

**BEFORE THE MACKENZIE DISTRICT COUNCIL**

**UNDER** The Resource Management Act 1991

**IN THE MATTER OF** Proposed Plan Change 18 to the  
Mackenzie District Plan

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**STATEMENT OF PRIMARY EVIDENCE OF MICHAEL JAMES THORSEN  
FOR  
MERIDIAN ENERGY LIMITED  
12 FEBRUARY 2021**

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## INTRODUCTION

1. My full name is Michael James Thorsen.
2. I have a PhD in Ecology from The University of Otago.
3. I am Director and Principal Ecologist with Ahika Consulting Ltd.
4. I have been working professionally in the biodiversity management field since 1990 for a number of organisations including the Department of Conservation (17 years), Mauritian Wildlife Foundation, United States Fish and Wildlife Service, St Helena National Trust, Landcare Research, Birdlife International, and as a freelance ecologist on a wide variety of flora and fauna restoration and protection projects throughout New Zealand, in Hawaii, Mauritius, Seychelles, Marquesas, St Helena and Kiribati.
5. I have been providing advice on ecological and biodiversity matters, including resource consent applications and related matters, to a number of companies since 2013.
6. I am familiar with the Mackenzie District and the general surrounds, having worked on several threatened plant, vegetation and invertebrate studies in the area since 2005.
7. I am familiar with the Environment Court's Code of Conduct for Expert Witnesses, as contained in Section 7 of the Environment Court's Practice Note 2014. I have complied with the Code of Conduct in preparing this evidence.

## SCOPE OF EVIDENCE

8. This evidence addresses Proposed Plan Change 18 (**PC18**) to the Mackenzie District Plan (**MDP**).
9. I have been asked by Meridian Energy Limited (**Meridian**) to evaluate, the definition of indigenous vegetation in PC18.
10. In preparing this evidence I have considered the following documents:
  - a) PC18;

- b) Meridian’s submissions and further submissions;
- c) The submissions and further submissions of Canterbury Regional Council (**CRC**), the Mackenzie Guardians (MG), the Environmental Defence Society (**EDS**), the Royal Forest and Bird Protection Society of New Zealand Inc (**FB**), and the Department of Conservation (**DOC**);
- d) The Section 42A Hearings Report (14 December 2020) prepared by Liz White;
- e) The Section 42A Hearings Report – Ecology (10 December 2020) prepared by Mike Harding;

### **PC18 DEFINITION OF INDIGENOUS VEGETATION**

11. The definition of indigenous vegetation in PC18 reads:

*“Means a plant community of species native to New Zealand, which may include exotic vegetation but does not include plants within a domestic garden or that have been planted for the use of screening/shelter purposes e.g. as farm hedgerows, or that have been deliberately planted for the purpose of harvest.”*

12. In my opinion there are three key concerns with this definition as follows:
- a) Inclusion of an unspecified quantity or extent of “*exotic vegetation*”;
  - b) The phrase “*exotic vegetation*” is inconsistent with the use of “*species*”; and
  - c) The definition captures indigenous species that may not be naturally occurring within the Mackenzie Basin.
13. The inclusion of an unspecified quantity or extent of “*exotic vegetation*” means that this definition would capture the predominance of the Mackenzie District, including areas that have been actively farmed or modified by other authorised activities for many years.
14. I consider that it is valid to include exotic species in the definition of indigenous vegetation (which, strictly speaking, contains no exotic species) on the basis

that very few vegetation communities in New Zealand (excepting some high alpine, some subantarctic, and a few very small expanses elsewhere) are now truly indigenous vegetation with no representation by exotic plant species. Further, I understand that no vegetation communities are representative of pre-human vegetation of New Zealand as they are all modified to varying degrees by processes such as browsing from exotic mammals and/or infestation by exotic insects, exotic fungi or other exotic pests. On this basis, I consider that it is pragmatic to recognise an element of exotic species in the definition of indigenous vegetation.

15. However, including exotic species also creates an issue. In general, as indigenous plant communities are invaded by exotic species and damaged by exotic pests and anthropogenic changes, they become less 'natural' and therefore less 'indigenous'. This can be viewed as a spectrum of purely indigenous vegetation with no exotic influence at one end and with purely exotic vegetation with no indigenous species at the other end. The presumed purpose of the definition of indigenous vegetation is to describe at what point on this spectrum is the vegetation not considered 'indigenous' (and instead is considered 'exotic vegetation'). This change point needs to make ecological sense, be interpretable in the field, and be measurable in cases of disagreement.
16. If this point is set too low then the definition could represent nearly any vegetation community, including those that would not usually be considered indigenous, and also exotic vegetation communities that are colonised by indigenous species or that are heavily modified by dense stands of exotic plants such as stands of wilding pine or broom or gorse infestations.
17. My second concern is that the phrase "*exotic vegetation*" is inconsistent with the use of "*species*" in the first part of the definition. The term "*exotic vegetation*" in an ecological sense can mean a variety of things including cover by a single species or a mosaic of exotic species. I recommend that this phrase be changed to "*exotic species*" as this is more precise and reflects the overall intention of the definition.

18. My third concern is that the indigenous species present may not be naturally occurring within the Mackenzie Basin. Though I am not aware of any species in the Mackenzie Basin where this is the case, it is well known to have occurred in other areas and could possibly occur in this area.
19. Problems with the proposed definition have also been identified by CRC, MG, EDS, DOC and other submitters, and different definitions of indigenous vegetation have been proposed by submitters.

#### **S42A REPORT'S RECOMMENDED DEFINITION**

20. The S42A report recommends adoption of the following definition of indigenous vegetation:

*“Means a community of vascular plants, mosses and/or lichens that include species native to the ecological district. The community may include exotic species”.*

21. My concerns with this definition are:
  - a) While I support the inclusion of indigenous non-vascular plant communities (i.e., mosses and lichens), there are few people in New Zealand that can assess whether a moss or lichen species is *“native to the ecological district”* meaning application of this definition will be difficult; and
  - b) My earlier concern about the inclusion of an unspecified quantity or extent of *“exotic vegetation”* in the proposed definition equally applies to the definition recommended in the s42A Report. The test in both definitions is that if there is an occurrence of any native species anywhere within the area (no matter the size), then it qualifies as indigenous vegetation, and I do not support this approach in PC18.
22. In paragraph 87(e) the Section 42A Hearings Report – Ecology, Mr Harding notes that the revised definition will capture most of the remaining non-cultivated vegetation in the Mackenzie Basin. In my opinion, the revised definition will capture nearly all vegetation that is not addressed in the revised

definition (as per the s42A Report's recommendations) of "*improved pasture*" and will also capture many areas of wilding pine, weedy exotic shrubland, fallow land, abandoned pasture, dry pasture and mown amenity grassland which has been colonised by indigenous plants. In my opinion, this is too low a bar, it does not support the objectives of PC18 and it is inconsistent with related definitions in other planning documents in New Zealand.

#### **DEFINITIONS SOUGHT BY OTHER SUBMITTERS**

23. I do not support the definitions of indigenous vegetation sought by CRC, MG, EDS and DoC.
24. CRC seeks the addition of several situations where the vegetation in an area should be considered indigenous vegetation. While these are valid concerns, the trouble with listing situations is that the list needs to be extensive to capture the full range of situations. I believe the situations referred to by CRC can be captured within an improved definition of indigenous vegetation.
25. EDS proposes the following definition:

*"Means any plant community, which supports plant species naturally originating in New Zealand and their associated ecosystems, including where exotic species (species not naturally occurring in New Zealand) form part of that ecosystem (including tussock grasslands)."*
26. In my opinion, associated ecosystems are often poorly known, and can extend for a considerable distance beyond the site (e.g., native birds as seed dispersers). This definition also does not quantify the extent or quantity of exotic vegetation that can be present. I consider that clear exclusions from the definition are an important part of the definition as they provide confidence to people in those situations that the rules relating to indigenous vegetation do not apply.
27. I understand that CRC, MG, EDS, FB and DOC did not support the exceptions proposed in the original definition. I believe that exceptions can be valid in

instances where uncertainty could exist. I accept that such exceptions may be better included in rules rather than within the definition. In my recommended definition I propose some instances that I believe should be considered exceptions, whether within the definition, or as part of a rule.

#### **DEFINITIONS OF INDIGENOUS VEGETATION IN OTHER PLANNING DOCUMENTS**

28. The Resource Management Act 1991 and the Canterbury Regional Policy Statement do not include a definition of indigenous vegetation. Accordingly, to help to resolve the concerns I have raised in this evidence, I have looked to the definitions of indigenous vegetation that have been adopted by other planning documents in New Zealand.

29. The Southland Regional Policy Statement 2017 defines indigenous vegetation as:

*“Any local indigenous plant community through the course of its growth or succession consisting primarily of native species and habitats normally associated with that vegetation type, soil or ecosystem or having the potential to develop these characteristics. It includes vegetation with these characteristics that has been regenerated with human assistance following disturbance or as mitigation for another activity, but excludes plantations and vegetation that have been established for commercial harvesting.”*

30. My concerns with this definition are that the word *“primarily”* is not quantified and therefore is open to interpretation, and that *“potential to develop”* is a largely unknowable attribute.

31. The Bay of Plenty Regional Policy Statement 2018 defines indigenous vegetation as:

*“Any native naturally occurring plant community containing a complement of habitats and native species normally associated with that vegetation type or having the potential to develop these*

*characteristics. It includes vegetation with these characteristics that has regenerated following disturbance, has been restored or planted. It excludes plantations and vegetation that have been established for commercial purposes.”*

32. My concerns with this definition are that it is not quantified and therefore it is open to interpretation, and that it does not reference the presence of exotic species.

33. The Hawke’s Bay Resource Management Plan 2019, defines indigenous vegetation as:

*“Vegetation that occurs naturally in New Zealand or arrived in New Zealand without human assistance.”*

34. As with the Bay of Plenty Regional Policy Statement 2018, my concerns with the Hawke’s Bay Resource Management Plan 2019 definition are that it is not quantified and therefore open to interpretation, and that it does not reference the presence of exotic species.

35. The Horizons Regional Council’s One Plan 2018 defines indigenous vegetation as:

*“Indigenous means, for the purposes of Schedule F, vegetation comprised predominantly of indigenous species, but which may include scattered\* exotic species.”, with “scattered” defined as “Scattered means, for the purposes of Schedule F and this glossary, species that contribute less than species which are occasional\*, common\*, abundant\* or dominant\* and can be expected to be encountered infrequently, and with a sparse distribution within the area of interest. This is a measure of the contribution to an area of interest (eg., the same habitat type or forest tier) of a species in relation to other species in the same area, and is not simply a frequency count as both biomass and density of a given species are considered.” Note, these definitions only apply to matters under Schedule F (Indigenous Biological Diversity).”*



36. My concerns with this definition are that it is not quantified and therefore open to interpretation and it only includes a limited amount of exotic vegetation and therefore is of limited applicability in a Mackenzie Basin context.
37. The Waitaki District Plan 2010, defines indigenous vegetation as:
- “A plant community in which species indigenous to that part of New Zealand are important in terms of coverage, structure and/or species diversity. For these purposes, coverage by indigenous species or number of indigenous species shall exceed 30% of the total area or total number of species present, where structural dominance is not attained. Where structural dominance occurs (that is indigenous species are in the tallest stratum and are visually conspicuous) coverage by indigenous species shall exceed 20% of the total area.”*
38. The Otago Regional Policy Statement, West Coast Regional Policy Statement, Greater Wellington Regional Policy Statement, and the Auckland Plan do not include definitions of indigenous vegetation despite each of these documents referring to indigenous vegetation.
39. A common theme in the preceding definitions is that indigenous vegetation is defined by a predominance of indigenous plant species. However, the dominance by indigenous species is not quantified and therefore is open to interpretation. My view is that dominance means that indigenous species represent at least 50% of the vegetation, measured using a normal quantitative method.
40. The exception to this is the definition adopted in the Waitaki District Plan, which incorporates 30% (or 20% if indigenous species compose the tallest stratum) cover by area or proportion of species. The vegetation in areas of the Waitaki District is not dissimilar to that present in the Mackenzie Basin, and the two areas are facing similar ecological pressures, and the indigenous vegetation communities in both areas are frequently degraded by weed species. Therefore, while this definition does not have the criteria of a

dominance by indigenous species as in the other definitions, I consider it appropriate in the context of the remaining natural vegetation in the Mackenzie Basin to use a lesser quantity of indigenous species to define indigenous vegetation.

41. While I consider that the Waitaki District Plan definition is workable, in my opinion it needs to be further developed to make it suitable for application in the Mackenzie Basin where areas can have extensive coverage of bare ground and/or lichen and mossfields, and to include exceptions to the definition where indigenous species have been deliberately planted for amenity or commercial purposes such as shelter belts, site landscaping and areas planted as carbon forest, and to exclude cultivated pasture and other near monoculture exotic crops that could inadvertently be captured by the species diversity criteria.

#### **RECOMMENDED DEFINITION OF INDIGENOUS VEGETATION**

42. Based on the preceding assessment, I recommend the following definition of indigenous vegetation for inclusion in PC18:

*“Means a plant community in which plant species indigenous to that part of New Zealand are important in terms of coverage, structure and/or species diversity. For these purposes, coverage by indigenous species or number of indigenous species shall exceed 30% of the total vegetated area or total number of species present, where structural dominance is not attained. Where structural dominance occurs (that is indigenous species are in the tallest stratum and are visually conspicuous) coverage by indigenous species shall exceed 20% of the total area. Areas where indigenous species have been planted for the purposes of amenity, shelter, landscaping, or as part of a commercial forest, or cultivated exotic crops and pasture, are excluded from this definition.”*

43. In my opinion, this definition is ecologically valid, can be reasonably employed in the field, and is measurable where there is disagreement.

A handwritten signature in black ink, appearing to read "M. Thorsen", with a long horizontal flourish extending to the right.

Michael James Thorsen

12 February 2021