

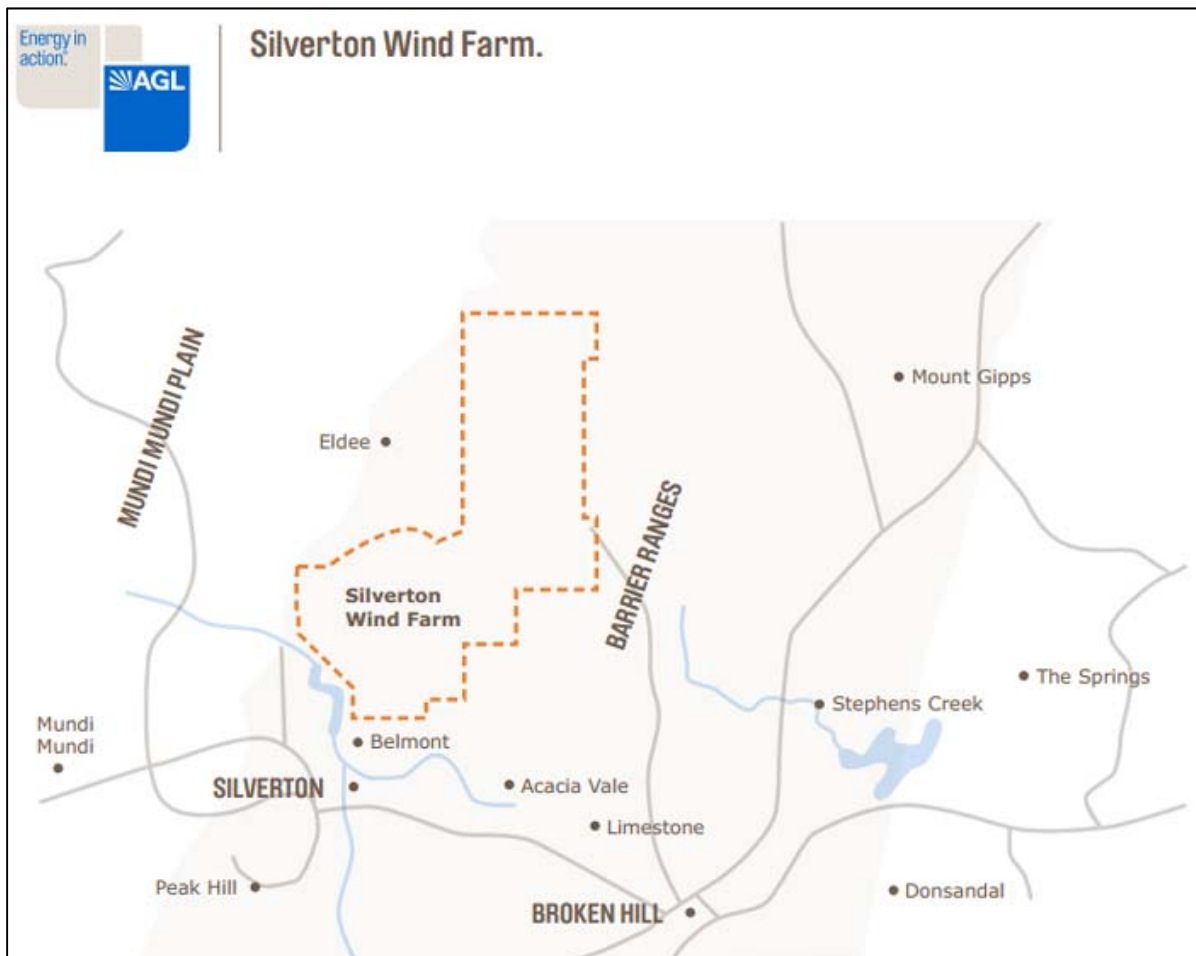
# ENVIRONMENTAL ASSESSMENT REPORT

## Silverton Wind Farm Project Approval Modification 3 (08\_0022 MOD 3) and Concept Approval Modification 2 (08\_0022 MOD 2)

### 1. INTRODUCTION

#### 1.1 Background

Silverton Wind Farm Developments, a wholly owned subsidiary of AGL Energy (AGL), has approval to construct and operate the Silverton Wind Farm (the project), located approximately 5 kilometres (km) north of Silverton and 25 km northwest of Broken Hill within the Unincorporated Area in the far west of NSW (see Figure 1).



*Figure 1: Regional Location*

The Silverton Wind Farm was approved by the then Minister for Planning on 25 May 2009. The approval comprised two stages - a project approval for Stage 1 and a larger concept approval for Stage 2.

The project approval (Stage 1) allows AGL to (see Figure 2):

- construct and operate up to 282 wind turbines up to 155 metres (m) high;
- construct and operate 5 substations and a switchyard;
- construct and operate a 24 km 220 kV transmission line connecting with an existing substation at Broken Hill; and
- install a range of ancillary infrastructure including internal access tracks, internal electricity cabling, and office and maintenance facilities.

The concept approval (Stage 2) allows AGL to construct a further 316 turbines and a 305 km transmission line (up to 500 kV) to Red Cliffs in Victoria (see Figure 2). However, as Stage 2 comprises a concept approval, AGL would not be able to construct and operate these components of the wind farm without a further project approval.

The Silverton Wind Farm is also declared to be a “critical infrastructure project” under the *Environmental Planning and Assessment Act* (EP&A Act), in accordance with an order made by the then Minister for Planning on 25 February 2008 concerning energy generating developments with capacity to generate at least 250 megawatts (MW).

The declaration of the proposed Silverton Wind Farm as “critical infrastructure” means that the project is, in the opinion of the Minister, essential for the State of NSW for economic, environmental or social reasons.

## **1.2 Project Setting**

The project is located in the southern portion of the Barrier Ranges which comprise a series of northeast and northwest trending rocky ridges rising up to 300 m above the surrounding plains.

The landscape in the surrounding plains predominantly consist of undeveloped, flat lands which have been subject to heavy disturbance from grazing activities and feral animals. Native vegetation in the area is sparse and typical of the communities found in the arid zone. However, there are a number of threatened species and endangered ecological communities that occur in the region, particularly in the Barrier Ranges.

There are no major perennial watercourses in the area, although a series of ephemeral creeks are present throughout the site. The key water feature in the vicinity of the project is the Umberumberka Reservoir which is owned by Essential Energy and managed by Essential Water. The reservoir is located less than 1 km to the west of the project, and provides part of the water supply for Silverton and Broken Hill. There is also a water pipeline from the Stephens Creek Reservoir which transects the project site.

Silverton is the main township in the area and has a population of less than 100. The town is located approximately 5.5 km south of the project, and has a number of tourist attractions including art galleries, museums, lookouts, heritage walking trails, and has been a popular setting for producing feature films.

Apart from a number of residences on the northern edge of Silverton, there are only 4 residences within 6 km of the project – Belmont Station, Eldee Station, Purnamoota, and a caretaker’s cottage near Umberumberka Reservoir (see Figure 2). The cottage is owned by Essential Energy and managed by Essential Water (formerly Country Water).

Apart from some road reserves, the project site comprises Crown land, which is leased for grazing purposes to 4 leasees under the *Western Lands Act 1901*. AGL has made lease arrangements directly with the NSW Department of Industry – Lands that allow it to construct and operate the project on the site. AGL also has in place agreements with the 4 leasees to compensate for loss of land and general impacts on their day-to-day operations (including the leaseholders of Belmont Station, Eldee Station, and Purnamoota). However, for the purposes of the assessment, any residence located on leasehold land has been conservatively treated as a privately-owned non-associated residence.

Major transport links in the region include the Silver City Highway and Barrier Hill Highway which provide access to Broken Hill. Silverton Road is the only sealed road that provides access to Silverton. A series of local roads including Daydream Mine Road and Wilangee Road provide access to the project site (see Figure 2).

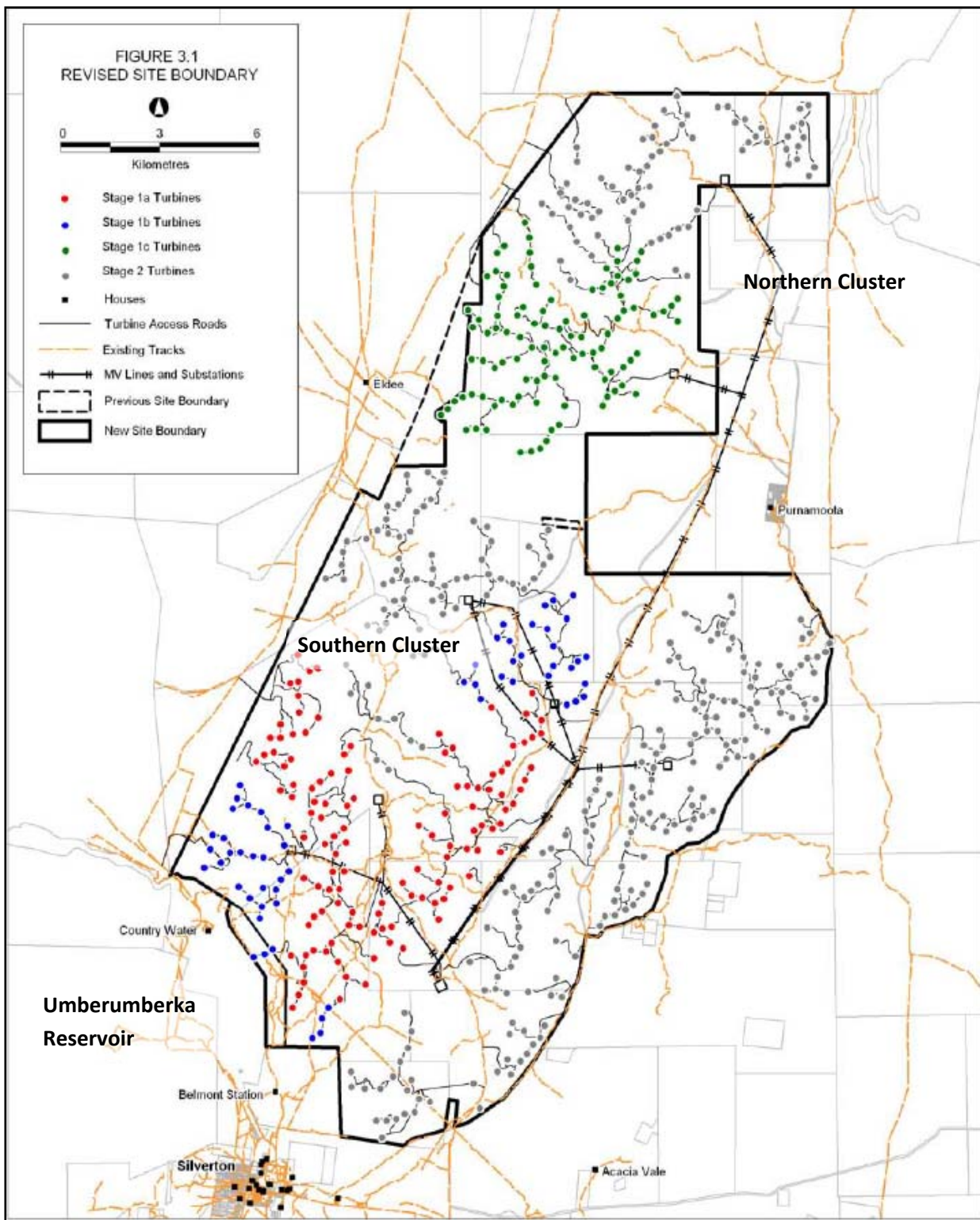


Figure 2: Approved Project (Stage 1 and Stage 2)

## 2. PROPOSED MODIFICATION

AGL is seeking to modify both the project approval (08\_022 MOD 3) and the concept approval (08\_022 MOD 2) for the Silverton Wind Farm.

The modification to the project approval involves (see Figure 3):

- reducing the maximum number of turbines from 282 to 172;
- increasing the maximum turbine tip height from 155 m to 180 m and rotor diameter from 110 m to 140 m;
- increasing the maximum turbine generation capacity from 3.6 to 5 MW; and
- taking water for construction from an existing pipeline between the Stephens Creek and Umberumberka Reservoirs (instead of a temporary pipeline to the Umberumberka Reservoir).

The modification is described in detail in the Environmental Assessment (EA) submitted in support of the application (see Appendix C).

The modification to the concept approval is administrative in nature, and involves removing various elements associated with Stage 2 of the original concept plan to ensure it is consistent with the project approval (as modified).

Since the application was lodged, AGL has removed another 2 turbines (B009 and B013) from the proposed layout to reduce visual impacts on the caretaker's residence at the Umberumberka Reservoir (i.e. VL6) and the public viewpoint at VL8 (see Figure 3).

As a result of these changes, the total number of turbines proposed is 170. However, AGL has advised that due to capacity constraints in the electricity network, the project would have an initial installed capacity of 200 megawatts (MW), which equates to approximately 60 turbines. While there are no immediate plans to upgrade the transmission line capacity, AGL wishes to retain the right to construct and operate all 170 turbines.

## 3. JUSTIFICATION

AGL's primary justification for the proposed modification reflects the general industry trend where developers are taking advantage of improvements in technology to enable similar energy outputs to be achieved with fewer, larger turbines. The larger turbines are able to generate electricity at lower wind speeds and therefore increased efficiency.

In this case, the original EA considered turbines with a capacity of up to 3.6 MW, and AGL is proposing to install turbines with a capacity of up to 5 MW. AGL advises that increasing the dimensions and capacity of the turbines would increase the efficiency by around 10%.

AGL has also put forward a number of economic, social and environmental benefits of the proposed modification.

From an economic perspective, the initial development of a 200 MW wind farm involves capital investment of \$500 million and creation of up to 150 jobs during construction and 10 jobs during operations. This level of investment and job creation would result in significant flow-on benefits to the regional economy.

The project would also contribute to the Australian and NSW Government greenhouse gas reduction and renewable energy policies, including the national *Renewable Energy Target* and the NSW *Renewable Energy Action Plan*.

In this regard, the project would initially produce 700,000 MWh of renewable electricity per annum, which is enough to power 120,000 average Australian homes and offset the carbon dioxide equivalent of around 170,000 cars. If the network capacity is upgraded and all the turbines are installed, the renewable benefits of the project would almost triple.



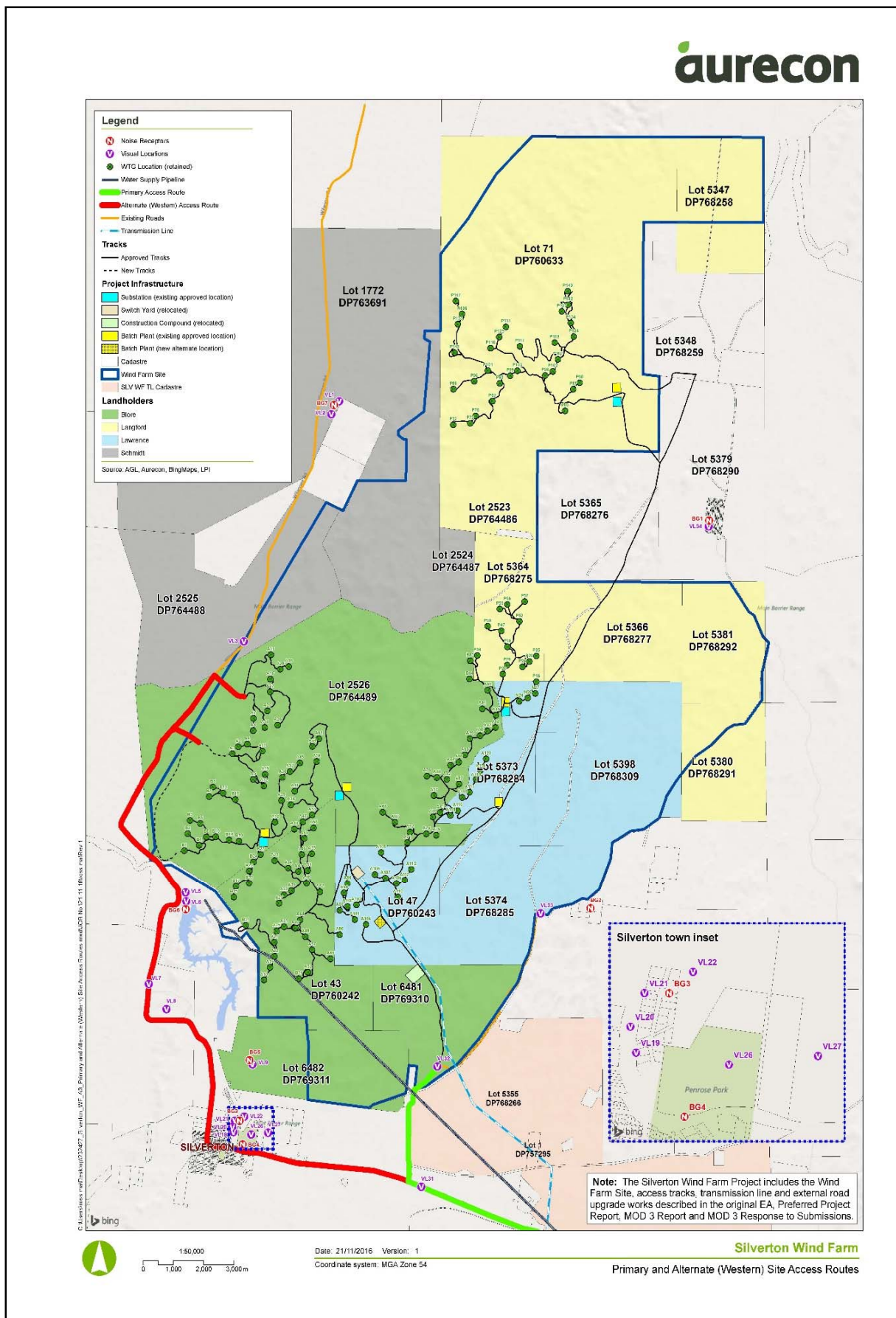


Figure 3: Proposed Modification

From a community perspective, AGL has been progressing a community enhancement program in consultation with the Silverton Village Committee that involves:

- provision of 5 kW solar PV systems for residents in Silverton (up to \$140,000);
- provision of domestic water tanks for the residents of Silverton (up to \$100,000);
- a community fund of approximately \$15,000 per year to assist in funding local community and environmental projects; and
- a feasibility study into improving mobile reception in the local area and up to \$50,000 towards any recommended works.

In developing the modified layout, AGL has also targeted the deletion of turbines nearest to sensitive receptors to reduce the potential visual and noise impacts of the project (see Figure 3). In particular, the setback from the northern edge of Silverton would be increased by around 800 m to a distance of approximately 5 km.

Finally, the removal of 112 approved turbines would significantly reduce the length of internal access tracks required for the project from 208 km to around 177 km. This would be offset to some extent by the larger turbine footings and hardstand areas, with the overall disturbance footprint reducing from 237 to 226 hectares (ha) (a reduction of 11 ha compared with the approved project).

#### **4. STATUTORY CONTEXT**

The project was originally approved under the former Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Although Part 3A was repealed on 1 October 2011, the project remains a 'transitional Part 3A project' under Schedule 6A of the EP&A Act. Under the current savings provisions, both the project approval and concept approval are to be modified under the former Section 75W of the EP&A Act.

The Minister for Planning is the approval authority for the modification applications. However, under the Minister's delegation of 14 September 2011, the Planning Assessment Commission must determine the applications. This is because AGL has made reportable political donations.

The modification requests do not seek approval for a new and fundamentally different project, but for an overall compression of the scale of an existing project in the same location. Although individual turbines are proposed to increase in size, the turbines would be located in the existing approved locations and at a reduced density.

Based on its assessment (see Section 5 below), the Department considers that the proposed changes would reduce the overall environmental impacts of the project compared to what is already approved.

Consequently, the Department is satisfied that the proposed changes can be characterised as a modification to the current project approval, and that the proposed modification can be considered within the scope of Section 75W of the EP&A Act.

#### **5. CONSULTATION**

The Department publicly exhibited the application and accompanying documentation from 5 August until 29 August 2016.

During the exhibition period, the Department received 12 submissions including 9 from government agencies and 4 from the general public. Following the exhibition of the EA, representatives from the Department visited the site on 27 September 2016, and met with the Silverton Village Committee and neighbouring leaseholders to get a better understanding of the key concerns associated with the proposed modification.

Of the 4 community submissions, 3 objected to the proposed modification and one provided comments. The Department notes that all submissions came from residents in the immediate vicinity of the project (i.e. within 6 km).

On 11 October 2016, the Department also received a petition with 56 signatures raising similar concerns to the public submissions about the impacts of the original project and the proposed modification on the Barrier Ranges and the local tourism industry (see Appendix F). The Department understands that around 25% of the signatures on the petition were from Silverton, with the remainder primarily visitors to the area.

AGL has undertaken extensive consultation with the local community and government agencies during the assessment process. It has provided regular updates to the project Community Consultative Committee, held meetings with the Silverton Village Committee and neighbouring landholders, and arranged a site inspection that was attended by several members of the local Silverton community.

Details of AGL's consultation in regard to the proposed modification are provided in its EA (see Appendix C).

AGL also provided a response to the issues raised in submissions (see Appendix E), and the Department has considered this response in its assessment of the merits of the proposed modification.

### **5.1 Agency Advice**

While none of the agencies objected to the proposed modification, several commented on particular aspects of the proposal and recommended conditions. These comments and recommendations are summarised below, and considered in more detail in Section 5 of this report.

The **Civil Aviation Safety Authority (CASA)** considered the project is unlikely to be a hazard to aviation safety given the limited levels of civilian air activity in the area. However, CASA noted that because the turbines would penetrate the navigable airspace (i.e. 500 feet), AGL would be required to notify Airservices Australia and the operators of Broken Hill Airport to ensure airspace procedures (i.e. the Lowest Safe Altitude) were adjusted to cater for the modified layout. CASA also requested that Airservices Australia be notified of the final turbine coordinates and survey heights. The Department has reflected these requirements in the recommended conditions.

**Airservices Australia** noted that the wind turbines would affect procedures at Broken Hill Airport but identified a number of mitigation measures that could be implemented to accommodate the project, subject to agreement by CASA and the operators of Broken Hill Airport. Airservices Australia noted that the wind farm would not adversely affect the performance of any Airservices Communication, Navigation and Surveillance (CNS) facilities.

**Department of Industry – Division of Resources and Energy (DRE)** noted that the proposed modification would have a lower impact on exploration activities than the approved project. The Division supports the project as it aligns with government policy to increase renewable energy generation, jobs and investment in NSW. DRE also recommended consultation with the applicant for Exploration Licence Application No. 5318. The Department notes AGL subsequently undertook this consultation in September 2016.

**Department of Primary Industries (DPI)** noted the reduced overall disturbance footprint would lower the potential for erosion and sedimentation impacts, but that the proposed controls would need to be adjusted to cater for the larger turbine footings. Existing approval conditions were supported, with the addition of a condition requiring compliance with DPI's *Guidelines for Watercourse Crossings on Waterfront Land*. The Department agrees and has reflected the recommended guideline requirements in the modified conditions.

**Environment Protection Authority (EPA)** advised it supports the proposal and recommended the inclusion of contemporary noise conditions in the modified conditions, including noise criteria for specific residences. The EPA also noted that an Environmental Protection Licence would be required for the project. The Department updated the conditions in consultation with EPA, as discussed further in Section 5 of this report.

**Office of Environment and Heritage (OEH)** acknowledged that the proposed modification would result in less disturbance and hence an overall reduction in biodiversity and heritage impacts. OEH requested

further clarification on the vegetation clearance calculations, which AGL responded to in its response to submissions. OEH raised some concerns about the potential for increased bird and bat strike risk as a result of the larger turbines (specifically in relation to a number of 'outlier' turbines) and recommended that further measures to address these risks be outlined in a Bird and Bat Adaptive Management Plan. The Department has considered this issue further in Section 5 of this report.

**Wentworth Shire Council** stated it had no objections.

**Broken Hill City Council** did not provide a formal submission on the application, but verbally advised it had no concerns with the project. However, on 15 November 2016, Council wrote to the Department requesting AGL be required to enter into a Voluntary Planning Agreement with Council (see Appendix G). This matter is further discussed in Section 5.4.

## 5.2 Public Submissions

Submissions and community feedback received by the Department raised concerns about the broader impacts of the project on the Barrier Ranges and Silverton, including impacts on the landscape, biodiversity and heritage values of the region. There was particular concern about the implications of these impacts on the local tourism industry.

While the Department acknowledges the concerns of the community about the project, many of these issues were fully considered during the assessment of the original project, and are not directly relevant to the assessment of the current modification.

Notwithstanding, the Department has considered the issues raised in submissions and has sought to strengthen and clarify the existing conditions of approval to address some of the community's concerns.

The Department has summarised the key issues raised in public submissions in Table 1, and has considered these issues further in Section 5. Full copies of all submissions are included in Appendix D.

**Table 1:** Summary of issues raised in submissions

<b>Issue</b>
<ul style="list-style-type: none"> <li>• <i>Visual:</i> <ul style="list-style-type: none"> <li>- additional visual impacts as a result of the increased turbine heights;</li> <li>- concerns about the proximity of the project and calls to impose a 6 km buffer for Silverton; and</li> <li>- adverse effects of shadow flicker and shadows for artists, photography and tourism.</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• <i>Noise:</i> <ul style="list-style-type: none"> <li>- increase in noise from larger turbines and failure to consider noise impacts associated with 5 MW turbine models; and</li> <li>- health impacts associated with infrasound from wind turbines.</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• <i>Aviation:</i> <ul style="list-style-type: none"> <li>- several landing strips were not identified in the EA; and</li> <li>- turbines would breach the Lowest Safe Altitude (LSALT – i.e. 500 feet) and interfere with operations at local landing strips.</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• <i>Other issues:</i> <ul style="list-style-type: none"> <li>- larger turbine footings would increase water demand during a period of water scarcity in the region;</li> <li>- increased noise and visual impacts would affect tourism in the area; and</li> <li>- interference with local telecommunications.</li> </ul> </li> </ul>



## 6. ASSESSMENT

In assessing the merits of the modification application, the Department has considered the:

- existing conditions of approval;
- previous EAs for the project, including previous modifications;
- EA for the proposed modification;
- submissions and AGL's response to submissions;
- applicable government policies and guidelines; and
- requirements of the EP&A Act.

The following is a summary of the findings of this assessment.

### 6.1 Visual

The Department considers that the targeted removal of 112 turbines from the approved layout has resulted in a material reduction in the overall density of the turbines in the landscape, an increase in the setback from residences and key viewing locations, and in some cases, a reduction in the number of turbines that would be visible.

The Department acknowledges that the proposed turbines are larger than those approved. However, apart from the caretaker's residence (VL6), the nearest residence would be over 2.5 km from the closest turbine, with the next nearest residence approximately 4 km away (VL2).

At these distances, the Department considers that a 25 m increase in tip height of a turbine would be difficult to distinguish, and any increase would be more than offset by the reduced number of turbines proposed. This is illustrated in photomontages prepared by AGL for Eldee Station (VL2) and the northern edge of Silverton near VL22 (see Figures 4 and 5).

Figures 6 and 7 show the deletion of turbines in more detail, and Table 2 sets out the revised setback distances from surrounding residents and public viewpoints.

**Table 2:** Comparison of receiver proximity to nearest turbines (\*indicates agreements in place with landowner)

Location	Distance from Approved Layout	Distance from Modified Layout
<i>Non-associated residences</i>		
VL2 (Eldee Station)*	2.46 km	4.00 km
VL6 (Caretaker's Residence)	1.58 km	1.63 km
VL9 (Belmont Station)*	1.91 km	2.57 km
VL19 (Silverton)	4.28 km	5.02 km
VL20 (Silverton)	4.06 km	4.78 km
VL21 (Silverton)	3.95 km	4.68 km
VL22 (Silverton)	3.83 km	4.58 km
VL27 (Silverton)	4.16 km	5.05 km
VL34 (Purnamoota)*	5.35 km	5.92 km
<i>Businesses and Public Viewpoints</i>		
VL5 (Umberumberka lookout)	1.43 km	1.49 km
VL8 (Mundi Mundi Plains lookout)	3.37 km	3.37 km
Silverton	4.78 km	5.50 km
VL33 (Daydream Mine)	4.99 km	5.41 km



Photomontage 1 - Eldee Station Homestead. View toward the original LVIA (2008) Stage 2 Silverton Wind Farm layout



Photomontage 1 - Eldee Station Homestead. View toward the Mod-3 wind turbine layout.

**Figure 4:** Photomontage from Eldee Station looking east



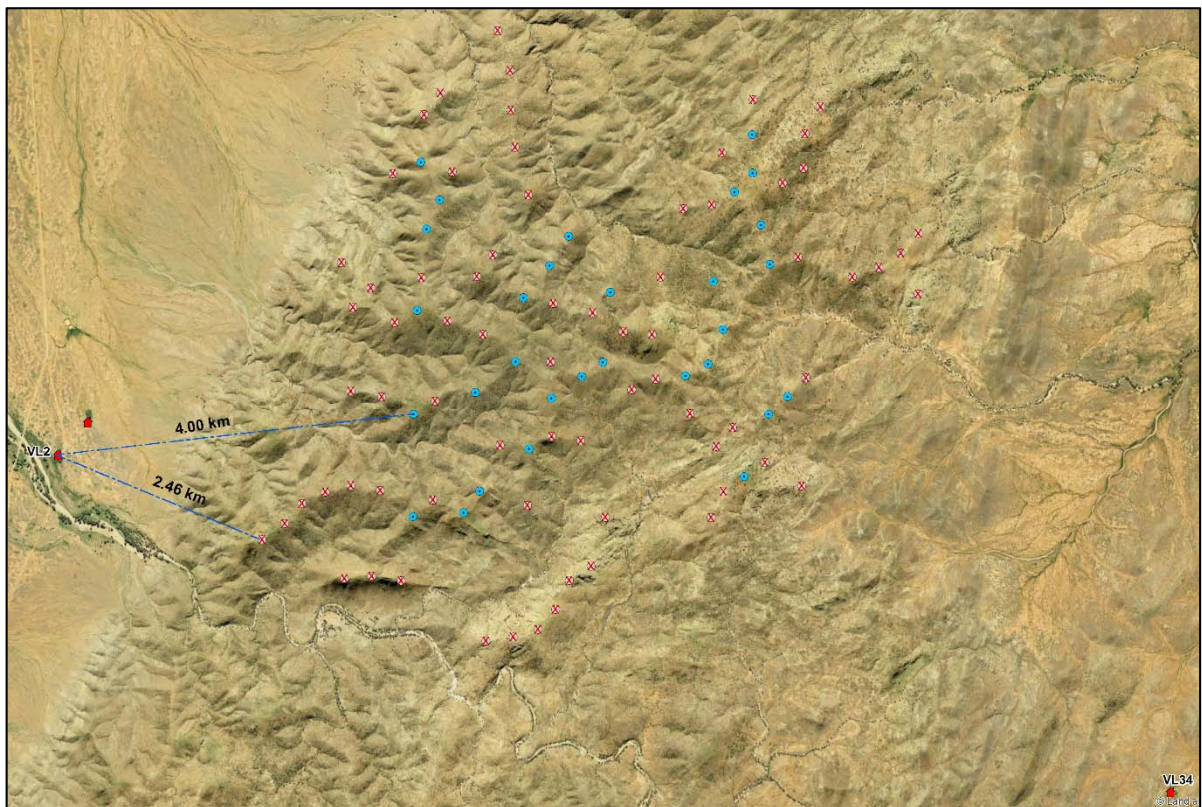
Photomontage 4 - North Silverton. View toward the LVIA Stage 1 Silverton Wind Farm layout



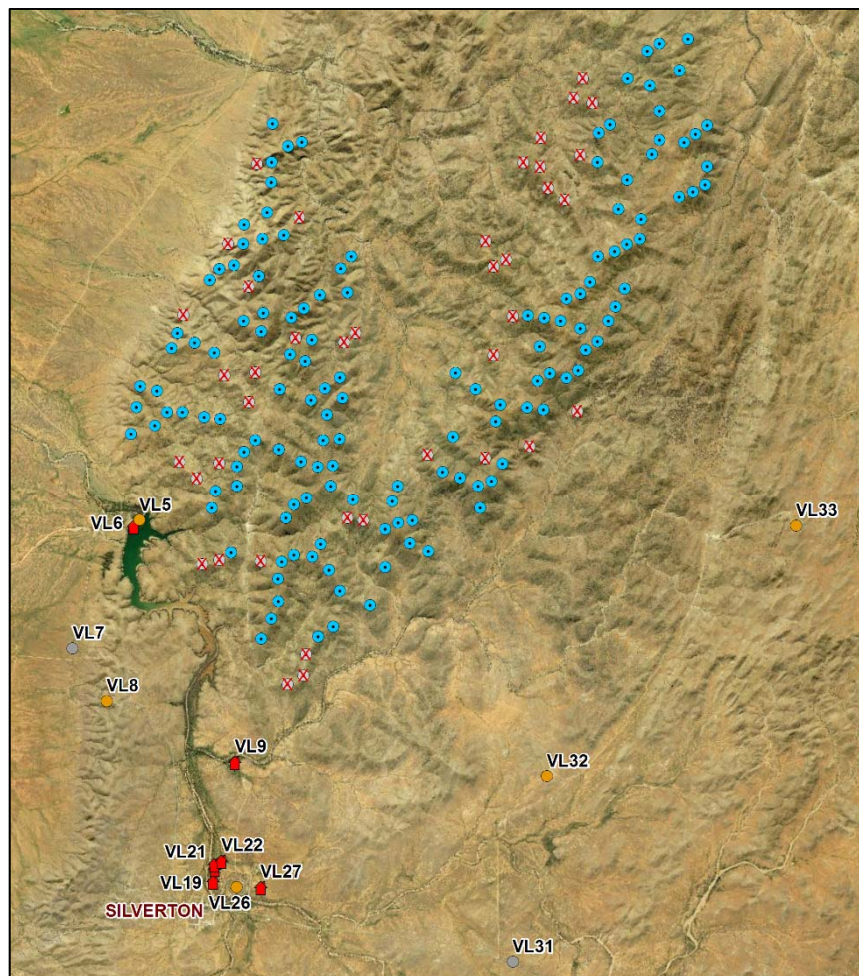
Photomontage 4 - North Silverton. View toward the Mod-3 wind turbine layout.

**Figure 5:** Photomontage from Silverton looking north





**Figure 6: Northern Cluster – Deleted Turbines**



**Figure 7: Southern Cluster – Deleted Turbines**



Umberumberka Reservoir

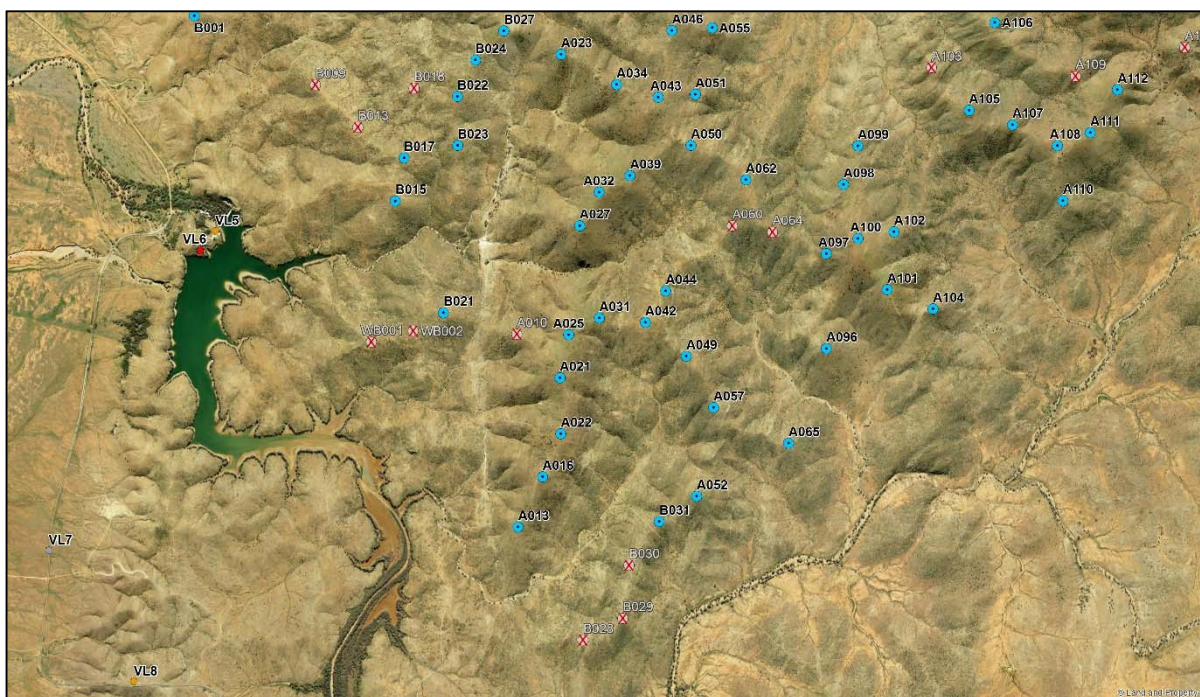
During the assessment process, the Department raised concerns about the visual impacts of the larger turbines on the caretaker’s residence (VL6), and the nearby Mundi Mundi Lookout (VL8).

In response to these concerns AGL is now proposing to delete two more of the closest turbines to the caretaker’s residence (B009 and B013), in addition to the turbines it already proposes to delete in this precinct (see Figure 8).

While this would only marginally decrease the setback from the residence (from 1.58 to 1.63 km), it would reduce the total number of turbines visible from the residence, and the extent of the horizontal view where turbines would be visible.

When combined with the proposed deletion of B018, WB001 and WB002 in particular, the Department considers that the visual impacts on the residence would be similar or slightly less than the approved project. The Department also notes that the residence is owned by Essential Energy and managed by Essential Water, and while the caretaker has raised concerns about visual impacts, no concerns have been raised by the owner/manager of the property.

In regard to the Mundi Mundi Lookout, AGL argues that the orientation of the lookout focus on the plains to the west and not eastwards towards the Barrier Ranges. It also notes that 6 of the 11 turbines in the vicinity of the lookout would be deleted, and the closest turbine would be well over 3 km away. The Department accepts these arguments, and considers that with the deletion of the turbines, the proposed modification would not result in any material increase in the visual impacts at this location.



**Figure 8: Deletion of Turbines near Umberumberka Reservoir**

Silverton

The Department recognises the concerns of the community about the visual impacts of the project on the landscape of the Barrier Ranges, and acknowledges the calls in submissions for a 6 km setback from Silverton. However, as mentioned above, the merits of the project as a whole are not under consideration, and the Department must confine its assessment to the proposed changes to the project.

In this regard, the removal of 112 turbines from Stage 1, combined with the removal of the 316 turbines associated with the Stage 2 concept approval, would substantially reduce the overall impact on the landscape values of the Barrier Ranges. That is not to say that these impacts would be eliminated, particularly in the Southern Cluster where the majority of turbines would be retained (i.e. near Silverton).

However, AGL has also taken steps to reduce visual impacts on Silverton through the deletion of 40 turbines in the Southern Cluster, and more specifically through the deletion of the 3 closest turbines (B28, B29 and B30). This increases the setback from Silverton by around 800 m to a distance of approximately 5 km, and from Belmont Station by around 700 m to a distance of about 2.6 km.

While this is not the 6 km requested in some submissions, the Department considers that the difference between 5 and 6 km would be unlikely to materially alter the residual visual impact. The Department also accepts AGL's arguments that it has acted reasonably to reduce visual impacts on Silverton, and there are technical and wind resource constraints that preclude further deletion of turbines in this part of the site.

In regard to Belmont Station, the Department understands that the leaseholders do not oppose the wind farm, and have not any raised in concerns about the proposed modification.

The Daydream Mine (VL33) is a popular tourist attraction in the region providing fully-guided underground and surface tours of the old mine workings. The Department considers that the proposed modification would not result in any significant impacts on this facility, as the mine is located over 5 km from the closest turbines, and views towards the project are partially shielded by intervening topography.

#### Shadow Flicker

Some submissions raised concerns about shadows and shadow flicker caused by the turbines. The Department notes that shadows and shadow flicker effects tend to occur within 2 km of turbines. Beyond this, the intensity of shadows is too diffuse to cause significant annoyance. Consequently, even with the larger turbines, the Department would not expect any significant shadow flicker impacts on residences in the area.

The only exception is the caretaker's residence which would be around 1.6 km from the closest turbine. However, the shadow flicker assessment identified that this location would experience less than 30 hours a year of shadow flicker, which is the limit prescribed in the Department's draft *Wind Energy Policy Framework* (2016).

#### Conclusion

The Department considers that the proposed modification would result in a reduction in visual impacts on the landscape as a whole, and on the local community. The Department also considers that the proposed increase in the size of the turbines would be more than offset by the increased setback from residences and key viewing locations, and in some cases, a reduction in the number of turbines that would be visible.

Notwithstanding, the Department has recommended a range of measures to minimise and mitigate the residual visual impacts of the project. In particular, the Department has recommended that AGL be required to:

- provide visual screening for any residence or tourist accommodation facility within 6 km of a turbine;
- ensure that shadow flicker from operational wind turbines does not exceed 30 hours a year at any non-associated residence;
- ensure wind turbines components and ancillary infrastructure have minimal reflective properties and low visual contrast; and
- ensure all external lighting is designed to minimise visual impacts in accordance with applicable Australian Standards.

## **6.2. Biodiversity**

While the project site is sparsely vegetated, there are patches of Porcupine Grass which is listed as a Critically Endangered Ecological Community (CEEC) under the *Threatened Species Conservation Act 1995* (TSC Act), and two other vegetation communities identified as having high conservation value (i.e. *Mulga/Red Malee Shrubland* and *Chenopod – Red Malee Woodland/Shrubland*), occurring on the site.

The project site also provides habitat for a number of threatened fauna species including the Barrier Range Dragon (previously classified as the Tawny Dragon), which is listed as endangered under the TSC Act. The Barrier Ranges is considered to be the primary habitat for this species in NSW.



Although the overall scale of the project has been reduced, including an 11 ha decrease in the total area to be cleared, localised disturbance at the turbine locations would increase due to the larger turbine footings and hardstand areas required to accommodate the larger turbines.

However, AGL has made a commitment to comply with the existing clearing limit in the project approval, which restricts clearing of the Porcupine Grass CEEC to 0.81 ha, through careful micro-siting of turbines and access tracks.

The Department notes that there is around 400 ha of the Porcupine Grass CEEC identified in the region, and accepts the outcomes of AGL's ecological assessment which concluded the project (as modified) would not result in a significant impact on this community. The Department has also recommended that AGL also be required to prepare a Recovery Plan for the Porcupine Grass CEEC and to enhance its conservation value on the site, including developing specific performance and completion criteria.

Based on the modified layout, clearing of mallee woodland/shrubland would be reduced from 0.77 to 0.54 ha, and the Department has included the lower limit in the recommended conditions of approval.

AGL has also sought to reduce the impacts of the project on habitat for the Barrier Range Dragon through the deletion of turbines. A number of 'hotspots' for this species have been identified across the site, along with a number of 'significant rocky outcrops' which provide potential habitat.

The modified layout would remove the 2 turbines that were proposed in a known Barrier Range Dragon hotspots, and 10 out of 14 turbines located in significant rock outcrop areas. As a result of these changes, the Department considers the potential impacts on the Barrier Range Dragon would decrease as a result of the proposed modification compared to the approved project. The Department has also recommended that AGL be required to prepare and implement a management plan for the Barrier Range Dragon and to enhance the potential habitat for this species on the site.

#### Birds and Bats

OEH raised some concerns about the potential for increased bird and bat strike as a result of the larger turbines (specifically in relation to a number of 'outlier' turbines), and recommended that further measures to address these risks be outlined in a Bird and Bat Adaptive Management Plan.

A Bird and Bat Risk Assessment for the proposed modification was undertaken by NGH Environmental. The assessment concluded that the overall collision risk to birds and bats would be lower due to the reduction in the total Rotor Swept Area (RSA) for the project of 32,185 m<sup>2</sup>.

However, the assessment noted that the larger 140 m rotor diameter would increase the individual RSA of each turbine by up to 5,887 m<sup>2</sup> and would also lower the minimum ground clearance (tip to ground distance) to 29.5 m (i.e. 4.5 m lower than the approved turbine design).

The assessment found that these factors may mean there is an increased collision risk to birds and bats in specific locations (proximity to woodland vegetation communities and 'outlier' turbines) than previously identified.

AGL proposes to manage these risks through appropriate micro-siting of turbines (including applying appropriate buffer distances to treed vegetation and fauna habitat) and the development of monitoring and mitigation measures as part of a Bird and Bat Adaptive Management Plan for the project.

#### Conclusion

Overall, the Department considers that the proposed modification would reduce biodiversity impacts compared with the approved project, and that any residual impacts can be managed through careful design and micro-siting of turbines and other infrastructure.

To ensure this occurs, the Department has recommended that AGL be required to:

- comply with strict clearing limits for the Porcupine Grass CEEC and mallee woodland/shrubland communities;
- enhance the Porcupine Grass CEEC to ensure a net gain in the conservation value of this community on the site, including performance and completion criteria that would need to be met over the life of the project;

- avoid any development within mapped Barrier Range Dragon hotspots;
- locate turbines as far away as practicable from treed vegetation, rocky outcrops, caves and disused mine shafts/sites;
- setback turbines at least 200 m from any raptor nests; and
- provide final layout plans demonstrating how micro-siting has been applied to avoid impacts on known threatened fauna locations and habitat.

AGL would also be required to prepare a detailed Biodiversity Management Plan and Bird and Bat Adaptive Management Plan for the project, in consultation with OEH and Department of Industry – Lands. These documents would include a description of the measures that would be implemented to achieve with the obligations set out above, and a detailed program for monitoring and reporting on the performance of the project over time.

### **6.3. Noise**

A number of submissions raised concerns about the potential for increased noise from the larger turbines and that the assessment failed to consider noise impacts associated with 5 MW turbine models.

The EA includes a Noise Impact Assessment undertaken by SLR Consulting Australia Pty Ltd (SLR) in accordance with the applicable guidelines. SLR developed a worst-case noise profile based on 4 turbine models under consideration by AGL. All of these turbines were within the 3.2 to 3.6 MW range.

While it is recognised that the noise spectrums used in the assessment did not include a 5 MW turbine model, advice from the Department's noise expert indicates that the noise levels used in the assessment were very conservative, and likely to be 1 to 2 dB higher than the noise generated by a typical 5 MW turbine.

The Department accepts this advice, and notes that regardless of the final model selected, AGL would be required to comply with the noise limits in the project approval at all receivers, and the noise would be subject to compliance monitoring to ensure this is the case.

In this regard, the noise predictions indicate that compliance with the applicable criteria would be readily achievable at all residences, including at the caretaker's residence (VL6) which is located around 1.6 km from the closest turbine. This is consistent with the Department's experience which indicates that noise limits can usually be achieved at distances of 1.2 to 1.3 km from turbines.

The EPA recommended the retention of the existing conditions, subject to some technical updates, and the addition of conditions identifying noise limits at specific residences. The Department has recommended conditions to reflect the advice of the EPA.

Finally, the Department acknowledges the concerns of some members of the community about the health impacts of infrasound and low frequency noise associated with wind turbines. The Department's draft *Wind Energy Policy* (2016) refers to the advice of the National Health and Medical Research Council (NHMRC) in regard to this matter. In a statement released in 2015, the NHMRC states that '*there is currently no consistent evidence that wind farms cause adverse health outcomes in humans*'. Based on this advice, the Department does not consider that the proposed modification (or the project as a whole) would result in any adverse health outcomes for the local community.

### **6.4. Other issues**

The Department has summarised its assessment of a range of other matters in Table 3.

**Table 3: Assessment of Other Issues**

Summary of Assessment	Recommendation
<b>Heritage</b>	
<ul style="list-style-type: none"> <li>While localised ground disturbance would increase due to the larger turbine footings and hardstand areas required, the overall reduction in scale of the project would reduce the number of heritage items impacted from:                             <ul style="list-style-type: none"> <li>403 to 296 Aboriginal artefacts (a reduction of 107); and</li> <li>65 to 34 non-indigenous heritage items (a reduction of 31).</li> </ul> </li> <li>As no new turbine locations have been proposed in the modification, the Department considers that the proposed modification would not materially increase impacts on identified heritage items.</li> <li>The current approved management regimes and protection hierarchy of avoid, salvage and conserve would still apply to the proposed modification, including obligations to avoid sites of high significance.</li> </ul>	<ul style="list-style-type: none"> <li>Avoid any impacts on identified Aboriginal and historic heritage sites with high significance, as well as heritage items outside the project disturbance area.</li> <li>Minimise impacts on heritage items within the project disturbance area, and undertake appropriate salvage where impacts cannot be avoided.</li> <li>Prepare and implement a consolidated Heritage Management Plan, in consultation with OEH, Aboriginal stakeholders and any local historical organisations.</li> </ul>
<b>Soil &amp; Water</b>	
<ul style="list-style-type: none"> <li>The modified layout would reduce the overall disturbance of the approved project, reduce the number of crossing of ephemeral streams, and reduce the disturbance of steep slopes.</li> <li>Both DPI Water and the Department consider that the proposed modification would not increase the erosion and sedimentation impacts of the project, and that these impacts could be effectively managed using standard best practice construction techniques.</li> <li>The Department has also recommended conditions requiring AGL to ensure it does not cause any water pollution.</li> <li>In regard to water supply, AGL advises it is no longer possible to take water from the Uumberberka Reservoir, which is at historically low levels. The proposed modification allows water to be extracted from a pipeline from Stephen's Creek Reservoir, which is located approximately 12 km northeast of Broken Hill.</li> <li>AGL has advised that it has secured water allocations for the project with Essential Water.</li> </ul>	<ul style="list-style-type: none"> <li>No pollution of water, unless authorised by an Environment Protection Licence.</li> <li>Comply with applicable guidelines for controlling sediment and erosion, waterway crossings, and storage of dangerous goods during the construction and operation of the project.</li> <li>Ensure sufficient water supply is available for all stages of the project, and if necessary, adjust activities to match the available water supply.</li> </ul>
<b>Aviation</b>	
<ul style="list-style-type: none"> <li>The EA included a report on aviation related issues prepared by SGS Hart Aviation (SGS).</li> <li>One licensed aerodrome (i.e. Broken Hill Airport – 26 km southeast of the project) and 9 unlicensed airstrips were identified within 55 km of the project.</li> <li>The assessment concluded that while the proposed maximum height of wind turbines (594 ft) would penetrate navigable airspace (500 ft), the project is unlikely to be a hazard to aviation given the limited air activity in the area.</li> <li>However, both CASA and Airservices Australia recommended that AGL be required to notify the operators of Broken Hill Airport to ensure airspace procedures (i.e. the Lowest Safe Altitude) are adjusted to cater for the modified layout.</li> <li>The aviation assessment also concluded that there would be no need for night lighting of the turbines, which has been confirmed by CASA and Department of Defence.</li> <li>Some concerns were raised by the leaseholders of Eldee Station about the approaches to the local airstrip on the property. However, as the approach is on a north-northwest alignment (i.e. not towards the project site), and is over 4 km from the project, the larger turbines would be able to be readily avoided by aircraft.</li> </ul>	<ul style="list-style-type: none"> <li>Prior to the construction of any wind turbines, provide relevant aviation authorities (including Airservices Australia and Broken Hill Airport) with the coordinates and final heights of each wind turbine and mast.</li> </ul>

Summary of Assessment	Recommendation
<b>Traffic &amp; Transport</b>	
<ul style="list-style-type: none"> <li>• Traffic numbers, types of vehicles, transport routes and transport timeframes would remain the same as previously assessed.</li> <li>• None of the road authorities (RMS, Broken Hill Council, and Department of Industry – Lands) have raised any objections to the proposed modification, subject to conditions addressing road upgrades, maintenance and traffic management.</li> <li>• The Department considers that the construction and operational impacts of the project would remain essentially unchanged as a result of the proposed modification, and can be appropriately managed through suitable conditioning.</li> <li>• The Department notes that Council has recently written to AGL about some residual issues with local roads (see Appendix G).</li> <li>• However, the Department considers that the recommendation to prepare and implement a Road Upgrade and Maintenance Strategy in consultation with Council would adequately address Council's concerns about these matters.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure all heavy and over-dimensional vehicles use the designated heavy vehicle route for the project, and minimise the use of the route to the west of the Silverton Road/Daydream Mine Road intersection.</li> <li>• Prepare and implement a Road Upgrade and Maintenance Strategy for the project, in consultation with the RMS, Council and Department of Industry – Lands.</li> <li>• Prepare and implement a detailed Traffic Management Plan, in consultation with relevant road authorities.</li> </ul>
<b>Communication Systems</b>	
<ul style="list-style-type: none"> <li>• Wind farms and other infrastructure have the potential to cause interference between the transmitting and receiving locations of telecommunication systems (such as radio, televisions, mobile phones and mobile/fixed radio transmitters).</li> <li>• One public submission raised concerns about the modified turbines potentially disrupting existing telecommunication services.</li> <li>• While the Department does not consider the modified layout would result in any increased risk of interference with radio and telecommunication services, the existing approval requires AGL to 'make good' any disruption to these services caused by the project.</li> <li>• AGL has also proposed as part of its community enhancement initiatives (see below) to investigate options into improving mobile phone reception in the local area.</li> </ul>	<ul style="list-style-type: none"> <li>• Minimise any interference with radiocommunication services in the area.</li> <li>• Make good any disruption to these services as soon as practicable.</li> </ul>
<b>Community Contributions</b>	
<ul style="list-style-type: none"> <li>• AGL has been progressing a Community Enhancement Program in consultation with the Silverton Village Committee and has committed to: <ul style="list-style-type: none"> <li>- provision of 5 kW solar PV systems for residents in Silverton (up to \$140,000);</li> <li>- provision of domestic water tanks for the residents of Silverton (up to \$100,000);</li> <li>- a community fund of approximately \$15,000 per year to assist in funding local community and environmental projects; and</li> <li>- a feasibility study into improving mobile phone reception in the local area and up to \$50,000 towards any recommended works.</li> </ul> </li> <li>• The Department considers the proposed contributions are reasonable, and appropriately focus benefits towards the local Silverton community.</li> <li>• As mentioned above, Broken Hill Council requested AGL be required to enter into a Voluntary Planning Agreement (VPA) with Council (see Appendix G).</li> <li>• However, the Department notes that: <ul style="list-style-type: none"> <li>- the project is located outside the Broken Hill local government area;</li> <li>- it has no power to impose a VPA unless it is in the terms of an offer by AGL (and there is no such offer); and</li> <li>- the current application is a modification to an existing approval, and if anything would result in a reduced demand on Council infrastructure and services compared with the project as originally approved.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Implement the Community Enhancement Program, in consultation with the Silverton Village Committee, the Community Consultative Committee, and Council, and including appropriate governance arrangements for the dispersal of the annual contributions.</li> </ul>

<b>Summary of Assessment</b>	<b>Recommendation</b>
<ul style="list-style-type: none"> <li>The Department has advised Council about these limitations, and understands that Council is continuing to liaise with AGL about this matter. In this regard, the Department notes that there is nothing to prevent Council and AGL entering into a planning agreement outside the terms of the project approval.</li> <li>Notwithstanding, the Department has recommended AGL be required to consult with Council in regard to the Community Enhancement Fund, including in regard to the proposed governance arrangements.</li> </ul>	

## 6. RECOMMENDED CONDITIONS

The Department has drafted a Notice of Modification (see Appendix A) and consolidated approval that it considers would provide a robust framework for managing the environmental impacts of the project. The Department has also drafted a Notice of Modification for the concept approval (see Appendix B), which removes Stage 2 of the project and aligns this instrument with the project approval (as modified)

In modifying the project approval, the Department has taken the opportunity to update and strengthen the existing conditions to focus more on outcomes and to better reflect contemporary conditions applying to other wind farms in NSW.

In line with this approach, the Department has:

- set strict micro-siting limits;
- set strict noise criteria;
- set strict limits for clearing EECs and high biodiversity value vegetation;
- recommended environmental performance measures and limits (where applicable) relating to blasting, air quality, soil and water, biodiversity, heritage, transport, visual amenity, waste, bushfire management, rehabilitation and decommissioning; and
- consolidated the number of post-approval management plans to both strengthen and simplify the regulation of the project.

The Department has liaised with relevant government authorities in developing the recommended conditions. AGL has reviewed the recommended conditions and has raised no objections.

## 7. CONCLUSION

The Department has assessed the modification applications in accordance with the relevant requirements of the EP&A Act.

The assessment found that the modification would reduce the overall scale of the project at a broader landscape level, and would have improved environmental and amenity (specifically visual) outcomes for the local community.

Notwithstanding, the Department acknowledges the concerns of the local community about the impacts of the project as a whole, and the potential increase in impacts associated with the larger turbines. However, the Department considers that any increase in the turbine heights would be more than compensated for by the significant reduction in the number of turbines, especially the targeted deletion of the turbines closest to Silverton and other residences in the area.

The Department has drafted a detailed set of recommended conditions incorporating a range of strict environmental management, monitoring and reporting requirements. The recommended conditions that focus on performance-based outcomes to provide greater clarity for all stakeholders about the required standard of environmental performance of the project.

As is the case for all major projects in NSW, the Department and EPA would continue to have a compliance role in monitoring the ongoing environmental performance of the project and enforcing the conditions of approval.

Importantly, the modified project would still deliver a range of substantial social and economic benefits, including 200 MW of renewable energy, \$500 million of capital investment, 150 jobs during the construction phase, and \$290,000 plus \$15,000 a year towards local projects in the Silverton community.

The Department has carefully weighed the impacts of the proposed modification against the benefits. On balance, the Department considers that the benefits outweigh any residual impacts, and that the modification is approvable, subject to a range of stringent conditions.

## 8. RECOMMENDATION

It is recommended that the Planning Assessment Commission, as delegate of the Minister:

- **considers** the findings and recommendations of this report;
- **determines** the application under Section 75W; and
- **signs** the attached Notices of Modification for the project approval (see Appendix A) and concept approval (see Appendix B).

*Phillipa Duncan . 25.11.16*

Phillipa Duncan  
Team Leader  
Resource Assessments

*Michael Young 25/11/16.*

Mike Young  
Director  
Resource Assessments



**APPENDIX A: NOTICE OF MODIFICATION – PROJECT APPROVAL**

**APPENDIX B: NOTICE OF MODIFICATION – CONCEPT APPROVAL**

## **APPENDIX C: ENVIRONMENTAL ASSESSMENT**

See Department's website

[http://majorprojects.planning.nsw.gov.au/index.pl?action=view\\_job&job\\_id=7834](http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=7834)

## **APPENDIX D: SUBMISSIONS**

See Department's website

[http://majorprojects.planning.nsw.gov.au/index.pl?action=view\\_job&job\\_id=7834](http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=7834)

## **APPENDIX E: RESPONSE TO SUBMISSIONS**

See Department's website

[http://majorprojects.planning.nsw.gov.au/index.pl?action=view\\_job&job\\_id=7834](http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=7834)

**APPENDIX F: COMMUNITY PETITION**



**APPENDIX G: BROKEN HILL CITY COUNCIL LETTERS**