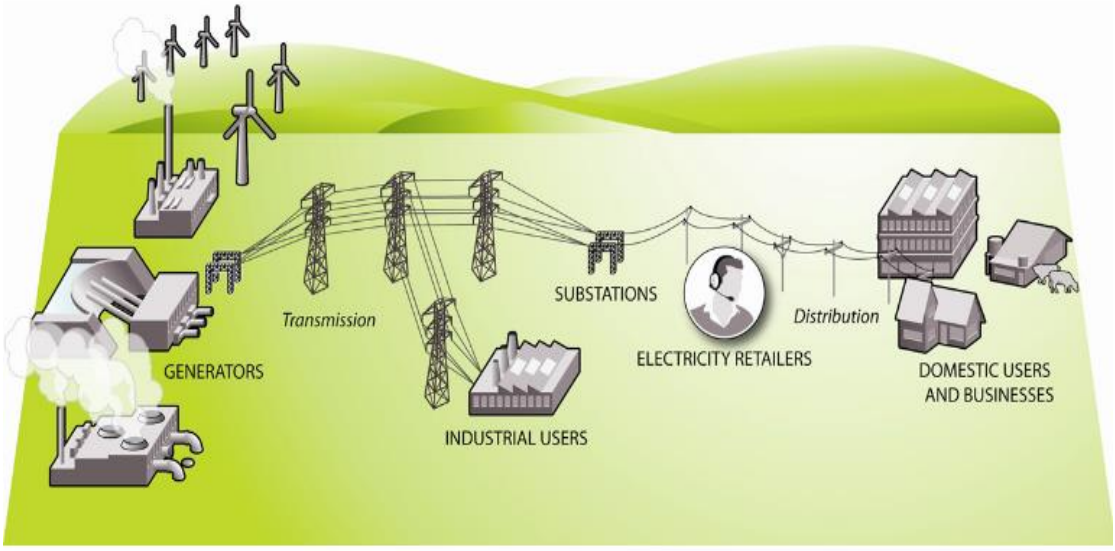

Figure 1. Electricity Industry in New Zealand. Source MBIE

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 that 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) as well as the regions such as the Far North. 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 Far North District

5.1. There is one National Grid transmission line that traverses the district, namely the Kaikohe-Maungatapere A ("**KOE-MPE A**") 110 kV transmission line on steel towers. Approximately 27km of the total line length is within the Far North District, with the remainder in the Whangārei District where the southern extent terminates at Maungatapere Substation.

5.2. **Appendix 1** of Transpower's submission included a map showing the location and extent of KOE-MPE A within the Far North District and a copy is attached to this evidence at **Appendix B**.

5.3. 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.

5.4. For Transpower's transmission planning purposes, the Far North District falls within the Northland region. The existing transmission network for the Northland region is set out graphically in Figure 2 below.[3]

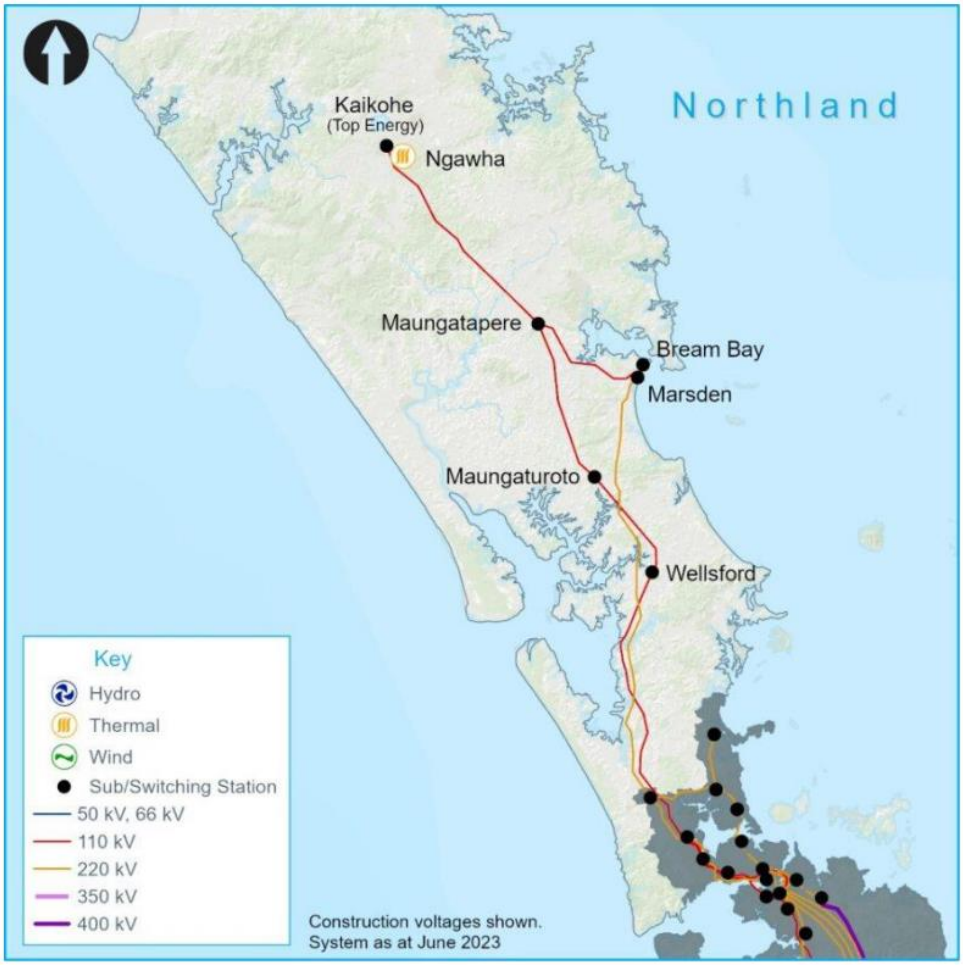

Figure 2: Northland region transmission. Source: Transpower Transmission Planning Report 2023)

5.5. The Northland region supplies a mixture of industrial, commercial and other loads. Geothermal generation and a small but increasing amount of solar generation is connected within the distribution networks. The region is supplied by a 220kV double-circuit "main" line from Huapai substation in the Auckland region and a 110kV double-circuit "backup" line from Henderson. As generation capacity within Northland is well short of that needed to meet local demand, most of the region's electricity supply is imported from the central North Island, through the Auckland region.

5.6. The Northland regional peak electricity demand is forecast to grow by an average 2.0 per cent per annum over the next 15 years, from 231 megawatts ("**MW**") in 2023 to

[3] Transpower Transmission Planning Report, 2023, page 95.

311 MW by 2038. This is equal to the national average growth rate of 2.0 per cent per annum.[4]

5.7. 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 Far North District

5.8. The main project work planned for the KOE-MPE A transmission line in the next year includes routine maintenance such as insulator replacements and tower painting.

5.9. While Transpower currently has no specific plans for new transmission assets in the district, that could change at any stage. For example, where new National Grid transmission lines are needed to connect new renewable energy generation sources to the network. This is discussed further below.

6. The National Grid's Role in Aotearoa New Zealand's Energy Future

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

[4] Transpower Transmission Planning Report, 2023, page 97

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[5] 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 forecasts that electricity demand will increase by 68% 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 decades, 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 wherever those generation sources are located. For example, if new renewable

[5] Transmission Tomorrow was reviewed in 2023. The 2023 refresh confirmed that the 2018 strategy remains valid (page 9).

generation sources are constructed in the Far North, new National Grid assets may need to be authorised and constructed within the District to connect the generation to the existing National Grid 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 Far North district, the Northland 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 PDP.

7.2. Transpower’s relief through the PDP 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 Far North District and New Zealand.

Rebecca Mary Eng

13 May 2024

Appendix A: Statement of Experience
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Career Summary

Technical Lead – Environmental 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: National Grid Assets in the Far North District

Transpower Assets

Far North District

Legend

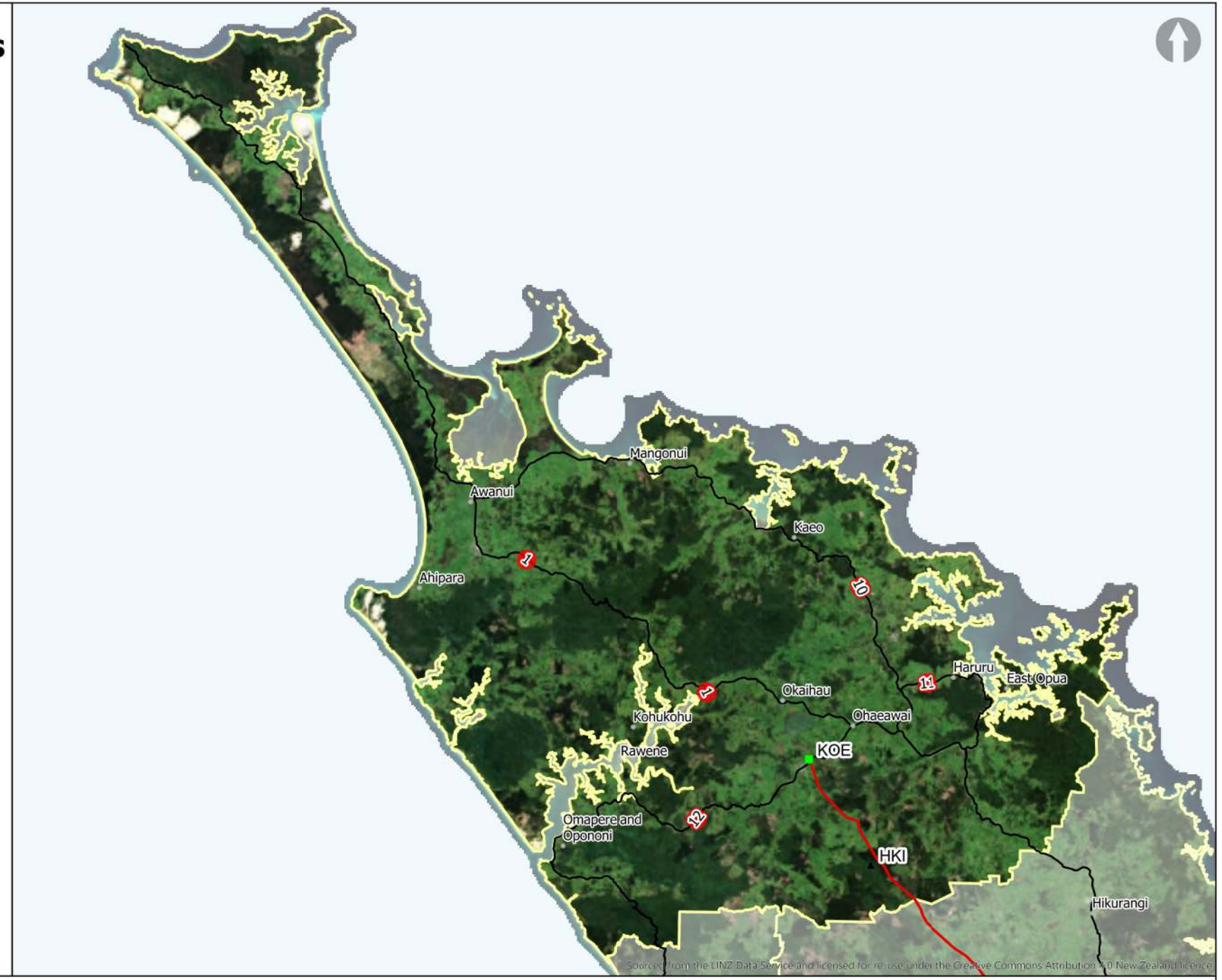
Territorial Land Authority
- Boundary

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



TRANSPOWER
Prepared by: Transpower Geospatial

Projection: NZTM 2000 Scale: 1:563,000 Plan Size: A3L

0 1,000 2,000 km

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