

**BEFORE THE HEARINGS PANEL APPOINTED
BY THE OTAGO REGIONAL COUNCIL**

IN THE MATTER of an original submission on the
Proposed Regional Policy
Statement for Otago 2021 (**PRPS**)

BETWEEN **NETWORK WAITAKI LIMITED**

Submitter 0320

AND **OTAGO REGIONAL COUNCIL**

**BRIEF OF EVIDENCE OF SHANE WATSON ON BEHALF OF
NETWORK WAITAKI LIMITED**



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BRIEF OF EVIDENCE OF SHANE WATSON ON BEHALF OF NETWORK WAITAKI LIMITED

1. Executive Summary

- 1.1 Network Waitaki Limited (“**Network Waitaki**”) is an Electricity Distribution Business (“**EDB**”).
- 1.2 Its role is to distribute electricity from Grid Exit Points that form part of the National Grid and deliver it to customers. This requires operating, maintaining, upgrading and developing an efficient and safe electricity distribution network.
- 1.3 Network Waitaki was incorporated in 1993 and the Waitaki Power Trust holds 100% of the shares on behalf of electricity consumers in the region.
- 1.4 Network Waitaki services a mix of towns, rural land and remote farmland dispersed over a large area. Approximately 90% of its customers are supplied through the Ōamaru Grid Exit Point in the Otago region.
- 1.5 Development of the network is driven by the peak demand for electricity by the customers. Historically, the main driver for network development has been irrigation demand, firmly establishing Network Waitaki as a summer peaking network. However, decarbonisation and climate change are rapidly changing the landscape within which Network Waitaki operates providing both opportunities and challenges. Increased electrification from vehicles, facilitation of renewable technologies including distributed generation, decarbonisation of industries and adverse weather events are signalled to become additional key drivers.
- 1.6 The role of Network Waitaki in continuing operation of the existing network as well as evolving to adapt to these anticipated landscape changes to power the future of Otago cannot be understated. The need to protect and enable this infrastructure is a key issue for the region. How Network Waitaki delivers this essential service is reliant in part on the long-term direction and policy provisions of the proposed Otago Regional Policy Statement (“**the pORPS**”) which has a critical role of infusing the development of local resource management policies, including district plans and their associated resource consenting requirements.
- 1.7 Adopting the relief sought by Network Waitaki and other electricity distribution networks in the region (PowerNet and Aurora Energy Limited) will enable the continued delivery of a safe, protected, reliable and efficient electricity distribution network for the people, businesses and communities of the Otago region, now and in the future.

2. Introduction

2.1 My name is Shane Charles Watson.

2.2 I am the General Manager Network at Network Waitaki since December 2021.

2.3 My experience includes nearly 40 years' engineering and asset management experience in the New Zealand electricity transmission and distribution sectors, and 20 years' experience with Orion New Zealand Limited, the third largest electricity distribution network, managing its electrical assets.

2.4 In my role as General Manager Network, I provide leadership, coordination, and oversight to all aspects of operating the Network, including asset management, development, and network operations. My role coordinates resources across multiple teams to deliver the outcomes of the organisation's Asset Management Plan and I drive continual improvement of our asset management practices.

2.5 I have been authorised by Network Waitaki (submitter number 00320) to provide evidence on its behalf.

3. Scope of Evidence

3.1 I have been asked to provide this brief of evidence on behalf of Network Waitaki on the pORPS. In particular, this evidence will:

- (a) Describe the current Network Waitaki network in Otago and its relationship with the National Grid;
- (b) Set out the network development plans and obligations it currently has;
- (c) Discuss the importance of the Network Waitaki's Electricity Sub-Transmission Infrastructure ("**ESTI**") and Significant Electricity Distribution Infrastructure ("**SEDI**");
- (d) Discuss the current resource management challenges faced by Network Waitaki, and
- (e) Provide a conclusion.

3.2 In preparing this evidence I have reviewed the evidence of Mr David Paterson for Aurora Energy Limited, who operate an electricity distribution business throughout Dunedin, Central Otago and Queenstown Lakes Districts. For the purpose of setting out the background of what NWL does, the regulations it is subject to and the broad nature of

the distribution network I adopt the explanation contained in the following sections of Mr Paterson's evidence, where it relates to EDBs generally, to avoid repetition:

- (a) Section 4 Technical and Operational Requirements of Electricity Distribution in Otago
- (b) Section 5 Lifeline Utility
- (c) Section 8 New Zealand Electrical Code of Practice for Electrical Safe Distances

4. Network Waitaki's electricity distribution network in the Otago region

4.1 Network Waitaki provides electricity to approximately 13,170 customer connections in its area of supply, primarily throughout the Waitaki District which traverses both the Canterbury and Otago regions. The map contained in Appendix 1 provides an overview of Network Waitaki's entire area of supply.

4.2 The operating environment of the Waitaki region is a mixture of coastal plains and alpine areas. The climate is traditionally dry and cold in winter, and dry and hot in summer. The area is known to suffer from drought conditions. Extreme weather events can include wind and snowstorms, floods and fire. We expect to experience at least one significant weather event every year. The impact of these events is typically restricted to the inland area of the network, but can occasionally affect the whole region, and in extreme events can affect neighbouring regions as well. Despite the typically dry summer conditions, vegetation growth is robust throughout most of our network, and management of vegetation near our assets is an ongoing focus of our operations.

4.3 Approximately 11,000 of Network Waitaki's customers are in the Otago region. 80% of the customer base is residential, with the majority of these customers located in the urban centre of Ōamaru. The remainder of the population in the Otago region are dispersed throughout the surrounding areas and several other small townships up to the southern side of the Waitaki River bridge, west out to Ngapara and south to Shag Point, as at Appendix 2.

4.4 The remaining 20% of the customer base is comprised of agriculture, commercial and industrial customers. The rural economy of the region is based on a mixture of beef and sheep farming, crops, and dairy. Irrigation is a major source of the growth on our network, being widely used throughout the region, via schemes that include border-dyke systems, direct pumping from a local water source, or reticulated systems to the farm gate. The Ministry for Business, Innovation, and Employment records that the contribution to the

regional economy from the agriculture sector was 15.7% of GDP in 2019 (most recent published figures)¹. There is also a significant manufacturing sector in the region, contributing approximately 12.6% to the regional economy in 2019².

4.5 The Ōamaru Grid Exit Point (“**GXP**”) is the primary source of power that feeds the Otago region in Network Waitaki’s area of supply. A GXP is a substation where electricity is taken from the National Grid, in this case at 110,000 volts (110kV), and converted to sub-transmission voltages of 33,000 volts (33kV) to enter the electricity distribution network.

4.6 Network Waitaki’s current electricity distribution network serving the Otago region encompasses:

- (a) 10 zone substations, where electricity is managed and transformed from sub-transmission voltages (33kV or above) down to lower voltages for distribution;
- (b) Approximately 125km of sub-transmission overhead lines and associated poles, and 4.3km of sub-transmission underground cables – these provide the critical link in transporting electricity between zone substations. All existing sub-transmission network is presently operated at 33kV;
- (c) Approximately 1,010 km of high voltage 11,000 volts (11kV) overhead lines and underground cables which connect the zone substations with local distribution substations and kiosks with transformers to distribute the electricity further into local communities;
- (d) Approximately 777km of low voltage overhead lines and underground cables, which along with a variety of ground mounted equipment, including cabinets and boxes, manage the supply of power to individual locations.
- (e) Communications and telemetry equipment at zone substations and other sites. This equipment enables remote monitoring and control of network equipment and provides contact with operating staff and contractors in the field.

4.7 An overview of the Ōamaru GXP, zone substations and sub-transmission network in the Otago region can be seen in Appendix 2.

¹ Source: MBIE Regional Economic Activity Web Tool. <http://webrear.mbie.govt.nz/summary/new-zealand>, Nov 2022

² Source: MBIE Regional Economic Activity Web Tool <http://webrear.mbie.govt.nz/summary/new-zealand>, Nov 2022

5. Network development plans

5.1 Network Waitaki has a 10-year Asset Management Plan which is prepared on an annual basis to outline the assets we manage and our approach to managing them. For management of existing assets, this includes a forecast expenditure on maintenance and planned renewal of assets for the planning period, activities necessary to keep members of the public safe and maintain the reliable supply of electricity to our zone substations and minimise supply interruptions. Typically, assets have a lifespan of 40-60 years. However, they may be replaced or upgraded prior to that, usually in response to a network safety matter or customer demand.

5.2 In addition to management of the existing network, the Asset Management Plan also details a robust process for planning development of the network when a development driver is triggered. For example, this can be a new customer connection, safety, security of supply, or readiness for the future. The process requires preparation of a business case containing an options analysis and if approved, the project will be designed and scheduled into the works programme. Consideration of the location at the business case level will identify a general vicinity. However, the selection of a specific property location for a new asset occurs at the planning investigation phase of a project. It is at this stage that environmental matters, including consideration of the presence of sensitive environments such as a heritage area, Significant Natural Area or Outstanding Natural Landscape, are considered. It can take many years from initial conception through to operation of a significant asset, such as a new zone substation or a new sub-transmission line. Long term planning and strategy is a function of operating as an EDB and enables us to provide a network that is fit for purpose over decades and delivers the best value for our customers - while meeting their capacity needs both now and into the future.

5.3 This section describes three key network development projects.

Transmission capacity constraint

5.4 The Ōamaru Grid Exit Point (“**GXP**”) is approaching its capacity limit to provide electricity for increasing demand. This may occur sooner than expected depending on the timing and likelihood of decarbonisation of large industrial customers. The response to this capacity issue to date has been to utilise electricity from the Waitaki GXP in the Canterbury region in addition to the Ōamaru GXP. However, this is a temporary measure and a long term, viable solution is required.

5.5 Following consideration of a range of long-term solution options and a robust business case process, Network Waitaki plans to:

- (a) construct a new 220kV/110kV/33kV GXP in the vicinity of the Black Point area by 2027 (most likely in the Canterbury region); and
- (b) design the new GXP to accommodate two future 110kV overhead lines back to the Ōamaru GXP.

Irrigation demand growth

5.6 There is still a reasonably large amount of land in the Papakaio plains area that is to be converted from border-dyke irrigation to spray irrigation which will increase the demand for electricity.

5.7 To provide for this forecasted demand increase, Network Waitaki will:

- (a) Construct a new zone substation in the Awamoko area (under construction);
- (b) Construct 12.5km of new 110kV sub-transmission line connecting the Awamoko Zone Substation to Papakaio Zone Substation; and
- (c) Construct 16km of new 110kV sub-transmission line from Awamoko Zone Substation to Duntroon Zone Substation.

Distribution generation

5.8 Distribution generation, or embedded generation, refers to a range of technologies and scales, including small-scale systems such as photovoltaic modules, small wind turbines and micro-hydro schemes to generate electricity and is a tool for achieving decarbonisation.

5.9 Distributed generation occurs at an individual location such as a home or business which can generate electricity for that installation and may also be capable of feeding surplus generated electricity into the electricity distribution network, rather than the National Grid. The connection of distributed generation to the electricity distribution network is regulated by Part 6 of the Electricity Industry Participation Code 2010³ which sets out the regulated terms that will apply unless parties have agreed otherwise.

5.10 Network Waitaki actively works with customers to advise them of distribution alternatives such as distribution generation from wind or solar. At present, Network Waitaki has 142

³ Electricity Authority, Electricity Industry Participation Code 2010, <https://www.ea.govt.nz/code-and-compliance/the-code/>

solar roof top generation plants, 5 hydro plants and 1 wind generator connected to and injecting into the network.

- 5.11 It is anticipated that over the next 10 years, there will be an increase in the take up of distributed generation. This is likely to be driven by views on climate change, government incentives, cost reductions, new value streams of having control of distributed energy and ownership models which enable access to these technologies with low capital outlay.
- 5.12 Network Waitaki welcomes this signalled change, particularly where sufficiently large, distributed generation customers are located in an area of strategic importance where a contribution to peak demand reduction could be deemed useful.
- 5.13 This snapshot of network development projects reflect the obligation Network Waitaki has to deliver a safe, reliable, secure, resilient and cost-effective supply of electricity that meets the performance expectations of our customers.
- 5.14 Critically, these network development projects rely on the development of the Electricity Sub-Transmission Infrastructure, classified as Significant Electricity Distribution Infrastructure, which I now turn attention to.

6. Importance of Electricity Sub-Transmission Infrastructure (“ESTI”) and Significant Electricity Distribution Infrastructure (“SEDI”)

- 6.1 Electricity Sub-Transmission Infrastructure (ESTI) is the backbone of the electricity distribution network forming part of the fabric of the region, underpinning network capacity and critically transporting electricity between zone substations for distribution around the Otago region.
- 6.2 Zone substations and overhead lines or underground cables operating at 33kV or above by Network Waitaki are classed as ESTI.
- 6.3 It is the ESTI which Network Waitaki must steadily develop and upgrade to gradually increase capacity in its network to support population and commercial growth, decarbonisation and increased electrification in the years to come. This is exemplified by the three projects which I described in Section 5 of this evidence.
- 6.4 Further, the ESTI supports other Regionally Significant Infrastructure that is identified in the pORPS such as:
 - (a) The Ōamaru Hospital and other emergency services;

- (b) Ōamaru airport;
 - (c) Waitaki District Council's wastewater, water supply and stormwater infrastructure;
 - (d) Telecommunication and radiocommunication networks; and
 - (e) Railway network
- 6.5 I understand that the ESTI is recognised in the pORPS as Regionally Significant Infrastructure. It is imperative that this status is retained for the reasons discussed in this section.
- 6.6 As mentioned earlier, all existing ESTI is currently operated at 33kV and must be able to continue to operate safely and efficiently. The 33kV sub-transmission network is predominantly overhead construction, apart from some short lengths of underground cable. The overhead lines are supported mainly by wooden and concrete poles.
- 6.7 The location of the existing ESTI is a combination of private land, referred to in the electricity distribution industry as 'over-boundary', and in the road corridor.
- 6.8 Equipment located over-boundary and established prior to 1993 is enabled, authorised, and protected by the Electricity Act 1992. Over boundary equipment established after this date is generally authorised by private property rights, particularly easements.
- 6.9 Network installation in the road corridor is both authorised and governed by various legislation – particularly the Electricity Act 1992, the Utilities Access Act 2010 and the National Code of Practice for Utility Operators Access to Transpower Corridors 2019. At a high level, this framework enables access by utility operators to transport corridors and ensures they are managed in a way that maximises public benefit, treats operators fairly, minimises disruption during works, maintains safety in a nationally consistent manner.
- 6.10 A failure on the ESTI system can affect several zone substations, and therefore result in a power outage for many customers. For example, a disruption at Transpower's Ōamaru GXP in 2019 cut supply for Network Waitaki causing a power outage for the Ōamaru Hospital and approximately 8000 homes from Shag Point to south of the Waitaki bridge and inland to Duntroon. Fortunately, in this instance Network Waitaki was able to restore power quickly for Ōamaru Hospital, emergency services, some schools and supermarkets within half an hour and homes within several hours. This was done by reconfiguring the network to provide a backup supply from another sub-transmission line. Constructing the network in a manner to provide backup supply when certain parts of

the line are out of service is a common asset management practice to provide resiliency and reliability of supply.

6.11 The failure of any one ESTI line has a far greater impact on the network than the failure of one, or indeed many, lower voltage lines. This is because the ESTI has the purpose of feeding zone substations, which in turn supplies lower voltage lines. Further, ESTI lines take longer to reinstate in the event of a failure. Network Waitaki target repair times of 12 hours applies to sub-transmission equipment versus 4 hours for overhead lines and 6 hours for underground cables.

6.12 Current major risks to the ESTI include:

- (a) Vehicle impact where the network is located within the road corridor;
- (b) Extreme weather events such as high winds or heavy snow;
- (c) Unmanaged or inappropriate vegetation selection or location and associated fire risk;
- (d) External equipment such as pivot irrigators moving into, spraying or being blown into lines;
- (e) Land use activities being developed in close proximity to ESTI and causing reverse sensitivity issues.

6.13 I understand that relief is sought to include a new definition for Significant Electricity Distribution Infrastructure (**SEDI**), and then to include an amendment to the definition of Regionally Significant Infrastructure to include SEDI.

6.14 Our sought relief for a new definition for SEDI is as follows:

Means electricity distribution which supplies:

- a) essential and emergency services (such as hospitals and lifeline facilities);*
- b) other regionally significant infrastructure or individual consumers requiring supply of 1MW or more;*
- c) 700 or more consumers; or*
- d) communities that are isolated and which do not have an alternative supply in the event the line or cable is compromised and where the assets are difficult to replace in the event of failure.*

- 6.15 For absolute clarity, all ESTI is classified as Significant Electricity Distribution Infrastructure and necessitates the appropriate policy provisions for the on-going operation, maintenance and replacement in addition to protection from incompatible activities. I was involved in securing the corridor protection provision for ESTI and other significant electricity distribution infrastructure in the operative Christchurch District Plan. I consider those provisions have worked well in practice, benefiting both developer and Orion in achieving safe, compatible developments and providing appropriate protection.
- 6.16 Network Waitaki does not consider any of its 11kV overhead lines to meet the SEDI criteria above. However, that said Network Waitaki does not speak for other EDBs in the region, PowerNet and Aurora.
- 6.17 I now turn to the current challenges with the resource management framework to support the relief sought by Network Waitaki as detailed in the planning evidence by Ms Megan Justice.

7. Current resource management challenges

- 7.1 This section discusses the following current resource management challenges:
- (a) Retaining the ability to operate, maintain (including access), upgrade and develop infrastructure;
 - (b) Protection of infrastructure; and
 - (c) Integrated land use planning

Retaining the ability to operate, maintain, upgrade and develop

- 7.2 Network Waitaki is supportive of a planning framework which achieves environmental outcomes while enabling the operation, maintenance, upgrading and development of the electricity distribution network.
- 7.3 When considering where to locate new infrastructure, particularly ESTI, Network Waitaki carefully considers matters such as natural hazards (whether flooding, seismic, coastal or climate change related) and sensitive receiving environments (significant natural areas, outstanding natural landscapes, areas of cultural significance, or areas of historic heritage for example), against functional and operational network needs. In Network Waitaki's view, if there is a viable, or practicable, engineering solution which avoids locating in those sensitive environments, then that option is typically preferred.
- 7.4 However, depending on the extent and location of these areas and demand on the electricity distribution network, there are at times an operational and functional need to

install new network in sensitive areas to fulfil the obligation to provide a safe, reliable and efficient electricity supply. This obligation applies irrespective of any land use and planning requirements of the local authority. This particularly applies to customer connections, when a customer premises is already located within or adjacent to a particular sensitive receiving environment, it is not an option for Network Waitaki to simply avoid installing network in that area because that land has been classified in a particular way. In these situations, where the installation of network cannot be avoided, equipment is designed as far as practicable to reflect the particular environment. For example, where reasonably practicable, this might include reducing the number of poles in a given area, where electrically possible, or installing an underground cable instead of overhead lines.

- 7.5 It is therefore just as important that provision is made for the operation and maintenance (including replacement) of infrastructure in sensitive areas. This is not only to apply to new assets where a functional and operational need has been demonstrated through the consenting process, but also for application to existing network which, through the course of updating a district plan, may subsequently be located in a newly identified sensitive area, such as a Significant Natural Area.
- 7.6 Extreme weather events such as the heavy flooding in July 2022 and August 2022 continually remind us of the importance of electricity as an essential service to the community and in the event of a network failure, the hardship it can bring the community. Regulatory frameworks under the RMA ought to appropriately consider the necessity and utility of electricity distribution and enable Network Waitaki (and other EDBs in Otago) to operate, maintain, upgrade and develop our network to ensure its ongoing resilience and reliability.
- 7.7 The Waitaki District Plan is the primary regulatory framework for the majority of Network Waitaki's operations and is currently being reviewed. I understand a tentative date for notification of the proposed Waitaki District Plan is in the next couple of years. It is therefore imperative the pORPS incorporates the relief sought by the planning evidence of Ms Justice to protect and provide for the electricity distribution network, including in sensitive environments where is a functional or operational need to do so.

Protection of infrastructure

- 7.8 The evidence of Mr Paterson provides an overview of operational issues facing electricity distribution network operators due to improperly planned development and / or incompatible new activities near ESTI.

7.9 The recommended definition in the Section 42A Officer's Report defines reverse sensitivity supported by Network Waitaki in its further submission (ref. FS00320) as:

means the potential for the operation of an existing lawfully established activity to be constrained or curtailed by the more recent establishment or intensification of other activities which are sensitive to the effects of the established activity.

7.10 Other reverse sensitivity effects in addition to those identified in the evidence of Mr Paterson can relate to electro-magnetic fields, noise, radio interference or visual amenity from a nearby sensitive activity. For example, a Network Waitaki zone substation which has been present since the 1960s and largely remains surrounding by rural land, received a complaint in 2014 from adjacent residential activity (established after the zone substation) regarding the low-frequency hum noise coming from the outdoor transformer. To address this complaint, Network Waitaki made significant investment to replace those transformers at that time.

7.11 Then in 2022, Network Waitaki received notification (on a limited basis) of a resource consent application to subdivide and intensify an adjacent, undeveloped lot in proximity to the zone substation, into 10 residential lots, increasing the potential for similar complaints to be raised in the absence of appropriate mitigation measures.

7.12 In the event that reverse sensitivity concerns are not considered then Network Waitaki is required to take steps to avoid, remedy or mitigate those effects to either pre-empt a future complaint, or respond to one. Remedying reverse sensitivity effects for the electricity distribution network can be difficult and costly, typically due to safety and network requirements and the limited inability to 'move' network without significant cost which would be disproportionate to the actual level of effect that the equipment has on the environment.

7.13 Unmanaged trees or inappropriate selection/location of tree species near overhead electricity lines are a common occurrence. Trees can create interference with lines causing power outages and can be a causal or contributing factor for wildfire under certain climatic conditions. Where there are trees in proximity to electricity lines, these need to be maintained in a manner that complies with the legislative requirements of the Electricity (Hazards from Trees) Regulations 2003. Network Waitaki has the power under this legislation to either cut the trees, and charge costs back to the tree owner, or to serve notice on the tree owner to cut the trees.

- 7.14 However, this legislation does not apply to trees outside of the encroachment zones defined. For example, trees may be planted on the opposite side of a road corridor to electricity lines. Such trees may have grown to such a height that in the event of high winds they could fall over onto the lines, cutting the link between zone substations and causing a power outage to thousands. In this example, the Electricity (Hazards from Trees) Regulations 2003 do not apply and Network Waitaki cannot require action to be taken, without negotiation with the tree owner and a possible cost. In this regard, unmanaged or inappropriate tree selection including planned plantations near the electricity distribution network, particularly ESTI, can pose a considerable risk.
- 7.15 The absence of adequate protection and management provisions in the pORPS has the potential to lead to further costly, reverse sensitivity related complaints and inharmonious development and community outcomes. In my experience with managing the Orion electricity distribution network, recognition of ESTI as Regionally Significant Infrastructure at the Regional Policy Statement level has achieved sufficient protection in the local District Plan with associated corridor protection rules for development and incompatible activities. In turn, these provisions improved safety around the network, ensuring a number of new dwellings, warehouses and commercial buildings have been constructed in accordance with safety requirements and retained Orion's ability to continue to operate, maintain and upgrade their critical assets.

Integrated land use planning

- 7.16 The need for upgrades to existing infrastructure or new infrastructure, particularly ESTI, is a direct result of continued growth and customer demand. Therefore, it may be necessary for Network Waitaki to construct a new sub-transmission line(s) or a new zone substation for integration with the wider ESTI system, in addition to installation of new local, lower voltage network.
- 7.17 In my experience with Orion, recognition of electricity distribution in integrated land use planning policies within the pORPS has resulted in better outcomes for development and prompted early discussions to facilitate cost-effective solutions.
- 7.18 Electricity is critical to service any form of development or planned growth and it is important that adverse effects on strategic infrastructure and sufficient protection is provided to ensure the on-going operation, maintenance, upgrading and development of this network. This can be achieved through the inclusion of appropriate integrated land use planning provisions in the pORPS as put forward by Ms Justice's planning evidence.

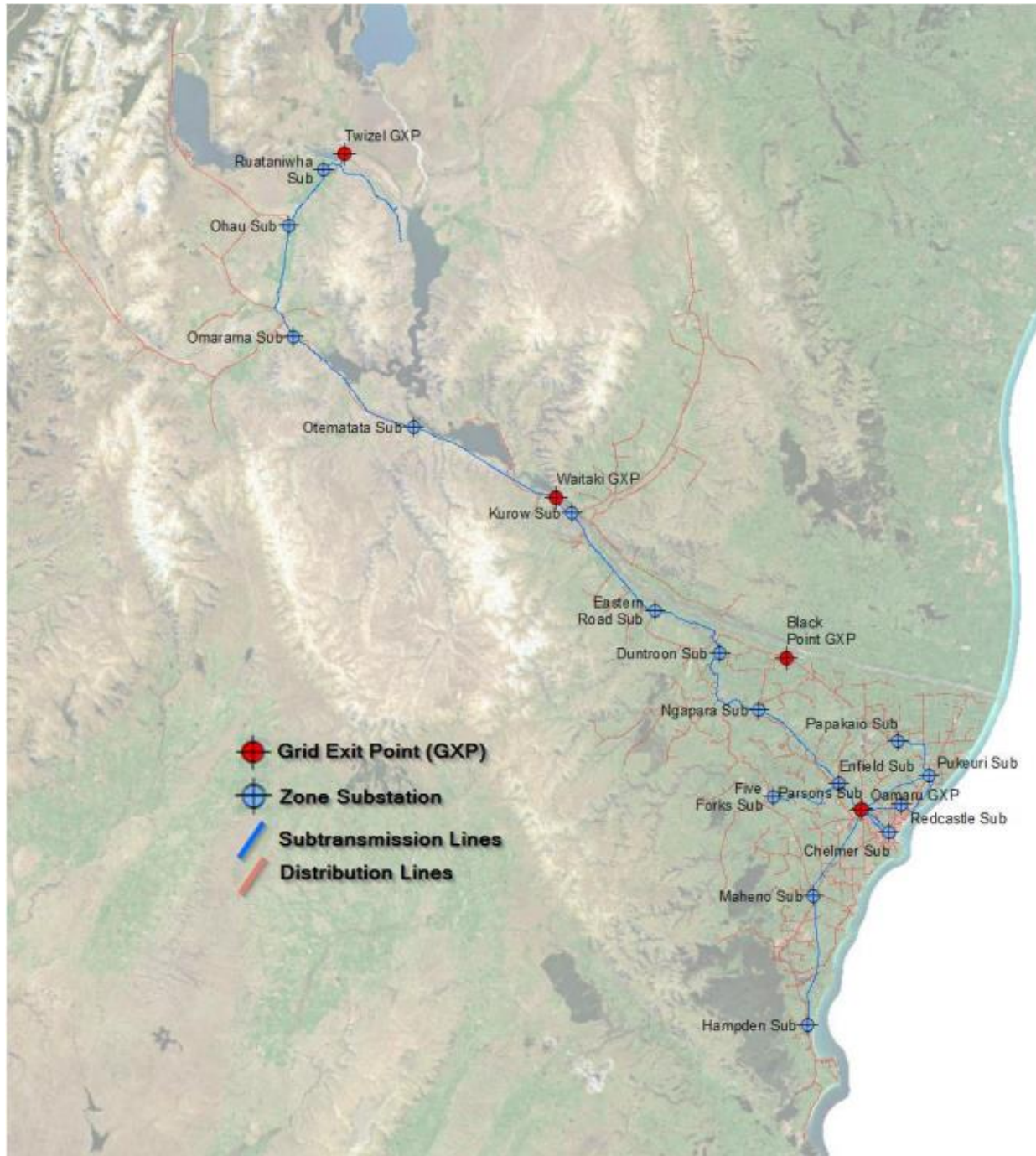
8. Conclusion

- 8.1 The demand for electricity is forecast to increase, particularly as Aotearoa New Zealand shifts progressively towards a low carbon economy. Network Waitaki must be in the best position possible to meet the Otago communities' expectations for performance of a safe, reliable, secure, resilient and cost-effective electricity distribution network. Regulatory frameworks, such as the pORPS, must do their part in facilitating the protection and on-going operation, maintenance, upgrade and development of the network. I consider that the recommendations put forward in Ms Justice's evidence are the most appropriate way to achieve this outcome.

Dated Wednesday 23 November 2022

Shane Watson

Appendix 1: Network Waitaki's Area of Supply



Appendix 2: Network Waitaki's Electricity Sub-Transmission Infrastructure in the Otago Region

