Appendix C

Visual Impact Assessment (Green Bean Design)

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Flyers Creek Wind Farm Modification 4

VISUAL IMPACT ASSESSMENT

Prepared for:

FLYERS CREEK WIND FARM PTY LTD

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DOUCMENT CONTROL

Item	Detail
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Contents

Figures

Tables

Executive summary

Green Bean Design Pty Ltd has been commissioned by Flyers Creek Wind Farm Pty Ltd to prepare a Visual Impact Assessment (VIA) report for the Flyers Creek Wind Farm Modification-4 Application (Mod 4).

This VIA has been prepared with regard to the visual assessment process outlined in the New South Wales State Government Wind Energy: Visual Assessment Bulletin December 2016 (the Guidelines) as applicable to the Flyers Creek Wind Farm (FCWF) Mod 4 Application.

The FCWF Project Approval permits the construction and operation of up to 38 wind turbines to a maximum 150 metre (m) tip height. This VIA has been prepared to assess the potential visual effect of the Flyers Creek Wind Farm Mod 4 amendments which include:

- tip height up to 160m
- hub height 90 to 92m
- rotor dimeter up to 140m
- blade length up to 70m, and
- rotor swept area up to 15,386m^2

The total number of wind turbines would be 38, as approved and in accordance with the Project Approval. The 38 wind turbines would remain located in accordance with the existing Project Approval.

The Zone of Visual Influence Diagrams (**Figures 2** and **3)** demonstrate the area of land from which the FCWF approved and Mod 4 wind turbines would be theoretically visible (as well as overall number of wind turbines being visible at tip height), would be very similar in extent.

Apart from the reinstatement of a 132kv transmission line, there would be no significant change to previously approved ancillary wind farm infrastructure.

This VIA included a consideration of 78 residential dwellings within 3.2km of the approved wind turbine locations. The overall assessment of visual effects associated with the Mod 4 wind turbines is summarised as Low to Negligible. The difference between the FCWF approved and Mod 4 wind turbine is not considered to be of a magnitude that would significantly increase visual effects associated with the approved development. Key differences between the FCWF approved and Mod 4 wind turbines are illustrated in **Figures 4, 5, 6** and **7**.

Fifteen wire frame diagrams have been prepared to illustrate the wind turbines within the approved FCWF and Mod 4 wind turbine layout. The wireframes have been prepared from the photomontage locations included in the original FCWF Visual Assessment (Aurecon May 2011).

The proposed amendments to the FCWF wind turbines would result in a low level of visual magnitude and an unchanged visual rating in accordance with the FCWF approved project. The proposed Mod 4 amendments would not introduce elements that are any more prominent or out of character with the approved FCWF project,

and the potential for the Mod 4 wind turbines to result in any additional significant cumulative visual effects is considered to be low.

1 Introduction

1.1 Introduction

This VIA has been prepared to compare the potential visual effect of the FCWF Mod 4 project with the visual ratings determined for the approved FCWF project. The FCWF approved visual ratings have been extracted from the Flyers Creek Wind Farm Visual Assessment Report, Aurecon May 2011, together with additional visual analysis presented in the approved Flyers Creek Wind Farm MP 08_0252 – Modification 3 Application.

The comparison between the approved FCWF and Mod 4 wind turbines has been used to determine if any of the approved FCWF visual ratings applied to view locations within 3.2 kilometres (km) of the approved FCWF are subject to an increased level of visual effect as a result of the Mod 4 amendments. This VIA has not undertaken an assessment to verify the visual ratings determined in prior approved FCWF applications.

GBD confirm the following information has been provided by the Proponent, or procured by GBD, for consideration and/or incorporation into this VIA:

- confirmation of FCWF Mod 4 wind turbine layout
- FCWF Mod 4 wind turbines description and design criteria
- Zone of Visual Influence (ZVI) diagrams
- wireframe models illustrating the approved FCWF and the Mod 4 wind turbines
- Flyers Creek Wind Farm Project Approval and Consolidated Conditions of Consent and
- Flyers Creek Wind Farm Visual Assessment Report, Aurecon May 2011.

2 Report structure

2.1 Report structure

This VIA report been structured into twelve parts as outlined in Table 2:

Table 2 – Report structure

Report section	Description
Section 1 Introduction	This section provides an introduction to the Mod 4 VIA.
Section 2 Mod 4 VIA report structure	This section outlines the Mod 4 VIA report structure and the report sections included in the Mod 4 VIA.
Section 3 Methodology	This section sets out the methodology employed in the Mod 4 VIA preparation.
Section 4 Approved FCWF and proposed Mod 4 amendments	This section describes the key differences between the approved FCWF and Mod 4 amendments.
Section 5 Zone of Visual Influence (ZVI) diagrams	This section identifies the area of land surrounding the wind farm from which the approved FCWF and Mod 4 wind turbines, or portions of wind turbine structures, may be theoretically visible.
Section 6 Ancillary structures	This section describes infrastructure associated with the wind farm other than the wind turbines.
Section 7 Visual effects	This section describes the assessment and determination of residual visual effects between the approved FCWF and proposed Mod 4 amendments.
Section 8 Visual assessment	This section considers the NSW State Government Wind Energy: Visual Assessment Bulletin December 2016 as applicable to the Mod 4 VIA.
Section 9 Wire frame models	This section describes and presents wire frame models prepared for the Mod 4 VIA.

Table 2 – Report structure

Report section	Description
Section 10 Mod 4 switching station and 132kV powerline	This section considers potential visual effects associated with the Mod 4 132kV powerline and switching station connection to the existing Orange North to Cadia 132kV powerline.
Section 11 Review of Consolidated Conditions of Consent	This section identifies the FCWF Consolidated Conditions of Consent (November 2017) relevant to visual amenity and confirms their applicability to the proposed Mod 4 amendments.
Section 12 Conclusion	Conclusions are drawn on the overall visual effect of the proposed Mod 4 amendments within the surrounding viewshed.

3 Methodology

3.1 Introduction

The VIA Mod 4 methodology included the following activities:

- desktop review of the approved FCWF wind turbine layout
- desktop review of the switching station location and 132kV powerline alignment
- preparation of ZVI diagrams
- assessment of significance of residual visual effects and
- preparation of wire frame models and illustrative figures.

3.2 Desktop study

A desktop study was carried out to review the FCWF approved project together with associated reports and approval documentation. The desktop study also included a review of the approved wind turbine layout, proposed switchyard location and 132kV powerline alignment, as well as the surrounding landscape and dwelling locations. This was carried out by reference to topographic maps as well as aerial photographs of the surrounding landscape.

3.3 ZVI diagrams

ZVI Diagrams were prepared to illustrate the theoretical visibility of the approved FCWF wind turbines (tip height at 150m) and Mod 4 wind turbines (tip height at 160m). The ZVI Diagrams are illustrated in **Figures 2** and **3**.

3.4 Wind turbine magnitude of visual effects

The determination of residual visual effects resulting from the Mod 4 amendments would result primarily from observable differences between the approved FCWF and the Mod 4 wind turbines. Observable differences may include views toward wind turbines (hubs, rotor face and blade tips) where previously screened by landform.

3.5 Wind turbine visual effects

This VIA has considered the potential visual effects for dwellings located within 3.2km of the approved FCWF project. The 3.2km threshold distance (blue line, refer Figure 1) has been established by reference to the NSW Wind Energy Visual Bulletin, December 2016 (Figure 5 Visual magnitude thresholds for visual assessment).

This VIA has not addressed the Stage 1 Preliminary Environmental Assessment (pre-lodgement) guidelines as these are not pertinent to the proposed Mod 4 VIA. Similarly, Stage 2 of the Guidelines (Figure 1, Steps in the Visual Assessment), addresses the preparation of a Visual Baseline Study as part of the Environmental Impact Statement, which is also not pertinent to the proposed Mod 4 VIA.

This VIA has considered the Visual Assessment Process set out in Appendix 1 of the Guidelines against the proposed Mod 4 project where relevant to the Modification Application.

3.6 Proposed switching station and 132kV powerline visual assessment

This VIA has considered and assessed the potential visual effect of the proposed switching station and 132kV powerline on people at residential dwellings within 1km of this infrastructure. In determining the potential visual effect this VIA considers the overall visibility of the electrical infrastructure as well as the capability of the landscape to visually absorb infrastructure elements.

3.7 Wind turbine wire frame models

Wire frame models have been prepared from fifteen locations included in the approved FCWF Visual Assessment Report. The wire frame models illustrate and contrast the approved FCWF wind turbines and the proposed Mod 4 wind turbines. The wireframe locations are illustrated in **Figure 10** and the wireframes in **Figures 11** to **25**.

4 Proposed Mod 4

4.1 Approved FCWF wind turbine

The FCWF Development Consent permits construction and operation of up to 38 wind turbines to a maximum 150m tip height in addition to a range of ancillary wind farm infrastructure.

4.2 Proposed Mod 4 wind turbine

The Mod 4 wind turbine would include:

- a 90m hub height (or 92m with a 136m rotor diameter)
- blade length up to 70m
- rotor diameter up to 140m (or 136m with a 92m hub height) and
- wind turbine tip height up to 160m.

Table 3 outlines the approved FCWF and Mod 4 wind turbine design criteria.

Table 3: Approved FCWF and Mod 4 design criteria

	Hub height	Rotor diameter	Tip height	Total number
Approved FCWF wind turbine	100m	112m	150m	38
Mod 4 wind turbine	Up to 92m	Up to 140m	Up to 160m	38
Difference	- 8m	+28m	+10m	0
Percentage difference	-8%	+25%	+6.7%	0%

Table 4: Approved FCWF and proposed Mod 4 swept area

	Rotor diameter	Swept area
Approved FCWF wind turbine	112m	9,847m^2
Mod 4 wind turbine	140m	15,386m^2
Difference	+28m	+5,539m^2
Percentage difference	+25%	+56%

No changes are proposed to the approved turbine locations as part of Mod 4. The approved turbine locations are shown on **Figure 1**.

4.3 Proposed Mod 4 distance and hub visibility

The Mod 4 wind turbine layout would not result in any changes to distances between residential dwellings and the approved FCWF wind turbines. The number of wind turbine hubs visible from residential dwellings surrounding the wind farm site would be subject to some minor variations due to a reduction in the hub height.

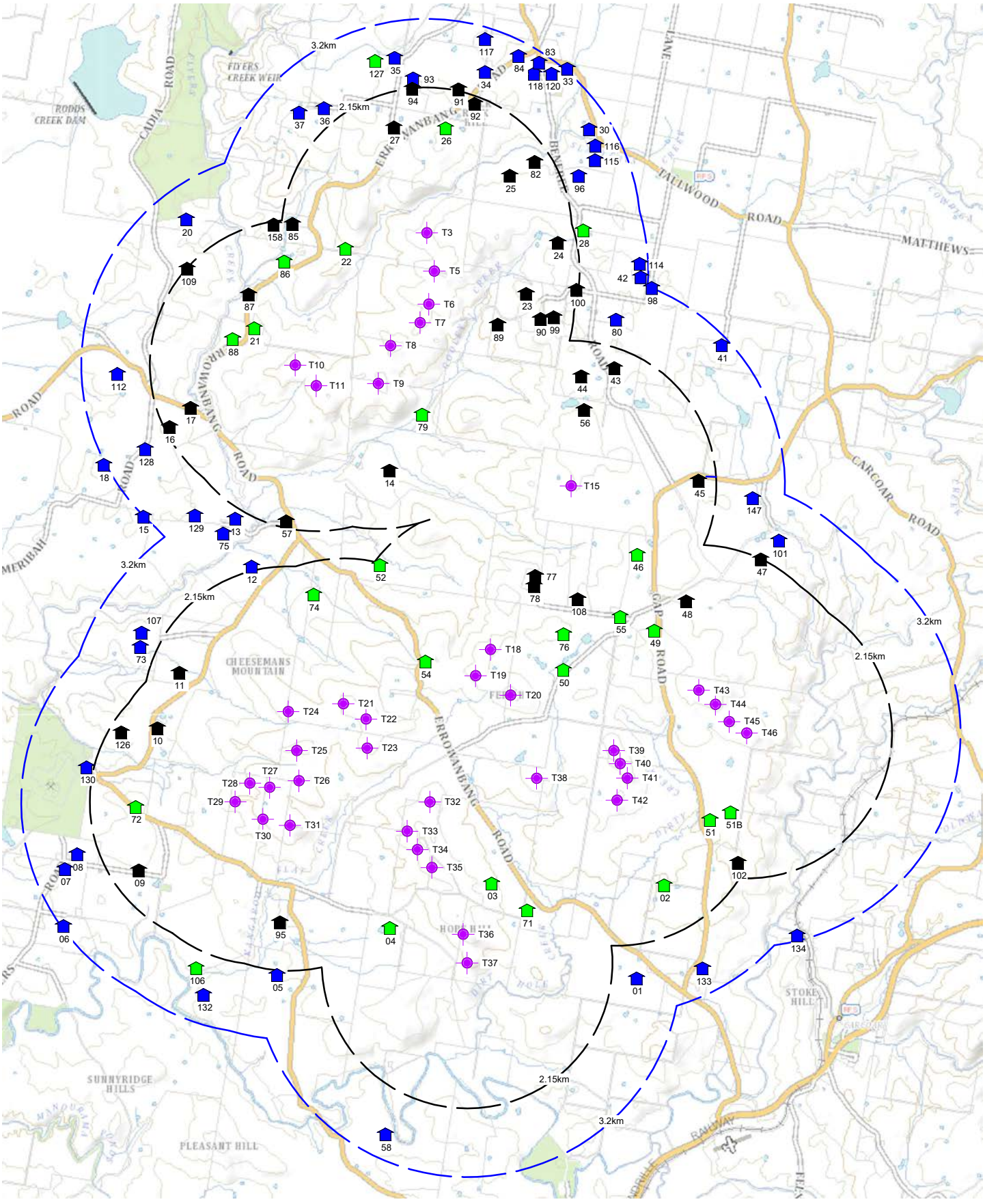
4.4 Proposed Mod 4 switching station and 132kV powerline

The key visual components of the switching station and 132kV powerline would likely comprise:

- control building and access road

- security fence surrounding the proposed switching station
- transformer and bus bar
- lighting mast and lighting for security and maintenance
- single tapered powerline poles up to approximately 24m high (including angle pole arrangements where required)
- aluminium alloy conductors and
- an aerial earth wire and communications link.

Views toward a typical 132kV powerline are illustrated in **Figure 27**.



Legend

- Approved FCWF wind turbine location (indicative location)
- Associated dwelling within 3.2 km of an approved FCWF wind turbine
- Non associated dwelling within 2.15 km of an approved FCWF wind turbine
- Non associated dwelling between 2.15 km and 3.2 km of an approved FCWF wind turbine
- 2.15 km wind tubine distance offset in accordance with DPE Visual Bulletin Dec 2016, Figure 5 - 160 m tip height
- 3.2 km wind tubine distance offset in accordance with DPE Visual Bulletin Dec 2016, Figure 5 - 160 m tip height

0km 1km

Figure 1
FCWF approved wind turbine layout

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Note:
FCWF Mod-4 wind turbine locations are as per approved wind turbine locations.

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5 Zone of Visual Influence Diagrams

5.1 Introduction

Figures 2 and **3** illustrate the theoretical visibility of the approved FCWF wind turbines at 150m tip height, and Mod 4 wind turbines at 160m tip height. The ZVI diagrams do not account for the screening influence of vegetation or built structures.

Within the recognised limitations of ZVI diagrams, the overall extent of approved FCWF and Mod 4 wind turbine visibility, covers a very similar extent across the landscape surrounding the approved FCWF wind farm.

The similarity in theoretical wind turbine visibility demonstrates the influence of local topographical features on views toward the approved FCWF and Mod 4 wind turbines, together with the relatively minor differences in wind turbine tip height. The ZVI diagrams also illustrate that the Mod 4 wind turbines would have a limited increase in visual effects across the FCWF viewshed.

Whilst the overall extent of wind turbine visibility would be varied by topography for both the approved FCWF and the Mod 4 wind turbines, the number of wind turbines visible (to tip height) from receiver locations within the wind farm viewshed is likely to be subject to a very minor increase. However, when compared to the approved FCWF wind turbines, the increase in wind turbine visibility would be largely restricted to the upper sections (rotor blades) of wind turbine structures, rather than whole wind turbines.

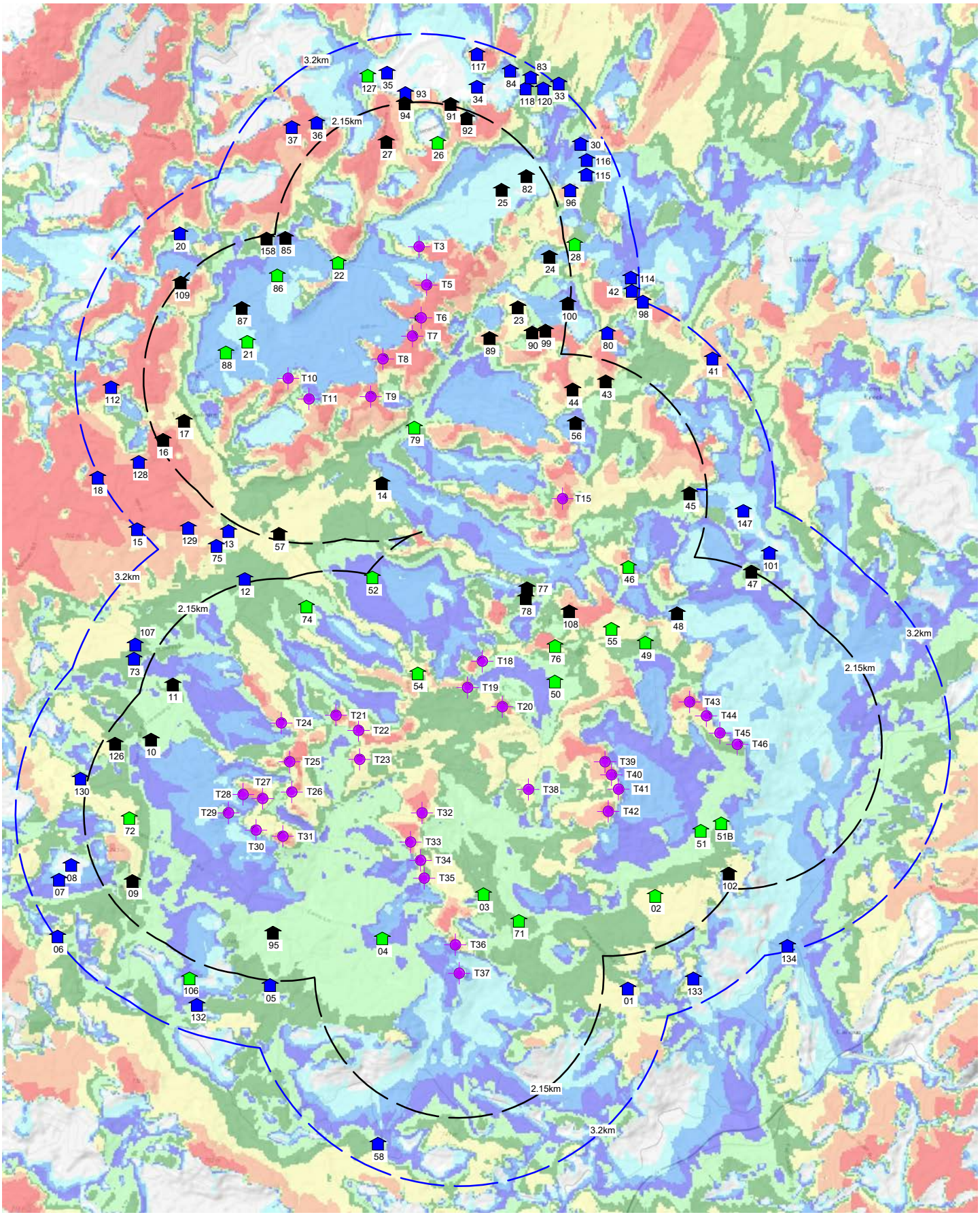

Figure 2
FCWF ZVI Diagram approved 150 metre tip height

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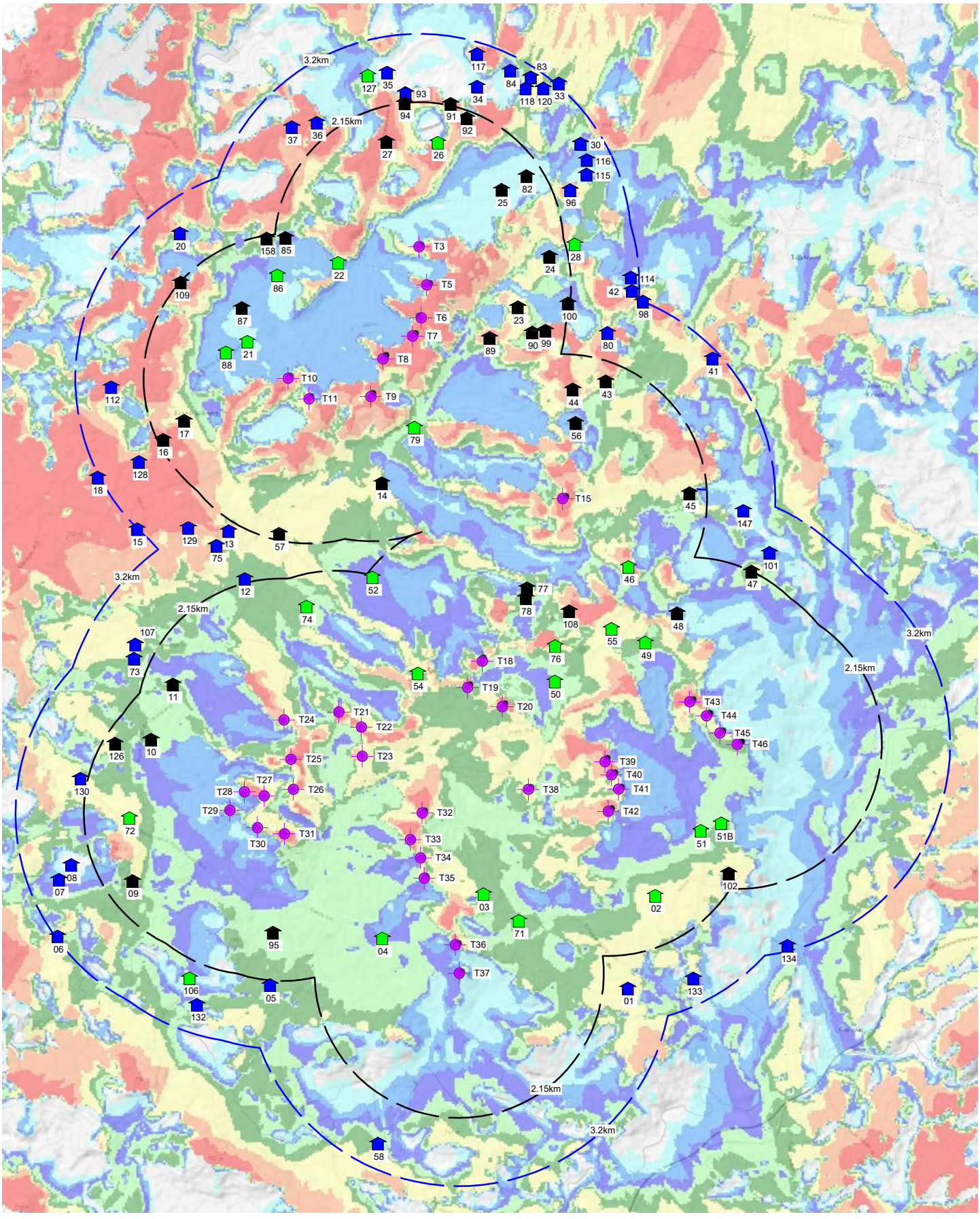

Approved FCWF and proposed Mod-4 wind turbine (indicative location)

Associated dwelling within 3.2 km of an approved FCWF wind turbine

Non associated dwelling within 2.15 km of an approved FCWF wind turbine

Non associated dwelling between 2.15 km and 3.2 km of an approved FCWF wind turbine

2.15 km wind tubine distance offset in accordance with DPE Visual Bulletin Dec 2016, Figure 5 - 160 m tip height

3.2 km wind tubine distance offset in accordance with DPE Visual Bulletin Dec 2016, Figure 5 - 160 m tip height

1 - 5 turbines
6 - 10 turbines
11 - 15 turbines
16 - 20 turbines
21 - 25 turbines
26 - 30 turbines
31 - 35 turbines
36 - 38 turbines

0km 1km

Figure 3
FCWF ZVI Diagram at 160 metre tip height

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6 Ancillary structures

6.1 Introduction

The approved FCWF includes a range of ancillary structures which include, but are not limited to:

- wind monitoring masts
- on-site access tracks
- substation
- 33kV overhead powerline and
- control and operation facilities building.

The proposed Mod 4 amendment includes the reinstatement of a 132kV transmission line from the wind farm substation to a connection with the North Orange to Cadia 132kV powerline and associated switching station as detailed in Section 10 of this VIA. Subject to this, the proposed Mod 4 amendment would not result in any fundamental change to approved FCWF ancillary structures and would not result in any additional visual impacts to those outlined in the approved application.

7 Visual effects

7.1 Introduction

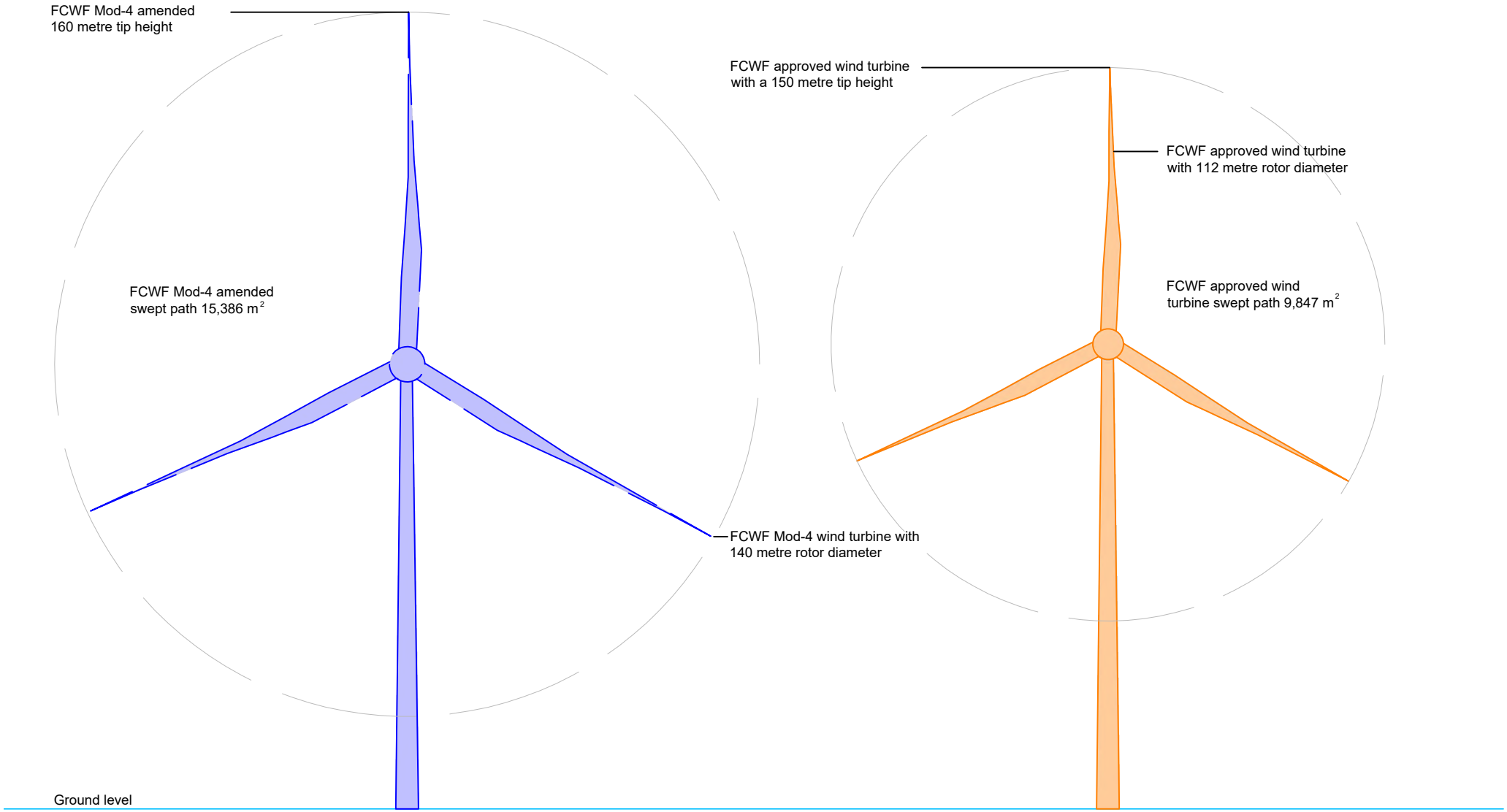
Whilst the Mod 4 wind turbine tip height would extend up to 10m above the approved FCWF wind turbine height, this VIA has determined that the overall scale of the Mod 4 wind turbine would not result in an order of visual magnitude that is significantly above the visual magnitude of the approved FCWF wind turbines. A comparison of the approved FCWF and Mod 4 wind turbines is illustrated in **Figures 4** and **5**.

It is also noted that the Mod 4 wind turbines would be consistent with the approved FCWF wind turbines with regard to their visual form, design, pattern and colour. The location of associated and non-associated residential dwellings within 3.2km of the Mod 4 wind turbine layout is illustrated in **Figure 1**.

Figures 6 illustrates the elevated angle of view (toward tip height) for the approved FCWF and Mod 4 wind turbines from a view distance of 2km and 5km respectively. **Figure 6** illustrates that the Mod 4 wind turbine would result in less than one third of a degree view angle above the approved FCWF wind turbine from a 2km view distance. The additional view angle from a view distance of 5km would be approximately 7 minutes (around one tenth of one degree) increase in view angle.

Figure 7 illustrates the perceived and relative height difference between the approved FCWF wind turbine and the Mod 4 wind turbine. From a view distance of 5km the approved FCWF and Mod 4 wind turbines would be perceived at less than half the height of the Mod 4 wind turbine when viewed at a distance of 2km. The relatively small increase in view angle toward the Mod 4 wind turbine tip height, at a view distance of 5km (and beyond) is considered unlikely to result in a level of visual magnitude greater than the approved FCWF wind turbines.

Within the parameters of normal human vision, the Mod 4 wind turbines are not considered to give rise to an increased level of visual magnitude over and above the approved FCWF project.



FCWF Mod-4 wind turbine with a 160 metre tip height

FCWF approved wind turbine with a 150 metre tip height

Figure 4-
FCWF approved and Mod-4 wind turbine comparison

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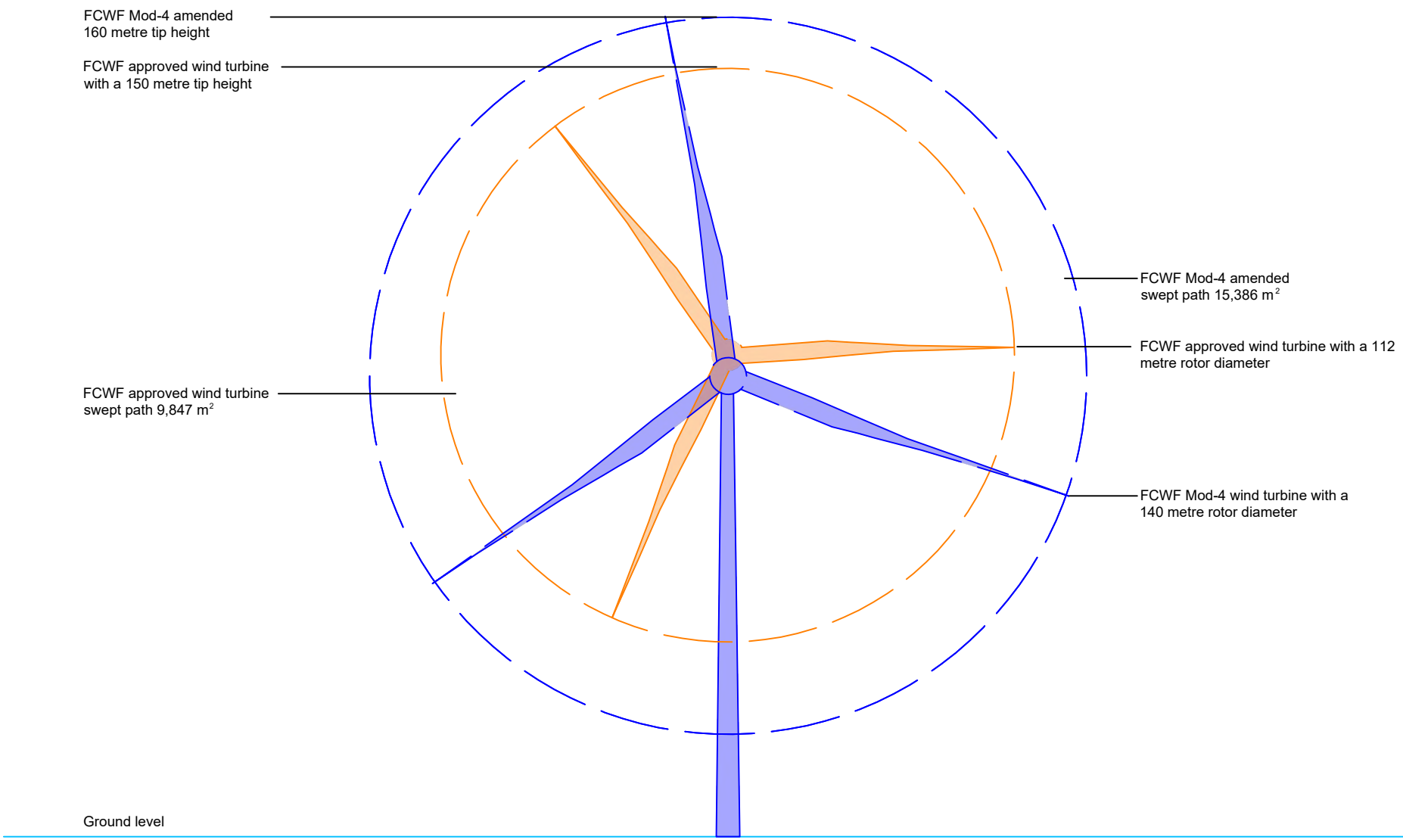

Figure 5-
FCWF approved and Mod-4 wind turbine overlay

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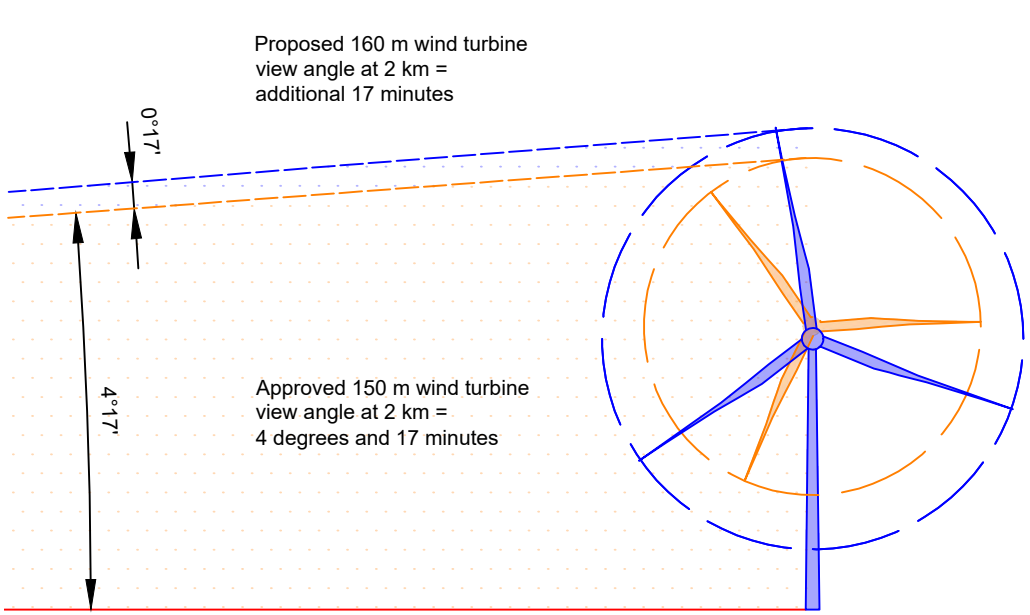
Orange line = view line toward tip height of FCWF approved wind turbine (150 metres)

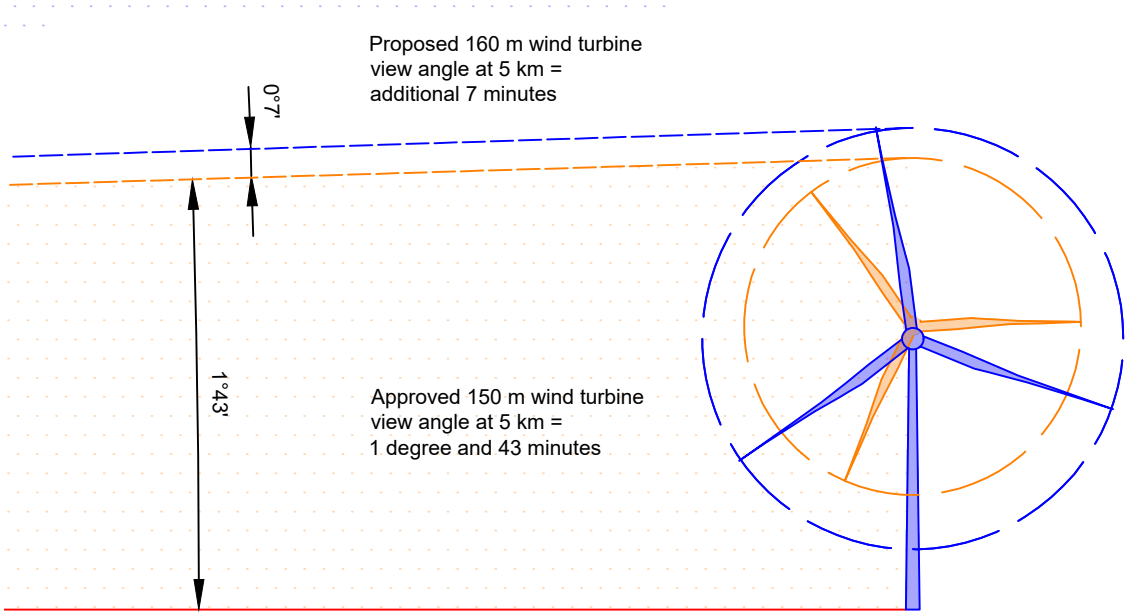
Blue line = view line toward tip height of Mod-4 wind turbine (160 metres)

Comparative height of approved FCWF and Mod-4 wind turbine from a 2 km view distance

Comparative height of approved FCWF proposed Mod-4 wind turbine from a 5 km view distance



View angle toward approved FCWF and Mod-4 wind turbine tip of blade from a 2 km view distance



View angle toward approved FCWF and Mod-4 wind turbine tip of blade from a 5 km view distance

Figure 6 - FCWF approved and Mod-4 wind turbine view angle comparison at 2 km and 5 km view distance

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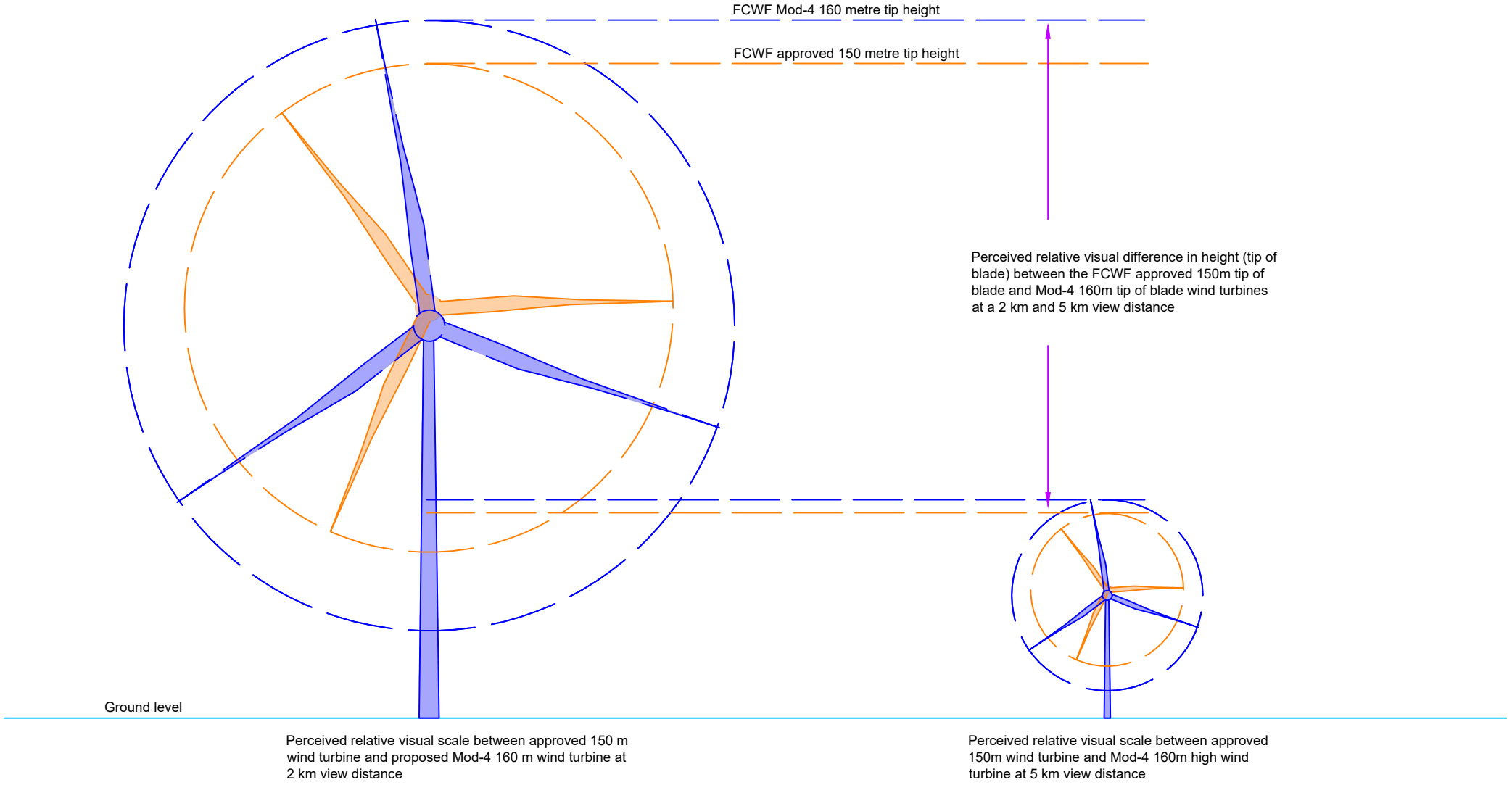


Figure 7 - FCWF approved and Mod-4 wind turbine comparison at 2 km and 5 km view distance

For the purpose of this VIA the magnitude of visual effect takes account of the scale of the change in the view with respect to the loss or addition of features in the view and changes in its composition or contrast with the landscape, including the proportion of the view occupied by the Mod 4 wind turbine relative to the approved FCWF wind turbine. For the purpose of this VIA **Table 6** outlines ratings and definitions associated with the magnitude of visual effects.

Table 6 – Magnitude of visual effect

Visual effect	Magnitude
Amendments to the approved FCWF project would result in a major and prominent visual effect and introduce elements that contrast or are not in character with the approved FCWF project.	High
Amendments to the approved FCWF project would result in a partial visual effect and introduce elements which may be prominent, but not completely out of character with the approved FCWF project.	Medium
Amendments to the approved FCWF project would result in minor visual effects and introduce elements which are not prominent or out of character with the approved FCWF project.	Low
Amendments to the approved FCWF project would result in a very minor visual effect and introduce elements which are not prominent or uncharacteristic of the approved FCWF project. There would likely be 'no change' to the approved FCWF visual effect.	Negligible

7.2 Magnitude of visual effect matrix

Table 7 sets out the assessment of visual effects from residential dwellings up to 2.15km from the approved FCWF project. The locations of residential dwellings included in this VIA are illustrated in **Figure 1**.

Whilst the assessment includes a determination of visual effects from dwellings, it also takes into account any curtilage surrounding each dwelling which may be considered an extension to the dwelling for domestic or social activities. The criteria set out in **Table 6** are noted against each dwelling, with a visual effect rating determined against the matrix in **Table 7**.

Table 7 – Magnitude of visual effect matrix (Refer **Figure 1** for non-associated residential dwelling locations)

Residential dwelling ID	Category of receiver location	Approximate distance to Mod 4 wind turbine (m)	Approved FCWF Visual Rating*	Description and magnitude of Mod 4 visual effect	Mod 4 magnitude
Residential dwellings within 2.15 km of approved FCWF wind turbine					
09	Non-associated residential dwelling	1,866	Moderate-Low	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment
10	Non-associated residential dwelling	1,674	Moderate	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment
11	Non-associated residential dwelling	1,767	Moderate	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment

Table 7 – Magnitude of visual effect matrix (Refer **Figure 1** for non-associated residential dwelling locations)

Residential dwelling ID	Category of receiver location	Approximate distance to Mod 4 wind turbine (m)	Approved FCWF Visual Rating*	Description and magnitude of Mod 4 visual effect	Mod 4 magnitude
14	Non-associated residential dwelling	1,339	Moderate	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment
16	Non-associated residential dwelling	2,140	Moderate	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment
17	Non-associated residential dwelling	1,672	Moderate-Low	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment

Table 7 – Magnitude of visual effect matrix (Refer **Figure 1** for non-associated residential dwelling locations)

Residential dwelling ID	Category of receiver location	Approximate distance to Mod 4 wind turbine (m)	Approved FCWF Visual Rating*	Description and magnitude of Mod 4 visual effect	Mod 4 magnitude
23	Non-associated residential dwelling	1,459	Moderate	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment
24	Non-associated residential dwelling	1,935	Moderate	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment
25	Non-associated residential dwelling	1,591	Moderate-Low	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment

Table 7 – Magnitude of visual effect matrix (Refer **Figure 1** for non-associated residential dwelling locations)

Residential dwelling ID	Category of receiver location	Approximate distance to Mod 4 wind turbine (m)	Approved FCWF Visual Rating*	Description and magnitude of Mod 4 visual effect	Mod 4 magnitude
27	Non-associated residential dwelling	1,709	High-Moderate	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment
43	Non-associated residential dwelling	2,008	Moderate-Low	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment
44	Non-associated residential dwelling	1,689	Low	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment

Table 7 – Magnitude of visual effect matrix (Refer **Figure 1** for non-associated residential dwelling locations)

Residential dwelling ID	Category of receiver location	Approximate distance to Mod 4 wind turbine (m)	Approved FCWF Visual Rating*	Description and magnitude of Mod 4 visual effect	Mod 4 magnitude
45	Non-associated residential dwelling	1,968	Moderate	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment
47	Non-associated residential dwelling	2,238	Moderate-Low	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment
48	Non-associated residential dwelling	1,358	Moderate-Low	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment

Table 7 – Magnitude of visual effect matrix (Refer **Figure 1** for non-associated residential dwelling locations)

Residential dwelling ID	Category of receiver location	Approximate distance to Mod 4 wind turbine (m)	Approved FCWF Visual Rating*	Description and magnitude of Mod 4 visual effect	Mod 4 magnitude
56	Non-associated residential dwelling	1,046	Moderate-Low	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment
57	Non-associated residential dwelling (former school)	2,287	Moderate	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment
77	Non-associated residential dwelling	1,325	Moderate-Low	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment

Table 7 – Magnitude of visual effect matrix (Refer **Figure 1** for non-associated residential dwelling locations)

Residential dwelling ID	Category of receiver location	Approximate distance to Mod 4 wind turbine (m)	Approved FCWF Visual Rating*	Description and magnitude of Mod 4 visual effect	Mod 4 magnitude
78	Non-associated residential dwelling	1,154	Moderate-Low	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment
82	Non-associated residential dwelling	2,013	Moderate-Low	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment
85	Non-associated residential dwelling	2,055	Moderate-Low	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment

Table 7 – Magnitude of visual effect matrix (Refer **Figure 1** for non-associated residential dwelling locations)

Residential dwelling ID	Category of receiver location	Approximate distance to Mod 4 wind turbine (m)	Approved FCWF Visual Rating*	Description and magnitude of Mod 4 visual effect	Mod 4 magnitude
87	Non-associated residential dwelling	2,333		The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment
89	Non-associated residential dwelling	1,199	High-Moderate	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment
90	Non-associated residential dwelling	1,762	Moderate	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment

Table 7 – Magnitude of visual effect matrix (Refer **Figure 1** for non-associated residential dwelling locations)

Residential dwelling ID	Category of receiver location	Approximate distance to Mod 4 wind turbine (m)	Approved FCWF Visual Rating*	Description and magnitude of Mod 4 visual effect	Mod 4 magnitude
91	Non-associated residential dwelling	2,242	Moderate-Low	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment
92	Non-associated residential dwelling	2,126	Low	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment
94	Non-associated residential dwelling	2,211	Moderate	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment

Table 7 – Magnitude of visual effect matrix (Refer **Figure 1** for non-associated residential dwelling locations)

Residential dwelling ID	Category of receiver location	Approximate distance to Mod 4 wind turbine (m)	Approved FCWF Visual Rating*	Description and magnitude of Mod 4 visual effect	Mod 4 magnitude
95	Non-associated residential dwelling	1,481	Moderate	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment
99	Non-associated residential dwelling	1,903	Moderate	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment
100	Non-associated residential dwelling	2,179	Low	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment

Table 7 – Magnitude of visual effect matrix (Refer **Figure 1** for non-associated residential dwelling locations)

Residential dwelling ID	Category of receiver location	Approximate distance to Mod 4 wind turbine (m)	Approved FCWF Visual Rating*	Description and magnitude of Mod 4 visual effect	Mod 4 magnitude
102	Non-associated residential dwelling	1,989	Moderate-Low	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment
108	Non-associated residential dwelling	1,573	Moderate-Low	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment
109	Non-associated residential dwelling	2,277	Moderate	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment

Table 7 – Magnitude of visual effect matrix (Refer **Figure 1** for non-associated residential dwelling locations)

Residential dwelling ID	Category of receiver location	Approximate distance to Mod 4 wind turbine (m)	Approved FCWF Visual Rating*	Description and magnitude of Mod 4 visual effect	Mod 4 magnitude
126	Non-associated residential dwelling	2,169	Nil	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment
158	Non-associated residential dwelling	2,326	Moderate	The observable scale of change would be partially limited by distance between the dwelling and closest approved FCWF wind turbine. There would be very limited change in the composition or contrast between the approved FCWF and proposed Mod 4 development. Magnitude rating Low – resulting in no change to the approved FCWF visual impact rating.	Unchanged from approved FCWF Impact Assessment

* Approved FCWF Visual Imapct Assessment as determined by Aurecon FCWF Environmental Assessment (Appendix C, C1- Visual Assessment May 2011)

7.3 Magnitude of visual effect summary

The Magnitude of Visual Effects Matrix includes 35 non-associated dwellings within 2.15km of an approved FCWF wind turbine. An additional 41 non-associated dwellings occur between a distance of 2.15 and 3.2km from an approved FCWF wind turbine.

The overall assessment of the magnitude of visual effect associated with dwellings within 2.15km of the Mod 4 wind turbines is summarised as Low. The delta (degree of change) between the approved FCWF and Mod 4 wind turbine structures, whilst noticeable from proximate dwelling view locations would not result in any significant increased degree of visibility above that of the approved FCWF wind turbines.

With regard to dwellings beyond 2.15km of the FCWF approved project, GBD note that the Department of Planning and Environment determined that:

'…the Department agrees with the Proponent that the visual impact of turbines on residences outside of 5km for this project is low, and so it is acceptable for the impact assessment to be confined to within this radius. The Department further considers that for the vast majority of non-associated residences, (those greater than 2km from a turbine) the distance between turbines and the distance between the residences and turbines, would be sufficient to ensure that their view field would not be dominated by the turbine structures. From outside of this distance sufficient natural and other man-made elements would exist to add variety and "break up" any views towards the turbines' (Flyers Creek Wind Farm Director General's Environmental Assessment Report November 2011).

8 Visual assessment

8.1 Introduction

Following the assessment of the magnitude of visual effects between the approved FCWF and the proposed Mod 4 wind turbines, this VIA has undertaken a further consideration of the potential visual effect of the Mod 4 project on people at dwellings surrounding the approved wind farm development. The consideration of visual effects has been prepared with regard to the Guidelines, and specifically the inputs required for the baseline study outlined in the Guidelines Appendix 1: Visual Assessment Process.

8.2 Sensitive Land Use Designations

The approved FCWF wind farm project is wholly located within land use zone RU1 (Primary Production). Land use zone RU1 is not considered to be a sensitive land use designation as per the Guidelines, Appendix 1 Table 3.

8.3 Viewer sensitivity levels and visibility distance zones

Viewer sensitivity and visibility distance zones are included in Table 8. These predominantly include Level 2 Sensitivity Levels from rural dwellings. Visibility distance zones have been classified from far foreground to near middle ground views.

Table 8 – Visual assessment matrix (Refer **Figure 1** for dwelling locations)

Receiver location	Category of receiver location and viewer sensitivity level	Approximate distance to proposed Mod 4 wind turbine (m) and Distance Zone	Visual Influence Zone	Approved FCWF Visual Rating*	FCWF approved and Mod 4 amendments
09	Non-associated residential dwelling Level 2	1,866 Far foreground	VIZ1	Moderate-Low	*Wind farm is at 1.9 km to the north-east of the residence with a view angel of 90°. The visual impact is assessed as being Moderate to Low due to significant tree screening on all sides of the residence which will limit the wind farm visibility* (Aurecon 2011). The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over and above the approved FCWF project. The Mod 4 amendment would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m increase to the wind turbine tip height would not result in any greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.
10	Non-associated residential dwelling Level 2	1,674 Far foreground	VIZ1	Moderate	*Close views of the wind farm to the east and more distant views to the north. The visual impact is assessed as Moderate due to the screening by extensive tree plantings* (Aurecon 2011). The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over

Table 8 – Visual assessment matrix (Refer **Figure 1** for dwelling locations)

Receiver location	Category of receiver location and viewer sensitivity level	Approximate distance to proposed Mod 4 wind turbine (m) and Distance Zone	Visual Influence Zone	Approved FCWF Visual Rating*	FCWF approved and Mod 4 amendments
					and above the approved FCWF project. The Mod 4 amendment would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m increase to the wind turbine tip height would not result in any greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.
11	Non-associated residential dwelling Level 2	1,767 Far foreground	VIZ1	Moderate	*Close views of the wind farm to east and south-east. The visual impact is assessed as Moderate due to partial screening that will limit some of the wind farm visibility* (Aurecon 2011). The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over and above the approved FCWF project. The Mod 4 amendment would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m increase to the wind turbine tip height would not result in any greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.

Table 8 – Visual assessment matrix (Refer **Figure 1** for dwelling locations)

Receiver location	Category of receiver location and viewer sensitivity level	Approximate distance to proposed Mod 4 wind turbine (m) and Distance Zone	Visual Influence Zone	Approved FCWF Visual Rating*	FCWF approved and Mod 4 amendments
14	Non-associated residential dwelling Level 2	1,339 Far foreground	VIZ1	Moderate	*Visibility is high due to close distance to turbines, viewangle and elevation above residence. Screening by trees on ridges may limit some of the wind farm visibility* (Aurecon 2011). The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over and above the approved FCWF project. The Mod 4 amendment would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m increase to the wind turbine tip height would not result in any greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height. **Figures 8** and **9** have been prepared to illustrate the approved FCWF and Mod 4 wind turbines, as well as the increase in view angle (less than half of 1 degree) associated with the Mod 4 wind turbine viewed from dwelling 14. These figures demonstrate that the Independent Planning Commission recommendation to provide screen planting with regard to achieving a satisfactory level of visual

Table 8 – Visual assessment matrix (Refer **Figure 1** for dwelling locations)

Receiver location	Category of receiver location and viewer sensitivity level	Approximate distance to proposed Mod 4 wind turbine (m) and Distance Zone	Visual Influence Zone	Approved FCWF Visual Rating*	FCWF approved and Mod 4 amendments
					impact for dwelling 14 could also be readily achieved for the Mod 4 amended wind turbine.
16	Non-associated residential dwelling Level 2	2,140 Near middle-ground	VIZ2	Moderate	*The visual impact is assessed as Moderate due to elevated location of the residence and aspect toward the wind farm but the wide viewfield angle being broken up by extensive vegetation screening at the residence* (Aurecon 2011). The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over and above the approved FCWF project. The Mod 4 amendment would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m increase to the wind turbine tip height would not result in any greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.
17	Non-associated residential dwelling	1,672 Far foreground	VIZ1	Moderate to Low	*Some clear views to parts of the northern group of turbines. The visual impact is assessed as Moderate to Low due to low position in*

Table 8 – Visual assessment matrix (Refer **Figure 1** for dwelling locations)

Receiver location	Category of receiver location and viewer sensitivity level	Approximate distance to proposed Mod 4 wind turbine (m) and Distance Zone	Visual Influence Zone	Approved FCWF Visual Rating*	FCWF approved and Mod 4 amendments
	Level 2				*narrow valley with tree screening that limits visibility of parts of the wind farm* (Aurecon 2011). The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over and above the approved FCWF project. The Mod 4 amendment would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m increase to the wind turbine tip height would not result in any greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.
23	Non-associated residential dwelling Level 2	1,459 Far foreground	VIZ1	Moderate	*The visual impact is assessed as Moderate due to close distance to turbines, viewfield angle and elevation above residence. Partial screening is available which will limit visibility of some parts of the wind farm* (Aurecon 2011). The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over and above the approved FCWF project. The Mod 4 amendment

Table 8 – Visual assessment matrix (Refer **Figure 1** for dwelling locations)

Receiver location	Category of receiver location and viewer sensitivity level	Approximate distance to proposed Mod 4 wind turbine (m) and Distance Zone	Visual Influence Zone	Approved FCWF Visual Rating*	FCWF approved and Mod 4 amendments
					would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m increase to the wind turbine tip height would not result in any greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.
24	Non-associated residential dwelling	1,935 Far foreground	VIZ1	Moderate	*The visual impact is assessed as Moderate due to northerly aspect of the residence away from nearest turbines. There is some tree screening which could limit some visibility* (Aurecon 2011). The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over and above the approved FCWF project. The Mod 4 amendment would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m increase to the wind turbine tip height would not result in any greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.

Table 8 – Visual assessment matrix (Refer **Figure 1** for dwelling locations)

Receiver location	Category of receiver location and viewer sensitivity level	Approximate distance to proposed Mod 4 wind turbine (m) and Distance Zone	Visual Influence Zone	Approved FCWF Visual Rating*	FCWF approved and Mod 4 amendments
25	Non-associated residential dwelling Level 2	1,591 Far foreground	VIZ1	Moderate to Low	*The visual impact is assessed as Moderate to Low due to the east, north and westerly aspects for the house and trees on southern side. Only three turbines are likely to be visible but the closest is at 1.1km* (Aurecon 2011). The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over and above the approved FCWF project. The Mod 4 amendment would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m increase to the wind turbine tip height would not result in any greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.
27	Non-associated residential dwelling Level 2	1,709 Far foreground	VIZ1	High to Moderate	*The visual impact is assessed as High to Moderate due to elevated position of residence and limited screening. Removal of Turbines 1 and 2 has reduced impact for this location* (Aurecon 2011). The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over

Table 8 – Visual assessment matrix (Refer **Figure 1** for dwelling locations)

Receiver location	Category of receiver location and viewer sensitivity level	Approximate distance to proposed Mod 4 wind turbine (m) and Distance Zone	Visual Influence Zone	Approved FCWF Visual Rating*	FCWF approved and Mod 4 amendments
					and above the approved FCWF project. The Mod 4 amendment would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m increase to the wind turbine tip height would not result in any greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.
43	Non-associated residential dwelling Level 2	2,008 Near middle-ground	VIZ2	Moderate to Low	*The visual impact is assessed as Moderate to Low due to significant topographic and tree screening for the residence* (Aurecon 2011). The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over and above the approved FCWF project. The Mod 4 amendment would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m increase to the wind turbine tip height would not result in any greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.

Table 8 – Visual assessment matrix (Refer **Figure 1** for dwelling locations)

Receiver location	Category of receiver location and viewer sensitivity level	Approximate distance to proposed Mod 4 wind turbine (m) and Distance Zone	Visual Influence Zone	Approved FCWF Visual Rating*	FCWF approved and Mod 4 amendments
44	Non-associated residential dwelling Level 2	1,689 Far foreground	VIZ1	Low	*The visual impact is assessed as Low due to significant topographic and tree screening for the residence. See Section C1.3 for more details* (Aurecon 2011). The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over and above the approved FCWF project. The Mod 4 amendment would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m increase to the wind turbine tip height would not result in any greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.
45	Non-associated residential dwelling Level 2	1,968 Far foreground	VIZ1	Moderate	*The visual impact is assessed as Moderate due to partial screening by trees and topography* (Aurecon 2011). The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over and above the approved FCWF project. The Mod 4 amendment would decrease the wind turbine tower height and lower the

Table 8 – Visual assessment matrix (Refer **Figure 1** for dwelling locations)

Receiver location	Category of receiver location and viewer sensitivity level	Approximate distance to proposed Mod 4 wind turbine (m) and Distance Zone	Visual Influence Zone	Approved FCWF Visual Rating*	FCWF approved and Mod 4 amendments
					nacelle. An increase to the swept area of the rotor face, and a 10m increase to the wind turbine tip height would not result in any greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.
47	Non-associated residential dwelling Level 2	2,238 Near middle-ground	VIZ2	Moderate to Low	*The visual impact is assessed as Moderate to Low due to partial to full screening by vegetation* (Aurecon 2011). The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over and above the approved FCWF project. The Mod 4 amendment would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m increase to the wind turbine tip height would not result in any greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.
48	Non-associated residential dwelling	1,358 Far foreground	VIZ1	Moderate to Low	*The visual impact is assessed as Moderate to Low due to limited number of turbines potentially visible, low position of the residence*

Table 8 – Visual assessment matrix (Refer **Figure 1** for dwelling locations)

Receiver location	Category of receiver location and viewer sensitivity level	Approximate distance to proposed Mod 4 wind turbine (m) and Distance Zone	Visual Influence Zone	Approved FCWF Visual Rating*	FCWF approved and Mod 4 amendments
	Level 2				*and presence of trees that will reduce the visibility of the wind farm further* (Aurecon 2011). The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over and above the approved FCWF project. The Mod 4 amendment would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m increase to the wind turbine tip height would not result in any greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.
56	Non-associated residential dwelling Level 2	1,046 Far foreground	VIZ1	Moderate to Low	*The visual impact is assessed as Moderate to Low due to the residence being low set on the north-eastern side of the hill with aspect away from the wind farm and there being substantial tree and shrub screening at the residence* (Aurecon 2011). The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over and above the approved FCWF project. The Mod 4 amendment

Table 8 – Visual assessment matrix (Refer **Figure 1** for dwelling locations)

Receiver location	Category of receiver location and viewer sensitivity level	Approximate distance to proposed Mod 4 wind turbine (m) and Distance Zone	Visual Influence Zone	Approved FCWF Visual Rating*	FCWF approved and Mod 4 amendments
					would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m increase to the wind turbine tip height would not result in any greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.
57	Non-associated residential dwelling (former school) Level 2	2,287 Near middle-ground	VIZ1	Moderate	*Some views to the wind farm site are screened by trees and this will reduce the visibility rating to Moderate* (Aurecon 2011). The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over and above the approved FCWF project. The Mod 4 amendment would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m increase to the wind turbine tip height would not result in any greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.

Table 8 – Visual assessment matrix (Refer **Figure 1** for dwelling locations)

Receiver location	Category of receiver location and viewer sensitivity level	Approximate distance to proposed Mod 4 wind turbine (m) and Distance Zone	Visual Influence Zone	Approved FCWF Visual Rating*	FCWF approved and Mod 4 amendments
77	Non-associated residential dwelling Level 2	1,325 Far foreground	VIZ1	Moderate to Low	*The visual impact is assessed as Moderate to Low due to some tree and landscape screening and minor topographic fluctuations. Photomontage 8a demonstrates that only 3 turbines are prevalent in the primary view* (Aurecon 2011). The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over and above the approved FCWF project. The Mod 4 amendment would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m increase to the wind turbine tip height would not result in any greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.
78	Non-associated residential dwelling Level 2	1,154 Far foreground	VIZ1	Moderate to Low	*The visual impact is assessed as Moderate to Low due to some tree screening and minor topographic fluctuations near the residence not fully represented by Windfarmer software* (Aurecon 2011). The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over

Table 8 – Visual assessment matrix (Refer **Figure 1** for dwelling locations)

Receiver location	Category of receiver location and viewer sensitivity level	Approximate distance to proposed Mod 4 wind turbine (m) and Distance Zone	Visual Influence Zone	Approved FCWF Visual Rating*	FCWF approved and Mod 4 amendments
					and above the approved FCWF project. The Mod 4 amendment would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m increase to the wind turbine tip height would not result in any greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.
82	Non-associated residential dwelling Level 2	2,013 Near middle-ground	VIZ2	Moderate to Low	*The visual impact is assessed as Moderate to Low due to northerly aspect of the residence away from nearest turbines and some tree screening which could limit some wind farm visibility* (Aurecon 2011). The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over and above the approved FCWF project. The Mod 4 amendment would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m increase to the wind turbine tip height would not result in any

Table 8 – Visual assessment matrix (Refer **Figure 1** for dwelling locations)

Receiver location	Category of receiver location and viewer sensitivity level	Approximate distance to proposed Mod 4 wind turbine (m) and Distance Zone	Visual Influence Zone	Approved FCWF Visual Rating*	FCWF approved and Mod 4 amendments
					greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.
85	Non-associated residential dwelling Level 2	2,055 Near middle-ground	VIZ2	Moderate to Low	*The visual impact is assessed as Moderate to Low. While portions of up to 24 turbines are potentially visible, the views of complete turbines will be reduced by vegetation and intervening topography* (Aurecon 2011). The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over and above the approved FCWF project. The Mod 4 amendment would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m increase to the wind turbine tip height would not result in any greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.
87	Non-associated residential dwelling	2,333 Near middle-ground	VIZ2	Low	*The visual impact is assessed as Low due to the few potentially visible turbines being screened by existing vegetation surrounding the residence* (Aurecon 2011).

Table 8 – Visual assessment matrix (Refer **Figure 1** for dwelling locations)

Receiver location	Category of receiver location and viewer sensitivity level	Approximate distance to proposed Mod 4 wind turbine (m) and Distance Zone	Visual Influence Zone	Approved FCWF Visual Rating*	FCWF approved and Mod 4 amendments
	Level 2				The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over and above the approved FCWF project. The Mod 4 amendment would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m increase to the wind turbine tip height would not result in any greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.
89	Non-associated residential dwelling Level 2	1,199 Far foreground	VIZ1	High to Moderate	*The visual impact is assessed as High to Moderate due to close distance to turbines wide viewfield angle and elevation of some turbines above residence. Many of the turbines are potentially visible and there is little screening at this residence which is located on a cleared knoll (Aurecon 2011).* The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over and above the approved FCWF project. The Mod 4 amendment would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m

Table 8 – Visual assessment matrix (Refer **Figure 1** for dwelling locations)

Receiver location	Category of receiver location and viewer sensitivity level	Approximate distance to proposed Mod 4 wind turbine (m) and Distance Zone	Visual Influence Zone	Approved FCWF Visual Rating*	FCWF approved and Mod 4 amendments
					increase to the wind turbine tip height would not result in any greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.
90	Non-associated residential dwelling Level 2	1,762 Far foreground	VIZ1	Moderate	*The visual impact is assessed as Moderate due to close distance to some turbines and wide viewfield angle. Existing screening by large trees likely to reduce the number of visible turbines* (Aurecon 2011). The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over and above the approved FCWF project. The Mod 4 amendment would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m increase to the wind turbine tip height would not result in any greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.
91	Non-associated residential dwelling	2,242 Near middle-ground	VIZ2	Moderate to Low	*The visual impact is assessed as Moderate to Low due to many of the potentially visible turbines not being visible at the residence due to*

Table 8 – Visual assessment matrix (Refer **Figure 1** for dwelling locations)

Receiver location	Category of receiver location and viewer sensitivity level	Approximate distance to proposed Mod 4 wind turbine (m) and Distance Zone	Visual Influence Zone	Approved FCWF Visual Rating*	FCWF approved and Mod 4 amendments
	Level 2				*northerly aspect (northern side of hill) and mature trees on ridge to south of the residence* (Aurecon 2011). The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over and above the approved FCWF project. The Mod 4 amendment would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m increase to the wind turbine tip height would not result in any greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.
92	Non-associated residential dwelling Level 2	2,126 Near middle-ground	VIZ2	Low	*The visual impact is assessed as Low due to substantial screening to the south of the residence* (Aurecon 2011). The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over and above the approved FCWF project. The Mod 4 amendment would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m

Table 8 – Visual assessment matrix (Refer **Figure 1** for dwelling locations)

Receiver location	Category of receiver location and viewer sensitivity level	Approximate distance to proposed Mod 4 wind turbine (m) and Distance Zone	Visual Influence Zone	Approved FCWF Visual Rating*	FCWF approved and Mod 4 amendments
					increase to the wind turbine tip height would not result in any greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.
94	Non-associated residential dwelling Level 2	2,211 Near middle-ground	VIZ2	Moderate	*The visual impact is assessed as Moderate due to viewfield angle, distance and position of the residence on ridgeline with southerly aspect and limited existing screening* (Aurecon 2011). The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over and above the approved FCWF project. The Mod 4 amendment would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m increase to the wind turbine tip height would not result in any greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.
95	Non-associated residential dwelling	1,481 Far foreground	VIZ1	Moderate	*The visual impact is assessed as Moderate due to close distance to some turbines, wide viewfield angle and elevation of turbines above residence. Topography will reduce the number of complete visible*

Table 8 – Visual assessment matrix (Refer **Figure 1** for dwelling locations)

Receiver location	Category of receiver location and viewer sensitivity level	Approximate distance to proposed Mod 4 wind turbine (m) and Distance Zone	Visual Influence Zone	Approved FCWF Visual Rating*	FCWF approved and Mod 4 amendments
	Level 1 (Local Heritage Listing)				*turbines. Turbine 31 has been relocated to the north to reduce its impact at this location* (Aurecon 2011). The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over and above the approved FCWF project. The Mod 4 amendment would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m increase to the wind turbine tip height would not result in any greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.
99	Non-associated residential dwelling Level 2	1,903 Far foreground	VIZ1	Moderate	*The visual impact is assessed as Moderate due to close distance to turbines, very wide viewfield angle and elevation of the residence on hill with views to much of the wind farm site. However existing screening will reduce the number of visible turbines* (Aurecon 2011). The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over and above the approved FCWF project. The Mod 4 amendment

Table 8 – Visual assessment matrix (Refer **Figure 1** for dwelling locations)

Receiver location	Category of receiver location and viewer sensitivity level	Approximate distance to proposed Mod 4 wind turbine (m) and Distance Zone	Visual Influence Zone	Approved FCWF Visual Rating*	FCWF approved and Mod 4 amendments
					would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m increase to the wind turbine tip height would not result in any greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.
100	Non-associated residential dwelling Level 2	2,179 Near middle-ground	VIZ2	Low	*The visual impact is assessed as Low due to only a few turbines likely to be visible due to existing screening around residence* (Aurecon 2011). The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over and above the approved FCWF project. The Mod 4 amendment would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m increase to the wind turbine tip height would not result in any greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.

Table 8 – Visual assessment matrix (Refer **Figure 1** for dwelling locations)

Receiver location	Category of receiver location and viewer sensitivity level	Approximate distance to proposed Mod 4 wind turbine (m) and Distance Zone	Visual Influence Zone	Approved FCWF Visual Rating*	FCWF approved and Mod 4 amendments
102	Non-associated residential dwelling Level 2	1,989 Far foreground	VIZ1	Moderate to Low	*The visual impact is assessed as Moderate to Low due to aspect. While a significant part of the wind farm may be visible from this location it is indicated that there is no residence at this site* (Aurecon 2011). The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over and above the approved FCWF project. The Mod 4 amendment would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m increase to the wind turbine tip height would not result in any greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.
108	Non-associated residential dwelling Level 2	1,573 Far foreground	VIZ1	Moderate to Low	*The visual impact is assessed as Moderate to Low. While some turbines are close and overall viewfield angle (without screening) is large there is significant existing screening that will reduce views to parts of the wind farm* (Aurecon 2011).

Table 8 – Visual assessment matrix (Refer **Figure 1** for dwelling locations)

Receiver location	Category of receiver location and viewer sensitivity level	Approximate distance to proposed Mod 4 wind turbine (m) and Distance Zone	Visual Influence Zone	Approved FCWF Visual Rating*	FCWF approved and Mod 4 amendments
					The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over and above the approved FCWF project. The Mod 4 amendment would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m increase to the wind turbine tip height would not result in any greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.
109	Non-associated residential dwelling Level 2	2,277 Near middle-ground	VIZ2	Moderate	*The visual impact is assessed as Moderate due to only 2 turbines being within 3 km. The residence is on an elevated location with easterly aspect and little vegetation that would serve to screen views to the wind farm* (Aurecon 2011). The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over and above the approved FCWF project. The Mod 4 amendment would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m increase to the wind turbine tip height would not result in any

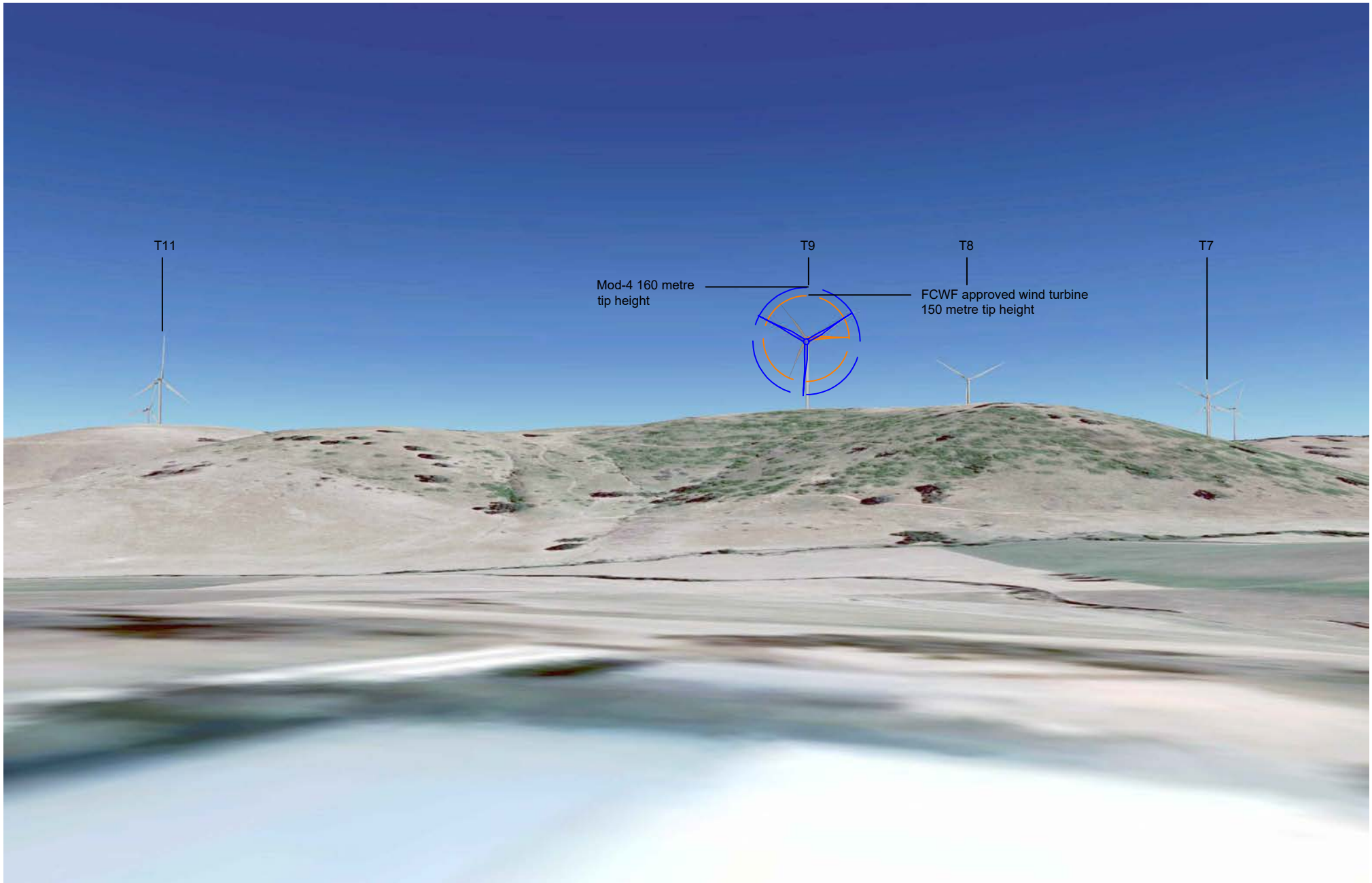
Table 8 – Visual assessment matrix (Refer **Figure 1** for dwelling locations)

Receiver location	Category of receiver location and viewer sensitivity level	Approximate distance to proposed Mod 4 wind turbine (m) and Distance Zone	Visual Influence Zone	Approved FCWF Visual Rating*	FCWF approved and Mod 4 amendments
					greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.
126	Identified as former mine site -	2,169 Near middle-ground	-	Nil	The visual impact is assessed as Nil as the location is a former mine site rather than a residence.
158	Non-associated residential dwelling Level 2	2,326 Near middle-ground	VIZ2	Moderate	*The visual impact is assessed as Moderate with up to 27 turbine hubs being potentially visible and with the elevated residence, easterly aspect and little vegetation to reduce the wind farm visibility. Visibility on the ridges between the residence and the turbine sites will provide some mitigation. The deletion of Turbine 2 has reduced the visual impact at this location* (Aurecon 2011). The Mod 4 amendment is not considered to result in any significant increase in wind turbine visibility from this dwelling location over and above the approved FCWF project. The Mod 4 amendment would decrease the wind turbine tower height and lower the nacelle. An increase to the swept area of the rotor face, and a 10m increase to the wind turbine tip height would not result in any

Table 8 – Visual assessment matrix (Refer **Figure 1** for dwelling locations)

Receiver location	Category of receiver location and viewer sensitivity level	Approximate distance to proposed Mod 4 wind turbine (m) and Distance Zone	Visual Influence Zone	Approved FCWF Visual Rating*	FCWF approved and Mod 4 amendments
					greater visual dominance when compared to the approved FCWF wind turbine at a 150m tip height.

* Approved FCWF Visual Rating as determined by Aurecon (Flyers Creek Wind Farm, Environmental Assessment, Appendix C May 2011)



Google Earth model view toward FCWF approved and Mod-4 wind turbine T9 from dwelling R14.
Approximate view distance 1.3 km

Figure 8
FCWF approved and Mod-4 wind turbine overlay from dwelling R14

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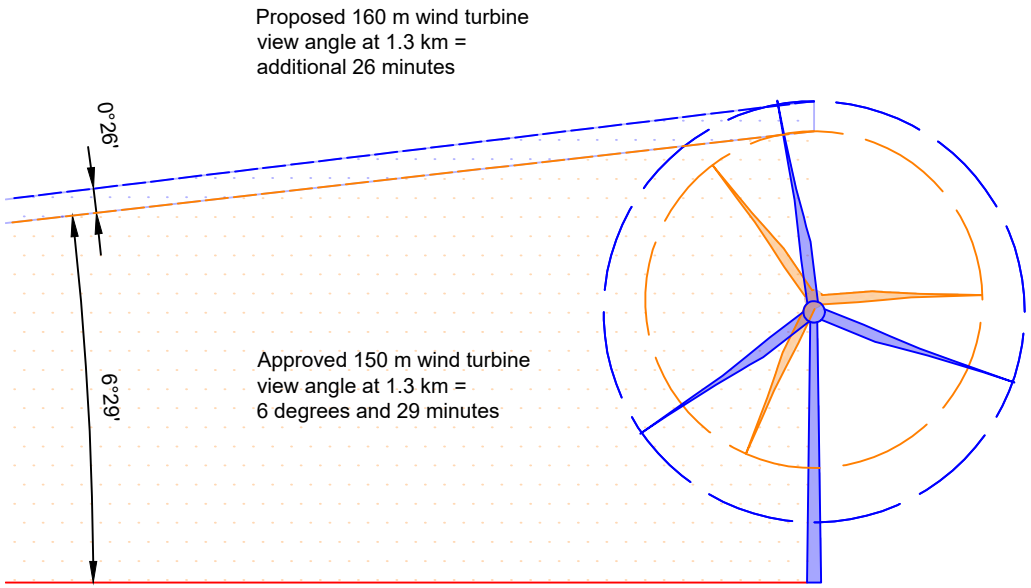
Orange line = view line toward tip height of FCWF approved wind turbine (150 metres)
Blue line = view line toward tip height of Mod-4 wind turbine (160 metres)

Comparative height of approved FCWF proposed Mod-4 wind turbine from a 1.3 km view distance



View angle toward approved FCWF and Mod-4 wind turbine tip of blade from a 1.3 km view distance

Figure 9 - FCWF approved and Mod-4 wind turbine view angle comparison at 1.3 km view distance

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9 Wire frame models

9.1 Introduction

The wireframe model locations have been selected to illustrate viewpoints from public and dwelling locations with views toward the approved FCWF.

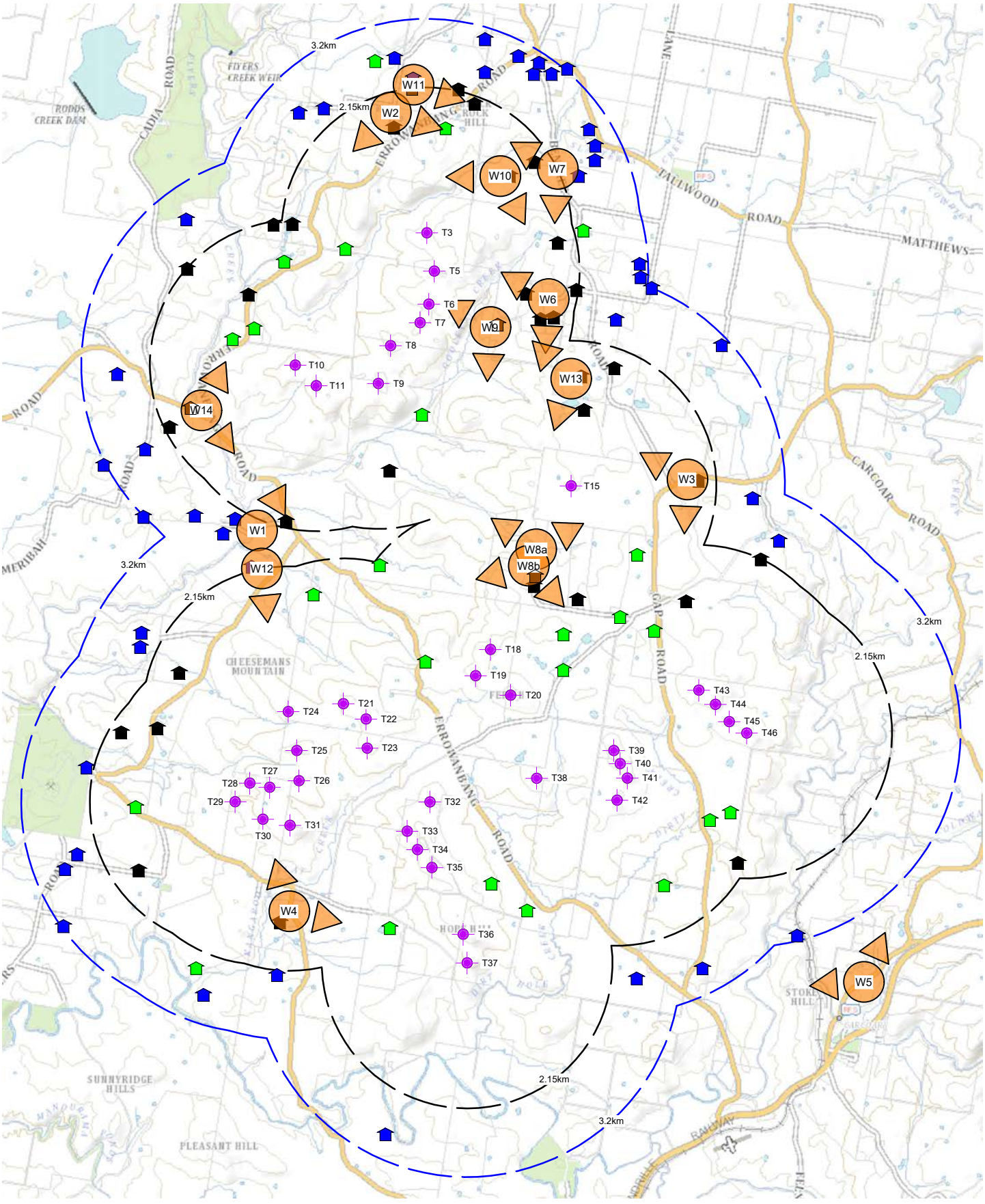
The 15 wireframe locations are illustrated in **Figure 10**, and the wireframes presented in **Figures 11** to **25**. The wireframe models illustrate views toward the approved FCWF and the Mod 4 amendment. The wire frame models illustrate the wind turbines with and without their individual identification numbers for clarity.

The wire frame models do not include, or illustrate, the location of tree planting between the wire frame view point and the approved FCWF and Mod 4 wind turbines. The wire frame models are therefore considered to be very conservative in both the extent of view and visibility of wind turbines indicated in each wire frame model.

9.2 Wireframe model preparation

The wireframes have been prepared with regard to the general guidelines set out in the Scottish Natural Heritage (2017) Visual representation of windfarms: good practice guidance. The wireframe models were generated through the following steps:

- a digital terrain model (DTM) of the project site was created from a terrain model of the surrounding area using digital contours
- the site DTM was loaded in the DNV-GL 'WindFarmer' software package
- the layout of the wind farm and 3D representation of the wind turbine was configured in 'WindFarmer'
- the location of each viewpoint was configured in 'WindFarmer'
- the view from each wireframe model location was then assessed in 'WindFarmer'. This process requires accurate mapping of the terrain as modelled
- the final image was converted to JPG format and imported and annotated as the final figure.



Legend

- FCWF approved wind turbine location (indicative location)
- Associated dwelling within 3.2 km of approved wind turbine
- Non associated dwelling within 2.15 km of approved wind turbine
- Non associated dwelling between 2.15 km and 3.2 km of approved wind turbine
- 2.15 km wind tubine distance offset in accordance with DPE Visual Bulletin Dec 2016, Figure 5 - 160 m tip height
- 3.2 km wind tubine distance offset in accordance with DPE Visual Bulletin Dec 2016, Figure 5 - 160 m tip height
- Indicative wire frame location and general view direction

0km 1km

Figure 10
FCWF wire frame locations

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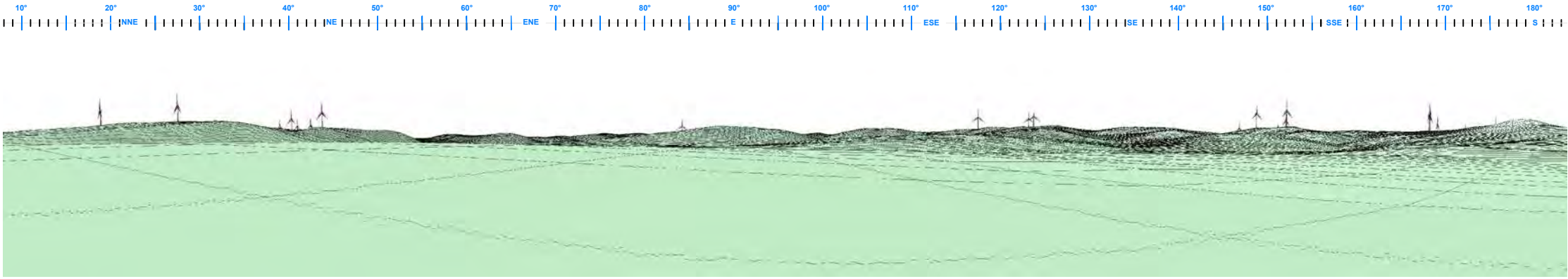
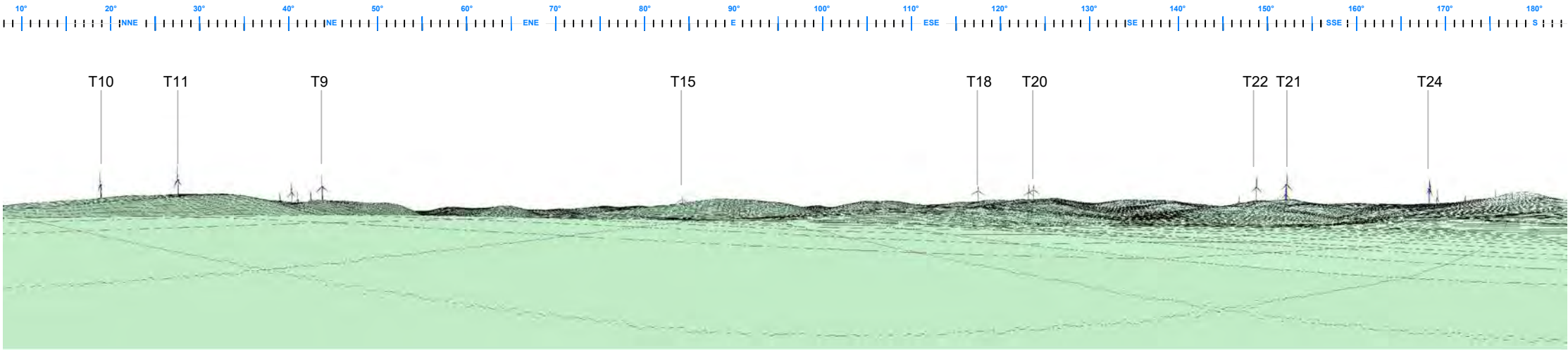
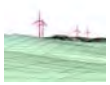


Flyers Creek Wind Farm, Viewpoint W1 looking north east to south east from Beneree Flyers Creek Road: Approved 150m tip of blade wind turbines (red) and Mod 4 160m tip of blade wind turbines (blue)
Approximate distance to closest approved wind turbine (T11) 2,000 metres



Flyers Creek Wind Farm, Viewpoint W1 looking north east to south east from Beneree Flyers Creek Road: Proposed Mod 4 160m tip of blade wind turbines (blue) only



FCWF approved wind turbine at 150m tip height

Proposed FCWF Mod 4 wind turbine at 160m tip height

Notes:
Views toward wind turbines or portions of wind turbines below the green wireframe will be screened by landform.

The wireframe model does not account for existing tree cover and/or planting which may screen views toward the wind turbines.

Figure 11 -
Wire frame W1 from
Beneree Flyers Creek Road

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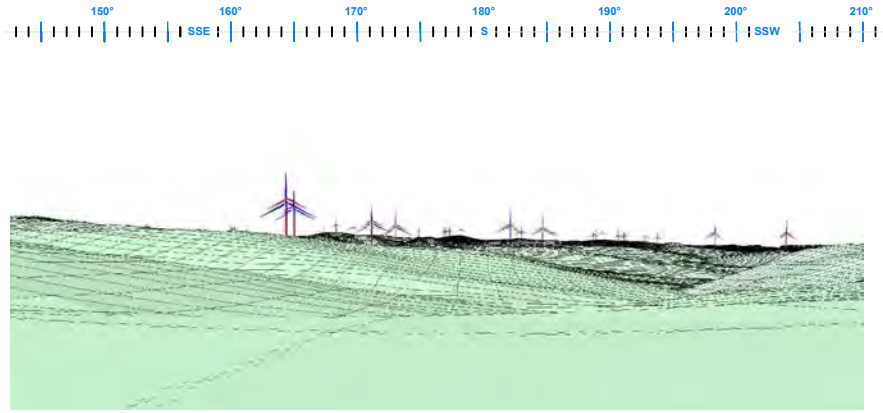
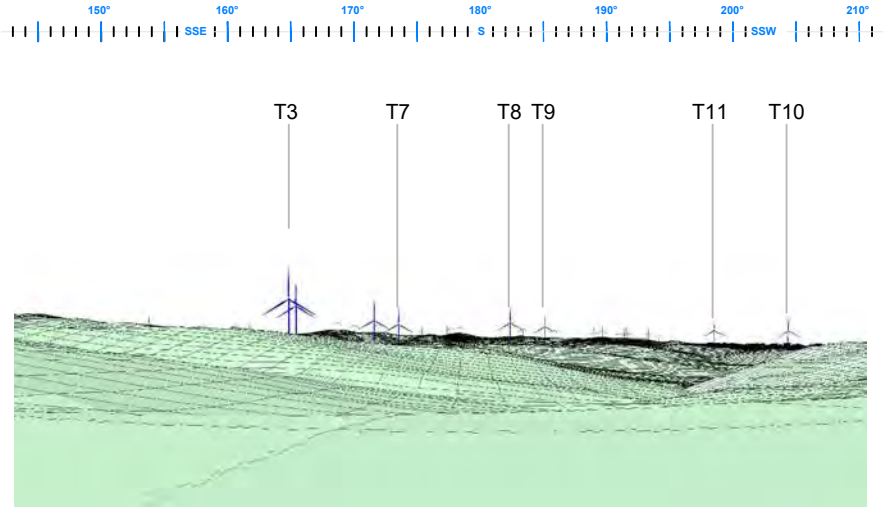
Flyers Creek Wind Farm Modification 4



Flyers Creek Wind Farm, Viewpoint W2 looking south east to south west from Beneree Flyers Creek Road and Watersons Lane intersection: Approved 150m tip of blade wind turbines (red) and Mod 4 160m tip of blade wind turbines (blue)
Approximate distance to closest approved wind turbine (T3) 1,540 metres



Flyers Creek Wind Farm, Viewpoint W2 looking south east to south west from Beneree Flyers Creek Road and Watersons Lane intersection: Mod 4 160m tip of blade wind turbines (blue) only.
Approximate distance to closest approved wind turbine (T3) 1,540 metres

FCWF approved wind turbine at 150m tip height

Proposed FCWF Mod 4 wind turbine at 160m tip height

Flyers Creek Wind Farm Modification 4

Notes:
Views toward wind turbines or portions of wind turbines below the green wireframe will be screened by landform.

The wireframe model does not account for existing tree cover and/or planting which may screen views toward the wind turbines.

Figure 12 -
Wire frame W2 from Beneree Flyers Creek Road and Watersons Lane

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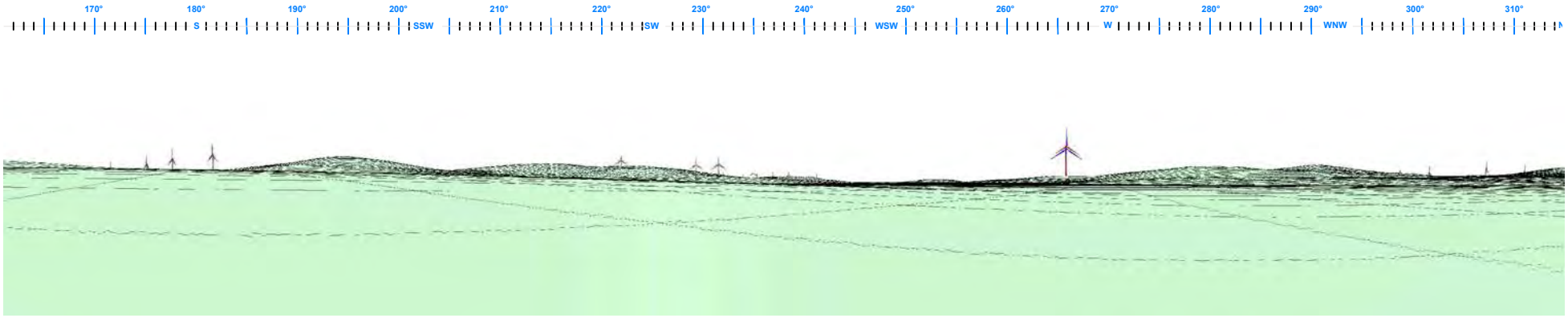
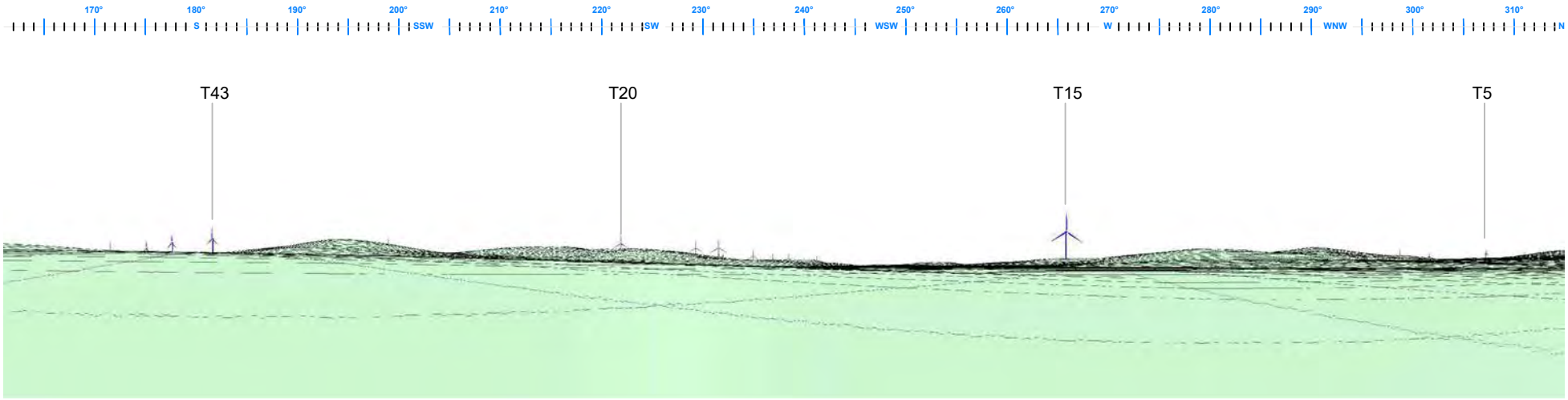
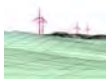


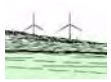
Flyers Creek Wind Farm, Viewpoint W3 looking south south east to north west from Platform Road: Approved 150m tip of blade wind turbines (red) and Mod 4 160m tip of blade wind turbines (blue)
Approximate distance to closest approved wind turbine (T15) 1,835 metres



Flyers Creek Wind Farm, Viewpoint W3 looking south south east to north west from Platform Road: Proposed Mod 4 160m tip of blade wind turbines (blue) only



FCWF approved wind turbine at 150m tip height



Proposed FCWF Mod 4 wind turbine at 160m tip height

Notes:
Views toward wind turbines or portions of wind turbines below the green wireframe will be screened by landform.

The wireframe model does not account for existing tree cover and/or planting which may screen views toward the wind turbines.

Figure 13 -
Wire frame W3 from Platform Road

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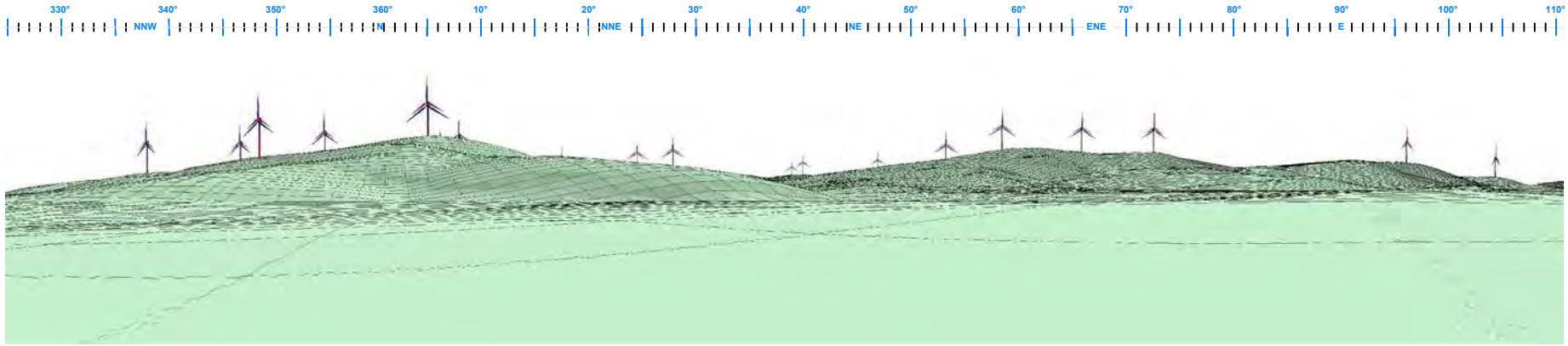
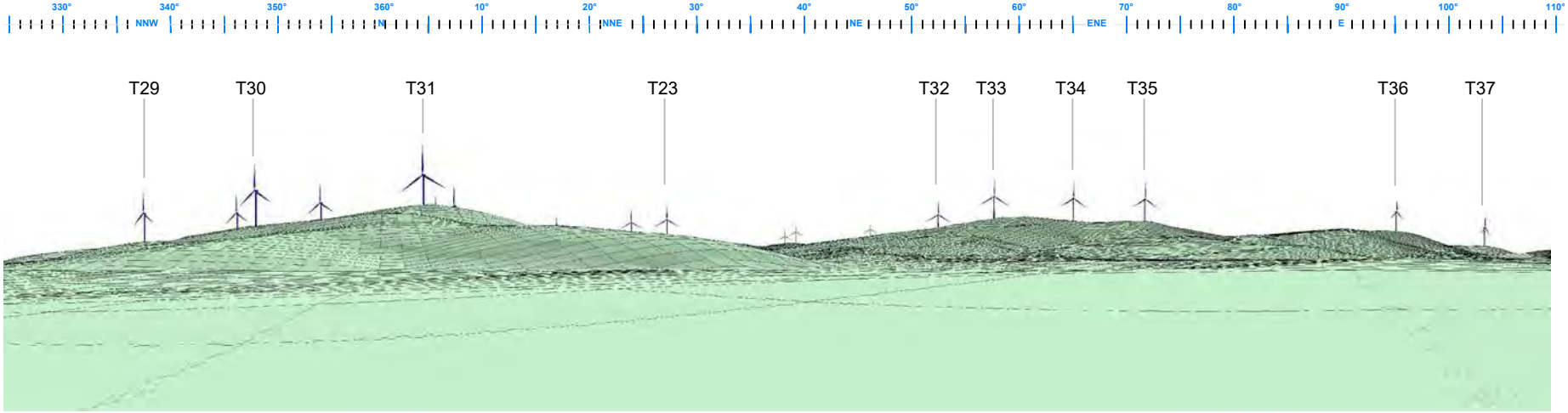
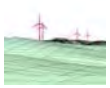
Flyers Creek Wind Farm Modification 4



Flyers Creek Wind Farm, Viewpoint W4 looking north north west to east south east from Mandurama to Burnt Yards Road: Approved 150m tip of blade wind turbines (red) and Mod 4 160m tip of blade wind turbines (blue) Approximate distance to closest approved wind turbine (T31) 1,360 metres



Flyers Creek Wind Farm, Viewpoint W4 looking north north west to east south east from Mandurama to Burnt Yards Road: Proposed Mod 4 160m tip of blade wind turbines (blue) only



FCWF approved wind turbine at 150m tip height

Proposed FCWF Mod 4 wind turbine at 160m tip height

Notes:
Views toward wind turbines or portions of wind turbines below the green wireframe will be screened by landform.

The wireframe model does not account for existing tree cover and/or planting which may screen views toward the wind turbines.

Figure 14 -
Wire frame W4 from Mandurama to Burnt Yards Road

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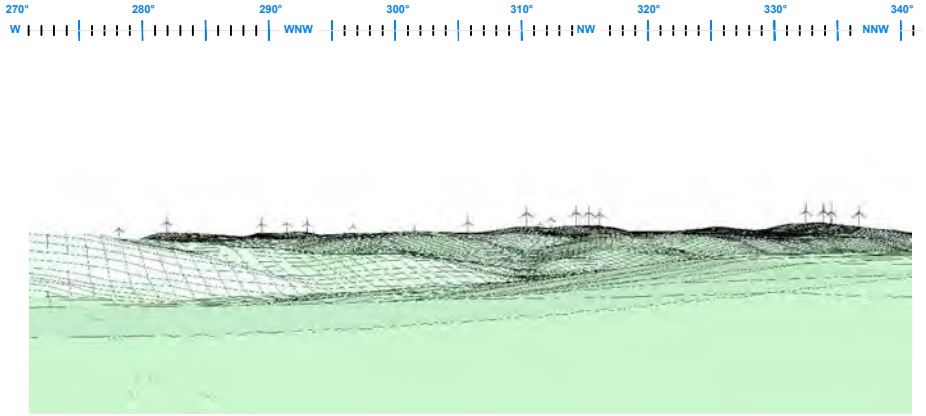
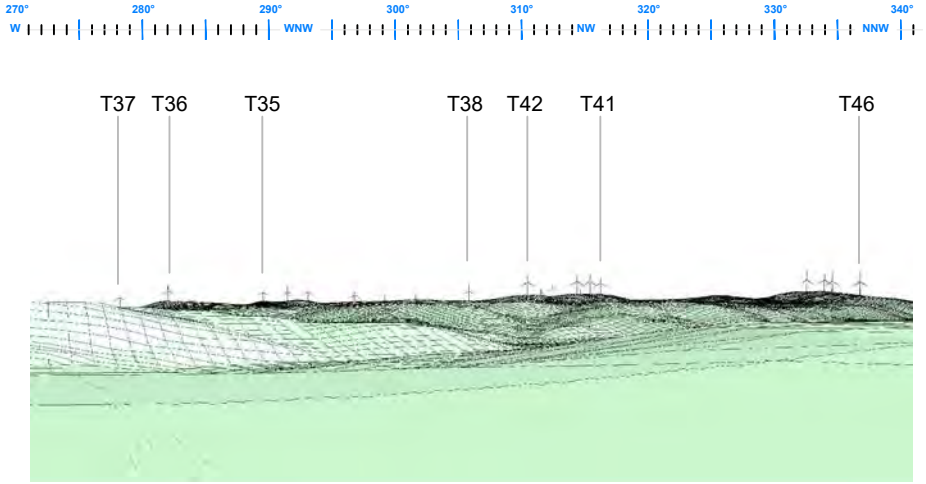
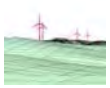
Flyers Creek Wind Farm Modification 4



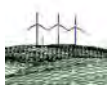
Flyers Creek Wind Farm, Viewpoint W5 looking west to north north west from Carcoar (off Rodd Street):
Approved 150m tip of blade wind turbines (red) and Mod 4 160m tip of blade wind turbines (blue)
Approximate distance to closest approved wind turbine (T31) 4,400 metres



Flyers Creek Wind Farm, Viewpoint W5 looking west to north north west from Carcoar (off Rodd Street):
Proposed Mod 4 160m tip of blade wind turbines (blue) only



FCWF approved wind turbine at 150m tip height



Proposed FCWF Mod 4 wind turbine at 160m tip height

Flyers Creek Wind Farm Modification 4

Notes:
Views toward wind turbines or portions of wind turbines below the green wireframe will be screened by landform.

The wireframe model does not account for existing tree cover and/or planting which may screen views toward the wind turbines.

Figure 15 -
Wire frame W5 from Carcoar (off Rodd Street)

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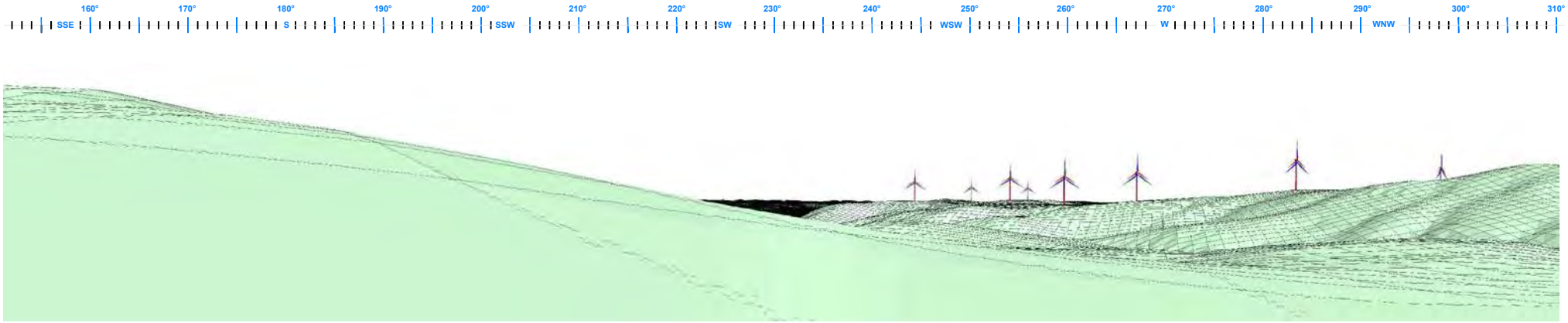
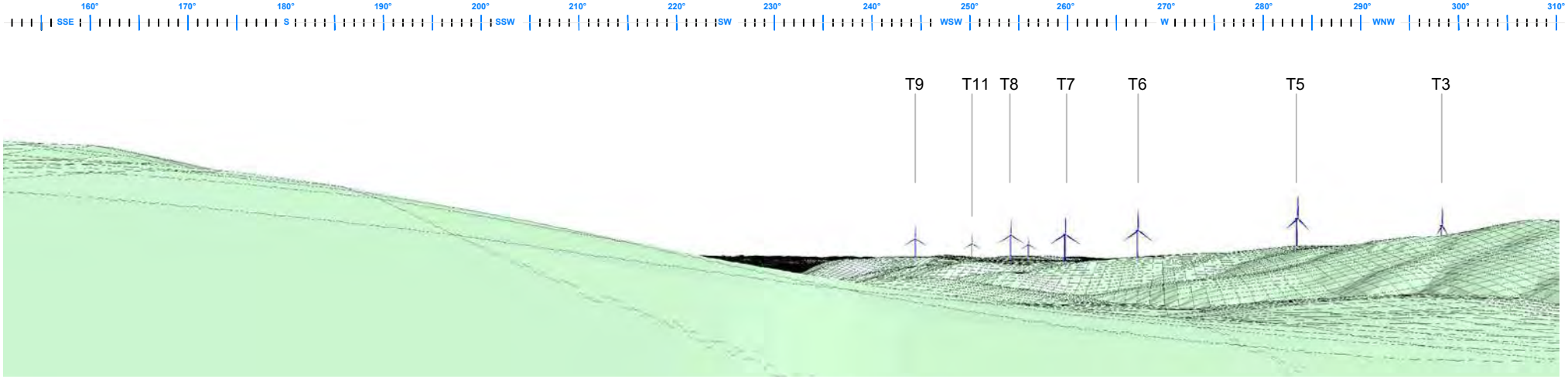
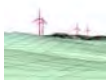


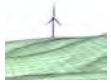
Flyers Creek Wind Farm, Viewpoint W6 looking south south east to west north west from Dixons Lane: Approved 150m tip of blade wind turbines (red) and Mod 4 160m tip of blade wind turbines (blue)
Approximate distance to closest approved wind turbine (T5) 1,680 metres



Flyers Creek Wind Farm, Viewpoint W6 looking south south east to west north west from Dixons Lane:
Proposed Mod 4 160m tip of blade wind turbines (blue) only



FCWF approved wind turbine at 150m tip height



Proposed FCWF Mod 4 wind turbine at 160m tip height

Notes:
Views toward wind turbines or portions of wind turbines below the green wireframe will be screened by landform.

The wireframe model does not account for existing tree cover and/or planting which may screen views toward the wind turbines.

Figure 16 -
Wire frame W6 from Dixons Lane

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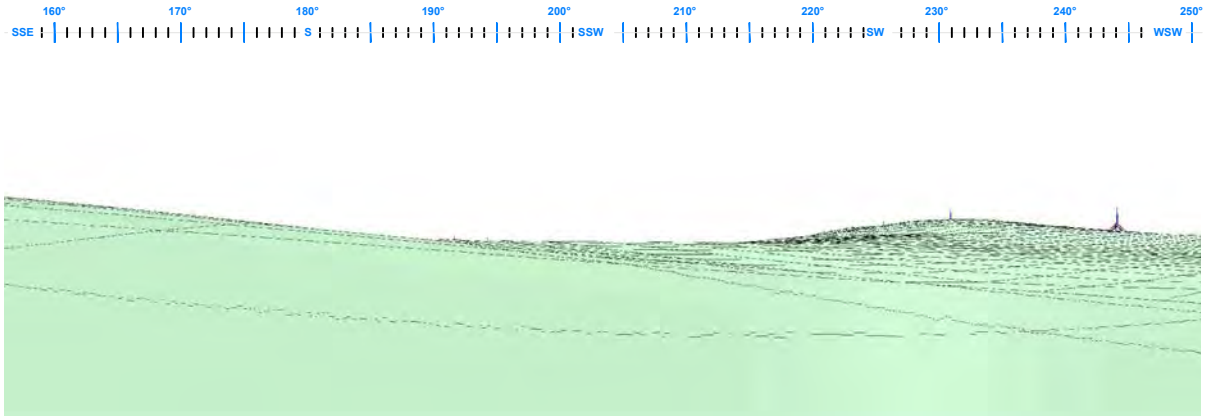
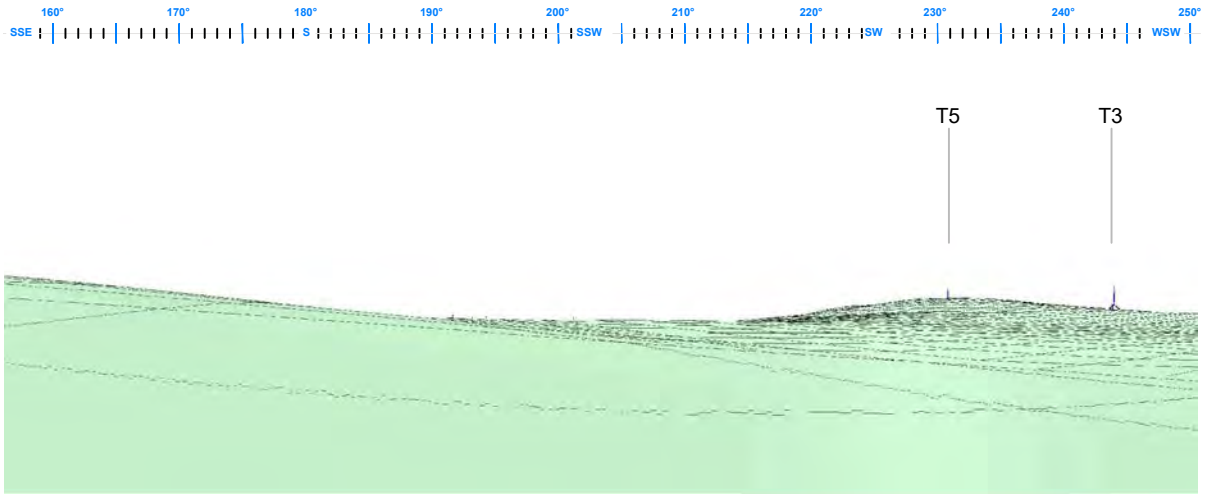
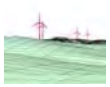
Flyers Creek Wind Farm Modification 4



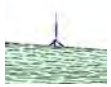
Flyers Creek Wind Farm, Viewpoint W7 looking south south east to west south west from Beneree Road:
Approved 150m tip of blade wind turbines (red) and Mod 4 160m tip of blade wind turbines (blue)
Approximate distance to closest approved wind turbine (T3) 2,250 metres



Flyers Creek Wind Farm, Viewpoint W7 looking south south east to west south west from Beneree Road:
Proposed Mod 4 160m tip of blade wind turbines (blue) only



FCWF approved wind turbine at 150m tip height



Proposed FCWF Mod 4 wind turbine at 160m tip height

Flyers Creek Wind Farm Modification 4

Notes:
Views toward wind turbines or portions of wind turbines below the green wireframe will be screened by landform.

The wireframe model does not account for existing tree cover and/or planting which may screen views toward the wind turbines.

Figure 17 -
Wire frame W7 from Beneree Road

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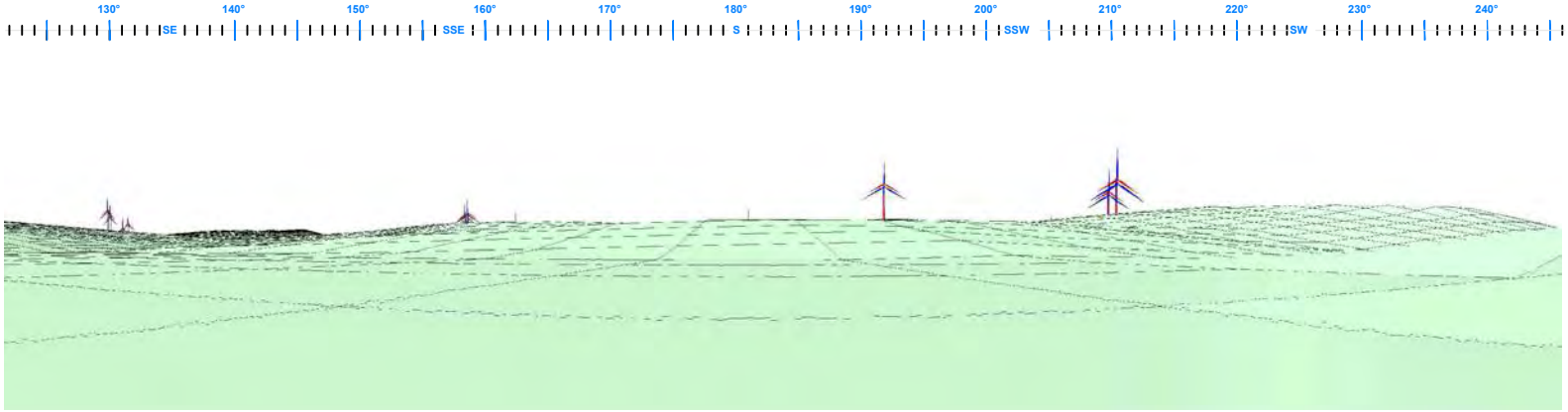
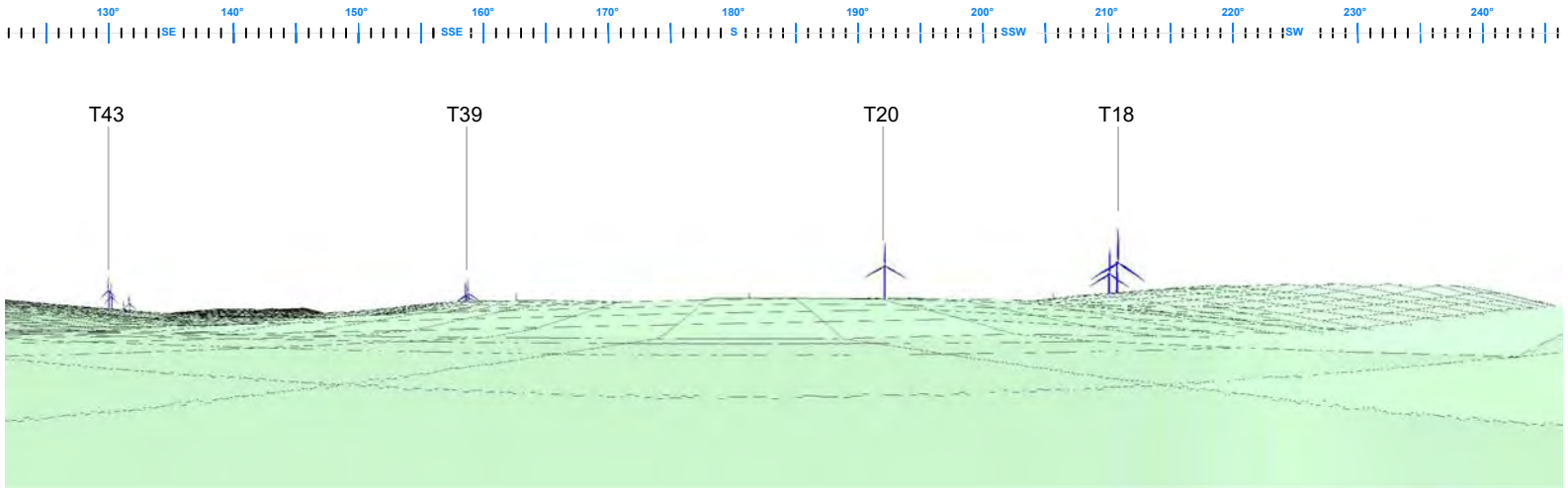
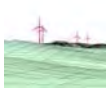


Flyers Creek Wind Farm, Viewpoint W8a looking south east to south west off Dunstaffnage Lane:
Approved 150m tip of blade wind turbines (red) and Mod 4 160m tip of blade wind turbines (blue)
Approximate distance to closest approved wind turbine (T18) 1,350 metres



Flyers Creek Wind Farm, Viewpoint W8a looking south east to south west from Dunstaffnage Lane:
Proposed Mod 4 160m tip of blade wind turbines (blue) only



FCWF approved wind turbine at 150m tip height

Proposed FCWF Mod 4 wind turbine at 160m tip height

Notes:
Views toward wind turbines or portions of wind turbines below the green wireframe will be screened by landform.

The wireframe model does not account for existing tree cover and/or planting which may screen views toward the wind turbines.

Figure 18 -
Wire frame W8a off Dunstaffnage Lane

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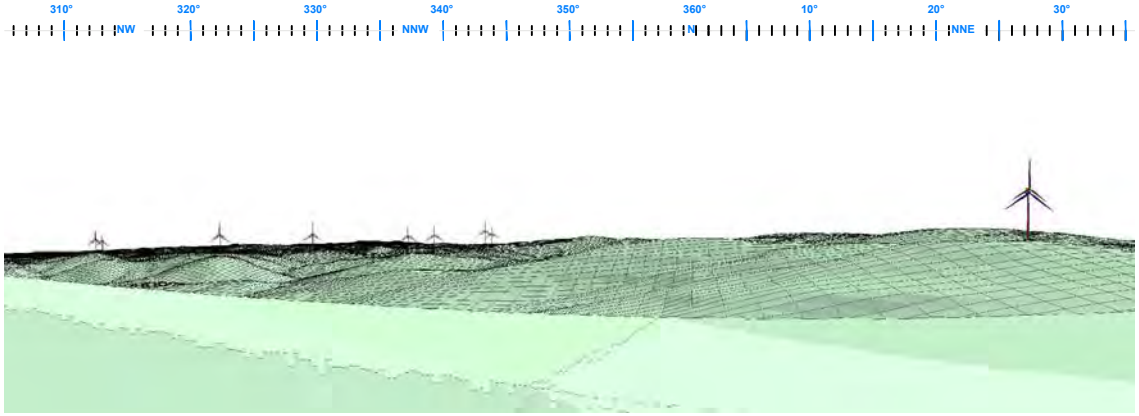
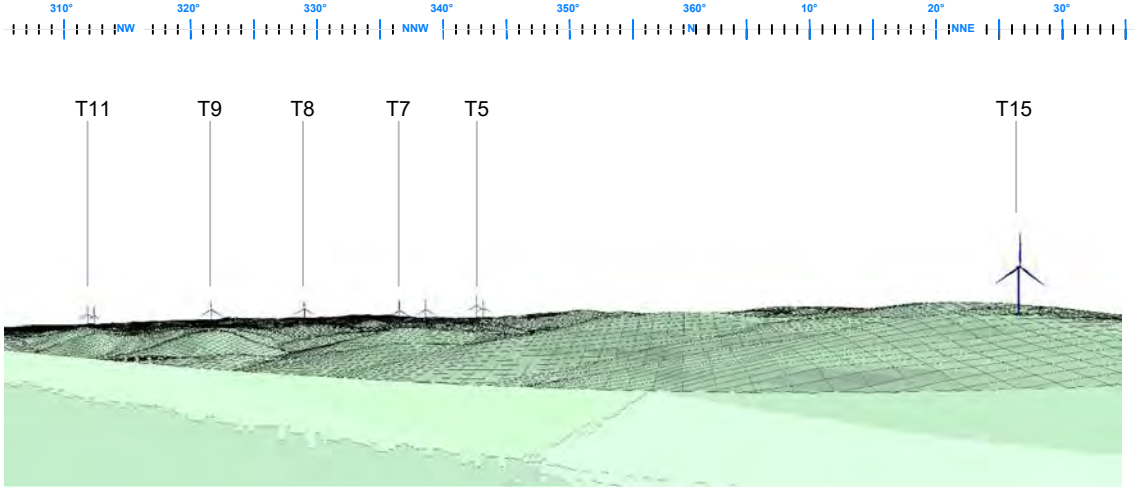
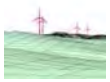
Flyers Creek Wind Farm Modification 4



Flyers Creek Wind Farm, Viewpoint W8b looking north west to north north east off Dunstaffnage Lane:
Approved 150m tip of blade wind turbines (red) and Mod 4 160m tip of blade wind turbines (blue)
Approximate distance to closest approved wind turbine (T15) 1,400 metres



Flyers Creek Wind Farm, Viewpoint W8b looking north west to north north east from Dunstaffnage Lane:
Proposed Mod 4 160m tip of blade wind turbines (blue) only



FCWF approved wind turbine at 150m tip height

Proposed FCWF Mod 4 wind turbine at 160m tip height

Flyers Creek Wind Farm Modification 4

Notes:
Views toward wind turbines or portions of wind turbines below the green wireframe will be screened by landform.

The wireframe model does not account for existing tree cover and/or planting which may screen views toward the wind turbines.

Figure 19 -
Wire frame W8b off Dunstaffnage Lane

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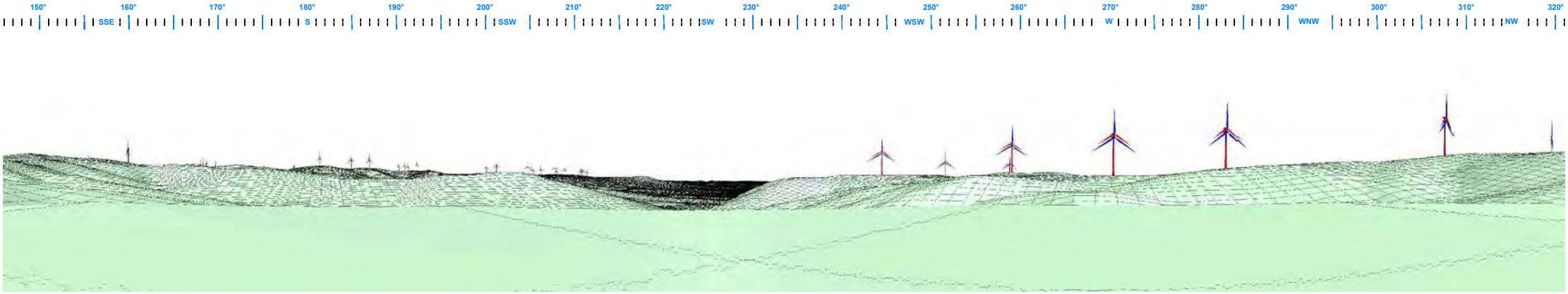
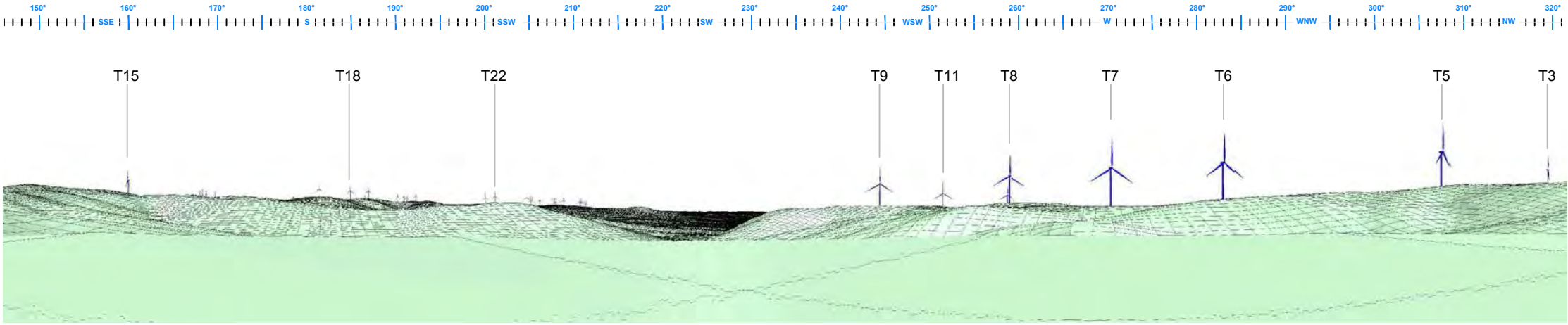
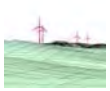


Flyers Creek Wind Farm, Viewpoint W9 looking south south east to north west from dwelling 89: Approved 150m tip of blade wind turbines (red) and Mod 4 160m tip of blade wind turbines (blue)
Approximate distance to closest approved wind turbine (T6) 1,144 metres



Flyers Creek Wind Farm, Viewpoint W9 looking south south east to north west from dwelling 89:
Proposed Mod 4 160m tip of blade wind turbines (blue) only



FCWF approved wind turbine at 150m tip height

Proposed FCWF Mod 4 wind turbine at 160m tip height

Notes:
Views toward wind turbines or portions of wind turbines below the green wireframe will be screened by landform.

The wireframe model does not account for existing tree cover and/or planting which may screen views toward the wind turbines.

Figure 20 -
Wire frame W9
Residence 89

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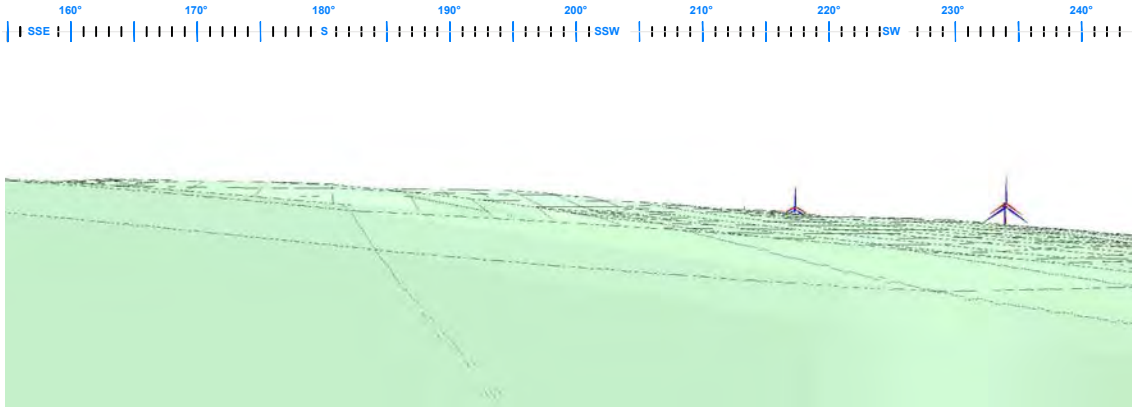
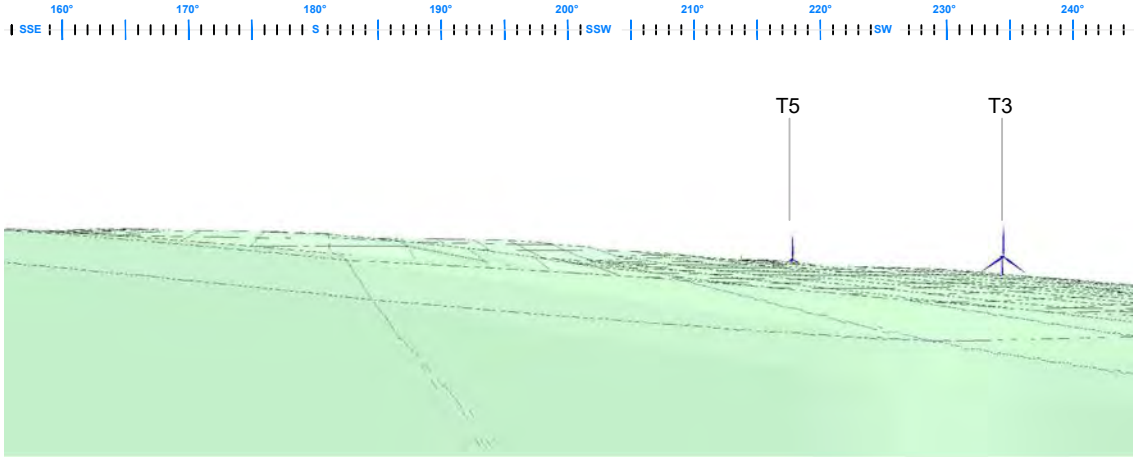
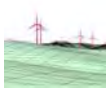
Flyers Creek Wind Farm Modification 4



Flyers Creek Wind Farm, Viewpoint W10 looking south south east to west south west from dwelling 25:
Approved 150m tip of blade wind turbines (red) and Mod 4 160m tip of blade wind turbines (blue)
Approximate distance to closest approved wind turbine (T3) 1,550 metres



Flyers Creek Wind Farm, Viewpoint W10 looking south south east to west south west from dwelling 25:
Proposed Mod 4 160m tip of blade wind turbines (blue) only



FCWF approved wind turbine at 150m tip height

Proposed FCWF Mod 4 wind turbine at 160m tip height

Notes:
Views toward wind turbines or portions of wind turbines below the green wireframe will be screened by landform.

The wireframe model does not account for existing tree cover and/or planting which may screen views toward the wind turbines.

Figure 21 -
Wire frame W10
Residence 25

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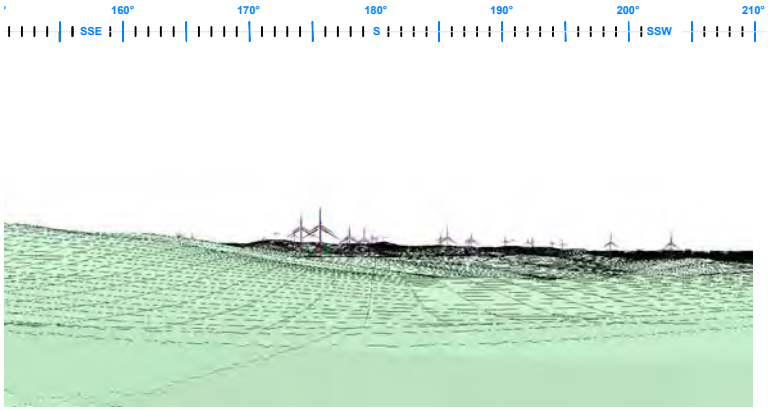
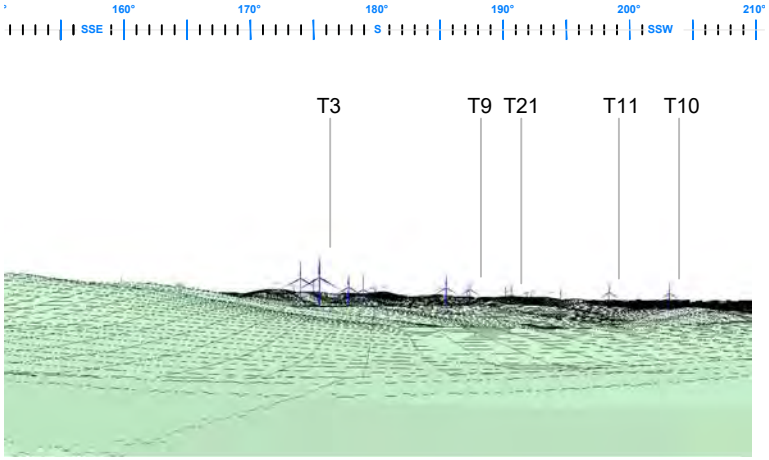
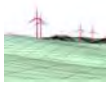
Flyers Creek Wind Farm Modification 4



Flyers Creek Wind Farm, Viewpoint W11 looking south south east to south south west from dwelling 94:
Approved 150m tip of blade wind turbines (red) and Mod 4 160m tip of blade wind turbines (blue)
Approximate distance to closest approved wind turbine (T3) 2,190 metres



Flyers Creek Wind Farm, Viewpoint W11 looking south south east to south south west from dwelling 94:
Proposed Mod 4 160m tip of blade wind turbines (blue) only



FCWF approved wind turbine at 150m tip height

Proposed FCWF Mod 4 wind turbine at 160m tip height

Notes:
Views toward wind turbines or portions of wind turbines below the green wireframe will be screened by landform.

The wireframe model does not account for existing tree cover and/or planting which may screen views toward the wind turbines.

Figure 22 -
Wire frame W11
Residence 94

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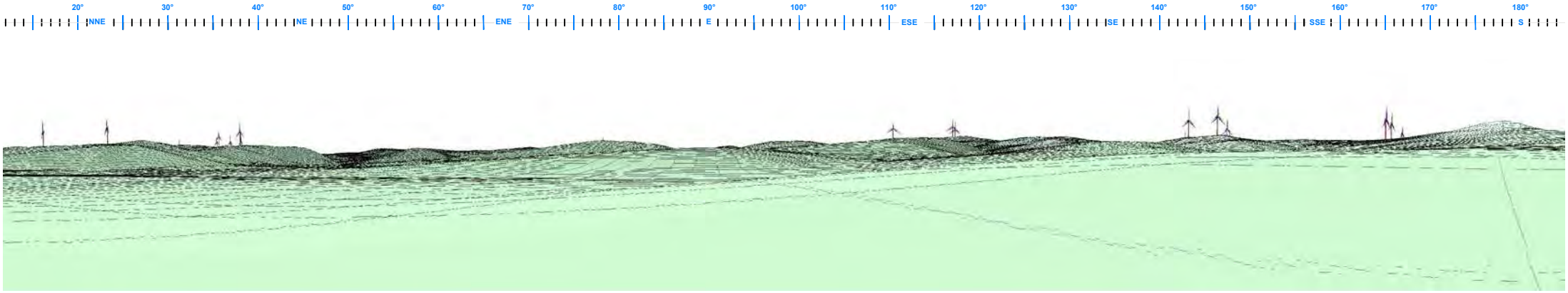
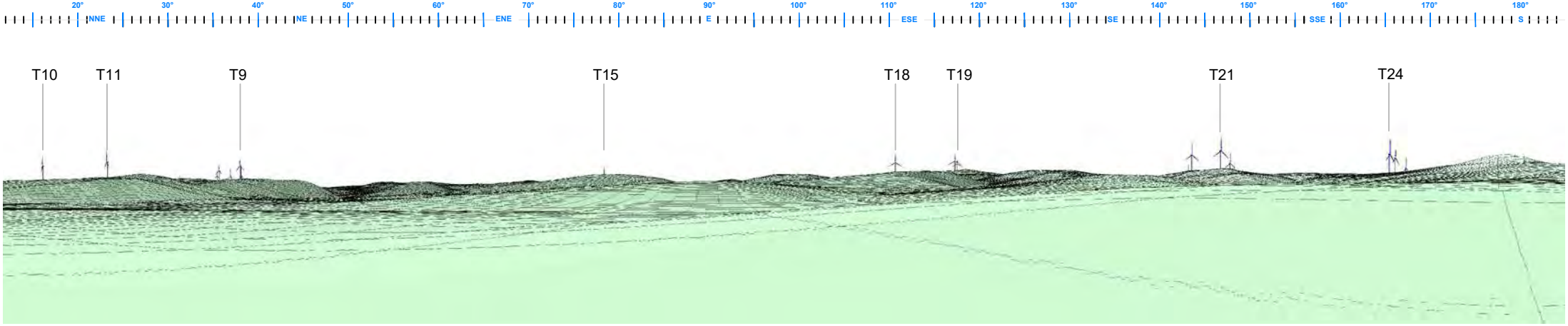
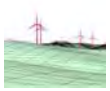
Flyers Creek Wind Farm Modification 4



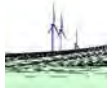
Flyers Creek Wind Farm, Viewpoint W12 looking south south east to south south west from dwelling 12: Approved 150m tip of blade wind turbines (red) and Mod 4 160m tip of blade wind turbines (blue)
Approximate distance to closest approved wind turbine (T24) 2,290 metres



Flyers Creek Wind Farm, Viewpoint W12 looking south south east to south south west from dwelling 12:
Proposed Mod 4 160m tip of blade wind turbines (blue) only



FCWF approved wind turbine at 150m tip height



Proposed FCWF Mod 4 wind turbine at 160m tip height

Notes:
Views toward wind turbines or portions of wind turbines below the green wireframe will be screened by landform.

The wireframe model does not account for existing tree cover and/or planting which may screen views toward the wind turbines.

Figure 23 -
Wire frame W12
Residence 12

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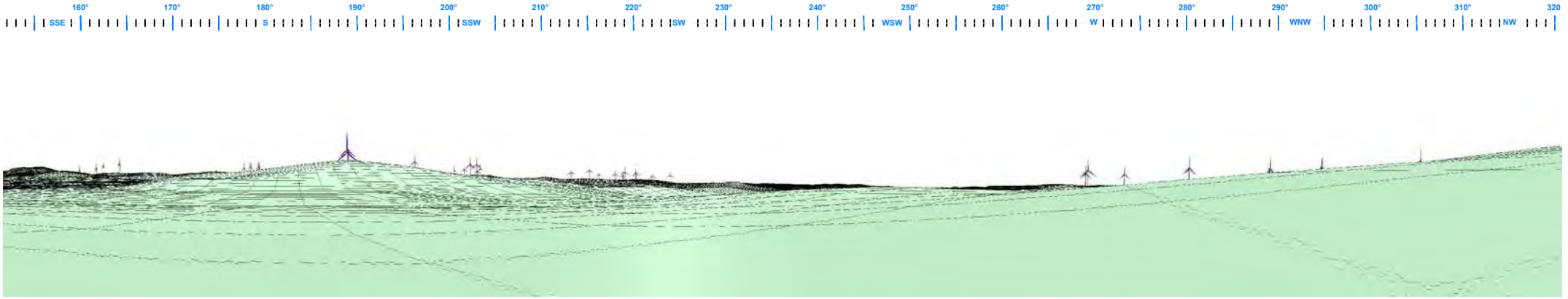
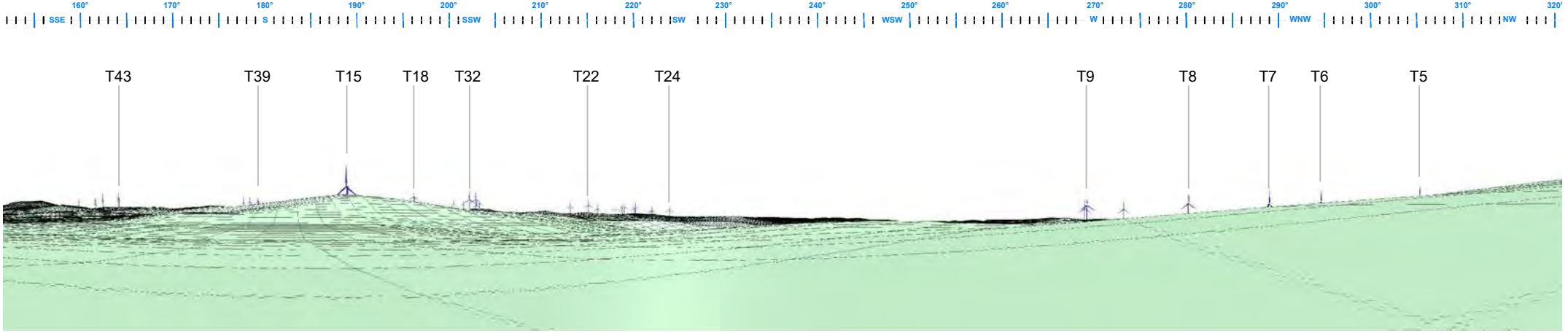
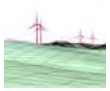
Flyers Creek Wind Farm Modification 4



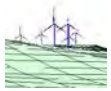
Flyers Creek Wind Farm, Viewpoint W13 looking south south east to north west from dwelling 44: Approved 150m tip of blade wind turbines (red) and Mod 4 160m tip of blade wind turbines (blue)
Approximate distance to closest approved wind turbine (T15) 1,675 metres



Flyers Creek Wind Farm, Viewpoint W13 looking south south east to north west from dwelling 44:
Proposed Mod 4 160m tip of blade wind turbines (blue) only



FCWF approved wind turbine at 150m tip height



Proposed FCWF Mod 4 wind turbine at 160m tip height

Notes:
Views toward wind turbines or portions of wind turbines below the green wireframe will be screened by landform.

The wireframe model does not account for existing tree cover and/or planting which may screen views toward the wind turbines.

Figure 24
Wire frame W13
Residence 44

Flyers Creek Wind Farm Modification 4

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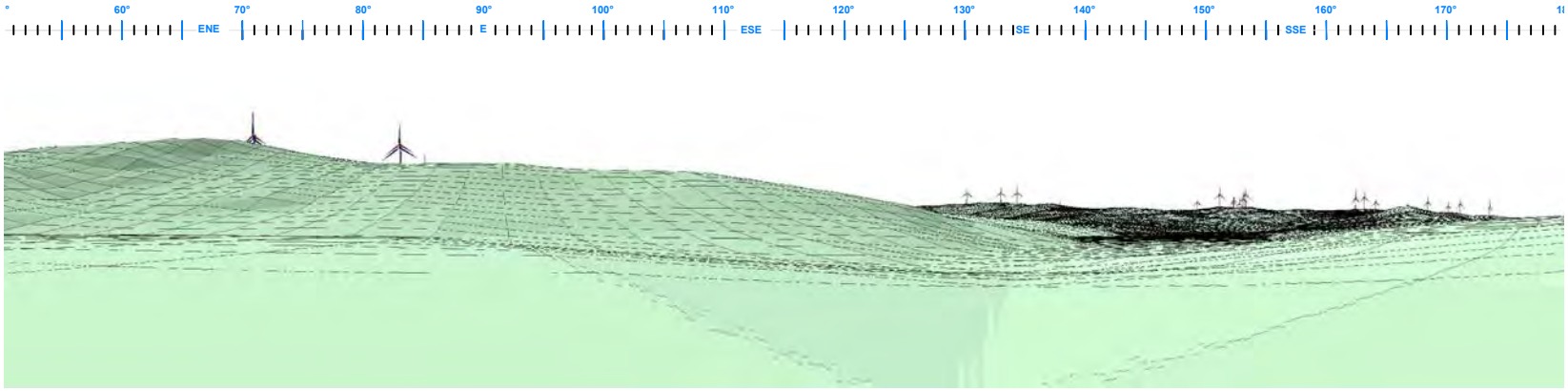
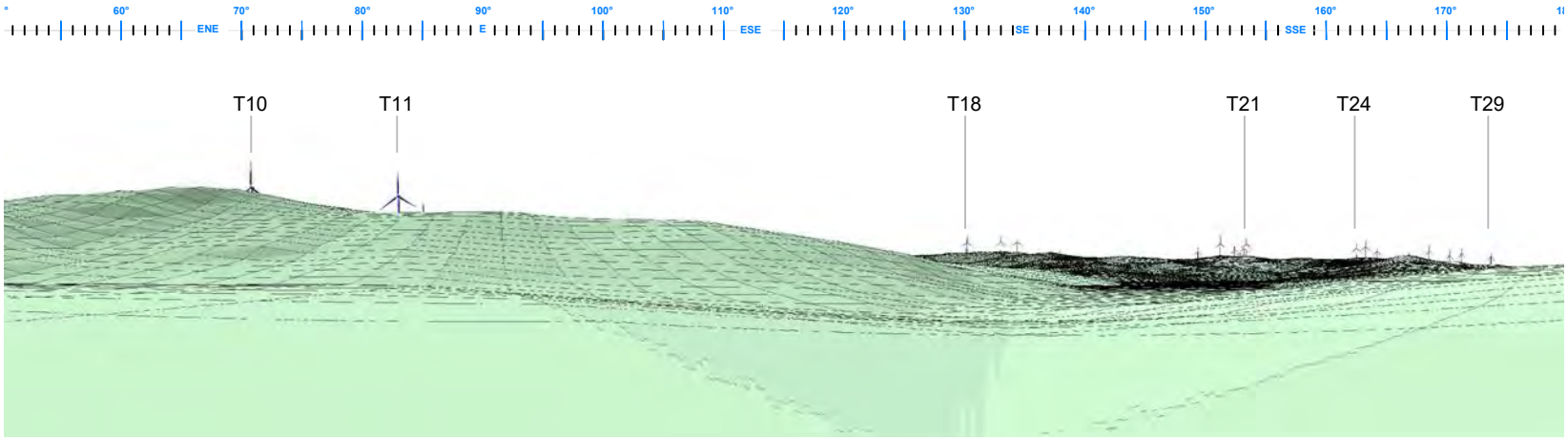
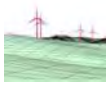


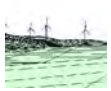
Flyers Creek Wind Farm, Viewpoint W14 looking east north east to south from dwelling 17: Approved 150m tip of blade wind turbines (red) and Mod 4 160m tip of blade wind turbines (blue)
Approximate distance to closest approved wind turbine (T10) 1,660 metres



Flyers Creek Wind Farm, Viewpoint W14 looking east north east to south from dwelling 17:
Proposed Mod 4 160m tip of blade wind turbines (blue) only



FCWF approved wind turbine at 150m tip height



Proposed FCWF Mod 4 wind turbine at 160m tip height

Notes:
Views toward wind turbines or portions of wind turbines below the green wireframe will be screened by landform.

The wireframe model does not account for existing tree cover and/or planting which may screen views toward the wind turbines.

Figure 25
Wire frame W14
Residence 17

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Flyers Creek Wind Farm Modification 4

10 Mod 4 switching station and 132kV powerline

10.1 Introduction

The Mod 4 amendment includes a proposed 132kV powerline and switching station to collect and connect electricity from the approved FCWF substation to the existing Orange North to Cadia 132kV powerline.

The proposed Mod 4 132kV powerline would extend south for around 11.3km from the proposed switching station site alongside the Cadia Road corridor to Panuara Road. The proposed 132kV powerline would then extend alongside Panuara Road before turning north east for around 3km connecting to the FCWF wind farm substation.

Subject to landowner agreements, the proposed 132kV powerline would be installed as an overhead structure for its entire length of around 14.3km. Without necessary landowner agreements, around 3.6km of the Mod 4 132kV powerline would be installed underground alongside Panuara Road and north to the southern edge of the pine plantation east of the Cadia Road corridor.

Both the overhead and underground Mod 4 132kV powerline options would require the removal of some existing vegetation, including trees alongside Panuara Road and the establishment of a 45m wide easement on the edge of the pine plantation east of Cadia Road.

The Mod 4 132kV powerline route in **Figure 26** illustrates alternative powerline options for sections of both overhead or underground installations subject to landowner agreements.

10.2 Visual absorption capability

Visual absorption capability (VAC) is a classification system used to describe the relative ability of the landscape to accept modifications and alterations without the loss of landscape character or deterioration of visual amenity. Whilst the application of a VAC classification system is not particularly useful for large scale structures, it can be applied to smaller ancillary structures, such as powerline infrastructure, where scale and form is more readily absorbed by elements (topography and vegetation) within the surrounding landscape. VAC relates to physical characteristics of the landscape that are often inherent and often quite static in the long term.

Undulating areas with a combination of open views interrupted by groups of trees and small forested areas would have a higher capability to visually absorb the proposed switching station and powerline without significantly changing its amenity.

On the other hand, areas of cleared vegetation on level ground with limited screening, or areas spanning across prominent ridgelines without significant vegetation, would have a lower capability to visually absorb the proposed switching station and powerline without changing the visual character and potentially reducing visual amenity.

Given the extent and combination of existing natural and cultural character within the wind farm site, the capability of the landscape to absorb the key components of the electrical infrastructure would be primarily dependent upon vegetation cover and landform.

For the purpose of this VIA, the VAC ratings have been determined as:

Low – electrical infrastructure components would be highly visible either due to lack of screening by existing vegetation or surrounding landform (e.g. open flat farmland cleared of vegetation, or steep hillside crossing ridgeline).

Medium – electrical infrastructure components would be visible but existing vegetation and surrounding landform would provide some screening or background to reduce visual contrast.

High – electrical infrastructure components would be extensively screened by surrounding vegetation and undulating landform.

10.3 VAC summary

The landscape along the majority of the powerline route, including the switching station site, is considered to have an overall moderate to high VAC, with some ability to accept modifications and alterations without the loss of landscape character or deterioration of existing levels of visual amenity. A higher VAC would occur in areas that present a backdrop of timbered or scattered tree cover. Areas of lower VAC would occur over cleared and/or pasture land as well as sections spanning road corridors. Whilst the portions of the powerline route would be located close residential dwellings, views toward the powerline would occur with sloping hillside beyond which would tend to increase the overall VAC and reducing visual effect.

The overall moderate level of VAC would largely result from the location of the proposed powerline route relative to densely timbered areas and scattered tree cover alongside road corridors. The moderate VAC would also tend to reduce the potential for cumulative impacts to occur where views toward the powerline included views toward proposed electrical infrastructure elements.

10.4 Assessment of proposed electrical infrastructure visual effect

The potential visual effect of the switching station and powerline infrastructure would primarily result from the combination of the degree of visual magnitude and the sensitivity of view locations. The degree of visual magnitude is determined through a combination of:

- the extent to which the switching station and powerline would be visible from sensitive view locations
- the degree of visual contrast between the switching station and powerline and the surrounding landscape that would be visible from surrounding view locations and
- the distance between the proposed switching station and powerline.

The sensitivity of view locations is dependent on the category and type of situation from which people may view the switching station and powerline (e.g. resident or motorist).

The potential visual catchment of the proposed switching station and powerline is the extent to which they would be visible from surrounding areas. Identification of the visual catchment considers the character of the landscape, landform and existing structural elements with regard to their potential for localised visual screening effects.

For the purpose of this VIA, the electrical infrastructure visual catchment has been determined within an approximate 1km offset from the proposed switching station location or each side of the Mod 4 132kV powerline. Views from beyond 1km would have a greater tendency to be screened by undulating landform or the presence of vegetation for portions of the powerline route. Whilst the powerline may be noticeable from areas beyond a 1km distance, the powerline is unlikely to appear as a dominant visual element within the landscape beyond this distance.

The 1km visual catchment is a generalised assessment, where views toward the proposed powerline could, in some situations, be blocked by buildings, vegetation or local landform features at specific points within the 1km offset, and similarly glimpses of the proposed powerline would be available from isolated positions outside the view catchment area. **Table 9** presents the receiver location matrix for electrical infrastructure. Dwelling locations within 1km of the switching station and powerline infrastructure are illustrated in **Figure 26**.

Distance criteria have been adopted as follows:

Category	**Distance**
Long distance view	>1 km
Medium distance view	500 m – 1km
Short distance view	200m – 500m
Very short distance view	< 200m

The potential visual magnitude of the switching station and/or 132kV powerline is expressed as a rating of High, Medium, Low or Nil. For the purposes of this VIA visibility ratings have been defined as:

High – The switching station and 132kV powerline may result in a very dominant and physical change to the landscape and includes the potential for proximate views toward extensive portions of the powerline from sensitive receptor locations.

Medium – The construction of the powerline may result in a prominent physical change to the landscape although the powerline would not appear to be substantially different in scale and character to the existing landscape from surrounding receptor locations.

Low – The construction of the powerline is unlikely to result in a prominent change to the landscape and views from surrounding receptor locations toward the powerline may be difficult to distinguish from elements within the surrounding landscape.

Nil – The construction of the powerline would not create a noticeable change to the existing landscape and is unlikely to result in views toward the powerline from surrounding receptor locations.

Table 9 – Electrical infrastructure visual effect matrix (Refer **Figure 26** for dwelling locations)

Receiver location	Category of receiver location and viewer sensitivity level	Approximate distance to Mod 4 132kV powerline and/or switching station	VAC	Mod 4 visual effect
16	Non-associated residential dwelling Level 2	340m	Low to Moderate	Short distance views north west to north east will extend toward short sections of the overhead 132kV powerline alongside the Panuara Road corridor; however, views will be partially obstructed by scattered tree cover surrounding the dwelling. A short extent of powerline (generally in excess of 500 m) may be visible as the 132kV powerline spans the Beneree Flyers Creek Road and extends north east across gently rising land toward the FCWF substation. Views toward the 132kV powerline would significantly reduced if a section of the powerline were to be installed underground. The Mod 4 switching station location would not be visible from this location. Mitigation through landscape planting could be installed to screen the majority of views toward the overhead 132 kV powerline.
17	Non-associated residential dwelling Level 2	75m	Low to Moderate	Short distance views will extend north east toward a short section of the overhead 132kV powerline across gently rising land toward the FCWF substation. Rising land to the east of the dwelling would provide a backdrop to views from the dwelling, which will also be partially screened by scattered tree cover surrounding the dwelling.

Table 9 – Electrical infrastructure visual effect matrix (Refer **Figure 26** for dwelling locations)

Receiver location	Category of receiver location and viewer sensitivity level	Approximate distance to Mod 4 132kV powerline and/or switching station	VAC	Mod 4 visual effect
				Views toward the 132kV powerline would partially reduced if a section of the powerline were to be installed underground. The Mod 4 switching station location would not be visible from this location. Mitigation through landscape planting could be installed to screen the majority of views toward the overhead 132 kV powerline.
20	Non-associated residential dwelling Level 2	500m	Moderate	Medium distance views west to south west toward the overhead 132kV powerline alongside the Cadia Road corridor would be largely screened by tree cover beyond the dwelling, with tree cover to the west of Cadia Road forming a backdrop to views from the east. The Mod 4 switching station location would not be visible from this location. Mitigation through landscape planting could be installed to screen the majority of any views toward the overhead 132 kV powerline.
87	Non-associated residential dwelling	920m	High	Medium distance views toward the overhead 132kV powerline would be largely screened by a combination of landform and tree cover beyond the dwelling.

Table 9 – Electrical infrastructure visual effect matrix (Refer **Figure 26** for dwelling locations)

Receiver location	Category of receiver location and viewer sensitivity level	Approximate distance to Mod 4 132kV powerline and/or switching station	VAC	Mod 4 visual effect
	Level 2			The Mod 4 switching station location would not be visible from this location.
109	Non-associated residential dwelling Level 2	250m	Low to Moderate	Short distance views west to south west toward the overhead 132kV powerline alongside the Cadia Road corridor would be partially screened by tree cover beyond the dwelling, with tree cover to the west of Cadia Road forming a backdrop to views from the east. The Mod 4 switching station location would not be visible from this location. Mitigation through landscape planting could be installed to screen the majority of any views toward the overhead 132 kV powerline.
112	Non-associated residential dwelling Level 2	480m	Low	Short to Medium distance views north east to south east would extend toward the overhead 132kV powerline alongside a short section of the Cadia Road corridor, as well as more distant views toward the powerline east of the Beneree Flyers Creek Road (generally beyond 1.4km). The Mod 4 switching station location would not be visible from this location.

Table 9 – Electrical infrastructure visual effect matrix (Refer **Figure 26** for dwelling locations)

Receiver location	Category of receiver location and viewer sensitivity level	Approximate distance to Mod 4 132kV powerline and/or switching station	VAC	Mod 4 visual effect
				Mitigation through landscape planting could be installed to screen the majority of any views toward the overhead 132 kV powerline.
128	Non-associated residential dwelling Level 2	800m	High	Medium distance views toward the overhead 132kV powerline would be largely screened by a combination of landform and tree cover beyond the dwelling. The Mod 4 switching station location would not be visible from this location.
H1	Non-associated residential dwelling Level 2	1,000m	High	Long distance views toward the overhead 132kV powerline and switching station would be largely screened by a tree cover beyond the dwelling. Short distance views generally west toward the existing North Orange to Cadia 132kV powerline would also be largely screened by vegetation surrounding and beyond the dwelling. Mitigation through landscape planting could be installed to screen the majority of any views toward the overhead 132 kV powerline and the switching station facility.

Table 9 – Electrical infrastructure visual effect matrix (Refer **Figure 26** for dwelling locations)

Receiver location	Category of receiver location and viewer sensitivity level	Approximate distance to Mod 4 132kV powerline and/or switching station	VAC	Mod 4 visual effect
H2	Non-associated residential dwelling Level 2	310m	Low to Moderate	Short distance views south toward the switching station site would be partially screened from the dwelling by tree planting surrounding the curtilage. Views toward the Mod 4 132kV powerline would be largely screened by scattered tree cover beyond the dwellings as well as the denser pine plantation south of the proposed switching station location. Short distance views generally east to south toward the existing North Orange to Cadia 132kV powerline would also be partially screened by vegetation surrounding and beyond the dwelling. Mitigation through landscape planting could be installed to screen the majority of any views toward the switching station facility from the dwelling.
H3	Non-associated residential dwelling Level 2	120m	Moderate to High	Short distance views east toward the Mod 4 132kV powerline and north toward switching station site would be partially screened from the dwelling by tree planting surrounding the curtilage, as well as tree planting alongside the Cadia Road corridor. Short distance views west toward the existing North Orange to Cadia 132kV powerline are largely screened by tree planting around the dwelling. Mitigation through landscape planting could be installed to screen the majority of any views toward the switching station from the dwelling.

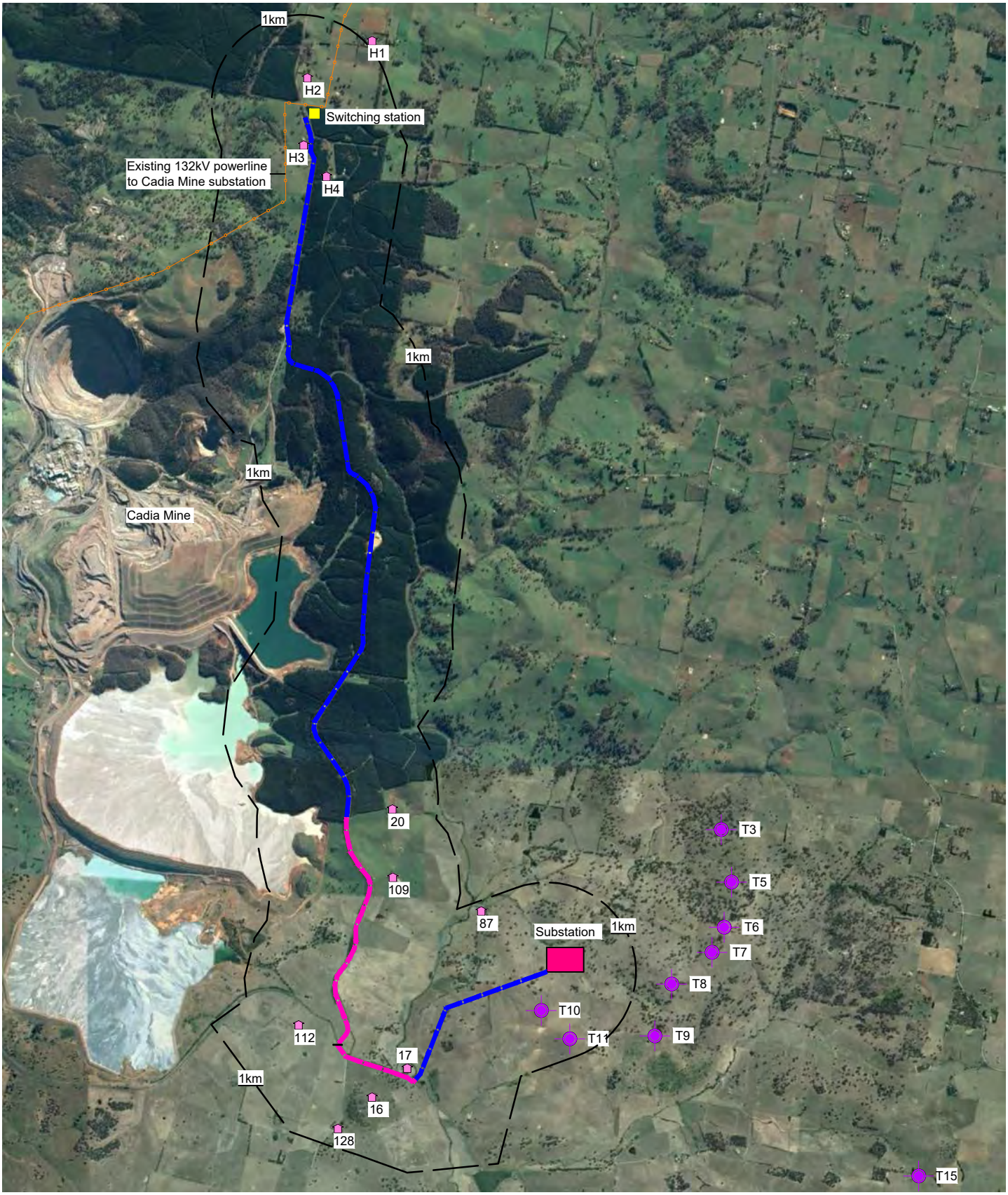
Table 9 – Electrical infrastructure visual effect matrix (Refer **Figure 26** for dwelling locations)

Receiver location	Category of receiver location and viewer sensitivity level	Approximate distance to Mod 4 132kV powerline and/or switching station	VAC	Mod 4 visual effect
H4	Non-associated residential dwelling Level 2	105m	High	Short distance views west toward the Mod 4 132kV powerline, switching station site and the existing North Orange to Cadia 132kV powerline, would be screened from the dwelling by tree planting surrounding the curtilage and beyond the dwelling.

A total of 11 non-associated dwellings have been identified within a 1km offset from the Mod 4 132kV powerline route. An assessment of visual effect determined that existing tree cover and undulating landform would screen or partially screen views toward sections of the Mod 4 132kV powerline, including an 8.5km section located within the pine plantation either side of the Cadia Road corridor.

The proposed powerline would span a small number of local unsealed and sealed roads including the Beneree Flyers Creek Road, Panuara Road and Cadia Road. These roads carry a generally low volume of traffic, and transitory views from vehicles travelling along these roads would be unlikely to result in a significant level of impact.

Overall, this VIA has determined that the electrical infrastructure associated with the Mod 4 amendments would be unlikely to have a significant visual impact on surrounding dwelling locations.



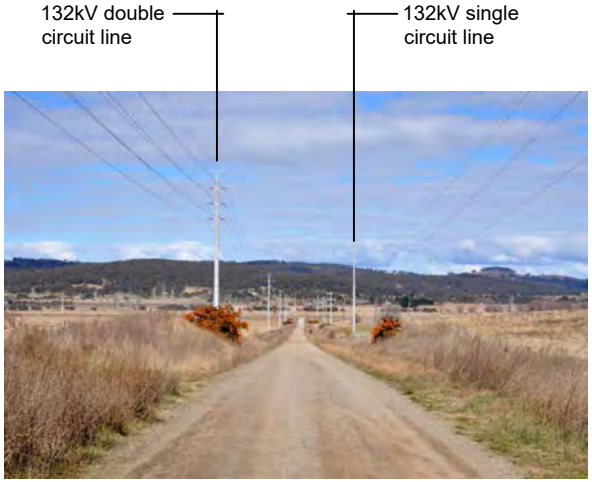
Legend

- FCWF approved wind turbine location (indicative location)
- Dwelling within 1 km of Mod 4 132kV powerline
- Mod 4 132 kV powerline indicative overhead route option
- Mod 4 132 kV powerline indicative underground route option (or overhead subject to landowner agreement)
- Approved FCWF substation (indicative location)
- Mod 4 switching station (indicative location)
- Mod 4 132 kV powerline 1 km distance offset

0km 1km

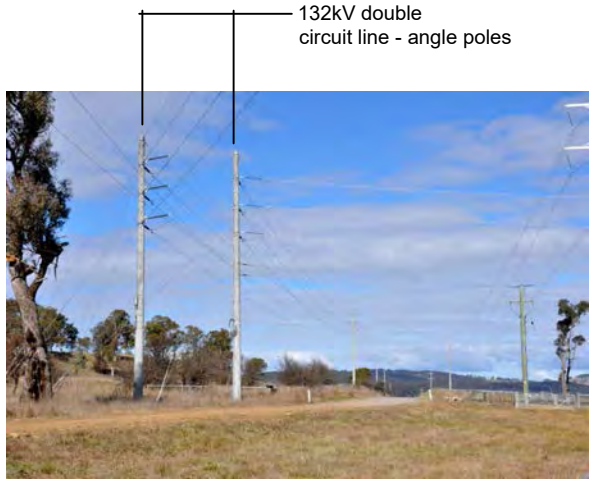
Figure 26
FCWF 132kV powerline indicative alignment

GREEN BEAN DESIGN
landscape architects



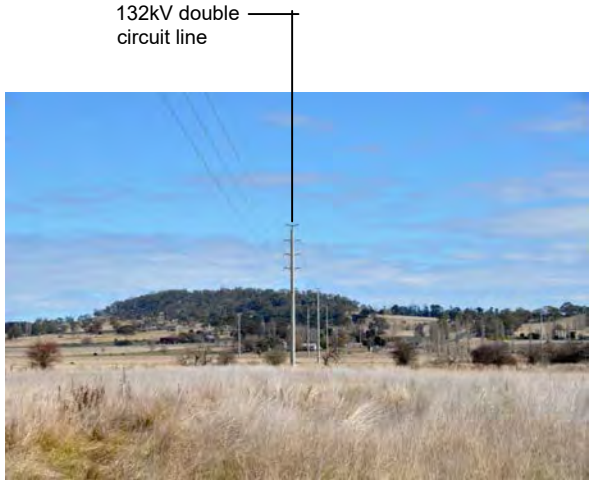
Comparative single and double circuit 132kV powerline (supporting structures)

Double circuit 132kV powerline (supporting structure) along road

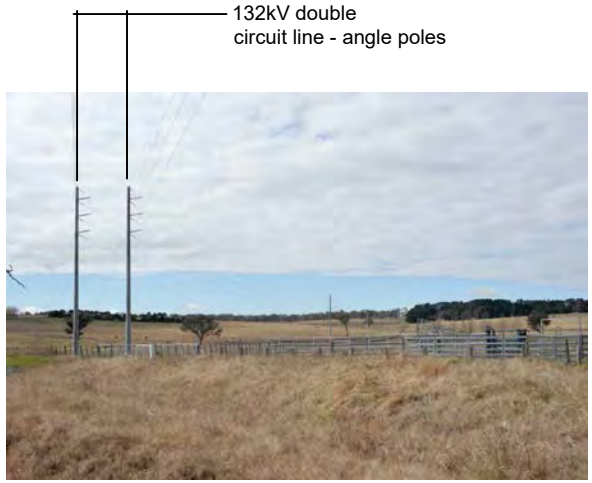


Double circuit 132kV powerline (angle pole structure) at road crossing

132kV double circuit powerline crossing rural agricultural land



132kV double circuit powerline crossing rural agricultural land



Double circuit 132kV powerline (angle pole structure) at road crossing

Figure 27-
132kV powerline, typical illustrations

11 Review of Conditions of Consent

11.1 Introduction

The FCWF consolidated Conditions of Consent have been reviewed as part of this VIA to determine the type and extent of additional mitigation measures that would be required or should be modified as a result of the proposed Mod 4 amendments.

11.2 Review of Conditions of Consent

The following Table outlines the existing Conditions relevant to mitigate the potential visual effects of the FCWF Mod 4 amendments.

Table 10 Conditions of Consent

Condition	Description	Comment
D20	For a period of 5 years from the commencement of construction of any wind turbine, the owner of any non-associated residence within 4 km of any wind turbine may ask the Proponent to implement visual impact mitigation measures on their land to minimise the visual impacts of the development on their residence (including its curtilage). Upon receiving such a written request from the owner of these residences, the Proponent must implement appropriate mitigation measures (such as landscaping and vegetation screening) in consultation with the owner. These mitigation measures must be reasonable and feasible, aimed at reducing the visibility of the wind turbines from the residence and its curtilage, and commensurate with the level of visual impact on the residence. All mitigation measures must be implemented within 12 months of receiving the written request, unless the Secretary agrees otherwise. If the Proponent and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Secretary for resolution.	This condition remains valid.

Condition	Description	Comment
	Notes: • To avoid any doubt, mitigation measures are not required to be implemented to reduce the visibility of wind turbines from any other locations on the property other than the residence and its curtilage. • The identification of appropriate visual impact mitigation measures will be more effective following the construction of the wind turbines. While owners may ask for the implementation of visual impact mitigation measures shortly after the commencement of the erection of the turbine, they should consider the merits of delaying this request until the relevant wind turbines are visible from their residence.	
D21	Landscaping works to reduce the visual impact of the Project shall generally comprise of indigenous and locally occurring species.	This condition remains valid.
D22	The Proponent must: (a) minimise the off-site visual impacts of the development; (b) ensure the wind turbines are: • painted off white/grey, unless otherwise agreed by the Secretary; and • finished with a surface treatment that minimises the potential for glare and reflection; (c) ensure the visual appearance of all ancillary infrastructure (including paint colours) blends in as far as possible with the surrounding landscape; and (d) not mount any advertising signs or logos on wind turbines or ancillary infrastructure.	This condition remains valid.
D23	Shadow flicker from the Project must not exceed 30 hours / annum at any residence, unless the owner of the residence agrees to a higher level.	These conditions remain valid.
D24	The substation and associated facility site shall be designed and constructed to minimise visual intrusion to the nearest sensitive receivers as far as feasible and reasonable including appropriate external finishes to	This condition remains valid.

Condition	Description	Comment
	minimise glare or reflection, landscape planting to screen views and external lighting requirements in accordance with condition D25.	
D25	With the exception of aviation hazard lighting implemented in accordance with the requirements of this condition, no external lighting other than low intensity security night lighting is permitted on site unless otherwise agreed or directed by the Secretary or required by Civil Aviation Safety Authority. Prior to the commencement of construction, the Proponent shall consult with the Civil Aviation Safety Authority on the need for aviation hazard lighting in relation to the wind turbines. Any aviation hazard lighting shall be implemented in a manner that minimises visual intrusion to surrounding non-associated receivers as far as feasible and reasonable.	This condition remains valid.
D26	A Design and Landscaping Plan shall be prepared to outline measures to ensure appropriate development and maintenance of landscaping on the site to achieve adequate landscape buffers and address the visual impacts arising from the Project, including turbines, site access roads and associated above ground infrastructure, as far as is feasible and reasonable. The Plan shall be prepared by a qualified landscape architect and where relevant meet any requirements of Council. The Plan shall include design treatments for the turbines and ancillary infrastructure, including, but not necessarily limited to: (a) landscape elements and built elements, including proposed treatments, finishes and materials of exposed surfaces (including colour specifications); (b) lighting; (c) a schedule of species to be used in landscaping; (d) details of the timing and progressive implementation of landscape works; and	We note the requirement for provision of a Design and Landscaping Plan prior to **commencement of construction**. However, the final layout and extent of works subject to potential landscape screening may undergo adjustments during the construction period. Accordingly, we request that the Design and Landscaping Plan be prepared prior to the wind farm **commissioning.** We note that requirements for condition D26 (a) have been previously addressed in condition D22. We request that D26 (a) be deleted.

Condition	Description	Comment
	(e) procedures and methods to monitor and maintain landscaped areas. The Plan shall be submitted for the approval of the Secretary prior to the commencement of construction, unless otherwise agreed by the Secretary.	

Overall the existing conditions imposed on the Project Approval, together with requested amendments, are considered to remain appropriate to continue to manage the visual impacts from Mod 4.

12 Conclusion

12.1 Conclusion

The potential level of change to visual effects determined for the approved FCWF has been based upon professional judgement in consideration of:

- the proposed amendments to the approved FCWF wind turbines
- the overall magnitude of the Mod 4 wind turbines compared to the approved FCWF wind turbines
- the overall visual effect of the Mod 4 wind turbines compared to the approved FCWF wind turbines
- the location and visibility of the Mod 4 switching station and 132kV powerline
- the overall VAC of the landscape within which the Mod 4 switching station and 132kV powerline would be located and
- the overall visual effect of the Mod 4 switching station and 132kV powerline.

This VIA has compared the approved FCWF wind turbines against the proposed Mod 4 wind turbine design and concludes that the proposed change to wind turbine tip height would be discernible from some surrounding and proximate view locations where views toward the approved FCWF wind turbines exist.

Additional levels of wind turbine visibility would be very limited and largely confined to upper portions of rotor blades and blade tips. Visibility toward wind turbine hubs would likely decrease where the hub is currently partially visible or located just above a ridge or hill slope view.

The Mod 4 wind turbine is not considered to be of a magnitude that would significantly increase visual effects and visual impact ratings associated with the approved FCWF project.

Overall, this VIA has determined that the proposed reinstatement of the 132kv transmission line and switching station proposed as part of Mod 4 would be unlikely to have a significant visual impact on surrounding dwelling locations.

The implementation of both on site and off-site landscape works would provide visual mitigation for a number of dwellings surrounding the approved FCWF wind farm site in accordance with the Conditions of Consent.

Limitations

GBD has prepared this report in accordance with the usual care and thoroughness of the consulting profession for the use of Flyers Creek Wind Farm Pty Ltd. It is based on generally accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this report. It is prepared in accordance with the scope of work and for the purpose outlined in the GBD Proposal dated 17th April 2018.

The methodology adopted and sources of information used are outlined in this report. GBD has made no independent verification of this information beyond the agreed scope of works and GBD assumes no responsibility for any inaccuracies or omissions. No indications were found during our investigations that information contained in this report as provided to GBD was false.

This report was prepared between April and July 2018 and is based on the conditions encountered and information reviewed at the time of preparation. GBD disclaims responsibility for any changes that may have occurred after this time.

This report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties. This report does not purport to give legal advice. Legal advice can only be given by qualified legal practitioners.