

**BEFORE THE QUEENSTOWN LAKES DISTRICT COUNCIL**

**IN THE MATTER OF** the Resource Management Act  
1991

**AND**

**IN THE MATTER OF** of the Queenstown Lakes  
Proposed District Plan

**AURORA ENERGY LIMITED**

**Submitter OS635**

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**STATEMENT OF EVIDENCE IN CHIEF BY JOANNE DOWD**

**Hearing Date: 17 August 2016**

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## INTRODUCTION

1. My name is Joanne Dowd. I hold a masters degree in Town and Country Planning from The Queens University of Belfast, obtained in 1993. I have been a full member of the UK Royal Town Planning Institute since 1997. I am also a member of the Resource Management Law Association since 2006. I am employed as Network Policy Manager with Delta Utility Services Limited ("Delta"). I have been employed in my present position since June 2015 and I have 22 years international planning experience in both the private and public sector.
2. My experience includes a mix of local authority and consultancy planning and resource management work. In recent years, I have focused on providing consultancy advice with respect to regional and district plans, utility developments, resource consents and environmental management and environmental effects assessments. This includes extensive experience with large-scale projects involving inputs from multidisciplinary teams.
3. As I am an employee of Delta, I am unable to comply with the Code of Conduct for expert witnesses contained in the Environment Court Practice Note. However, I have prepared this evidence with reference to it. I confirm that I have read the Code of Conduct for expert witnesses contained in the Environment Court Practice Note and that I agree to comply with it. I confirm that I have considered all the material facts that I am aware of that might alter or detract from the opinions I express. In particular, unless I state otherwise, this evidence is within my scope of expertise and I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

## OVERVIEW OF SUBMISSION

4. Aurora Energy Limited ("Aurora") owns, operates and maintains an electricity distribution network in Dunedin and Central Otago within the Otago region. This network carries electricity from the National Grid to more than 85,000 homes and businesses across Dunedin City and Central Otago Region. Aurora owns substations, lines and cables located in public road reserve, as well as on private property.

5. The electricity network owned by Aurora comprises high voltage power lines (above and below ground) which distribute electricity to local substations where the voltage is reduced before distribution through standard power lines (overhead and underground) as seen throughout the Otago Region. Aurora's overhead line network extends to 3,889 km of which 513 km are high voltage subtransmission lines up to 66kV. In addition to the distribution network, Aurora has the capacity to own and operate high voltage (up to 110kV) transmission lines, and associated structures, and may be required own such assets as regional electricity demand grows.
6. Aurora's network covers a number of geographically distinct areas: Dunedin City (which covers the urban areas of Dunedin and Mosgiel, and the inner reaches of the Taieri Plains), Central Otago (stretches from Raes Junction in the south to Lake Wakatipu and Wanaka in the north-west and St Bathans and Makarora in the north-east).
7. Electricity is a vital resource for New Zealand, its economy and social and cultural wellbeing. The networks owned by Aurora are considered as regionally significant and critical infrastructure and should be recognised as such within the Proposed Queenstown Lakes District Plan 2015 ("Proposed Plan"). Given population growth within the District, demand for electricity is increasing and Aurora seeks to secure the ability to meet this demand in the most efficient and cost effective manner. Due to the nature and scale of Auroras' assets, continual upgrade, maintenance and renewal of these assets is required to ensure security of supply of electricity within Otago.
8. The network utility activities undertaken by Aurora are subject to technical, operational and locational constraints and it is important that provision is made within the Proposed Plan to recognise and provide for such constraints while providing opportunities for potential adverse effects of such infrastructure to be avoided, remedied or mitigated. Aurora, therefore, seeks to ensure that its network is adequately provided for within the Proposed Plan to protect it from potential adverse effects from other activities, and that the networks' future operation, upgrade, maintenance and renewal is not impeded.

9. Therefore Aurora's submission and further submissions are primarily concerned with ensuring that the Proposed Plan appropriately recognises the significance of the electricity distribution network as a physical resource under section 5 of the Resource Management Act 1991 ("**RMA**").
10. In addition, Aurora has sought protection of its assets from adverse effects, including reverse sensitivity effects, associated with land uses and activities and appropriate management of potential adverse effects of Aurora's network, taking into consideration the specific locational, technical and operational requirements of its network.
11. In my opinion, the distribution assets owned by Aurora are critical to sustaining and growing the Queenstown Lakes District and have positive effects in terms of enabling people and communities to provide for their social, economic and cultural wellbeing and for their health and safety.
12. Submissions and further submissions lodged by Aurora sought amendments to a number of controls proposed to be introduced and amendments to various objectives, policies and rules. Aurora's further submission supports relief sought by other submitters where this would appropriately recognise and provide for network utility and energy generation activities.
13. In its submissions, Aurora also sought corridor protection for its strategic electricity distribution assets. Such corridor protection measures for distribution assets are operative in a number of District Plans around New Zealand and have been operating well without adverse effects on landowners while ensuring that safety clearances required under The New Zealand Electrical Code of Practice for Electrical Safe Distances ("**NZECP 34:2001**") and the Electricity (Hazards from Trees) Regulations 2003 from electricity distribution assets are maintained. In my opinion, it is appropriate that the Proposed Plan contains a policy and rule framework to protect the integrity of these high voltage and critical distribution lines, and their ability to provide the safe, secure and efficient supply of electricity. In my view such measures will protect distribution infrastructure against land uses and development effects (i.e., reverse

sensitivity) that have the potential to compromise its operation. The Operative District Plan currently fails to adequately protect such critical infrastructure (i.e., lines less than 110kV) with the result being that developments have the potential to be consented without input from the affected asset owner. The high voltage assets and Critical Electricity Lines (“CELS”) owned by Aurora are not covered by the National Environmental Standards for Electricity Transmission activities (“NESETA”), nor any other National Environmental Standard, hence protection of such infrastructure is best provided through the Proposed Plan review process currently being undertaken.

14. I have presented evidence to the Strategic Directions Hearing which included discussion around the proposed definition of *Regionally Significant Infrastructure*. I attach a copy of that evidence for completeness as **Appendix A** and include some further discussion around this issue below. I will also be providing detailed evidence at the Energy and Utilities Chapter hearings which are to be held later this year, in which I will provide a more fulsome consideration of the CEL provisions which Aurora seek to be inserted within the Proposed Plan. However, as the submissions relating to provisions associated with CEL's have been addressed by the s42A Report author as part of this hearing, I consider it necessary to provide the panel with some detail on:
- (a) the nature of Aurora's distribution network;
  - (b) the key issues associated with Aurora's CEL infrastructure; and
  - (c) the necessity for corridor protection measures within the Proposed Plan.

#### **EXPLANATION OF DISTRIBUTION NETWORK**

15. Aurora's network is hierarchical, or branchlike, in nature. It has a number of high voltage cables and lines which each carry a large amount of electricity and which each supply many thousands of customers. Electricity is transformed off these high voltage lines to thousands of low voltage lines which each serve anywhere between one and a few hundred customers.

16. Given the number of customers supplied from each of the high voltage lines, the failure of any one of these high voltage lines has a far greater impact than the failure of one, or indeed many, low voltage lines. Aurora's high voltage lines are critical to its network and critically important to the region.
17. Aurora considers the importance of its high voltage lines to the community needs to be recognised and protected under the Proposed Plan through suitable corridor protection rules. Without such corridor protection rules there is a risk of development under and in close proximity to high voltage lines as no other applicable legislation provides suitable safeguard.
18. In New Zealand, electricity produced by generation companies at various hydro, wind, geothermal etc plants is transmitted by the national grid operator, Transpower, to network operators like Aurora.
19. Aurora takes delivery of the electricity from Transpower's network at various points in Transpower's network known as Grid Exit Points (GXPs). In Queenstown this is limited to the Frankton GXP. After receipt of electricity at GXPs, Aurora then delivers that electricity through its network to homes and businesses in Dunedin and Central Otago on behalf of electricity retailers who purchase the electricity from generators on the wholesale market and sell it to customers.
20. Electricity is transformed off these high voltage lines, at numerous substations, to lower voltage lines which each serve anywhere between one and a few hundred customers. Often the transformation from high voltage to low voltage is 33kV to 11kV or 6.6kV, and then to the 400 volts used in the home.

## **SECURITY AND IMPORTANCE OF INFRASTRUCTURE**

21. In recognition of the role Aurora plays to ensure distribution of a reliable and secure supply of electricity to Central Otago, and its role in keeping the economy running and improving the community's well-being, Aurora is a Lifeline Utility as named in the Civil Defence Emergency Management Act 2002 (CDEM Act). The CDEM Act informs the National CDEM Strategy which outlines a vision for a resilient New Zealand and

recognises that lifeline utility resilience contributes strongly to community resilience.

22. Under the CDEM Act, Aurora is required to ensure it is able to function to the fullest possible extent, even though this may be at a reduced level, during and after an emergency. Aurora is also to undertake hazard and risk analysis and is to carry out risk mitigation measures.
23. In recognition of the importance of this role, Aurora was an active participant in the Otago Lifelines Utility vulnerabilities project which assessed the potential impacts of hazards on the region's lifeline infrastructure and identified mitigation strategies to reduce the risk to the community.
24. One of Aurora's identified vulnerabilities is the risk of damage occurring to critical high voltage lines, or the inability to repair critical high voltage lines easily. In my view, this risk can be minimized and/or mitigated with suitable corridor protection rules in the Proposed Plan.
25. The lines sought to be protected by Aurora are of high local importance.
26. Their importance warrants protection under the Proposed Plan through suitable corridor protection rules. Without such corridor protection rules there is a risk of development under or in close proximity to high voltage lines as no other legislation applicable to the lines provides suitable safeguard from development that may put this infrastructure at risk.

## **ELECTRICITY LEGISLATION**

27. The Electricity Act 1992 provided some protection for lines that were legally installed under previous Acts and Regulations i.e. before 1992.
28. The Electricity Act 1992 provides a right to occupy exclusively the space occupied by the lines, and to operate, inspect, maintain, replace and upgrade the lines, because the lines have the status of "existing works" under the Electricity Act 1992. These rights are sometimes referred to as statutory easement rights or existing use rights.
29. However, the Electricity Act 1992 does not include detailed obligations for land owners under the lines and does not prevent underbuild or land

use incompatible with the ongoing use and maintenance of the lines. It is possible that buildings could be constructed, and other activities undertaken, beneath the lines. Simply, the Electricity Act 1992 on its own does not afford sufficient protection from activities interfering with lines.

30. In addition to the Electricity Act 1992, the New Zealand Electrical Code of Practice 34 ("Code") also governs the use of lines corridors. The Code sets minimum safe electrical distance requirements for overhead electric line installations. The Code states that the minimum safe distances have been set primarily to protect persons, property, vehicles and mobile plant from harm or damage from electrical hazards.
31. Section 2 of the Code covers safe distance requirements for excavation and construction near overhead electric line support structures. These requirements are summarised in the figures at page 6 and page 7 of the Code.
32. In summary, the minimum safe distances for excavation near either a pole or a tower, without written consent of the network owner, are as set out in the tables below.

Within 2.2m of pole or stay wire	Work is no greater than 300mm in depth
Between 2.2m and 5m of pole or stay wire	Work is greater than 750mm in depth
Within 6m of tower or stay wire	Work is no greater than 300mm in depth
Between 6m and 12m of tower or stay wire	Work is greater than 3m in depth

33. In summary, the minimum safe distances between buildings and overhead electric line support structures (i.e. the pole or tower) are as set out in the table below which is copied from section 2 of the Code. These distances are relevant to the 'underbuild' discussion that follows in my evidence below.



**TABLE 1 MINIMUM SAFE DISTANCES BETWEEN BUILDINGS AND OVERHEAD ELECTRIC LINE SUPPORT STRUCTURES**

<b>Circuit Voltage</b>	<b>Pole</b>	<b>Tower (pylon)</b>
11 kV to 33 kV	2 m	6 m
Exceeding 33 kV to 66 kV	6 m	9 m
Exceeding 66 kV	8 m	12 m

34. Section 3 of the Code sets safe distance requirements for the construction of buildings and other structures near existing conductors (i.e. the actual electrical line rather than the pole or tower). Depending upon the situation there are many distances set out in Section 2 and 3 of the Code. The distances that are of relevance to the conductors/lines that Aurora seeks protection for under the Proposed District Plan are set out in the table overleaf. In summary, the distances established in the Code do not prevent underbuild near the lines Aurora seeks to protect.

	<b>Exceeding 1kV but not exceeding</b>	<b>Exceeding 33kV but not exceeding</b>
	Bare or covered (m)	Bare (m)
Vertically above those parts of any structure normally accessible to persons	4.5	5.5
Vertically above those parts of any structure not normally accessible to persons but on which a person can stand	3.7	4.5
In any direction (other than vertically above) from those parts of any structure normally accessible to persons, or from any part not normally accessible to persons but on which a person can stand	2.1	3.0
In any direction from those parts of any structure not normally accessible to persons	1.5	2.5

35. There are numerous instances on the Aurora network of underbuild having occurred under high voltage lines.

36. Whilst existing cases of underbuild will not be affected or be able to be reversed by the insertion of corridor protection rules in the Proposed Plan, in my view it will stop any more instances occurring without Aurora having an opportunity to review and participate in the process. It will also increase awareness of the CELs and the care that needs to be taken when developing in close proximity to them. There remain many places on Aurora's high voltage network where such underbuild is possible. Under the Code, notification to Aurora of a build is only required if the build falls within minimum distances. Historically Aurora has had experience turning up to a site, for inspection or maintenance etc, and finding a new structure under the lines that Aurora had not previously been aware of.
37. In my opinion, when such developments occur, they can be challenging and costly to overcome, especially retrospectively, and if they cannot be overcome, as is often the case, then the security of the affected line is compromised.
38. Having a structure under a line can cause various issues, including some which a property owner may not be aware of before taking ownership of the property or building:
- (a) Lines (technically called conductors) do occasionally fall to the ground. Fortunately such instances are rare, but it does happen. Often such failures are due to third party activities such as falling trees; but insulators, conductors or conductor joints can fail. Clearly a dropped conductor poses significant risk both in terms of mechanical damage and electrocution.
  - (b) Periodically conductors will need to be replaced. Underbuild removes the possibility of the conductor being lowered to the ground if due for replacement. This means any new line needs to be "rolled out" from the top of a pole and the old line "rolled in" from the top of a pole. The new wire is generally pulled through from the support structures at a reduced tension (with bigger sags). If underbuild is present in a span, it may not be possible to reduce the tensions without hitting the buildings or getting uncomfortably close to them. In such instances hurdles, or props,

would generally be required to ensure conductors are kept clear of the buildings. Other alternatives are possible, but add considerably to cost and they tend to increase loadings on the support structures during the stringing works. Some existing support structures may not have sufficient capacity to allow such methods to be used safely. All of the above adds time, cost and safety risks to the replacement process.

- (c) On lines strung with twin conductors, the spacers along the span also require periodic replacement (generally before conductors need to be replaced). The usual method to access the spacers is for linemen to travel along the conductors on trolleys, often with the line still in service. The weight of the lineman increases conductor sag significantly. If buildings are present under the line, the use of trolleys may not be possible due to insufficient clearance. Other techniques such as use of helicopters (not good over buildings) or turning off the line and using elevated work platforms (if access permits) would be required.
- (d) Underbuild also causes problems for maintenance as well as replacement. For instance, if a fault has occurred on a line, and say a damaged meter of the line needs to be replaced, instead of being able to replace the meter section by lifting a maintenance crew up to the line in say a crane or industrial cherry picker, now the entire length of line between the towers needs to be "rolled back" to a support structure and a new section rolled out. This means maintenance crews climbing the support structure and undertaking much more complicated work. This adds time, cost and safety risks to the maintenance. It becomes even more problematic if access to the support structures themselves has become difficult.
- (e) Given access requirements, maintenance of support structure foundations can be problematic if structures exist around them.
- (f) Having structures near lines and towers results in the need for Aurora to communicate with home or business owners as to our maintenance and replacement plans. This in turn means that we

need to work in with any requests of the property owner for timing of works and quality of reinstatement (eg tower foundation replacement that involves extensive digging can lead to 'owner requests' for an alternative look).

- (g) Physical inspection of a line with underbuild becomes problematic as inspectors generally walk along the line route looking up at the conductor and joints. Most inspection is visual. Clearly the closer the inspector can get to the line the better. Buildings restrict access. Thermal imaging cameras may sometimes be used, however these are not effective if too far from the line.
- (h) With any underbuild, there is the risk that landowners will install additional aerials and other ancillary structures which may be too close to the live conductors to be electrically safe. Because such additions tend to be of a random nature and often do not require consent there is no practical way for the line operator to be responsive to the risk posed to both the landowner and the security of electrical supply from such installations.
- (i) Maintenance of the buildings under a line also becomes problematic and can be fatal if adequate electrical clearances are not maintained at all times. Replacing roofing and guttering can be particularly hazardous.
- (j) Two types of noise occur with high voltage lines. The first is caused by wind blowing across the conductors, insulators and structures. The second is caused by electrical discharges (corona) along insulators and conductors which produce a crackling sound. For this reason it is prudent to position buildings away from lines.
- (k) Rain water tends to run down conductors and drip off at the low point in the span. If a building is situated under this point, the noise of the water hitting the roof can be noisy for occupants.

39. As previously discussed, the Code specifies certain distances that excavation works must be from towers and poles (and associated stay

wires). While the Code specifies such distances, and despite communication efforts made by Aurora, Aurora often finds developers/contractors undertaking excavation work prohibited by the Code.

40. In my view, this can be addressed by having the Code prescriptions effectively repeated in the Proposed Plan, in plain English terms, will help reduce the incidence of prohibited excavation work. The benefits of this are that it would help reduce the incidence of the following issues:

- (a) Earthworks too close to the foundations of towers or poles naturally destabilise the support structures and compromise the structural integrity of these supports and associated overhead distribution lines. Such destabilisation has an impact on the networks resilience, particularly given the high voltage critical nature of the lines we are seeking to protect via the Proposed Plan.
- (b) Contact with conductors occurring. Such contact poses a significant safety risk.
- (c) Earthworks hindering the possibility of the conductor being lowered to the ground for replacement, or hindering the network maintenance or replacement activities and causing additional hazards for Aurora's staff undertaking such works.
- (d) Earthworks also create potentially hazardous environments for workers underneath the lines, and can cause difficulties when deploying equipment such as a crane or cherry picker.
- (e) Piles of soil are often left under our lines. This can often reduce the clearance distances to the conductor (i.e. electrical line itself) and create safety issues for workers and the public (particularly children who tend to like to scramble to the top of such soil piles).

41. In describing the above I have endeavoured to show that having structures (buildings/fences/swimming pools) and excavations under, or very near to, a line:

- (a) increases risk to people and property,

- (b) complicates maintenance issues adding significantly to maintenance costs and duration;
- (c) possibly impacts on the reliability of power supply as repair can be delayed and take longer;
- (d) can create reliability issues due to land use creating discharges (i.e. smoke, dust) that degrades the electrical insulation performance of the line causing power outages; and
- (e) can, if an electrical fault occurs, have the potential to cause significant harm or death as the structure may incur hazardous voltages.

## **SECTION 42A REPORT AND PLANNER'S RECOMMENDATIONS**

- 42. Aurora is concerned that issues associated with reverse sensitivity for its regionally significant infrastructure have not been adequately addressed within the Subdivision Chapter of the Proposed Plan. Council has associated issues of reverse sensitivity primarily with the National Grid, with little regard or recognition that such effects can impact on the sub-transmission and distribution assets of other network utility operators.
- 43. The District's sub-transmission network is an element of electricity distribution that can be adversely effected by reverse sensitivity to the same degree as other high voltage transmission lines.
- 44. Corridor protection is a term that relates to providing a buffer or separation between development and overhead electricity distribution and transmission lines. Aurora seeks to have elements of its identified electricity lines (33kV distribution lines and the identified strategic 11kV electricity lines) recognised within the Proposed Plan. Critical electricity lines are lines located throughout the Queenstown Lakes District, that are not covered by NPSET but have the potential to be crucial to the region's quality, reliability and security of electrical supply. These electricity lines are crucial because they contribute to the social and economic wellbeing and health and safety of the region and are lines that:

- i) Supply essential public services; or
  - ii) Supply large industrial or commercial electricity consumers; or
  - iii) Supply high numbers of consumers; or
  - iv) Are difficult to replace with an alternative electricity supply if they are compromised.
45. The Proposed Otago Regional Policy Statement 2015 includes provisions that seek to *recognise the functional needs of infrastructure of regional and national importance* (Proposed Policy 3.4.1) and to *protect infrastructure corridors for infrastructure needs, now and for the future* (Proposed Policy 3.4.2).
46. Aurora made submissions to the Otago Regional Council that it's identified CELs should be recognised as regionally significant and critical infrastructure and as such benefit from measures to protect such infrastructure corridors for infrastructure needs and into the future. Aligned with this, Aurora has sought to include a range of provisions within the Proposed Plan which seek to protect the integrity of these high voltage and critical distribution lines, and their ability to provide safe, secure and efficient supply of electricity. The provisions requested included a policy and rule framework which included new definitions; amendments to Chapter 30 (Energy and Utilities) policies, notification, setback from network utilities rules; proposed new performance standards for setbacks from CELs; and consequential changes throughout the various activity zones (contravention of performance standards activity status and assessment matters) and provisions associated with the Subdivision Chapter, subject of this hearing.
47. The s42A Report Author includes discussion around Aurora's submissions on the Subdivision Chapter. While the relief sought by Aurora in its submission point 635.42 is similar to relief sought by Transpower Limited under its submission points 805.95 and 805.13 (which relate specifically to the Energy and Utilities Chapter), the relief sought by both organisations is actually quite different. As discussed above the submission points made by Aurora on the Subdivision Chapter are part of a suite of provisions which relate solely to the defined CELs included within Aurora's original submission. These include corridor protection for the following assets:

- All 33kV and 66kV sub-transmission and distribution overhead lines and underground cables;
  - 11kV overhead line to Glenorchy;
  - 11kV overhead line between the Cardrona Substation up to the ski fields;
  - 11kV overhead line to Treble Cone; and
  - 11kV overhead line to Makarora.
48. The s42A Report Author has recommended that subdivision be set back from nationally and regionally important infrastructure. This is consistent with the relief sought by Aurora.
49. However, to give effect to Aurora's relief the s42A Report Author has recommended amendments which necessitate a setback from the National Grid. In my view, the s42A Report Author has mistakenly concluded that the distribution lines that Aurora seeks to protect are part of the National Grid. In making recommendations in line with Aurora's relief the s42A Report Author has inadvertently provided no relief to Aurora because only National Grid assets are protected.
50. The difference between the National Grid and Aurora's distribution assets are set out above. Given the recommendation within the s42A Report, that regionally important infrastructure be protected, which I support, it is my opinion that subdivision should also be set back from the identified CELs included within Aurora's original submission and should also be covered by the proposed definition of *Regionally Significant Infrastructure*". Inclusion of corridor protection measures within the Proposed Plan will ensure that the public are aware of their obligations around this critical infrastructure. Further the provisions as proposed in the Aurora submission relating to Subdivision will in my view provide regulatory protection that would ensure the relevant objectives and policies of the Proposed ORPS are being achieved.



**CONCLUSION**

51. Aurora's critical infrastructure provides power to thousands of people throughout the Otago region. The importance of that infrastructure requires protection under the District Plan.
52. The planner has agreed that the subdivision provisions need to provide setbacks from regionally important infrastructure.
53. In order to give effect to Aurora, and the planner's, recommendations the subdivision chapter should be amended in accordance with the relief sought by Aurora.

**J Dowd**

**3 August 2016**

# APPENDIX A

**BEFORE THE QUEENSTOWN LAKES DISTRICT COUNCIL**

**IN THE MATTER OF**                      the Resource Management Act 1991

**AND**

**IN THE MATTER OF**                      Proposed Queenstown Lakes District Plan 2015  
– Part 1 – Hearing Stream 1B - Strategic  
Direction, Urban Development and Landscape -  
Chapters 3, 4 and 6 - appearing on behalf of  
Aurora Energy Limited - Submitter 635 and  
Further Submission 1121)

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**STATEMENT OF EVIDENCE BY JOANNE DOWD**

**17 March 2016**

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## 1. INTRODUCTION

### Qualifications and Experience

- 1.1 My name is Joanne Dowd. I hold a masters degree in Town and Country Planning from The Queens University of Belfast, obtained in 1993. I have been a full member of the UK Royal Town Planning Institute since 1997. I am also a member of the Resource Management Law Association since 2006 and I currently sit on the Otago Branch committee. I am employed as Network Policy Manager with Delta Utility Services Limited (“Delta”). I have been employed in my present position since June 2015 and I have 22 years international planning experience in both the private and public sector.
- 1.2 My experience includes a mix of local authority and consultancy planning and resource management work. In recent years, I have focused on providing consultancy advice with respect to regional and district plans, utility developments, resource consents and environmental management and environmental effects assessments. This includes extensive experience with large-scale projects involving inputs from multidisciplinary teams.
- 1.3 Recent projects in which I have been involved with are set out within **Attachment A** to this evidence.
- 1.4 I confirm that I have read the Code of Conduct for expert witnesses contained in the Environment Court Practice Note and that I agree to comply with it. I confirm that I have considered all the material facts that I am aware of that might alter or detract from the opinions I express. In particular, unless I state otherwise, this evidence is within my scope of expertise and I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

## 2. OVERVIEW OF SUBMISSION

- 2.1 Aurora Energy Limited (“Aurora”) owns, operates and maintains an electricity distribution network in Dunedin and Central Otago within the Otago region. This network carries electricity from the National Grid to more than 85,000 homes and businesses across Dunedin City and Central Otago Region. Aurora owns substations, lines and cables located in public road reserve, as well as on private property.

- 2.2 The electricity network owned by Aurora comprises high voltage power lines (above and below ground) which distribute electricity to local substations where the voltage is reduced before distribution through standard power lines (overhead and underground) as seen throughout the Otago Region. Aurora's overhead line network extends to 3,889 km of which 513 km are high voltage subtransmission lines up to 66kV. In addition to the distribution network, Aurora has the capacity to own and operate high voltage (up to 110kV) transmission lines, and associated structures, and may be required own such assets as regional electricity demand grows.
- 2.3 Aurora's network covers a number of geographically distinct areas: Dunedin City (which covers the urban areas of Dunedin and Mossgiel, and the inner reaches of the Taieri Plains), Central Otago (stretches from Raes Junction in the south to Lake Wakatipu and Wanaka in the north-west and St Bathans and Makarora in the north-east).
- 2.4 Electricity is a vital resource for New Zealand, its economy and social and cultural wellbeing. The networks owned by Aurora are considered as regionally significant and critical infrastructure and should be recognised as such within the Proposed Queenstown Lakes District Plan 2015 ("**Proposed Plan**"). Given population growth within the District, demand for electricity is increasing and Aurora seeks to secure the ability to meet this demand in the most efficient and cost effective manner. Due to the nature and scale of Auroras' assets, continual upgrade, maintenance and renewal of these assets is required to ensure security of supply of electricity within Otago
- 2.5 The network utility activities undertaken by Aurora are subject to technical, operational and locational constraints and it is important that provision is made within the Proposed Plan to recognise and provide for such constraints while providing opportunities for potential adverse effects of such infrastructure to be avoided, remedied or mitigated. Aurora, therefore, seeks to ensure that its network is adequately provided for within the Proposed Plan such that it is protected from potential adverse effects of other activities, and that the networks' future operation, upgrade, maintenance and renewal are not impeded.

### 3. SUBMISSION POINTS

#### Strategic Directions Chapter Submissions

- 3.1 Aurora lodged a number of submissions on the Strategic Directions Chapter predominantly to ensure that, due to its over-arching nature, appropriate recognition was given to the benefits of network utility infrastructure, in general, and *Regionally Significant Infrastructure*, in particular, and the contribution it makes to the economy of the District.
- 3.2 Aurora submitted that the Chapter should include more enabling provisions for network utility infrastructure and identify infrastructure that is significant within the region including a definition of what constituted *Regionally Significant Infrastructure*.
- 3.3 The Section 42A Report Officer has recommended that the majority of the relief sought by Aurora, in regards to these matters be rejected. However, the Section 42A report does recommend some changes to the chapter which addresses some of the points of relief sought by Aurora, but in a less comprehensive manner than sought.
- 3.4 An overarching concern for Aurora is the proposed definition of *Regionally Significant Infrastructure*, which, (as currently worded), excludes Aurora's distribution network by only referring to *Electricity Transmission Infrastructure*.
- 3.5 Under Clause 3 - "*Interpretation*" of the National Policy Statement on Electricity Transmission 2008, "*Electricity transmission network, electricity transmission and transmission activities ...*" are all determined to mean that they form:

*"part of the national grid of transmission lines and cables ..."*

- 3.6 The *National Grid* is defined as the assets used or owned by Transpower New Zealand Limited ("Transpower"). I note that the proposed definition has been derived by the Section 42A Report Officer from a combination of the wording from Policy 3.5.1 of the Proposed Regional Policy Statement 2015 and modified to reflect submissions made by Transpower. However, both the definition proposed by Transpower and Aurora in original submissions, sought to include "*electricity distribution networks*". There is no justification provided within the

Section 42A report, why electricity distribution networks have been specifically excluded from the recommended definition.

- 3.7 In my view, if a definition of *Regionally Significant Infrastructure* is to be included within the Proposed Plan, then the definition should include provision for electricity distribution which is a critical component of electricity supply. In my opinion, the electricity distribution network is a significant physical resource which is critical in terms of sustaining growth within the district and as such, the Proposed Plan should include provisions to ensure it is managed in the most appropriate way to enable people and communities to provide for their social, economic and cultural wellbeing.
- 3.8 I note that both the Section 42A reports for Strategic Directions and Landscape Chapters include recommendations for amendments to notified provisions, which seek to address shortfalls in the policy framework relating to regionally significant infrastructure. While I support these amendments in general, it is my view that the exclusion of distribution infrastructure from the definition of Regionally Significant Infrastructure has the potential to compound the ability of electricity distribution companies to develop, operate and maintain their networks as no provision has been made for them within either the Strategic Directions or Landscape Chapters. Including "*Electricity Distribution*" within the definition of Regionally Significant Infrastructure will address this issue.
- 3.9 Subject to the above, I make the following further comments on other relevant provisions within the Strategic Directions Chapter. The Section 42A report, recommends changes to Objective 3.2.5.1 (now 3.2.1.6) in order to recognise the necessity and importance of infrastructure in its own right and to provide a comprehensive planning framework.
- 3.10 The recommended changes are generally aligned with the relief sought by Aurora in its original submission, although I note that Aurora lodged a further submission in support of a submission by PowerNet Limited (FS1121.7) which supported the inclusion of the word "*electricity*" within the objective. In my view it is appropriate that provision should be made for electricity within the wording of Objective 3.2.1.6 and should be reworded as follows:

*Maintain and promote the efficient and effective operation, maintenance, development and upgrading of the District's regionally significant*

*infrastructure, including designated airports, key roading, **electricity** and communication technology networks.*

- 3.11 The Section 42A Report Author has also recommended new Policy 3.2.1.7.1 which seeks to:

*Safeguard the efficient and effective operation of regionally significant infrastructure from new incompatible activities.*

- 3.12 The inclusion of such a provision is aligned with the provisions of the Proposed Otago Regional Policy Statement 2015 and in my view is appropriate and I generally supportive of the policy. However, in the event that electricity distribution is not accepted as regionally significant infrastructure, then I consider Policy 3.2.1.7 should read as follows:

*Safeguard the efficient and effective operation of regionally significant **and electricity distribution** infrastructure from new incompatible activities.*

- 3.13 Aurora also sought the inclusion of a new objective and policy to address the fact that the Strategic Directions Chapter did not recognise or provide for the location, technical or operational constraints associated with linear infrastructure networks. Aurora also supported a submission by PowerNet Limited (251.3) which sought to include similar provisions.

- 3.14 The Section 42A report author rejects Aurora's original submission but accepts the further submission (FS1121.9), although I note that no changes have been translated into the proposed provisions. In my view it is appropriate that the technical, operational and locational requirements of network utility infrastructure is recognised and provided for and I support the introduction of provisions as proposed by Aurora or provisions of similar or like effect. However, in the event that "*electricity distribution*" is not accepted as regionally significant infrastructure, then I consider the new objectives and policy should read as follows:

Objective xxx

Recognise that Regionally Significant Infrastructure and **electricity distribution networks have** specific location and technical constraints

Policy xxx

Manage potential effects of Regionally Significant Infrastructure **and electricity distribution networks** on the surrounding environment having regard to the economic benefits and locational, technical and operational requirements of such infrastructure.

## LANDSCAPE CHAPTER

- 3.15 The submissions made by Aurora on the Landscape Chapter, sought to ensure that an appropriate balance was achieved between protection of landscape values and the technical and operational constraints of infrastructure providers. I note that the majority of the relief sought by Aurora on these matters has been rejected by the Section 42A Report Officer. There is no justification provided as to why the relief sought has been rejected. Those submission parts that have been accepted in part have resulted in recommended changes which, under the current definition of regionally significant infrastructure would not apply to Aurora.
- 3.16 The Section 42A Report Author has agreed that additional provisions are appropriate given the particular locational constraints of infrastructure, such that the following policy should be incorporated into the Landscape Chapter:

*Regional Significant Infrastructure shall be located to avoid degradation of the landscape, while acknowledging location constraints.*

- 3.17 In my view, the recommended policy wording does not go far enough in terms of recognising the technical and operational constraints which I consider are important if a balanced consent regime is to be provided for infrastructure within areas of landscape value. In my view the policy should provide the ability for infrastructure providers such as Aurora to not only avoid, but also to remedy or mitigate significant adverse effects. In the event that “*electricity distribution*” is not accepted as regionally significant infrastructure, then I consider the policy should be amended as follows:



*Regional Significant Infrastructure and electricity distribution networks shall be located to avoid, remedy or mitigate significant adverse effects on degradation of the landscape within Outstanding Natural Landscapes or Outstanding Natural Features, while acknowledging locational, technical and operational constraints.*

#### **4. CONCLUSION**

- 4.1 Aurora welcome the opportunity to be involved in the development of the Proposed Plan. Through this process Aurora seeks to ensure that its distribution assets are appropriately recognised as regionally significant and protected from the potential adverse effects of other activities, and that provision is made for operation, repair, upgrading and maintenance activities while appropriately managing potential adverse effects. In my view the amendments sought by Aurora on provisions contained in the Proposed Plan will promote the sustainable management of natural and physical resources and will assist Aurora in delivering a robust and reliable power distribution network within the District.

**J Dowd**

**17 March 2016**

# APPENDIX A

## Summary of Recent Project Experience

### Summary of Recent Project Experience

- Preparation of submissions on behalf of Aurora Energy Limited, on the Second Generation Dunedin City Plan.
- Preparation of submissions on behalf of Aurora Energy Limited, on the Queenstown Lakes District Plan.
- Resource consent for utility structures in Townscape Protection areas – Dunedin.
- Resource consent for an Electric Vehicle Charging Station – Dunedin.
- Preparation of Notice of Requirements for new electricity zone substations throughout Southland and Invercargill on behalf of The Power Company Limited.
- Preparation of outline plans for development of the Kennington Sub Station, Invercargill, on behalf of The Power Company Limited
- Infinity Investment Group – Riverside Stage 6 Variation to the Queenstown Lakes District Plan
- Infinity Investment Group – Peninsula Bay Plan Change, Wanaka
- Infinity Investment Group – Hillend Station, Wanaka
- Gibbston Valley Station – Obtaining resource consent for a luxury golf and viticultural resort within the Gibbston Valley including visitor accommodation, commercial activities, residential use and community facilities.
- Anthem Ventures Ltd – Resource Consent for Winery complex and associated development within the Gibbston Valley.
- University of Otago – Resource Consent Application to utilise research vessels in the inland waters of Fiordland.
- RPR Properties – Proposed Private Plan Change at Westacott Park, Dunedin.
- RJH Enterprises Ltd – Resource Consent for a Good Food Market and Rural Selling Place, Invercargill.

- HW Richardson Group – Provision of Resource Management Advice Relating to the Location of Proposed Concrete Batching Plants throughout New Zealand.