

**BEFORE AN INDEPENDENT HEARING COMMISSIONER FOR WAITOMO
DISTRICT COUNCIL**

IN THE MATTER of the Resource Management Act 1991 (“Act”)

AND

IN THE MATTER of an application to vary resource consent
RM050019 by Taumatotara Wind Farm
Limited under s127 of the Act

**EVIDENCE OF SIMON CHAPMAN
ON BEHALF OF TAUMATOTARA WIND FARM LIMITED
[ECOLOGY]
23 OCTOBER 2023**

Counsel: G K Chappell

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1. INTRODUCTION

1.1 My full name is Simon Chapman. I am employed as a Principal Ecologist by Ecology New Zealand Limited (Ecology NZ).

1.2 I have 20 years' experience as a professional ecologist. I hold the qualifications of Bachelor of Science (1999) and Postgraduate Diploma in Applied Science (2007), both from Lincoln University. I consider myself to be a generalist ecologist with specialist skills in indigenous flora and fauna.

1.3 My work experience includes the design and implementation of biodiversity surveys and monitoring programmes, undertaking and peer reviewing ecological impact assessments, and developing and implementing ecological mitigation, management, and restoration plans. My employers and roles through my career include:

(a) Ecology New Zealand (2016 - present): Ecology Manager and Principal Ecologist

(b) Golder Associates (2014 – 2016): Group Leader – Water Management and Ecology

(c) Andrew Stewart (2013 - 2014): Ecology Manager

(d) Boffa Miskell (2007 - 2013):

(i) Principal Ecologist (2009 - 2013)

(ii) Senior Ecologist (2007 - 2009)

(e) Envirologic (2001 - 2007): Principal Ecologist / Director

1.4 The majority of my work involves leading ecology teams to assess and manage the ecological effects of large-scale projects including linear infrastructure (roading and rail), quarries/mines, energy projects (hydro schemes and wind farms), and some of the country's largest residential, commercial, and industrial developments. Examples of my recent projects I consider relevant to the current proposal include:

(a) Kaimai Wind Farm (2018 - present)

(b) Auckland Regional Landfill - Dome Valley - Terrestrial Ecology Review for Council (2020 - 2023)

- (c) SH1 Waikato Expressway – Cambridge to Piarere (2017 - present)
- (d) SH1 Mt Messenger Tunnel Bypass (2016 - 2019)
- (e) Waikato Bridge and Peacockes Strategic Services (2018 - present)
- (f) Kings Quarry Peer Review (2021 - present)
- (g) SH3 Awakino Tunnel Bypass (2017 - 2021)
- (h) Te Uku Wind Farm (2008 – 2013)

- 1.5 I regularly provide ecological expertise to central and local government clients primarily with ecology review work to assist with the processing of resource consent applications, plan changes, and Notices of Requirement. The topics I provide advice on include terrestrial, freshwater, wetland, and coastal ecology, threatened species monitoring and conservation, biodiversity offsetting / compensation, and ecological mitigation, management, and restoration.
- 1.6 I have specialist expertise and experience in matters directly relevant to this project, especially indigenous fauna, including bats and avifauna.
- 1.7 My long-tailed bat experience includes successful trapping and radio-tracking studies in the Waitakere Ranges, the Hunua Ranges, Waitomo, Piopio (King Country), Mount Messenger (Taranaki), Puketitiri (Hawkes Bay), and Geraldine (South Canterbury). I am listed by the Department of Conservation on their database of competent bat ecologists as a “trainer” holding all competencies relevant to long-tailed bat surveys, monitoring, and mitigation/management.
- 1.8 I have been appointed as the project bat ecologist on a wide range of projects. For example, I am currently the bat ecologist for Hamilton City Council's Waikato Bridge and Peacockes Strategic Services project, a role I have held since 2018. I have successfully implemented DOC's bat roost protocols (which I peer reviewed for DOC in 2021) on many projects to minimise the risks of impacting bat roosts during tree removal.

- 1.9 In addition to the wind farm projects mentioned above, I have carried out bat assessments at several other proposed wind farm sites including Waiouru (Project Central Wind), Ahipara Gumfields, and Pouto Peninsula.
- 1.10 I have been engaged by Taumatotara Wind Farm Limited ("T4") to provide expert evidence in respect of ecology.
- 1.11 In preparing my evidence I have relied on site details from the following reports:
- (a) Kessels & Associates. 2005a. Ecological Assessment of proposed windfarms Taumatotara West Rd, Taharoa Taumatamaire Rd, Awakino. Prepared for Ventus Energy;
 - (b) Craig, J & Chapman, S. 2021. Taumatotara Windfarm: Ecological Effects Assessment of the Existing 22 Turbine. Consented Activity plus the Proposed Tip Height Variation in response to s92 Requests;
 - (c) The AEE submitted with the original application and the 2020 application for variation; and
 - (d) The 2011 Section 42A Report.

Code of conduct

- 1.12 I confirm that I have read the Expert Witness Code of Conduct set out in the Environment Court's Practice Note 2023. I have complied with the Code of Conduct in preparing this evidence and will continue to comply with it while giving oral evidence. Except where I state that I am relying on the evidence of another person, this written evidence is within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed in this evidence.

Scope of evidence

- 1.13 In my evidence, I:
- (a) Provide an executive summary of my key conclusions;
 - (b) Outline the nature of the Site and its environs with respect to indigenous biodiversity and matters of ecological significance;

- (c) Summarise the relevant aspects of the project;
- (d) Summarise the planning context;
- (e) Outline my assessment of effects;
- (f) Address the section 42A Report;
- (g) Address proposed ecology conditions; and
- (h) Summarise my findings.

1.14 I do not respond directly to individual submissions that raise issues relating to biodiversity as these are assessed throughout my evidence.

2. EXECUTIVE SUMMARY

2.1 Ventus Energy was granted consent to construct a 22-turbine wind farm at Taumatotara West Rd, Te Anga in 2008 with a variation granted in 2011.

2.2 This application for a variation to the resource consent for the Taumatotara wind farm (as amended) proposes to reduce the number of turbines to 8 at a turbine maximum of height of 180.5m.

2.3 The site of the consented wind farm is located along a ridge that is on pastoral grazing farms.

2.4 The proposed variation for the Taumatotara Wind Farm avoids the ecological effects of the consented turbines and their construction at the southern end of the project site. The removal of turbines 12-22 from the consent reduces the area covered by approximately three kilometres.

2.5 The reduction in number of turbines reduces the numbers of turbines near remnant indigenous forest. The variation removes the impact on the freshwater environment through avoidance of the wetland and stream head waters that are in the southern part of the site.

2.6 Bird and bat activity was surveyed on the site. The reduction in the number of turbines by 14 and total rotor sweep area by 14% from the consented wind farm minimises the effects on commuting and foraging terrestrial avifauna and bats.

- 2.7 Overall, the key plank of the application is the avoidance of effects through the significant reduction in the number of turbines and the overall reduction in rotor sweep area. I conclude that the ecological effects are likely to be less than under the existing consent. A package of ecological conditions is proposed and represents an opportunity to better align the existing consent conditions with current best practice.

3. THE SITE

- 3.1 The site of the consented wind farm is located on a ridge near Te Anga in the Waitomo District. It is located on pastoral grazing farms owned by separate landowners, all of whom have given their approval to the project.¹
- 3.2 The site has an elevation ranging between 300m and 320m with defined but level ridgelines with steep slopes on the flanks. The gradient of the site is moderate to steep with slopes, generally between 1 in 20 and 1 in 5.
- 3.3 The farms on which the T4 turbines will be located are dominated by exotic pastoral species. Small fragments of native bush and scrub also exist in the surrounding area.²

4. EXISTING CONSENT ENVIRONMENT

- 4.1 Ventus Energy was granted consent to construct a 22-turbine wind farm at Taumatotara West Rd, Te Anga in 2008 with a variation granted in 2011.³
- 4.2 Taumatotara West Road dissects the consented wind farm, with turbines 1-6 located North of the road and turbines 7-22 located on the ridge running south from the road. The vegetation in the immediate vicinity of the turbine locations is pasture.
- 4.3 In addition, on the property north of the road there is a small mixed broadleaf mahoe-kohekohe remnant with a grazed understory near the

¹ Craig, J & Chapman, S. 2021. Taumatotara Windfarm: Ecological Effects Assessment of the Existing 22 Turbine. Consented Activity plus the Proposed Tip Height Variation in response to s92 Requests.

² Kessels & Associates. 2005a. Ecological Assessment of proposed windfarms Taumatotara West Rd, Taharoa Taumatamaire Rd, Awakino. Prepared for Ventus Energy

³ Waitomo District Council 2006. Planners Report for the Taumatotara Windfarm resource consent application by Ventus Energy (NZ) Limited.

locations of Turbines 3 and 4⁴. This is shown in the Separation Distance Map included with the Section 42A report at Appendix 9.

- 4.4 When the variation application was lodged in 2020 there was a small radiata pine plantation to the south of the Taumatotara West Road, near the location of turbine 7. This plantation has now been felled.
- 4.5 More extensive patches of forest are found below the steep ridge slopes running south from Taumatotara West Road and below the ridge on which turbines 12– 22 are located. These are more diverse than the remnants above the road, are larger, and have protection from stock due to the steepness of the terrain. They have a similar composition as the northern remnant with tawa, kamahi, and kahikatea more dominant down the slope.
- 4.6 The larger blocks of indigenous vegetation to the south of the site have been described as mixed canopy tawa dominant. These too, are subject to the impacts of grazing.
- 4.7 Towards the southern end of the consented site from turbines 12 to 22 freshwater features exist. Two streams are present, being upper tributaries of the Mangaohuinga Stream, and the Tawarau River. A small wetland that supports a low diversity of exotic wetland species, such as *Juncus effusus* and a small pond behind a dam with a variety of wetland species around its margins is described in the initial site assessment.⁵
- 4.8 Construction of the wind farm under the 2008 consent would not have resulted in the removal of any trees or stands of trees from the site of the 22 turbines with the implication that no roost site would be disturbed. This position has not changed with the new application for variation.

Bird surveys for 2008 consent application

- 4.9 The two assessments to support the 2008 consent application were prepared by Kessels and Associates and included bird surveys, vegetation descriptions, freshwater environment descriptions.⁶

⁴ Supra note 2 (Kessels a)

⁵ Kessels & Associates. 2005b. Proposed Wind Farm Turbine Sites 18-22 Assessment of Ecological Effects December 2005. Prepared for Ventus Energy.

⁶ Supra Note 5 (Kessels b)

- 4.10 The bird surveys supporting the assessment of effects for the 2008 consent were carried out twice in 2004, and once in 2005. The 2004 surveys included two 3-hour sessions during the dawn chorus recording all birds observed and heard. In 2005, all birds observed and heard were also recorded during the site visit.
- 4.11 These surveys showed consistent species presence which included common introduced and Not Threatened indigenous species. Kessels noted that Chaffinch was the most frequently heard in 2005.⁷
- 4.12 Native bird species included grey warbler, kingfisher, kereru, Australasian harrier, fantail, silvereye, paradise shelduck, etui and welcome swallow. Kessels noted tomtits in the forested area in the southernmost area of the currently consented site.⁸

Further surveys to support the Variation Application

- 4.13 As part of the application to vary the consent the northern half of the wind farm was surveyed twice in 2021 to support my 2021 report.⁹ The 2021 surveys of the turbine 1-11 sites consisted of 5-minute bird counts at each of the turbine sites on 15 February 2021 and 23 March 2021. They recorded predominantly Australian Magpie, but also included Not Threatened native species; fantail, welcome swallow, grey warbler, paradise shelduck, tui and kereru.
- 4.14 The 2021 effects assessment referenced the 2008 Taharoa radar monitoring of migratory shorebirds Appendix 1 (below). It was evident that shorebirds did not approach the Taumatotara ridgeline and did not have flight paths that intersected the Taumatotara wind farm site.

New Zealand Falcon

- 4.15 Without any reported sightings during the project bird surveys, Dr Craig and I deemed a 1986 record of a New Zealand falcon in the wider

⁷ Supra note 2 (Kessels a)

⁸ Supra Note 5 (Kessels b)

⁹ Craig, J. & Chapman, S. 2021. Taumatotara Windfarm: Ecological Effects Assessment of the Existing 22 Turbine Consented Activity plus the Proposed Tip Height Variation in response to s92 Requests.

landscape was worthy of further investigation to determine the levels of potential effect on this At-Risk (recovering) species.¹⁰

- 4.16 New Zealand falcon have large home ranges and it is considered a possibility that, even without suitable falcon roosting habitat, they might occasionally fly through the area.¹¹
- 4.17 A US study found that the highest wind turbine collision rates for raptors in the US were when the wind farm was in important foraging habitat, and that close proximity to canyons was a factor. The Kessels' assessment had concluded that as the proposed wind farm was not located in known important foraging habitat for the NZ falcon, and that as the wind farm site is on a ridge top these were mitigating factors.⁷
- 4.18 The 2021 assessment noted that since the original consent, a number of wind farms have been built or consented where it is known that New Zealand falcon both nest and forage within the wind farm envelope. These include Mahinerangi, Turitea, Puketoi, Te Uku wind farms.
- 4.19 I am particularly familiar with the Te Uku wind farm and note that although New Zealand falcon were not recorded during the mortality assessments at the Te Uku Wind Farm, they are known to be regularly present throughout the wider landscape.^{12,13}

Bat pass numbers

- 4.20 The assessment of effects for the 2008 T4 consent considered that the impact of the wind farm on bats was likely to be minimal. It suggested that the bats' size and mobility were mitigating factors.¹⁴

¹⁰ Supra Note 7 (Kessels b)

¹¹ Supra Note 2 (Kessels a)

¹² Kessels & Associates. 2017. Significant Natural Areas of the Waikato District: Terrestrial and Wetland Ecosystems. Prepared for Waikato Regional Council.

¹³ Boffa Miskel. 2014. Project Te Uku Post-construction Avifauna & Bat Monitoring Year 3 Annual Report Prepared for Meridian Energy Limited.

¹⁴ Supra note 2 (Kessels a)

- 4.21 Since then, there has been increasing recognition in international literature that certain bat species are susceptible to impacts with wind turbines. Although, these are typically migratory species.^{15,16}
- 4.22 Consequently, in 2021 to support the application for variation an acoustic bat survey (“2021 Bat Survey”) was carried out over 20 days to more clearly determine levels of bat activity on the site in the late summer through to early autumn. This is the time of the year when bats are known to be highly active due to consistent warm nights and the females being post-natal.¹⁷.
- 4.23 The 2021 Bat Survey located the monitors in areas close to the turbine sites attached to the nearest trees or fenceposts. Accordingly, the monitor locations varied from 39 to 305 metres from the turbine sites (see Appendix 2 below).
- 4.24 To clarify, the use of bat passes, or average bat passes per night is an indicator of bat presence. Pass counts do not reflect actual bat numbers or population size, as a single foraging bat may pass a site several times. The presence of long-tailed bats in the landscape does not automatically suggest that they will be harmed by the wind farm.
- 4.25 I assessed this survey as a reasonable approach for determining bat presence at the site.
- 4.26 The 2021 Bat Survey shows a total of 560 passes across the site. Four hundred and eighty passes were recorded on just four monitors. Three of those monitors, were numbers 9,10 and 11. They recorded 73 percent of the total passes and were attached along the edge of the same scrub remnant (SNA R16UP042.02). The monitor at Site 1 was 245 metres from turbine 1 and hung in a small group of pines and recorded 12.5 percent of passes (Appendix 2 below)¹⁸.

¹⁵ Voigt., C, Kaiser, K., Look, S., Scharnweber, K., & Scholz, C. 2022. Wind turbines without curtailment produce large numbers of bat fatalities throughout their lifetime: A call against ignorance and neglect. *Journal of Global Ecology and Conservation*.

¹⁶ New Zealand Bat Recovery Group. 2023. Bats and windfarms in New Zealand V5.0. Department of Conservation.

¹⁷ O'Donnell CFJ 2002. Timing of breeding, productivity and survival of long-tailed bats *Chalinolobus tuberculatus* (Chiroptera: Vespertilionidae) in cold-temperate rainforest.

¹⁸ Craig, J. & Chapman, S. 2021. Taumatotara Windfarm: Ecological Effects Assessment of the Existing 22 Turbine Consented Activity plus the Proposed Tip Height Variation in response to s92 Requests

- 4.27 Of the 15 functioning monitors deployed, 10 recorded less than one pass per night on average. There were an average 2.4 passes per monitor across the 6.5 km site. Lowest bat pass numbers (zero) were recorded in the open area monitoring sites. This survey confirmed that there were long-tailed bats present in the landscape.¹⁹
- 4.28 Seasonal variations in activity were recorded but activity levels did not change following the wind farm becoming operational.
- 4.29 The bat passes recorded are presented in the table attached as Appendix 2. Relative to other areas, in my experience, the results illustrate that there were low levels of bat activity across the currently consented site (i.e., all 22 turbines).

Te Uku Wind Farm

- 4.30 My experience with the Te Uku Wind Farm is that activity and mortality data for bats from this wind farm, (being a larger wind farm also along the western Waikato Region), had similar levels (i.e., low levels) of bat activity as T4 that were identified in the Te Uku pre-construction survey.²⁰
- 4.31 The mortality data at Te Uku Wind Farm, which constitutes one of the few studies of bat activity at an operational wind farm in NZ, did not show that there were any bat fatalities in the 3-year post construction monitoring. That monitoring was ceased at that time, with the agreement of the Department of Conservation.

Other studies

- 4.32 Migratory microbats comprise the majority of mortalities in all wind farm studies to date. Long-tailed bats are not known as migratory bats.^{21,22}

¹⁹ Craig, J. & Chapman, S. 2021. Taumatotara Windfarm: Ecological Effects Assessment of the Existing 22 Turbine Consented Activity plus the Proposed Tip Height Variation in response to s92 Requests.

²⁰ Boffa Miskel. 2014. Project Te Uku Post-construction Avifauna & Bat Monitoring Year 3 Annual Report Prepared for Meridian Energy Limited.

²¹ Erickson, W., Kronner, K. & Gritski, B. (2003) Nine Canyon Wind Power Project: Avian and Bat Monitoring Report, September 2002 - August 2003. Technical report submitted to Energy Northwest and the Nine Canyon Technical Advisory Committee.

²² Barclay, R. M. R., Baerwald, E. F. & Gruver, J. C. (2007) Variation in bat and bird fatalities at wind energy facilities: assessing the effects of rotor size and tower height. *Can. J. Zool.*, 85, 381-387.

- 4.33 Studies in Germany and Finland have shown that forest specialist bat species actively avoid wind turbines.^{23,24} There is no current understanding of the impact on New Zealand's bat species.²⁵

5. THE PROJECT VARIATION

- 5.1 The current approved consent RM050019 following the approved variation in 2011, is for 22 turbines at a height of 121.5 metres for the northernmost 11 turbines and 110 metres high for the southernmost 11 turbines.²⁶
- 5.2 The application for a variation to the resource consent for the Taumatotara wind farm proposes to reduce the number of turbines to 11 at a turbine height of 172.5 metres. This has since been updated to further reduce the number of turbines by 3 with an increased height of 180.5m (Appendix 3 below).
- 5.3 These turbines have been identified as 1, 3, 5, 6, 7, 8, 10, and 11 (Appendix 2). These are in the northern half of the currently consented wind farm. To clarify, the consented turbines 2, 4, 9 and 12 to 22 will be removed from the consent and not constructed.
- 5.4 This final configuration removes a total of 14 turbines from the original consent and reduces the total rotor swept area of the wind farm by 14 percent.

6. PLANNING CONTEXT

District Plans

- 6.1 The current consent was granted, and this variation is being applied for under the Waitomo District Operative District Plan.

²³ Ellerbrok, J. S., Delius, A., Peter, F., Farwig, N., & Voigt, C. C. (2022). Activity of forest specialist bats decreases towards wind turbines at forest sites. *Journal of Applied Ecology*, 59, 2497–2506. <https://doi.org/10.1111/1365-2664.14249>

²⁴ Gaultier, S., Lilley, T., Vesterinen, E., Brommer, J. 2023. The presence of wind turbines repels bats in boreal forests, *Landscape and Urban Planning*, Volume 231

²⁵ Place, V, Marshall, B, Heinze, B, Sass, S. 2009. Proposed Yass Wind farm: Wind Farm Risks to Birds and Microbats.

²⁶ Waitomo District Council 2011. Waitomo District Council report on a non-notified application pursuant to Section 127 of the Resource Management Act 1991 – Waitomo District Council land use consent RM050019A.

- 6.2 A review of the operative planning maps shows that there are no protected or significant natural areas on the properties of the consented wind farm.
- 6.3 Potential Significant Natural Areas (SNAs) of Local and Regional importance have been subsequently mapped under the proposed Waitomo District Plan (Appendix 2). There are some proposed SNAs located in proximity to some turbines, but none that will be directly impacted by the construction or operation of the wind farm as no clearance of indigenous vegetation is required for construction of the wind farm site. The proposed SNAs are shown on the map in Appendix 2 below.
- 6.4 There are 4 proposed locally significant SNA (R16018.02, three labelled R16UP042.02) and 1 small SNA that is regionally significant (R16018) near the turbine array proposed in this variation (Turbines 1-11). These blocks were described above.²⁷
- 6.5 Turbines 12 and 13 are by a proposed locally significant SNA (R16UP042.02) and turbines 17 - 22 are located close to a proposed regionally significant SNA (R16UP046) and have been described previously.²⁸
- 6.6 Removal of turbines 12 to 22 will avoid the location of 6 turbines within 100 metres of the proposed regionally significant SNA. This leaves only 4 turbines near the locally significant SNA in the northern section of the string of turbines. As noted above, these northern blocks were described as heavily grazed in the undergrowth.
- 6.7 The proposed SNAs have been established by a desktop study and will be verified by an ecologist against the Waikato Regional Policy Statement's (WRPS) criteria for significance (WRPS Part 5, Appendix 5).²⁹ Mr Shearer will address the planning context in more detail in his evidence, but I understand that little weight can be given to the SNAs identified under the Proposed District Plan as hearings have yet to be heard.
- 6.8 Since the consent was first granted several documents have been released that are directly relevant to wind farms and renewable energy generation.

²⁷ Supra Note 2

²⁸ Supra Note 5 Page 5

²⁹ <https://www.waitomo.govt.nz/media/xzwpu22s/dp-fact-sheet-sna.pdf>

Regional Policy Statements

6.9 The National Policy Statement for Renewable Energy Generation (NPSREG) was gazetted in 2011.³⁰ This document acknowledges that the development and operation of *“renewable electricity generation can compete with matters of national importance as set out in section 6 of the Act, and with matters to which decision-makers are required to have particular regard under section 7 of the Act”*.

6.10 It addresses this conflict through Policy C2:

“When considering any residual environmental effects of renewable electricity generation activities that cannot be avoided, remedied or mitigated, decision-makers shall have regard to offsetting measures or environmental compensation including measures or compensation which benefit the local environment and community affected”.

6.11 This policy is echoed in the operating Waikato Regional Policy Statement Part 3, EIT-M1³¹:

“Residual effects of renewable energy generation activities which cannot be avoided, remedied or mitigated can be offset or compensated to benefit the affected community or the Region”.

6.12 Earlier this year the National Policy Statement for Indigenous Biodiversity (NPSIB) was gazetted³². This document sets out the way that the effects management hierarchy operates for indigenous biodiversity but importantly, nothing in the NPSIB applies to wind farms.

“1.3 (3) Nothing in this National Policy Statement applies to the development, operation, maintenance or upgrade of renewable electricity generation assets and activities and electricity transmission network assets and activities. For the avoidance of doubt, renewable electricity generation assets and activities, and electricity transmission network assets and activities, are not “specified infrastructure” for the purposes of this National Policy Statement.”

6.13 My understanding is that the overriding policy is the NPSREG.

³⁰ NZ Government 2011. National Policy Statement for Renewable Energy Generation.

³¹ Waikato Regional Council 2022. Waikato Regional Policy Statement.

³² Ministry for the Environment. 2023. National Policy Statement for Indigenous Biodiversity.

Department of Conservation Advice Note

- 6.14 Although not a planning document with any statutory authority I note that the Department of Conservation has been working on some advice notes for wind farms.³³ A final version of the Bats and Wind Farm Advice Note was recently released in October 2023. This is addressed further below.

Section 127 of the Resource Management Act

- 6.15 Importantly, as the application is for a variation of an existing consent under s127 of the Resource Management Act, I understand that the effects to be assessed refer to the difference between those effects that have been consented by the existing consent and the effects of the updated variation proposal.
- 6.16 The above factors have informed my assessment of the effects of the application for variation.

7. EFFECTS ASSESSMENT

- 7.1 The proposed application to vary the current consent, as outlined above, has resulted in a significant decrease in the number of turbines that may be constructed, by removing 14 of the 22 consented turbines.
- 7.2 The removal of these turbines in favour of fewer larger turbines will see a reduction in linear space of the wind farm from approximately 6.5 kilometres to approximately 3.5 kilometres across the landscape.
- 7.3 Furthermore, the overall rotor swept area is reduced by 14%.
- 7.4 The removal of the string of turbines 12 to 22 over a 3-kilometre span nearly halves the potential for impact on the flight paths of avifauna and long tailed bats (*Chalinolobus tuberculatus*) that occupy the area relative to that currently consented.
- 7.5 The southern area (i.e., 12-22) also constitutes half of the recorded bat activity along the consented wind farm array (Refer Appendix Two). As a corollary, the reduction in turbines across that area must represent a reduction in effect.

³³ New Zealand Bat Recovery Group. 2023. Bats and windfarms in New Zealand V5.0. Department of Conservation.

- 7.6 The removal of turbines 12-22 in the southern part of the wind farm also avoids any potential effects on freshwater environments that were identified by Kessels³⁴, including streams and wetlands and the fauna within.
- 7.7 The proposed variation avoids turbines 18-22 being constructed along the ridge which is bound by indigenous vegetation mapped as proposed SNA R16UP04202³ in the Proposed District Plan.³⁵ This avoidance measure will remove any impact or effect upon birds and bats that may be using that ridgeline for commuting or foraging.
- 7.8 The siting of the 9 turbines, including that they are not near the end of a ridge, overall reduces the risk to bats and birds.
- 7.9 I acknowledge that there is an increase in the turbine height for the remaining turbines but assessing impact on the heights at which bats pass is difficult. No literature has measured the heights at which long-tailed bats fly.
- 7.10 In my view, taking into account the above factors, it is reasonable to conclude that the effects on bat and bird activity will be less than under the existing consent.

8. SECTION 42A REPORT

- 8.1 The report by Dr Leigh Bull of Blue Green Ecology Limited (The Blue Green Report) forms the basis for the Section 42A Report's response to matters regarding ecology.
- 8.2 The Blue Green Report identifies that best practice guidelines have been created since the initial ecological assessments of the wind farm. It identifies that the assessments were done in accordance with standards that pre-dated these guidelines.

Report Focus

- 8.3 The Blue Green Report focuses almost exclusively on bats and does not refer to the positive effects to be gained from the proposed variation through the avoidance of freshwater habitats. Freshwater habitats, in

³⁴ Supra Note 2 (Kessels a)

³⁵ <https://maps.waitomo.govt.nz/IntraMaps90/>

addition to their intrinsic value, are recognised as a key bat foraging areas.³⁶

- 8.4 Further, the Report does not acknowledge the avoidance of effects achieved by:
- (a) Substantially reducing the turbine numbers;
 - (b) Reducing the overall (cumulative) rotor sweep area; and
 - (c) Reducing the numbers of turbines in proximity to indigenous vegetation across the landscape, noting that indigenous vegetation and forest edges form valued bat foraging habitat.
- 8.5 Nor does the Report take into account the NPSREG which acknowledges competing priorities with matters of national importance and which recognises that avoiding, mitigating or remedying adverse effects is not always possible for renewable energy generation. Where that is the case offsetting and compensation may be appropriate and this may include community compensation.

Reliance on the Department of Conservation Advice Note

- 8.6 The Blue Green Report highlights and relies on the development of the Department of Conservation Bats and Windfarms Advice Note (“Advice Note”) over several years.
- 8.7 The Advice Note is based on overseas data of bat wind farm interactions. Much of the advice addresses the pre-consenting phase of a wind farm development, and in my view, as such has little relevance to a variation application.
- 8.8 It addresses the options to reduce bat fatalities at wind farms, however other than turbine placement, these have not been tested in New Zealand and are admittedly experimental.
- 8.9 The Blue Green Report refers to the consideration of curtailment and the use of deterrents as a potential mitigation to avoid harm to bats.

³⁶ Griffiths, R. (2007) Activity patterns of long-tailed bats (*Chalinolobus tuberculatus*) in a rural landscape, South Canterbury, New Zealand, *New Zealand Journal of Zoology*, 34:3, 247-258

- 8.10 Throughout this project and the ongoing development of Advice Note, it has become clearer that the options of curtailment and deterrents are problematic.
- 8.11 Deterrents are noted in the Advice Note as being experimental in the New Zealand context and will require animal ethics approvals. An earlier version of the Advice Note said that Wildlife Act approval would also be required.
- 8.12 Curtailment is noted as being untested in New Zealand wind farms and international literature suggests that this method leads to reductions in bat and bird fatalities but has not eliminated all fatalities. I understand that few if any overseas wind farms utilise curtailment as strategy for bat mortality reduction on an ongoing basis.

9. PROPOSED CONDITIONS

- 9.1 Despite the Blue Green Report's observations, it recommends a series of conditions to address the perceived effects arising from the activity. These are designed to ensure that the consent is operating in line with current best practice and include requirements for additional baseline monitoring and a systematic post-operation activity and mortality survey.
- 9.2 The Blue Green Report suggests that additional monitoring will give a clearer indication of the levels of residual ecological effect to the flight activities of bats and birds.
- 9.3 I recognise that there have been changes to best practices since the original consent was granted and generally support the intent of the Section 42A Report's proposed ecological conditions subject to some changes to allow the project to commence and progress smoothly. Overall, I agree that the package of conditions should address the following:
- (a) Baseline studies for avifauna and bat population monitoring prior to commissioning of the first turbine for preparation by a suitably qualified expert in terrestrial ecology (SQEP) and in consultation with other parties;
 - (b) Post construction avifauna and bat population monitoring and management, if required, as a result of the baseline monitoring, for a period of two years. The monitoring plan will need to be

prepared by a SQEP and identify methods and options to avoid, remedy, mitigate, offset or compensate for any significant adverse effects;

- (c) A requirement to keep a register of observations of effects of the wind farm activities on wildlife (per condition 37);
- (d) A requirement for reporting and recording of evidence of bird strikes;
- (e) The use of bat detectors on turbines 1, 7 and 11.
- (f) A requirement to forward bat records to the Department of Conservation;
- (g) Annual reporting to the Council (condition 41)
- (h) Retention of the existing conditions relating to bird perches (conditions 42-44)
- (i) Retention of existing conditions 45 and 46 limiting clearance of native vegetation and implementing a pest plant control programme;
- (j) A requirement to provide compensation in the sum of \$25,000 per year for five years to support bat population investigations.

9.4 In my view this package of conditions together with the amendments proposed in Mr Shearer's evidence will generally accord with the Blue Green Report's concerns that the following aspects are required:

- (a) A baseline study for NZ Falcon;
- (b) The collection of baseline data for bats over three key activity periods;
- (c) Standardised post construction mortality monitoring.

9.5 I agree that the baseline studies will provide quantifiable measures of the potential impacts of the wind farm on avifauna and bats and will provide the data from which to determine ongoing management of any effects.

- 9.6 The key disagreement is in relation to the Blue Green Report's proposals to delete that part of condition 40 that provides that "any modification or restriction on the operation of the wind turbines" will be excluded from the management plan. This is for reasons I have discussed above in relation to curtailment, and as this is a variation to an existing consent where there are positive effects.
- 9.7 In responses to the Section 92 requests, T4 previously had indicated a commitment to pest management exceeding the pest plant control programme requirements in existing condition 46. While this is still a matter to which T4 is committed,³⁷ I understand that the difficulty arises in relation to the certainty of a condition that requires third party (i.e., landowner) consent. Nevertheless, I support the intent of such a commitment as pest management is generally of assistance in reducing predators of indigenous avifauna and bats. In combination with the fencing of stock and feral browsers from existing forest remnants, it will also reduce foliage browse and ground cover improving the habitat for bats and avifauna as well as other terrestrial fauna.
- 9.8 Overall, in the context of this variation application I support the package of ecological conditions as set out in the evidence of Mr Shearer.

10. SUMMARY

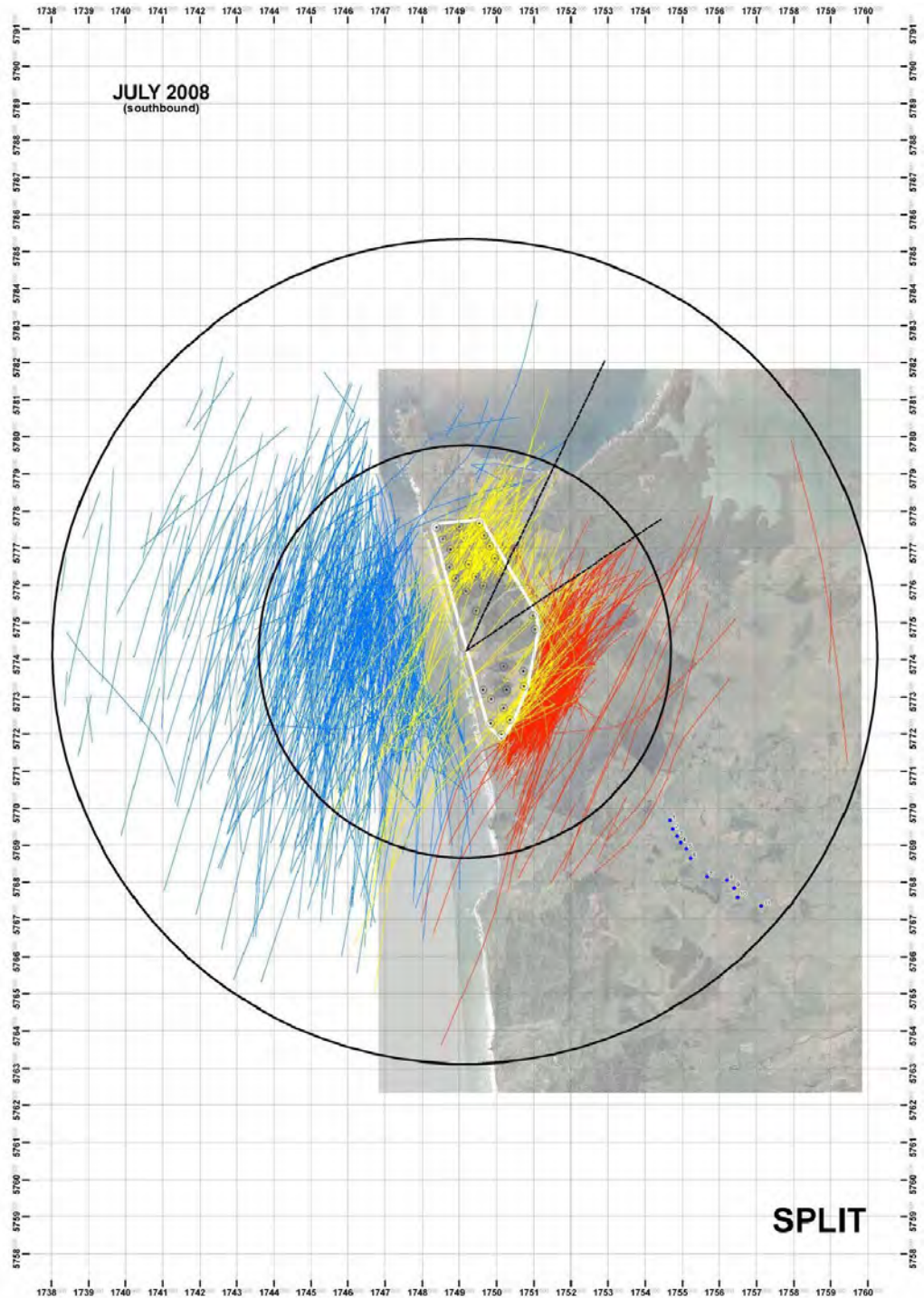
- 10.1 The proposed variation for the Taumatotara Wind Farm avoids, remedies or mitigates ecological effects for the reasons set out below:
- (a) The updated variation removes 13 turbines. In particular, the level of effects for commuting and foraging terrestrial fauna have been avoided at the southern end of the project site by the reduction in number of turbines and the linear space they occupy;
 - (b) Removal of the southern turbines in proximity to the wetland, and streams will further avoid effects on freshwater environments that were subject to the design as currently consented;
 - (c) The updated variation will not be removing any additional indigenous flora, or fauna roosting or nesting habitat;

³⁷ Evidence of Mr G Starr (Corporate)

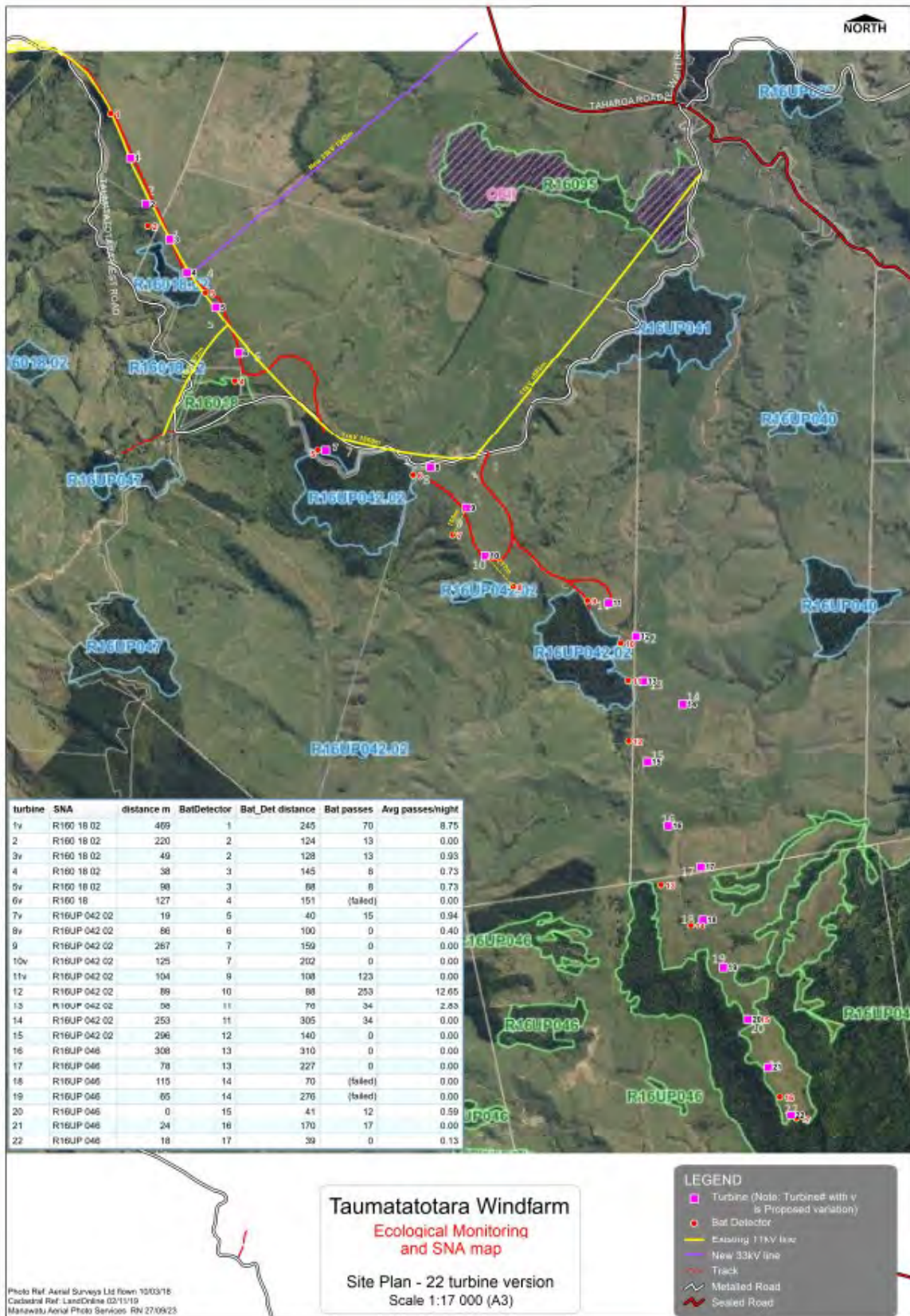
- (d) The total rotor swept area has been reduced by 14% from the consented wind farm.
- 10.2 The remaining residual effect is the potential for bats and birds to collide with the remaining turbines or be impacted by their operation, for example; barotrauma. However, as this effect is likely to have been reduced because of the matters identified above, any effects are both minimised and positive.
- 10.3 As a precautionary measure, and to address any uncertainty about the level of effects on avifauna arising from the operation of a wind farm at Taumatotara, baseline monitoring will more clearly determine the local avifauna populations.
- 10.4 In addition, to the extent that there is any uncertainty as to the difference in effects, the applicant has offered compensation in the sum of \$25,000 per annum for five years to support an investigation of bat populations in the geographical area running from Marokopa, Te Anga, Te Waitere and Taharoa. This research can be targeted directly at developing a methodology that is able to test bat behaviour around wind farms. The proposed compensation is consistent with the NPSREG.
- 10.5 I continue to support the concept of additional pest management but acknowledge that this may have to take place outside of the conditions of consent.
- 10.6 Overall, bearing in mind that this is a variation application and that the key plank of the application is the avoidance of effects through the significant reduction in the number of turbines and the overall reduction in rotor sweep area, in my opinion the ecological effects are likely to be less than under the existing consent. Further, I consider that the proposed package of ecological conditions is appropriate and represents an opportunity to better align the existing consent conditions with current best practice.

Simon Chapman

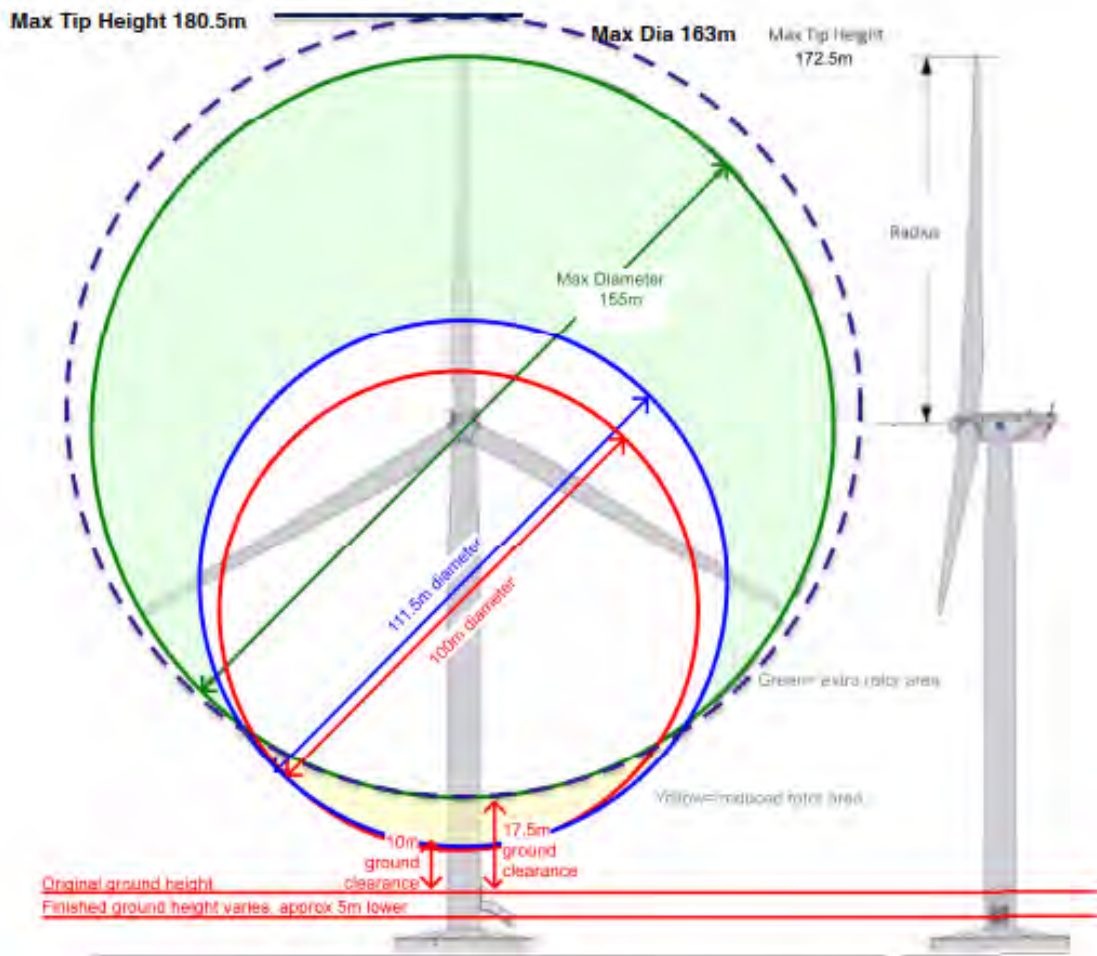
Appendix One:



Appendix Two:



Appendix 3:



Wind Turbine Diameter Changes

Original - 2008	100m diameter
2011 Consent modification	111.5m
APPLIED FOR 2020	155m
Increased Diameter for 8 turbine layout	163 m

(Scale approx 1:1300 at A4)