

# 8.0 VIEWPOINT ANALYSIS

## VIEWPOINT BWF24- Mudgee Road



VIEWPOINT BWF24- Mudgee Road



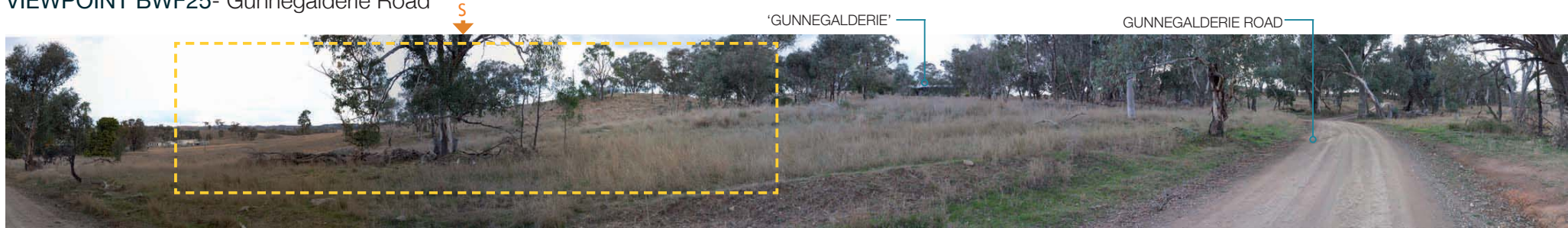
Image cropped from BWF24

VIEWPOINT BWF24		Landscape Description	Potential Visual Impact
Location	Mudgee Road	View from the intersection of Mudgee Road and Gunnegalderie Road at the entry to the property 'Ahwahnee', located on the eastern side of the road. The topography slopes from the viewpoint to a local rise in the foreground, vegetated by both retained roadside vegetation and plantings along the property boundary.	From this viewpoint it is likely glimpses of a few of the proposed wind turbines would be visible through the vegetation. The visual effect from this viewpoint has been assessed as low due to the speed of travel along Mudgee Road.
Coordinates	S 32 ° 25.474' E 149 ° 07.574'		
Elevation	612m		
Viewing Distance (to nearest turbine)	1.59 km	The visual sensitivity from this viewpoint has been assessed as moderate due to the land use as a major travel corridor.  (Note: Ahwahnee is an involved landowner).	The overall visual impact from this viewpoint has been assessed as low.
Viewing Direction	North west		
Land use	Major Road / Rural Residence		
LCU	Mount Bodangora		
Visual Sensitivity	Moderate		
Visual Effect	Low		
Potential Visual Impact	Low		



# 8.0 VIEWPOINT ANALYSIS

VIEWPOINT BWF25- Gunnegalderie Road



VIEWPOINT BWF25- Gunnegalderie Road



Image cropped from BWF25

VIEWPOINT BWF25		Landscape Description	Potential Visual Impact
Location	Gunnegalderie Road	View from an enclave of rural properties along Gunnegalderie Road. Gunnegalderie Road is an unsealed minor road servicing a number of homesteads and connecting Mudgee Road to Twelve Mile Road. Photograph was taken looking south towards the proposed location of the sub station. Views towards the proposed sub station are predominantly enclosed by a low rise in the topography and vegetation surrounding the homestead 'Gunnegalderie'.  The visual sensitivity from this viewpoint has been assessed as high due to the close proximity of the viewpoint to a residence.	The proposed wind farm is obstructed from view by the topography and dense vegetation. The proposed substation will not be visible from this viewpoint and therefore there is no visual impact.
Coordinates	S 32 ° 25.723' E 149 °09.882'		
Elevation	575m		
Viewing Distance (to nearest turbine)	1.61 km		
Viewing Direction	South west		
Land use	Local Unsealed Road / Rural Residence		
LCU	Mount Bodangora		
Visual Sensitivity	High		
Visual Effect	-		
Potential Visual Impact	-		



# 8.0 VIEWPOINT ANALYSIS

## VIEWPOINT BWF26 Spicers Creek Road



VIEWPOINT BWF26- Spicers Creek Road



Image cropped from BWF26

VIEWPOINT BWF26		Landscape Description	Potential Visual Impact
Location	Spicers Creek Road	View from the entry to the property 'Gillinghall' looking in a southerly direction towards the proposed wind turbines. Spicers Creek Road is an unsealed local road to the north east of the study site running from Gollan Road to Mudgee Road servicing a number of isolated homesteads. Spicers Creek Road runs along the valley floor associated with Spicers Creek. The landscape is flat and primarily utilised for canola crops and improved pasture. Some isolated plantings associated with Gillinghall Road are visible in the middle ground.	From this viewpoint it is likely that 10 of the proposed wind turbines will be visible. Vegetation in the mid distance associated with Gillinghall Road will potentially screen the majority of the visible turbines. The visual effect from this viewpoint has been assessed as low due to the distance from the proposed turbines and extent of screening vegetation.
Coordinates	S 32 ° 19.756' E 149 ° 05.948'		
Elevation	415m		
Viewing Distance (to nearest turbine)	5.88 km		
Viewing Direction	South		
Land use	Unsealed Local Road / Rural Residence	The visual sensitivity of this viewpoint has been assessed as high due to the close proximity to a homestead.	The overall potential visual impact has been rated as low from this viewpoint.
LCU	Spicers Creek		
Visual Sensitivity	Moderate		
Visual Effect	Low		
Potential Visual Impact	Low		

# 8.0 VIEWPOINT ANALYSIS

## VIEWPOINT BWF27- Spicers Creek Road



VIEWPOINT BWF27- Spicers Creek Road



Image cropped from BWF27

VIEWPOINT BWF27		Landscape Description	Potential Visual Impact
Location	Spicers Creek Road	View from an intersection along Spicers Creek Road looking south west towards the Site. The topography is flat improved pasture and a sparse coverage of roadside vegetation. Views extend to a vegetated rise to the west.  The visual sensitivity from this viewpoint has been assessed as low.	From this viewpoint it is likely 9 of the proposed wind turbines will be visible. The visual effect has been rated as low due to the distance from the site.  The overall visual impact from this viewpoint has been assessed as low.
Coordinates	S 32 ° 21.679' E 149 ° 07.538'		
Elevation	464m		
Viewing Distance (to nearest turbine)	5.37 km		
Viewing Direction	South west		
Land use	Unsealed minor road		
LCU	Spicers Creek		
Visual Sensitivity	Low		
Visual Effect	Low		
Potential Visual Impact	Low		



# 8.0 VIEWPOINT ANALYSIS

## VIEWPOINT BWF28- Spicers Creek Road & Mudgee Road Intersection



VIEWPOINT BWF28- Spicer's Creek Road & Mudgee Road Intersection



Image cropped from BWF28

VIEWPOINT BWF28		Landscape Description	Potential Visual Impact
Location	Spicers Creek Road	View from the corner of Spicer's Creek Road and Mudgee Road looking east towards the study site. The topography is undulating and a low rise in the foreground obstructs views to the east. Dense vegetation associated with Spicer's Creek is visible in the middle ground of the photograph to the south. Roadside vegetation occurs along most of Mudgee Road.  The visual sensitivity from this viewpoint has been rated as moderate.	Views to the proposed wind turbines are obstructed from this viewpoint by a combination of topography and vegetation. None of the proposed wind turbines would be visible from this viewpoint.
Coordinates	S 32 ° 23.256' E 149 ° 09.604'		
Elevation	516m		
Viewing Distance (to nearest turbine)	3.97 km		
Viewing Direction	South west		
Land use	Major Travel Corridor		
LCU	Mount Bodangora		
Visual Sensitivity	Moderate		
Visual Effect	-		
Potential Visual Impact	-		



# 8.0 VIEWPOINT ANALYSIS

## VIEWPOINT BWF29- Oakey Creek Road



VIEWPOINT BWF29 - Oakey Creek Road



Image cropped from BWF29

VIEWPOINT BWF29		Landscape Description	Potential Visual Impact
Location	Oakey Creek Road	View from Oakey Creek Road, approximately 2.85 km north from Mudgee Road. Photograph was taken in a southerly direction towards the proposed wind turbines. The landscape is predominantly improved pasture. An isolated farmhouse and associated ancillary buildings are visible to the north east, surrounded by a mixture of native and exotic vegetation. Views extend to the distant vegetated ranges. A low rise in topography in the foreground contains most views.	From this viewpoint 22 of the proposed wind turbines will be potentially visible. Vegetation along the ridge of the low rise in the mid distance will screen some views to the proposed turbines. Due to the distance from the wind farm, the visual effect has been assessed as low.
Coordinates	S 32 ° 21.540' E 149 ° 09.782'		
Elevation	517m		
Viewing Distance (to nearest turbine)	6.26km		
Viewing Direction	East		
Land use	Minor Road / Rural Residence	The visual sensitivity from this viewpoint has been assessed as moderate due to the close proximity of the farm house to the viewpoint.	The overall visual impact from this viewpoint has been assessed as low.
LCU	Spicers Creek		
Visual Sensitivity	Moderate		
Visual Effect	Low		
Potential Visual Impact	Low		



# 8.0 VIEWPOINT ANALYSIS

## VIEWPOINT BWF30- Oakey Creek Road



VIEWPOINT BWF30- Oakey Creek Road



Image cropped from BWF30

VIEWPOINT BWF30		Landscape Description	Potential Visual Impact
Location	Oakey Creek Road	View from Oakey Creek Road at a bend in the road approximately 6 km south of Gollan Road. Photograph was taken 200m south of an isolated property looking in a southerly direction towards the proposed wind farm. The landscape is slightly sloping, cleared, improved pasture. Roadside vegetation lines the southern side of the road. Views extend towards the south to Mount Bodangora and are contained to the east by Spicers Pinnacle.	From this viewpoint it is likely that 21 wind turbines will be visible through the vegetation. Due to the distance to the proposed turbines from this viewpoint and the vegetation in the mid distance, the proposed wind turbines will be noticeable, however the visual effect has been rated as low.
Coordinates	S 32 ° 20.053' E 149 ° 09.719'		
Elevation	476m	The visual sensitivity from this viewpoint has been assessed as moderate due to the close proximity to a rural residence.	The overall visual impact from this viewpoint has been assessed as low.
Viewing Distance (to nearest turbine)	8.55 km		
Viewing Direction	South		
Land use	Local Road / Rural Residence		
LCU	Spicers Creek		
Visual Sensitivity	Moderate		
Visual Effect	Low		
Potential Visual Impact	Low		

# 8.0 VIEWPOINT ANALYSIS

## 8.2 VIEWPOINT SUMMARY

VIEW-POINT	PHOTO-MONTAGE	DISTANCE To nearest proposed turbine	POTENTIAL VISUAL PROMINENCE Based on distance	VERTICAL ANGLE Based on near- est proposed turbine	VISUAL PROMENENCE Based on vertical angle	% OF VISIBLE TURBINES	EXISTING POTENTIAL SCREENING FACTORS	VISUAL SENSITIVITY RATING	VISUAL EFFECT RATING	VISUAL IMPACT RATING
BWF01	-	12.18 km	Insignificant	0.71°	Potentially Noticable	80%	Distance	LOW	LOW	LOW
BWF02	-	10.27 km	Potentially Noticable	0.84°	Potentially Noticable	20%	Distance & Topography	LOW	LOW	LOW
BWF03	-	7.09 km	Potentially Noticable	1.09°	Potentially Noticable	-	Vegetation & Topography	LOW	-	-
BWF04	PM01	5.89 km	Potentially Noticable	1.46°	Potentially Noticable	80%	Distance	LOW	LOW	LOW
BWF05	-	5.33 km	Potentially Noticable	1.61°	Potentially Noticable	60%	Distance	LOW	LOW	LOW
BWF06	-	7.29 km	Potentially Noticable	1.18°	Potentially Noticable	60%	Distance	LOW	LOW	LOW
BWF07	-	8.02 km	Potentially Noticable	1.07°	Potentially Noticable	-	Distance & Vegetation	LOW	-	-
BWF08	-	4.52 km	Potentially Noticable	1.90°	Potentially Noticable	20%	Foreground Vegetation	MODERATE	LOW	LOW
BWF09	PM02	5.26 km	Potentially Noticable	1.63°	Potentially Noticable	80%	Distance	MODERATE	MODERATE	MODERATE
BWF10	-	2.85 km	Potentially Noticable	4.11°	Potentially Dominant	20%	Foreground Vegetation & Topography	LOW	LOW	LOW
BWF11	-	2.42 km	Highly Visible	3.55°	Potentially Dominant	20%	Topography & Vegetation	HIGH	LOW	MODERATE
BWF12	-	2.68 km	Potentially Noticable	3.20°	Potentially Dominant	20%	Foreground Vegetation & Topography	HIGH	LOW	MODERATE
BWF13	PM03	2.99 km	Potentially Noticable	2.87°	Potentially Dominant	80%	Ridge line Vegetation	HIGH	HIGH	HIGH
BWF14	-	5.87 km	Potentially Noticable	1.46°	Potentially Noticable	20%	Topography & Distance	LOW	LOW	LOW
BWF15	PM04	2.65 km	Potentially Noticable	3.24°	Potentially Dominant	80%	Ridge line Vegetation	HIGH	HIGH	HIGH
BWF16	-	1.50 km	Highly Visible	5.71°	Potentially Dominant	20%	Roadside Vegetation & Topography	MODERATE	MODERATE	MODERATE
BWF17	PM05	0.88 km	Highly Visible	9.67°	Potentially Dominant	40%	Roadside Vegetation	HIGH	MODERATE	MODERATE
BWF18	PM06	1.14 km	Highly Visible	7.50°	Potentially Dominant	80%	Topography	MODERATE	HIGH	HIGH
BWF19	PM07	0.84 km	Highly Visible	10.12°	Potentially Dominant	20%	Foreground Vegetation & Topography	HIGH	LOW	MODERATE
BWF20	-	1.26 km	Highly Visible	6.79°	Potentially Dominant	60%	Roadside Vegetation	HIGH	HIGH	HIGH
BWF21	-	0.51 km	Highly Visible	16.39°	Potentially Dominant	40%	Roadside Vegetation	HIGH	HIGH	HIGH
BWF22	PM08	2.26 km	Highly Visible	3.80°	Potentially Dominant	60%	Vegetation & Distance	MODERATE	MODERATE	MODERATE
BWF23	-	2.87 km	Highly Visible	2.99°	Potentially Dominant	20%	Topography & Vegetation	MODERATE	LOW	LOW
BWF24	PM09	1.59 km	Highly Visible	5.39°	Potentially Dominant	20%	Topography & Vegetation	MODERATE	LOW	LOW
BWF25	-	1.61 km	Highly Visible	5.32°	Potentially Dominant	20%	Topography & Vegetation	HIGH	-	-
BWF26		5.88 km	Potentially Noticable	1.46°	Potentially Noticable	40%	Topography & Vegetation	HIGH	LOW	LOW
BWF27	-	5.37 km	Potentially Noticable	1.60°	Potentially Noticable	20%	Distance & Topography	LOW	LOW	LOW
BWF28	-	3.97 km	Potentially Noticable	2.16°	Potentially Noticable	-	Topography	MODERATE	-	-
BWF29	-	6.26 km	Potentially Noticable	1.37°	Potentially Noticable	60%	Vegetation & Distance	MODERATE	LOW	LOW
BWF30	-	8.55 km	Potentially Noticable	1.01°	Potentially Noticable	60%	Vegetation & Distance	MODERATE	LOW	LOW

TABLE 13: Viewpoint Summary



# 8.0 VIEWPOINT ANALYSIS

## 8.2 SUMMARY OF VIEWPOINT ANALYSIS

As it was discussed in the rationale for the viewpoint selection process, these viewpoints are representative of the worst case scenario. For each viewpoint, the potential visual impact was analysed through the use of a combination of the Zone of Visual Influence, 3D terrain modelling, topographic maps and on site analysis.

The visual sensitivity and visual effect of each viewpoint have been assessed which, when combined, result in an overall visual impact for the viewpoint (Refer to Study Method Tables 1 & 2). A summary of the results for each viewpoint has been included in Table 12.

Of the 30 viewpoints assessed as part of this VIA, the wind turbines would be visible from 26 of the viewpoints. Of the 26 viewpoints from which the wind turbines would be visible, 14 of these have been assessed as having a low visual impact, 7 have been assessed as having a moderate visual impact and 5 were assessed as having a high visual impact.

Generally, the further the viewpoint is from the proposed development the more wind turbines would be visible. However as the viewer distance increases the scale and therefore visual impact of the wind turbines decreases. For example, viewpoint BWF09 located off Montefiores Nr Elong Elong Road was taken from an elevated vantage point and 80% of the proposed development is visible. However due to the distance from the proposal, the visual effect is moderate as the view of the wind turbines occupies only 1.46 degrees of vertical angle.

In contrast viewpoints located close to the proposed wind turbines have a large vertical angle, yet generally a much smaller percentage of the turbines are visible due to obstruction by topography and existing vegetation. For example, viewpoint BWF24 is located within 2km of the proposal, however foreground vegetation and topography obstruct views to the majority of the wind turbines.

Of the 5 viewpoints that were rated as having a high visual impact, three were taken near involved landowners (BWF18 Meadowlands, BWF20 Glen Oak, BWF21 Strathmore). BWF13 and BWF15 were taken from the northern edge of Bodangora Village and represent the worst case scenario for the rural residential properties in Bodangora.

It is important to note these rankings are used to make a comparison between viewpoints and do not necessarily reflect the actual visual impact. Each viewpoint has local influences (such as vegetation and topography) which may potentially screen the wind farm from view. These screening factors have been noted in the viewpoint summary.



# 9.0 PHOTOMONTAGES

## 9.1 PHOTOMONTAGES

Photomontages of the proposed Wind Turbines within the existing context were prepared to assist in the impact assessment of the proposed Bodangora Wind Farm. The photomontages seek to convey the final visual image of the proposal from typical vantage points. Considerable effort was made to obtain photos in clear weather conditions to ensure that the photomontages would represent the worst case scenario. In some cases where weather conditions were poor, photomontages have been altered with a blue sky to represent the worst case scenario.

The photomontages are based on worst case scenario without the inclusion of the proposed mitigation methods. Additional photomontages are provided showing measures to mitigate the impact of the proposed wind farm and how they reduce the determined impact.

### 9.1.1 Photomontage Viewpoint Locations

A variety of indicative photomontage viewpoints have been included for the preparation of photomontages to best represent a range of distances as well as locations with differing views. A total of 9 viewpoints were selected for the production of photomontages.

Locations of the photomontages are shown in Figure 14.

MONTAGE	VIEWPOINT	NUMBER OF VISIBLE TURBINES	VISUAL IMPACT
PM01	BWF04	25	LOW
PM02	BWF09	30	MODERATE
PM03	BWF13	26	HIGH
PM04	BWF15	25	HIGH
PM05	BWF17	8	MODERATE
PM06	BWF18	23	HIGH
PM07	BWF19	4	MODERATE
PM08	BWF22	16	LOW
PM09	BWF24	4	MODERATE

TABLE 14: Photomontage Locations

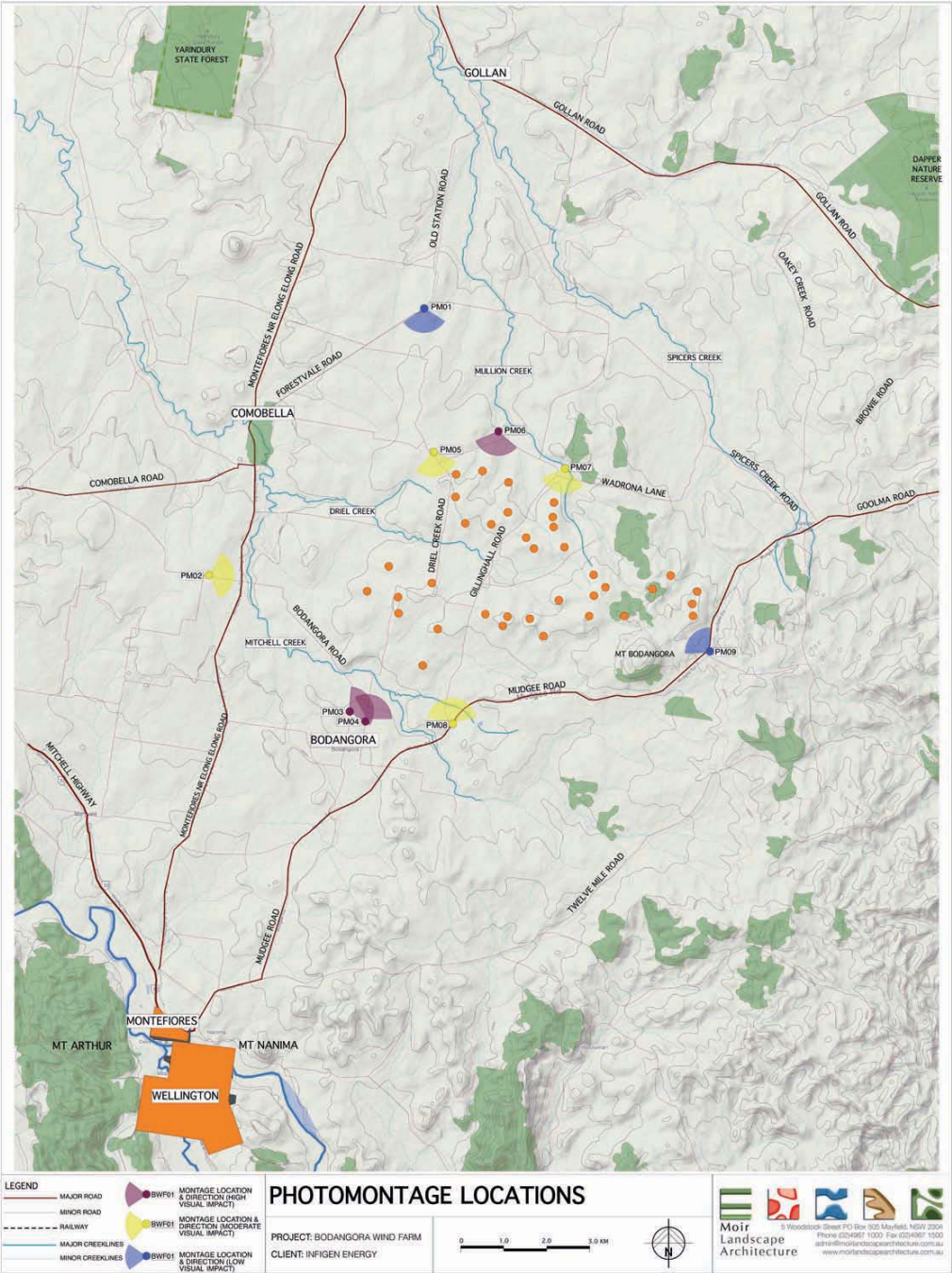


FIGURE 14: Photomontage Locations



# 9.0 PHOTOMONTAGES

## 9.1.2 Photomontage Development Process

Photomontages are representations of the Wind Farm that are superimposed onto a photograph of the Site. The process for generating these images involves computer generation of a wire frame perspective view of the Wind Turbines and the topography from each viewpoint.

The photo simulations based on photography from typical sensitive viewpoints are included within the following analysis section. The images that the photo simulations have been based on have been captured with a Canon 40D SLR digital camera with a lens of 50mm which closely represents the central field of vision of the human eye.

The process for photomontage development is demonstrated in the following example:



Computer generated display of existing and proposed wind farm using Digital Terrain Model.



Scaled perspective view of Digital Terrain Model placed over photograph of the existing landscape.



Photomontage developed using scaled photographs of wind turbines.

FIGURE 15: Photomontage Development Process

## 9.1.3 Photomontage Sky Comparisons

In addition to generating photomontages comparing the existing and proposed views, photomontages have been developed with superimposed skies to compare different backdrops. Although efforts were made to obtain photographs in clear weather, some photographs were taken with a grey sky back drop. To assist in simulating a worst case scenario, a blue sky was overalyed into each of the photomontages to provide a comparison for each viewpoint.



Proposed photomontage developed using original grey sky photograph



Proposed photomontage developed using superimposed blue sky

FIGURE 16: Photomontage Sky Comparison Development Process



# 9.0 PHOTOMONTAGES

PHOTOMONTAGE 1. BWF04- Forrestvale Road



PHOTOMONTAGE 1A: Existing view from Forrestvale Road



PHOTOMONTAGE 1B: Proposed view from Forrestvale Road



PHOTOMONTAGE 1C: Proposed view zoomed and cropped from Photomontage 1B.



PHOTOMONTAGE 1D: Comparison of backgrounds





# 9.0 PHOTOMONTAGES

## PHOTOMONTAGE 2. BWF09- Unsealed Local Road



PHOTOMONTAGE 2A: Existing view from unsealed road off Montefiores Nr Elong Elong Road.



PHOTOMONTAGE 2B: Proposed view from unsealed road off Montefiores Nr Elong Elong Road.



PHOTOMONTAGE 2C: Proposed view zoomed and cropped from Photomontage 2B.



PHOTOMONTAGE 2D: Comparison of backgrounds



# 9.0 PHOTOMONTAGES

PHOTOMONTAGE 3. BWF13- Bodangora Road



PHOTOMONTAGE 3A: Existing view from Bodangora Road.



PHOTOMONTAGE 3B: Proposed view from Bodangora Road.



PHOTOMONTAGE 3C: Proposed view zoomed and cropped from Photomontage 3B.



PHOTOMONTAGE 3D: Comparison of backgrounds





# 9.0 PHOTOMONTAGES

PHOTOMONTAGE 4. BWF15- Driel Creek Road



PHOTOMONTAGE 4A: Existing view from Driel Creek Road



PHOTOMONTAGE 4B: Proposed view from Driel Creek Road



PHOTOMONTAGE 4C: Proposed view zoomed and cropped from Photomontage 4B.



PHOTOMONTAGE 4D: Comparison of backgrounds.



# 9.0 PHOTOMONTAGES

PHOTOMONTAGE 5. BWF17- 'Westview'



PHOTOMONTAGE 5A: Existing view from 'Westview'



PHOTOMONTAGE 5B: Proposed view from 'Westview'



PHOTOMONTAGE 5C: Proposed view zoomed and cropped from Photomontage 5B.



PHOTOMONTAGE 5D: Comparison of backgrounds.

