BEFORE THE MACKENZIE DISTRICT PLAN REVIEW HEARINGS PANEL

Under	the Resource Management Act 1991 (the Act)
In the matter of	Proposed Plan Changes 23, 24, 25, 26 and 27 to the Mackenzie District Plan
Between	**Mackenzie District Council** Local Authority
And	**Transpower New Zealand Limited** Submitter and Further Submitter

Statement of evidence of John Vincent Sutherland on behalf of Transpower New Zealand Limited

Dated 3 May 2024

1 Executive Summary

1.1 Transpower New Zealand Limited ("**Transpower"**) is a State-Owned Enterprise that owns and operates New Zealand's National Grid and has the primary role of ensuring the delivery of reliable and secure electricity supply across the country.

1.2 National Grid assets in the Mackenzie District ("**the District**") serve communities at a local, regional and national scale. There are five substations and nine high voltage National Grid transmission lines ranging from 110 kilovolts ("**kV**") to 350 kV in capacity and collectively stretching to around 320 kilometres in length within the District. Transpower also has other facilities within the Mackenzie District, such as communication assets.

1.3 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.

1.4 Transpower's submission seeks that appropriate planning provisions are included in the Mackenzie District Plan 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 Mackenzie District, the Canterbury Region and beyond.

1.5 **Ms Ainsley McLeod**'s evidence addresses recommendations in each of the section 42A (of the Resource Management Act 1991 (**"RMA**") reports for Plan Changes 23, 24, 25, 26 and 27. **Ms McLeod** largely agrees with the conclusions in the s42A reports and recommends that some further amendments are necessary and appropriate (in terms of the requirements of s32 of the RMA) to achieve consistency with, and give effect to (as appropriate), higher order provisions; to improve the efficiency, clarity and usability of the Proposed District Plan and achieve the purpose of the RMA. I concur with the amendments sought in **Ms McLeod**'s evidence.

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2 Qualifications and experience

2.1 My full name is John Vincent Sutherland.

2.2 I am employed by Transpower as an Environmental Planner (in Transpower's Environment Group). My relevant experience, qualifications, and commitment to comply with the Code of Conduct for Expert Witnesses are included in **Appendix A**.

2.3 I confirm that I am authorised to give this evidence on behalf of Transpower.

2.4 I have read the statement of evidence of **Ms McLeod** and support the planning solutions which her evidence recommends.

3 Scope of evidence

3.1 My evidence will address the following:

a. Transpower and the National Grid;

b. The location of existing National Grid assets in the Mackenzie District and the significant role these play locally, regionally and nationally;

c. Current electricity transmission projects in the Mackenzie District;

d. Restricting public access during works on the National Grid for health and safety;

e. The National Grid's role in Aotearoa New Zealand's energy future; and;

f. Conclusions.

3.2 The primary focus of my evidence is to provide context for Transpower's role and function, and the importance of the National Grid.

4 Transpower and the National Grid

Transpower

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. The National 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 now given efforts to decarbonise the economy. 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's role is distinct from electricity generation, distribution or retail. Transpower provides the required infrastructure to transport electricity from the point of generation (Meridian and Genesis Energy, for example) to where it is used – be that large industrial 'direct connect' customers (such as Tiwai Point Aluminium Smelter and NZ Steel at Glenbrook) or the local lines distribution companies – which for the Mackenzie District is Alpine Energy. These users may be a considerable distance from the point of generation.

4.4 Transpower also manages New Zealand's power system in real time. This role is known as the 'System Operator', and it's one carried out by Transpower under contract to the Electricity Authority[3]. As System Operator, Transpower operates the electricity market to ensure electricity is transmitted through the National Grid and delivered whenever and wherever it is needed, 24 hours a day, seven days a week. This requires balancing electricity supply and demand in real time.

4.5 Transpower's main role is to ensure the reliable supply of electricity to the country. 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 is a schematic of the electricity industry in New Zealand, with the National Grid assets being represented as '*Transmission*' and '*Substations*'.

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

[2] Clearing manager | Electricity Authority

[3] The Electricity Authority is an independent Crown entity responsible for the governance and regulation of New Zealand's electricity industry.

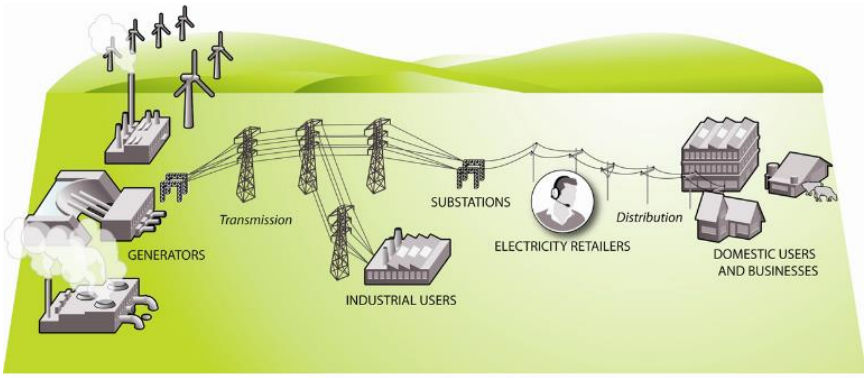

Figure 1: Electricity Industry in New Zealand. Source: Ministry of Business, Innovation and Employment.

4.6 As a State-Owned Enterprise, and as per Transpower's Statement of Corporate Intent for 1 July 2023, 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 (of which there are two: the Minister for State-Owned Enterprises and the Minister of Finance). 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 functions is to maintain and develop the National Grid, which contributes to New Zealand's economic and social aspirations. This function is reflected in the single objective in the National Policy Statement on Electricity Transmission 2008 ("**NPSET**"), which is a National Policy Statement prepared under the RMA.

4.8 Prudent investment in the National Grid, long term transmission planning strategies, and developing technologies are crucial to ensure the most can be made from existing National Grid infrastructure. Routine maintenance and access to the Grid is essential to defer the need for new lines and substations and to create better options for when building new National Grid infrastructure is required. This investment 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.

4.9 The National Grid has operational requirements and engineering constraints that dictate and constrain where it is located and the way in which it is operated, maintained, upgraded and developed.

4.10 In order to undertake its role, Transpower relies on the planning framework to enable its operation, maintenance, upgrading and development of the National Grid.

The National Grid Network

4.11 The National Grid comprises some 11,000 kilometres of transmission lines supported by towers and poles, and over 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.

4.12 The National Grid has 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. The bulk of the National Grid backbone was built around 60 years ago and comprises most of the 220 kV lines throughout New Zealand, along with the High Voltage Direct Current (HVDC) link which connects the North and South Islands.

4.13 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 and is considered a nationally significant physical resource.

4.14 The National Grid is an interlinked network. Electricity flows along transmission lines via lines supported by towers, 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 Transpower's National Grid infrastructure in the Mackenzie District

National Grid Assets in the Mackenzie District

5.1 There are nine National Grid transmission lines that traverse the Mackenzie District, five substations and two communication sites located within it. Full details of these assets are provided as **Appendix B** of my evidence (and are listed on pages 4 and 5 of Transpower's original submission). In the Mackenzie District, Transpower has transmission lines that cover some 320 kilometres within the District:

5.2 I have included a map showing these National Grid assets in the Mackenzie District attached as **Appendix C** of my evidence.

5.3 For Transpower's transmission planning purposes, the Mackenzie District is located within the South Canterbury region as set out geographically below in **Figure 2**.

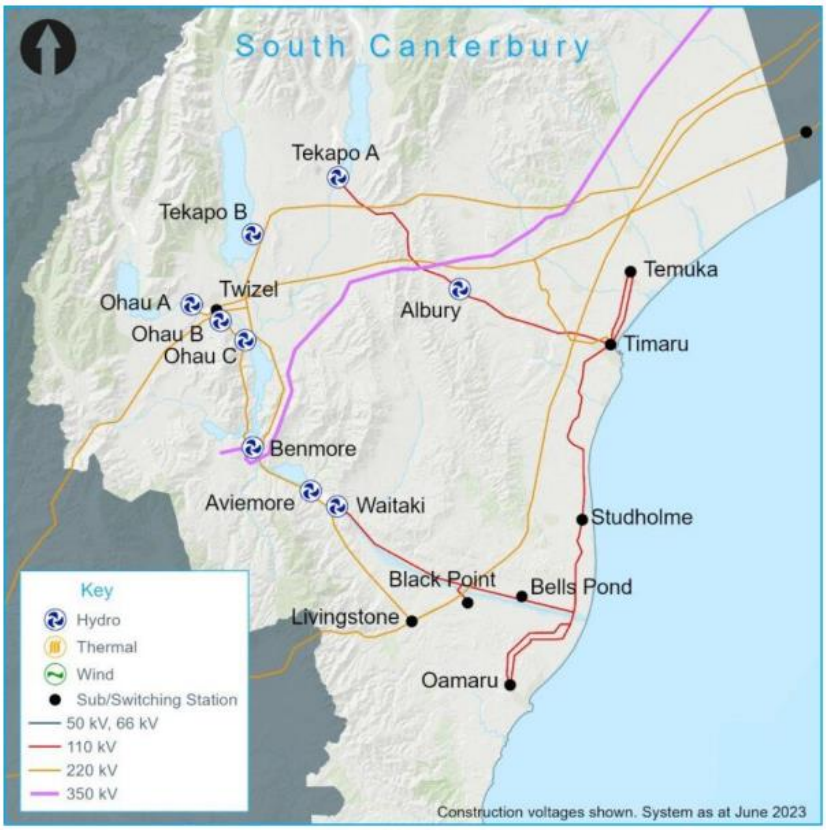

Figure 2: Transmission in the South Canterbury Region (Source: Transpower Transmission Planning Report 2023)

5.4 The South Canterbury region includes a mix of significant provincial towns (Timaru and Oamaru) and smaller rural localities. The region supports a diverse range of primary based industries and Transpower expects significant electricity demand growth from initiatives to decarbonise these industries. The region also hosts the bulk of the South Island's hydro generation and the southern end of the HVDC inter-island link.

5.5 Transmission within the South Canterbury region primarily comprises 220 kV and 110 kV transmission circuits, with interconnecting transformers at Timaru and Waitaki Substations. The 220 kV transmission circuits form part of the National Grid backbone.

5.6 The South Canterbury regional peak demand is forecast to grow by an average of 2.7 per cent per annum over the next 15 years, from 231 megawatts ("**MW**") in 2023 to 347 MW by 2038. This rate of growth exceeds the national average growth rate of 2.0 per cent per annum.

5.7 Much of the 110 kV transmission network is at capacity, mainly as a result of increased load associated with the dairy industry, including dairy processing and irrigation. Supplying existing and committed new load via the 110 kV network is currently achievable but will become increasingly difficult to manage if potential new load centres are developed in the area.

5.8 Within the Mackenzie District, peak demand is forecast to double at Tekapo A Substation over the next 15 years (from ~6 MW in 2023, to 12 MW in 2038). Increases are also forecasted at the Twizel and Albury Substations (from 8 and 6 MW to 9 and 8 MW respectively).

Transpower's Projects in the Mackenzie District

5.9 Transpower continues to invest in the National Grid in terms of both maintenance and enhancement of its asset base. Transpower's development and investment strategy is centred on maximising the use of existing infrastructure, therefore maintaining the environmental footprint for as long as possible before the introduction of new infrastructure.

5.10 Transpower is also carrying out business as usual maintenance and upgrade works on its assets within the District. At Tekapo A Substation, a new 33 kV switchroom building is being constructed to accommodate the replacement and relocation of aging 33 kV equipment. Regular maintenance works will continue to occur on transmission lines such as pole replacements, vegetation maintenance, access track works, foundation strengthening, tower painting and flood protection works.

6 Restricting public access during works on the National Grid for health and safety.

6.1 In her evidence, **Ms McLeod** addresses the Officer's Report recommendations relating to proposed Objective PA-O1 in Plan Change 27: Subdivision, Earthworks, Public Access and Transport. My evidence provides examples of works on the National Grid that may require public access to be prevented in order to protect the health and safety of people and communities.

6.2 Typical works undertaken to maintain, upgrade and develop the National Grid within publicly accessible surface waterbodies can necessitate access restrictions to ensure the health and safety of people and communities. These works can include support structure foundation refurbishments, insulator repairs, structure blasting and painting, and steel member or full structure replacements. When a transmission line traverses the extent of a surface waterbody, the conductors (wires) that span across may require replacement (reconductoring) to maintain the transmission line. Upgrading the transmission line could involve a change to a larger conductor type or installing additional conductors to increase its capacity. Changes in conductor type or configuration can change how the transmission line reacts and may create new electrical clearance violations. To achieve electrical clearances, this can involve mid-span earthworks, vegetation clearance, parallel body extensions to increase a structure's height (by inserting an additional section to the body of an existing structure), or the installation of mid-span structures to lift conductors. To ensure appropriate access to the transmission line for crews, this can involve vegetation clearance and earthworks along access tracks and around structures.

6.3 In the Mackenzie District, the Benmore – Islington A (BEN-ISL-A) 220 kV transmission line crosses the Ōpihi River approximately 3.5km north-west of Fairlie township. There is also a National Grid transmission support structure (BEN-ISL-A0275) located within the river extent. This section of Ōpihi River is a site of significance to Māori being the Te-Kopi-O-Opihi Trail, which is categorised as an ancient trail. A map showing this location is provided as **Appendix D** to my evidence. For example, when works on structure BEN-ISL-A0275 are undertaken, whether it be for foundation refurbishment or blasting and painting, Transpower would establish temporary fencing and signage to

clearly signal to the public the nature and extent of the works and to ensure the health and safety of people by preventing access to a live works site.

6.4 A recent example is foundation refurbishment works on marine-based National Grid support structures on Transpower's Henderson – Ōtāhuhu A (HEN-OTA-A) 220 kV transmission line in Te Whau River located in Te Atatū, Auckland. Five structures (HEN-OTA A0073, 74, 76, 78 and 79) are located within the river extent and can be accessed by the public, particularly water-based users from the Te Atatū Boat Club and the West End Rowing Club located nearby. There is a Significant Ecological Area overlay that applies to the location of these works so this is a comparable environment to one that would likely be subject to Objective PA-O1 in the Mackenzie District. Transpower has recently completed works on structure 79 where there were several pieces of amphibius mobile plant manoeuvring to and from a laydown area across the river to transport equipment to the structure, as well as around the structure site to undertake refurbishment works. Preventing public access to the structure and avoiding close contact with the movement and use of equipment and mobile plant ensured the health and safety of the public and community. This also allowed Transpower to continue with the critical refurbishment works efficiently.

6.5 In her evidence, **Ms McLeod** describes the implications of Objective PA-O1 from a planning perspective. Transpower authorises works on existing transmission lines using the Resource Management (National Environmental Standards for Electricity Transmission Activities) Regulations 2009 ("**NESETA"**). Despite the enabling rules in the NESETA for maintenance and minor upgrade activities, works located within the extent of surface waterbodies with recreational, scenic, ecological, indigenous biodiversity, conservation, mana whenua or amenity values may then mean resource consent needs to be sought and any relevant objectives of the District Plan would need to be considered.

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

Transmission Tomorrow (2016)

7.1 Transpower's 2016 publication "*Transmission Tomorrow*" [4] sets out Transpower's strategy for the future development of the National Grid for the

[4] Transpower - Transmission Tomorrow26052016_0.pdf

next 30 years and beyond. It 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)

7.2 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')[5]. 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.

7.3 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)

7.4 In 2020, Transpower published a further document, "*Whakamana i Te Mauri Hiko – Empowering our Energy Future*" (2020)[6] which sets out a blueprint for how New Zealand may achieve getting 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 the emissions-intensive transport and process heat sectors.

[5] TP Energy Futures - Te Mauri Hiko 11 June'18.pdf (transpower.co.nz)

[6] Whakamana i Te Mauri Hiko - Empowering our Energy Future | Transpower

7.5 As the economy electrifies in pursuit of the most cost efficient and renewable sources, the Whakamana i Te Mauri Hiko base case predicts that by 2050 electricity demand is likely to more than double. 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, the National Grid is the infrastructure on which New Zealand's zero-carbon future will be built. 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.

8 Conclusions

8.1 The National Grid is critical to the social and economic wellbeing of the Mackenzie District 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, provided for and protected in the proposed Mackenzie District Plan.

8.2 Transpower's relief sought through the Mackenzie District Proposed Plan Changes 23, 24, 25, 26 and 27 will ensure integrated management of activities through the District Plan to provide for the sustainable development of both the National Grid infrastructure and other natural and physical resources, all of which are critical for the future development of the Mackenzie District and Aotearoa New Zealand.

John Sutherland

3 May 2024

Appendix A: Relevant Experience and Qualifications

1. I am an Environmental Planner (in Transpower's Environment Group) whose responsibilities include:

    a. Strategic planning. This planning is achieved through the development and implementation of Transpower's corridor management programme at a national level and local level.

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

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

    d. Internal/external stakeholder engagement with Councils, iwi, developers and customers.

2. I have been employed by Transpower for over 6 and half years, and during this time my responsibilities have included:

    a. preparing environmental planning assessments, developing strategy and policies, and processes to deliver and monitor all the necessary environmental approvals for numerous major capex projects concerning both transmission lines and substations across the country.

    b. working with customers to secure the necessary environmental approvals to enable new generation and local electricity distribution connections to the National Grid.

    c. responding to landowners and developers to ensure that reverse sensitivity effects of any development are managed, and the National Grid is not compromised, and more importantly, people are not harmed.

d. partnering and working with stakeholders, ensuring that key relationships are informed, risks are identified, and reputations are enhanced.

3. I have a Master of Resource and Environmental Planning from Massey University and a Bachelor of Arts in English and Geography from Victoria University. I have over 6 and half years' experience working as an Environmental Planner, and I am an Intermediate member of the New Zealand Planning Institute.

4. I confirm I have read the Code of Conduct for Expert Witnesses contained in the Environment Court 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. 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.

Appendix B: National Grid Assets within the Mackenzie District

The following National Grid assets are within the Mackenzie District:

Transmission Lines:

- Benmore – Haywards A (BEN-HAY-A) 350 kV HVDC overhead transmission line on towers;
- Benmore – Islington A (BEN-ISL-A) 220 kV overhead transmission line on towers;
- Benmore – Twizel A (BEN-TWZ-A) 220 kV overhead transmission line on towers;
- Christchurch – Twizel A (CHH-TWZ-A) 220 kV overhead transmission line on towers;
- Ohau A – Twizel A (OHA-TWZ-A) 220 kV overhead transmission line on towers;
- Roxburgh – Twizel A (ROX-TWZ-A) 220 kV overhead transmission line on towers;
- Tekapo A – Timaru A (TKA-TIM-A) 110 kV overhead transmission line on poles (including pi poles);
- Tekapo B – Deviation A (TKB-DEV-A) 220 kV overhead transmission line on towers;
- Twizel – Deviation A (TWZ-DEV-A) 220 kV overhead transmission line on towers;

Substations:

- Albury Substation;
- Ohau A Substation;
- Tekapo A Substation;
- Tekapo B Substation;
- Twizel Substation; and

Communication sites:

- Mt Mary
- Tekapo A